HALDER

STANDARD PARTS



TABLE OF CONTENTS



Erwin Halder KG	Page 2	1
Machine and Fixture Elements	Page 46	2
Clamping Elements	Page 360	3
Operating Elements	Page 554	4
Machine Elements	Page 658	5
T-Slot Systems	Page 706	6
Hole and Dowel Systems	Page 766	7
Standard Parts for Fixture Systems	Page 798	8
Multiple Clamping Systems	Page 852	9
Multi-Vices	Page 882	10
Basic Elements	Page 892	11
Zero-Point Clamping Systems	Page 902	12
Technical Data	Page 934	13



1 ERWIN HALDER KG

YOUR COMPETENT PARTNER

MADE IN GERMANY

We have been serving customers in industry and retail as a reliable and proficient partner for more than 80 years. The latest chapters in the success story of this family-owned and operated business are now written by the family‘s third generation. Never wavering from its original mission statement, the company has remained in charge of the entire process chain – from development to production to global distribution. Remaining true to the company‘s original calling as instilled by our founder, we still strive to offer our customers products and service of unrivalled quality.





KNOW-HOW

Quality and service ensured by the manufacturer
Our long years of experience have put us in a position that allows us offer you the advice and expertise necessary to implement the custom solution that fits your needs best! Our continually growing standard selection currently includes more than 12,000 items.



QUALITY

Your partner for all types of scenarios
You cannot make high-precision products without relying on high-precision production equipment. Our use of cutting-edge machine tools made by renowned manufacturers and operated by highly trained specialists is your guarantee for quality products that satisfy the highest standards.



SERVICE

Delivery promise
All orders received by 4:00pm will leave our factory on the same day.
Delivery dependability
We deliver 98.4 % of all orders received by the confirmed date.
Order hotline
Just tell us what you need. And, we will take care of the rest!
Phone +49 7392 7009-333

OUR RANGE OF SERVICES

EVERYTHING FROM A SINGLE SOURCE!

We bring our innovative staff, machinery and methods into play to help you satisfy all your manufacturing needs - whether you produce custom or standard parts, need to complete simple installation jobs or manufacture complex assemblies.

www.halder.com/HalderInside

DESIGN DEVELOPMENT	PROCUREMENT	COMPONENT INSTALLATION
SURFACE ENGINEERING	INSPECTION	MANUFAC-TURING



Halder logistics



Halder manufacturing / production

Reg.-Nr. 2460 Reg.-Nr. 2460 Reg.-Nr. 2460

Production organization approval in accordance with EASA Part 21G

Machine and Fixture Elements

Spring Plungers

EH 22030.
Spring Plungers
with ball and internal hexagon



→ p. 49

EH 22030.
Spring Plungers
with pin and internal hexagon



→ p. 51

EH 22030.
Spring Plungers
headed, with ball and internal hexagon



→ p. 53

EH 22031.
Spring Plungers
with moveable ball and internal hexagon



→ p. 55

EH 22040.
Spring Plungers
plastic



→ p. 57

EH 22050.
Spring Plungers
with ball and slot



→ p. 58

EH 22050.
Spring Plungers
with ceramic ball and slot, stainless steel A4



→ p. 60

EH 22050.
Spring Plungers
with pin and slot



→ p. 61

EH 22050.
Spring Plungers
headed, with ball and slot



→ p. 63

EH 22051.
Spring Plungers
with moveable ball and slot



→ p. 65

EH 22060.
Spring Plungers
with internal hexagon



→ p. 67

EH 22060.
Spring Plungers
with internal hexagon and seal



→ p. 69

EH 22070.
Spring Plungers
smooth



→ p. 71

EH 22070.
Spring Plungers
long



→ p. 72

EH 22080.
Spring Plungers
smooth, with collar and ball



→ p. 74

EH 22080.
Spring Plungers
smooth, long, with collar and ball



→ p. 76

EH 22080.
Spring Plungers
smooth, with collar and ball, self-clamping



→ p. 77

EH 22080.
Spring Plungers
smooth, with collar and pin



→ p. 78

EH 22080.
Spring Plungers
smooth, without collar



→ p. 79

EH 22081.
Spring Plungers
smooth, without collar, with moveable ball



→ p. 80

EH 22082.
Holders
for spring plungers



→ p. 81

EH 22090.
Spring Plungers
double-sided



→ p. 82

EH 22100.
Spring Bodies



→ p. 83

EH 2B020.
Spring Plungers
with pin and slot - INCH



→ p. 85

Machine and Fixture Elements

EH 2B030.
Spring Plungers
with pin and internal hexagon - INCH



→ p. 88

EH 2B050.
Spring Plungers
with ball and slot - INCH



→ p. 91

EH 2B080.
Spring Plungers
smooth, with collar and ball, self-clamping – INCH



→ p. 94

Index Plungers / Index Bolts

EH 22110.
Index Plungers Mini Indexes



→ p. 96

EH 22110.
Index Plungers Mini Indexes
basic type



→ p. 97

EH 22110.
Index Plungers Mini Indexes
stainless steel



→ p. 99

EH 22110.
Index Plungers Compact
with hexagon collar



→ p. 101

EH 22110.
Index Plungers Compact
with hexagon collar and locking



→ p. 103

EH 22110.
Index Plungers Compact
with hexagon collar, with T-handle



→ p. 105

EH 22110.
Index Plungers Compact
with hexagon collar and locking, with T-handle



→ p. 106

EH 22110.
Index Plungers
with mounting flange, horizontal



→ p. 108

EH 22110.
Mounting Blocks
for index bolts and index plungers, die-cast



→ p. 109

EH 22110.
Locating Bushings
for index bolts and index plungers



→ p. 111

EH 22110.
Positioning Bushings
for index bolts and index plungers



→ p. 112

EH 22120.
Index Plungers
with hexagon collar



→ p. 113

EH 22120.
Index Plungers
with hexagon collar, stainless steel



→ p. 114

EH 22120.
Index Plungers
with hexagon collar and locking



→ p. 115

EH 22120.
Index Plungers
with hexagon collar and locking, stainless steel



→ p. 116

EH 22120.
Index Plungers
without hexagon collar



→ p. 117

EH 22120.
Index Plungers
without hexagon collar, stainless steel



→ p. 119

EH 22120.
Index Plungers
threadless, weldable



→ p. 120

EH 22120.
Index Plungers
with hexagon collar, short



→ p. 121

EH 22120.
Distance Collars
for index plungers



→ p. 122

Machine and Fixture Elements

EH 22120.
Index Plungers
with mounting flange



→ p. 124

EH 22120.
Index Plungers
simple finish



→ p. 125

EH 22120.
Index Plungers
for thin-walled pieces



→ p. 127

EH 22120.
Index Plungers
with pull-ring



→ p. 128

EH 22122.
Index Plungers
with release lock



→ p. 130

EH 22122.
Index Plungers
with rapid locking head



→ p. 131

EH 22120.
Index Bolts



→ p. 132

EH 22120.
Mounting Blocks
for index bolts and index plungers



→ p. 134

EH 22120.
Index Bolts
with mounting flange



→ p. 135

EH 22120.
Index Bolts
with mounting flange, horizontal



→ p. 136

EH 22121.
Index Bolts
simple finish



→ p. 138

EH 22130.
Precision Index Plungers
with cylindrical pin



→ p. 139

EH 22130.
Precision Index Plungers
with tapered pin



→ p. 141

Lateral Spring Plungers

EH 22140.
Lateral Spring Plungers



→ p. 144

EH 22150.
Lateral Plungers
smooth, without seal



→ p. 146

EH 22150.
Lateral Plungers
smooth, with seal



→ p. 148

EH 22150.
Lateral Plungers
with plastic spring and pin



→ p. 150

EH 22150.
Lateral Plungers
smooth, without seal, with female thread



→ p. 152

EH 22150.
Lateral Plungers
smooth, with seal, with female thread



→ p. 153

EH 22150.
Eccentric Mounting Bushings
for lateral plungers, smooth



→ p. 154

EH 22150.
Lateral Plungers
with thread, without seal



→ p. 155

Machine and Fixture Elements

EH 22150.
Lateral Plungers
with thread, with seal



→ p. 157

EH 22150.
Lateral Plungers
with thread, without seal, with female thread



→ p. 159

EH 22150.
Lateral Plungers
with thread, with seal, with female thread



→ p. 161

EH 22160.
Lateral Spring Plungers
with spring steel sheet



→ p. 163

EH 2B150.
Lateral Plungers
smooth, without seal - INCH



→ p. 165

EH 2B150.
Lateral Plungers
smooth, with seal - INCH



→ p. 167

EH 2B150.
Lateral Plungers
with plastic spring and pin - INCH



→ p. 169

EH 2B150.
Lateral Plungers
smooth, without seal, with female thread - INCH



→ p. 171

EH 2B150.
Lateral Plungers
smooth, with seal, with female thread - INCH



→ p. 172

EH 2B150.
Eccentric Mounting Bushings
for lateral plungers, smooth - INCH



→ p. 173

Locking Elements

EH 22200.
Spring-Loaded Catches
DIN 6310 catches with spring



→ p. 174

EH 22260.
Door Catches



→ p. 175

EH 22260.
Clamping Catches



→ p. 176

Shaft / C-Washers

EH 22270.
Shaft-End Washers



→ p. 178

EH 22280.
Captive C-Washers
DIN 6371 with countersunk screw DIN 923



→ p. 179

EH 22290.
C-Washers
DIN 6372



→ p. 180

Machine and Fixture Elements

Lifting Pins

EH 22330.
Ball Lock Connectors
self-locking, with holder



→ p. 181

EH 22330.
Ball Lock Connectors
self-locking, with holder, compact construction



→ p. 183

EH 22340.
Ball Lock Connectors
self-locking, with holding rings



→ p. 185

EH 22350.
Lifting Pins
self-locking



→ p. 187

EH 22350.
Lifting Pins
self-locking, stainless steel



→ p. 189

EH 22350.
Locating Bushings
for lifting pins



→ p. 191

EH 22350.
Locating Bushings, plain
for lifting pins



→ p. 193

EH 22350.
Locating Bushings with Seal, plain
for lifting pins



→ p. 195

EH 22351.
Lifting Pins
self-locking, with handle



→ p. 197

EH 22352.
Threaded Lifting Pins
self-locking



→ p. 199

Ball Lock Pins

EH 22340. /EH 22350.
Ball Lock Pins
self-locking, with T-handle



→ p. 202

EH 22340. /EH 22350.
Ball Lock Pins
self-locking, with L-handle



→ p. 206

EH 22340. /EH 22350.
Ball Lock Pins
self-locking, with button handle



→ p. 210

EH 22340. /EH 22350.
Ball Lock Pins
self-locking, with safety handle



→ p. 214

EH 22360.
Clamping Pins
self-locking, with span compensation



→ p. 217

EH 22370. /EH 22380.
Ball Lock Pins
self-locking, with standard handle



→ p. 218

EH 22390.
Ball Lock Pins
self-locking, with standard handle, titanium



→ p. 222

EH 22370. /EH 22380.
Ball Lock Pins
self-locking, with elastic grip



→ p. 223

Machine and Fixture Elements

EH 22370.
Ball Lock Pins
self-locking, with combination handle



→ p. 225

EH 22380.
Ball Lock Pins
self-locking, with combination handle, precipitation-hardened



→ p. 228

EH 22370. /EH 22380.
Ball Lock Pins
self-locking, with adjustable handle



→ p. 231

EH 22400.
Socket Pins
with spring-loaded balls



→ p. 233

EH 22400.
Locating Bushings
for ball lock pins and socket pins



→ p. 234

EH 22400.
Locating Bushings
with flange, for ball lock pins and socket pins



→ p. 236

EH 22400.
Retaining Cables



→ p. 237

EH 22410. /EH 22420.
Clamp Lock Pins
with button handle



→ p. 241

EH 4210.
Ball Lock Pins
single acting - complies with NASM / MS17984



→ p. 245

EH 4211.
Ball Lock Pins
single acting - complies with NASM / MS17985



→ p. 247

EH 4212.
Ball Lock Pins
single acting - complies with NASM / MS17986



→ p. 250

EH 4213.
Ball Lock Pins
single acting - complies with NASM / MS17987



→ p. 252

Grub Screws / Thrust Pads

EH 22540.
Grub Screws
DIN 6332 with thrust point



→ p. 255

EH 22560.
Thrust Pads
DIN 6311 and low model



→ p. 257

EH 22570.
Thrust Pads
plastic



→ p. 258

EH 22570.
Grub Screws
ball-headed



→ p. 259

Mounting Pads / Fulcrum Screws

EH 22590.
Mounting Pads



→ p. 260

EH 22590.
Mounting Pads
protected against slipping



→ p. 262

EH 22590.
Mounting Pads
with fastening holes



→ p. 264

EH 22591.
Fulcrum Screws



→ p. 265

Machine and Fixture Elements

Support Legs

EH 22593.
Support Legs



→ p. 266

EH 22593.
Support Legs
protected against slipping



→ p. 269

EH 22594.
Support Legs
impact cushioning



→ p. 272

Locating and Seating Elements

EH 22600.
Seating Elements
with plastic contact surface, orienting



→ p. 273

EH 22620.
Grippers round/square
with hard metal insert, ribbed



→ p. 274

EH 22620.
Hard Metal Inserts
for locating hole



→ p. 275

EH 22620.
Hard Metal Inserts
front mounting



→ p. 276

EH 22620.
Hard Metal Inserts



→ p. 277

EH 22630.
Locating and Seating Pins
DIN 6321



→ p. 278

EH 22630.
Seating Pins
partially DIN 6321 (old norm)



→ p. 280

EH 22630.
Locating Pins
with bore hole similar to DIN 6321



→ p. 281

EH 22630.
Locating Pins
with ball end



→ p. 283

EH 22640.
Feet
DIN 6320 with threaded shank



→ p. 351

EH 22680.
Seating Pins
ribbed or pointed



→ p. 286

EH 22680.
Seating Pins
pin shape



→ p. 287

EH 22690.
Pins



→ p. 288

EH 22690.
Seating Pins
adjustable



→ p. 291

EH 22691.
Pins
with plastic contact surface



→ p. 292

Machine and Fixture Elements

Ball Elements / Push Plungers

EH 22700.
Ball-Ended Thrust Screws
headed, ball protected against rotating



→ p. 295

EH 22700.
Ball-Ended Thrust Screws
headless, ball protected against rotating



→ p. 297

EH 22710.
Ball-Ended Thrust Screws
headed, round ball



→ p. 299

EH 22710.
Ball-Ended Thrust Screws
headed, flat-faced ball



→ p. 300

EH 22720.
Ball-Ended Thrust Screws
headless, round ball



→ p. 302

EH 22720.
Ball-Ended Thrust Screws
headless, flat-faced ball



→ p. 304

EH 22720.
Ball-Ended Thrust Screws
headless, with fine-pitch thread



→ p. 307

EH 22720.
Ball-Ended Thrust Screws
headless, short



→ p. 308

EH 22720.
Ball-Ended Thrust Screws
headless, round ball and hexalobular socket



→ p. 309

EH 22720.
Ball-Ended Thrust Screws
headless, flat-faced ball and hexalobular socket



→ p. 310

EH 22760.
Thrust Screws
with brass pad



→ p. 311

EH 22760.
Thrust Screws
with plastic pad



→ p. 312

Self-Aligning Pads

EH 22730.
Self-Aligning Pads



→ p. 315

EH 22730.
Self-Aligning Pads
with hard metal ball, ribbed



→ p. 316

EH 22731.
Self-Aligning Pads
self-resetting



→ p. 317

EH 22731.
Self-Aligning Pads
with hard metal ball, ribbed and self-resetting



→ p. 319

EH 22740.
Self-Aligning Pads
adjustable



→ p. 320

EH 22741.
Self-Aligning Pads
adjustable, self-resetting



→ p. 321

Machine and Fixture Elements

Ball Casters

EH 22750.
Ball Casters
with sheet steel housing



→ p. 323

EH 22750.
Tolerance Rings



→ p. 324

EH 22750.
Ball Casters
with mounting elements



→ p. 325

EH 22751.
Ball Casters
plastic



→ p. 326

EH 22752.
Ball Casters
screwable, plain bearing



→ p. 327

EH 22753.
Ball Casters
plain bearing



→ p. 328

Retrieval Systems

EH 22800.
Positioning Sensors
pneumatic



→ p. 329

EH 22800.
Positioning Sensors
pneumatic



→ p. 330

EH 22800.
Positioning Sensors
self-aligning, pneumatic



→ p. 331

EH 22800.
Positioning Sensors
self-aligning, pneumatic



→ p. 332

EH 22800.
Monitoring Units for Positioning Sensors
pneumatic



→ p. 333

EH 22810.
Polling Units
with sensor



→ p. 336

EH 22810.
Radio Transmitters
for polling unit



→ p. 338

EH 22810.
Radio Receivers
for polling unit



→ p. 339

Oil-Sight Glasses

EH 22860.
Oil-Sight Glasses



→ p. 340

Machine and Fixture Elements

Expander® Sealing Plugs

EH 22880.
Expander® Sealing Plugs
body from case-hardened steel



→ p. 341

EH 22880.
Expander® Sealing Plugs
body from stainless steel



→ p. 342

EH 22880.
Setting Dies
for Expander® sealing plug



→ p. 343

EH 22880.
Expander® Sealing Plugs
with pull-anchor



→ p. 345

EH 22880.
Expander® Sealing Plugs
with elongated pull-anchor



→ p. 346

EH 22880.
Distance Bushings
for Expander® sealing plugs with elongated pull-anchor



→ p. 347

EH 22880.
Assembly Tools
for Expander® sealing plugs with pull-anchor



→ p. 348

Swing Bolts

EH 22980.
Swing Bolts
DIN 444, form B



→ p. 353

EH 22980.
Swing Bolts
DIN 444, form B, quality 8.8 high precision design



→ p. 354

Rod Ends

EH 22982.
Rod Ends
DIN 12240-4, with male thread



→ p. 355

EH 22982.
Rod Ends
DIN 12240-4, with female thread



→ p. 357

Clamping Elements

Nuts for T-Slots

EH 23010.
Nuts for T-Slots
DIN 508



→ p. 362

EH 23010.
Nuts for T-Slots
DIN 508, semi-finished



→ p. 364

EH 23010.
Nuts for T-Slots
DIN 508 with slip protection



→ p. 365

EH 23020.
Nuts for T-Slots
extended



→ p. 366

EH 23020.
Nuts for T-Slots
rhombus



→ p. 367

EH 23020.
Nuts for T-Slots
rhombus, semi-finished



→ p. 368

Clamping Screws

EH 23030.
T-Bolts
DIN 787



→ p. 369

EH 23040.
Studs
DIN 6379 for T-nuts



→ p. 371

EH 23040.
Studs
DIN 6379 b_1 long for T-nuts



→ p. 373

EH 23040.
Studs
with internal hexagon, similar to DIN 6379, for T-nuts



→ p. 374

Spherical / Plain Washers

EH 23050.
Spherical Washers / Conical Seats
DIN 6319



→ p. 375

EH 23050.
Spherical Washers / Conical Seats
similar to DIN 6319, stainless steel



→ p. 377

EH 23050.
Compact Spherical Washers / Conical Seats
similar to DIN 6319



→ p. 379

EH 23060.
Shaft / Plain Washers
DIN 6340 heat-treated



→ p. 380

EH 23060.
Washers
high precision design



→ p. 381

EH 23061.
Shaft / Plain Washers



→ p. 382

Clamping Elements

Clamping Nuts

EH 23070.
Fixture Nuts
DIN 6330 (height 1,5 d)



→ p. 383

EH 23080.
Collar Nuts
DIN 6331 (height 1,5 d)



→ p. 384

EH 23080.
Collar Nuts with Conical Seat



→ p. 385

EH 23090.
Extension Nuts
(height 3 d)



→ p. 386

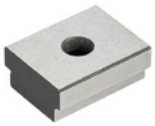
Precision Slot Nuts

EH 23100.
Drive Blocks
DIN 2079



→ p. 387

EH 23110.
Fixed Slot Tenons



→ p. 388

EH 23110.
Fixed Slot Tenons
with cylindrical fastening



→ p. 389

EH 23110.
Centering Pins



→ p. 390

EH 23110.
Centering Pins
stepped



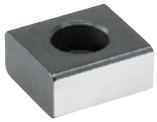
→ p. 391

EH 23120.
Loose Slot Tenons
DIN 6323



→ p. 392

EH 23130.
Low Slot Tenons



→ p. 393

Positioning Clamping Elements

EH 23111.
Positioning Clamping Pins



→ p. 395

EH 23111.
Manual Handles
for positioning clamping pins



→ p. 397

EH 23111.
Bushings
for positioning clamping pins



→ p. 398

EH 23111.
Locating Bushings
for positioning clamping pins, for press fit



→ p. 399

EH 23111.
Locating Bushings
for positioning clamping pins, for screw fit



→ p. 400

Clamping Elements

Positioning Bushings

EH 23112.
Positioning Bushings
with collar, DIN 172 A



→ p. 401

EH 23112.
Positioning Bushings
without collar, DIN 179 A



→ p. 404

Clamps

EH 23140.
Clamps
DIN 6314 flat



→ p. 407

EH 23150.
Clamps
DIN 6315 B forked



→ p. 408

EH 23160.
Clamps
DIN 6316 with goose-neck



→ p. 409

EH 23160.
Clamps
stepped



→ p. 410

EH 23170.
Clamps
with nose, closed



→ p. 411

EH 23180.
Clamps
with flat-faced ball, similar to DIN 6314



→ p. 412

EH 23180.
Clamps
with nose



→ p. 413

EH 23190.
Clamps
with soft face, similar to DIN 6314



→ p. 414

EH 23190.
Clamps
with exchangeable soft jaw



→ p. 416

EH 23200.
Supporting Elements
for clamps



→ p. 417

Straight Clamps, slotted

EH 23185.
Clamps
slotted, with adjustable counter piece



→ p. 419

EH 23185.
Clamps
slotted, with adjustable counter piece, with T-bolt



→ p. 420

EH 23185.
Clamps
slotted, with adjustable counter piece, with stud



→ p. 421

EH 23185.
Clamps
slotted, with adjustable counter piece, with stud with internal hexagon



→ p. 422

Clamping Elements

EH 23185.
Support Extensions
for straight clamps, slotted,
with adjustable counter piece



→ p. 423

Clamping Element Systems

EH 23700.
Clamping Element Systems



→ p. 424

EH 23700.
Straight Clamps
short



→ p. 426

EH 23700.
Straight Clamps
long



→ p. 427

EH 23700.
Intermediate Elements



→ p. 428

EH 23700.
Intermediate Elements
with support



→ p. 429

EH 23700.
Base Elements



→ p. 430

EH 23700.
Base Elements
swivelling



→ p. 431

EH 23700.
Base Elements
low



→ p. 432

EH 23700.
Base Elements
for location hole



→ p. 433

Horizontal Clamping Elements

EH 23210.
Down-Hold Clamps
with cranked clamping lever



→ p. 434

EH 23210.
Down-Hold Clamps
without clamping lever



→ p. 435

EH 23210.
Down-Hold Clamps
without clamping lever, with
support



→ p. 436

EH 23210.
Holding Plates
for down-hold clamps



→ p. 437

Clamping Elements

EH 23211.
Sub-Part Clamps



→ p. 438

EH 23229.
Push-Pull Clamps



→ p. 440

EH 23230.
Push Plungers
with pin, protected against rotating



→ p. 441

EH 23230.
Locating Clamps



→ p. 442

EH 23231.
Clamping Vices



→ p. 443

EH 23231.
Standard Jaws
for vices



→ p. 445

EH 23231.
Interchangeable Jaws
for vices, with pull-down effect



→ p. 446

EH 23240.
Stabilizing Clamping Jaws



→ p. 447

EH 23250.
Taper Clamping Units



→ p. 448

EH 23250.
Coverings
for taper clamping units



→ p. 450

EH 23251.
Double Edge Clamps



→ p. 451

EH 23251.
Double Edge Clamps
machinable chucks



→ p. 452

EH 23280.
Stops
cylindrical



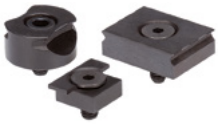
→ p. 453

EH 23290.
Pitbull® Clamps



→ p. 454

EH 23290.
Clamping Claws



→ p. 455

EH 23210.
Supporting Plates



→ p. 456

EH 23281.
Stops



→ p. 457

Supporting Elements

EH 23220.
Bedding Supports



→ p. 458

EH 23220.
Supporting Elements



→ p. 460

Clamping Elements

Floating Clamps

EH 23320.
Floating Clamps
compact construction, combined clamping and locking M 12



→ p. 462

EH 23320.
Floating Clamps
compact construction, separate clamping and locking M 12



→ p. 465

EH 23320.
Floating Clamps
combined clamping and locking M 12



→ p. 467

EH 23320.
Floating Clamps
separate clamping and locking M 12



→ p. 469

EH 23320.
Standard Clamping Jaws
for floating clamp M 12



→ p. 471

EH 23320.
Clamping Jaws
for floating clamp M 12



→ p. 472

EH 23320.
Floating Clamps
combined clamping and locking M 16



→ p. 475

EH 23320.
Clamping Jaws
for floating clamp M 16



→ p. 477

Push-Pull Clamps

EH 23260.
Clamping Devices "actima"



→ p. 478

Eccentric Clamping Elements

EH 23270.
Eccentric Clamping Clamps



→ p. 480

EH 23270.
Eccentric Clamping Washers



→ p. 481

EH 23271.
Eccentric Clamps



→ p. 482

EH 23380.
Double Eccentric Levers
with fulcrum pin



→ p. 483

EH 23390.
Eccentric Levers
with fulcrum pin



→ p. 484

EH 23390.
Eccentric Quick Clamps
with female thread



→ p. 485

EH 23390.
Eccentric Quick Clamps
with screw



→ p. 486

EH 23400.
Fulcrum Pins



→ p. 488

Clamping Elements

EH 23410.
Eccentric Clamps



→ p. 489

EH 23410.
Eccentric Clamping Modules
with shaft location



→ p. 490

Down-Thrust Clamps

EH 23310.
Down-Thrust Clamps
swivelling, size 25



→ p. 492

EH 23310.
Down-Thrust Clamps
swivelling, size 40



→ p. 494

EH 23310.
Down-Thrust Clamps
swivelling, low construction, size 44



→ p. 496

EH 23310.
Down-Thrust Clamps
swivelling, size 60



→ p. 498

EH 23310.
Down-Thrust Clamps
swivelling, size 82.5



→ p. 500

EH 23310.
Down-Thrust Clamps
moveable, size 40



→ p. 502

EH 23310.
Positioning Rings
for down-thrust clamp



→ p. 504

EH 23310.
Height Adjusting Cylinders



→ p. 505

EH 23370.
Clamping Claws



→ p. 506

Toggle Clamps

EH 23330.
Vertical Toggle Clamps
with horizontal base



→ p. 508

EH 23330.
Vertical Toggle Clamps
with vertical base



→ p. 510

EH 23330.
Vertical Toggle Clamps
with vertical base and solid support arm



→ p. 512

EH 23330.
Vertical Toggle Clamps
with vertical base and safety lock



→ p. 514

Clamping Elements

EH 23330.
Vertical Toggle Clamps
with angle base



→ p. 515

EH 23330.
Vertical Toggle Clamps
with angle base and safety lock



→ p. 516

EH 23330.
Vertical Toggle Clamps
with horizontal base and solid support arm



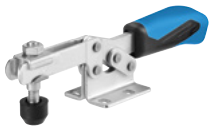
→ p. 517

EH 23330.
Vertical Toggle Clamps
with horizontal base and safety lock



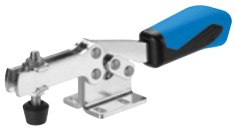
→ p. 518

EH 23330.
Horizontal Toggle Clamps
with horizontal base



→ p. 519

EH 23330.
Horizontal Toggle Clamps
with horizontal base / increased holding force



→ p. 521

EH 23330.
Horizontal Toggle Clamps
with horizontal base and solid support arm



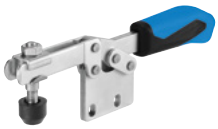
→ p. 522

EH 23330.
Horizontal Toggle Clamps
with horizontal base and safety lock



→ p. 523

EH 23330.
Horizontal Toggle Clamps
with vertical base



→ p. 524

EH 23330.
Horizontal Toggle Clamps
with vertical base and safety lock



→ p. 526

EH 23330.
Horizontal Toggle Clamps
with angle base



→ p. 527

EH 23330.
Toggle Clamps Push-Pull Type
with angle base



→ p. 528

EH 23330.
Toggle Clamps Push-Pull Type
with fastening thread



→ p. 530

EH 23330.
Toggle Clamps Hook Type
with horizontal base



→ p. 531

EH 23330.
Toggle Clamps Hook Type
vertical, with horizontal base



→ p. 533

EH 23330.
Combination Clamps
with horizontal base



→ p. 534

Compact Clamps

EH 23690.
Compact Clamps



→ p. 536

EH 23690.
Height Adapters
for compact clamp



→ p. 538

Clamping Elements

Centering Clamping Elements

EH 23340.
Centering Clamping Elements
with clamping segments



→ p. 540

EH 23340.
Centering Clamping Elements
with clamping balls



→ p. 542

EH 23340.
Centering Clamping Elements
with clamping segments, operation from the bottom



→ p. 544

EH 23340.
Centering Clamping Elements
with clamping balls, operation from the bottom



→ p. 546

EH 23340.
Centering Clamping Mandrels



→ p. 548

EH 23340.
Centering Clamping Mandrels
with lateral handling



→ p. 549

Shaft Clamps

EH 23341.
Shaft Clamps



→ p. 550

Clamping Plates

EH 23470.
Screw Jacks



→ p. 552

Operating Elements

Retaining Catches

EH 24100.
Retaining Catches
one-sided



→ p. 556

EH 24100.
Retaining Catches
double-sided



→ p. 557

EH 24101.
Retaining Catches
wing grip, one-sided



→ p. 558

U-Handles

EH 24300.
U-Handles



→ p. 559

EH 24300.
U-Handles
front mounting



→ p. 561

EH 24310.
U-Handles
with support washer



→ p. 562

EH 24310.
U-Handles



→ p. 563

EH 24320.
U-Handles
plastic, front mounting



→ p. 564

EH 24320.
U-Handles
plastic



→ p. 565

Tubular Handles

EH 24321.
Tubular Handles



→ p. 566

EH 24321.
Tubular Handles
front mounting



→ p. 567

Crank Handles

EH 24330.
Crank Handles
DIN 469 straight with square end DIN 79



→ p. 568

EH 24330.
Crank Handles
DIN 468 goose-neck form with square end DIN 79



→ p. 569

EH 24330.
Crank Handles



→ p. 570

EH 24330.
Crank Handles
stainless steel precision casting



→ p. 571

Operating Elements

EH 24331.
Crank Handles
with folding handle



→ p. 572

EH 24331.
Crank Handles
with folding handle, stainless steel



→ p. 573

Gear Lever Handles

EH 24350.
Gear Lever Handles



→ p. 574

Adjustable Clamping Levers

EH 24390.
Adjustable Clamping Levers
inner parts from stainless steel, with female thread



→ p. 575

EH 24390.
Adjustable Clamping Levers
inner parts from stainless steel, with screw



→ p. 576

EH 24400.
Adjustable Clamping Levers
with female thread



→ p. 578

EH 24400.
Adjustable Clamping Levers
with screw



→ p. 579

EH 24410.
Adjustable Clamping Levers
with clamping screw



→ p. 581

EH 24420.
Adjustable Clamping Levers
with axial bearing, with female thread



→ p. 584

EH 24420.
Adjustable Clamping Levers
with axial bearing, with screw



→ p. 585

EH 24420.
Adjustable Clamping Levers
with axial bearing from stainless steel, with female thread



→ p. 586

EH 24420.
Adjustable Clamping Levers
with axial bearing from stainless steel, with screw



→ p. 587

Operating Elements

Clamping Levers

EH 24430.
Clamping Levers



→ p. 588

EH 24440.
Adjustable Clamping Levers



→ p. 589

EH 24441.
Adjustable Flat Clamping Levers



→ p. 591

EH 24441.
Adjustable Flat Clamping Levers
stainless steel



→ p. 592

EH 24441.
Adjustable Flat Clamping Levers
with screw



→ p. 593

EH 24441.
Adjustable Flat Clamping Levers
with screw, stainless steel



→ p. 595

Clamping Levers / Clamping Nuts

EH 24470.
Clamping Levers
DIN 99



→ p. 597

EH 24470.
Clamping Nuts
welded



→ p. 598

EH 24470.
Clamping Nuts
welded, double-sided



→ p. 599

Rotating Handles

EH 24450.
Machine Handles
DIN 39



→ p. 600

EH 24460.
Rotating Machine Handles
DIN 98



→ p. 601

EH 24530.
Cylindrical Handles
rotating



→ p. 602

EH 24532.
Folding Handles
rotating



→ p. 603

Knurled Nuts / Knurled Thumb Screws

EH 24480.
Knurled Nuts
DIN 6303



→ p. 604

EH 24760.
Flat Knurled Nuts
DIN 467



→ p. 605

EH 24770.
Flat Knurled Thumb Screws
DIN 653



→ p. 606

EH 24780.
High Knurled Nuts (with Collar)
DIN 466



→ p. 607

Operating Elements

EH 24790.
High Knurled Thumb Screws
DIN 464



→ p. 608

EH 24820.
Knurled Nuts
plastic



→ p. 610

EH 24830.
Knurled Thumb Screws
plastic



→ p. 611

Tommy Nuts / Tommy Screws

EH 24490.
Tommy Screws
DIN 6304 with fixed pin



→ p. 612

EH 24500.
Tommy Screws
DIN 6306 with moveable pin



→ p. 613

EH 24510.
Tommy Nuts
DIN 6305 with fixed pin



→ p. 614

EH 24510.
Tommy Nuts
DIN 6307 with moveable pin



→ p. 615

Handles

EH 24512.
T-Handles



→ p. 616

EH 24540.
Mushroom-Type Knobs



→ p. 617

Thumb Knobs

EH 24520.
Thumb Knobs



→ p. 618

EH 24550.
Conical Knobs



→ p. 619

EH 24560.
Ball Knobs
DIN 319



→ p. 620

EH 24561.
Ball Knobs
metal types similar to DIN 319



→ p. 621

Star Grips / Star Grip Screws

EH 24650.
Star Grips
DIN 6336 cast iron



→ p. 622

EH 24660.
Star Grips
DIN 6336 light metal



→ p. 623

EH 24661.
Star Grips
DIN 6336 stainless steel die-cast



→ p. 624

EH 24670.
Star Grips
DIN 6336 plastic



→ p. 625

Operating Elements

EH 24690.
Star Grips
stainless steel



→ p. 626

EH 24690.
Grub Screws with Star Grip
stainless steel



→ p. 627

EH 24690.
Star Grips
stainless steel, solid



→ p. 628

EH 24740.
Grub Screws with Star Grip
DIN 6336 plastic



→ p. 629

EH 24750.
Star Grips
plastic



→ p. 630

EH 24750.
Grub Screws with Star Grip
plastic



→ p. 631

Palm Grips / Palm Grip Screws

EH 24620.
Palm Grips
DIN 6335 cast iron



→ p. 633

EH 24620.
Palm Grips
DIN 6335 cast iron, plastic-coated



→ p. 635

EH 24630.
Palm Grips
DIN 6335 light metal



→ p. 636

EH 24631.
Palm Grips
DIN 6335 stainless steel, die-cast



→ p. 637

EH 24640.
Palm Grips
DIN 6335 plastic



→ p. 638

EH 24700.
Palm Grips
with axial bearing



→ p. 639

EH 24730.
Grub Screws with Palm Grip
DIN 6335 plastic



→ p. 640

Torque Handles

EH 24710.
Torque Handles



→ p. 641

Operating Elements

Handwheels

EH 24570.
Disc-Type Handwheels
DIN 3670



→ p. 643

EH 24580.
Handwheels
DIN 950 cast iron



→ p. 645

EH 24590.
Handwheels
DIN 950 light metal



→ p. 648

EH 24591.
Handwheels
similar to DIN 950, stainless steel



→ p. 651

EH 24600.
Disc-Type Handwheels
light metal



→ p. 652

EH 24610.
Spoked Handwheels
light metal



→ p. 654

Clamping Screws

EH 24890.
Clamping Screws DIN 6332
headless pin combined with different handles



→ p. 656

Machine Elements

Initiator Elements

EH 25010.
Sensing Elements
with sensor adapter



→ p. 660

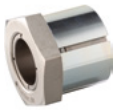
EH 25020.
Sensing Elements
with actuating bolt, protected against rotating



→ p. 661

Tapered Shaft Elements

EH 25050.
Tapered Shaft Hubs
no lock nut



→ p. 663

EH 25050.
Tapered Shaft Hubs
without lock nut, stainless steel



→ p. 665

EH 25050.
Tapered Shaft Hubs
with lock nut



→ p. 666

EH 25050.
Tapered Shaft Hubs
with lock nut, stainless steel



→ p. 668

Set Collars

EH 25069.
Set Collars



→ p. 673

EH 25070.
Set Collars
with sensor adapter



→ p. 675

EH 25071.
Set Collars
for quick setting



→ p. 676

Locking Nuts

EH 25030.
Clamping Nuts
self-locking



→ p. 677

Quick Plug Couplings

EH 25100.
Quick Plug Couplings
with radial offset compensation



→ p. 679

EH 25100.
Quick Plug Couplings
with radial offset compensation and screwed flange



→ p. 680

EH 25100.
Quick Plug Couplings
with angular and radial offset compensation



→ p. 681

Machine Elements

Levelling Feet

EH 25120.
Height Adjusting Elements



→ p. 683

EH 25120.
Height Adjusting Elements
high



→ p. 684

EH 25120.
Height Adjusting Elements
orienting



→ p. 685

Damping Elements

EH 25150.
Rubber Metal Buffers



→ p. 686

EH 25150.
Rubber Endstop Buffers
cylindrical



→ p. 688

EH 25150.
Rubber Endstop Buffers
parabolic



→ p. 690

EH 25150.
Rubber Endstop Buffers
truncated cone form



→ p. 691

EH 25151.
Silicone Endstop Buffers
truncated cone form



→ p. 692

EH 25150.
Rubber Endstop Buffers
low structure



→ p. 693

EH 25150.
Rubber Endstop Buffers
cylindrical, front mounting



→ p. 695

Hinges

EH 25160.
Hinges



→ p. 696

EH 25160.
Hinges
with mounting thread



→ p. 697

EH 25160.
Hinges
with adjustable friction resistance



→ p. 698

EH 25160.
Spacer Plates
for hinges



→ p. 699

EH 25160.
Threaded Plates
for hinges



→ p. 700

EH 25160.
Stops
for hinges



→ p. 701

T-Slot Systems

Base Elements

EH 1000.400 - EH 1000.500
Base Plates



→ p. 710

EH 1000.800
Base Plates
overall dimensions same as pallets DIN 55 201



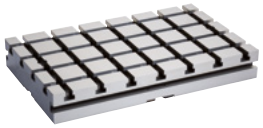
→ p. 711

EH 1002.100
Base Plates



→ p. 712

EH 1100.300 - EH 1100.500
Base Plates



→ p. 713

EH 1100.700 - EH 1103.500
Base Plates
overall dimensions same as pallets DIN 55 201



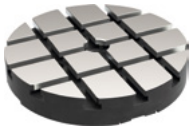
→ p. 715

EH 1101.300 - EH 1101.500
Connecting Elements



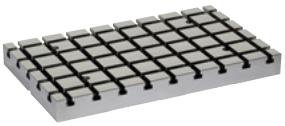
→ p. 716

EH 1102.100 - EH 1102.200
Base Plates



→ p. 717

EH 1200.300 - EH 1200.500
Base Plates
V70eco



→ p. 717

EH 1200.700 - EH 1203.500
Base Plates
V70eco, overall dimensions same as pallets DIN 55201



→ p. 719

EH 1104.300 - EH 1104.500
Supporting Plates
including accessories



→ p. 719

EH 1104.700 - EH 1104.900
Clamping Angles
modular design



→ p. 721

EH 1105.200
Clamping Angles



→ p. 723

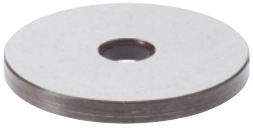
EH 1076.400
Clamping Angles



→ p. 724

Mounting Elements

EH 1007.400 - EH 1108.300
Spacers



→ p. 725

EH 1010.100 - EH 1110.100
Mounting Blocks



→ p. 725

EH 1010.200 - EH 1110.300
Mounting Blocks



→ p. 726

EH 1011.100 - EH 1111.100
Mounting Blocks



→ p. 727

T-Slot Systems

EH 1011.200 - EH 1111.300
Mounting Blocks



→ p. 727

EH 1210.100
Mounting Blocks
V70eco



→ p. 728

EH 1210.200 - EH 1210.300
Mounting Blocks
V70eco



→ p. 729

EH 1211.100
Mounting Blocks
V70eco



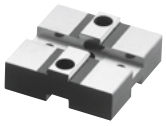
→ p. 729

EH 1211.200 - EH 1211.300
Mounting Blocks
V70eco



→ p. 730

EH 1111.700 - EH 1111.800
Intermediate Plates



→ p. 731

EH 1012.100 - EH 1112.400
Slotted Clamping Angles



→ p. 732

EH 1112.600 - EH 1112.800
Intermediate Elements



→ p. 733

EH 1013.600 - EH 1113.800
Clamping Bars



→ p. 733

EH 1114.000 - EH 1114.100
Support Clamping Bars



→ p. 734

EH 1014.500 - EH 1114.500
Stops



→ p. 735

EH 1115.100
Stops
cylindrical



→ p. 735

EH 1116.000 - EH 1116.100
Stops



→ p. 736

EH 1020.300 - EH 1121.500
Thrust Angles



→ p. 737

EH 1021.600 - EH 1021.700
Thrust Angles



→ p. 738

EH 1120.400 - EH 1122.300
Thrust Angles



→ p. 739

EH 1029.600 - EH 1129.600
T-Slot Centering Blocks



→ p. 740

EH 1030.000 - EH 1030.300
Nuts for T-Slots



→ p. 740

EH 1130.400 - EH 1130.600
T-Blocks



→ p. 741

EH 1031.100 - EH 1131.200
T-Clamping Blocks



→ p. 742

EH 1131.500 - EH 1131.700
T-Clamping Blocks



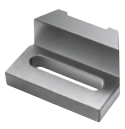
→ p. 743

EH 1032.100 - EH 1132.100
Wrenches



→ p. 743

EH 1132.500 - EH 1132.800
Butt Straps



→ p. 744

EH 1132.900
Clamping Heads



→ p. 745

T-Slot Systems

EH 1133.000 - EH 1133.200
Clamping Bars



→ p. 745

EH 1137.300
Clamping Vices
moveable jaw



→ p. 746

EH 1137.400
Clamping Vices
fixed jaw



→ p. 746

EH 1138.100
Clamping Vices
replacement jaw, soft



→ p. 747

EH 1138.400
Clamping Vices
replacement jaw, ribbed/flat



→ p. 747

EH 1139.400 - EH 1139.500
Wrenches



→ p. 748

EH 1040.300 - EH 1040.700
Locating Pins



→ p. 748

EH 1140.300 - EH 1141.500
Locating Pins



→ p. 749

EH 1141.600 - EH 1143.700
Locating Pins



→ p. 750

EH 1047.700 - EH 1147.700
Intermediate Plates



→ p. 751

EH 1047.800 - EH 1147.800
Support Clamping Bars



→ p. 752

EH 1047.900 - EH 1147.900
Supporting Plates



→ p. 752

EH 1048.200 - EH 1148.300
V-Blocks



→ p. 753

EH 1048.400 - EH 1148.400
Locating Segments



→ p. 754

EH 1048.500 - EH 1148.500
V-Blocks



→ p. 755

EH 1048.600 - EH 1148.600
Adjustable Rotating Elements



→ p. 755

EH 1149.000
Positioning Clamping Bars



→ p. 756

EH 1049.200 - EH 1149.200
Positioning Clamping Bars
two-sided



→ p. 757

EH 1162.000 - EH 1162.300
Fixed Drilling Supports



→ p. 757

EH 1163.000 - EH 1163.300
Fixed Drilling Supports
adjustable



→ p. 758

EH 1068.100 - EH 1068.300
Adapter Slot Clamping Elements
system V40/V70



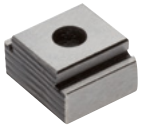
→ p. 759

EH 1068.600
Adapter Slot Centering Blocks
system V40/V70



→ p. 760

EH 1068.800
Adapter Slot Blocks
system V40/V70



→ p. 760

T-Slot Systems

Standard Ranges

EH 1090
Standard Ranges V40



→ p. 761

EH 1190
Standard Ranges V70

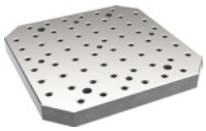


→ p. 763

Hole and Dowel Systems

Base Elements

EH 1500.200 - EH 1600.900
Base Plates



→ p. 769

EH 1501.300 - EH 1501.500
Base Plates



→ p. 770

EH 1506.200 - EH 1606.800
Clamping Angles



→ p. 771

EH 1508.200 - EH 1608.600
Clamping Cubes



→ p. 772

Mounting Elements

EH 1505.200 - EH 1605.400
Clamping Angles



→ p. 773

EH 1605.700
Clamping Angles



→ p. 774

EH 1510.100 - EH 1610.100
Consoles



→ p. 775

EH 1510.200 - EH 1610.200
Consoles



→ p. 776

EH 1511.500 - EH 1611.500
Clamping Angles



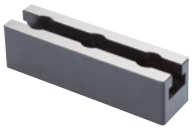
→ p. 777

EH 1512.000 - EH 1612.400
Mounting Elements



→ p. 778

EH 1513.600 - EH 1613.800
Clamping Bars



→ p. 778

EH 1614.500
Stops



→ p. 779

EH 1514.700 - EH 1614.700
Clamping Heads



→ p. 780

EH 1617.400 - EH 1617.900
Spacers



→ p. 781

EH 1520.400 - EH 1621.700
Stop Angles



→ p. 781

EH 1533.000 - EH 1633.200
Clamping Bars



→ p. 782

EH 1644.000
Thread Bolts



→ p. 782

EH 1547.900 - EH 1647.900
Supporting Plates



→ p. 783

EH 1548.100 - EH 1648.100
V-Blocks



→ p. 784

EH 1548.500 - EH 1648.500
V-Blocks



→ p. 785

Hole and Dowel Systems

EH 1548.700 - EH 1648.800
V-Block Elements right/left



→ p. 786

EH 1549.200 - EH 1649.200
Positioning Clamping Bars



→ p. 787

EH 1550.000 - EH 1650.000
Supporting Bars



→ p. 788

EH 1551.500 - EH 1651.700
Stops
cylindrical



→ p. 788

EH 1553.500 - EH 1653.500
Positioning Clamping Cylinders



→ p. 789

EH 1555.500 - EH 1655.500
Position Screws



→ p. 790

EH 1557.000 - EH 1657.000
Screw Plugs



→ p. 790

EH 1580.000
System Adapter Plates



→ p. 791

EH 1581.000
System Adapter Plates



→ p. 791

EH 1681.000
System Adapter Plates



→ p. 792

Standard Ranges

EH 1590
Standard Ranges L12



→ p. 793

EH 1690
Standard Ranges L16



→ p. 795

Standard Parts for Fixture Systems

Standard Parts for Fixture Systems

EH 22290.
C-Washers
DIN 6372



→ p. 800

EH 22540.
Grub Screws
DIN 6332 with thrust point



→ p. 800

EH 22680.
Seating Pins
ribbed or pointed



→ p. 801

EH 22680.
Seating Pins
pin shape



→ p. 802

EH 22690.
Pins



→ p. 803

EH 22700.
Ball-Ended Thrust Screws
headless, ball protected against rotating



→ p. 805

EH 22730.
Self-Aligning Pads



→ p. 806

EH 22731.
Self-Aligning Pads
self-resetting



→ p. 806

EH 22740.
Self-Aligning Pads
adjustable



→ p. 808

EH 22741.
Self-Aligning Pads
adjustable with self-resetting



→ p. 809

EH 23010.
Nuts for T-Slots
DIN 508



→ p. 810

EH 23020.
Nuts for T-Slots
extended



→ p. 810

EH 23020.
Nuts for T-Slots
rhombus



→ p. 811

EH 23040.
Studs
DIN 6379 b_1 long for T-nuts



→ p. 812

EH 23050.
Spherical Washers / Conical Seats
DIN 6319



→ p. 813

EH 23060.
Shaft / Plain Washers
DIN 6340 heat-treated



→ p. 814

EH 23070.
Fixture Nuts
DIN 6330 (height 1,5 d)



→ p. 815

EH 23080.
Collar Nuts
DIN 6331 (height 1,5 d)



→ p. 816

EH 23080.
Collar Nuts with Conical Seat



→ p. 817

EH 23090.
Extension Nuts
(height 3 d)



→ p. 818

EH 23110.
Fixed Slot Tenons
with cylindrical fastening



→ p. 819

EH 23110.
Centering Pins



→ p. 820

EH 23110.
Centering Pins
stepped



→ p. 821

EH 23120.
Loose Slot Tenons
DIN 6323



→ p. 822

Standard Parts for Fixture Systems

EH 23150.
Clamps
DIN 6315 B forked



→ p. 823

EH 23180.
Clamps
with nose



→ p. 824

EH 23700.
Clamping Element Systems



→ p. 825

EH 23700.
Straight Clamps
long



→ p. 826

EH 23700.
Intermediate Elements



→ p. 827

EH 23700.
Base Elements



→ p. 828

EH 23210.
Down-Hold Clamps
without clamping lever



→ p. 829

EH 23280.
Stops
cylindrical



→ p. 830

EH 23220.
Bedding Supports



→ p. 831

EH 23220.
Supporting Elements



→ p. 832

EH 23320.
Floating Clamps
compact construction, combined clamping and locking M 12



→ p. 834

EH 23320.
Floating Clamps
compact construction, separate clamping and locking M 12



→ p. 835

EH 23320.
Floating Clamps
combined clamping and locking M 12



→ p. 836

EH 23320.
Floating Clamps
separate clamping and locking M 12



→ p. 837

EH 23320.
Standard Clamping Jaws
for floating clamp M 12



→ p. 839

EH 23320.
Clamping Jaws
for floating clamp M 12



→ p. 840

EH 23310.
Down-Thrust Clamps
swivelling, size 25



→ p. 843

EH 23310.
Down-Thrust Clamps
swivelling, size 40



→ p. 844

EH 23310.
Down-Thrust Clamps
moveable, size 40



→ p. 845

EH 23310.
Positioning Rings
for down-thrust clamp



→ p. 847

EH 23310.
Height Adjusting Cylinders



→ p. 848

EH 23690.
Compact Clamps



→ p. 849

EH 23690.
Height Adapters
for compact clamp



→ p. 851

Multiple Clamping Systems

Components

EH 1585.
Clamping Bars
length 100



→ p. 855

EH 1585.
Clamping Bars
length 200



→ p. 856

EH 1585.
Clamping Bars
length 300



→ p. 857

EH 1585.
Clamping Bars
length 400 - 700



→ p. 858

EH 23250.
Taper Clamping Units
plain / ribbed, M8



→ p. 859

EH 23250.
Taper Clamping Units
plain / ribbed, M12



→ p. 860

EH 23250.
Taper Clamping Units
with screw fastened thread, M12



→ p. 861

EH 23250.
Adapter for Taper Clamping Units
for clamping bars



→ p. 862

EH 23250.
Anti-Turn Locking Devices for Taper Clamping Units
for clamping bars



→ p. 863

EH 23250.
Stop Plates for Taper Clamping Units
for clamping bars



→ p. 864

EH 1586.
Lateral Stops



→ p. 865

EH 1586.
Insertion Tools



→ p. 866

EH 1586.
Supports for Clamping Bar



→ p. 867

EH 1586.
Supports for Clamping Bar
with spring-loaded catch



→ p. 868

EH 1586.
Supports for Clamping Bar
magnetic



→ p. 868

EH 1586.
Stops
diamond coated



→ p. 869

EH 1586.
Stops
gripper studs



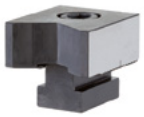
→ p. 870

EH 1586.
Stops
horizontal prisms



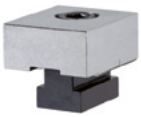
→ p. 871

EH 1586.
Stops
vertical prisms



→ p. 872

EH 1586.
Stops
soft



→ p. 873

EH 1586.
Stops
ribbed



→ p. 874

EH 1586.
Stops
plain



→ p. 875

EH 1586.
Stops
with mounting thread

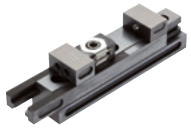


→ p. 876

Multiple Clamping Systems

Clamping Units

EH 1586.
Combination Clamping Bars



→ p. 877

Standard Ranges

EH 1586.410
Standard Ranges



→ p. 879

EH 1586.411
Standard Ranges



→ p. 879

EH 1586.412
Standard Ranges



→ p. 879

EH 1586.413
Standard Ranges



→ p. 879

EH 1586.414
Standard Ranges



→ p. 880

EH 1586.415
Standard Ranges



→ p. 880

EH 1586.416
Standard Ranges



→ p. 880

Multi-Vices

Multi-Vices MS 125

EH 1700.
Multi-Vices
MS 125



→ p. 884

You will find details and your contact persons under:
www.halder.com/Multi-Vices

Basic Elements

Clamping Angles

EH 1906.
Clamping Angles
semi-finished



→ p. 894

EH 1906.
Clamping Angles



→ p. 895

EH 1910.
Clamping Angles
welded, semi-finished



→ p. 896

EH 1910.
Clamping Angles
one-sided, welded, semi-finished



→ p. 897

Clamping Cubes

EH 1908.
Clamping Cubes
semi-finished



→ p. 898

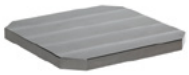
EH 1910.
Clamping Cubes
welded, semi-finished



→ p. 899

Base Plates

EH 1912.
Base Plates
semi-finished



→ p. 900

EH 1912.
Base Plates
with positioning holes



→ p. 901

Zero-Point Clamping Systems

Connecting Elements / Connecting Rings

EH 1990.
Connecting Elements
hydraulically operated, double acting, with lifting-off and blow-out



→ p. 908

EH 1990.
Connecting Elements
hydraulically operated, single acting with lifting-off



→ p. 909

EH 1990.
Connecting Elements
modular, mechanically operated



→ p. 910

EH 1990.
Connecting Elements
modular, hydraulically operated



→ p. 911

EH 1990.
Connecting Elements
modular, pneumatically operated



→ p. 912

EH 1990.
Connecting Elements
modular, pneumatically operated, reinforced



→ p. 913

EH 1990.
Connecting Elements
modular, mechanically operated, protected against twisting



→ p. 914

EH 1990.
Connecting Elements
modular, hydraulically operated, protected against twisting



→ p. 915

EH 1990.
Connecting Elements
modular, pneumatically operated, protected against twisting



→ p. 916

EH 1990.
Connecting Elements
modular, pneumatically operated, reinforced, protected against twisting



→ p. 917

EH 1990.
Control Modules



→ p. 918

EH 1990.
Connecting Rings



→ p. 919

Base Plates and Supporting Plates

EH 1990.
Base Plates
for 2 connecting elements



→ p. 922

EH 1990.
Base Plates
with 2 connecting elements



→ p. 923

EH 1990.
Base Plates
for 4 connecting elements



→ p. 924

EH 1990.
Base Plates
with 4 connecting elements



→ p. 925

EH 1990.
Base Plates
for 4 double acting connecting elements



→ p. 926

EH 1990.
Base Plates
with 4 double acting connecting elements



→ p. 927

EH 1990.
Base Plates
for 4 single acting connecting elements



→ p. 928

EH 1990.
Base Plates
with 4 single acting connecting elements



→ p. 929

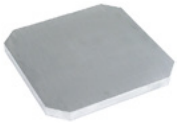
Zero-Point Clamping Systems

EH 1990.
Supporting Plates
with 2 connecting rings



→ p. 930

EH 1990.
Supporting Plates
with 4 connecting rings



→ p. 931

Accessories for Zero-Point Clamping Systems

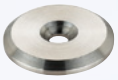
EH 1990.
Coverings
for connecting elements



→ p. 932

2 MACHINE AND FIXTURE ELEMENTS



	Product group	Page
	Spring Plungers	49
	Index Plungers / Index Bolts	96
	Lateral Spring Plungers	144
	Locking Elements	174
	Shaft / C-Washers	178
	Lifting Pins / Threaded Lifting Pins	181
	Ball Lock Pins	202
	Grub Screws / Thrust Pads	255
	Mounting Pads / Fulcrum Screws	260
	Support Legs	266
	Locating and Seating Elements	273
	Ball Elements / Push Plungers	295
	Self-Aligning Pads	315
	Ball Casters	322
	Retrieval Systems	329
	Oil-Sight Glasses	340
	Expander® Sealing Plugs	341
	Swing Bolts	353
	Rod Ends	355

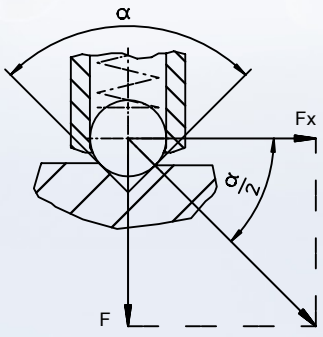
2

SPRING PLUNGERS

METRIC MODELS

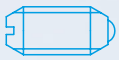


CALCULATION OF THE INDEXING RESISTANCE



$$Fx = \frac{F}{\tan \frac{\alpha}{2}}$$

Sample calculation for:
α = 60°, Fx = 1,732 x F
α = 90°, Fx = F
α = 120°, Fx = 0,577 x F

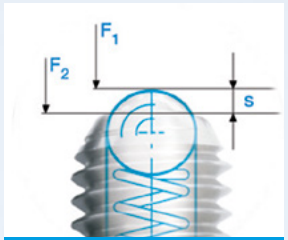


standard spring load



heavy spring load

www.halder.com/
SpringPlungers-Video



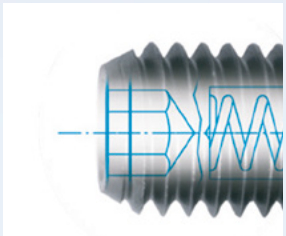
CERTIFIED

Certified spring load F1 and F2 and stroke s.



PREMIUM QUALITY

First-rate quality and minimum wear thanks to the use of hardened pins.



SECURE

Outstanding functional reliability thanks to - among other things - the assembly procedure used and a specific manufacturing process.



CLEAR

Coherent, uniform and clearly visible identification of the spring load thanks to a permanent marking on the body.

Spring Plungers • with ball and internal hexagon

EH 22030.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

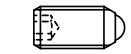
Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Spring
- Stainless steel

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



Standard spring load



Heavy spring load

MORE INFORMATION

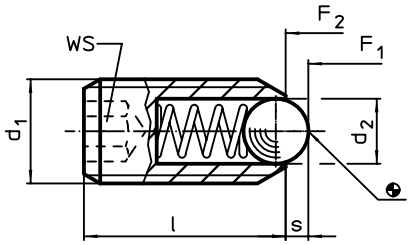
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data - Calculation of indexing resistance, see details at the start of the section.

DRAWING



ORDER INFORMATION

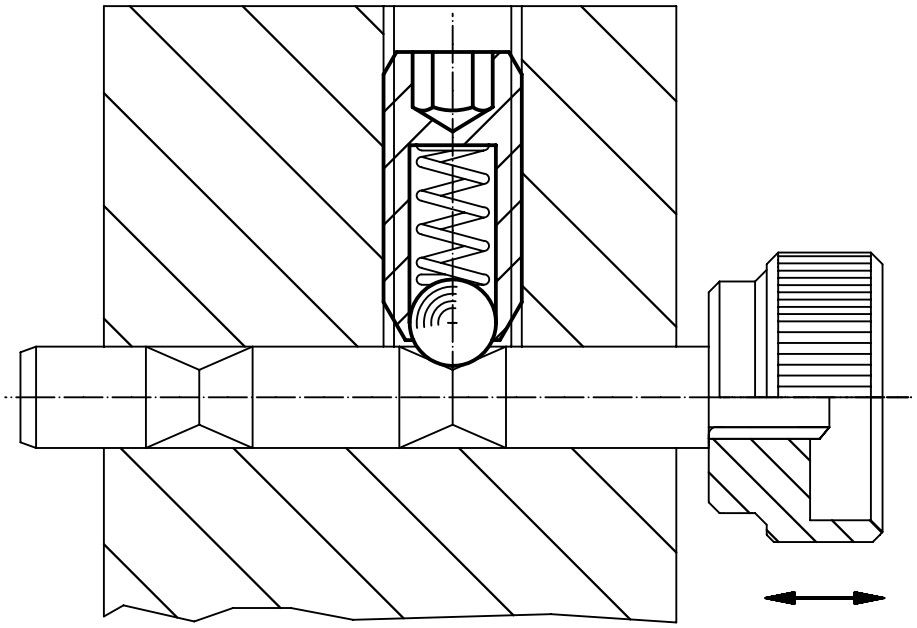
Dimensions			WS	Stroke	Spring load[1]				Art. No.
d_1	d_2	l		s	F_1 ~	F_2 ~	max.		
[mm]			[mm]	[mm]	[N]		[°C]	[g]	
free cutting steel, standard spring load									
M 3	1,5	8	1,5	0,4	3,0	4,5	250	0,3	22030.0003
M 4	2,5	12	2,0	0,8	8,5	14,0	250	0,7	22030.0004
M 5	3,0	14	2,5	0,9	8,0	14,0	250	1,2	22030.0005
M 6	3,5	15	3,0	1,0	11,0	18,0	250	1,8	22030.0006
M 8	4,5	18	4,0	1,5	18,0	31,0	250	3,9	22030.0008
M10	6,0	23	5,0	2,0	24,0	45,0	250	8,1	22030.0010
M12	8,0	26	6,0	2,5	26,0	49,0	250	13,0	22030.0012
M16	10,0	33	8,0	3,5	41,0	86,0	250	32,0	22030.0016
M20	12,0	43	10,0	4,5	56,0	111,0	250	66,0	22030.0020
M24	15,0	48	12,0	5,5	81,0	151,0	250	106,0	22030.0024
free cutting steel, heavy spring load									
M 4	2,5	12	2,0	0,8	12,0	18,0	250	0,7	22030.0044
M 5	3,0	14	2,5	0,9	15,0	22,0	250	1,2	22030.0045
M 6	3,5	15	3,0	1,0	19,0	28,0	250	1,8	22030.0046
M 8	4,5	18	4,0	1,5	36,0	62,0	250	4,1	22030.0048
M10	6,0	23	5,0	2,0	57,0	104,0	250	8,2	22030.0050
M12	8,0	26	6,0	2,5	61,0	110,0	250	13,0	22030.0052
M16	10,0	33	8,0	3,5	68,0	142,0	250	32,0	22030.0056
M20	12,0	43	10,0	4,5	84,0	166,0	250	66,0	22030.0060
M24	15,0	48	12,0	5,5	127,0	237,0	250	105,0	22030.0064

[1] statistical average value

Dimensions			WS	Stroke s	Spring load[1]				Art. No.
d_1	d_2	l			F_1 ~	F_2 ~	max.		
[mm]			[mm]	[mm]	[N]		[°C]	[g]	
stainless steel, standard spring load									
M 3	1,5	8	1,5	0,4	3,0	4,5	250	0,2	22030.0203
M 4	2,5	12	2,0	0,8	8,5	14,0	250	0,8	22030.0204
M 5	3,0	14	2,5	0,9	8,0	14,0	250	1,3	22030.0205
M 6	3,5	15	3,0	1,0	11,0	18,0	250	1,9	22030.0206
M 8	4,5	18	4,0	1,5	18,0	31,0	250	4,1	22030.0208
M10	6,0	23	5,0	2,0	24,0	45,0	250	8,2	22030.0210
M12	8,0	26	6,0	2,5	26,0	49,0	250	13,0	22030.0212
M16	10,0	33	8,0	3,5	41,0	86,0	250	32,0	22030.0216
M20	12,0	43	10,0	4,5	56,0	111,0	250	67,0	22030.0220
M24	15,0	48	12,0	5,5	81,0	151,0	250	107,0	22030.0224
stainless steel, heavy spring load									
M 4	2,5	12	0,8	2,0	12,0	18,0	250	0,8	22030.0244
M 5	3,0	14	2,5	0,9	15,0	22,0	250	1,2	22030.0245
M 6	3,5	15	3,0	1,0	19,0	28,0	250	1,9	22030.0246
M 8	4,5	18	4,0	1,5	36,0	62,0	250	4,2	22030.0248
M10	6,0	23	5,0	2,0	57,0	104,0	250	8,2	22030.0250
M12	8,0	26	6,0	2,5	61,0	110,0	250	13,0	22030.0252
M16	10,0	33	8,0	3,5	68,0	142,0	250	33,0	22030.0256
M20	12,0	43	10,0	4,5	84,0	166,0	250	66,0	22030.0260
M24	15,0	48	12,0	5,5	127,0	237,0	250	107,0	22030.0264

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • with pin and internal hexagon

EH 22030.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

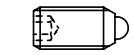
Pin
- Free cutting steel, hardened, blackened
- Stainless steel 1.4305

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Spring
- Stainless steel

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



Standard spring load



Heavy spring load

MORE INFORMATION

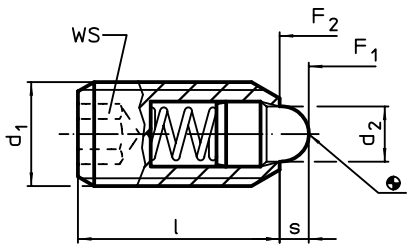
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data -

DRAWING



ORDER INFORMATION

Dimensions			WS	Stroke s	Spring load[1]				Art. No.
d_1	d_2	l			F_1 ~	F_2 ~	max.		
[mm]			[mm]	[mm]	[N]		[°C]	[g]	
free cutting steel, standard spring load									
M 4	1,8	12	2,0	1,5	4,5	12,5	250	0,6	22030.0104
M 5	2,4	14	2,5	2,0	5,0	13,0	250	1,3	22030.0105
M 6	2,7	15	3,0	2,0	6,0	17,0	250	1,9	22030.0106
M 8	3,8	18	4,0	2,0	16,0	33,0	250	4,2	22030.0108
M10	4,5	23	5,0	2,5	19,0	42,0	250	8,5	22030.0110
M12	6,2	26	6,0	3,5	22,0	57,0	250	13,0	22030.0112
M16	8,5	33	8,0	4,5	38,0	78,0	250	32,0	22030.0116
M20	10,0	43	10,0	6,5	39,0	81,0	250	67,0	22030.0120
M24	13,0	48	12,0	8,0	72,0	155,0	250	106,0	22030.0124
free cutting steel, heavy spring load									
M 6	2,7	15	3,0	2,0	11,0	25,0	250	2,0	22030.0146
M 8	3,8	18	4,0	2,0	23,0	59,0	250	4,2	22030.0148
M10	4,5	23	5,0	2,5	20,0	54,0	250	8,5	22030.0150
M12	6,2	26	6,0	3,5	38,0	96,0	250	13,0	22030.0152
M16	8,5	33	8,0	4,5	50,0	100,0	250	32,0	22030.0156
M20	10,0	43	10,0	6,5	52,0	133,0	250	67,0	22030.0160
M24	13,0	48	12,0	8,0	91,0	223,0	250	106,0	22030.0164

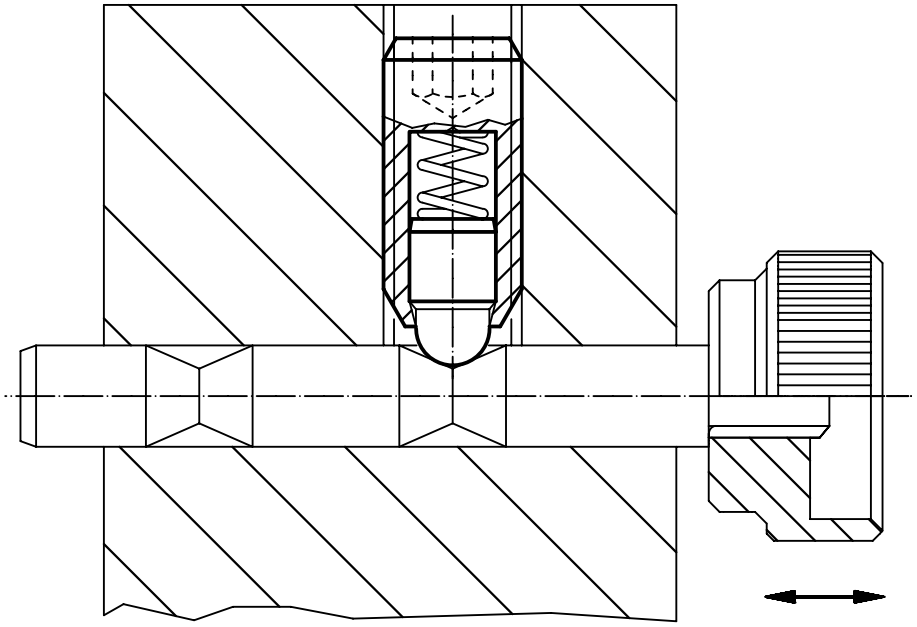
[1] statistical average value

→

Dimensions			WS	Stroke s	Spring load[1]				Art. No.
d_1	d_2	l			F_1 ~	F_2 ~	max.		
[mm]			[mm]	[mm]	[N]		[°C]	[g]	
stainless steel, standard spring load									
M 4	1,8	12	2,0	1,5	4,5	12,5	250	0,7	22030.0304
M 5	2,4	14	2,5	2,0	5,0	13,0	250	1,2	22030.0305
M 6	2,7	15	3,0	2,0	6,0	17,0	250	2,1	22030.0306
M 8	3,8	18	4,0	2,0	16,0	33,0	250	4,2	22030.0308
M10	4,5	23	5,0	2,5	19,0	42,0	250	8,6	22030.0310
M12	6,2	26	6,0	3,5	22,0	57,0	250	13,0	22030.0312
M16	8,5	33	8,0	4,5	38,0	78,0	250	32,0	22030.0316
M20	10,0	43	10,0	6,5	39,0	81,0	250	67,0	22030.0320
M24	13,0	48	12,0	8,0	72,0	155,0	250	104,0	22030.0324
stainless steel, heavy spring load									
M 6	2,7	15	3,0	2,0	11,0	25,0	250	1,9	22030.0346
M 8	3,8	18	4,0	2,0	23,0	59,0	250	4,4	22030.0348
M10	4,5	23	5,0	2,5	20,0	54,0	250	8,6	22030.0350
M12	6,2	26	6,0	3,5	38,0	96,0	250	14,0	22030.0352
M16	8,5	33	8,0	4,5	50,0	100,0	250	32,0	22030.0356
M20	10,0	43	10,0	6,5	52,0	133,0	250	68,0	22030.0360
M24	13,0	48	12,0	8,0	91,0	223,0	250	105,0	22030.0364

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • headed, with ball and internal hexagon

EH 22030.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. Precise screwing depth due to head.

Material

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

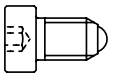
Spring
- Stainless steel

Assembly

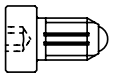
Respect dimension l_3 for M 4 / M 5.

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



Standard spring load



Heavy spring load

MORE INFORMATION

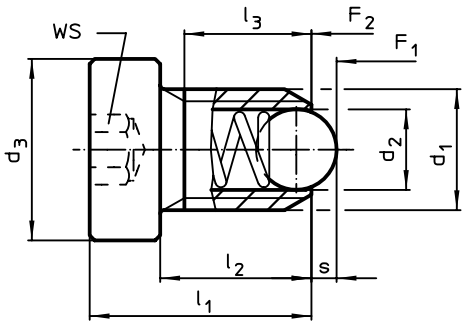
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

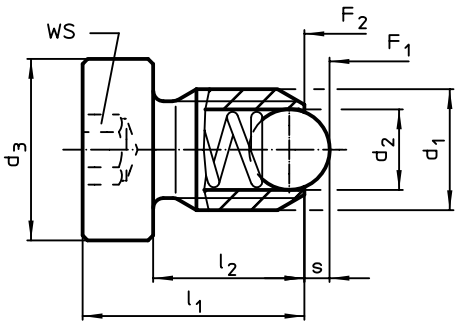
References

Thread lock on request, please refer to appendix - Technical Data -
Calculation of indexing resistance, see details at the start of the section.

DRAWING



Size M4+M5



Size M6–M12

ORDER INFORMATION

Dimensions						WS	Stroke s	Spring load[1]				Art. No.
d_1	d_2	d_3	l_1	l_2	l_3			F_1 ~	F_2 ~	max.		
[mm]						[mm]	[mm]	[N]		[°C]	[g]	
free cutting steel, standard spring load												
M 4	2,5	6	12	9,0	7,5	2,0	0,8	8,0	14,0	250	1,0	22030.0930
M 5	3,0	8	14	10,0	8,2	2,5	0,9	8,0	14,0	250	2,3	22030.0931
M 6	3,5	10	15	10,0	–	3,0	1,0	11,0	18,0	250	3,9	22030.0932
M 8	4,5	13	18	12,5	–	4,0	1,5	18,0	31,0	250	7,7	22030.0933
M10	6,0	16	23	17,0	–	5,0	2,0	24,0	45,0	250	14,0	22030.0934
M12	8,0	18	26	19,0	–	6,0	2,5	26,0	49,0	250	21,0	22030.0935
free cutting steel, heavy spring load												
M 4	2,5	6	12	9,0	7,5	2,0	0,8	12,0	18,0	250	1,0	22030.1040
M 5	3,0	8	14	10,0	8,2	2,5	0,9	15,0	22,0	250	2,3	22030.1050
M 6	3,5	10	15	10,0	–	3,0	1,0	19,3	26,6	250	3,9	22030.1060
M 8	4,5	13	18	12,5	–	4,0	1,5	36,0	60,5	250	7,7	22030.1080
M10	6,0	16	23	17,0	–	5,0	2,0	57,0	103,5	250	14,0	22030.1100
M12	8,0	18	26	19,0	–	6,0	2,5	61,0	110,0	250	21,0	22030.1120

[1] statistical average value

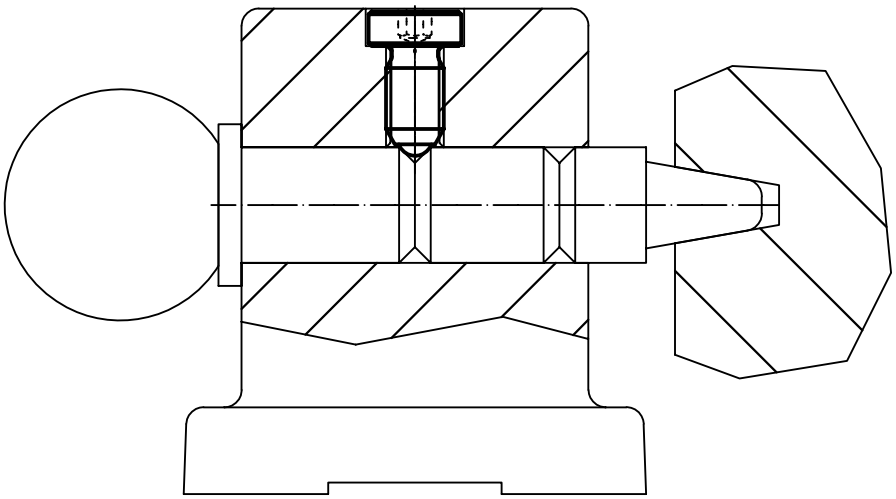
→

2

Dimensions						WS	Stroke s	Spring load[1]				Art. No.
d_1	d_2	d_3	l_1	l_2	l_3			F_1 ~	F_2 ~	max.		
[mm]						[mm]	[mm]	[N]		[°C]	[g]	
stainless steel, standard spring load												
M 4	2,5	6	12	9,0	7,5	2,0	0,8	8,0	14,0	250	1,1	22030.0940
M 5	3,0	8	14	10,0	8,2	2,5	0,9	8,0	14,0	250	2,3	22030.0941
M 6	3,5	10	15	10,0	–	3,0	1,0	11,0	18,0	250	3,9	22030.0942
M 8	4,5	13	18	12,5	–	4,0	1,5	18,0	31,0	250	7,8	22030.0943
M10	6,0	16	23	17,0	–	5,0	2,0	24,0	45,0	250	14,0	22030.0944
M12	8,0	18	26	19,0	–	6,0	2,5	26,0	49,0	250	21,0	22030.0945
stainless steel, heavy spring load												
M 4	2,5	6	12	9,0	7,5	2,0	0,8	12,0	18,0	250	1,1	22030.2040
M 5	3,0	8	14	10,0	8,2	2,5	9,0	15,0	22,0	250	2,3	22030.2050
M 6	3,5	10	15	10,0	–	3,0	1,0	19,3	26,6	250	3,9	22030.2060
M 8	4,5	13	18	12,5	–	4,0	1,5	36,0	60,5	250	7,8	22030.2080
M10	6,0	16	23	17,0	–	5,0	2,0	57,0	103,5	250	14,0	22030.2100
M12	8,0	18	26	19,0	–	6,0	2,5	61,0	110,0	250	21,0	22030.2120

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • with moveable ball and internal hexagon

EH 22031.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. The running of the ball minimises wear on the counterpart, this also results in a positive locking behaviour depending on the counterpart.
Plastic balls offer electric insulation.

Material

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

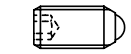
Bearing
- Plastic

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Spring
- Stainless steel

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



Standard spring load



Heavy spring load

MORE INFORMATION

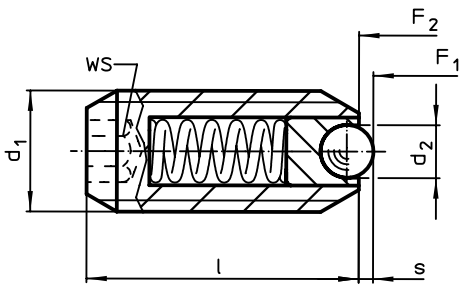
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data -
Calculation of indexing resistance, see details at the start of the section.

DRAWING



ORDER INFORMATION

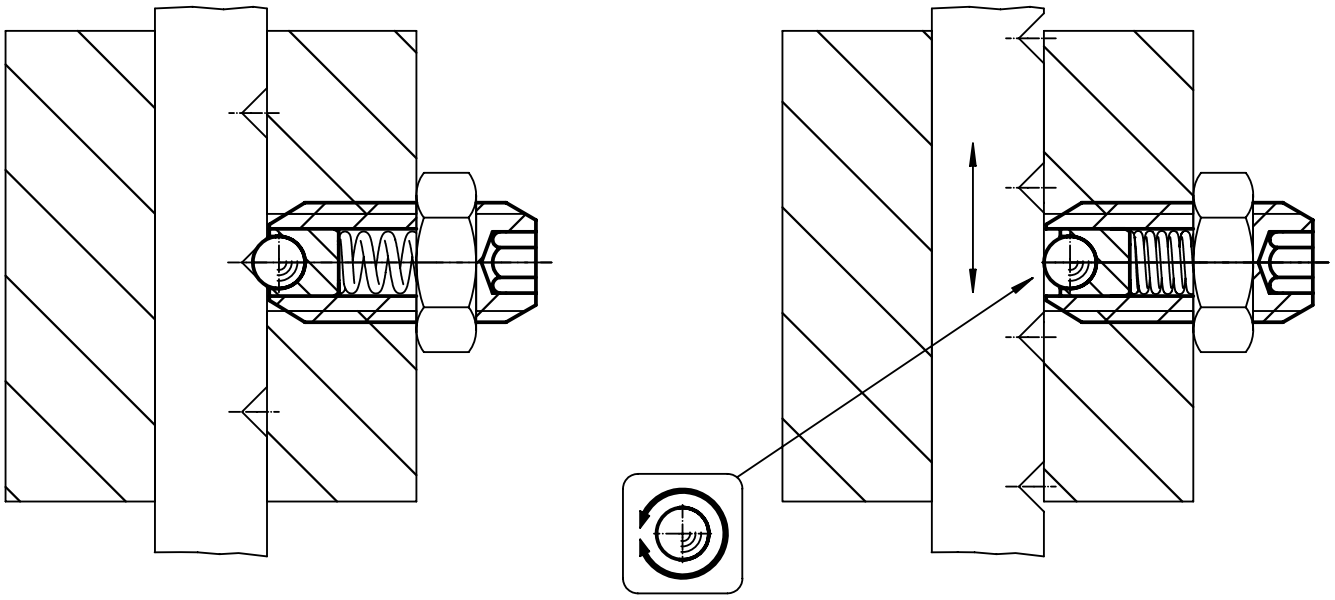
Dimensions			WS	Stroke s	Spring load[1]					Art. No.
d_1	d_2	l			F_1 ~	F_2 ~	min.	max.		
[mm]			[mm]	[mm]	[N]		[°C]		[g]	
free cutting steel, standard spring load										
M 5	2,0	14	2,5	0,50	4,8	6,8	-30	90	1,1	22031.0005
M 6	2,5	15	3,0	0,70	6,3	10,0	-30	90	2,1	22031.0006
M 8	3,5	18	4,0	0,95	16,0	24,0	-30	90	4,8	22031.0008
M10	4,5	23	5,0	1,40	18,8	31,7	-30	90	10,0	22031.0010
M12	6,5	26	6,0	2,50	24,0	49,0	-30	90	15,0	22031.0012
M16	8,5	33	8,0	3,10	38,0	68,0	-30	90	37,0	22031.0016
free cutting steel, heavy spring load										
M 5	2,0	14	2,5	0,50	10,0	14,0	-30	90	1,2	22031.0045
M 6	2,5	15	3,0	0,70	11,0	16,0	-30	90	2,2	22031.0046
M 8	3,5	18	4,0	0,95	23,0	40,0	-30	90	5,0	22031.0048
M10	4,5	23	5,0	1,40	28,0	54,3	-30	90	10,0	22031.0050
M12	6,5	26	6,0	2,50	36,5	77,3	-30	90	15,0	22031.0052
M16	8,5	33	8,0	3,10	50,0	88,7	-30	90	37,0	22031.0056

[1] statistical average value

Dimensions			WS	Stroke s	Spring load[1]					Art. No.
d_1	d_2	l			F_1 ~	F_2 ~	min.	max.		
[mm]			[mm]	[mm]	[N]		[°C]		[g]	
stainless steel, standard spring load										
M 5	2,0	14	2,5	0,50	4,8	6,8	-30	90	1,1	22031.0205
M 6	2,5	15	3,0	0,70	6,3	10,0	-30	90	2,1	22031.0206
M 8	3,5	18	4,0	0,95	16,0	24,0	-30	90	4,8	22031.0208
M10	4,5	23	5,0	1,40	18,8	31,7	-30	90	10,0	22031.0210
M12	6,5	26	6,0	2,50	24,0	49,0	-30	90	15,0	22031.0212
M16	8,5	33	8,0	3,10	38,0	68,0	-30	90	37,0	22031.0216
stainless steel, heavy spring load										
M 5	2,0	14	2,5	0,50	10,0	14,0	-30	90	1,2	22031.0245
M 6	2,5	15	3,0	0,70	11,0	16,0	-30	90	2,2	22031.0246
M 8	3,5	18	4,0	0,95	23,0	40,0	-30	90	5,0	22031.0248
M10	4,5	23	5,0	1,40	28,0	54,3	-30	90	10,0	22031.0250
M12	6,5	26	6,0	2,50	36,5	77,3	-30	90	15,0	22031.0252
M16	8,5	33	8,0	3,10	50,0	88,7	-30	90	37,0	22031.0256

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • plastic

EH 22040.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

Body
- Thermoplastic POM, blue

Ball
- Stainless steel, hardened
- Thermoplastic POM, white

Spring
- Stainless steel

MORE INFORMATION

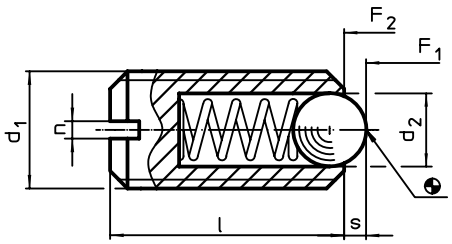
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data - Calculation of indexing resistance, see details at the start of the section.

DRAWING

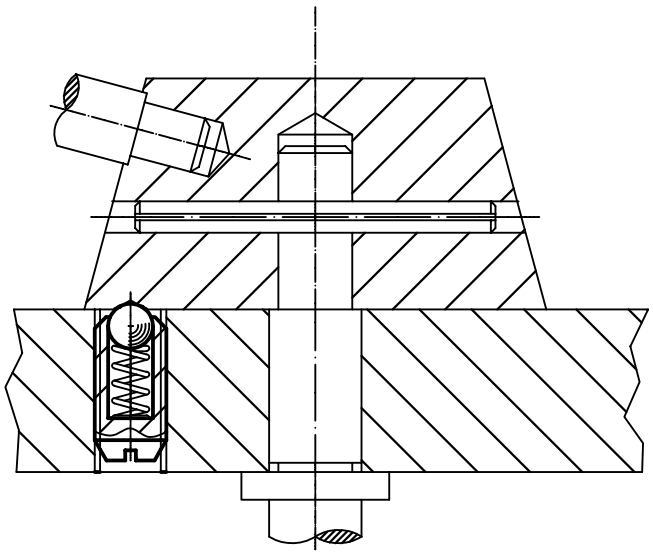


ORDER INFORMATION

Dimensions				Stroke	Spring load[1]					Art. No.
d_1	d_2	l	n	s	F_1 ~	F_2 ~	min.	max.		
[mm]				[mm]	[N]		[°C]		[g]	
ball from stainless steel										
M 6	3,5	14	1,0	0,9	12	17	-30	50	0,6	22040.0006
M 8	5,0	16	1,2	1,5	20	35	-30	50	1,3	22040.0008
M10	6,0	19	1,5	1,9	25	45	-30	50	2,6	22040.0010
ball from thermoplastic										
M 6	3,5	14	1,0	0,9	12	17	-30	50	0,5	22040.0406
M 8	5,0	16	1,2	1,5	20	35	-30	50	1,0	22040.0408
M10	6,0	19	1,5	1,9	25	45	-30	50	1,8	22040.0410

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • with ball and slot

EH 22050.

2



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

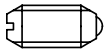
Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

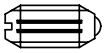
Spring
- Stainless steel

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



Standard spring load



Heavy spring load

MORE INFORMATION

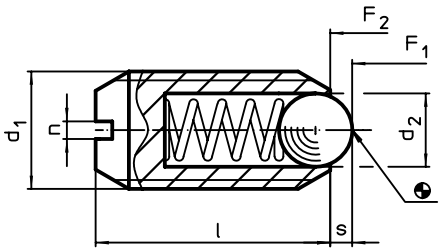
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data -
Calculation of indexing resistance, see details at the start of the section.

DRAWING



ORDER INFORMATION

Dimensions				Stroke	Spring load[1]				Art. No.
d_1	d_2	l	n	s	F_1 ~	F_2 ~	max.		
[mm]				[mm]	[N]		[°C]	[g]	
free cutting steel, standard spring load									
M 3	1,5	7	0,40	0,4	3,0	4,5	250	0,2	22050.0003
M 4	2,5	9	0,60	0,8	8,5	14,0	250	0,4	22050.0004
M 5	3,0	12	0,80	0,9	8,0	14,0	250	1,0	22050.0005
M 6	3,5	14	1,00	1,0	11,0	18,0	250	1,7	22050.0006
M 8	4,5	16	1,20	1,5	18,0	31,0	250	3,5	22050.0008
M10	6,0	19	1,50	2,0	24,0	45,0	250	6,6	22050.0010
M12	8,0	22	2,00	2,5	26,0	49,0	250	11,0	22050.0012
M16	10,0	24	2,00	3,5	41,0	86,0	250	23,0	22050.0016
M20	12,0	30	2,50	4,5	56,0	111,0	250	45,0	22050.0020
M24	15,0	34	3,00	5,5	81,0	151,0	250	72,0	22050.0024
free cutting steel, heavy spring load									
M 4	2,5	9	0,60	0,8	12,0	18,0	250	0,4	22050.0204
M 5	3,0	12	0,80	0,9	15,0	22,0	250	1,0	22050.0205
M 6	3,5	14	1,00	1,0	19,0	28,0	250	1,7	22050.0206
M 8	4,5	16	1,20	1,5	36,0	62,0	250	3,6	22050.0208
M10	6,0	19	1,50	2,0	57,0	104,0	250	6,6	22050.0210
M12	8,0	22	2,00	2,5	61,0	110,0	250	11,0	22050.0212
M16	10,0	24	2,00	3,5	68,0	142,0	250	23,0	22050.0216
M20	12,0	30	2,50	4,5	84,0	166,0	250	43,0	22050.0220
M24	15,0	34	3,00	5,5	127,0	237,0	250	73,0	22050.0224

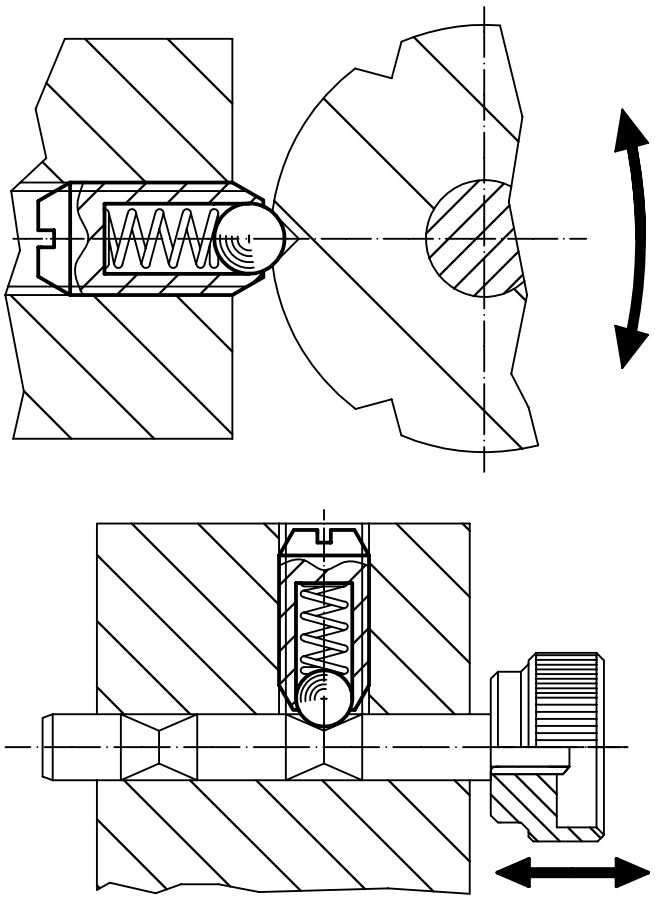
[1] statistical average value

→

Dimensions				Stroke	Spring load[1]				Art. No.
d_1	d_2	l	n	s	F_1 ~	F_2 ~	max.		
[mm]				[mm]	[N]		[°C]	[g]	
stainless steel, standard spring load									
M 2	1,0	4	0,25	0,3	0,8	1,5	250	0,1	22050.0402
M 3	1,5	7	0,40	0,4	3,0	4,5	250	0,2	22050.0403
M 4	2,5	9	0,60	0,8	8,5	14,0	250	0,4	22050.0404
M 5	3,0	12	0,80	0,9	8,0	14,0	250	1,0	22050.0405
M 6	3,5	14	1,00	1,0	11,0	18,0	250	1,7	22050.0406
M 8	4,5	16	1,20	1,5	18,0	31,0	250	3,7	22050.0408
M10	6,0	19	1,50	2,0	24,0	45,0	250	6,8	22050.0410
M12	8,0	22	2,00	2,5	26,0	49,0	250	11,0	22050.0412
M16	10,0	24	2,00	3,5	41,0	86,0	250	23,0	22050.0416
M20	12,0	30	2,50	4,5	56,0	111,0	250	45,0	22050.0420
M24	15,0	34	3,00	5,5	81,0	151,0	250	70,0	22050.0424
stainless steel, heavy spring load									
M 4	2,5	9	0,60	0,9	12,0	18,0	250	1,0	22050.0604
M 5	3,0	12	0,80	0,9	15,0	22,0	250	1,2	22050.0605
M 6	3,5	14	1,00	1,0	19,0	28,0	250	1,9	22050.0606
M 8	4,5	16	1,20	1,5	36,0	62,0	250	3,6	22050.0608
M10	6,0	19	1,50	2,0	57,0	104,0	250	6,7	22050.0610
M12	8,0	22	2,00	2,5	61,0	110,0	250	11,0	22050.0612
M16	10,0	24	2,00	3,5	68,0	142,0	250	23,0	22050.0616
M20	12,0	30	2,50	4,5	84,0	166,0	250	45,0	22050.0620
M24	15,0	34	3,00	5,5	127,0	237,0	250	72,0	22050.0624

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • with ceramic ball and slot, stainless steel A4

EH 22050.

2



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. The version from stainless steel A4 guarantees the highest corrosion protection.
Characteristics of the ceramic ball:

- Highly impact-resistant
- Abrasion resistant
- Antimagnetic
- Electrically isolating

Material

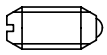
Body
- Stainless steel A4, passivated

Ball
- Ceramic

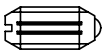
Spring
- Stainless steel A4, passivated

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



Standard spring load



Heavy spring load

MORE INFORMATION

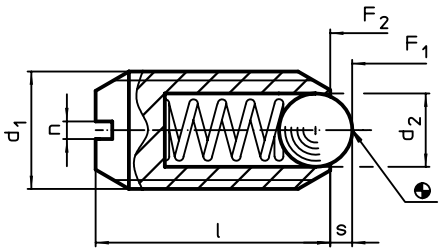
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data -
Calculation of indexing resistance, see details at the start of the section.

DRAWING



ORDER INFORMATION

Dimensions				Stroke	Spring load[1]				Art. No.
d_1	d_2	l	n	s	F_1 ~	F_2 ~	max.		
[mm]				[mm]	[N]		[°C]	[g]	
stainless steel A4, standard spring load									
M 4	2,5	9	0,6	0,8	8,5	14	250	0,4	22050.1404
M 5	3,0	12	0,8	0,9	8,0	14	250	0,9	22050.1405
M 6	3,5	14	1,0	1,0	11,0	18	250	1,6	22050.1406
M 8	4,5	16	1,2	1,5	18,0	31	250	3,5	22050.1408
M10	6,0	19	1,5	2,0	24,0	45	250	6,2	22050.1410
M12	8,0	22	2,0	2,5	26,0	49	250	9,8	22050.1412
M16	10,0	24	2,0	3,5	41,0	86	250	19,8	22050.1416
stainless steel A4, heavy spring load									
M 4	2,5	9	0,6	0,8	12,0	18	250	0,5	22050.1604
M 5	3,0	12	0,8	0,9	15,0	22	250	1,1	22050.1605
M 6	3,5	14	1,0	1,0	19,0	28	250	1,8	22050.1606
M 8	4,5	16	1,2	1,5	36,0	62	250	3,4	22050.1608
M10	6,0	19	1,5	2,0	57,0	104	250	6,1	22050.1610
M12	8,0	22	2,0	2,5	61,0	110	250	9,8	22050.1612
M16	10,0	24	2,0	3,5	68,0	142	250	19,8	22050.1616

[1] statistical average value

Spring Plungers • with pin and slot

EH 22050.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

Pin
- Free cutting steel, hardened, blackened
- Stainless steel 1.4305

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Spring
- Stainless steel

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



Standard spring load Heavy spring load

MORE INFORMATION

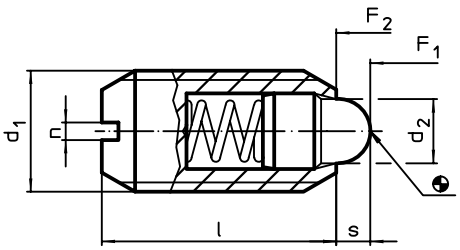
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data -

DRAWING



ORDER INFORMATION

Dimensions				Stroke	Spring load[1]				Art. No.
d_1	d_2	l	n	s	F_1 ~	F_2 ~	max.		
[mm]				[mm]	[N]		[°C]	[g]	
free cutting steel, standard spring load									
M 4	1,8	9	0,6	1,5	4,5	12,5	250	0,4	22050.0104
M 5	2,4	12	0,8	2,0	5,0	13,0	250	1,1	22050.0105
M 6	2,7	14	1,0	2,0	6,0	17,0	250	1,8	22050.0106
M 8	3,8	16	1,2	2,0	16,0	33,0	250	3,7	22050.0108
M10	4,5	19	1,5	2,5	19,0	42,0	250	7,1	22050.0110
M12	6,2	22	2,0	3,5	22,0	57,0	250	11,0	22050.0112
M16	8,5	24	2,0	4,5	38,0	78,0	250	23,0	22050.0116
M20	10,0	30	2,5	6,5	39,0	81,0	250	46,0	22050.0120
M24	13,0	34	3,0	8,0	72,0	155,0	250	73,0	22050.0124
free cutting steel, heavy spring load									
M 6	2,7	14	1,0	2,0	11,0	25,0	250	1,8	22050.0306
M 8	3,8	16	1,2	2,0	23,0	59,0	250	3,8	22050.0308
M10	4,5	19	1,5	2,5	20,0	54,0	250	7,0	22050.0310
M12	6,2	22	2,0	3,5	38,0	96,0	250	11,0	22050.0312
M16	8,5	24	2,0	4,5	50,0	100,0	250	23,0	22050.0316
M20	10,0	30	2,5	6,5	52,0	133,0	250	46,0	22050.0320
M24	13,0	34	3,0	8,0	91,0	223,0	250	74,0	22050.0324

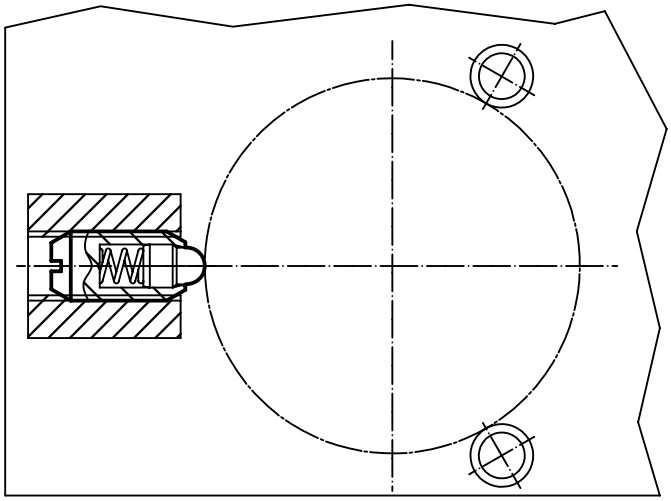
[1] statistical average value

2

Dimensions				Stroke	Spring load[1]				Art. No.
d_1	d_2	l	n	s	F_1 ~	F_2 ~	max.		
[mm]				[mm]	[N]		[°C]	[g]	
stainless steel, standard spring load									
M 4	1,8	9	0,6	1,5	4,5	12,5	250	0,6	22050.0504
M 5	2,4	12	0,8	2,0	5,0	13,0	250	1,3	22050.0505
M 6	2,7	14	1,0	2,0	6,0	17,0	250	2,0	22050.0506
M 8	3,8	16	1,2	2,0	16,0	33,0	250	3,9	22050.0508
M10	4,5	19	1,5	2,5	19,0	42,0	250	7,2	22050.0510
M12	6,2	22	2,0	3,5	22,0	57,0	250	11,0	22050.0512
M16	8,5	24	2,0	4,5	38,0	78,0	250	23,0	22050.0516
M20	10,0	30	2,5	6,5	39,0	81,0	250	47,0	22050.0520
M24	13,0	34	3,0	8,0	72,0	155,0	250	74,0	22050.0524
stainless steel, heavy spring load									
M 6	2,7	14	1,0	2,0	11,0	25,0	250	2,0	22050.0706
M 8	3,8	16	1,2	2,0	23,0	59,0	250	4,0	22050.0708
M10	4,5	19	1,5	2,5	20,0	54,0	250	7,1	22050.0710
M12	6,2	22	2,0	3,5	38,0	96,0	250	11,0	22050.0712
M16	8,5	24	2,0	4,5	50,0	100,0	250	23,0	22050.0716
M20	10,0	30	2,5	6,5	52,0	133,0	250	47,0	22050.0720
M24	13,0	34	3,0	8,0	91,0	223,0	250	75,0	22050.0724

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • headed, with ball and slot

EH 22050.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. Precise screwing depth due to head.

Material

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

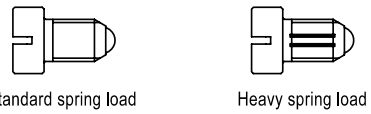
Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Spring
- Stainless steel

Assembly

Respect dimension l_3 for M 4 / M 5.

Characteristic



MORE INFORMATION

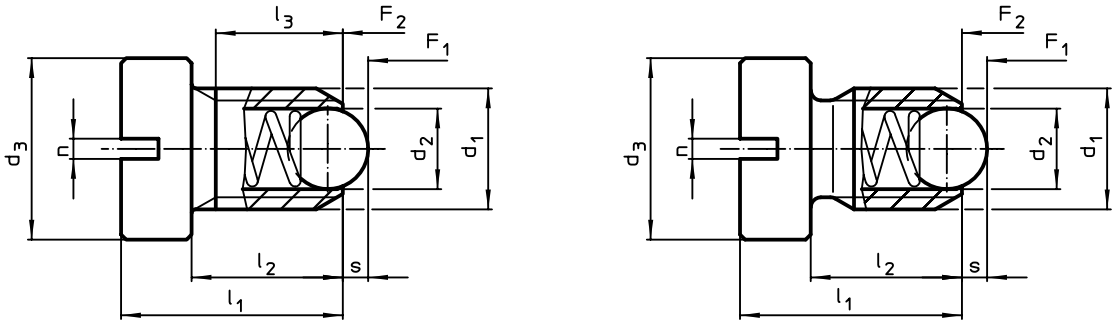
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data - Calculation of indexing resistance, see details at the start of the section.

DRAWING



Size M4+M5 | Size M6–M12

ORDER INFORMATION

Dimensions							Stroke s	Spring load[1]				Art. No.
d_1	d_2	d_3	l_1	l_2	l_3	n		F_1 ~	F_2 ~	max.		
[mm]							[mm]	[N]		[°C]	[g]	
free cutting steel, standard spring load												
M 4	2,5	6	9,5	6,5	5,0	0,6	0,8	8,0	14,0	250	0,92	22050.0930
M 5	3,0	8	12,5	8,5	6,7	0,8	0,9	8,0	14,0	250	2,10	22050.0931
M 6	3,5	10	14,0	9,0	–	1,0	1,0	11,0	18,0	250	3,70	22050.0932
M 8	4,5	13	16,5	11,0	–	1,2	1,5	18,0	31,0	250	7,50	22050.0933
M10	6,0	16	20,0	14,0	–	1,5	2,0	24,0	45,0	250	14,00	22050.0934
M12	8,0	18	22,0	15,0	–	2,0	2,5	26,0	49,0	250	19,00	22050.0935
free cutting steel, heavy spring load												
M 4	2,5	6	9,5	6,5	5,0	0,6	0,8	12,0	18,0	250	0,92	22050.1040
M 5	3,0	8	12,5	8,5	6,7	0,8	0,9	15,0	22,0	250	2,10	22050.1050
M 6	3,5	10	14,0	9,0	–	1,0	1,0	19,3	26,6	250	3,70	22050.1060
M 8	4,5	13	16,5	11,0	–	1,2	1,5	36,0	60,5	250	7,50	22050.1080
M10	6,0	16	20,0	14,0	–	1,5	2,0	57,0	103,5	250	14,00	22050.1100
M12	8,0	18	22,0	15,0	–	2,0	2,5	61,0	110,0	250	19,00	22050.1120

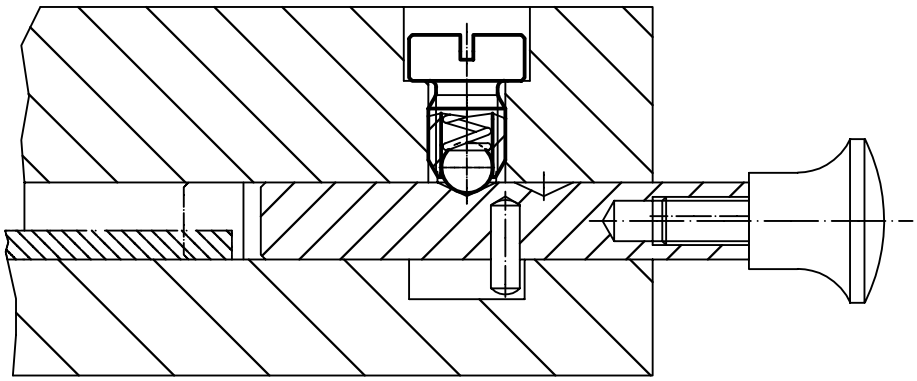
[1] statistical average value

2

Dimensions							Stroke s	Spring load[1]		max.		Art. No.
d_1	d_2	d_3	l_1	l_2	l_3	n		F_1 ~	F_2 ~			
[mm]							[mm]	[N]		[°C]	[g]	
stainless steel, standard spring load												
M 4	2,5	6	9,5	6,5	5,0	0,6	0,8	8,0	14,0	250	1,20	22050.0940
M 5	3,0	8	12,5	8,5	6,7	0,8	0,9	8,0	14,0	250	2,40	22050.0941
M 6	3,5	10	14,0	9,0	–	1,0	1,0	11,0	18,0	250	3,90	22050.0942
M 8	4,5	13	16,5	11,0	–	1,2	1,5	18,0	31,0	250	7,90	22050.0943
M10	6,0	16	20,0	14,0	–	1,5	2,0	24,0	45,0	250	14,00	22050.0944
M12	8,0	18	22,0	15,0	–	2,0	2,5	26,0	49,0	250	20,00	22050.0945
stainless steel, heavy spring load												
M 4	2,5	6	9,5	6,5	5,0	0,6	0,8	12,0	18,0	250	1,20	22050.1240
M 5	3,0	8	12,5	8,5	6,7	0,8	0,9	15,0	22,0	250	2,40	22050.1250
M 6	3,5	10	14,0	9,0	–	1,0	1,0	19,3	26,6	250	3,90	22050.1260
M 8	4,5	13	16,5	11,0	–	1,2	1,5	36,0	60,5	250	7,90	22050.1280
M10	6,0	16	20,0	14,0	–	1,5	2,0	57,0	103,5	250	14,00	22050.1300
M12	8,0	18	22,0	15,0	–	2,0	2,5	61,0	110,0	250	20,00	22050.1320

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • with moveable ball and slot

EH 22051.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. The running of the ball minimises wear on the counterpart, this also results in a positive locking behaviour depending on the counterpart.
Plastic balls offer electric insulation.

Material

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

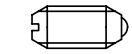
Bearing
- Plastic

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

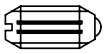
Spring
- Stainless steel

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



Standard spring load



Heavy spring load

MORE INFORMATION

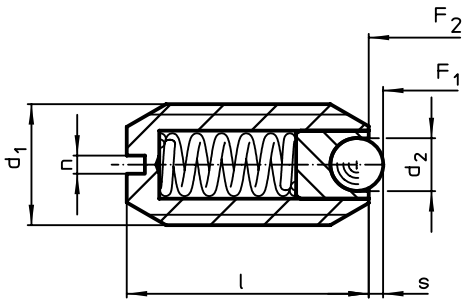
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data -
Calculation of indexing resistance, see details at the start of the section.

DRAWING



ORDER INFORMATION

Dimensions				Stroke	Spring load[1]					Art. No.
d_1	d_2	l	n	s	F_1 ~	F_2 ~	min.	max.		
[mm]				[mm]	[N]		[°C]		[g]	
free cutting steel, standard spring load										
M 5	2,0	12	0,8	0,50	4,8	6,8	-30	90	1,1	22051.0005
M 6	2,5	14	1,0	0,70	6,3	10,0	-30	90	2,0	22051.0006
M 8	3,5	16	1,2	0,95	16,0	24,0	-30	90	4,2	22051.0008
M10	4,5	19	1,5	1,40	18,8	31,7	-30	90	7,6	22051.0010
M12	6,5	22	2,0	2,50	24,0	49,0	-30	90	12,0	22051.0012
M16	8,5	24	2,0	3,10	38,0	68,0	-30	90	25,0	22051.0016
free cutting steel, heavy spring load										
M 5	2,0	12	0,8	0,50	10,0	14,0	-30	90	1,2	22051.0205
M 6	2,5	14	1,0	0,70	11,0	16,0	-30	90	2,1	22051.0206
M 8	3,5	16	1,2	0,95	23,0	40,0	-30	90	4,3	22051.0208
M10	4,5	19	1,5	1,40	28,0	54,3	-30	90	7,8	22051.0210
M12	6,5	22	2,0	2,50	36,5	77,3	-30	90	12,3	22051.0212
M16	8,5	24	2,0	3,10	50,0	88,7	-30	90	25,0	22051.0216

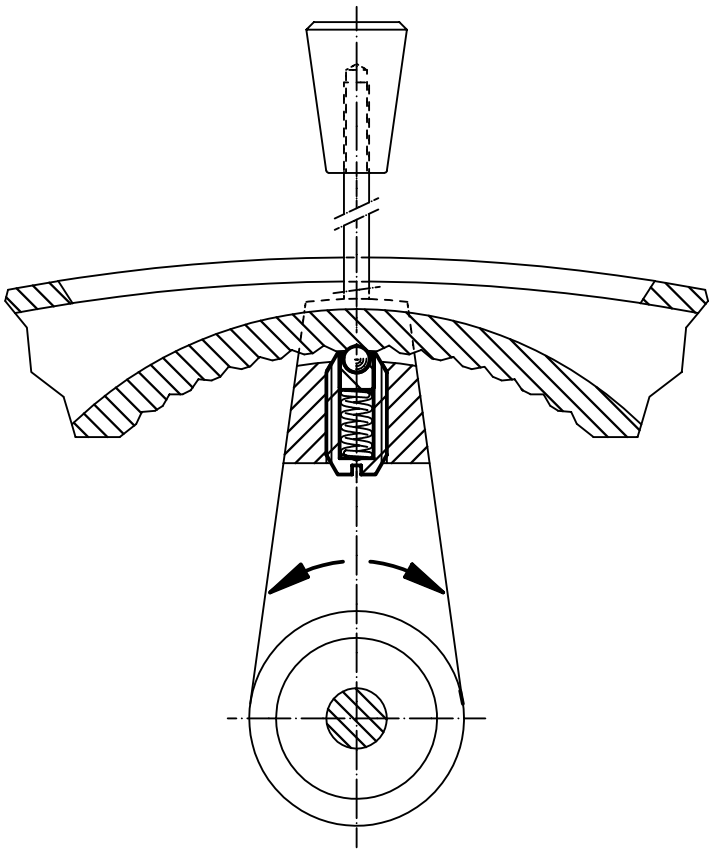
[1] statistical average value

2

Dimensions				Stroke	Spring load[1]					Art. No.
d_1	d_2	l	n	s	F_1 ~	F_2 ~	min.	max.		
[mm]				[mm]	[N]		[°C]		[g]	
stainless steel, standard spring load										
M 5	2,0	12	0,8	0,50	4,8	6,8	-30	90	1,1	22051.0405
M 6	2,5	14	1,0	0,70	6,3	10,0	-30	90	2,0	22051.0406
M 8	3,5	16	1,2	0,95	16,0	24,0	-30	90	4,2	22051.0408
M10	4,5	19	1,5	1,40	18,8	31,7	-30	90	7,6	22051.0410
M12	6,5	22	2,0	2,50	24,0	49,0	-30	90	12,0	22051.0412
M16	8,2	24	2,0	3,10	38,0	68,0	-30	90	25,0	22051.0416
stainless steel, heavy spring load										
M 5	2,0	12	0,8	0,50	10,0	14,0	-30	90	1,1	22051.0605
M 6	2,5	14	1,0	0,70	11,0	16,0	-30	90	2,1	22051.0606
M 8	3,5	16	1,2	0,95	23,0	40,0	-30	90	4,3	22051.0608
M10	4,5	19	1,5	1,40	28,0	54,3	-30	90	7,8	22051.0610
M12	6,5	22	2,0	2,50	36,5	77,3	-30	90	12,3	22051.0612
M16	8,5	24	2,0	3,10	50,0	88,7	-30	90	25,0	22051.0616

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • with internal hexagon

EH 22060.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

Pin
- Free cutting steel, hardened, blackened
- Thermoplastic POM, white
- Stainless steel 1.4305

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Spring
- Stainless steel

Assembly

Spring plungers can be mounted and removed by means of the slot or internal hexagon.
Please use a special assembly tool for mounting with a slot (pin side).

Characteristic

Standard spring load: no marking

Reinforced spring load: marked with two lines



MORE INFORMATION

Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

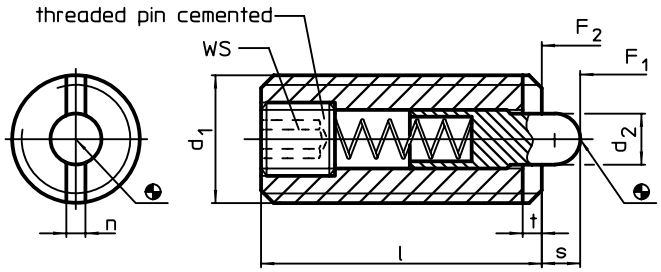
References

Thread lock on request, please refer to appendix - Technical Data -

Further products

Spring Plungers, with internal hexagon and seal . . . . . → p. 69

DRAWING



ORDER INFORMATION

Dimensions					WS	Stroke s	Spring load[1]					Art. No.
d_1	d_2	l	n	t			F_1 ~	F_2 ~	min.	max.		
[mm]					[mm]	[mm]			[°C]		[g]	
free cutting steel, standard spring load												
M 3	1,0	12	0,4	0,5	0,7	1,0	2,0 N	4 N	–	250	0,40	22060.0003
M 4	1,5	15	0,6	0,6	1,3	1,5	4,5 N	16 N	–	250	0,93	22060.0004
M 5	2,4	18	1,2	0,8	1,5	2,3	6,0 N	19 N	–	250	1,70	22060.0005
M 6	2,7	20	1,3	0,9	2,0	2,5	6,0 N	19 N	–	250	2,80	22060.0006
M 8	3,5	22	1,5	1,4	2,5	3,0	10,0 N	39 N	–	250	5,80	22060.0008
M10	4,0	22	1,5	1,4	3,0	3,0	10,0 N	39 N	–	250	9,20	22060.0010
M12	6,0	28	2,7	2,0	4,0	4,0	12,0 N	53 N	–	250	16,00	22060.0012
M16	7,5	32	3,2	2,5	5,0	5,0	45,0 N	100 N	–	250	35,00	22060.0016
M20	10,0	40	3,7	3,0	6,0	7,0	52,0 N	125 N	–	250	68,00	22060.0020
M24	12,0	52	3,7	3,0	8,0	10,0	70,0 N	170 N	–	250	131,00	22060.0024
free cutting steel, heavy spring load												
M 5	2,4	18	1,2	0,8	1,5	2,3	11,0 N	40 N	–	250	1,60	22060.0105
M 6	2,7	20	1,3	0,9	2,0	2,5	15,0 N	43 N	–	250	2,80	22060.0106
M 8	3,5	22	1,5	1,4	2,5	3,0	20,0 N	75 N	–	250	5,80	22060.0108
M10	4,0	22	1,5	1,4	3,0	3,0	20,0 N	75 N	–	250	9,30	22060.0110
M12	6,0	28	2,7	2,0	4,0	4,0	45,0 N	120 N	–	250	16,00	22060.0112
M16	7,5	32	3,2	2,5	5,0	5,0	64,0 N	160 N	–	250	33,00	22060.0116
M20	10,0	40	3,7	3,0	6,0	7,0	75,0 N	195 N	–	250	67,00	22060.0120
M24	12,0	52	3,7	3,0	8,0	10,0	75,0 N	245 N	–	250	129,00	22060.0124

[1] statistical average value →

Dimensions d_1	d_2	l	n	t	WS	Stroke s	Spring load[1] F_1 ~	F_2 ~	min.	max.		Art. No.
[mm]					[mm]	[mm]			[°C]		[g]	
free cutting steel, pin from thermoplastic, standard spring load												
M 4	1,5	15	0,6	0,6	1,3	1,5	4,5 N	16 N	-30	50	0,86	22060.0204
M 5	2,4	18	1,2	0,8	1,5	2,3	6,0 N	19 N	-30	50	1,50	22060.0205
M 6	2,7	20	1,3	0,9	2,0	2,5	6,0 N	19 N	-30	50	2,30	22060.0206
M 8	3,5	22	1,5	1,4	2,5	3,0	10,0 N	39 N	-30	50	5,10	22060.0208
M10	4,0	22	1,5	1,4	3,0	3,0	10,0 N	39 N	-30	50	8,10	22060.0210
M12	6,0	28	2,7	2,0	4,0	4,0	12,0 N	53 N	-30	50	14,00	22060.0212
M16	7,5	32	3,2	2,5	5,0	5,0	45,0 N	100 N	-30	50	31,00	22060.0216
stainless steel, standard spring load												
M 3	1,0	12	0,4	0,5	0,7	1,0	2,0 kN	4 kN	–	250	0,40	22060.0403
M 4	1,5	15	0,6	0,6	1,3	1,5	4,5 N	16 N	–	250	1,10	22060.0404
M 5	2,4	18	1,2	0,8	1,5	2,3	6,0 N	19 N	–	250	1,70	22060.0405
M 6	2,7	20	1,3	0,9	2,0	2,5	6,0 N	19 N	–	250	2,80	22060.0406
M 8	3,5	22	1,5	1,4	2,5	3,0	10,0 N	39 N	–	250	5,90	22060.0408
M10	4,0	22	1,5	1,4	3,0	3,0	10,0 N	39 N	–	250	9,50	22060.0410
M12	6,0	28	2,7	2,0	4,0	4,0	12,0 N	53 N	–	250	17,00	22060.0412
M16	7,5	32	3,2	2,5	5,0	5,0	45,0 N	100 N	–	250	35,00	22060.0416
M20	10,0	40	3,7	3,0	6,0	7,0	52,0 N	125 N	–	250	68,00	22060.0420
stainless steel, pin from thermoplastic, standard spring load												
M 4	1,5	15	0,6	0,6	1,3	1,5	4,5 N	16 N	-30	50	0,93	22060.0604
M 5	2,4	18	1,2	0,8	1,5	2,3	6,0 N	19 N	-30	50	1,60	22060.0605
M 6	2,7	20	1,3	0,9	2,0	2,5	6,0 N	19 N	-30	50	2,50	22060.0606
M 8	3,5	22	1,5	1,4	2,5	3,0	10,0 N	39 N	-30	50	5,10	22060.0608
M10	4,0	22	1,5	1,4	3,0	3,0	10,0 N	39 N	-30	50	8,50	22060.0610
M12	6,0	28	2,7	2,0	4,0	4,0	12,0 N	53 N	-30	50	14,00	22060.0612
M16	7,5	32	3,2	2,5	5,0	5,0	45,0 N	100 N	-30	50	32,00	22060.0616

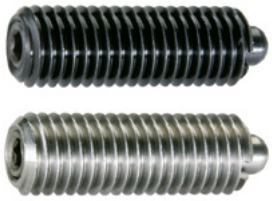
[1] statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool for mounting via slot (pin sided)			
	**M 3**	13	22060.0803
	M 4	29	22060.0804
	M 5	61	22060.0805
	M 6	67	22060.0806
	M 8	108	22060.0808
	M10	124	22060.0810
	M12	112	22060.0812
	M16	173	22060.0816
	M20	226	22060.0820
	**M24**	258	22070.0838

Spring Plungers • with internal hexagon and seal

EH 22060.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. By means of the seal, liquid cannot penetrate into the spring plunger.

Material

Pin
- Free cutting steel, hardened, blackened
- Stainless steel 1.4305

Seal
- NBR

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Spring
- Stainless steel

Assembly

Spring plungers can be mounted and removed by means of the slot or internal hexagon.
Please use a special assembly tool for mounting with a slot (pin side).
For the pin-sided assembly of the version d_1=M8 it is necessary to use the assembly tool for the version d_1=M10 (Art. No. 22060.0810).

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



MORE INFORMATION

Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

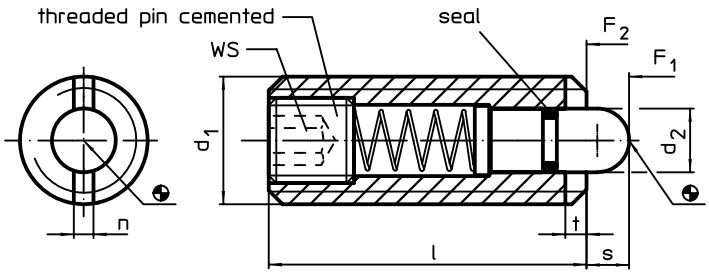
References

Compared to EH 22060., i.e. "no seal", there are deviations in dimension l, spring load and temperature range.
Thread lock on request, please refer to appendix - Technical Data -

Further products

Spring Plungers, with internal hexagon. . . . . → p. 67

DRAWING



ORDER INFORMATION

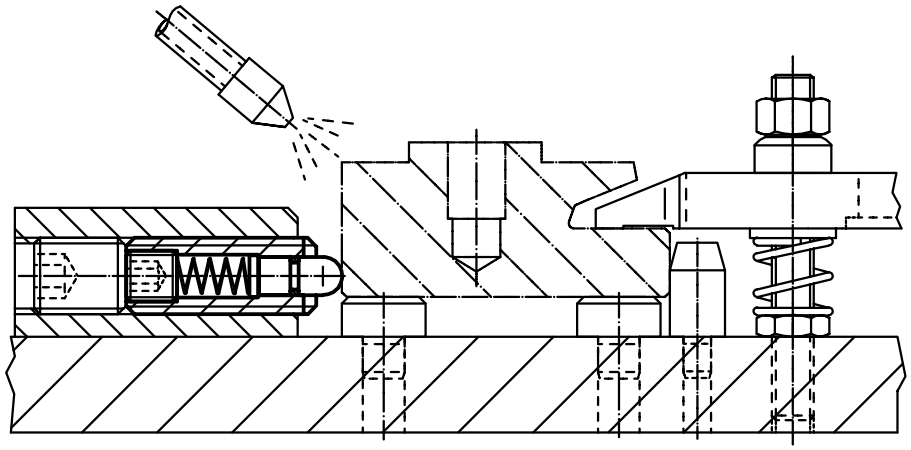
Dimensions					WS	Stroke s	Spring load[1]					Art. No.
d_1	d_2	l	n	t			F_1 ~	F_2 ~	min.	max.		
[mm]					[mm]	[mm]	[N]		[°C]		[g]	
free cutting steel, standard spring load												
M 8	3,8	26	1,5	1,4	2,5	3,0	9	24	-30	80	6,9	22060.0048
M10	4,0	28	1,5	1,4	3,0	3,5	15	30	-30	80	11,0	22060.0050
M12	6,0	35	2,7	2,0	4,0	4,0	24	50	-30	80	20,0	22060.0052
M16	7,5	40	3,2	2,5	5,0	5,0	36	58	-30	80	43,0	22060.0056
free cutting steel, heavy spring load												
M 8	3,8	26	1,5	1,4	2,5	3,0	17	39	-30	80	6,6	22060.0148
M10	4,0	28	1,5	1,4	3,0	3,5	22	43	-30	80	12,0	22060.0150
M12	6,0	35	2,7	2,0	4,0	4,0	40	80	-30	80	20,0	22060.0152
M16	7,5	40	3,2	2,5	5,0	5,0	44	113	-30	80	45,0	22060.0156
stainless steel, standard spring load												
M 8	3,8	26	1,5	1,4	2,5	3,0	9	24	-30	80	7,2	22060.0448
M10	4,0	28	1,5	1,4	3,0	3,5	15	30	-30	80	12,0	22060.0450
M12	6,0	35	2,7	2,0	4,0	4,0	24	50	-30	80	20,0	22060.0452
M16	7,5	40	3,2	2,5	5,0	5,0	36	58	-30	80	44,0	22060.0456

[1] statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool for mounting via slot (pin sided)			
	**M10**	124	22060.0810
	M12	112	22060.0812
	M16	173	22060.0816

APPLICATION EXAMPLE



Spring Plungers • smooth

EH 22070.



PRODUCT DESCRIPTION

Especially designed for the use in tool-making.
Usable as ejection pins and spring stops.
It is impossible for the complete spring plunger or any of its individual parts to come out of the retaining bore.

Material

Pin
- Steel, case-hardened, blackened
- Stainless steel 1.4305

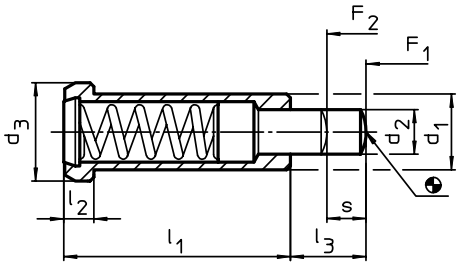
Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Spring
- Stainless steel

MORE INFORMATION

Notes
Special types on request.
Spring plungers are specially tested for spring range and forces.

DRAWING

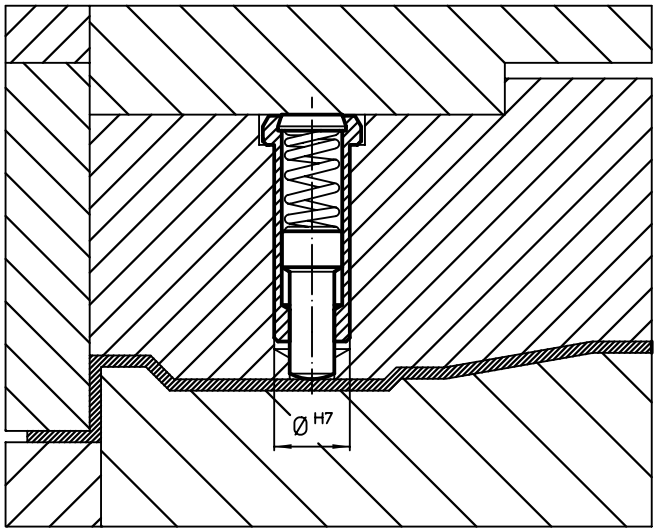


ORDER INFORMATION

Dimensions						Stroke s	Spring load[1]		Temperature max.	Location hole H7	Weight	Art. No.
d_1 -0,05	d_2	d_3	l_1	l_2	l_3		F_1 ~	F_2 ~				
[mm]						[mm]	[N]		[°C]	[mm]	[g]	
free cutting steel, standard spring load												
6	2,7	8	20	3,2	6	3,5	10	22	250	6	4,2	22070.0006
8	3,9	10	24	3,2	8	4,5	30	88	250	8	7,7	22070.0008
10	5,9	13	30	4,0	10	5,5	42	110	250	10	16,0	22070.0010
12	7,9	16	36	5,0	12	6,5	50	130	250	12	27,0	22070.0012
stainless steel, standard spring load												
6	2,7	8	20	3,2	6	3,5	10	22	250	6	4,2	22070.0106
8	3,9	10	24	3,2	8	4,5	30	88	250	8	7,7	22070.0108
10	5,9	13	30	4,0	10	5,5	42	110	250	10	16,0	22070.0110
12	7,9	16	36	5,0	12	6,5	50	130	250	12	27,0	22070.0112

[1] statistical average value

APPLICATION EXAMPLE



2

Spring Plungers • long

EH 22070.



PRODUCT DESCRIPTION

To be used for ejecting, as a detent, for applying pressure or as a shock element.

Material

Pin
- Steel, case-hardened, blackened
- Stainless steel 1.4305

Body
- Free cutting steel, blackened
- Stainless steel 1.4305
- Heat-treated steel, tempered, blackened

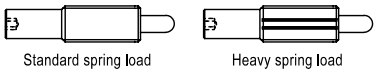
Spring
- Stainless steel

Assembly

Spring plungers can be mounted and removed by means of the slot or internal hexagon.
Please use a special assembly tool for mounting with a slot (pin side).

Characteristic

Standard spring load: no marking
Reinforced spring load: marked with two lines



MORE INFORMATION

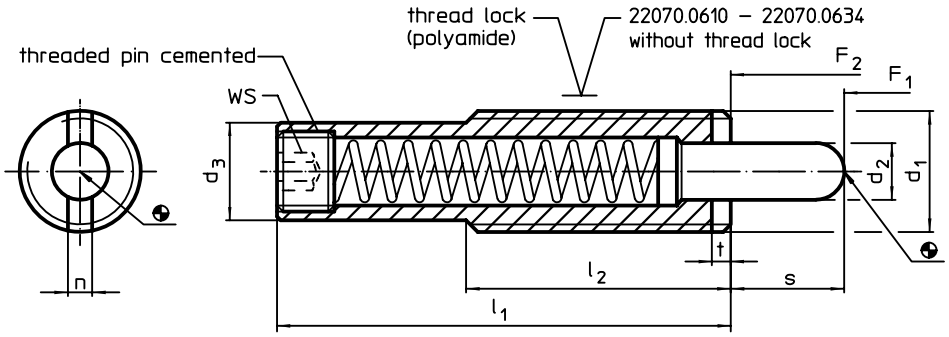
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Thread lock on request, please refer to appendix - Technical Data -

DRAWING



ORDER INFORMATION

Dimensions							Stroke s	WS	Spring load[1]				Art. No.
d_1	d_2	d_3	l_1	l_2	n	t			F_1 ~	F_2 ~	min.	max.	
[mm]							[mm]	[mm]	[N]		[°C]		[g]	
body from free cutting steel, standard spring load														
M10	4,0	7,8	**35**	25	1,5	1,4	**8**	3	6	16	-30	90	13	22070.0408
M12	5,5	9,5	**43**	35	2,7	2,0	**10**	4	4	18	-30	90	22	22070.0412
M16	8,0	13,4	**48**	35	3,2	3,0	**10**	6	7	24	-30	90	47	22070.0430
			58	35	3,2	3,0	**10**	6	15	42	-30	90	52	22070.0432
							15	6	9	33	-30	90	54	22070.0436
							20	6	4	23	-30	90	55	22070.0440
			83	35	3,2	3,0	**20**	6	11	43	-30	90	71	22070.0442
			98	35	3,2	3,0	**25**	6	13	41	-30	90	81	22070.0444
							30	6	13	47	-30	90	83	22070.0450
			118	35	3,2	3,0	**30**	6	24	110	-30	90	97	22070.0452
			148	35	3,2	3,0	**40**	6	13	63	-30	90	117	22070.0455
							50	6	7	43	-30	90	117	22070.0460
M24	10,0	19,6	**60**	45	3,7	3,0	**15**	8	14	87	-30	90	132	22070.0480
stainless steel, standard spring load														
M10	4,0	7,8	**35**	25	1,5	1,4	**8**	3	6	16	-30	90	13	22070.0208
M12	5,5	9,5	**43**	35	2,7	2,0	**10**	4	4	18	-30	90	22	22070.0212
M16	8,0	13,4	**48**	35	3,2	3,0	**10**	6	7	24	-30	90	47	22070.0230
			58	35	3,2	3,0	**15**	6	9	33	-30	90	54	22070.0236
							20	6	4	23	-30	90	55	22070.0240
			98	35	3,2	3,0	**25**	6	13	41	-30	90	81	22070.0244
							30	6	13	47	-30	90	83	22070.0250
			148	35	3,2	3,0	**40**	6	13	63	-30	90	117	22070.0255
							50	6	7	43	-30	90	117	22070.0260

[1] statistical average value

Dimensions							Stroke s	WS	Spring load[1]					Art. No.
d_1	d_2	d_3	l_1	l_2	n	t			F_1 ~	F_2 ~	min.	max.		
[mm]							[mm]	[mm]	[N]		[°C]		[g]	
M24	10,0	19,6	**60**	45	3,7	3,0	**15**	8	14	87	-30	90	132	22070.0280
body from free cutting steel, heavy spring load														
M10	4,0	7,8	**35**	25	1,5	1,4	**8**	3	12	22	-30	90	13	22070.0508
M12	5,5	9,5	**43**	35	2,7	2,0	**10**	4	7	46	-30	90	23	22070.0512
M16	8,0	13,4	**48**	35	3,2	3,0	**10**	6	10	43	-30	90	47	22070.0530
			58	35	3,2	3,0	**10**	6	14	84	-30	90	54	22070.0532
							15	6	10	57	-30	90	55	22070.0536
							20	6	8	33	-30	90	55	22070.0540
			83	35	3,2	3,0	**20**	6	18	72	-30	90	72	22070.0542
			98	35	3,2	3,0	**25**	6	20	70	-30	90	82	22070.0544
							30	6	20	80	-30	90	83	22070.0550
			148	35	3,2	3,0	**40**	6	21	113	-30	90	121	22070.0555
							50	6	13	75	-30	90	121	22070.0560
M24	10,0	19,6	**60**	45	3,7	3,0	**15**	8	24	192	-30	90	134	22070.0580
stainless steel, heavy spring load														
M10	4,0	7,8	**35**	25	1,5	1,4	**8**	3	12	22	-30	90	13	22070.0308
M12	5,5	9,5	**43**	35	2,7	2,0	**10**	4	7	46	-30	90	22	22070.0312
M16	8,0	13,4	**48**	35	3,2	3,0	**10**	6	10	43	-30	90	47	22070.0330
			58	35	3,2	3,0	**15**	6	10	57	-30	90	54	22070.0336
							20	6	8	33	-30	90	55	22070.0340
			98	35	3,2	3,0	**25**	6	20	70	-30	90	81	22070.0344
							30	6	20	80	-30	90	83	22070.0350
			148	35	3,2	3,0	**40**	6	21	113	-30	90	117	22070.0355
							50	6	13	75	-30	90	117	22070.0360
M24	10,0	19,6	**60**	45	3,7	3,0	**15**	8	24	192	-30	90	132	22070.0380
body from heat treated steel, standard spring load, without locking														
M16	7,3	13,4	**80**	35	3,2	3,0	**11**	8	17	74	–	250	69	22070.0610
			120	35	3,2	3,0	**21**	8	21	81	–	250	96	22070.0612
			150	35	3,2	3,0	**31**	8	21	89	–	250	117	22070.0614
			200	35	3,2	3,0	**41**	8	16	80	–	250	149	22070.0616
M22	9,0	19,0	**130**	50	3,5	4,0	**21**	8	80	214	–	250	211	22070.0630
			168	50	3,5	4,0	**31**	8	70	210	–	250	278	22070.0632
			226	50	3,5	4,0	**41**	8	76	208	–	250	358	22070.0634

[1] statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool for mounting via slot (pin sided)			
	**M10**	87	22070.0830
	M12	88	22070.0832
	M16	110	22070.0834
	M22	245	22070.0836
	M24	258	22070.0838

2

Spring Plungers • smooth, with collar and ball

EH 22080.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

Body
- Stainless steel 1.4303
- Brass
- Thermoplastic POM, blue

Ball
- Stainless steel, hardened
- Thermoplastic POM, white

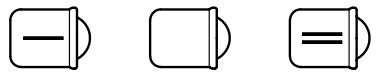
Spring
- Stainless steel

Assembly

A tolerance of H7 is recommended for the locating hole of d_1.

Characteristic

Light spring load: marked with one line
Standard spring load: no marking
Reinforced spring load: marked with two lines



MORE INFORMATION

Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

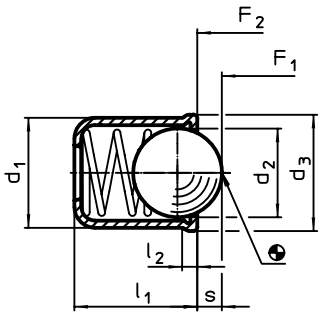
References

Calculation of indexing resistance, see details at the start of the section.
Version with higher spring forces see "EH 22080. Spring Plungers, smooth, long, with collar and ball".

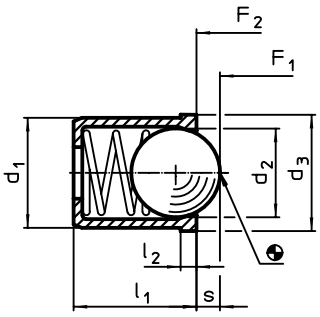
Further products

Spring Plungers, smooth, long, with collar and ball . . . . . → p. 76

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions d_1 +0,1 [mm]	d_2 [mm]	d_3 [mm]	l_1 [mm]	l_2 ~ [mm]	Stroke s [mm]	Spring load[1] F_1 ~ [N]	F_2 ~ [N]	min. [°C]	max. [°C]	Location hole H7 [mm]	[g]	Art. No.
body and ball from stainless steel, light spring load – picture 1												
4	3,00	4,6	5,0	0,9	1,00	0,4	1,0	–	250	4	0,3	22080.1004
5	4,00	5,6	6,0	0,9	1,40	0,5	4,7	–	250	5	0,6	22080.1005
6	5,00	6,5	7,0	1,0	1,80	2,3	6,5	–	250	6	1,0	22080.1006
8	6,50	8,5	9,0	1,1	2,40	4,0	9,0	–	250	8	2,1	22080.1008
10	8,50	11,0	13,0	1,5	3,30	3,9	10,0	–	250	10	4,4	22080.1010
12	10,00	13,0	16,0	2,3	4,00	6,2	14,6	–	250	12	7,3	22080.1012
body and ball from stainless steel, standard spring load – picture 1												
3	2,38	3,5	4,0	0,6	0,70	1,8	3,5	–	250	3	0,2	22080.0003
4	3,00	4,6	5,0	0,9	1,00	2,5	6,0	–	250	4	0,3	22080.0004
5	4,00	5,6	6,0	0,9	1,40	3,0	6,5	–	250	5	0,6	22080.0005
6	5,00	6,5	7,0	1,0	1,80	5,5	11,5	–	250	6	1,0	22080.0006
8	6,50	8,5	9,0	1,1	2,40	7,0	12,5	–	250	8	2,1	22080.0008
10	8,50	11,0	13,0	1,5	3,30	8,5	18,5	–	250	10	4,4	22080.0010
12	10,00	13,0	16,0	2,3	4,00	12,0	26,5	–	250	12	7,3	22080.0012

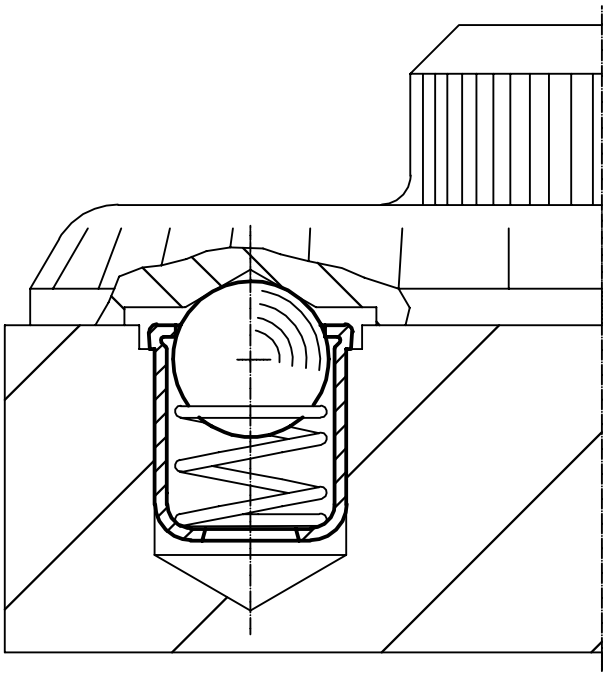
[1] statistical average value

→

Dimensions					Stroke	Spring load[1]				Location hole		Art. No.
d_1 +0,1	d_2	d_3	l_1	l_2 ~	s	F_1 ~	F_2 ~	min.	max.	H7		
[mm]					[mm]	[N]		[°C]		[mm]	[g]	
body and ball from stainless steel, heavy spring load – picture 1												
4	3,00	4,6	5,0	0,9	1,00	5,0	10,4	–	250	4	0,3	22080.2004
5	4,00	5,6	6,0	0,9	1,40	6,0	12,0	–	250	5	0,6	22080.2005
6	5,00	6,5	7,0	1,0	1,80	7,3	19,0	–	250	6	1,0	22080.2006
8	6,50	8,5	9,0	1,1	2,40	11,0	25,0	–	250	8	2,1	22080.2008
10	8,50	11,0	13,0	1,5	3,30	17,0	37,0	–	250	10	4,4	22080.2010
12	10,00	13,0	16,0	2,3	4,00	30,0	54,0	–	250	12	7,3	22080.2012
body from brass, ball from stainless steel, standard spring load – picture 2												
3	2,38	3,6	4,0	0,6	0,60	1,8	3,5	–	250	3	0,2	22080.0203
4	3,00	4,5	5,0	1,0	0,80	3,0	6,0	–	250	4	0,5	22080.0204
5	4,00	5,5	6,0	1,0	1,00	4,0	6,5	–	250	5	0,8	22080.0205
6	5,00	6,5	7,0	1,0	1,60	6,0	11,5	–	250	6	1,3	22080.0206
8	6,50	8,5	9,0	1,0	1,90	8,0	12,5	–	250	8	2,8	22080.0208
body from thermoplastic, ball from stainless steel, standard spring load – picture 2												
3	2,00	3,6	4,0	0,6	0,55	1,7	3,5	-30	50	3	0,1	22080.0403
4	3,00	4,6	5,0	1,0	0,80	3,0	6,5	-30	50	4	0,2	22080.0404
5	4,00	5,6	6,0	1,0	1,00	6,0	9,4	-30	50	5	0,4	22080.0405
6	5,00	6,5	7,0	1,0	1,60	6,2	12,6	-30	50	6	0,7	22080.0406
8	6,50	8,5	9,0	1,0	1,90	10,0	20,4	-30	50	8	1,5	22080.0408
10	8,00	11,0	13,5	1,5	2,40	11,9	22,3	-30	50	10	3,2	22080.0410
12	10,00	13,0	16,0	1,5	3,30	14,0	25,0	-30	50	12	5,8	22080.0412
body and ball from thermoplastic, standard spring load – picture 2												
4	3,00	4,6	5,0	1,0	0,80	3,0	6,5	-30	50	4	0,1	22080.0604
5	4,00	5,6	6,0	1,0	1,00	6,0	9,4	-30	50	5	0,2	22080.0605
6	5,00	6,5	7,0	1,0	1,60	6,2	12,6	-30	50	6	0,3	22080.0606
8	6,50	8,5	9,0	1,0	1,90	10,0	20,4	-30	50	8	0,6	22080.0608
10	8,00	11,0	13,5	1,5	2,40	11,9	22,3	-30	50	10	1,5	22080.0610
12	10,00	13,0	16,0	1,5	3,30	14,0	25,0	-30	50	12	2,5	22080.0612

[1] statistical average value

APPLICATION EXAMPLE



2

Spring Plungers • smooth, long, with collar and ball

EH 22080.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. This version has higher spring forces than the standard version. "EH 22080. Spring Plungers, smooth, with collar and ball".

Material

Body
- Stainless steel 1.4303

Ball
- Stainless steel, hardened

Spring
- Stainless steel

MORE INFORMATION

Notes

Special types on request.

Spring plungers are specially tested for spring range and forces.

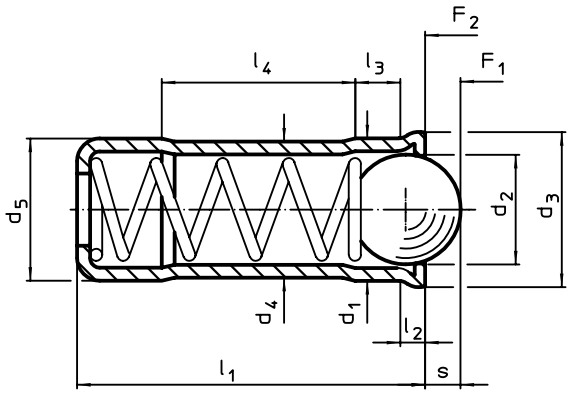
References

Calculation of indexing resistance, see details at the start of the section.

Further products

Spring Plungers, smooth, with collar and ball . . . . . → p. 74

DRAWING

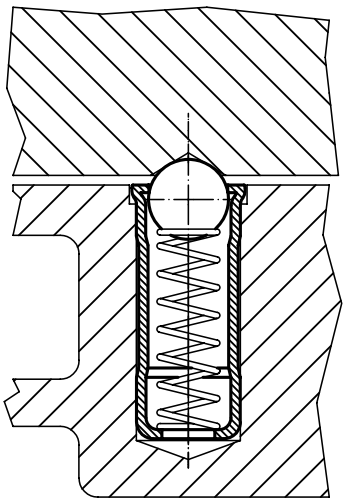


ORDER INFORMATION

Dimensions									Stroke s +0,2 -0,1	Spring load[1]		max.	Location hole H7		Art. No.
d_1 +0,1 +0,04	d_2	d_3	d_4	d_5 ±0,04	l_1	l_2 ~	l_3 ~	l_4 ~		F_1 ~	F_2 ~				
[mm]									[mm]	[N]		[°C]	[mm]	[g]	
4	3,0	4,6	3,85	4	10,7	0,9	1,8	5,6	0,9	12,9	19,0	250	4	0,6	22080.1104
5	4,0	5,6	4,85	5	12,0	0,9	2,1	6,0	1,3	19,3	29,2	250	5	1,0	22080.1105
6	5,0	6,5	5,85	6	15,0	1,0	2,3	8,2	1,7	28,0	47,5	250	6	2,0	22080.1106
8	6,5	8,5	7,55	8	18,0	1,1	2,9	9,5	2,3	40,0	67,3	250	8	4,0	22080.1108
10	8,5	11,0	9,55	10	26,0	1,5	4,2	14,3	3,1	66,0	105,0	250	10	8,0	22080.1110

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • smooth, with collar and ball, self-clamping

EH 22080.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. Due to expanding fit of the body, the spring plungers can accommodate variation of up to 0,2 mm in the locating bore. A less precise locating hole means lower machining costs.

Material

Body
- Thermoplastic POM, black

Ball
- Stainless steel, hardened
- Thermoplastic POM, white

Spring
- Stainless steel

Assembly

Thanks to the flexible design of the body, a direct manual mounting and a secure overhead installation is possible.

MORE INFORMATION

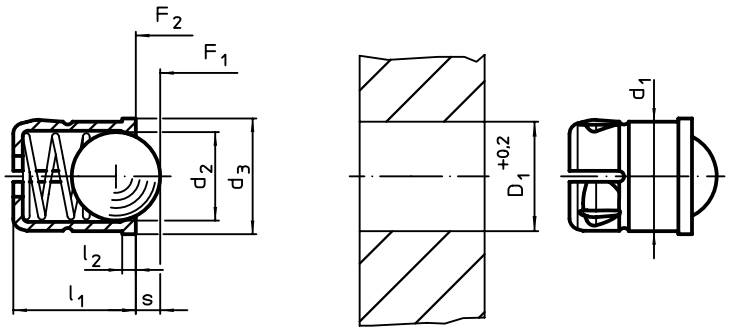
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Calculation of indexing resistance, see details at the start of the section.

DRAWING

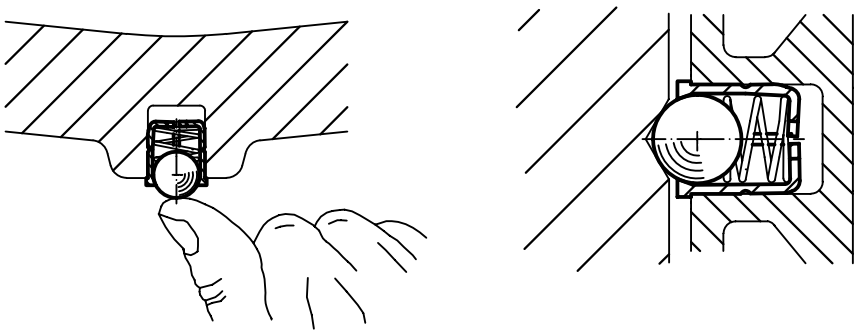


ORDER INFORMATION

Dimensions					Stroke	Spring load[1]				Location hole		Art. No.
d_1 +0,1	d_2	d_3	l_1 ±0,2	l_2 ~	s	F_1 ~	F_2 ~	min.	max.	D_1 +0,2		
[mm]					[mm]	[N]		[°C]		[mm]	[g]	
thermoplastic body, stainless steel ball												
4	3,0	4,6	5,0	1,0	0,8	3,0	6,5	-30	50	4	0,12	22080.0704
5	4,0	5,6	6,0	1,0	1,0	6,0	9,4	-30	50	5	0,34	22080.0705
6	5,0	6,5	7,0	1,0	1,6	6,2	12,6	-30	50	6	0,63	22080.0706
8	6,5	8,5	9,0	1,0	1,9	10,0	20,4	-30	50	8	1,40	22080.0708
10	8,0	11,0	13,5	1,5	2,4	11,9	22,3	-30	50	10	2,90	22080.0710
body and ball from thermoplastic												
4	3,0	4,6	5,0	1,0	0,8	3,0	6,5	-30	50	4	0,06	22080.0804
5	4,0	5,6	6,0	1,0	1,0	6,0	9,4	-30	50	5	0,17	22080.0805
6	5,0	6,5	7,0	1,0	1,6	6,2	12,6	-30	50	6	0,23	22080.0806
8	6,5	8,5	9,0	1,0	1,9	10,0	20,4	-30	50	8	0,57	22080.0808
10	8,0	11,0	13,5	1,5	2,4	11,9	22,3	-30	50	10	1,21	22080.0810

[1] statistical average value

APPLICATION EXAMPLE



2

Spring Plungers • smooth, with collar and pin

EH 22080.



PRODUCT DESCRIPTION

To be used for locating, tightening, as an assembly support, for applying pressure, as a detent, for ejection or as a shock absorber.

Material

Pin
- Stainless steel 1.4305
- Thermoplastic POM, white

Body
- Stainless steel 1.4303

Spring
- Stainless steel

Assembly

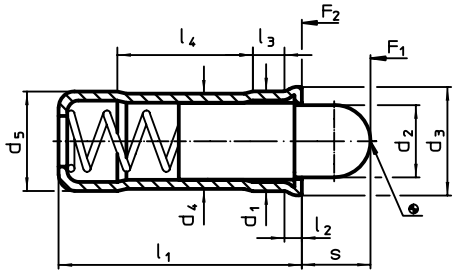
A tolerance of H7 is recommended for the locating hole of d_1.

MORE INFORMATION

Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

DRAWING

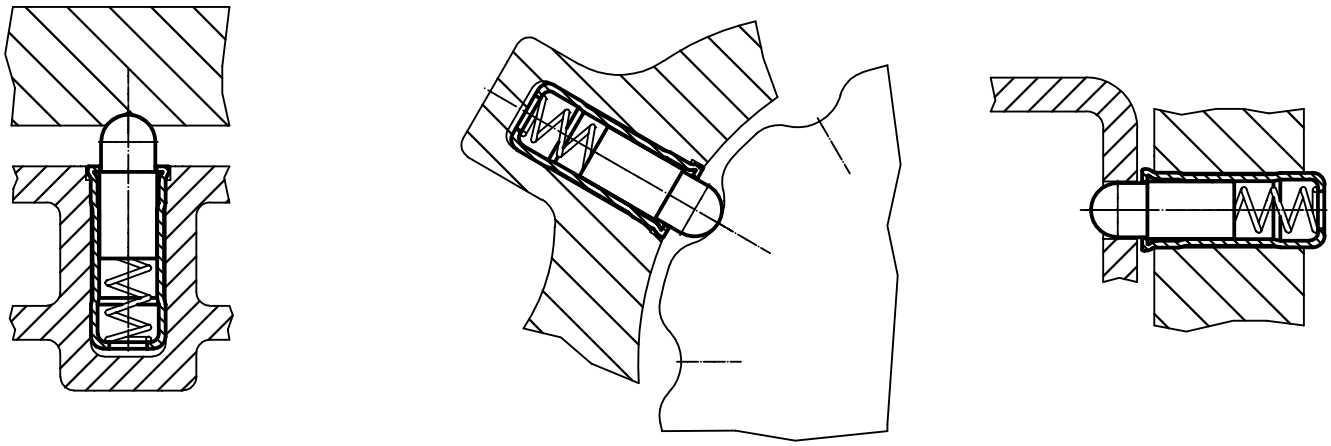


ORDER INFORMATION

Dimensions									Stroke s	Spring load[1]		Location hole H7		Art. No.
d_1 +0,1 +0,04	d_2	d_3	d_4	d_5 ±0,04	l_1	l_2 ~	l_3 ~	l_4 ~		F_1 ~	F_2 ~	min.	max.			
[mm]									[mm]	[N]		[°C]		[mm]	[g]	
body and pin from stainless steel																
4	2,8	4,6	3,85	4	10,7	0,9	1,8	5,6	2,7	3,0	8,2	–	250	4	0,7	22080.0104
5	3,8	5,6	4,85	5	12,0	0,9	2,1	6,0	4,0	3,3	9,0	–	250	5	1,2	22080.0105
6	4,8	6,5	5,85	6	15,0	1,0	2,3	8,2	5,5	6,1	12,0	–	250	6	2,2	22080.0106
8	6,2	8,5	7,55	8	18,0	1,1	2,9	9,5	6,5	9,0	20,1	–	250	8	4,2	22080.0108
10	8,1	11,0	9,55	10	26,0	1,5	4,2	14,3	8,0	16,2	29,0	–	250	10	9,0	22080.0110
stainless steel body, thermoplastic pin																
4	2,8	4,6	3,85	4	10,7	0,9	1,8	5,6	2,7	3,0	8,2	-30	50	4	0,5	22080.0124
5	3,8	5,6	4,85	5	12,0	0,9	2,1	6,0	4,0	3,3	9,0	-30	50	5	0,8	22080.0125
6	4,8	6,5	5,85	6	15,0	1,0	2,3	8,2	5,5	6,1	12,0	-30	50	6	1,3	22080.0126
8	6,2	8,5	7,55	8	18,0	1,1	2,9	9,5	6,5	9,0	20,1	-30	50	8	2,5	22080.0128
10	8,1	11,0	9,55	10	26,0	1,5	4,2	14,3	8,0	16,2	29,0	-30	50	10	5,0	22080.0130

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • smooth, without collar

EH 22080.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

Body
- Stainless steel 1.4305

Ball
- Stainless steel, hardened

Spring
- Stainless steel

Assembly

The locating hole has to be adapted to each individual application case. We recommend an F8 size location hole for easy assembly and a H9 size when tight fit is required.

Characteristic

Standard spring load: no marking

Reinforced spring load: marked with two lines



MORE INFORMATION

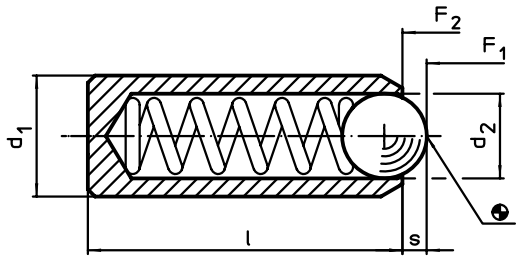
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Calculation of indexing resistance, see details at the start of the section.

DRAWING



ORDER INFORMATION

Dimensions			Stroke	Spring load[1]			Location hole joint connection F8 / press fit H9		Art. No.
d_1 ±0,04	d_2	l	s	F_1 ~	F_2 ~	max.			
[mm]			[mm]	[N]		[°C]	[mm]	[g]	
stainless steel, standard spring load									
2,0	1,0	3,5	0,30	0,8	1,5	250	2,0	0,1	22080.0306
2,5	1,5	5,0	0,40	2,8	4,7	250	2,5	0,2	22080.0308
3,0	2,0	7,0	0,65	4,5	7,5	250	3,0	0,4	22080.0310
3,5	2,5	9,0	0,80	8,5	14,0	250	3,5	0,6	22080.0312
4,0	3,0	11,0	0,90	8,0	14,0	250	4,0	0,8	22080.0315
4,5	3,2	12,0	0,95	9,5	16,5	250	4,5	1,1	22080.0317
5,0	3,5	13,0	1,00	11,0	18,0	250	5,0	1,5	22080.0320
5,5	4,0	14,0	1,20	15,5	25,0	250	5,5	1,9	22080.0322
6,0	4,5	15,0	1,50	18,0	31,0	250	6,0	2,3	22080.0325
8,0	6,0	18,0	2,00	24,0	45,0	250	8,0	5,0	22080.0327
10,0	8,0	20,0	2,50	26,0	49,0	250	10,0	8,3	22080.0330
12,0	10,0	22,0	3,50	41,0	86,0	250	12,0	12,0	22080.0332
stainless steel, heavy spring load									
2,0	1,0	3,5	0,30	1,3	2,2	250	2,0	0,1	22080.0356
2,5	1,5	5,0	2,50	4,7	7,1	250	2,5	0,2	22080.0358
3,0	2,0	7,0	0,65	7,8	11,6	250	3,0	0,4	22080.0360
3,5	2,5	9,0	0,80	12,0	18,0	250	3,5	0,6	22080.0362
4,0	3,0	11,0	0,90	15,0	22,0	250	4,0	0,8	22080.0365
4,5	3,2	12,0	0,95	18,7	25,1	250	4,5	1,1	22080.0367
5,0	3,5	13,0	1,00	19,3	26,6	250	5,0	1,5	22080.0370
5,5	4,0	14,0	1,20	25,1	39,2	250	5,5	1,9	22080.0372
6,0	4,5	15,0	1,50	36,0	60,5	250	6,0	2,3	22080.0375
8,0	6,0	18,0	2,00	57,0	103,5	250	8,0	5,0	22080.0377
10,0	8,0	20,0	2,50	61,0	110,0	250	10,0	8,3	22080.0380
12,0	10,0	22,0	3,50	68,0	143,0	250	12,0	12,0	22080.0382

[1] statistical average value

2

Spring Plungers • smooth, without collar, with moveable ball

EH 22081.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. The running of the ball minimises wear on the counterpart, this also results in a positive locking behaviour depending on the counterpart.
Plastic balls offer electric insulation.

Material

Body
- Stainless steel 1.4305

Ball
- Stainless steel, hardened

Bearing
- Plastic

Spring
- Stainless steel

Assembly

The locating hole has to be adapted to each individual application case. We recommend an F8 size location hole for easy assembly and a H9 size when tight fit is required.

MORE INFORMATION

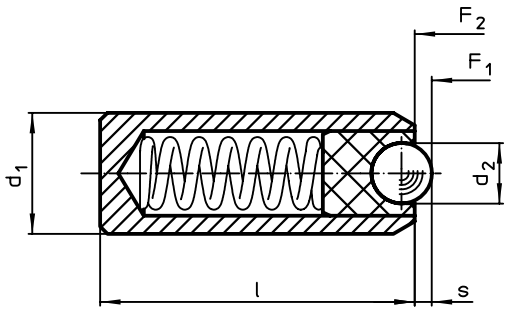
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Calculation of indexing resistance, see details at the start of the section.

DRAWING



ORDER INFORMATION

Dimensions			Stroke	Spring load[1]				Location hole joint connection F8 / press fit H9		Art. No.
d_1 ±0,04	d_2	l	s	F_1 ~	F_2 ~	min.	max.			
[mm]			[mm]	[N]		[°C]		[mm]	[g]	
body and ball from stainless steel										
4	2,0	11	0,50	4,8	6,8	-30	90	4	0,6	22081.0315
5	2,5	13	0,70	6,3	10,0	-30	90	5	1,2	22081.0320
6	3,5	15	0,95	16,0	24,0	-30	90	6	2,0	22081.0325
8	4,5	18	1,40	18,8	31,7	-30	90	8	4,3	22081.0327
10	6,5	20	2,50	24,0	49,0	-30	90	10	7,1	22081.0330
12	8,5	22	3,10	38,0	68,0	-30	90	12	11,0	22081.0332

[1] statistical average value

Holders • for spring plungers

EH 22082.



PRODUCT DESCRIPTION

Holders are used to mount spring plungers, smooth, with collar (EH 22080.) on the side.

Material

- Zinc die-cast, nickel-plated

Assembly

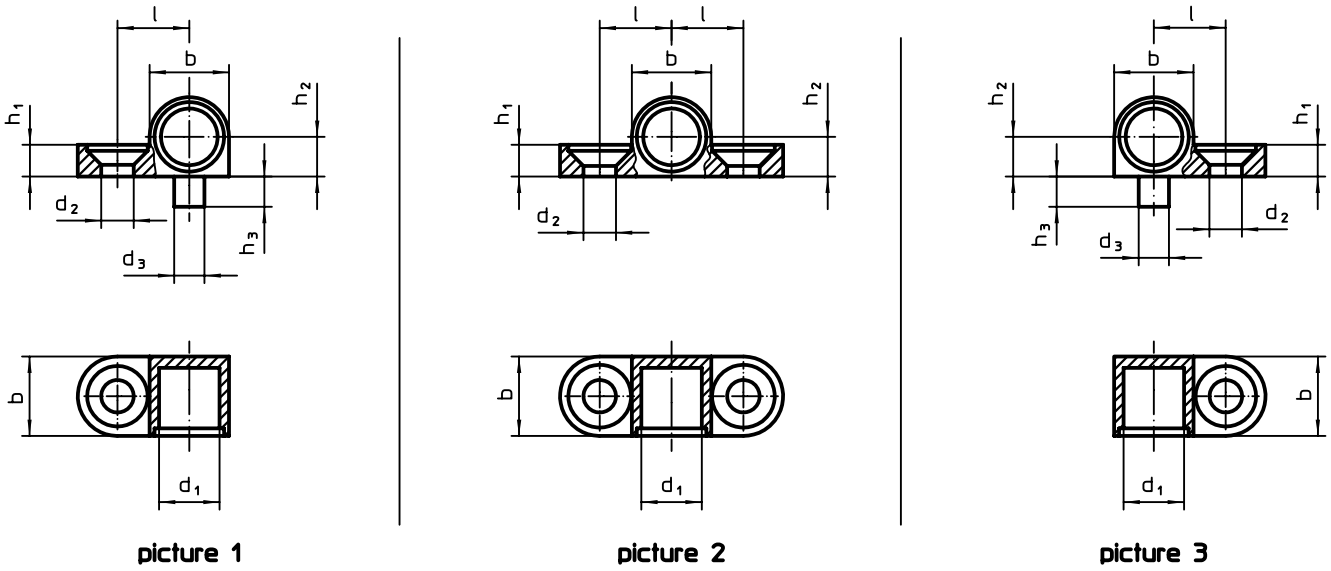
The left and right hand versions (picture 1 / picture 3) are attached using only one screw, and are also provided with an anti-turn locking device.

MORE INFORMATION

References

Suitable for spring plungers, smooth, with collar and ball (EH 22080.)

DRAWING

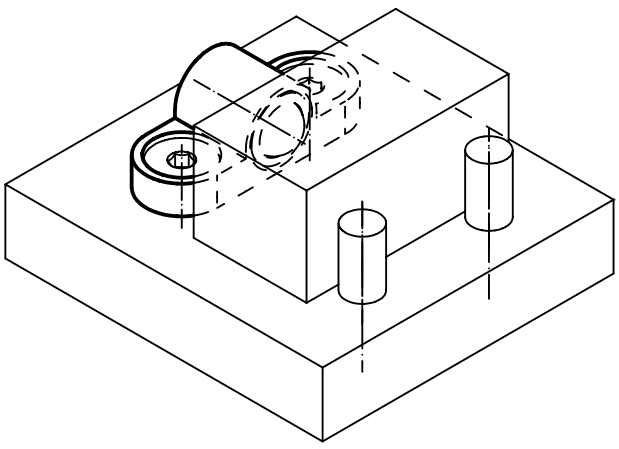


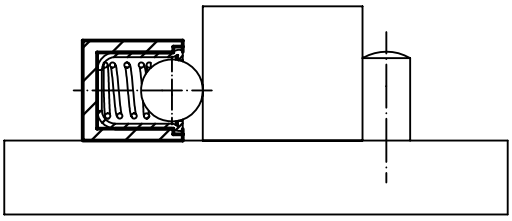
picture 1 | picture 2 | picture 3

ORDER INFORMATION

Dimensions								Suitable screw		Art. No.
d_1	d_2	d_3 -0,05	b	h_1	h_2 ±0,05	h_3	l ±0,05			
[mm]								[mm]	[g]	
left – picture 1										
6	3,2	3	8,5	3,2	4,25	3	7,5	M3	3	22082.0006
8	4,3	4	10,5	4,2	5,25	4	9,5	M4	5	22082.0008
two-sided – picture 2										
6	3,2	–	8,5	3,2	4,25	–	7,5	M3	4	22082.0106
8	4,3	–	10,5	4,2	5,25	–	9,5	M4	6	22082.0108
right – picture 3										
6	3,2	3	8,5	3,2	4,25	3	7,5	M3	3	22082.0206
8	4,3	4	10,5	4,2	5,25	4	9,5	M4	5	22082.0208

APPLICATION EXAMPLE





Spring Plungers • double-sided

EH 22090.



PRODUCT DESCRIPTION

To be used for locating and securing, as well as electric connection.

Material

Body
- Brass

Ball
- Stainless steel, hardened

Spring
- Stainless steel

MORE INFORMATION

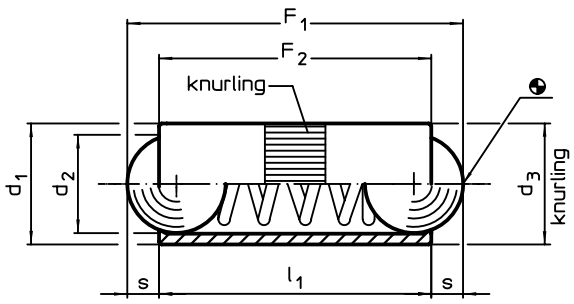
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Calculation of indexing resistance, see details at the start of the section.

DRAWING

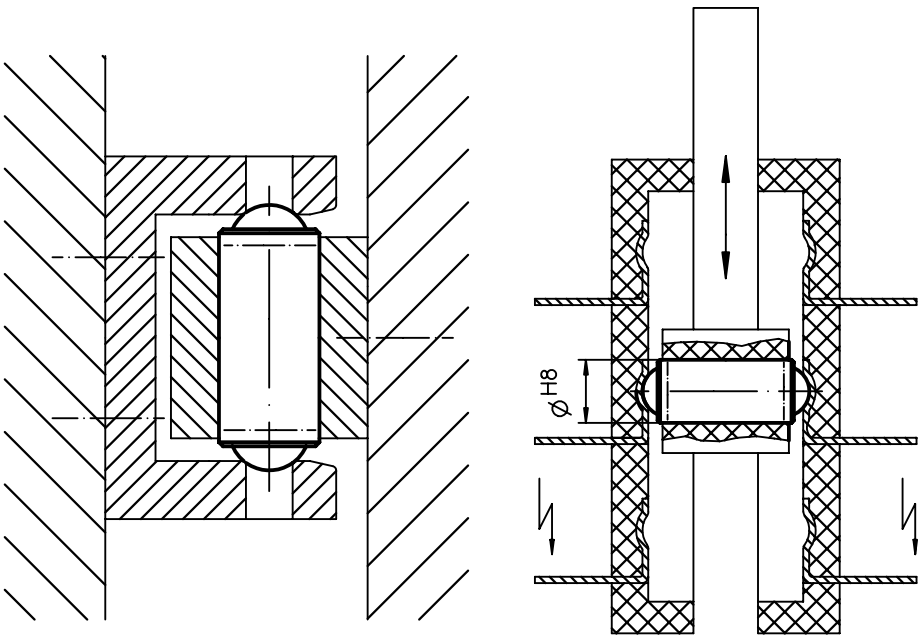


ORDER INFORMATION

Dimensions				Stroke	Spring load[1]			Location hole		Art. No.
d_1	d_2	d_3	l_1	s	F_1 ~	F_2 ~	max.	H8		
[mm]				[mm]	[N]		[°C]	[mm]	[g]	
2,5	2,0	2,52	5,3	0,65	1,3	2,5	250	2,5	0,22	22090.0025
3,0	2,5	3,02	7,3	0,80	2,0	4,5	250	3,0	0,34	22090.0030
4,0	3,0	4,03	9,0	0,90	2,5	7,5	250	4,0	0,65	22090.0040
5,0	4,0	5,03	10,8	1,20	3,5	8,0	250	5,0	1,27	22090.0050
6,0	5,0	6,03	12,6	1,60	3,5	10,5	250	6,0	1,99	22090.0060
7,0	6,0	7,03	14,0	2,00	4,0	12,0	250	7,0	3,00	22090.0070
8,0	6,5	8,03	18,0	2,10	6,0	15,0	250	8,0	5,10	22090.0080

[1] statistical average value

APPLICATION EXAMPLE



Spring Bodies

EH 22100.



PRODUCT DESCRIPTION

Spring bodies can be used for locating.

Material

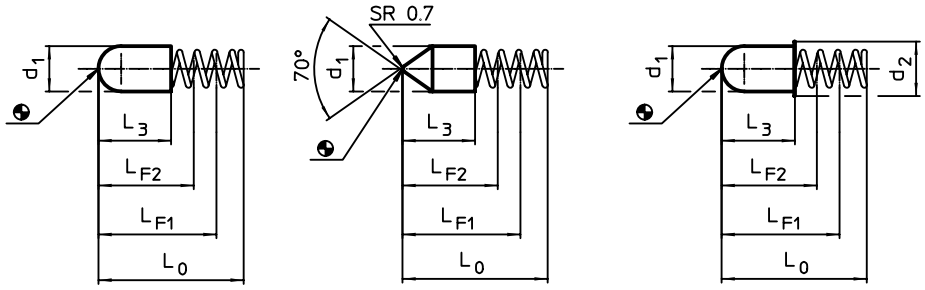
Body
- Steel, nickel-plated
- Stainless steel A2

Spring
- Stainless steel 1.4310

MORE INFORMATION

Notes
Special springs on request.

DRAWING



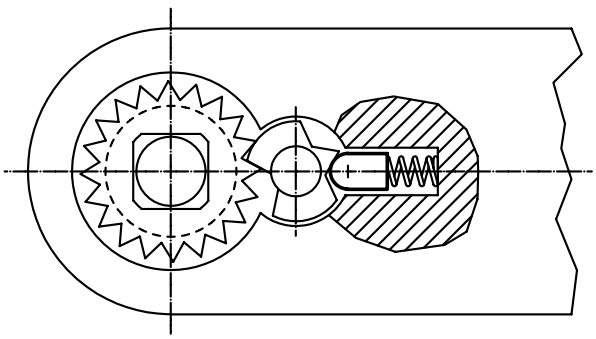
picture 1 picture 2 picture 3

ORDER INFORMATION

Dimensions						Stroke	Spring load[1]		Spring rate			Art. No.
d_1 ±0,05	l_0	d_2	L for F_1	L for F_2	L_3	s	F_1 ~	F_2 ~		max.		
[mm]						[mm]	[N]		[N/mm]	[°C]	[g]	
body from steel, round – picture 1												
2,2	**16**	–	12,0	10,5	7,8	1,5	2,2	3,0	0,53	250	0,13	22100.0012
2,6	**8**	–	6,5	5,2	3,8	1,3	1,1	2,0	0,70	250	0,07	22100.0016
3,0	**12**	–	9,0	8,7	6,0	0,3	6,2	6,8	2,00	250	0,18	22100.0022
	16	–	13,0	10,7	8,5	2,3	4,8	8,4	1,60	250	0,23	22100.0024
3,4	**12**	–	9,0	7,8	6,0	1,2	5,0	7,0	1,69	250	0,18	22100.0034
	15	–	12,0	8,2	7,3	3,8	5,9	13,3	1,95	250	0,22	22100.0036
4,0	**14**	–	12,0	9,0	8,0	3,0	5,0	12,3	2,45	250	0,41	22100.0042
5,0	**16**	–	13,0	10,4	8,0	2,6	8,0	15,0	2,70	250	0,59	22100.0052
body from stainless steel, round – picture 1												
3,0	**16**	–	13,0	10,6	8,0	2,4	4,8	8,6	1,60	250	0,22	22100.0124
3,6	**18**	–	15,0	11,5	9,0	1,5	6,7	14,5	2,24	250	0,36	22100.0137
4,0	**16**	–	13,0	11,4	7,5	1,6	8,0	12,3	2,70	250	0,37	22100.0144
body from steel, tipped – picture 2												
2,2	**16**	–	12,0	10,5	7,8	1,5	2,2	3,0	0,53	250	0,12	22100.0212
3,0	**11**	–	9,0	6,7	5,0	2,3	1,6	3,4	0,78	250	0,11	22100.0222
	16	–	13,0	10,7	8,5	2,3	4,8	8,4	1,60	250	0,23	22100.0224
body from stainless steel, round, with collar – picture 3												
3,0	**13**	4,1	10,0	8,9	7,0	1,1	5,3	7,2	1,75	250	0,19	22100.0373

[1] statistical average value

APPLICATION EXAMPLE



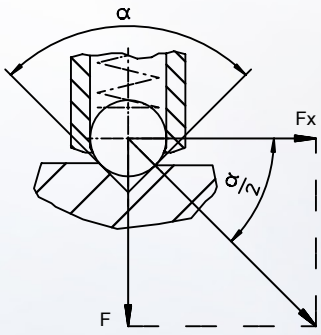
2

SPRING PLUNGERS

INCH MODELS



CALCULATION OF INDEXING RESISTANCE



$$Fx = \frac{F}{\tan \frac{\alpha}{2}}$$

Example of calculation for:
α = 60°, Fx = 1,732 x F
α = 90°, Fx = F
α = 120°, Fx = 0,577 x F



light spring load

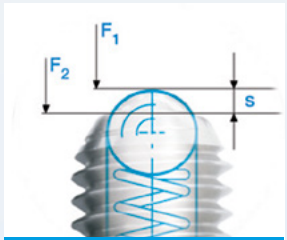


standard spring load



heavy spring load

www.halder.com/
SpringPlungers-Video



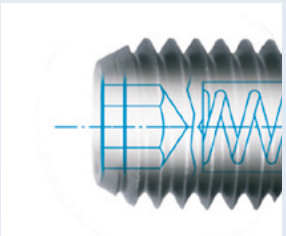
CERTIFIED

Certified spring load F1 and F2 and stroke s.



PREMIUM QUALITY

First-rate quality and minimum wear thanks to the use of hardened pins.



SECURE

Outstanding functional reliability thanks to - among other things - the assembly procedure used and a specific manufacturing process.



CLEAR

Coherent, uniform and clearly visible identification of the spring load thanks to a permanent marking on the body.

Spring Plungers • with pin and slot - INCH

EH 2B020.



PRODUCT DESCRIPTION

To be used for positioning, indexing, locking, latching as well as for other similar pressure applications.
Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

Pin
- Free cutting steel, hardened, blackened
- Stainless steel 1.4305 (ASTM-A-582)

Body
- Free cutting steel, blackened
- Stainless steel 1.4305 (ASTM-A-582)

Spring
- Stainless steel

Characteristic

Standard spring load: no marking
Heavy spring load: marked with two lines



Standard spring load Heavy spring load

MORE INFORMATION

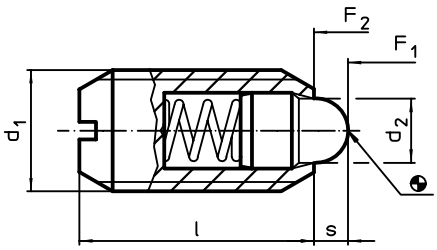
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.
- This product is manufactured in INCH dimensions.

References

A conversion table can be found in the technical data following these product information pages.
Thread lock: polyamide spot coating (for details please refer to the technical data pages).

DRAWING



ORDER INFORMATION

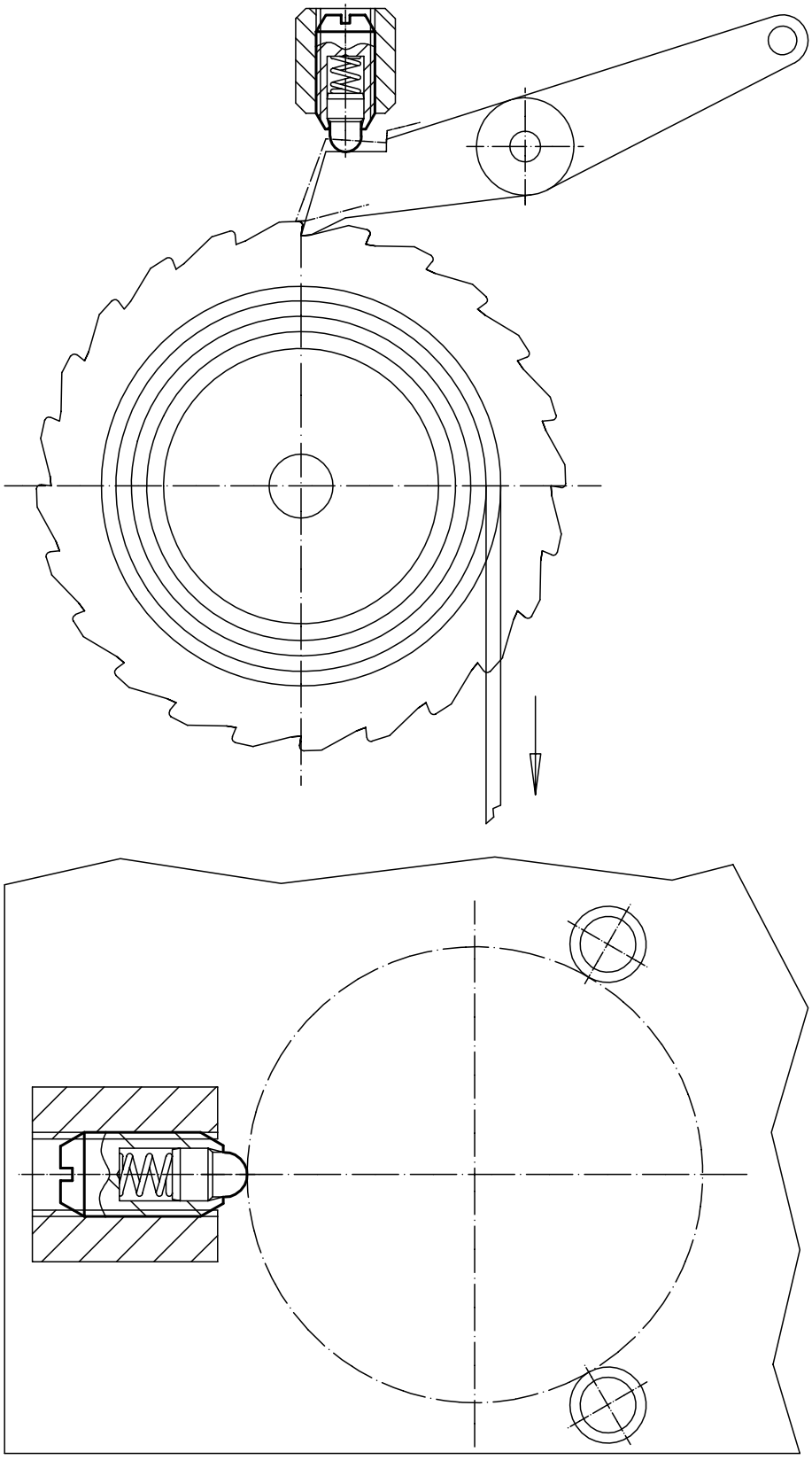
Dimensions				Stroke s	Spring load[1]					Art. No.	
d_1	Thread	d_2	l		F_1 ~	F_2 ~	min.	max.		without thread lock	with thread lock
		[inch]		[inch]	[lb]		[°F]		[oz]		
free cutting steel, standard spring load											
6-32	2A-UNC	0,046	3/8	0,063	0,5	1,5	-22	482	0,021	2B020.0033	–
								194	0,021	–	2B020.0233
8-32	2A-UNC	0,070	7/16	0,052	0,8	1,5	-22	482	0,032	2B020.0036	–
								194	0,032	–	2B020.0236
8-36	2A-UNF	0,070	7/16	0,052	0,8	1,5	-22	482	0,032	2B020.0038	–
								194	0,032	–	2B020.0238
10-32	2A-UNF	0,093	15/32	0,065	1,0	2,5	-22	482	0,042	2B020.0040	–
								194	0,042	–	2B020.0240
1/4-20	2A-UNC	0,119	17/32	0,078	1,1	3,5	-22	482	0,074	2B020.0042	–
								194	0,074	–	2B020.0242
5/16-18	2A-UNC	0,135	37/64	0,084	1,0	4,0	-22	482	0,123	2B020.0046	–
								194	0,123	–	2B020.0246
3/8-16	2A-UNC	0,186	5/8	0,110	1,5	4,5	-22	482	0,187	2B020.0048	–
								194	0,187	–	2B020.0248
1/2-13	2A-UNC	0,248	3/4	0,151	1,8	5,5	-22	482	0,377	2B020.0050	–
								194	0,377	–	2B020.0250
5/8-11	2A-UNC	0,310	1 1/16	0,215	2,0	8,5	-22	482	0,885	2B020.0052	–
								194	0,885	–	2B020.0252

[1] statistical average value

Dimensions				Stroke s	Spring load[1]					Art. No.	
d_1	Thread	d_2	l		F_1 ~	F_2 ~	min.	max.		without thread lock	with thread lock
		[inch]		[inch]	[lb]		[°F]		[oz]		
free cutting steel, heavy spring load											
6-32	2A-UNC	0,046	3/8	0,063	0,5	2,5	-22	482	0,018	2B020.0063	–
								194	0,018	–	2B020.0263
8-32	2A-UNC	0,070	7/16	0,052	1,8	4,6	-22	482	0,032	2B020.0066	–
								194	0,032	–	2B020.0266
8-36	2A-UNF	0,070	7/16	0,052	1,8	4,6	-22	482	0,032	2B020.0068	–
								194	0,032	–	2B020.0268
10-32	2A-UNF	0,093	15/32	0,065	2,6	6,3	-22	482	0,042	2B020.0070	–
								194	0,042	–	2B020.0270
1/4-20	2A-UNC	0,119	17/32	0,078	3,0	9,7	-22	482	0,074	2B020.0072	–
								194	0,074	–	2B020.0272
5/16-18	2A-UNC	0,135	37/64	0,084	3,8	13,0	-22	482	0,123	2B020.0076	–
								194	0,123	–	2B020.0276
3/8-16	2A-UNC	0,186	5/8	0,110	4,5	16,0	-22	482	0,190	2B020.0078	–
								194	0,190	–	2B020.0278
1/2-13	2A-UNC	0,248	3/4	0,151	5,0	22,4	-22	482	0,384	2B020.0080	–
								194	0,384	–	2B020.0280
5/8-11	2A-UNC	0,310	1 1/16	0,215	7,0	43,5	-22	482	0,907	2B020.0082	–
								194	0,907	–	2B020.0282
stainless steel, standard spring load											
6-32	2A-UNC	0,046	3/8	0,063	0,5	1,5	-22	482	0,021	2B020.0133	–
								194	0,021	–	2B020.0333
8-32	2A-UNC	0,070	7/16	0,052	0,8	1,5	-22	482	0,032	2B020.0136	–
								194	0,032	–	2B020.0336
8-36	2A-UNF	0,070	7/16	0,052	0,8	1,5	-22	482	0,032	2B020.0138	–
								194	0,032	–	2B020.0338
10-32	2A-UNF	0,093	15/32	0,065	1,0	2,5	-22	482	0,042	2B020.0140	–
								194	0,042	–	2B020.0340
1/4-20	2A-UNC	0,119	17/32	0,078	1,1	3,5	-22	482	0,074	2B020.0142	–
								194	0,074	–	2B020.0342
5/16-18	2A-UNC	0,135	37/64	0,084	1,0	4,0	-22	482	0,123	2B020.0146	–
								194	0,123	–	2B020.0346
3/8-16	2A-UNC	0,186	5/8	0,110	1,5	4,5	-22	482	0,190	2B020.0148	–
								194	0,190	–	2B020.0348
1/2-13	2A-UNC	0,248	3/4	0,151	1,8	5,5	-22	482	0,388	2B020.0150	–
								194	0,388	–	2B020.0350
5/8-11	2A-UNC	0,310	1 1/16	0,215	2,0	8,5	-22	482	0,892	2B020.0152	–
								194	0,892	–	2B020.0352
stainless steel, heavy spring load											
6-32	2A-UNC	0,046	3/8	0,063	0,5	2,5	-22	482	0,014	2B020.0163	–
								194	0,014	–	2B020.0363
8-32	2A-UNC	0,070	7/16	0,052	1,8	4,6	-22	482	0,032	2B020.0166	–
								194	0,032	–	2B020.0366
8-36	2A-UNF	0,070	7/16	0,052	1,8	4,6	-22	482	0,032	2B020.0168	–
								194	0,032	–	2B020.0368
10-32	2A-UNF	0,093	15/32	0,065	2,6	6,3	-22	482	0,042	2B020.0170	–
								194	0,042	–	2B020.0370
1/4-20	2A-UNC	0,119	17/32	0,078	3,0	9,7	-22	482	0,071	2B020.0172	–
								194	0,071	–	2B020.0372
5/16-18	2A-UNC	0,135	37/64	0,084	3,8	13,0	-22	482	0,123	2B020.0176	–
								194	0,123	–	2B020.0376
3/8-16	2A-UNC	0,186	5/8	0,110	4,5	16,0	-22	482	0,194	2B020.0178	–
								194	0,194	–	2B020.0378
1/2-13	2A-UNC	0,248	3/4	0,151	5,0	22,4	-22	482	0,399	2B020.0180	–
								194	0,399	–	2B020.0380
5/8-11	2A-UNC	0,310	1 1/16	0,215	7,0	43,5	-22	482	0,914	2B020.0182	–
								194	0,914	–	2B020.0382

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • with pin and internal hexagon - INCH

EH 2B030.

2



PRODUCT DESCRIPTION

To be used for positioning, indexing, locking, latching as well as for other similar pressure applications.
Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

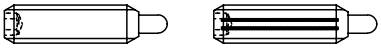
Pin
- Free cutting steel, hardened, blackened
- Stainless steel 1.4305 (ASTM-A-582)

Body
- Free cutting steel, blackened
- Stainless steel 1.4305 (ASTM-A-582)

Spring
- Stainless steel

Characteristic

Standard spring load: no marking
Heavy spring load: marked with two lines



Standard spring load | Heavy spring load

MORE INFORMATION

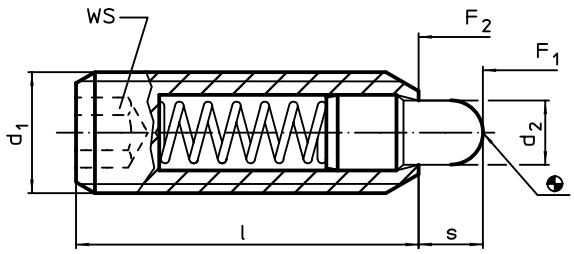
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.
- This product is manufactured in INCH dimensions.

References

A conversion table can be found in the technical data following these product information pages.
Thread lock: polyamide spot coating (for details please refer to the technical data pages).

DRAWING



ORDER INFORMATION

Dimensions				WS	Stroke s	Spring load[1]					Art. No.	
d_1	Thread	d_2	l			F_1 ~	F_2 ~	min.	max.		without thread lock	with thread lock
		[inch]		[inch]	[inch]	[lb]		[°F]		[oz]		
free cutting steel, standard spring load												
6-32	2A-UNC	0,046	17/32	1/16	0,063	0,5	1,5	-22	482	0,025	2B030.0033	–
									194	0,025	–	2B030.0233
8-32	2A-UNC	0,070	5/8	5/64	0,094	0,8	2,3	-22	482	0,042	2B030.0036	–
									194	0,042	–	2B030.0236
10-32	2A-UNF	0,093	3/4	3/32	0,125	1,4	2,7	-22	482	0,063	2B030.0040	–
									194	0,063	–	2B030.0240
1/4-20	2A-UNC	0,119	1	1/8	0,188	1,0	4,0	-22	482	0,134	2B030.0042	–
									194	0,134	–	2B030.0242
1/4-28	2A-UNF	0,119	1	1/8	0,188	1,0	4,0	-22	482	0,145	2B030.0044	–
									194	0,145	–	2B030.0244
5/16-18	2A-UNC	0,135	1	5/32	0,188	1,5	4,5	-22	482	0,205	2B030.0046	–
									194	0,205	–	2B030.0246
3/8-16	2A-UNC	0,186	1 1/8	3/16	0,188	2,7	7,2	-22	482	0,335	2B030.0048	–
									194	0,335	–	2B030.0248
1/2-13	2A-UNC	0,248	1 1/4	1/4	0,250	2,7	9,3	-22	482	0,656	2B030.0050	–
									194	0,656	–	2B030.0250
5/8-11	2A-UNC	0,310	1 1/2	5/16	0,313	3,5	10,6	-22	482	1,242	2B030.0052	–
									194	1,242	–	2B030.0252
3/4-10	2A-UNC	0,374	1 3/4	3/8	0,313	5,5	14,5	-22	482	2,152	2B030.0053	–
									194	2,152	–	2B030.0253
1-8	2A-UNC	0,499	2 13/32	3/8	0,500	4,0	31,0	-22	482	5,443	2B030.0054	–
									194	5,443	–	2B030.0254

[1] statistical average value

→

Dimensions				WS	Stroke s	Spring load[1]					Art. No.	
d_1	Thread	d_2	l			F_1 ~	F_2 ~	min.	max.		without thread lock	with thread lock
		[inch]		[inch]	[inch]	[lb]		[°F]		[oz]		
free cutting steel, heavy spring load												
6-32	2A-UNC	0,046	17/32	1/16	0,063	1,5	3,4	-22	482	0,026	2B030.0063	–
									194	0,026	–	2B030.0263
8-32	2A-UNC	0,070	5/8	5/64	0,094	2,6	6,6	-22	482	0,042	2B030.0066	–
									194	0,042	–	2B030.0266
10-32	2A-UNF	0,093	3/4	3/32	0,125	3,2	9,0	-22	482	0,067	2B030.0070	–
									194	0,067	–	2B030.0270
1/4-20	2A-UNC	0,119	1	1/8	0,188	3,1	10,1	-22	482	0,134	2B030.0072	–
									194	0,134	–	2B030.0272
1/4-28	2A-UNF	0,119	1	1/8	0,188	3,1	10,1	-22	482	0,145	2B030.0074	–
									194	0,145	–	2B030.0274
5/16-18	2A-UNC	0,135	1	5/32	0,188	3,0	15,0	-22	482	0,207	2B030.0076	–
									194	0,207	–	2B030.0276
3/8-16	2A-UNC	0,186	1 1/8	3/16	0,188	5,5	12,7	-22	482	0,335	2B030.0078	–
									194	0,335	–	2B030.0278
1/2-13	2A-UNC	0,248	1 1/4	1/4	0,250	6,6	16,0	-22	482	0,649	2B030.0080	–
									194	0,649	–	2B030.0280
5/8-11	2A-UNC	0,310	1 1/2	5/16	0,313	10,5	22,2	-22	482	1,245	2B030.0082	–
									194	1,245	–	2B030.0282
3/4-10	2A-UNC	0,374	1 3/4	3/8	0,313	6,7	33,0	-22	482	2,187	2B030.0083	–
									194	2,187	–	2B030.0283
1-8	2A-UNC	0,499	2 13/32	3/8	0,500	16,0	60,0	-22	482	5,538	2B030.0084	–
									194	5,538	–	2B030.0284
stainless steel, standard spring load												
6-32	2A-UNC	0,046	17/32	1/16	0,063	0,5	1,5	-22	482	0,018	2B030.0133	–
									194	0,018	–	2B030.0333
8-32	2A-UNC	0,070	5/8	5/64	0,094	0,8	2,3	-22	482	0,039	2B030.0136	–
									194	0,039	–	2B030.0336
10-32	2A-UNF	0,093	3/4	3/32	0,125	1,4	2,7	-22	482	0,063	2B030.0140	–
									194	0,063	–	2B030.0340
1/4-20	2A-UNC	0,119	1	1/8	0,188	1,0	4,0	-22	482	0,131	2B030.0142	–
									194	0,131	–	2B030.0342
1/4-28	2A-UNF	0,119	1	1/8	0,188	1,0	4,0	-22	482	0,141	2B030.0144	–
									194	0,141	–	2B030.0344
5/16-18	2A-UNC	0,135	1	5/32	0,188	1,5	4,5	-22	482	0,208	2B030.0146	–
									194	0,208	–	2B030.0346
3/8-16	2A-UNC	0,186	1 1/8	3/16	0,188	2,7	7,2	-22	482	0,328	2B030.0148	–
									194	0,328	–	2B030.0348
1/2-13	2A-UNC	0,248	1 1/4	1/4	0,250	2,7	9,3	-22	482	0,653	2B030.0150	–
									194	0,653	–	2B030.0350
5/8-11	2A-UNC	0,310	1 1/2	5/16	0,313	3,5	10,6	-22	482	1,242	2B030.0152	–
									194	1,242	–	2B030.0352
3/4-10	2A-UNC	0,374	1 3/4	3/8	0,313	5,5	14,5	-22	482	2,180	2B030.0153	–
									194	2,180	–	2B030.0353
1-8	2A-UNC	0,499	2 13/32	3/8	0,500	4,0	31,0	-22	482	5,474	2B030.0154	–
									194	5,474	–	2B030.0354

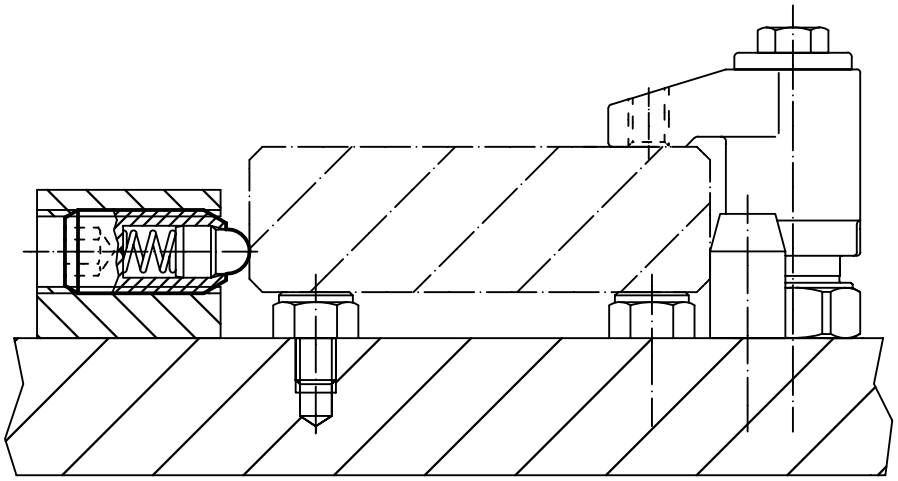
[1] statistical average value

→

Dimensions				WS	Stroke s	Spring load[1]					Art. No.	
d_1	Thread	d_2	l			F_1 ~	F_2 ~	min.	max.		without thread lock	with thread lock
		[inch]		[inch]	[inch]	[lb]		[°F]		[oz]		
stainless steel, heavy spring load												
6-32	2A-UNC	0,046	17/32	1/16	0,063	1,5	3,4	-22	482	0,025	2B030.0163	–
									194	0,025	–	2B030.0363
8-32	2A-UNC	0,070	5/8	5/64	0,094	2,6	6,6	-22	482	0,042	2B030.0166	–
									194	0,042	–	2B030.0366
10-32	2A-UNF	0,093	3/4	3/32	0,125	3,2	9,0	-22	482	0,063	2B030.0170	–
									194	0,063	–	2B030.0370
1/4-20	2A-UNC	0,119	1	1/8	0,188	3,1	10,1	-22	482	0,131	2B030.0172	–
									194	0,131	–	2B030.0372
1/4-28	2A-UNF	0,119	1	1/8	0,188	3,1	10,1	-22	482	0,145	2B030.0174	–
									194	0,145	–	2B030.0374
5/16-18	2A-UNC	0,135	1	5/32	0,188	3,0	15,0	-22	482	0,212	2B030.0176	–
									194	0,212	–	2B030.0376
3/8-16	2A-UNC	0,186	1 1/8	3/16	0,188	5,5	12,7	-22	482	0,339	2B030.0178	–
									194	0,339	–	2B030.0378
1/2-13	2A-UNC	0,248	1 1/4	1/4	0,250	6,6	16,0	-22	482	0,653	2B030.0180	–
									194	0,653	–	2B030.0380
5/8-11	2A-UNC	0,310	1 1/2	5/16	0,313	10,5	22,2	-22	482	1,252	2B030.0182	–
									194	1,252	–	2B030.0382
3/4-10	2A-UNC	0,374	1 3/4	3/8	0,313	6,7	33,0	-22	482	2,198	2B030.0183	–
									194	2,198	–	2B030.0383
1-8	2A-UNC	0,499	2 13/32	3/8	0,500	16,0	60,0	-22	482	5,524	2B030.0184	–
									194	5,524	–	2B030.0384

[1] statistical average value

APPLICATION EXAMPLE



Spring Plungers • with ball and slot - INCH

EH 2B050.



PRODUCT DESCRIPTION

To be used for positioning, indexing, locking, latching as well as for other similar pressure applications.
Spring plungers can be used for locating or for applying pressure, as a detent or for ejection.

Material

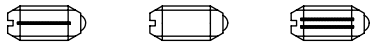
Body
- Free cutting steel, blackened
- Stainless steel 1.4305 (ASTM-A-582)

Ball
- Stainless steel, hardened

Spring
- Stainless steel

Characteristic

Light spring load: marked with one line
Standard spring load: no marking
Heavy spring load: marked with two lines



MORE INFORMATION

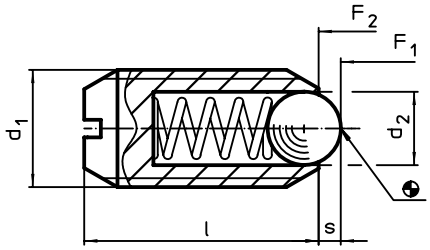
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.
- This product is manufactured in INCH dimensions.

References

A conversion table can be found in the technical data following these product information pages.
Thread lock: polyamide spot coating (for details please refer to the technical data pages).
Calculation of indexing resistance, see details at the start of the section.

DRAWING



ORDER INFORMATION

Dimensions				Stroke s	Spring load[1]					Art. No.	
d_1	Thread	d_2	l		F_1 ~	F_2 ~	min.	max.		without thread lock	with thread lock
		[inch]		[inch]	[lb]		[°F]		[oz]		
free cutting steel, light spring load											
10-32	2A-UNF	3/32	33/64	0,025	0,9	1,5	-22	482	0,049	2B050.0010	–
								194	0,049	–	2B050.0210
1/4-20	2A-UNC	1/8	17/32	0,035	2,1	4,0	-22	482	0,074	2B050.0012	–
								194	0,074	–	2B050.0212
5/16-18	2A-UNC	5/32	37/64	0,040	2,0	4,6	-22	482	0,123	2B050.0016	–
								194	0,123	–	2B050.0216
3/8-16	2A-UNC	3/16	5/8	0,048	2,5	5,0	-22	482	0,193	2B050.0018	–
								194	0,193	–	2B050.0218
1/2-13	2A-UNC	9/32	3/4	0,072	3,0	6,0	-22	482	0,397	2B050.0020	–
								194	0,397	–	2B050.0220
5/8-11	2A-UNC	3/8	63/64	0,096	4,5	9,0	-22	482	0,787	2B050.0022	–
								194	0,787	–	2B050.0222

[1] statistical average value

Dimensions				Stroke s	Spring load[1]					Art. No.	
d_1	Thread	d_2	l		F_1 ~	F_2 ~	min.	max.		without thread lock	with thread lock
		[inch]		[inch]	[lb]		[°F]		[oz]		
free cutting steel, standard spring load											
4-48	2A-UNF	1/16	3/16	0,020	0,1	0,5	-22	482	0,008	2B050.0031	–
								194	0,008	–	2B050.0231
5-40	2A-UNC	1/16	1/4	0,020	0,3	0,8	-22	482	0,016	2B050.0032	–
								194	0,016	–	2B050.0232
6-32	2A-UNC	5/64	5/16	0,023	0,5	1,0	-22	482	0,020	2B050.0033	–
								194	0,020	–	2B050.0233
6-40	2A-UNF	5/64	5/16	0,023	0,5	1,0	-22	482	0,020	2B050.0035	–
								194	0,020	–	2B050.0235
8-32	2A-UNC	3/32	11/32	0,025	0,8	1,3	-22	482	0,026	2B050.0036	–
								194	0,026	–	2B050.0236
8-36	2A-UNF	3/32	11/32	0,025	0,8	1,3	-22	482	0,026	2B050.0038	–
								194	0,026	–	2B050.0238
10-32	2A-UNF	3/32	33/64	0,025	2,0	3,1	-22	482	0,049	2B050.0040	–
								194	0,049	–	2B050.0240
1/4-20	2A-UNC	1/8	17/32	0,035	3,8	6,8	-22	482	0,073	2B050.0042	–
								194	0,073	–	2B050.0242
5/16-18	2A-UNC	5/32	37/64	0,040	4,0	8,4	-22	482	0,123	2B050.0046	–
								194	0,123	–	2B050.0246
3/8-16	2A-UNC	3/16	5/8	0,048	5,0	10,3	-22	482	0,198	2B050.0048	–
								194	0,198	–	2B050.0248
1/2-13	2A-UNC	9/32	3/4	0,072	6,0	12,0	-22	482	0,406	2B050.0050	–
								194	0,406	–	2B050.0250
5/8-11	2A-UNC	3/8	63/64	0,096	9,0	18,0	-22	482	0,811	2B050.0052	–
								194	0,811	–	2B050.0252
free cutting steel, heavy spring load											
10-32	2A-UNF	3/32	33/64	0,025	3,3	4,8	-22	482	0,049	2B050.0070	–
								194	0,049	–	2B050.0270
1/4-20	2A-UNC	1/8	17/32	0,035	5,6	8,6	-22	482	0,073	2B050.0072	–
								194	0,073	–	2B050.0272
5/16-18	2A-UNC	5/32	37/64	0,040	6,0	11,1	-22	482	0,122	2B050.0076	–
								194	0,122	–	2B050.0276
3/8-16	2A-UNC	3/16	5/8	0,048	7,5	15,1	-22	482	0,196	2B050.0078	–
								194	0,196	–	2B050.0278
1/2-13	2A-UNC	9/32	3/4	0,072	6,0	24,0	-22	482	0,408	2B050.0080	–
								194	0,408	–	2B050.0280
5/8-11	2A-UNC	3/8	63/64	0,096	7,0	40,0	-22	482	0,825	2B050.0082	–
								194	0,825	–	2B050.0282
stainless steel, light spring load											
10-32	2A-UNF	3/32	33/64	0,025	0,9	1,5	-22	482	0,048	2B050.0110	–
								194	0,048	–	2B050.0310
1/4-20	2A-UNC	1/8	17/32	0,035	2,1	4,0	-22	482	0,071	2B050.0112	–
								194	0,071	–	2B050.0312
5/16-18	2A-UNC	5/32	37/64	0,040	2,0	4,6	-22	482	0,123	2B050.0116	–
								194	0,123	–	2B050.0316
3/8-16	2A-UNC	3/16	5/8	0,048	2,5	5,0	-22	482	0,190	2B050.0118	–
								194	0,190	–	2B050.0318
1/2-13	2A-UNC	9/32	3/4	0,072	3,0	6,0	-22	482	0,397	2B050.0120	–
								194	0,397	–	2B050.0320
5/8-11	2A-UNC	3/8	63/64	0,096	4,5	9,0	-22	482	0,790	2B050.0122	–
								194	0,790	–	2B050.0322

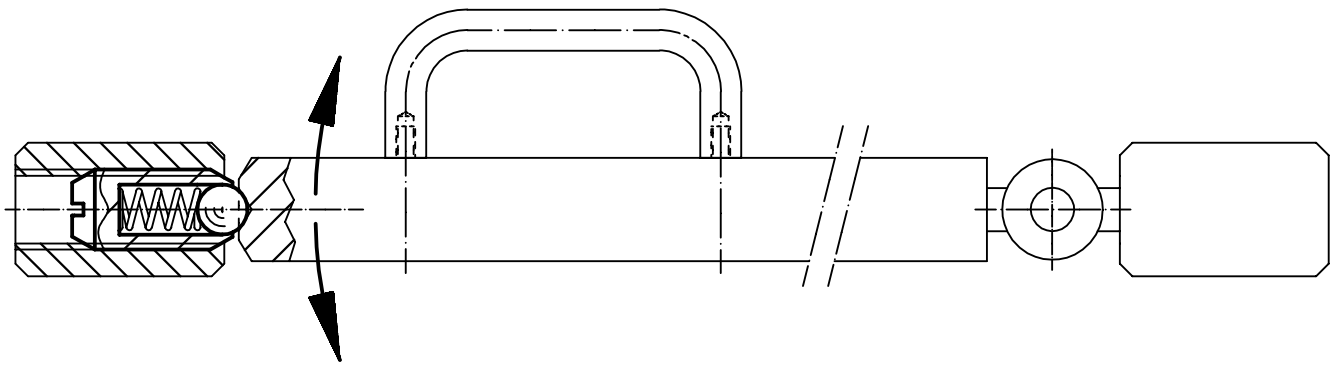
[1] statistical average value

→

Dimensions				Stroke s	Spring load[1]					Art. No.	
d_1	Thread	d_2	l		F_1 ~	F_2 ~	min.	max.		without thread lock	with thread lock
		[inch]		[inch]	[lb]		[°F]		[oz]		
stainless steel, standard spring load											
4-48	2A-UNF	1/16	3/16	0,020	0,1	0,5	-22	482	0,005	2B050.0131	–
								194	0,005	–	2B050.0331
5-40	2A-UNC	1/16	1/4	0,020	0,3	0,8	-22	482	0,015	2B050.0132	–
								194	0,015	–	2B050.0332
6-32	2A-UNC	5/64	5/16	0,023	0,5	1,0	-22	482	0,018	2B050.0133	–
								194	0,018	–	2B050.0333
6-40	2A-UNF	5/64	5/16	0,023	0,5	1,0	-22	482	0,019	2B050.0135	–
								194	0,019	–	2B050.0335
8-32	2A-UNC	3/32	11/32	0,025	0,8	1,3	-22	482	0,026	2B050.0136	–
								194	0,026	–	2B050.0336
8-36	2A-UNF	3/32	11/32	0,025	0,8	1,3	-22	482	0,026	2B050.0138	–
								194	0,026	–	2B050.0338
10-32	2A-UNF	3/32	33/64	0,025	2,0	3,1	-22	482	0,049	2B050.0140	–
								194	0,049	–	2B050.0340
1/4-20	2A-UNC	1/8	17/32	0,035	3,8	6,8	-22	482	0,072	2B050.0142	–
								194	0,072	–	2B050.0342
5/16-18	2A-UNC	5/32	37/64	0,040	4,0	8,4	-22	482	0,123	2B050.0146	–
								194	0,123	–	2B050.0346
3/8-16	2A-UNC	3/16	5/8	0,048	5,0	10,3	-22	482	0,198	2B050.0148	–
								194	0,198	–	2B050.0348
1/2-13	2A-UNC	9/32	3/4	0,072	6,0	12,0	-22	482	0,396	2B050.0150	–
								194	0,396	–	2B050.0350
5/8-11	2A-UNC	3/8	63/64	0,096	9,0	18,0	-22	482	0,813	2B050.0152	–
								194	0,813	–	2B050.0352
stainless steel, heavy spring load											
10-32	2A-UNF	3/32	33/64	0,025	3,3	4,8	-22	482	0,046	2B050.0170	–
								194	0,046	–	2B050.0370
1/4-20	2A-UNC	1/8	17/32	0,035	5,6	8,6	-22	482	0,074	2B050.0172	–
								194	0,074	–	2B050.0372
5/16-18	2A-UNC	5/32	37/64	0,040	6,0	11,1	-22	482	0,123	2B050.0176	–
								194	0,123	–	2B050.0376
3/8-16	2A-UNC	3/16	5/8	0,048	7,5	15,1	-22	482	0,197	2B050.0178	–
								194	0,197	–	2B050.0378
1/2-13	2A-UNC	9/32	3/4	0,072	6,0	24,0	-22	482	0,409	2B050.0180	–
								194	0,409	–	2B050.0380
5/8-11	2A-UNC	3/8	63/64	0,096	7,0	40,0	-22	482	0,825	2B050.0182	–
								194	0,825	–	2B050.0382

[1] statistical average value

APPLICATION EXAMPLE



2

Spring Plungers • smooth, with collar and ball, self-clamping – INCH

EH 2B080.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. The spring plungers compensate tolerances of up to 0.008" (inches) of the locating hole by self-clamping. This saves costs in the machining of the locating hole.

Material

Body
- Thermoplastic POM, black

Ball
- Stainless steel, hardened

Spring
- Stainless steel

Assembly

Thanks to the flexible design of the body, a direct manual mounting and a secure overhead installation is possible.

MORE INFORMATION

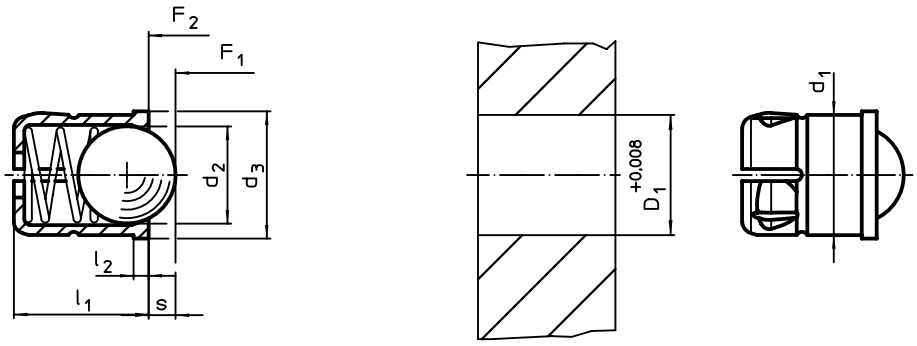
Notes

Special types on request.
Spring plungers are specially tested for spring range and forces.

References

Calculation of indexing resistance, see details at the start of the section.

DRAWING



ORDER INFORMATION

Dimensions					Stroke	Spring load[1]				Location hole		Art. No.
d_1 +0,004	d_2	d_3	l_1 ±0,01	l_2	s	F_1	F_2	min.	max.	D_1 +0,008		
[inch]					[inch]	[lb]		[°F]		[inch]	[oz]	
3/16	0,157	0,220	0,236	0,039	0,039	1,3	2,1	-22	122	3/16	0,01	2B080.0050
1/4	0,197	0,276	0,276	0,039	0,059	1,4	2,8	-22	122	1/4	0,02	2B080.0060
5/16	0,256	0,335	0,354	0,039	0,075	1,9	4,5	-22	122	5/16	0,05	2B080.0080
3/8	0,315	0,433	0,531	0,059	0,091	2,7	5,0	-22	122	3/8	0,10	2B080.0090
1/2	0,394	0,551	0,630	0,059	0,126	3,1	5,6	-22	122	1/2	0,18	2B080.0120

[1] statistical average value

CUSTOM PARTS - SPRING PLUNGERS

BARELY NOTICEABLE, YET INDISPENSABLE

Are you faced with an installation situation that requires a custom tool? We will find the solution! Apart from carrying an extensive selection of standard products, we also design custom solutions that are moulded to your specific requirements - even in small batches.

www.halder.com/
SpringPlungers-Video



2

Index Plungers Mini Indexes

EH 22110.



PRODUCT DESCRIPTION

Particularly suitable for screwing into thin walled pieces.
Performance in the smallest space requirements.

Material

Body
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

Locking pin
- Stainless steel 1.4305

Knob
- Thermoplastic PA 6, black, dull

Assembly

Screw in the mini index. By lifting the knob, the hexagon will be released for assembly.

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

When using the self-locking type the knob is pulled-out, turned 30° and secured by a notched catch.

MORE INFORMATION

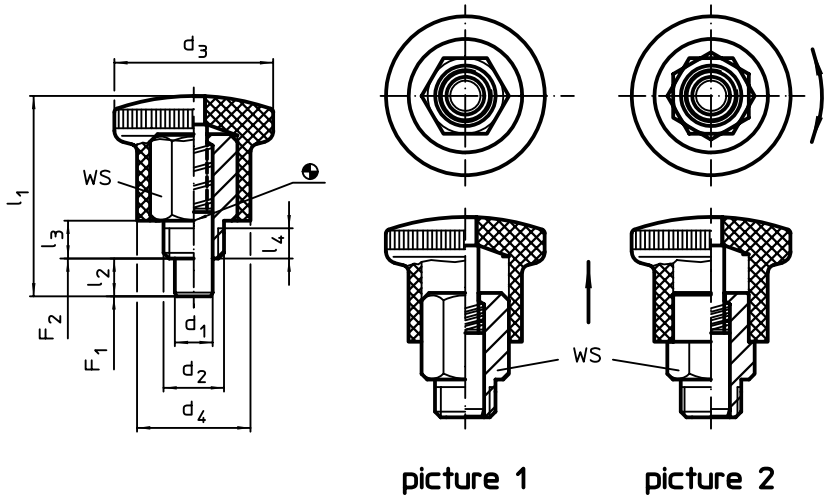
Notes

Knob not removable.

Further products

Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions								WS	Spring load[1]					Art. No.	
d_1 0 -0,06	d_2	d_3	d_4	l_1	l_2 min.	l_3	l_4 min.		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]								[mm]	[N]		[°C]		[g]		
without locking – picture 1															
4	M 8 x 0,75	21	15	26,5	5	5	3,5	10	4,5	12	-30	80	14	22110.0024	22110.0044
5	M 8 x 0,75	21	15	26,5	5	5	3,5	10	4,5	12	-30	80	14	22110.0026	22110.0046
6	M10 x 1	25	18	34,0	7	7	4,5	12	5,0	18	-30	80	25	22110.0028	22110.0048
7	M10 x 1	25	18	34,0	7	7	4,5	12	5,0	18	-30	80	26	22110.0030	22110.0050
with locking – picture 2															
4	M 8 x 0,75	21	15	26,5	5	5	3,5	10	4,5	12	-30	80	13	22110.0034	22110.0054
5	M 8 x 0,75	21	15	26,5	5	5	3,5	10	4,5	12	-30	80	14	22110.0036	22110.0056
6	M10 x 1	25	18	34,0	7	7	4,5	12	5,0	18	-30	80	24	22110.0038	22110.0058
7	M10 x 1	25	18	34,0	7	7	4,5	12	5,0	18	-30	80	25	22110.0040	22110.0060

[1] statistical average value

Index Plungers Mini Indexes • basic type

EH 22110.



PRODUCT DESCRIPTION

Particularly suitable for screwing into thin walled pieces.
Performance in the smallest space requirements.

Material

Body
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

Locking pin
- Stainless steel 1.4305

Knob
- Thermoplastic PA 6, black, dull

Assembly

Screw in the mini index. By lifting the knob, the hexagon will be released for assembly.

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

When using the self-locking type the knob is pulled-out, turned 30° and secured by a notched catch.

MORE INFORMATION

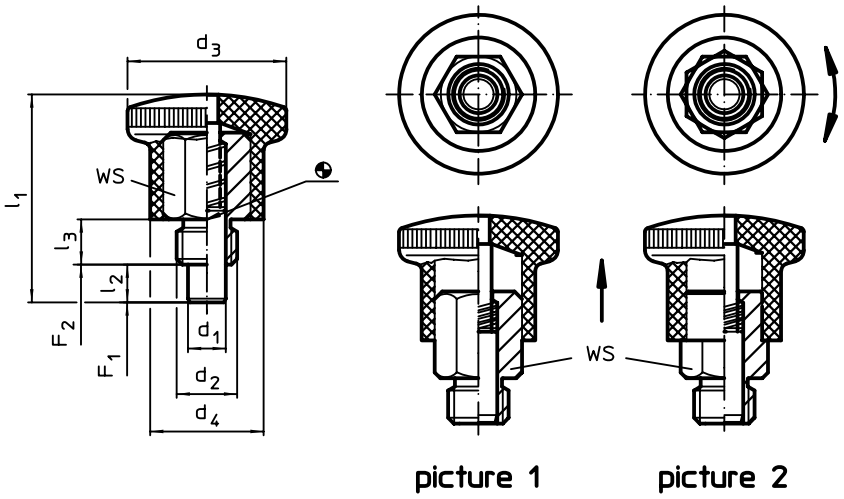
Notes

Knob not removable.

Further products

Distance Collars, for index plungers . . → p. 122

DRAWING



picture 1 picture 2

ORDER INFORMATION

Dimensions							WS	Spring load[1]					Art. No.	
d_1 h9	d_2	d_3	d_4	l_1	l_2 min.	l_3		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
without locking – picture 1														
4	M 8	21	15	27,5	5	6	10	4	12	-30	80	14	22110.0602	22110.0702
	M 8 x 1	21	15	27,5	5	6	10	4	12	-30	80	14	22110.0604	22110.0704
5	M10	25	18	34,0	6	8	12	6	16	-30	80	25	22110.0606	22110.0706
	M10 x 1	25	18	34,0	6	8	12	6	16	-30	80	25	22110.0608	22110.0708
6	M10	25	18	34,0	6	8	12	6	16	-30	80	25	22110.0610	22110.0710
	M10 x 1	25	18	34,0	6	8	12	6	16	-30	80	25	22110.0612	22110.0712
	M12	28	20	40,5	7	10	14	10	23	-30	80	40	22110.0614	22110.0714
	M12 x 1,5	28	20	40,5	7	10	14	10	23	-30	80	40	22110.0616	22110.0716
7	M12	28	20	40,5	7	10	14	10	23	-30	80	41	22110.0618	22110.0718
	M12 x 1,5	28	20	40,5	7	10	14	10	23	-30	80	41	22110.0620	22110.0720
8	M16	33	23	47,5	10	12	17	11	35	-30	80	66	22110.0622	22110.0722
	M16 x 1,5	33	23	47,5	10	12	17	11	35	-30	80	67	22110.0624	22110.0724
10	M16	33	23	47,5	10	12	17	11	35	-30	80	68	22110.0626	22110.0726
	M16 x 1,5	33	23	47,5	10	12	17	11	35	-30	80	69	22110.0628	22110.0728

[1] statistical average value

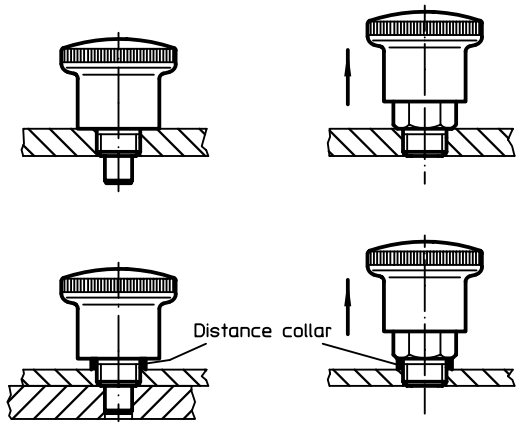
→

2

Dimensions							WS	Spring load[1]					Art. No.	
d_1 h9	d_2	d_3	d_4	l_1	l_2 min.	l_3		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
with locking – picture 2														
4	**M 8**	21	15	27,5	5	6	10	4	12	-30	80	13	22110.0630	22110.0730
	M 8 x 1	21	15	27,5	5	6	10	4	12	-30	80	13	22110.0632	22110.0732
5	**M10**	25	18	34,0	6	8	12	6	16	-30	80	23	22110.0634	22110.0734
	M10 x 1	25	18	34,0	6	8	12	6	16	-30	80	23	22110.0636	22110.0736
6	**M10**	25	18	34,0	6	8	12	6	16	-30	80	24	22110.0638	22110.0738
	M10 x 1	25	18	34,0	6	8	12	6	16	-30	80	25	22110.0640	22110.0740
	M12	28	20	40,5	7	10	14	10	23	-30	80	38	22110.0642	22110.0742
	M12 x 1,5	28	20	40,5	7	10	14	10	23	-30	80	39	22110.0644	22110.0744
7	**M12**	28	20	40,5	7	10	14	10	23	-30	80	39	22110.0646	22110.0746
	M12 x 1,5	28	20	40,5	7	10	14	10	23	-30	80	39	22110.0648	22110.0748
8	**M16**	33	23	47,5	10	12	17	11	35	-30	80	64	22110.0650	22110.0750
	M16 x 1,5	33	23	47,5	10	12	17	11	35	-30	80	65	22110.0652	22110.0752
10	**M16**	33	23	47,5	10	12	17	11	35	-30	80	66	22110.0654	22110.0754
	M16 x 1,5	33	23	47,5	10	12	17	11	35	-30	80	67	22110.0656	22110.0756

[1] statistical average value

APPLICATION EXAMPLE



Index Plungers Mini Indexes • stainless steel

EH 22110.



PRODUCT DESCRIPTION

Particularly suitable for screwing into thin walled pieces.
Performance in the smallest space requirements.

Material

Body
- Stainless steel 1.4305

Locking pin
- Stainless steel 1.4305

Knob
- Stainless steel 1.4308

Assembly

Screw in the mini index. By lifting the knob, the hexagon will be released for assembly.

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

When using the self-locking type the knob is pulled-out, turned 30° and secured by a notched catch.

MORE INFORMATION

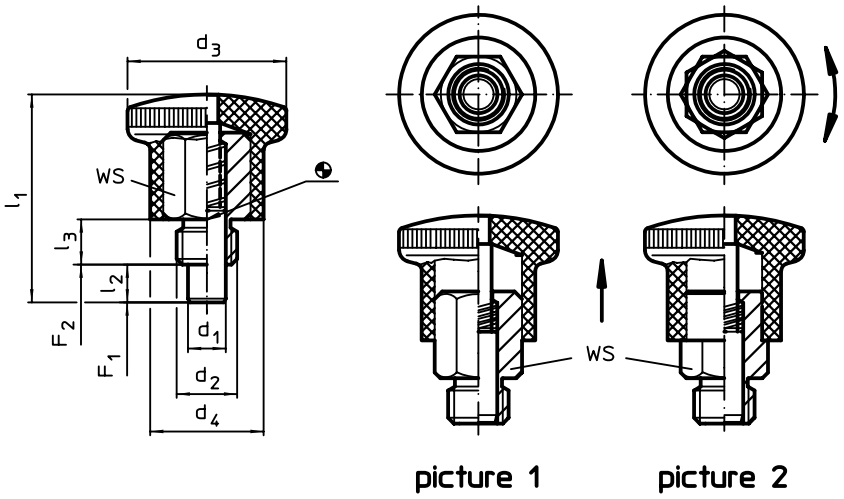
Notes

Knob not removable.

Further products

Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions							WS	Spring load[1]				Art. No.
d_1 h9	d_2	d_3	d_4	l_1	l_2 min.	l_3		F_1 ~	F_2 ~	max.		
[mm]							[mm]	[N]		[°C]	[g]	
without locking – picture 1												
4	M 8	21	15	27,5	5	6	10	4	12	250	28	22110.1102
	M 8 x 1	21	15	27,5	5	6	10	4	12	250	28	22110.1104
5	M10	25	18	34,0	6	8	12	6	16	250	49	22110.1106
	M10 x 1	25	18	34,0	6	8	12	6	16	250	50	22110.1108
6	M10	25	18	34,0	6	8	12	6	16	250	50	22110.1110
	M10 x 1	25	18	34,0	6	8	12	6	16	250	50	22110.1112
	M12	28	20	40,5	7	10	14	10	23	250	74	22110.1114
	M12 x 1,5	28	20	40,5	7	10	14	10	23	250	75	22110.1116
7	M12	28	20	40,5	7	10	14	10	23	250	75	22110.1118
	M12 x 1,5	28	20	40,5	7	10	14	10	23	250	75	22110.1120
8	M16	33	23	47,5	10	12	17	11	34	250	110	22110.1122
	M16 x 1,5	33	23	47,5	10	12	17	11	35	250	113	22110.1124
10	M16	33	23	47,5	10	12	17	11	35	250	113	22110.1126
	M16 x 1,5	33	23	47,5	10	12	17	11	35	250	113	22110.1128

[1] statistical average value

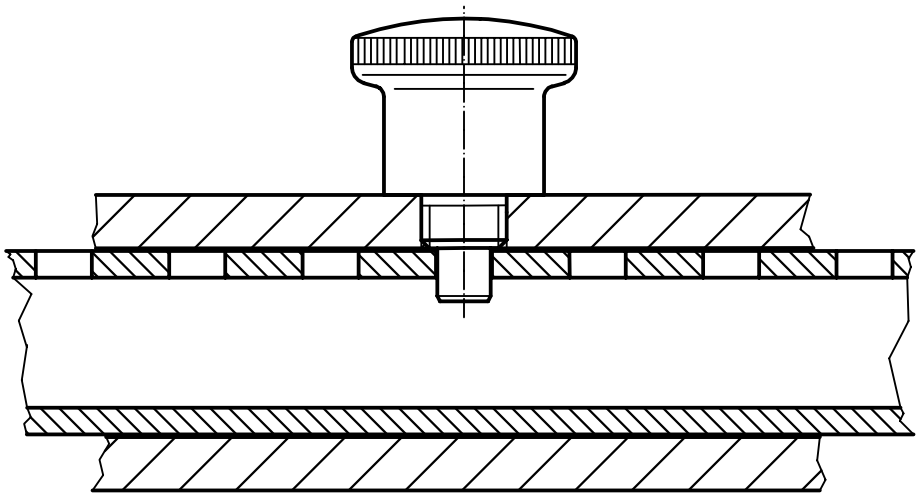
→

2

Dimensions							WS	Spring load[1]				Art. No.
d_1 h9	d_2	d_3	d_4	l_1	l_2 min.	l_3		F_1 ~	F_2 ~	max.		
[mm]							[mm]	[N]		[°C]	[g]	
with locking – picture 2												
4	**M 8**	21	15	27,5	5	6	10	4	12	250	27	**22110.1130**
	M 8 x 1	21	15	27,5	5	6	10	4	12	250	28	**22110.1132**
5	**M10**	25	18	34,0	6	8	12	6	16	250	48	**22110.1134**
	M10 x 1	25	18	34,0	6	8	12	6	16	250	49	**22110.1136**
6	**M10**	25	18	34,0	6	8	12	6	16	250	49	**22110.1138**
	M10 x 1	25	18	34,0	6	8	12	6	16	250	49	**22110.1140**
	M12	28	20	40,5	7	10	14	10	23	250	72	**22110.1142**
	M12 x 1,5	28	20	40,5	7	10	14	10	23	250	73	**22110.1144**
7	**M12**	28	20	40,5	7	10	14	10	23	250	73	**22110.1146**
	M12 x 1,5	28	20	40,5	7	10	14	10	23	250	74	**22110.1148**
8	**M16**	33	23	47,5	10	12	17	11	35	250	110	**22110.1150**
	M16 x 1,5	33	23	47,5	10	12	17	11	35	250	110	**22110.1152**
10	**M16**	33	23	47,5	10	12	17	11	35	250	112	**22110.1154**
	M16 x 1,5	33	23	47,5	10	12	17	11	35	250	114	**22110.1156**

[1] statistical average value

APPLICATION EXAMPLE



Index Plungers Compact • with hexagon collar

EH 22110.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.
Types with / without lock have the same building height.
Due to a thread recess the index plungers can be completely screwed in.

Material

Body
- Steel, blackened
- Stainless steel 1.4305

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black, dull

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

MORE INFORMATION

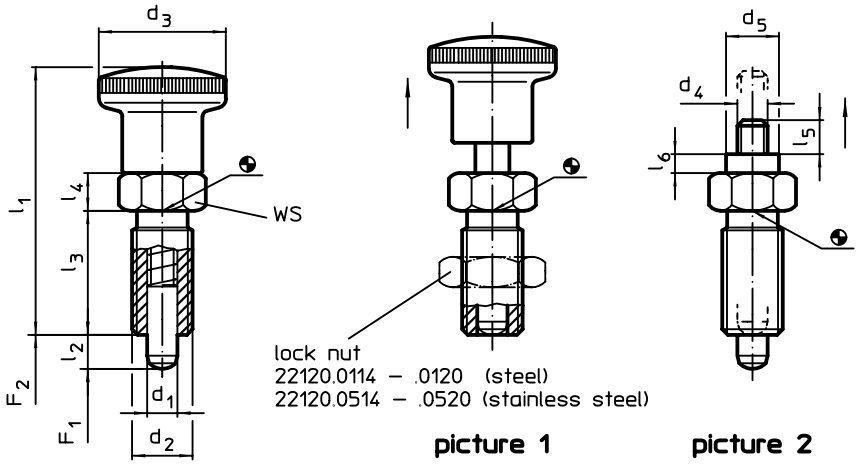
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions											WS	Spring load[1]					Art. No.	
d_1 -0,02 -0,04	l_2 min.	d_2	d_3	d_4	d_5	l_1	l_3	l_4	l_5	l_6		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]											[mm]	[N]		[°C]		[g]		
with knob – picture 1																		
4	4	M 8 x 1	16	–	–	35,0	16	5	–	–	10	4,5	12,0	-30	80	10	22110.0103	22110.0203
	6	M 8 x 1	16	–	–	35,0	16	5	–	–	10	4,0	12,5	-30	80	10	22110.0104	22110.0204
5	5	M10 x 1	19	–	–	40,0	18	6	–	–	12	5,0	15,0	-30	80	18	22110.0106	22110.0206
	8	M10 x 1	19	–	–	40,0	18	6	–	–	12	5,0	18,0	-30	80	18	22110.0107	22110.0207
6	6	M12 x 1,5	23	–	–	48,0	22	6	–	–	14	6,5	19,0	-30	80	29	22110.0109	22110.0209
	9	M12 x 1,5	23	–	–	48,0	22	6	–	–	14	6,0	25,0	-30	80	29	22110.0110	22110.0210
8	8	M16 x 1,5	28	–	–	58,0	26	8	–	–	17	8,5	26,0	-30	80	62	22110.0112	22110.0212
	12	M16 x 1,5	28	–	–	58,0	26	8	–	–	17	8,5	28,0	-30	80	62	22110.0113	22110.0213
10	12	M16 x 1,5	28	–	–	58,0	26	8	–	–	17	9,5	38,0	-30	80	63	22110.0115	22110.0215
12	15	M20 x 1,5	33	–	–	67,0	33	10	–	–	22	11,5	40,0	-30	80	128	22110.0116	22110.0216
16	20	M24 x 2	33	–	–	78,5	38	12	–	–	27	13,0	54,0	-30	80	204	22110.0117	22110.0217

[1] statistical average value →

2

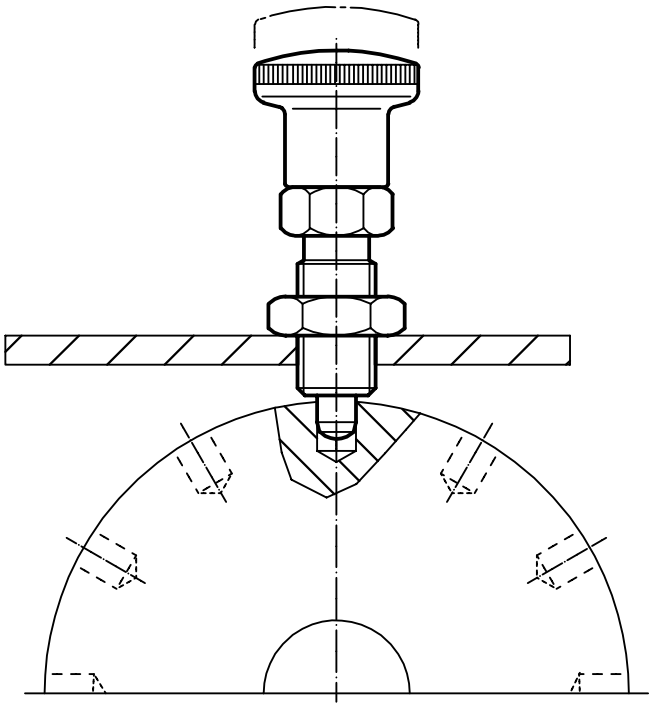
Dimensions											WS	Spring load[1]					Art. No.	
d_1 -0,02 -0,04	l_2 min.	d_2	d_3	d_4	d_5	l_1	l_3	l_4	l_5	l_6		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]											[mm]	[N]		[°C]		[g]		
without knob – picture 2																		
4	**4**	M 8 x 1	–	M3	7	–	16	5	4,5	2,5	10	4,5	12,0	–	250	9	22110.0143	22110.0243
	6	M 8 x 1	–	M3	7	–	16	5	4,5	2,5	10	4,0	12,5	–	250	9	22110.0144	22110.0244
5	**5**	M10 x 1	–	M4	8	–	18	6	5,5	3,0	12	5,0	15,0	–	250	16	22110.0146	22110.0246
	8	M10 x 1	–	M4	8	–	18	6	5,5	3,0	12	5,0	18,0	–	250	16	22110.0147	22110.0247
6	**6**	M12 x 1,5	–	M5	9	–	22	6	7,0	3,5	14	6,5	19,0	–	250	25	22110.0149	22110.0249
	9	M12 x 1,5	–	M5	9	–	22	6	7,0	3,5	14	6,0	25,0	–	250	25	22110.0150	22110.0250
8	**8**	M16 x 1,5	–	M6	10	–	26	8	8,5	4,0	17	8,5	26,0	–	250	55	22110.0152	22110.0252
	12	M16 x 1,5	–	M6	10	–	26	8	8,5	4,0	17	8,5	28,0	–	250	55	22110.0153	22110.0253
10	**12**	M16 x 1,5	–	M6	10	–	26	8	8,5	4,0	17	9,5	38,0	–	250	56	22110.0155	22110.0255
12	**15**	M20 x 1,5	–	M6	12	–	33	10	8,5	4,0	22	11,5	40,0	–	250	111	22110.0156	22110.0256
16	**20**	M24 x 2	–	M8	15	–	38	12	11,5	5,0	27	13,0	54,0	–	250	194	22110.0157	22110.0257

[1] statistical average value

ACCESSORIES

	Dimensions d_2	Wrench size		Art. No.	
	[mm]	[mm]	[g]	steel	stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M 8 x 1**	13	2,7	22120.0114	22120.0514
	M10 x 1	16	5,2	22120.0115	22120.0515
	M12 x 1,5	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518
	M20 x 1,5	30	32,0	22120.0120	22120.0520
	M24 x 2	36	58,0	22120.0122	22120.0522

APPLICATION EXAMPLE



Index Plungers Compact • with hexagon collar and locking

EH 22110.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.
Types with / without lock have the same building height.
Due to a thread recess the index plungers can be completely screwed in.

Material

Body
- Steel, blackened
- Stainless steel 1.4305

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black, dull

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

The knob is pulled-out, turned 90° and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

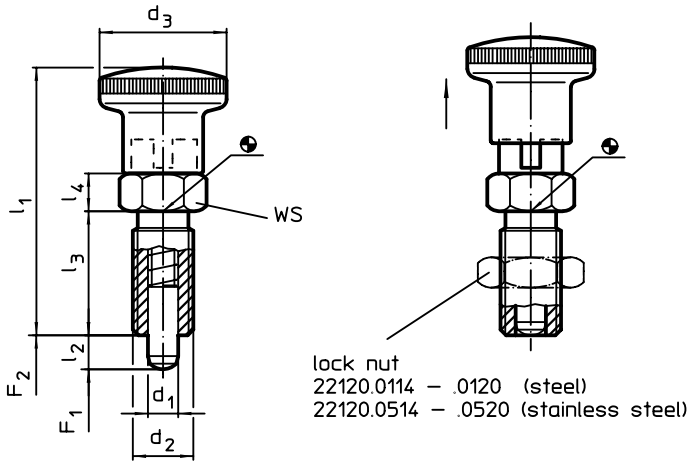
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions							WS	Spring load[1]					Art. No.	
d_1 -0,02 -0,04	l_2 min.	d_2	d_3	l_1	l_3	l_4		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
4	4	M 8 x 1	16	35,0	16	5	10	4,5	12,0	-30	80	12	22110.0123	22110.0223
	6	M 8 x 1	16	35,0	16	5	10	4,0	12,5	-30	80	12	22110.0124	22110.0224
5	5	M10 x 1	19	40,0	18	6	12	5,0	15,0	-30	80	20	22110.0126	22110.0226
	8	M10 x 1	19	40,0	18	6	12	5,0	18,0	-30	80	20	22110.0127	22110.0227
6	6	M12 x 1,5	23	48,0	22	6	14	6,5	19,0	-30	80	31	22110.0129	22110.0229
	9	M12 x 1,5	23	48,0	22	6	14	6,0	25,0	-30	80	33	22110.0130	22110.0230
8	8	M16 x 1,5	28	58,0	26	8	17	8,5	26,0	-30	80	65	22110.0132	22110.0232
	12	M16 x 1,5	28	58,0	26	8	17	8,5	28,0	-30	80	68	22110.0133	22110.0233
10	12	M16 x 1,5	28	58,0	26	8	17	9,5	38,0	-30	80	69	22110.0135	22110.0235
12	15	M20 x 1,5	33	67,0	33	10	22	11,5	40,0	-30	80	125	22110.0136	22110.0236
16	20	M24 x 2	33	78,5	38	12	27	13,0	54,0	-30	80	220	22110.0137	22110.0237

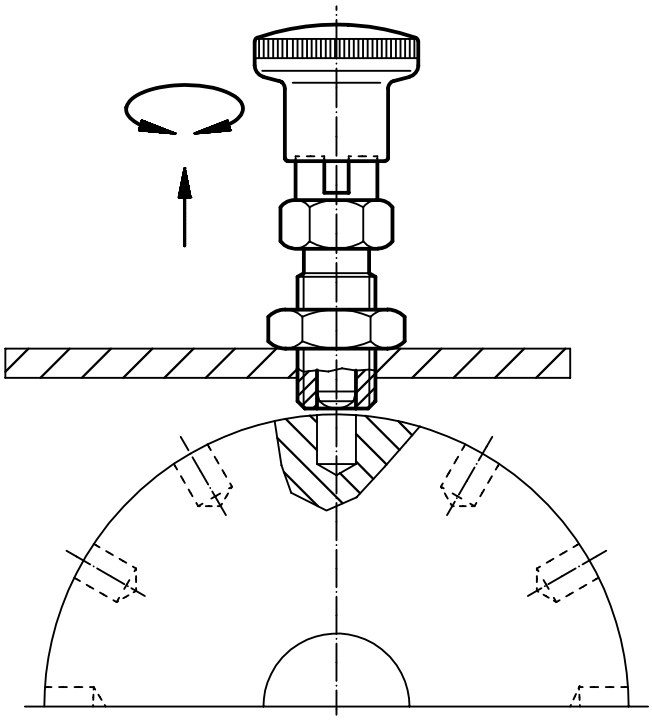
[1] statistical average value

2

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M 8 x 1**	13	2,7	22120.0114	22120.0514
	M10 x 1	16	5,2	22120.0115	22120.0515
	M12 x 1,5	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518
	M20 x 1,5	30	32,0	22120.0120	22120.0520
	M24 x 2	36	58,0	22120.0122	22120.0522

APPLICATION EXAMPLE



Index Plungers Compact • with hexagon collar, with T-handle

EH 22110.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.
Simple handling, e.g. when using safety gloves, with higher pull release.
Types with / without lock have the same building height.
Due to a thread recess the index plungers can be completely screwed in.

Material

Body
- Steel, blackened
- Stainless steel 1.4305

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black, dull

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

MORE INFORMATION

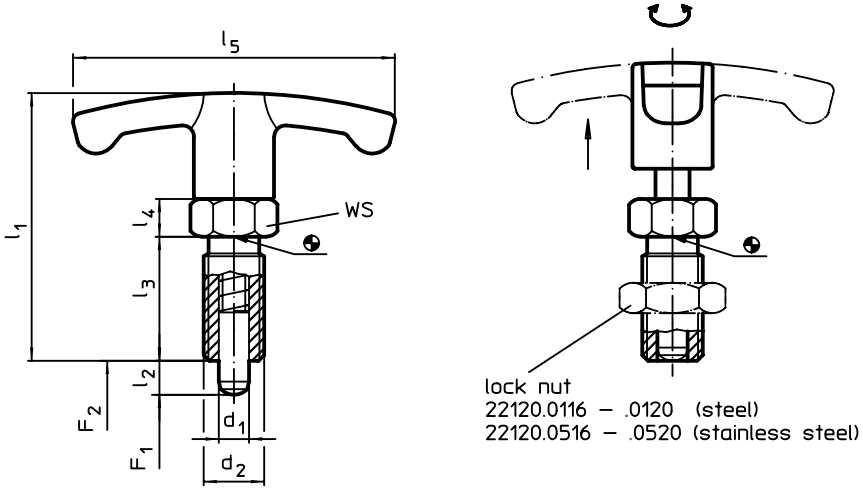
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions							WS	Spring load[1]					Art. No.	
d_1 -0,02 -0,04	l_2	d_2	l_1	l_3	l_4	l_5		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
6	6	M12 x 1,5	48	22	6	54	14	6,5	19	-30	80	31	22110.0820	22110.0920
	9	M12 x 1,5	48	22	6	54	14	6,0	25	-30	80	32	22110.0822	22110.0922
8	8	M16 x 1,5	59	26	8	59	17	8,5	26	-30	80	64	22110.0824	22110.0924
	12	M16 x 1,5	59	26	8	59	17	8,5	28	-30	80	65	22110.0826	22110.0926
10	12	M16 x 1,5	59	26	8	59	17	9,5	38	-30	80	66	22110.0828	22110.0928
12	15	M20 x 1,5	68	33	10	59	22	11,5	40	-30	80	121	22110.0830	22110.0930

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M12 x 1,5**	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518
	M20 x 1,5	30	32,0	22120.0120	22120.0520

2

Index Plungers Compact • with hexagon collar and locking, with T-handle

EH 22110.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.
Simple handling, e.g. when using safety gloves, with higher pull release.
Types with / without lock have the same building height.
Due to a thread recess the index plungers can be completely screwed in.

Material

Body
- Steel, blackened
- Stainless steel 1.4305

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black, dull

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

The T-handle is pulled out, turned 90° and secured by an internal notched catch (when locking pin should not overhang). The positions are defined distinctively by the T-handle.

MORE INFORMATION

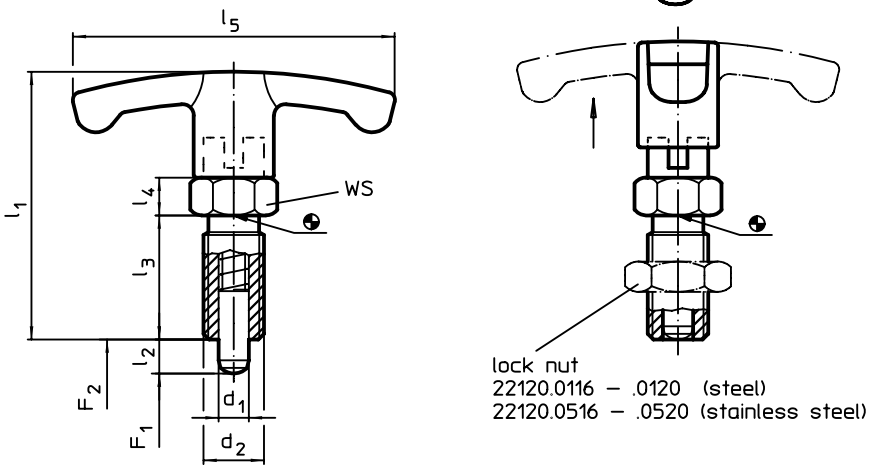
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

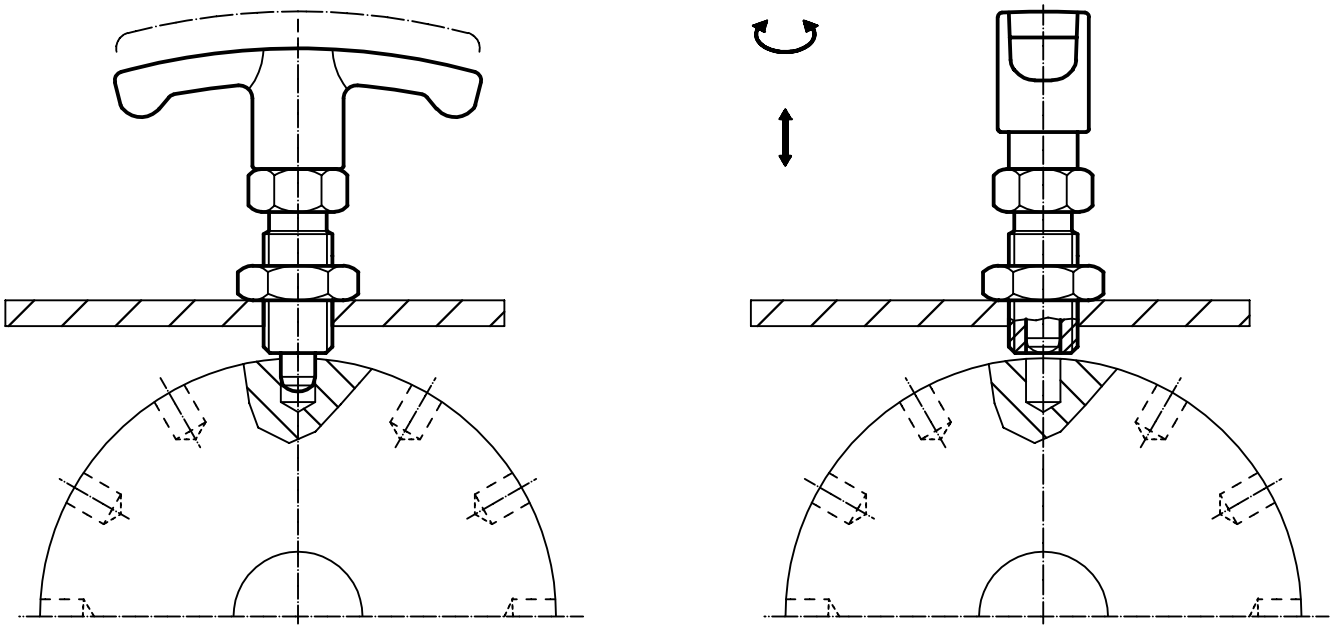
Dimensions							WS	Spring load[1]					Art. No.	
d_1	l_2	d_2	l_1	l_3	l_4	l_5		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
6	6	M12 x 1,5	48	22	6	54	14	6,5	19	-30	80	33	22110.0832	22110.0932
	9	M12 x 1,5	48	22	6	54	14	6,0	25	-30	80	34	22110.0834	22110.0934
8	8	M16 x 1,5	59	26	8	59	17	8,5	26	-30	80	68	22110.0836	22110.0936
	12	M16 x 1,5	59	26	8	59	17	8,5	28	-30	80	71	22110.0838	22110.0938
10	12	M16 x 1,5	59	26	8	59	17	9,5	38	-30	80	72	22110.0840	22110.0940
12	15	M20 x 1,5	68	33	10	59	22	11,5	40	-30	80	127	22110.0842	22110.0942

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M12 x 1,5**	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518
	M20 x 1,5	30	32,0	22120.0120	22120.0520

APPLICATION EXAMPLE



2

Index Plungers • with mounting flange, horizontal

EH 22110.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Housing
- Zinc die-cast, plastic coated, black

Locking pin
- Stainless steel 1.4305

Knob
- Thermoplastic PA 6, black, dull

Pull-ring
- Stainless steel 1.4310

Assembly

Assembly by means of washers ISO 7092.

Operation

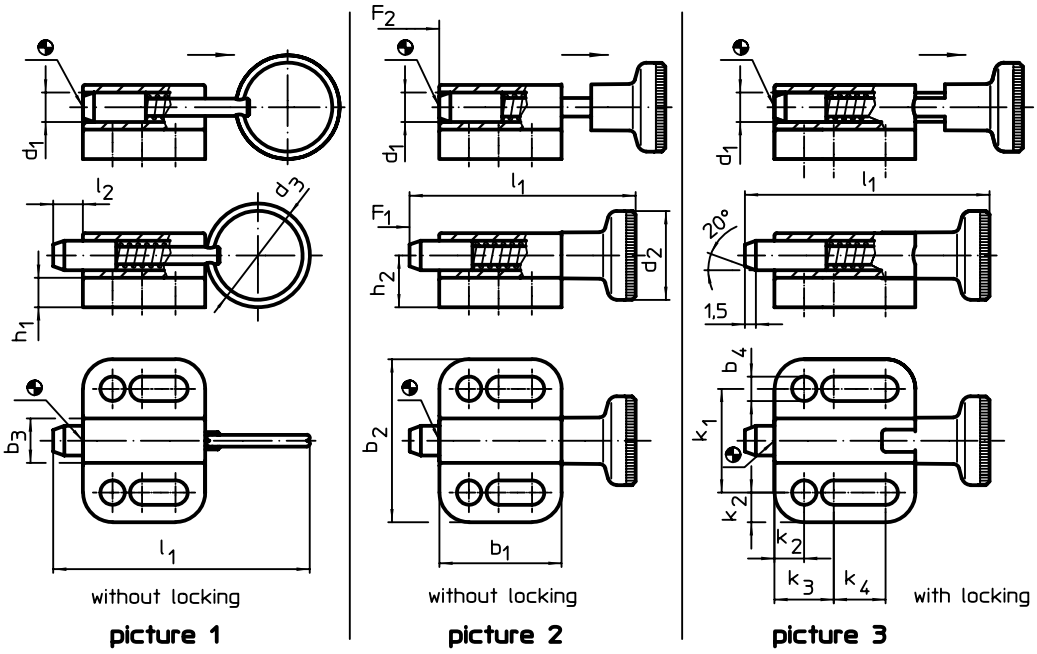
When using locking index plungers, the knob is pulled-out, turned 90° and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

Notes

Knob not removable.

DRAWING



ORDER INFORMATION

Dimensions																Spring load[1]					Art. No.
d_1 h9	d_2	d_3	b_1	b_2	b_3	b_4 -0,2	h_1	h_2	k_1 ±0,05	k_2	k_3	k_4	l_1	l_2 min.		F_1 ~	F_2 ~	min.	max.		
[mm]																[N]		[°C]		[g]	
with pull-ring, without locking – picture 1																					
4	–	14	16,5	22	6,0	3,3	4,0	7,0	14	4,0	8	4,5	34,5	4		3	12	–	100	10	22110.0304
5	–	18	22,0	28	8,0	4,3	4,5	9,5	18	5,0	10	7,0	45,0	5		5	24	–	100	20	22110.0305
6	–	24	27,5	32	10,0	5,4	5,0	10,5	21	5,5	12	10,0	57,5	6		5	21	–	100	40	22110.0306
8	–	30	33,0	34	12,0	5,4	6,0	12,5	23	5,5	12	15,5	71,0	8		6	22	–	100	58	22110.0308
10	–	30	35,0	39	14,5	6,5	6,0	14,5	27	6,0	15	13,5	75,0	10		4	25	–	100	83	22110.0310
with knob, without locking – picture 2																					
4	12	–	16,5	22	6,0	3,3	4,0	7,0	14	4,0	8	4,5	30,5	4		3	12	-30	80	11	22110.0324
5	16	–	22,0	28	8,0	4,3	4,5	9,5	18	5,0	10	7,0	40,0	5		5	24	-30	80	20	22110.0325
6	18	–	27,5	32	10,0	5,4	5,0	10,5	21	5,5	12	10,0	49,0	6		5	21	-30	80	37	22110.0326
8	21	–	33,0	34	12,0	5,4	6,0	12,5	23	5,5	12	15,5	59,0	8		6	22	-30	80	59	22110.0328
10	25	–	35,0	39	14,5	6,5	6,0	14,5	27	6,0	15	13,5	67,5	10		4	25	-30	80	90	22110.0330
with knob and locking – picture 3																					
4	12	–	19,0	22	6,0	3,3	4,0	7,0	14	4,0	8	7,0	33,0	4		3	12	-30	80	10	22110.0344
5	16	–	25,5	28	8,0	4,3	4,5	9,5	18	5,0	10	10,5	43,5	5		5	24	-30	80	26	22110.0345
6	18	–	30,5	32	10,0	5,4	5,0	10,5	21	5,5	12	13,0	52,0	6		5	21	-30	80	40	22110.0346
8	21	–	37,5	34	12,0	5,4	6,0	12,5	23	5,5	12	20,0	63,5	8		6	22	-30	80	67	22110.0348
10	25	–	40,0	39	14,5	6,5	6,0	14,5	27	6,0	15	18,5	72,5	10		4	25	-30	80	98	22110.0350

[1] statistical average value

Mounting Blocks • for index bolts and index plungers, die-cast

EH 22110.



PRODUCT DESCRIPTION

Assembly support and extended applications for index bolts and index plungers. Also to be used as a seat for locating bushings EH 22110.

Material

Threaded pin
- Steel, blackened, with brass pad

Body
- Zinc die-cast, plastic coated, black

Assembly

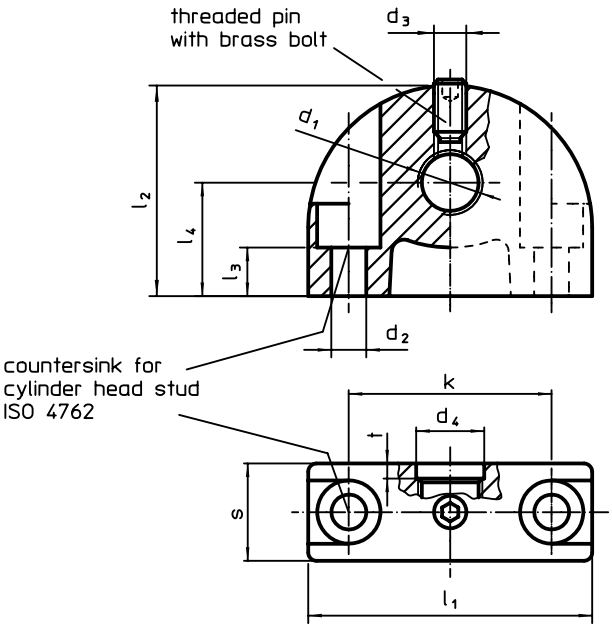
Index plunger must be assembled in hole d_1 on countersink side.

MORE INFORMATION

Further products

Positioning Bushings, for index bolts and index plungers . . . . . → p. 112

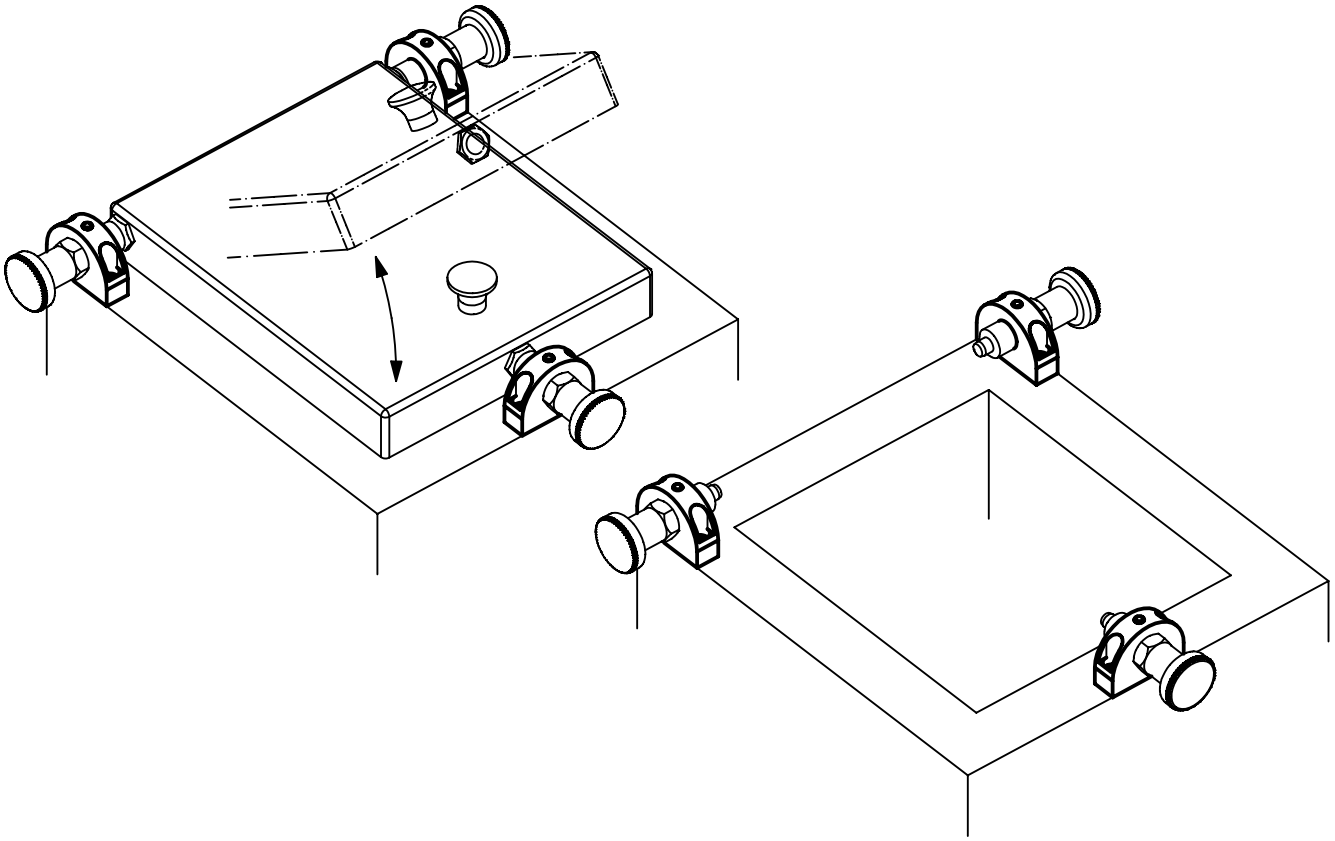
DRAWING



ORDER INFORMATION

Dimensions													Art. No.
d_1	d_2	d_3	d_4	k	l_1	l_2	l_3	l_4	s	t	max. [°C]	[g]	
					[mm]								
mounting hole vertical to index bolt and index plunger													
M 8 x 1	4,3	M4	8,2	25	35	26	11,5	14	12	2	100	39	22110.0408
M 8	4,3	M4	8,2	25	35	26	6,0	14	12	2	100	40	22110.0508
M10 x 1	4,3	M4	10,2	25	35	26	11,5	14	12	2	100	36	22110.0410
M10	4,3	M4	10,2	25	35	26	6,0	14	12	2	100	38	22110.0510
M12 x 1,5	4,3	M4	12,2	25	35	26	11,5	14	12	3	100	41	22110.0412
M12	4,3	M4	12,2	25	35	26	6,0	14	12	3	100	35	22110.0512
M16 x 1,5	5,3	M5	16,2	35	47	34	15,5	18	14	3	100	77	22110.0416
M16	5,3	M5	16,2	35	47	34	10,0	18	14	3	100	76	22110.0516
M20 x 1,5	5,3	M5	20,2	35	47	34	15,5	18	14	3	100	68	22110.0420

APPLICATION EXAMPLE



Locating Bushings • for index bolts and index plungers

EH 22110.



PRODUCT DESCRIPTION

Used for locating the locking pin of index bolts and index plungers. Suitable for mounting blocks 22110.0412 and 22110.0416.

Material

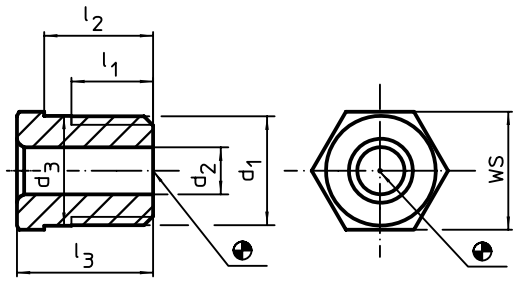
- Steel, nitrided

MORE INFORMATION

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109

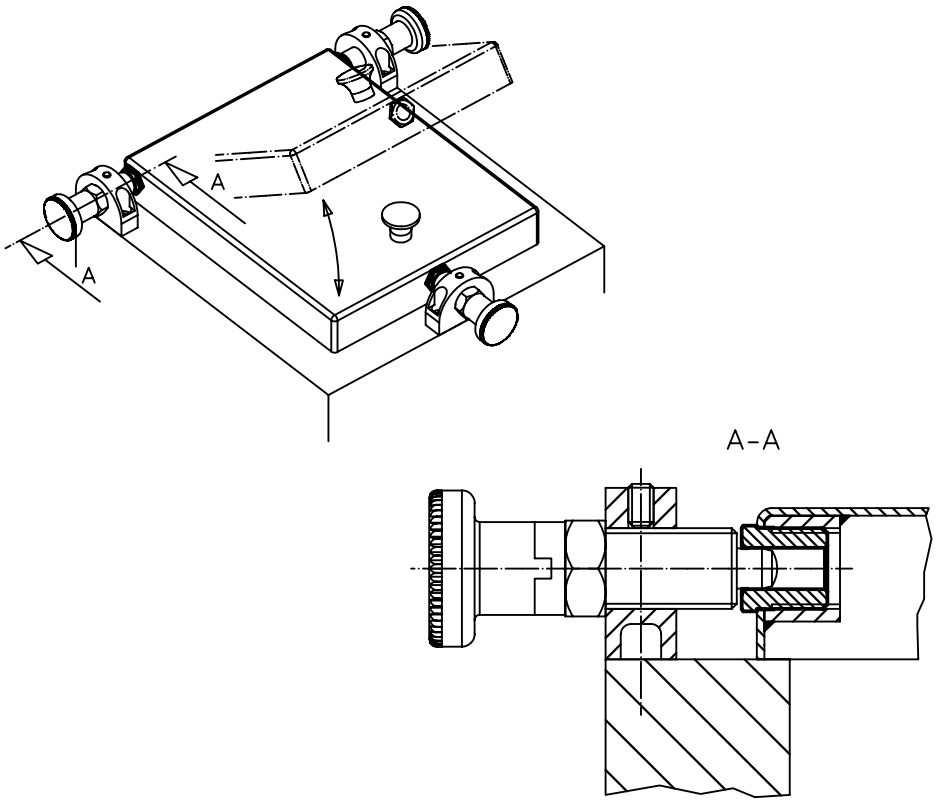
DRAWING



ORDER INFORMATION

Dimensions						For pin	WS	max.		Art. No.
d_1	d_2 +0,1	d_3 ±0,3	l_1 min.	l_2 -0,3	l_3					
[mm]						[mm]	[mm]	[°C]	[g]	
M12 x 1,5	4,2	12,1	9	10	13	**4**	13	250	10	22110.0454
	5,2	12,1	9	10	13	**5**	13	250	10	22110.0455
	6,2	12,1	9	10	13	**6**	13	250	9	22110.0456
M16 x 1,5	8,2	16,1	11	12	15	**8**	17	250	18	22110.0458
	10,2	16,1	11	12	15	**10**	17	250	14	22110.0460
	12,2	16,1	11	12	15	**12**	17	250	9	22110.0462

APPLICATION EXAMPLE



2

Positioning Bushings • for index bolts and index plungers

EH 22110.



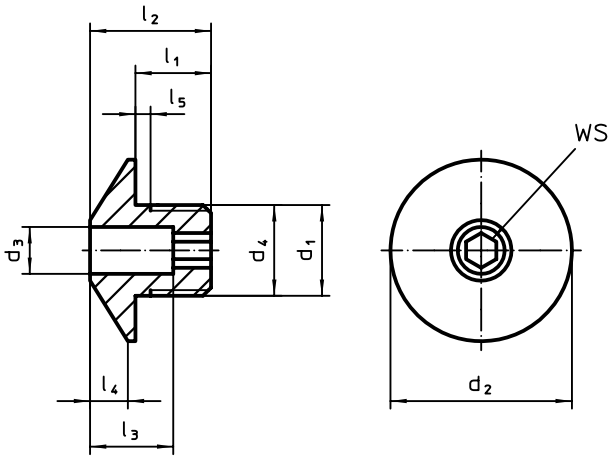
PRODUCT DESCRIPTION

Positioning bushings are suitable for index plungers and index bolts.
Low wear thanks to hardened running ball.

Material

- Steel, hardened, blackened
- Stainless steel, hardened

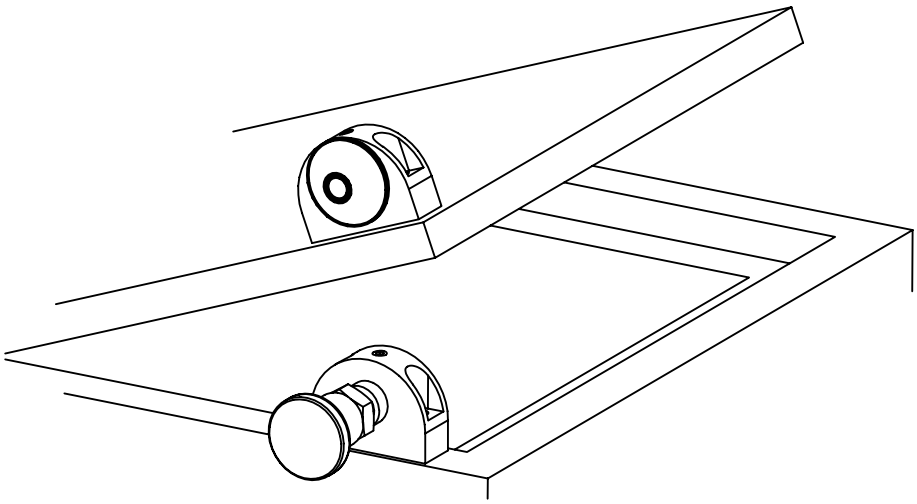
DRAWING



ORDER INFORMATION

Dimensions									For pin	WS		Art. No.	
d_1	d_3 +0,1	d_2	d_4 -0,05	l_1	l_2	l_3	l_4	l_5 +0,5				steel	stainless steel
[mm]									[mm]	[mm]	[g]		
M12 x 1,5	**4,2**	24	12	10	16	11	5	1,5	**4**	4	17	22110.0464	22110.0474
	5,2	24	12	10	16	11	5	1,5	**5**	4	16	22110.0465	22110.0475
	6,2	24	12	10	16	11	5	1,5	**6**	4	16	22110.0466	22110.0476
M16 x 1,5	**8,2**	32	16	12	20	13	7	1,5	**8**	6	36	22110.0468	22110.0478
	10,2	32	16	12	20	13	7	1,5	**10**	6	33	22110.0470	22110.0480
	12,2	32	16	12	20	13	7	1,5	**12**	6	33	22110.0472	22110.0482

APPLICATION EXAMPLE



Index Plungers • with hexagon collar

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black, dull

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

MORE INFORMATION

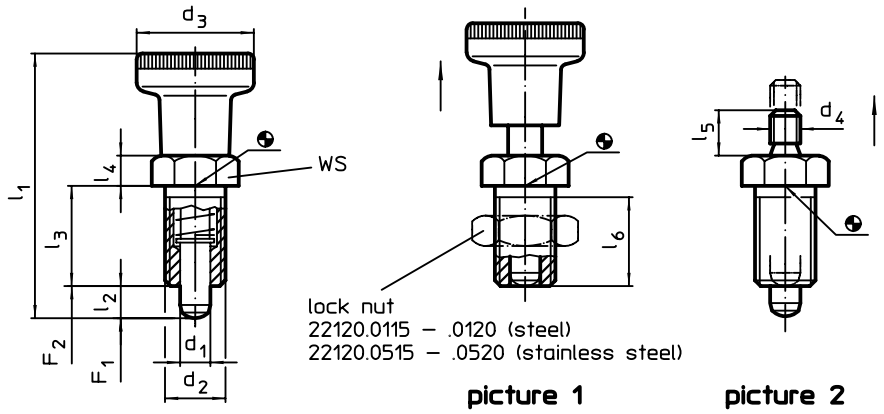
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122

DRAWING



picture 1 picture 2

ORDER INFORMATION

Dimensions										WS	Spring load[1]					Art. No.	
d_1 -0,02 -0,04	d_2	d_3	d_4	l_1 ~	l_2 min.	l_3	l_4	l_5	l_6 min.		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]										[mm]	[N]		[°C]		[g]		
with knob – picture 1																	
5	M10 x 1	21	–	45,0	5	17	5	–	15	12	6,0	14	-30	80	19	22120.0005	22120.0405
6	M12 x 1,5	25	–	54,5	6	20	6	–	17	14	5,5	13	-30	80	31	22120.0006	22120.0406
8	M16 x 1,5	31	–	69,0	8	26	8	–	23	19	11,5	28	-30	80	71	22120.0008	22120.0408
10	M20 x 1,5	31	–	80,0	10	33	10	–	30	22	23,0	54	-30	80	115	22120.0010	22120.0410
without knob – picture 2																	
5	M10 x 1	–	M5	–	5	17	5	6	15	12	6,0	14	–	250	14	22120.0025	22120.0425
6	M12 x 1,5	–	M6	–	6	20	6	10	17	14	5,5	13	–	250	23	22120.0026	22120.0426
8	M16 x 1,5	–	M8	–	8	26	8	12	23	19	11,5	28	–	250	54	22120.0028	22120.0428
10	M20 x 1,5	–	M8	–	10	33	10	12	30	22	23,0	54	–	250	79	22120.0030	22120.0430

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M10 x 1**	16	5,2	22120.0115	22120.0515
	M12 x 1,5	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518
	M20 x 1,5	30	32,0	22120.0120	22120.0520

2

Index Plungers • with hexagon collar, stainless steel

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Stainless steel 1.4305

Locking pin
- Stainless steel 1.4305, nickel-plated

Knob
- Stainless steel 1.4305

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

MORE INFORMATION

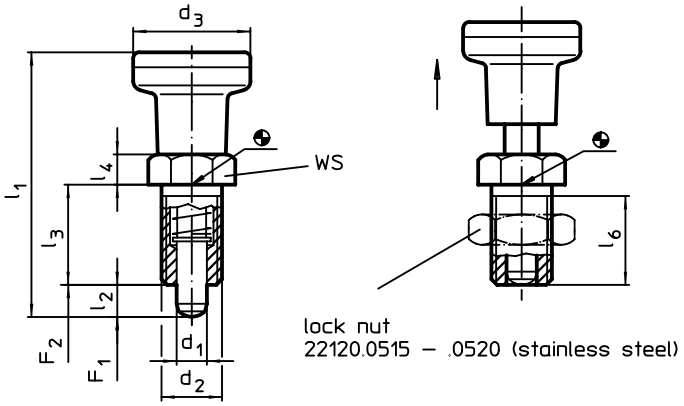
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions								WS	Spring load[1]				Art. No.
d_1 -0,02 -0,04	d_2	d_3	l_1 ~	l_2 min.	l_3	l_4	l_6 min.		F_1 ~	F_2 ~	max.		stainless steel
[mm]								[mm]	[N]		[°C]	[g]	
5	M10 x 1	21	45,0	5	17	5	15	12	6,0	14	250	39	22120.0485
6	M12 x 1,5	25	54,5	6	20	6	17	14	5,5	13	250	65	22120.0486
8	M16 x 1,5	31	69,0	8	26	8	23	19	11,5	28	250	132	22120.0488
10	M20 x 1,5	31	80,0	10	33	10	30	22	23,0	54	250	175	22120.0490

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes				
	**M10 x 1**	16	5,2	22120.0515
	M12 x 1,5	18	7,4	22120.0516
	M16 x 1,5	24	18,0	22120.0518
	M20 x 1,5	30	32,0	22120.0520

Index Plungers • with hexagon collar and locking

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black, dull

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

The knob is pulled-out, turned 90° and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

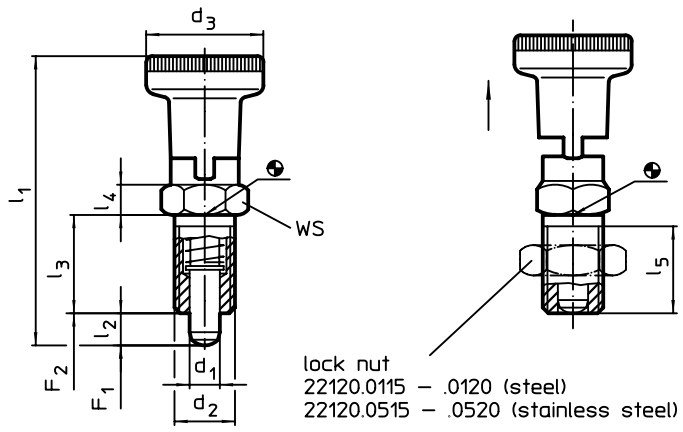
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions								WS	Spring load[1]					Art. No.	
d_1 -0,02 -0,04	d_2	d_3	l_1 ~	l_2 min.	l_3	l_4	l_5 min.		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]								[mm]	[N]		[°C]		[g]		
5	M10 x 1	21	51,0	5	17	5	15	12	6,0	14	-30	80	22	22120.0205	22120.0605
6	M12 x 1,5	25	61,0	6	20	6	17	14	5,5	13	-30	80	36	22120.0206	22120.0606
8	M16 x 1,5	31	75,5	7	26	8	23	19	11,5	28	-30	80	79	22120.0208	22120.0608
10	M20 x 1,5	31	91,0	10	33	10	30	22	28,0	54	-30	80	134	22120.0210	22120.0610

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M10 x 1**	16	5,2	22120.0115	22120.0515
	M12 x 1,5	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518
	M20 x 1,5	30	32,0	22120.0120	22120.0520

2

Index Plungers • with hexagon collar and locking, stainless steel

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Stainless steel 1.4305

Locking pin
- Stainless steel 1.4305, nickel-plated

Knob
- Stainless steel 1.4305

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

The knob is pulled-out, turned 90° and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

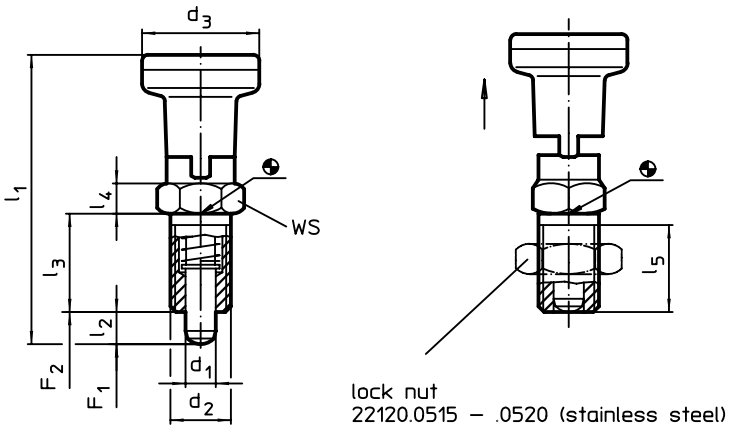
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions								WS	Spring load[1]				Art. No.
d_1 -0,02 -0,04	d_2	d_3	l_1 ~	l_2 min.	l_3	l_4	l_5 min.		F_1 ~	F_2 ~	max.		stainless steel
[mm]								[mm]	[N]		[°C]	[g]	
5	M10 x 1	21	51,0	5	17	5	15	12	6,0	14	250	43	22120.0615
6	M12 x 1,5	25	61,0	6	20	6	17	14	5,5	13	250	71	22120.0616
8	M16 x 1,5	31	75,5	7	26	8	23	19	11,5	28	250	144	22120.0618
10	M20 x 1,5	31	91,0	10	33	10	30	22	28,0	54	250	202	22120.0620

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes				
	**M10 x 1**	16	5,2	22120.0515
	M12 x 1,5	18	7,4	22120.0516
	M16 x 1,5	24	18,0	22120.0518
	M20 x 1,5	30	32,0	22120.0520

Index Plungers • without hexagon collar

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black

Assembly

Suitable mounting tools are available.

MORE INFORMATION

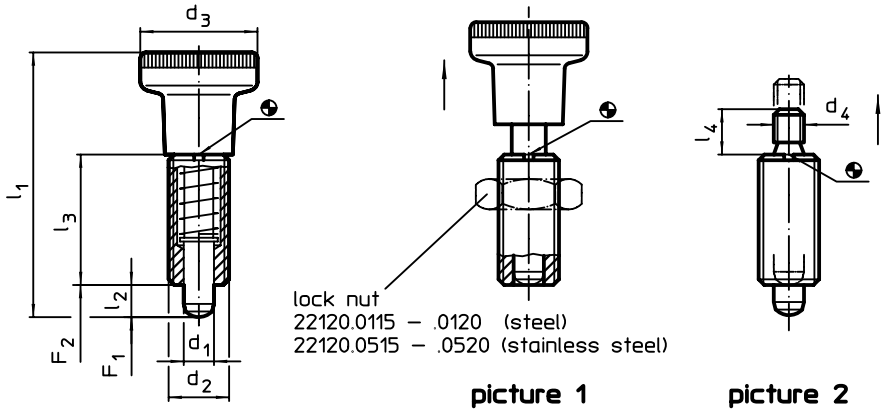
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions								Spring load[1]					Art. No.	
d_1 -0,02 -0,04	d_2	d_3	d_4	l_1 ~	l_2 min.	l_3	l_4	F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]								[N]		[°C]		[g]		
with knob – picture 1														
5	M10 x 1	21	–	45,0	5	22	–	6,0	14	-30	80	17	22120.0045	22120.0445
6	M12 x 1,5	25	–	54,5	6	26	–	5,5	13	-30	80	27	22120.0046	22120.0446
8	M16 x 1,5	31	–	69,0	8	34	–	11,5	28	-30	80	63	22120.0048	22120.0448
10	M20 x 1,5	31	–	80,0	10	41	–	23,0	54	-30	80	104	22120.0050	22120.0450
without knob – picture 2														
5	M10 x 1	–	M5	–	5	22	6	6,0	14	–	250	12	22120.0065	22120.0465
6	M12 x 1,5	–	M6	–	6	26	10	5,5	13	–	250	12	22120.0066	22120.0466
8	M16 x 1,5	–	M8	–	8	34	12	11,5	28	–	250	46	22120.0068	22120.0468
10	M20 x 1,5	–	M8	–	10	43	12	23,0	54	–	250	87	22120.0070	22120.0470

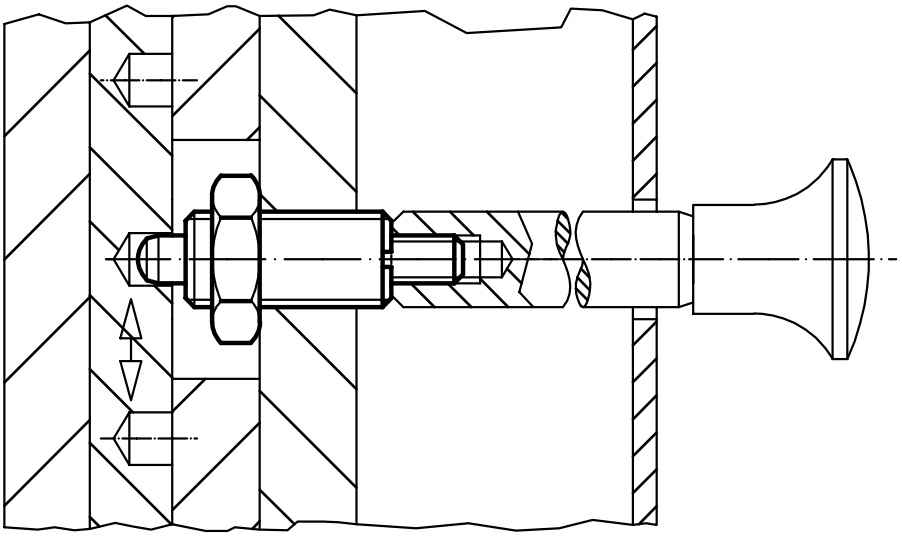
[1] statistical average value

2

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M10 x 1**	16	5,2	22120.0115	22120.0515
	M12 x 1,5	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518
	M20 x 1,5	30	32,0	22120.0120	22120.0520
mounting tool for the following sizes					
	**M10 x 1**	–	9,5	22120.0955	–
	M12 x 1,5	–	14,0	22120.0956	–
	M16 x 1,5	–	25,0	22120.0958	–
	M20 x 1,5	–	27,0	22120.0960	–

APPLICATION EXAMPLE



Index Plungers • without hexagon collar, stainless steel

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Stainless steel 1.4305

Locking pin
- Stainless steel 1.4305, nickel-plated

Knob
- Stainless steel 1.4305

Assembly

Suitable mounting tools are available.

MORE INFORMATION

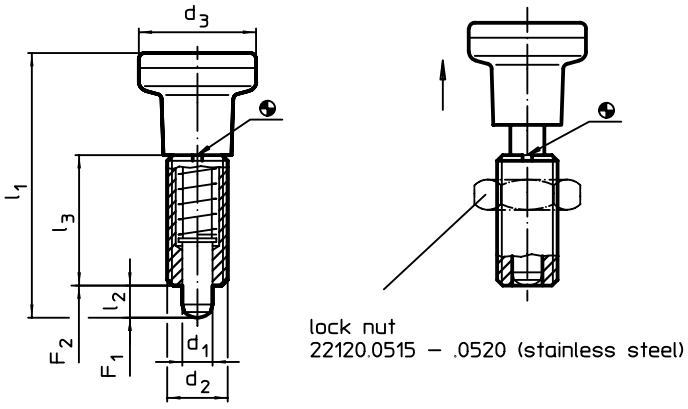
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Distance Collars, for index plungers . . → p. 122

DRAWING



ORDER INFORMATION

Dimensions						Spring load[1]				Art. No.
d_1 -0,02 -0,04	d_2	d_3	l_1 ~	l_2 min.	l_3	F_1 ~	F_2 ~	max.		stainless steel
[mm]						[N]		[°C]	[g]	
5	M10 x 1	21	45,0	5	22	6,0	14	250	37	22120.0475
6	M12 x 1,5	25	54,5	6	26	5,5	13	250	62	22120.0476
8	M16 x 1,5	31	69,0	8	34	11,5	28	250	124	22120.0478
10	M20 x 1,5	31	80,0	10	41	23,0	54	250	165	22120.0480

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. stainless steel	Art. No. steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M10 x 1**	16	5,2	22120.0515	–
	M12 x 1,5	18	7,4	22120.0516	–
	M16 x 1,5	24	18,0	22120.0518	–
	M20 x 1,5	30	32,0	22120.0520	–
mounting tool for the following sizes					
	**M10 x 1**	–	9,5	–	22120.0955
	M12 x 1,5	–	14,0	–	22120.0956
	M16 x 1,5	–	25,0	–	22120.0958
	M20 x 1,5	–	27,0	–	22120.0960

2

Index Plungers • threadless, weldable

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Steel, blackened, weldable

Locking pin
- Steel, hardened

Knob
- Thermoplastic PA 6, black

Assembly

Attached by welding or glueing.

MORE INFORMATION

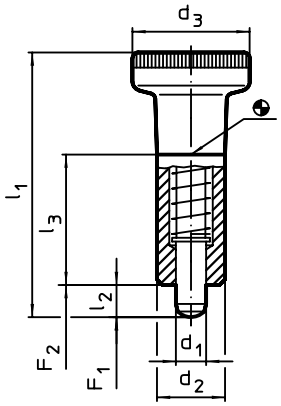
Notes

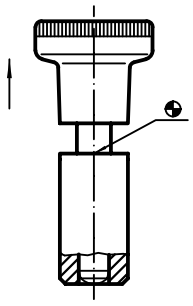
Knob not removable.

Further products

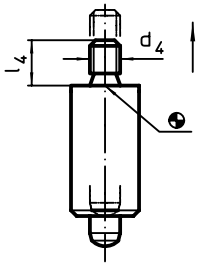
Locating Bushings, for index bolts and index plungers . . . . . → p. 111

DRAWING





picture 1



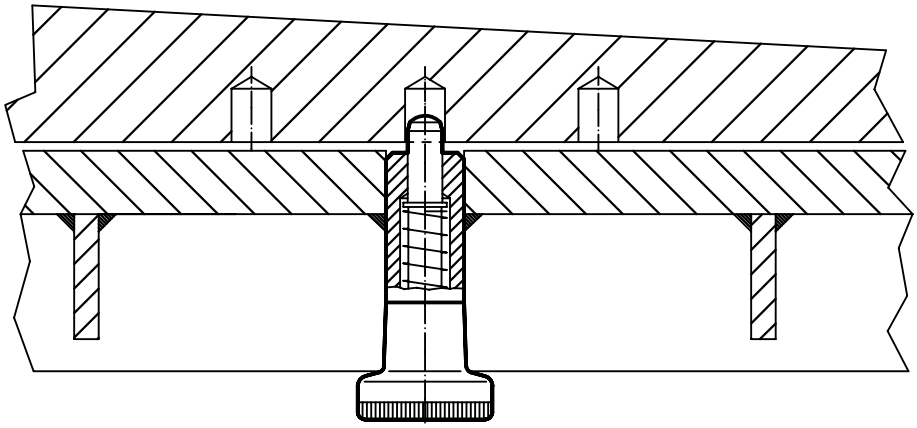
picture 2

ORDER INFORMATION

Dimensions								Spring load[1]					Art. No.
d_1 -0,02 -0,04	d_2 h9	d_3	d_4	l_1 ~	l_2 min.	l_3	l_4	F_1 ~	F_2 ~	min.	max.		
[mm]								[N]		[°C]		[g]	
with knob – picture 1													
5	12	21	–	45,0	5	22	–	7,0	16	-30	80	25	22120.0805
6	14	25	–	54,5	6	26	–	6,5	15	-30	80	40	22120.0806
8	18	31	–	69,0	8	34	–	12,0	31	-30	80	84	22120.0808
without knob – picture 2													
5	12	–	M5	–	5	22	6	7,0	16	–	250	19	22120.0825
6	14	–	M6	–	6	26	10	6,5	15	–	250	32	22120.0826
8	18	–	M8	–	8	34	12	12,0	31	–	250	67	22120.0828

[1] statistical average value

APPLICATION EXAMPLE



Index Plungers • with hexagon collar, short

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.
The small dimensions are a feature of these index plungers.

Material

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black, dull

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

When using locking index plungers, the knob is pulled-out, turned 90° and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

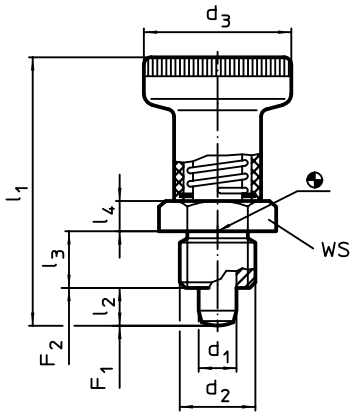
Notes

Knob not removable.
Lock nuts have to be purchased separately.

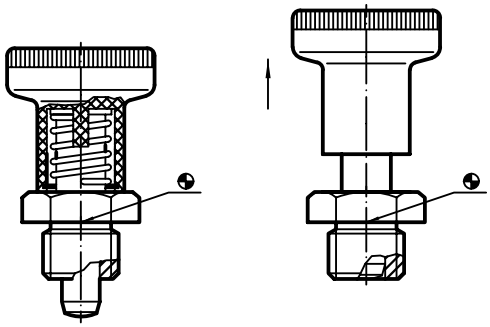
Further products

Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122

DRAWING



picture 1



picture 2 with locking

ORDER INFORMATION

Dimensions							WS	Spring load[1]					Art. No.	
d_1 -0,02 -0,04	d_2	d_3	l_1 ~	l_2 min.	l_3 -0,15	l_4		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
without locking – picture 1														
6	M12 x 1,5	25	45	6	10	5	17	7	19	-30	80	35	22120.0226	22120.0246
8	M16 x 1,5	31	54	8	12	6	19	14	24	-30	80	62	22120.0228	22120.0248
with locking – picture 2														
6	M12 x 1,5	25	45	6	10	5	17	7	19	-30	80	35	22120.0236	22120.0256
8	M16 x 1,5	31	54	8	12	6	19	14	24	-30	80	61	22120.0238	22120.0258

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M12 x 1,5**	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518

2

Distance Collars • for index plungers

EH 22120.



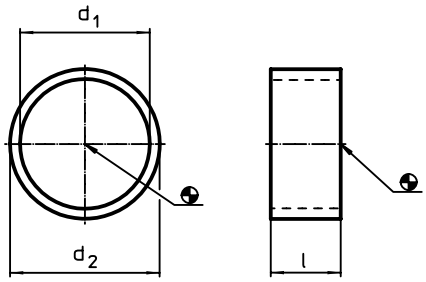
PRODUCT DESCRIPTION

Distance collars adapt the thread of index plungers to different thread reaches.

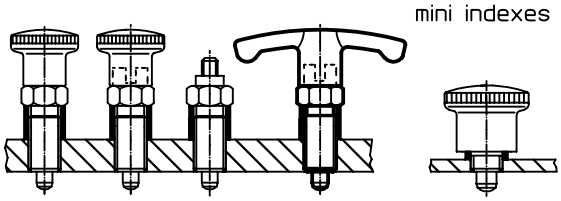
Material

- Stainless steel 1.4305

DRAWING

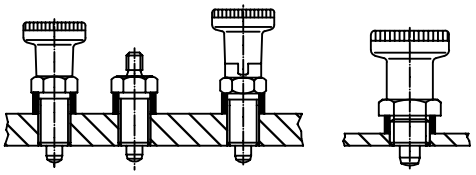


EH 22110. mini indexes



picture 1 picture 2

EH 22120. index plunger short



picture 3 picture 4

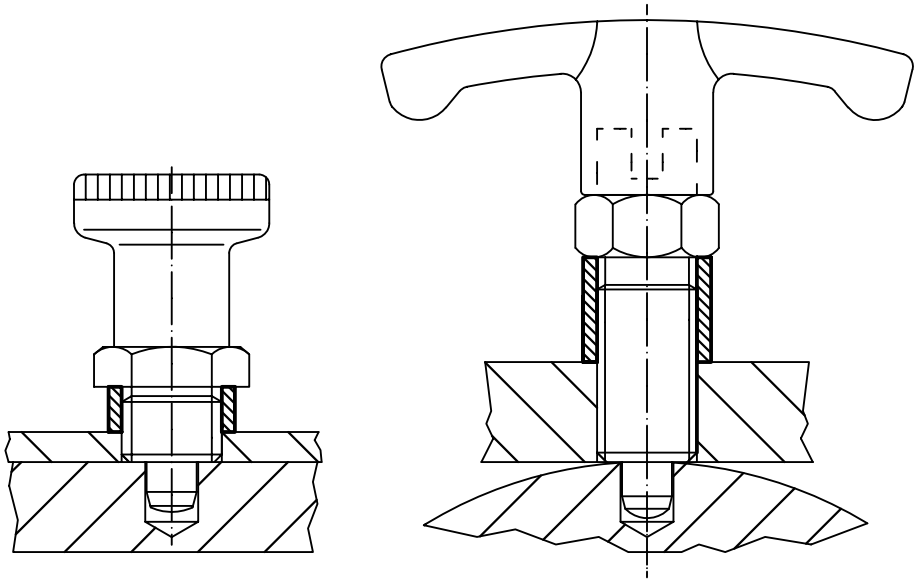
ORDER INFORMATION

Dimensions			For index plungers size	For finish picture			Art. No.
d_1 H12	l ±0,1	d_2 -0,1			max.		
[mm]			[mm]		[°C]	[g]	
8	2	10	M 8	1/2	250	0,52	22120.0632
	3	10	M 8	1	250	0,61	22120.0633
	4	10	M 8	1	250	1,10	22120.0634
	6	10	M 8	1	250	1,23	22120.0636
	8	10	M 8	1	250	1,60	22120.0638
	10	10	M 8	1	250	2,00	22120.0640
10	2	12	M10	1/2/3	250	0,62	22120.0642
	4	12	M10	1/2/3	250	1,10	22120.0644
	6	12	M10	1/3	250	1,50	22120.0646
	8	12	M10	1/3	250	2,10	22120.0648
	10	12	M10	1/3	250	2,32	22120.0650
	12	12	M10	1/3	250	3,00	22120.0652
12	2	14	M12	1	250	0,60	22120.0662
	4	14	M12	1	250	1,30	22120.0664
	6	14	M12	1	250	1,90	22120.0666
	8	14	M12	1	250	2,50	22120.0668
	2	17	M12	3/4	250	2,00	22120.0672
	4	17	M12	3/4	250	3,40	22120.0674
	5	17	M12	3/4	250	4,40	22120.0675

→

Dimensions			For index plungers size	For finish picture	max.		Art. No.
d_1 H12	l ±0,1	d_2 -0,1					
[mm]			[mm]		[°C]	[g]	
16	4	17	M16	1	250	0,70	22120.0676
	6	17	M16	1	250	1,00	22120.0677
	8	17	M16	1	250	1,40	22120.0678
	10	17	M16	1	250	2,00	22120.0679
	12	17	M16	1	250	2,10	22120.0680
	2	19	M16	3/4	250	1,20	22120.0682
	4	19	M16	3/4	250	2,80	22120.0684
	6	19	M16	3/4	250	3,80	22120.0686
	8	19	M16	3/4	250	4,80	22120.0688
	10	19	M16	3	250	6,10	22120.0690
	12	19	M16	3	250	7,50	22120.0692
20	6	22	M20	1/3	250	2,90	22120.0693
	8	22	M20	1/3	250	4,00	22120.0694
	10	22	M20	1/3	250	4,90	22120.0695
	12	22	M20	1/3	250	5,90	22120.0696
	14	22	M20	1/3	250	6,90	22120.0697
	16	22	M20	1/3	250	7,80	22120.0698
	18	22	M20	1/3	250	9,00	22120.0699

APPLICATION EXAMPLE



2

Index Plungers • with mounting flange

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.
For fixing onto thin walled parts.
The small dimensions are a feature of these index plungers.

Material

Flange
- Zinc die-cast, zinc-plated by galvanization

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black, dull

Operation

When using locking index plungers the knob is pulled out and turned 90°.

MORE INFORMATION

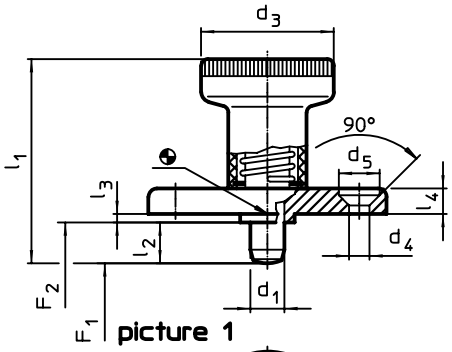
Notes

Knob not removable.

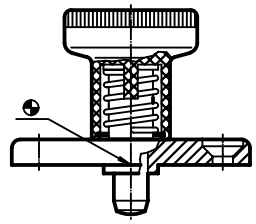
Further products

Locating Bushings, for index bolts and index plungers . . . . . → p. 111

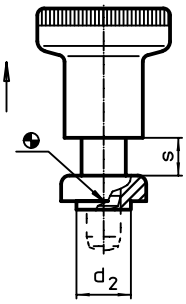
DRAWING

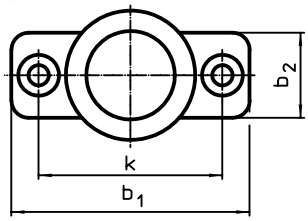


picture 1



picture 2 with locking





ORDER INFORMATION

Dimensions													Spring load[1]					Art. No.	
d_1 -0,02 -0,04	l_2	b_1	b_2	d_2 -0,02 -0,1	d_3	d_4	d_5	k	l_1	l_3 -0,15	l_4	s	F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]													[N]		[°C]		[g]		
without locking – picture 1																			
6	**6**	40	18	10	25	4,3	8,3	30	37	2,5	4,5	6	8,5	22	-30	80	26	22120.0926	22120.0966
	14	40	18	10	25	4,3	8,3	30	45	2,5	4,5	6	8,5	22	-30	80	38	22120.0927[2]	22120.0967[2]
8	**8**	46	20	12	31	5,3	10,4	34	44	2,5	5,5	8	15,5	28	-30	80	59	22120.0928	22120.0968
	18	46	20	12	31	5,3	10,4	34	54	2,5	5,5	8	15,5	28	-30	80	63	22120.0929[2]	22120.0969[2]
with locking – picture 2																			
6	**6**	40	18	10	25	4,3	8,3	30	37	2,5	4,5	6	8,5	22	-30	80	36	22120.0936	22120.0976
	14	40	18	10	25	4,3	8,3	30	45	2,5	4,5	6	8,5	22	-30	80	38	22120.0937[2]	22120.0977[2]
8	**8**	46	20	12	31	5,3	10,4	34	44	2,5	5,5	8	15,5	28	-30	80	60	22120.0938	22120.0978
	18	46	20	12	31	5,3	10,4	34	54	2,5	5,5	8	15,5	28	-30	80	63	22120.0939[2]	22120.0979[2]

[1] statistical average value
[2] Locking pin is not completely retractable

Index Plungers • simple finish

EH 22120.



PRODUCT DESCRIPTION

Application is limited to cases not requiring a precise positioning.
Simple finish with very small dimensions.

Material

Body
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

Locking pin
- Stainless steel 1.4305

Knob
- Thermoplastic PA 6, black, dull

Pull-ring
- Stainless steel 1.4310

Operation

When using locking index plungers, the knob is pulled-out, turned 90° and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

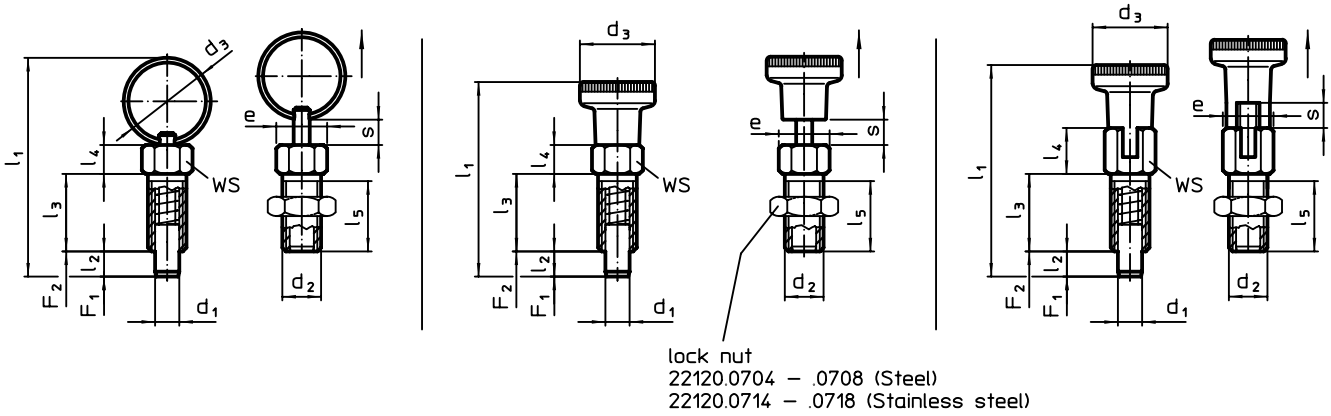
Notes

Lock nuts have to be purchased separately.

Further products

Locating Bushings, for index bolts and index plungers . . . . . → p. 111

DRAWING



picture 1 picture 2 picture 3

ORDER INFORMATION

Dimensions										WS	Tightening torque max.	Spring load[1]						Art. No.	
d_1 h9	d_2	d_3	e	l_1	l_2 min.	l_3	l_4	l_5	s min.			F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]										[mm]	[Nm]	[N]		[°C]		[g]		
with pull-ring, without locking – picture 1																		
3	M 6	14	6,9	34,0	3,5	12	4,5	10,0	3,5	6	2	3	12	–	250	3,2	22120.0723	22120.0773
4	M 6	14	6,9	34,5	4,0	12	4,5	10,0	4,0	6	2	3	12	–	250	3,6	22120.0724	22120.0774
5	M 8	18	9,2	45,0	5,0	16	6,0	13,5	5,0	8	7	5	24	–	250	8,4	22120.0725	22120.0775
6	M10	24	11,5	57,5	6,0	20	7,5	17,0	6,0	10	15	5	21	–	250	17,0	22120.0726	22120.0776
8	M12	30	13,8	71,0	8,0	24	9,0	20,5	8,0	12	20	6	22	–	250	31,0	22120.0728	22120.0778
with knob, without locking – picture 2																		
3	M 6	12	6,9	30,0	3,5	12	4,5	10,0	3,5	6	2	3	12	-30	80	3,6	22120.0743	22120.0783
4	M 6	12	6,9	30,5	4,0	12	4,5	10,0	4,0	6	2	3	12	-30	80	4,0	22120.0744	22120.0784
5	M 8	16	9,2	40,0	5,0	16	6,0	13,5	5,0	8	7	5	24	-30	80	9,2	22120.0745	22120.0785
6	M10	18	11,5	49,0	6,0	20	7,5	17,0	6,0	10	15	5	21	-30	80	18,0	22120.0746	22120.0786
8	M12	21	13,8	59,0	8,0	24	9,0	20,5	8,0	12	20	6	22	-30	80	31,0	22120.0748	22120.0788
with knob and locking – picture 3																		
3	M 6	12	6,9	32,5	3,5	12	7,0	10,0	3,5	6	2	3	12	-30	80	3,8	22120.0763	22120.0793
4	M 6	12	6,9	33,0	4,0	12	7,0	10,0	4,0	6	2	3	12	-30	80	4,2	22120.0764	22120.0794
5	M 8	16	9,2	43,5	5,0	16	9,5	13,5	5,0	8	7	5	24	-30	80	9,8	22120.0765	22120.0795
6	M10	18	11,5	52,0	6,0	20	10,5	17,0	6,0	10	15	5	21	-30	80	18,0	22120.0766	22120.0796
8	M12	21	13,8	63,5	8,0	24	13,5	20,5	8,0	12	20	6	22	-30	80	33,0	22120.0768	22120.0798

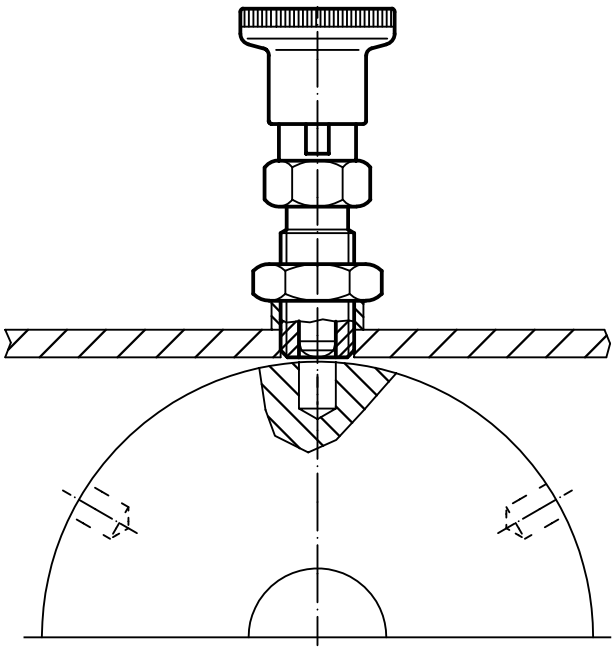
[1] statistical average value

2

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 4035 for the following sizes					
	**M 6**	10	1,3	22120.0704	22120.0714
	M 8	13	2,8	22120.0705	22120.0715
	M10	16	5,3	22120.0706	22120.0716
	M12	18	7,6	22120.0708	22120.0718

APPLICATION EXAMPLE



Index Plungers • for thin-walled pieces

EH 22120.



PRODUCT DESCRIPTION

Index plungers with throughgoing bore for thin-walled pieces.

Material

Body
- Steel, zinc-plated by galvanization

Locking pin
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black, dull

Assembly

By means of a fastening collet, the index plungers can be mounted into pieces having a wall thickness of 1-5 mm.

Operation

When using the self-locking type, the knob is pulled-out, turned 90° and secured by a notched catch. Depending on the clamping length, the bolt may overhang.

MORE INFORMATION

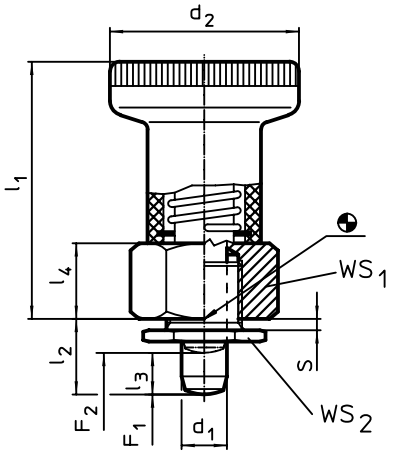
Notes

Knob not removable.

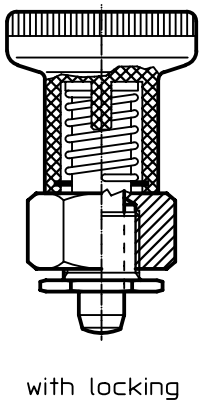
Further products

Locating Bushings, for index bolts and index plungers . . . . . → p. 111

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions								WS_1	WS_2	Spring load[1]					Art. No.
d_1 -0,02 -0,04	l_2	d_2	d_3	l_1	l_3	l_4	s			F_1 ~	F_2 ~	min.	max.		
[mm]								[mm]	[mm]	[N]		[°C]		[g]	
without locking – picture 1															
6	**8,5**	25	10	34	6,0	10	1 – 5	17	14	8,5	22	-30	80	39	22120.0266
	10,5	25	10	34	6,0	10	1 – 5	17	14	8,5	22	-30	80	40	22120.0267
8	**10,0**	31	12	40	7,5	12	1 – 5	19	16	15,5	28	-30	80	63	22120.0268
	12,0	31	12	40	7,5	12	1 – 5	19	16	15,5	28	-30	80	63	22120.0269
with locking – picture 2															
6	**8,5**	25	10	34	6,0	10	1 – 5	17	14	8,5	22	-30	80	39	22120.0286
	10,5	25	10	34	6,0	10	1 – 5	17	14	8,5	22	-30	80	39	22120.0287
8	**10,0**	31	12	40	7,5	12	1 – 5	19	16	15,5	28	-30	80	61	22120.0288
	12,0	31	12	40	7,5	12	1 – 5	19	16	15,5	28	-30	80	62	22120.0289

[1] statistical average value

ACCESSORIES

	[g]	Art. No.
assembly tool		
	27	22120.0299

2

Index Plungers • with pull-ring

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Steel, blackened
- Stainless steel 1.4305

Locking pin
- Stainless steel 1.4305, nickel-plated

Pull-ring
- Stainless steel 1.4310

Assembly

Lock nuts have to be purchased separately.

Operation

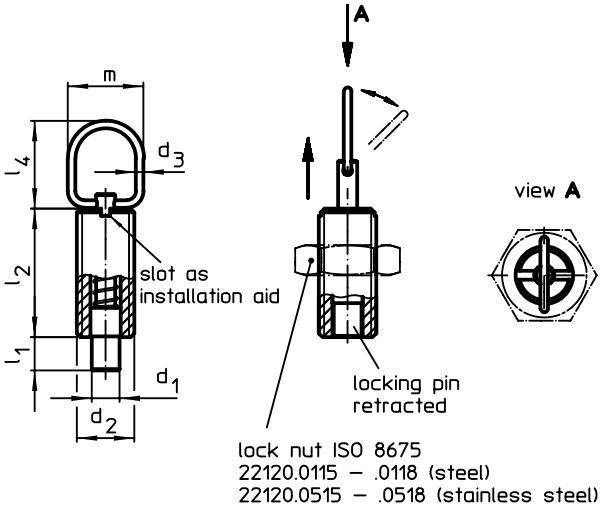
When using the model with locking mechanism, you turn the pull-ring by 90° after retracting the locking pin and secure the ring using the notched catch (if the locking pin should not overhang).

MORE INFORMATION

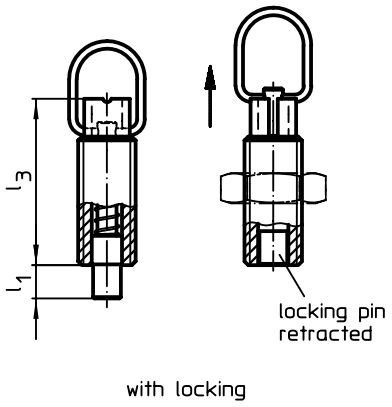
Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122
Mounting Blocks, for index bolts and index plungers . . . . . → p. 134

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions								Stroke s	Spring load[1]				Art. No.	
d_1 -0,05 -0,1	d_2	d_3	l_1 min.	l_2	l_3	l_4	m		F_1 ~	F_2 ~	max.		steel	stainless steel
[mm]								[mm]	[N]		[°C]	[g]		
without locking – picture 1														
5	M10	1,5	5	22	28	23	18	5	5	15	250	11	22120.1310	22120.1410
	M10 x 1	1,5	5	22	28	23	18	5	5	15	250	12	22120.1312	22120.1412
6	M12	2,0	6	24	31	25	22	6	6	21	250	18	22120.1314	22120.1414
	M12 x 1,5	2,0	6	24	31	25	22	6	6	21	250	18	22120.1316	22120.1416
8	M16	2,0	9	34	44	25	22	9	7	27	250	43	22120.1318	22120.1418
	M16 x 1,5	2,0	9	34	44	25	22	9	7	27	250	45	22120.1320	22120.1420
10	M16	2,0	9	34	44	25	22	9	7	27	250	45	22120.1322	22120.1422
	M16 x 1,5	2,0	9	34	44	25	22	9	7	27	250	47	22120.1324	22120.1424

[1] statistical average value →

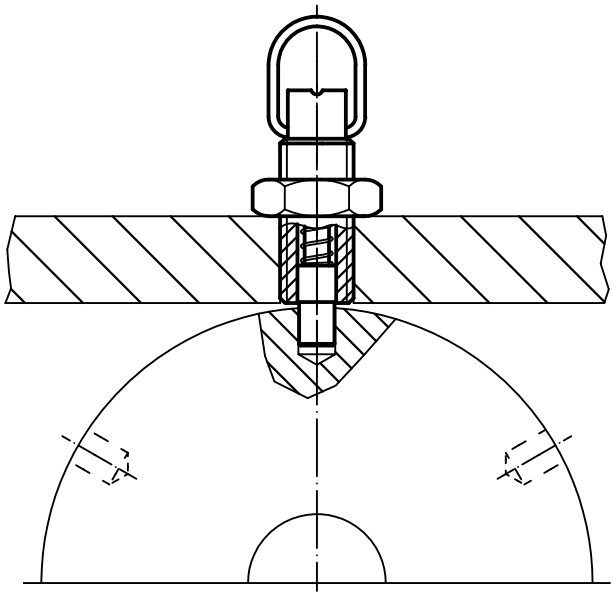
Dimensions								Stroke s	Spring load[1]				Art. No.	
d_1 -0,05 -0,1	d_2	d_3	l_1 min.	l_2	l_3	l_4	m		F_1 ~	F_2 ~	max.		steel	stainless steel
[mm]								[mm]	[N]		[°C]	[g]		
with locking – picture 2														
5	**M10**	1,5	5	22	28	23	18	5	5	15	250	12	22120.1340	22120.1440
	M10 x 1	1,5	5	22	28	23	18	5	5	15	250	13	22120.1342	22120.1442
6	**M12**	2,0	6	24	31	25	22	6	6	21	250	19	22120.1344	22120.1444
	M12 x 1,5	2,0	6	24	31	25	22	6	6	21	250	20	22120.1346	22120.1446
8	**M16**	2,0	9	34	44	25	22	9	7	27	250	48	22120.1348	22120.1448
	M16 x 1,5	2,0	9	34	44	25	22	9	7	27	250	51	22120.1350	22120.1450
10	**M16**	2,0	9	34	44	25	22	9	7	27	250	50	22120.1352	22120.1452
	M16 x 1,5	2,0	9	34	44	25	22	9	7	27	250	53	22120.1354	22120.1454

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 4035 for the following sizes					
	**M10**	16	5,3	22120.0706	22120.0716
	M12	18	7,6	22120.0708	22120.0718
	M16	24	18,0	22120.0710	22120.0720
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M10 x 1**	16	5,2	22120.0115	22120.0515
	M12 x 1,5	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518

APPLICATION EXAMPLE



2

Index Plungers • with release lock

EH 22122.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Steel, blackened
- Stainless steel 1.4305

Press button
- Thermoplastic POM, red

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black-grey, matt

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

Actuate the red press button, and hold it in the pressed position. Only then can the locking pin be drawn in by pulling the knob.

MORE INFORMATION

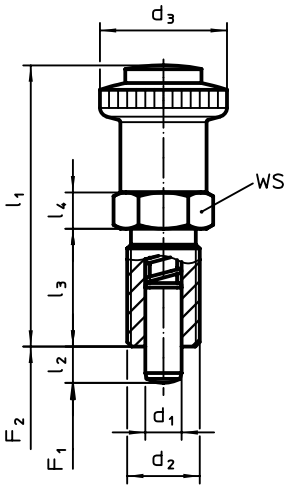
Notes

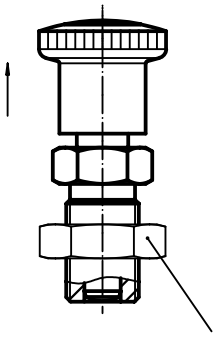
Knob not removable.
Lock nuts have to be purchased separately.

Further products

Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122
Mounting Blocks, for index bolts and index plungers . . . . . → p. 134

DRAWING





lock nut
22120.0116 - .0118 (Steel)
22120.0516 - .0518 (Stainless steel)

ORDER INFORMATION

Dimensions							WS	Spring load[1]					Art. No.	
d_1 -0,02 -0,04	d_2	l_2 min.	d_3	l_1 ~	l_3	l_4		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
6	M12 x 1,5	6	28	56	22	6	19	6,5	19	-30	80	44	22122.0005	22122.0105
		9	28	56	22	6	19	6,0	25	-30	80	45	22122.0010	22122.0110
8	M16 x 1,5	8	28	62	26	8	19	8,5	26	-30	80	70	22122.0015	22122.0115
		12	28	62	26	8	19	8,5	28	-30	80	72	22122.0020	22122.0120
10	M16 x 1,5	12	28	62	26	8	19	9,5	38	-30	80	74	22122.0025	22122.0125

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	M12 x 1,5	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518

Index Plungers • with rapid locking head

EH 22122.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Body
- Steel, blackened
- Stainless steel 1.4305

Press button
- Thermoplastic POM, red

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Knob
- Thermoplastic PA 6, black-grey, matt

Assembly

The screw length can be adapted by distance collars for index plungers (EH 22120.).

Operation

The locking pin is drawn in and locked by pulling the knob. The projecting red press button indicates the locking position (locking pin drawn in). Pushing the red press button causes the locking pin to jump back into the locking position.

MORE INFORMATION

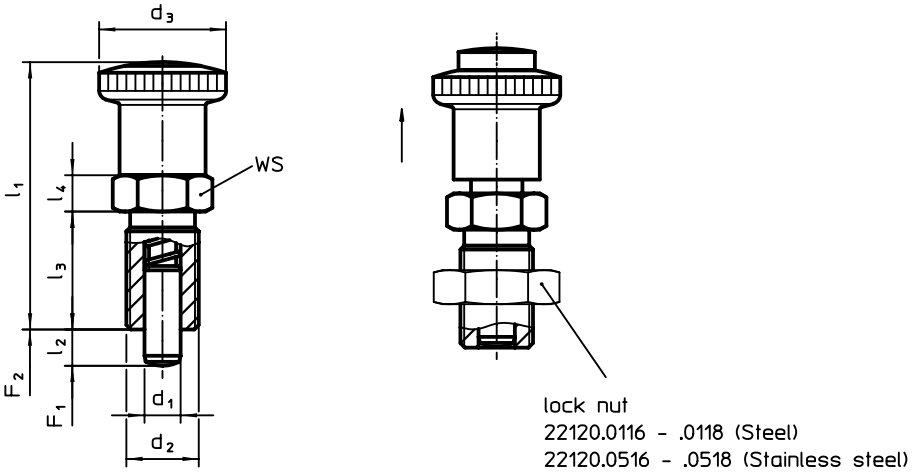
Notes

Knob not removable.
Lock nuts have to be purchased separately.

Further products

Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Distance Collars, for index plungers . . → p. 122
Mounting Blocks, for index bolts and index plungers . . . . . → p. 134

DRAWING



ORDER INFORMATION

Dimensions							WS	Spring load[1]					Art. No.	
d_1 -0,02 -0,04	d_2	l_2 min.	d_3	l_1 ~	l_3	l_4		F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
6	M12 x 1,5	6	30	53,5	22	6	19	6,5	19	-30	80	47	22122.0205	22122.0305
		9	30	53,5	22	6	19	6,0	25	-30	80	48	22122.0210	22122.0310
8	M16 x 1,5	8	30	59,5	26	8	19	8,5	26	-30	80	74	22122.0215	22122.0315
		12	30	59,5	26	8	19	8,5	28	-30	80	77	22122.0220	22122.0320
10	M16 x 1,5	12	30	59,5	26	8	19	9,5	38	-30	80	78	22122.0225	22122.0325

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	M12 x 1,5	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518

2

Index Bolts

EH 22120.



PRODUCT DESCRIPTION

Index bolts are used for indexing purposes.
Plastic cover for grip allows better handling.

Material

Body
- Free cutting steel, blackened
- Stainless steel 1.4305

Locking pin
- Steel, hardened
- Stainless steel 1.4305, nickel-plated

Catch
- Free cutting steel, blackened
- Dry powdered metal 1.4404

Plastic cap
- Thermoplastic, black, dull

Operation

By turning the index bolt 180° the locking pin will be pulled-in and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

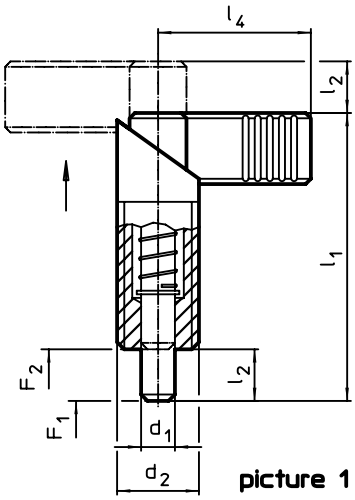
Notes

Lock nuts have to be purchased separately.

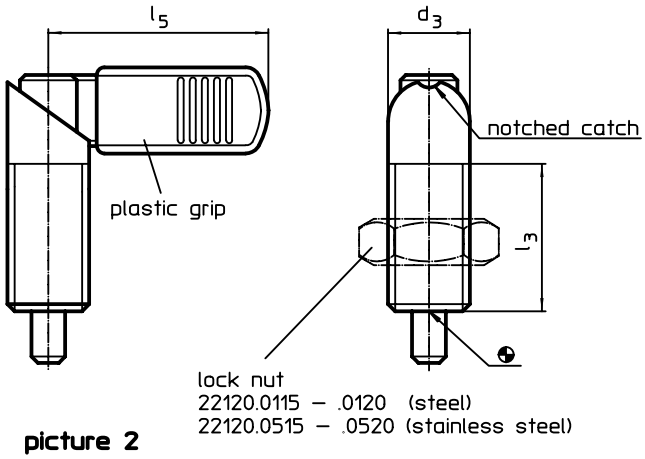
Further products

Mounting Blocks, for index bolts and index plungers, die-cast. . . . . → p. 109
Locating Bushings, for index bolts and index plungers . . . . . → p. 111
Mounting Blocks, for index bolts and index plungers . . . . . → p. 134

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions								Spring load[1]					Art. No.	
d_1 -0,02 -0,04	d_2	d_3	l_1	l_2	l_3	l_4	l_5	F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]								[N]		[°C]		[g]		
without plastic cover for grip – picture 1														
4	**M10 x 1**	10	37,5	6	19	21	–	7,0	20,0	–	250	17	22120.0302	22120.0308
5	**M10 x 1**	10	37,5	6	19	21	–	7,0	20,0	–	250	18	22120.0304	22120.0310
6	**M10 x 1**	10	37,5	6	19	21	–	7,0	20,0	–	250	18	22120.0306	22120.0312
5	**M12 x 1,5**	12	47,0	8	26	26	–	8,5	19,5	–	250	29	22120.0313	22120.0323
6	**M12 x 1,5**	12	47,0	8	26	26	–	8,5	19,5	–	250	29	22120.0314	22120.0324
	M16 x 1,5	16	56,0	10	30	32	–	11,5	30,5	–	250	59	22120.0316	22120.0326
8	**M12 x 1,5**	12	47,0	8	26	26	–	8,5	19,5	–	250	30	22120.0315	22120.0325
	M16 x 1,5	16	56,0	10	30	32	–	11,5	30,5	–	250	61	22120.0317	22120.0327
	M20 x 1,5	20	69,0	12	36	37	–	21,0	57,5	–	250	121	22120.0318	22120.0328
10	**M16 x 1,5**	16	56,0	10	30	32	–	11,5	30,5	–	250	64	22120.0319	22120.0329
	M20 x 1,5	20	69,0	12	36	37	–	21,0	57,5	–	250	123	22120.0320	22120.0330
12	**M20 x 1,5**	20	69,0	12	36	37	–	21,0	57,5	–	250	127	22120.0322	22120.0332

[1] statistical average value →

Dimensions								Spring load[1]					Art. No.	
d_1 -0,02 -0,04	d_2	d_3	l_1	l_2	l_3	l_4	l_5	F_1 ~	F_2 ~	min.	max.		steel	stainless steel
[mm]								[N]		[°C]		[g]		
with plastic cover for grip – picture 2														
5	**M12 x 1,5**	12	47,0	8	26	–	32	8,5	19,5	-30	80	30	22120.0353	22120.0363
6	**M12 x 1,5**	12	47,0	8	26	–	32	8,5	19,5	-30	80	30	22120.0354	22120.0364
	M16 x 1,5	16	56,0	10	30	–	42	11,5	30,5	-30	80	61	22120.0356	22120.0366
8	**M12 x 1,5**	12	47,0	8	26	–	32	8,5	19,5	-30	80	32	22120.0355	22120.0365
	M16 x 1,5	16	56,0	10	30	–	42	11,5	30,5	-30	80	63	22120.0357	22120.0367
	M20 x 1,5	20	69,0	12	36	–	52	21,0	57,5	-30	80	124	22120.0358	22120.0368
10	**M16 x 1,5**	16	56,0	10	30	–	42	11,5	30,5	-30	80	66	22120.0359	22120.0369
	M20 x 1,5	20	69,0	12	36	–	52	21,0	57,5	-30	80	128	22120.0360	22120.0370
12	**M20 x 1,5**	20	69,0	12	36	–	52	21,0	57,5	-30	80	131	22120.0362	22120.0372

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel	Art. No. stainless steel
lock nuts ISO 8675 (DIN 439) for the following sizes					
	**M10 x 1**	16	5,2	22120.0115	22120.0515
	M12 x 1,5	18	7,4	22120.0116	22120.0516
	M16 x 1,5	24	18,0	22120.0118	22120.0518
	M20 x 1,5	30	32,0	22120.0120	22120.0520

2

Mounting Blocks • for index bolts and index plungers

EH 22120.



PRODUCT DESCRIPTION

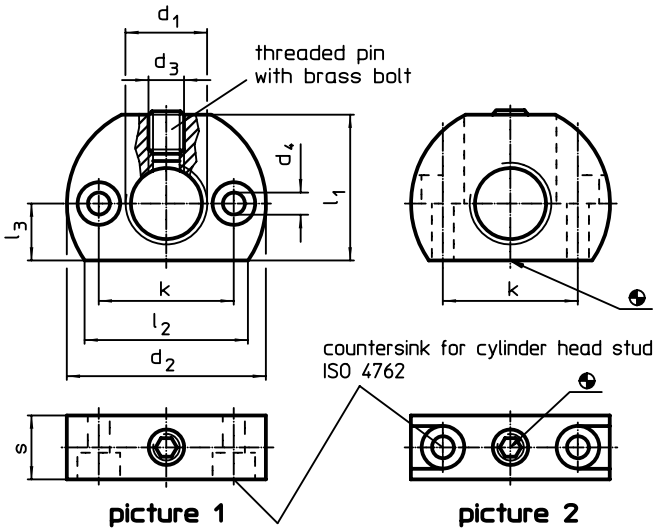
Assembly support and extended applications for index bolts.
Also usable for index plungers size 6, 8 and 10.

Material

Threaded pin
- Steel, blackened, with brass pad
- Stainless steel, with brass pad

Body
- Steel, blackened
- Stainless steel 1.4305

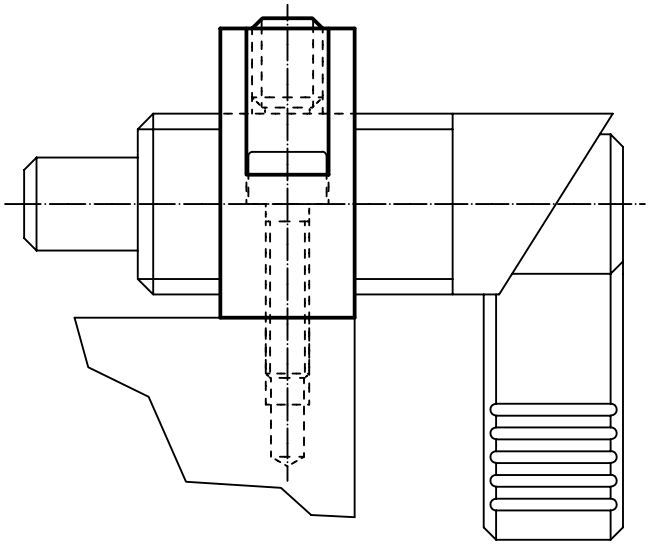
DRAWING



ORDER INFORMATION

Dimensions											Art. No.	
d_1	d_2	d_3	d_4	k ±0,1	l_1	l_2 ~	l_3	s	max. [°C]	[g]	steel	stainless steel
				[mm]								
mounting hole parallel to index bolt and index plunger – picture 1												
M12 x 1,5	32	M5	4,5	21	22	26,5	9	12	250	43	22120.0345	22120.0545
M16 x 1,5	46	M8	5,5	32	33	38,0	13	15	250	122	22120.0346	22120.0546
M20 x 1,5	46	M8	5,5	32	33	38,0	13	15	250	109	22120.0350	22120.0550
mounting hole vertical to index bolt and index plunger – picture 2												
M12 x 1,5	32	M5	4,5	21	22	26,5	9	12	250	37	22120.0347	22120.0547
M16 x 1,5	46	M8	5,5	32	33	38,0	13	15	250	106	22120.0348	22120.0548
M20 x 1,5	46	M8	5,5	32	33	38,0	13	15	250	94	22120.0352	22120.0552

APPLICATION EXAMPLE



Index Bolts • with mounting flange

EH 22120.



PRODUCT DESCRIPTION

Index bolts are used for indexing purposes.
Plastic cover for grip allows better handling.

Material

Body
- Steel, blackened

Locking pin
- Steel, nitrided, black

Plastic cap
- Thermoplastic, black, dull

Assembly

Right and left mounting is possible due to countersinks on both sides.

Index bolt for lateral fastening.

Operation

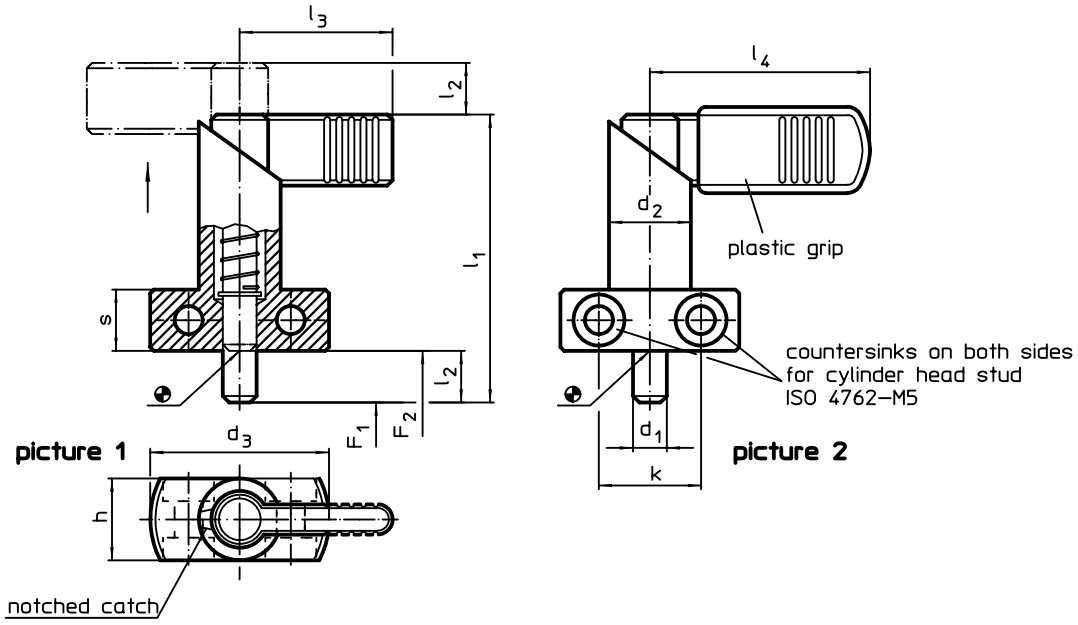
By turning the index bolt 180° the locking pin will be pulled-in and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

Further products

Locating Bushings, for index bolts and index plungers . . . . . → p. 111

DRAWING



ORDER INFORMATION

Dimensions										Spring load[1]					Art. No.
d_1 0 -0,05	l_2	d_2	d_3	h	k	l_1	l_3	l_4	s	F_1 ~	F_2 ~	min.	max.		
[mm]										[N]		[°C]		[g]	
without plastic cover for grip – picture 1															
6	**10**	16	35	16	20	56	32	–	12	12	32	–	250	82	22120.0376
8	**10**	16	35	16	20	56	32	–	12	12	32	–	250	85	22120.0378
	12	20	40	20	22	69	37	–	15	21	58	–	250	163	22120.0379
10	**10**	16	35	16	20	56	32	–	12	12	32	–	250	85	22120.0381
	12	20	40	20	22	69	37	–	15	21	58	–	250	167	22120.0382
12	**12**	20	40	20	22	69	37	–	15	21	58	–	250	168	22120.0384
with plastic cover for grip – picture 2															
6	**10**	16	35	16	20	56	–	42	12	12	32	-30	80	83	22120.0386
8	**10**	16	35	16	20	56	–	42	12	12	32	-30	80	85	22120.0388
	12	20	40	20	22	69	–	52	15	21	58	-30	80	169	22120.0389
10	**10**	16	35	16	20	56	–	42	12	12	32	-30	80	86	22120.0391
	12	20	40	20	22	69	–	52	15	21	58	-30	80	171	22120.0392
12	**12**	20	40	20	22	69	–	52	15	21	58	-30	80	171	22120.0394

[1] statistical average value

2

Index Bolts • with mounting flange, horizontal

EH 22120.



PRODUCT DESCRIPTION

Index bolts are used for indexing purposes.

Material

Housing
- Zinc die-cast, plastic coated, black

Locking pin
- Steel, zinc-plated by galvanization

Catch
- Plastic

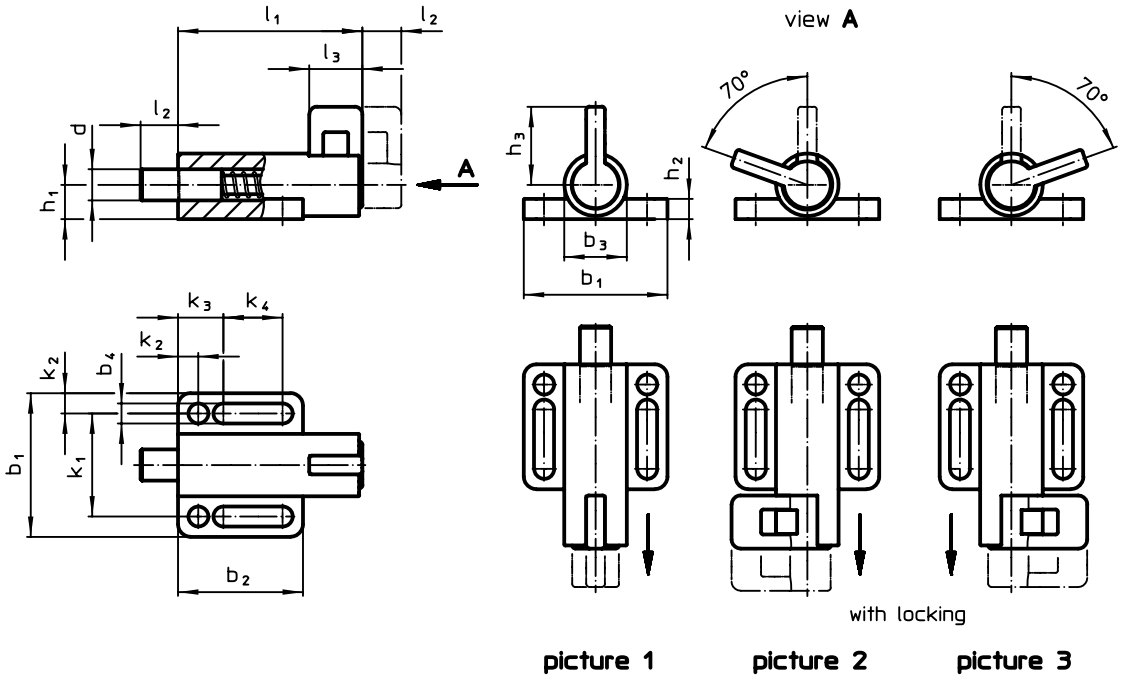
Assembly

Assembly by means of washers ISO 7092.

Operation

When using the model with locking mechanism, you pull out the bolt, turn it by 70° and secure it using the notched catch (if the locking pin should not overhang).

DRAWING



ORDER INFORMATION

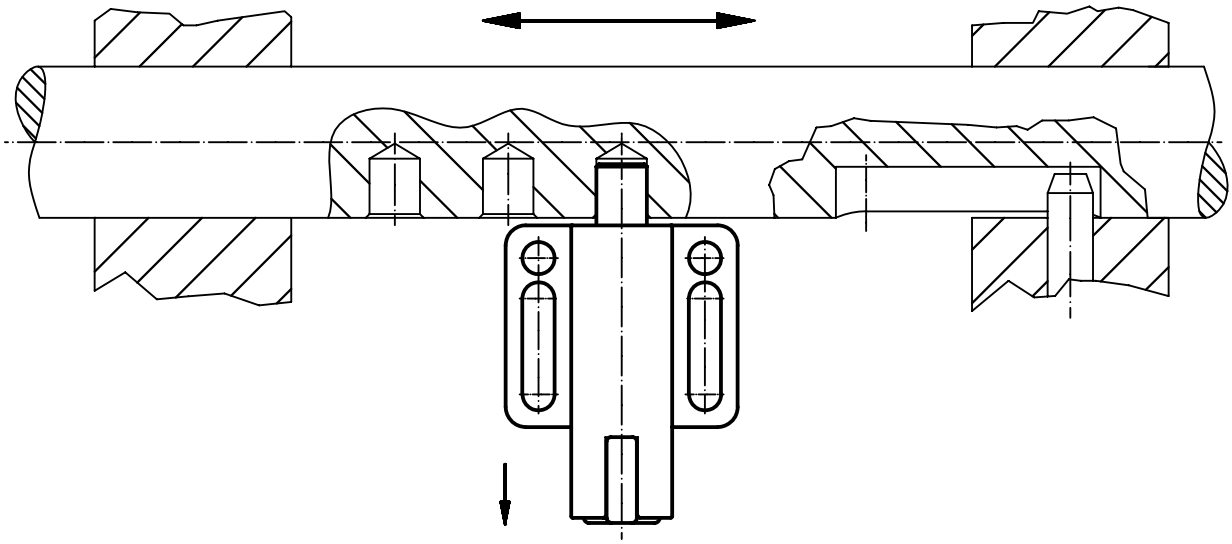
Dimensions															Spring load[1]					Art. No.
d -0,05	l_2 min.	b_1	b_2	b_3	b_4	h_1	h_2	h_3	k_1	k_2	k_3	k_4	l_1	l_3	F_1 ~	F_2 ~	min.	max.		
[mm]															[N]		[°C]		[g]	
without locking – picture 1																				
6	**10**	38	32	16	5,4	8,5	6	23	27	5,5	12,0	14,5	57	14	21	27	-30	80	68	22120.1016
8	**10**	38	32	16	5,4	8,5	6	23	27	5,5	12,0	14,5	57	14	21	27	-30	80	69	22120.1020
	12	46	40	20	6,4	11,0	6	29	33	6,5	14,5	19,0	71	17	25	38	-30	80	131	22120.1024
10	**10**	38	32	16	5,4	8,5	6	23	27	5,5	12,0	14,5	57	14	21	27	-30	80	72	22120.1028
	12	46	40	20	6,4	11,0	6	29	33	6,5	14,5	19,0	71	17	25	38	-30	80	133	22120.1032
12	**12**	46	40	20	6,4	11,0	6	29	33	6,5	14,5	19,0	71	17	25	38	-30	80	137	22120.1036

[1] statistical average value

Dimensions															Spring load[1]					Art. No.
d -0,05	l_2 min.	b_1	b_2	b_3	b_4	h_1	h_2	h_3	k_1	k_2	k_3	k_4	l_1	l_3	F_1 ~	F_2 ~	min.	max.		
[mm]															[N]		[°C]		[g]	
with locking, left – picture 2																				
6	**10**	38	32	16	5,4	8,5	6	23	27	5,5	12,0	14,5	57	14	21	27	-30	80	67	22120.1116
8	**10**	38	32	16	5,4	8,5	6	23	27	5,5	12,0	14,5	57	14	21	27	-30	80	69	22120.1120
	12	46	40	20	6,4	11,0	6	29	33	6,5	14,5	19,0	71	17	25	38	-30	80	130	22120.1124
10	**10**	38	32	16	5,4	8,5	6	23	27	5,5	12,0	14,5	57	14	21	27	-30	80	71	22120.1128
	12	46	40	20	6,4	11,0	6	29	33	6,5	14,5	19,0	71	17	25	38	-30	80	133	22120.1132
12	**12**	46	40	20	6,4	11,0	6	29	33	6,5	14,5	19,0	71	17	25	38	-30	80	136	22120.1136
with locking, right – picture 3																				
6	**10**	38	32	16	5,4	8,5	6	23	27	5,5	12,0	14,5	57	14	21	27	-30	80	67	22120.1216
8	**10**	38	32	16	5,4	8,5	6	23	27	5,5	12,0	14,5	57	14	21	27	-30	80	69	22120.1220
	12	46	40	20	6,4	11,0	6	29	33	6,5	14,5	19,0	71	17	25	38	-30	80	130	22120.1224
10	**10**	38	32	16	5,4	8,5	6	23	27	5,5	12,0	14,5	57	14	21	27	-30	80	71	22120.1228
	12	46	40	20	6,4	11,0	6	29	33	6,5	14,5	19,0	71	17	25	38	-30	80	132	22120.1232
12	**12**	46	40	20	6,4	11,0	6	29	33	6,5	14,5	19,0	71	17	25	38	-30	80	136	22120.1236

[1] statistical average value

APPLICATION EXAMPLE



2

Index Bolts • simple finish

EH 22121.



PRODUCT DESCRIPTION

Index bolts are used for indexing purposes.
Application limited for cases in which no precise positioning is needed. The high stroke of the pin enables for a variety of applications, e.g. as door bolt.
Simple version in compact design.

Material

Body
- Free cutting steel, zinc-plated by galvanization

Locking pin
- Steel, zinc-plated by galvanization

Lock nut
- Steel, zinc-plated by galvanization

Operation

By lifting the index bolt the locking pin will be pulled in. The turning of the index bolt positions the pin when it is pulled in.

MORE INFORMATION

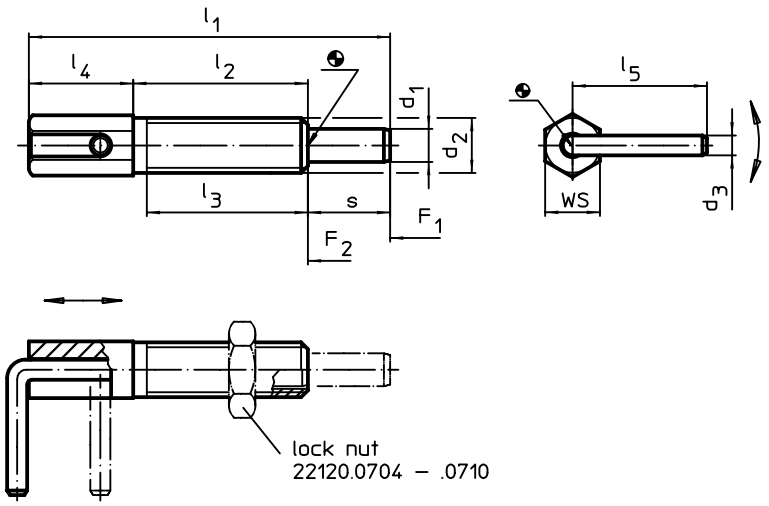
Notes

Lock nuts have to be purchased separately.

Further products

Locating Bushings, for index bolts and index plungers . . . . . → p. 111

DRAWING



ORDER INFORMATION

Dimensions									WS	Spring load[1]		Tightening torque max.	max.		Art. No.
d_1	d_2	d_3	l_1	l_2	l_3	l_4	l_5	s		F_1 ~	F_2 ~				
[mm]									[mm]	[N]		[Nm]	[°C]	[g]	
4	M 6	2,3	41,5	20,0	17,0	12,0	15,5	9,5	6	3,0	10,0	1,6	250	6	22121.0105
5	M 8	3,0	54,0	27,0	24,0	15,0	19,2	12,0	8	3,5	13,5	4,5	250	14	22121.0110
6	M10	3,5	65,0	33,5	30,0	17,5	22,9	14,0	10	4,0	16,0	10,0	250	26	22121.0115
8	M12	4,7	73,0	31,8	28,0	22,2	31,2	19,0	12	4,0	22,0	13,0	250	55	22121.0120
10	M16	4,7	102,5	50,5	44,5	27,0	32,7	25,0	16	4,0	23,0	42,0	250	103	22121.0125

[1] statistical average value

ACCESSORIES

	Dimensions d_2 [mm]	Wrench size [mm]	[g]	Art. No. steel
lock nuts ISO 4035 for the following sizes				
	**M 6**	10	1,3	22120.0704
	M 8	13	2,8	22120.0705
	M10	16	5,3	22120.0706
	M12	18	7,6	22120.0708
	M16	24	18,0	22120.0710

Precision Index Plungers • with cylindrical pin

EH 22130.



PRODUCT DESCRIPTION

Precision index plungers together with bushings are a perfect combination for quick positioning and mounting.
The precise tolerance of both, the precision index plunger and the bushing, guarantees a high repeatability of these two elements.

Material

Pin
- Case-hardened steel, case-hardened, blackened and ground

Bushing
- Case-hardened steel, case-hardened, blackened and ground

Body
- Case-hardened steel, case-hardened, blackened and ground

Ball knob
- Thermoplastic, greyish black

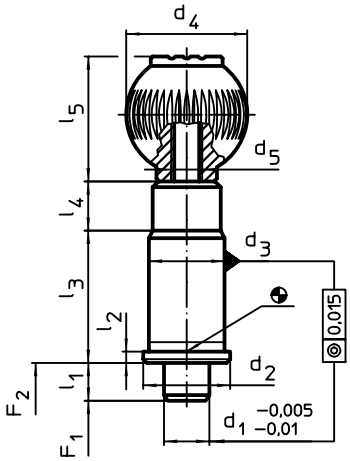
Assembly

To achieve precise setting, ball grip and index plunger have to be glued after assembly.

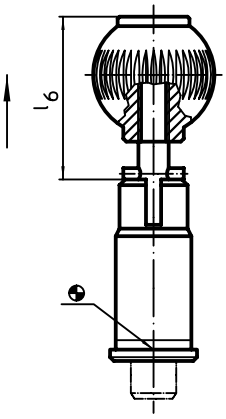
Operation

When using locking index plungers the knob is pulled out and turned 90°.

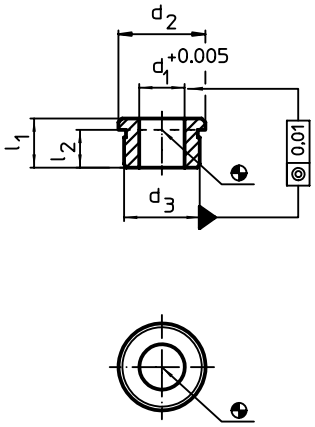
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

Dimensions											Spring load[1]			Art. No.
d_1 -0,005 -0,01	d_2	d_3 n6	d_4	d_5	l_1 min.	l_2	l_3	l_4	l_5	l_6	F_1 ~	F_2 ~		
[mm]											[N]		[g]	
without locking – picture 1														
10	19	16	25	M 6	10	2,5	31	13	25,0	–	15	30	79	22130.0010
12	23	20	32	M 8	10	3,0	35	13	33,0	–	15	35	138	22130.0012
16	28	25	40	M10	10	3,0	42	13	41,5	–	20	50	226	22130.0016
20	33	30	40	M10	10	3,0	50	13	41,5	–	36	63	350	22130.0020
25	42	38	50	M10	10	3,0	60	13	51,0	–	20	73	649	22130.0025
with locking – picture 2														
10	19	16	25	M 6	10	2,5	31	13	25,0	36,5	15	30	79	22130.0060
12	23	20	32	M 8	10	3,0	35	13	33,0	44,5	15	35	136	22130.0062
16	28	25	40	M10	10	3,0	42	13	41,5	53,0	20	50	228	22130.0066
20	33	30	40	M10	10	3,0	50	13	41,5	53,0	36	63	350	22130.0070
25	42	38	50	M10	10	3,0	60	13	51,0	62,5	20	73	650	22130.0075

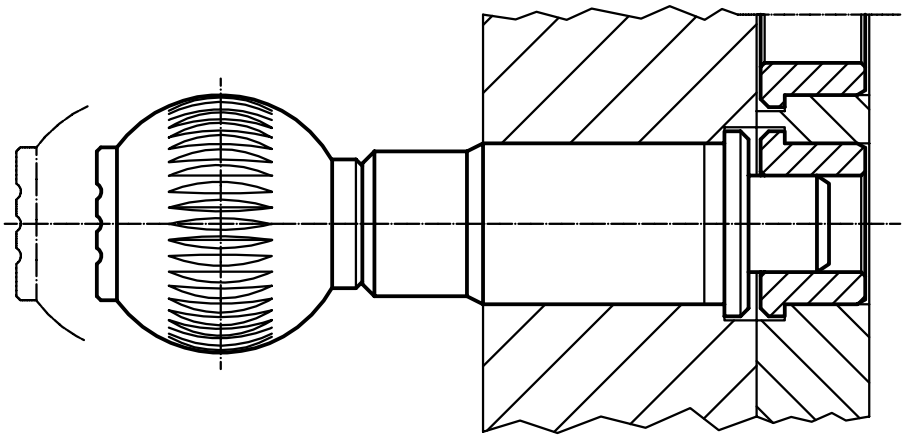
[1] statistical average value

2

ACCESSORIES

	Dimensions						Art. No.
	d_1 +0,005	d_2	d_3 n6	l_1 min.	l_2		
	[mm]					[g]	
cylindrical bushing – picture 3							
	**10**	19	16	11	8,5	11	22130.0090
	12	23	20	13	10,0	22	22130.0092
	16	28	25	17	14,0	40	22130.0093
	20	33	30	16	13,0	51	22130.0094
	25	42	38	19	16,0	99	22130.0096

APPLICATION EXAMPLE



Precision Index Plungers • with tapered pin

EH 22130.



PRODUCT DESCRIPTION

Precision index plungers together with bushings are a perfect combination for quick positioning and mounting.
The precise tolerance of both, the precision index plunger and the bushing, guarantees a high repeatability of these two elements.

Material

Pin
- Case-hardened steel, case-hardened, blackened and ground

Bushing
- Case-hardened steel, case-hardened, blackened and ground

Body
- Case-hardened steel, case-hardened, blackened and ground

Ball knob
- Thermoplastic, greyish black

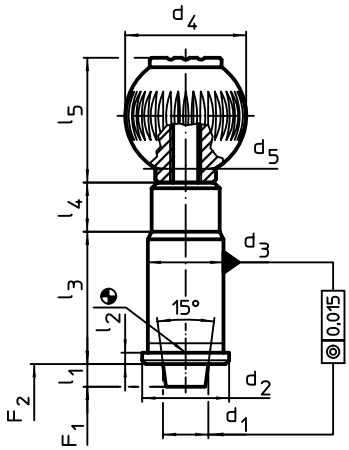
Assembly

To achieve precise setting, ball grip and index plunger have to be glued after assembly.

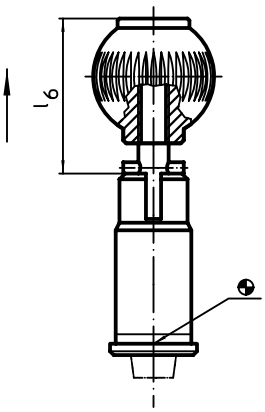
Operation

When using locking index plungers the knob is pulled out and turned 90°.

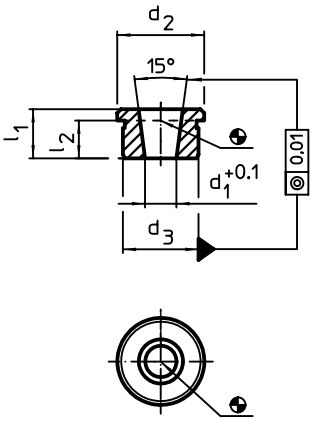
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

Nominal diameter	Dimensions											Spring load[1]			Art. No.
	d_1	d_2	d_3 n6	d_4	d_5	l_1 min.	l_2	l_3	l_4	l_5	l_6	F_1 ~	F_2 ~		
[mm]	[mm]											[N]		[g]	
without locking – picture 1															
10	10	19	16	25	M 6	6	2,5	31	13	25,0	–	19	29	78	22130.0110
12	12	23	20	32	M 8	6	3,0	35	13	33,0	–	22	35	135	22130.0112
16	16	28	25	40	M10	6	3,0	42	13	41,5	–	30	50	227	22130.0116
20	20	33	30	40	M10	6	3,0	50	13	41,5	–	46	63	348	22130.0120
25	25	42	38	50	M10	6	3,0	60	13	51,0	–	39	73	654	22130.0125
with locking – picture 2															
10	10	19	16	25	M 6	6	2,5	31	13	25,0	32,5	19	29	78	22130.0160
12	12	23	20	32	M 8	6	3,0	35	13	33,0	40,5	22	35	135	22130.0162
16	16	28	25	40	M10	6	3,0	42	13	41,5	49,0	30	50	228	22130.0166
20	20	33	30	40	M10	6	3,0	50	13	41,5	49,0	46	63	348	22130.0170
25	25	42	38	50	M10	6	3,0	60	13	51,0	58,5	39	73	651	22130.0175

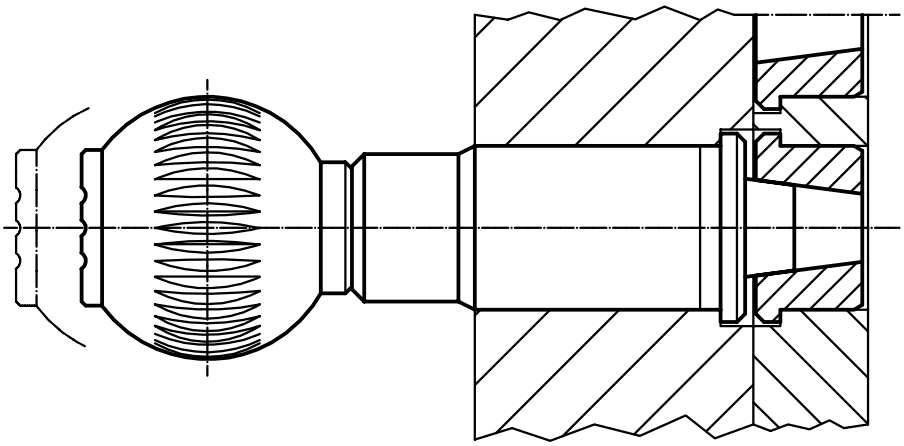
[1] statistical average value

2

ACCESSORIES

	Nominal diameter	Dimensions						Art. No.
		d_1 +0,1	d_2	d_3 n6	l_1 min.	l_2		
	[mm]	[mm]					[g]	
tapered bushing – picture 3								
	**10**	**7,10**	19	16	11	8,5	13	22130.0190
	12	**8,28**	23	20	13	10,0	25	22130.0192
	16	**11,52**	28	25	17	14,0	47	22130.0193
	20	**15,49**	33	30	16	13,0	60	22130.0194
	25	**19,70**	42	38	19	16,0	114	22130.0196

APPLICATION EXAMPLE



2

LATERAL PLUNGERS

METRIC MODELS

Our lateral plungers are the perfect choice for all applications that require you to position and press on workpieces. The models we offer also include screw-in and press-in options as well as versions that are sealed against chips and dirt.



2

Lateral Spring Plungers

EH 22140.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting.

Material

Ball
- Stainless steel, hardened
- Thermoplastic POM, white
- Ball-bearing steel, hardened

Body
- Free cutting steel, blackened

Spring
- Stainless steel
- Plastic (PU)

Assembly

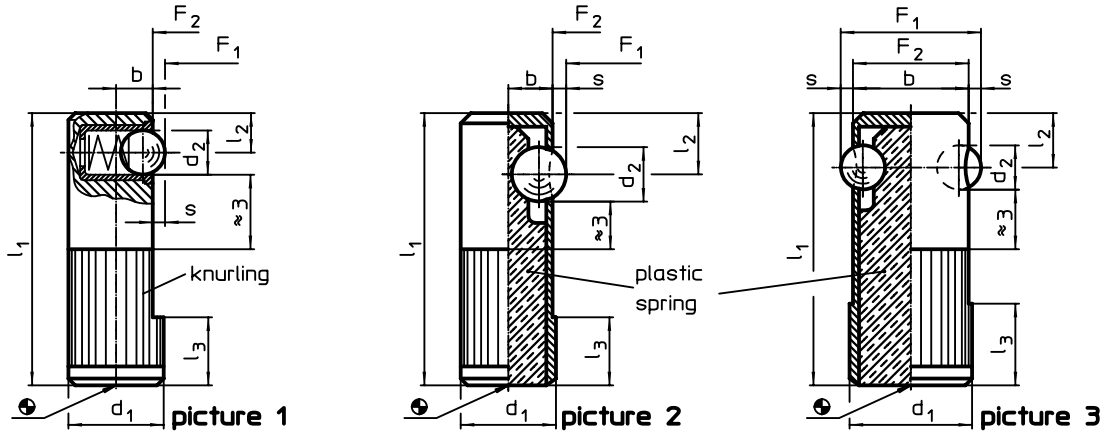
Insertion bore l_3 to be considered.

MORE INFORMATION

Notes

Special types on request.

DRAWING

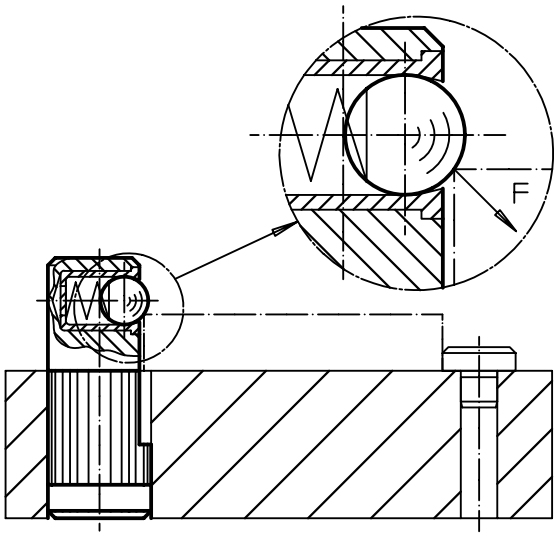


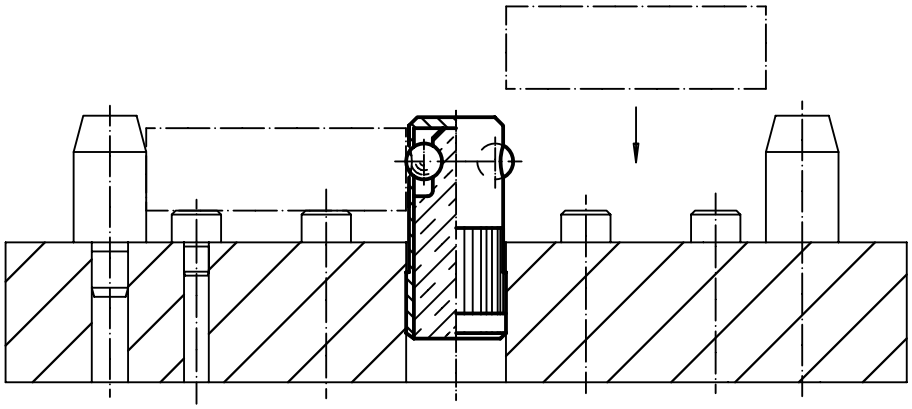
ORDER INFORMATION

Dimensions d_1 +0,1	d_2	l_1	l_2	l_3	b	Location hole H8	Stroke s	Spring load[1] F_1 ~	F_2 ~	min.	max.		Art. No.
[mm]						[mm]	[mm]	[N]		[°C]		[g]	
ball from stainless steel, standard spring load, one-sided – picture 1													
8	3,0	25	3,6	6	3,2	8	0,8	2,5	6,5	-30	50	9	22140.0008
10	4,0	30	4,2	7	4,0	10	1,0	4,5	9,0	-30	50	17	22140.0010
12	5,0	35	4,8	9	5,0	12	1,6	6,5	13,0	-30	50	29	22140.0012
14	6,5	40	5,8	10	5,4	14	1,9	8,0	18,0	-30	50	43	22140.0014
ball from thermoplastic, standard spring load, one-sided – picture 1													
8	3,0	25	3,6	6	3,2	8	0,8	2,5	6,5	-30	50	9	22140.0108
10	4,0	30	4,2	7	4,0	10	1,0	4,5	9,0	-30	50	17	22140.0110
12	5,0	35	4,8	9	5,0	12	1,6	6,5	13,0	-30	50	28	22140.0112
14	6,5	40	5,8	10	5,4	14	1,9	8,0	18,0	-30	50	42	22140.0114
ball from ball-bearing steel, heavy spring load, one-sided – picture 2													
10	5,5	30	7,0	8	4,5	10	1,0	60,0	170,0	-40	80	9	22140.0410
12	6,5	35	8,0	9	5,5	12	1,5	80,0	260,0	-40	80	14	22140.0412
14	8,0	40	9,0	10	6,5	14	2,0	120,0	480,0	-40	80	20	22140.0414
ball from ball-bearing steel, heavy spring load, on both sides – picture 3													
16	5,5	35	7,0	11	15,0	16	1,5	110,0	220,0	-40	80	21	22140.0616
18	6,5	40	8,0	12	17,0	18	1,8	120,0	330,0	-40	80	29	22140.0618
22	8,0	45	9,0	15	21,0	22	2,5	130,0	540,0	-40	80	45	22140.0622

[1] statistical average value

APPLICATION EXAMPLE





2

Lateral Plungers • smooth, without seal

EH 22150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting.

Material

Body
- Aluminium Al

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Pin
- Steel, case-hardened, zinc-plated by galvanization
- Thermoplastic POM, white

Assembly

Installation by pressing in.
Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = coordinate dimension,
s = stroke,
z = stop diameter
Calculation dimension x:
y greater than or equal to l_2 - d_2/2, then
x = d_2/2 - s
or
y smaller than l_2 - d_2/2, then
x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0,123]

Characteristic

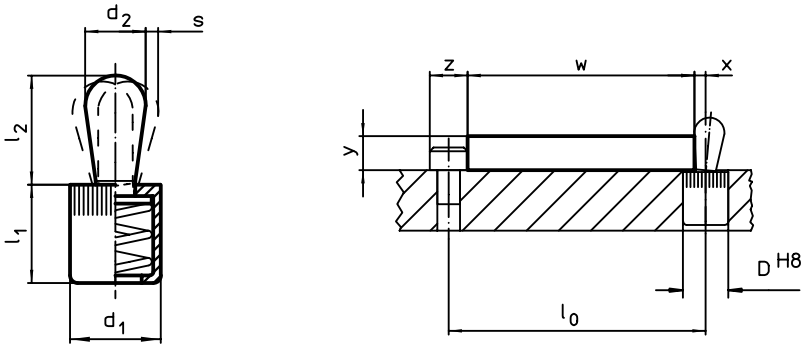
Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth . . . . . → p. 154

DRAWING



ORDER INFORMATION

Dimensions d_1 [mm]	Dimensions d_2 [mm]	Spring load F max.[1) ~ [N]	Dimensions l_1 -2 [mm]	Dimensions l_2 [mm]	Stroke s [mm]	Location hole D H8 [mm]	max. [°C]	[g]	Art. No.
pin: steel/light spring load									
6	**3**	**10**	7	4,0	1,0	6	250	0,60	**22150.0010**
10	**5**	**20**	11	6,7	1,6	10	250	2,60	**22150.0020**
	6	**40**	11	10,7	2,0	10	250	3,40	**22150.0025**
12	**8**	**50**	13	13,6	2,6	12	250	6,80	**22150.0030**
16	**10**	**100**	17	16,7	3,2	16	250	14,00	**22150.0040**
pin: steel/standard spring load									
6	**3**	**20**	7	4,0	1,0	6	250	0,63	**22150.0011**
10	**5**	**50**	11	6,7	1,6	10	250	2,80	**22150.0021**
	6	**75**	11	10,7	2,0	10	250	3,60	**22150.0026**
12	**8**	**100**	13	13,6	2,6	12	250	7,30	**22150.0031**
16	**10**	**150**	17	16,7	3,2	16	250	15,00	**22150.0041**
pin: steel/heavy spring load									
6	**3**	**40**	7	4,0	1,0	6	250	0,66	**22150.0012**
10	**5**	**100**	11	6,7	1,6	10	250	3,00	**22150.0022**
	6	**100**	11	10,7	2,0	10	250	3,90	**22150.0027**
12	**8**	**150**	13	13,6	2,6	12	250	7,80	**22150.0032**
16	**10**	**200**	17	16,7	3,2	16	250	15,00	**22150.0042**

[1) statistical average value

→

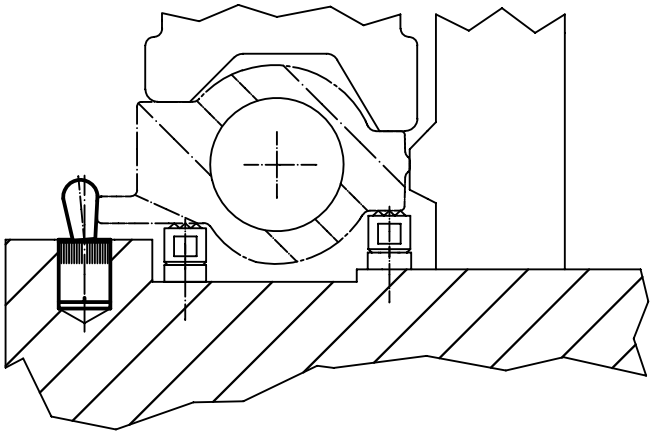
Dimensions d_1 [mm]	Dimensions d_2 [mm]	Spring load F max.[1) ~ [N]	Dimensions l_1 -2 [mm]	Dimensions l_2 [mm]	Stroke s [mm]	Location hole D H8 [mm]	max. [°C]	[g]	Art. No.
pin: thermoplastic/light spring load									
6	**3**	**10**	7	4,0	1,0	6	80	0,34	**22150.0050**
10	**5**	**20**	11	6,7	1,6	10	80	1,30	**22150.0060**
	6	**40**	11	10,7	2,0	10	80	1,54	**22150.0062**
12	**8**	**50**	13	13,9	2,6	12	80	2,90	**22150.0070**
16	**10**	**100**	17	16,7	3,2	16	80	6,60	**22150.0080**

[1) statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool			
	**6**	19	**22150.0830**
	10	49	**22150.0831**
	12	65	**22150.0832**
	16	105	**22150.0833**

APPLICATION EXAMPLE



Lateral Plungers • smooth, with seal

EH 22150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting. Sealed against chips and dirt.

Material

Seal
- CR

Body
- Aluminium Al

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Pin
- Steel, case-hardened, zinc-plated by galvanization
- Thermoplastic POM, white

Assembly

Installation by pressing in.
Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = coordinate dimension,
s = stroke,
z = stop diameter
Calculation dimension x:
y greater than or equal to l_2 - d_2/2, then
x = d_2/2 - s
or
y smaller than l_2 - d_2/2, then
x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0,123]

Characteristic

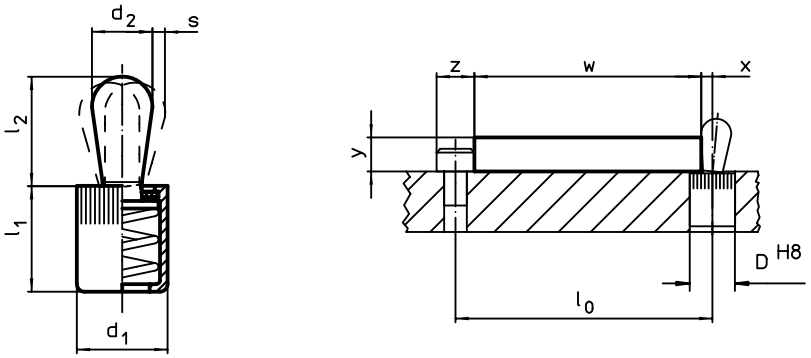
Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth . . . . . → p. 154

DRAWING



ORDER INFORMATION

Dimensions d_1 [mm]	Dimensions d_2 [mm]	Spring load F max.[1] ~ [N]	Dimensions l_1 -2 [mm]	Dimensions l_2 [mm]	Stroke s [mm]	Location hole D H8 [mm]	max. [°C]	[g]	Art. No.
pin: steel/light spring load									
6	**3**	**10**	7	3,7	1,0	6	110	0,60	**22150.0110**
10	**5**	**20**	12	6,0	1,6	10	110	2,60	**22150.0120**
	6	**40**	12	10,0	2,0	10	110	3,40	**22150.0125**
12	**8**	**50**	14	13,0	2,6	12	110	6,90	**22150.0130**
16	**10**	**100**	18	16,4	3,2	16	110	15,00	**22150.0140**
pin: steel/standard spring load									
6	**3**	**20**	7	3,7	1,0	6	110	0,60	**22150.0111**
10	**5**	**50**	12	6,0	1,6	10	110	2,90	**22150.0121**
	6	**75**	12	10,0	2,0	10	110	3,60	**22150.0126**
12	**8**	**100**	14	13,0	2,6	12	110	7,50	**22150.0131**
16	**10**	**150**	18	16,4	3,2	16	110	15,00	**22150.0141**
pin: steel/heavy spring load									
6	**3**	**40**	7	3,7	1,0	6	110	0,70	**22150.0112**
10	**5**	**100**	12	6,0	1,6	10	110	3,00	**22150.0122**
	6	**100**	12	10,0	2,0	10	110	3,90	**22150.0127**
12	**8**	**150**	14	13,0	2,6	12	110	7,90	**22150.0132**
16	**10**	**200**	18	16,4	3,2	16	110	16,00	**22150.0142**

[1] statistical average value →

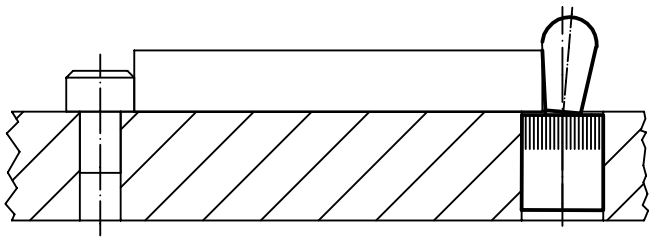
Dimensions d_1 [mm]	Dimensions d_2 [mm]	Spring load F max.[1) ~ [N]	Dimensions l_1 -2 [mm]	Dimensions l_2 [mm]	Stroke s [mm]	Location hole D H8 [mm]	max. [°C]	[g]	Art. No.
pin: thermoplastic/light spring load									
6	**3**	**10**	7	3,7	1,0	6	80	0,46	22150.0150
10	**5**	**20**	12	6,0	1,6	10	80	1,40	22150.0160
	6	**40**	12	10,0	2,0	10	80	1,60	22150.0165
12	**8**	**50**	14	13,0	2,6	12	80	2,92	22150.0170
16	**10**	**100**	18	16,4	3,2	16	80	7,30	22150.0180

[1) statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool			
	**6**	19	22150.0830
	10	49	22150.0831
	12	65	22150.0832
	16	105	22150.0833

APPLICATION EXAMPLE



2

Lateral Plungers • with plastic spring and pin

EH 22150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting.

Material

Spring
- Plastic

Pin
- Steel, case-hardened, blackened
- Stainless steel
- Thermoplastic POM, white

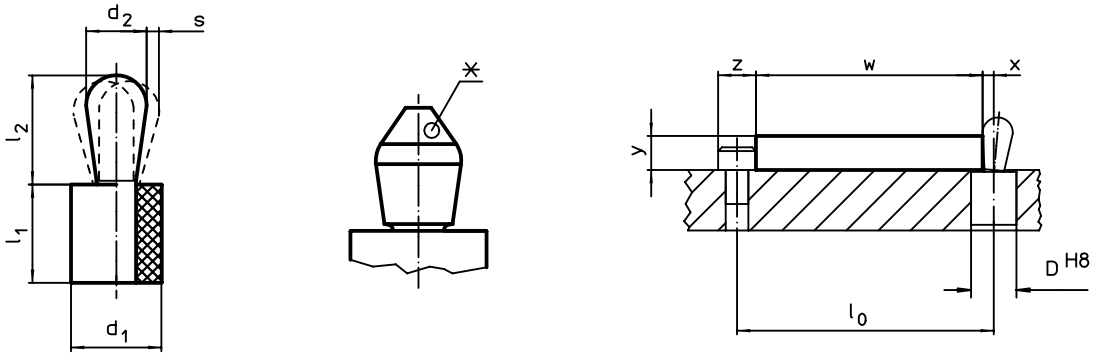
Assembly

It is recommended to moisten the body.
Installation by pressing in.
Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = coordinate dimension,
s = stroke,
z = stop diameter
Calculation dimension x:
y greater than or equal to l_2 - d_2/2, then
x = d_2/2 - s
or
y smaller than l_2 - d_2/2, then
x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0,123]

Characteristic

Light spring load = blue spring
Standard spring load = red spring
Heavy spring load = green spring

DRAWING



*some sizes (see chart) have a deviating pin shape

ORDER INFORMATION

Dimensions d_1 [mm]	Dimensions d_2 [mm]	Spring load F max.[1] ~ [N]	Dimensions l_1 -1 [mm]	Dimensions l_2 ±0,5 [mm]	Stroke s [mm]	Location hole D H8 [mm]	max. [°C]	[g]	Art. No.
pin: steel/light spring load									
6	**3**	**10**	7	3,7	0,4	5,9	100	0,54	22150.0200[2]
8	**4**	**15**	9	5,2	0,6	7,9	100	1,20	22150.0202
10	**5**	**30**	9	7,3	0,8	9,9	100	2,10	22150.0204
	6	**20**	9	10,3	1,0	9,9	100	2,90	22150.0207
pin: steel/standard spring load									
6	**3**	**20**	7	3,7	0,4	5,9	100	0,52	22150.0201[2]
8	**4**	**30**	9	5,2	0,6	7,9	100	1,20	22150.0203
10	**5**	**60**	9	7,3	0,8	9,9	100	2,10	22150.0205
	6	**30**	9	10,3	1,0	9,9	100	2,90	22150.0208
12	**8**	**50**	13	13,3	1,2	11,9	100	6,80	22150.0211
16	**10**	**80**	16	16,9	1,6	15,9	100	15,00	22150.0213
pin: steel/heavy spring load									
10	**5**	**90**	9	7,3	0,8	9,9	100	2,10	22150.0206
	6	**60**	9	10,3	1,0	9,9	100	2,90	22150.0209
12	**8**	**100**	13	13,3	1,2	11,9	100	6,80	22150.0212
16	**10**	**160**	16	16,9	1,6	15,9	100	15,00	22150.0214

[1] statistical average value
[2] deviating pin shape (see drawing)

Dimensions d_1 [mm]	Dimensions d_2 [mm]	Spring load F max.[1] ~ [N]	Dimensions l_1 -1 [mm]	Dimensions l_2 ±0,5 [mm]	Stroke s [mm]	Location hole D H8 [mm]	max. [°C]	[g]	Art. No.
pin: stainless steel/light spring load									
6	**3**	**10**	7	3,7	0,4	5,9	100	0,52	22150.0215[2]
8	**4**	**15**	9	5,2	0,6	7,9	100	1,20	22150.0217
10	**5**	**30**	9	7,3	0,8	9,9	100	2,10	22150.0219
	6	**20**	9	10,3	1,0	9,9	100	2,90	22150.0222
pin: stainless steel/standard spring load									
6	**3**	**20**	7	3,7	0,4	5,9	100	0,51	22150.0216[2]
8	**4**	**30**	9	5,2	0,6	7,9	100	1,20	22150.0218
10	**5**	**60**	9	7,3	0,8	9,9	100	2,10	22150.0220
	6	**30**	9	10,3	1,0	9,9	100	2,90	22150.0223
12	**8**	**50**	13	13,3	1,2	11,9	100	6,80	22150.0226
16	**10**	**80**	16	16,9	1,6	15,9	100	15,00	22150.0228
pin: stainless steel/heavy spring load									
10	**5**	**90**	9	7,3	0,8	9,9	100	2,10	22150.0221
	6	**60**	9	10,3	1,0	9,9	100	2,90	22150.0224
12	**8**	**100**	13	13,2	1,2	11,9	100	6,80	22150.0227
16	**10**	**160**	16	16,6	1,6	15,9	100	15,00	22150.0229
pin: thermoplastic/light spring load									
6	**3**	**10**	7	3,7	0,4	5,9	80	0,26	22150.0230[2]
8	**4**	**15**	9	5,2	0,6	7,9	80	0,61	22150.0232
10	**5**	**30**	9	7,3	0,8	9,9	80	0,99	22150.0234
	6	**20**	9	10,3	1,0	9,9	80	1,10	22150.0237
pin: thermoplastic/standard spring load									
6	**3**	**20**	7	3,7	0,4	5,9	80	0,27	22150.0231[2]
8	**4**	**30**	9	5,2	0,6	7,9	80	0,59	22150.0233
10	**5**	**60**	9	7,3	0,8	9,9	80	0,95	22150.0235
	6	**30**	9	10,3	1,0	9,9	80	1,00	22150.0238
12	**8**	**50**	13	13,3	1,2	11,9	80	0,23	22150.0240
16	**10**	**80**	16	16,9	1,6	15,9	80	0,49	22150.0242
pin: thermoplastic/heavy spring load									
10	**5**	**90**	9	7,3	0,8	9,9	80	0,97	22150.0236
	6	**60**	9	10,3	1,0	9,9	80	0,11	22150.0239
12	**8**	**100**	13	13,3	1,2	11,9	80	0,23	22150.0241
16	**10**	**160**	16	16,9	1,6	15,9	80	0,51	22150.0243

[1] statistical average value
[2] deviating pin shape (see drawing)

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool			
	**6**	23	22150.0840
	8	47	22150.0841
	10	46	22150.0842
	12	98	22150.0843
	16	145	22150.0844

Lateral Plungers • smooth, without seal, with female thread

EH 22150.

2



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting.

Material

Body
- Aluminium Al

Threaded washer
- Steel, blackened

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Assembly

Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = stroke,
z = stop diameter

Calculation dimension x for workpieces:
$x = d_2/2 - s$
Installation by pressing in.

Characteristic

Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

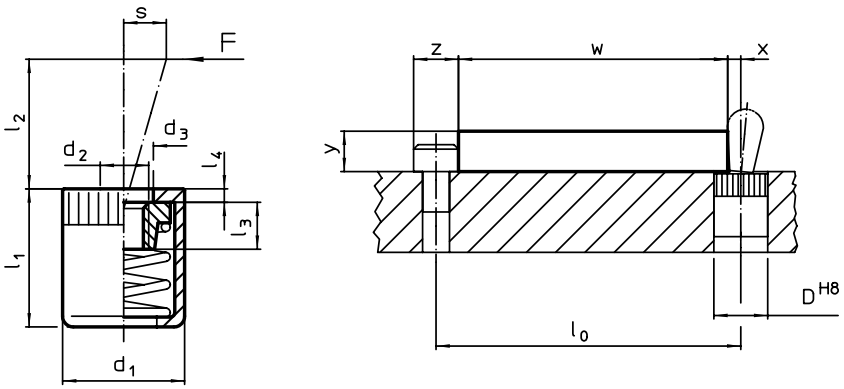
Notes

Individual set screws can be screwed in the plate with threaded hole.

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth . . . . . → p. 154

DRAWING



ORDER INFORMATION

Dimensions d_1 [mm]	Dimensions d_2 [mm]	Spring load F max.[1] ~ [N]	Dimensions d_3 [mm]	Dimensions l_1 -2 [mm]	Dimensions l_2 [mm]	Dimensions l_3 [mm]	Dimensions l_4 [mm]	Stroke s [mm]	Location hole D H8 [mm]	max. [°C]	[g]	Art. No.
light spring load												
10	**M4**	**20**	6,3	11	2,5	4,5	1,2	1,6	10	250	1,8	**22150.1020**
		40	6,3	11	7,5	4,5	1,2	2,0	10	250	1,9	**22150.1025**
16	**M6**	**100**	10,2	17	11,5	7,5	1,7	3,2	16	250	9,4	**22150.1040**
standard spring load												
10	**M4**	**50**	6,3	11	2,5	4,5	1,2	1,6	10	250	2,1	**22150.1021**
		75	6,3	11	7,5	4,5	1,2	2,0	10	250	2,1	**22150.1026**
16	**M6**	**150**	10,2	17	11,5	7,5	1,7	3,2	16	250	9,4	**22150.1041**
heavy spring load												
10	**M4**	**100**	6,3	11	2,5	4,5	1,2	1,6	10	250	2,3	**22150.1022**
		100	6,3	11	7,5	4,5	1,2	2,0	10	250	2,5	**22150.1027**
16	**M6**	**200**	10,2	17	11,5	7,5	1,7	3,2	16	250	9,3	**22150.1042**

[1] statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool			
	**10**	49	**22150.0831**
	16	105	**22150.0833**

Lateral Plungers • smooth, with seal, with female thread

EH 22150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting. Sealed against chips and dirt.

Material

Seal
- CR

Body
- Aluminium Al

Threaded washer
- Steel, blackened

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Assembly

Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = stroke,
z = stop diameter
Calculation dimension x for workpieces:
$x = d_2/2 - s$
Installation by pressing in.

Characteristic

Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

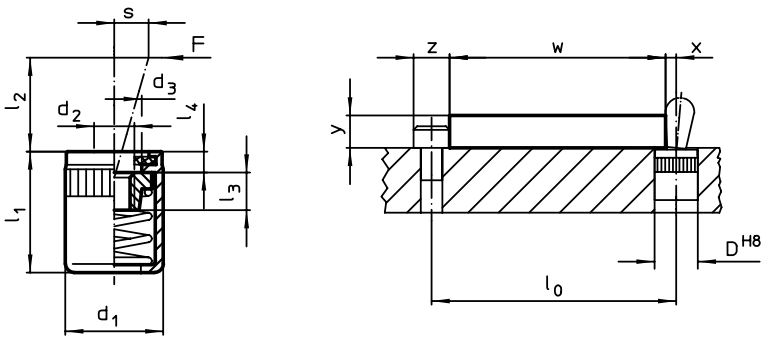
Notes

Individual set screws can be screwed in the plate with threaded hole.

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth . . . . . → p. 154

DRAWING



ORDER INFORMATION

Dimensions d_1	Dimensions d_2	Spring load F max.[1] ~	Dimensions d_3	Dimensions l_1 -2	Dimensions l_2	Dimensions l_3	Dimensions l_4	Stroke s	Location hole D H8	max.		Art. No.
[mm]		[N]	[mm]					[mm]	[mm]	[°C]	[g]	
light spring load												
10	**M4**	**20**	6,3	12	2,5	4,5	1,8	1,6	10	110	1,9	22150.1120
		40	6,3	12	7,5	4,5	1,8	2,0	10	110	2,0	22150.1125
16	**M6**	**100**	10,2	18	11,5	7,5	2,0	3,2	16	110	9,6	22150.1140
standard spring load												
10	**M4**	**50**	6,3	12	2,5	4,5	1,8	1,6	10	110	2,2	22150.1121
		75	6,3	12	7,5	4,5	1,8	2,0	10	110	2,2	22150.1126
16	**M6**	**150**	10,2	18	11,5	7,5	2,0	3,2	16	110	9,5	22150.1141
heavy spring load												
10	**M4**	**100**	6,3	12	2,5	4,5	1,8	1,6	10	110	2,3	22150.1122
					7,5	4,5	1,8	2,0	10	110	2,5	22150.1127
16	**M6**	**200**	10,2	18	11,5	7,5	2,0	3,2	16	110	10,0	22150.1142

[1] statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool			
	**10**	49	22150.0831
	16	105	22150.0833

2

Eccentric Mounting Bushings • for lateral plungers, smooth

EH 22150.



PRODUCT DESCRIPTION

The eccentric mounting bushing is used in conjunction with smooth lateral plungers EH 22150. for positioning or clamping workpieces with large tolerances.

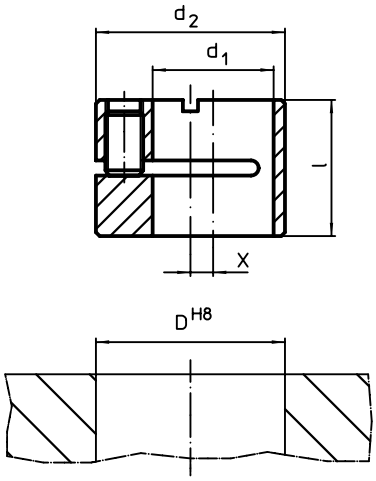
Material

Body
- Steel, blackened

Assembly

Mounting and position determination by means of clamping with threaded pin.

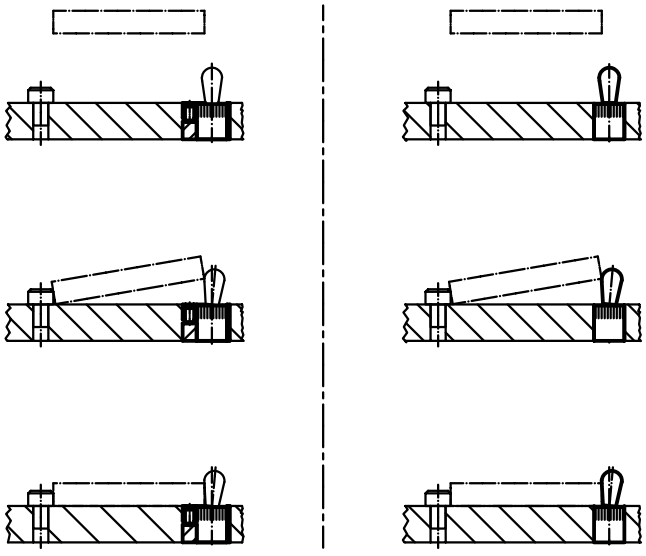
DRAWING



ORDER INFORMATION

Dimensions				Location hole		Art. No.
d_1 H7	d_2 h9	l	x	D H8		
[mm]				[mm]	[g]	
6	12	9,9	2	12	5,5	22150.0806
10	16	11,9	2	16	9,5	22150.0810
12	18	13,9	2	18	13,0	22150.0812
16	25	17,9	3	25	35,0	22150.0816

APPLICATION EXAMPLE



Lateral Plungers • with thread, without seal

EH 22150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting.

Material

Body
- Steel, zinc-plated by galvanization

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Pin
- Steel, case-hardened, zinc-plated by galvanization
- Thermoplastic POM, white

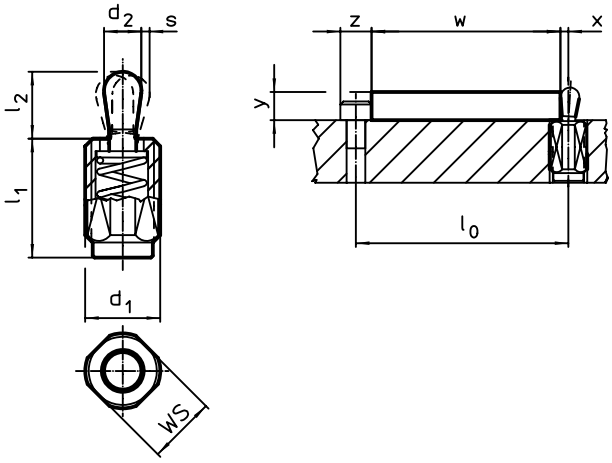
Assembly

Lateral plungers are installed by screwing in by means of a mounting tool.
Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = coordinate dimension,
s = stroke,
z = stop diameter
Calculation dimension x:
y greater than or equal to $l_2 - d_2/2$, then
$x = d_2/2 - s$
or
y smaller than $l_2 - d_2/2$, then
$x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0{,}123]$

Characteristic

Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

DRAWING



ORDER INFORMATION

Dimensions					Stroke	WS			Art. No.
d_1	l_1 -2	Spring load F max.[1] ~	d_2	l_2	s		max.		
[mm]		[N]	[mm]		[mm]	[mm]	[°C]	[g]	
pin: steel/light spring load									
M12	11,5	20	5	6,4	1,6	10	250	4,0	22150.0310
	19,0	20	5	6,4	1,6	10	250	5,9	22150.0314
	26,5	20	5	6,4	1,6	10	250	7,9	22150.0318
	11,5	40	6	10,4	2,0	10	250	4,8	22150.0330
	19,0	40	6	10,4	2,0	10	250	6,6	22150.0334
	26,5	40	6	10,4	2,0	10	250	8,6	22150.0338
M18 x 1,5	18,0	100	10	16,9	3,2	16	250	19,0	22150.0350
	31,5	100	10	16,9	3,2	16	250	28,0	22150.0354
	45,0	100	10	16,9	3,2	16	250	36,0	22150.0358

[1] statistical average value

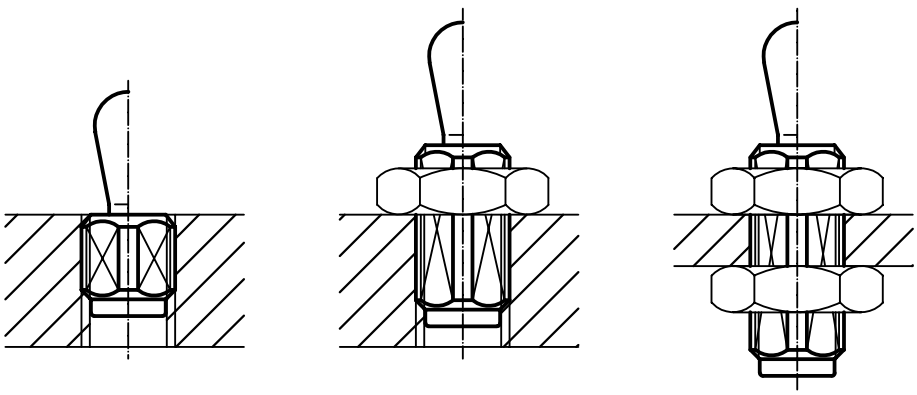
Dimensions					Stroke	WS	max.		Art. No.
d_1	l_1 -2	Spring load F max.[1] ~	d_2	l_2	s				
[mm]		[N]	[mm]		[mm]	[mm]	[°C]	[g]	
pin: steel/standard spring load									
M12	11,5	50	5	6,4	1,6	10	250	4,1	22150.0311
	19,0	50	5	6,4	1,6	10	250	6,4	22150.0315
	26,5	50	5	6,4	1,6	10	250	8,3	22150.0319
	11,5	75	6	10,4	2,0	10	250	4,9	22150.0331
	19,0	75	6	10,4	2,0	10	250	7,1	22150.0335
	26,5	75	6	10,4	2,0	10	250	9,6	22150.0339
M18 x 1,5	18,0	150	10	16,9	3,2	16	250	20,0	22150.0351
	31,5	150	10	16,9	3,2	16	250	29,0	22150.0355
	45,0	150	10	16,9	3,2	16	250	39,0	22150.0359
pin: steel/heavy spring load									
M12	11,5	100	5	6,4	1,6	10	250	4,4	22150.0312
	19,0	100	5	6,4	1,6	10	250	6,9	22150.0316
	26,5	100	5	6,4	1,6	10	250	9,0	22150.0320
	11,5	100	6	10,4	2,0	10	250	5,4	22150.0332
	19,0	100	6	10,4	2,0	10	250	7,7	22150.0336
	26,5	100	6	10,4	2,0	10	250	10,0	22150.0340
M18 x 1,5	18,0	200	10	16,9	3,2	16	250	21,0	22150.0352
	31,5	200	10	16,9	3,2	16	250	30,0	22150.0356
	45,0	200	10	16,9	3,2	16	250	40,0	22150.0360
pin: thermoplastic/light spring load									
M12	11,5	20	5	6,4	1,6	10	80	2,7	22150.0370
	19,0	20	5	6,4	1,6	10	80	4,6	22150.0375
	26,5	20	5	6,4	1,6	10	80	6,5	22150.0383
	11,5	40	6	10,4	2,0	10	80	3,1	22150.0373
	19,0	40	6	10,4	2,0	10	80	4,8	22150.0380
	26,5	40	6	10,4	2,0	10	80	6,8	22150.0385
M18 x 1,5	18,0	100	10	16,9	3,2	16	80	12,0	22150.0390
	31,5	100	10	16,9	3,2	16	80	20,0	22150.0393
	45,0	100	10	16,9	3,2	16	80	30,0	22150.0395

[1] statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool			
	M12	76	22150.0820
	M18 x 1,5	137	22150.0822

APPLICATION EXAMPLE



Lateral Plungers • with thread, with seal

EH 22150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting. Sealed against chips and dirt.

Material

Seal
- CR

Body
- Steel, zinc-plated by galvanization

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Pin
- Steel, case-hardened, zinc-plated by galvanization
- Thermoplastic POM, white

Assembly

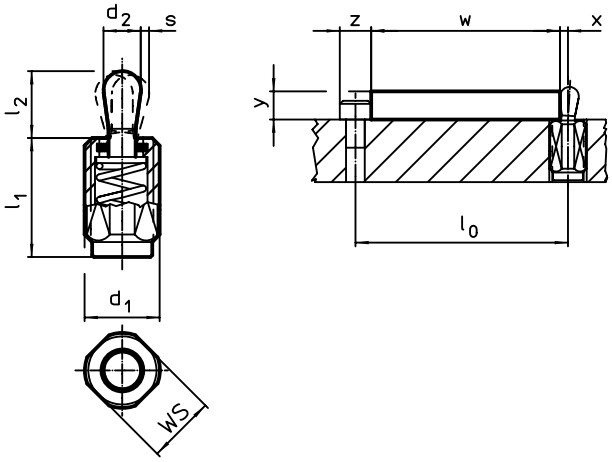
Lateral plungers are installed by screwing in by means of a mounting tool.
Formula for calculating the center distance for the mounting hole:

$l_0 = z/2 + w + x$,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = coordinate dimension,
s = stroke,
z = stop diameter
Calculation dimension x:
y greater than or equal to $l_2 - d_2/2$, then
$x = d_2/2 - s$
or
y smaller than $l_2 - d_2/2$, then
$x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0{,}123]$

Characteristic

Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

DRAWING



ORDER INFORMATION

Dimensions					Stroke	WS	max.		Art. No.
d_1	l_1 -2	Spring load F max.[1] ~	d_2	l_2	s				
[mm]		[N]	[mm]		[mm]	[mm]	[°C]	[g]	
pin: steel/light spring load									
M12	**11,5**	**20**	5	6	0,8	10	110	3,8	22150.0410
	19,0	**20**	5	6	0,8	10	110	5,6	22150.0414
	26,5	**20**	5	6	0,8	10	110	7,5	22150.0418
	11,5	**40**	6	10	1,0	10	110	4,7	22150.0430
	19,0	**40**	6	10	1,0	10	110	6,5	22150.0434
	26,5	**40**	6	10	1,0	10	110	8,3	22150.0438
M18 x 1,5	**18,0**	**100**	10	16	1,6	16	110	20,0	22150.0450
	31,5	**100**	10	16	1,6	16	110	28,0	22150.0454
	45,0	**100**	10	16	1,6	16	110	36,0	22150.0458

[1] statistical average value

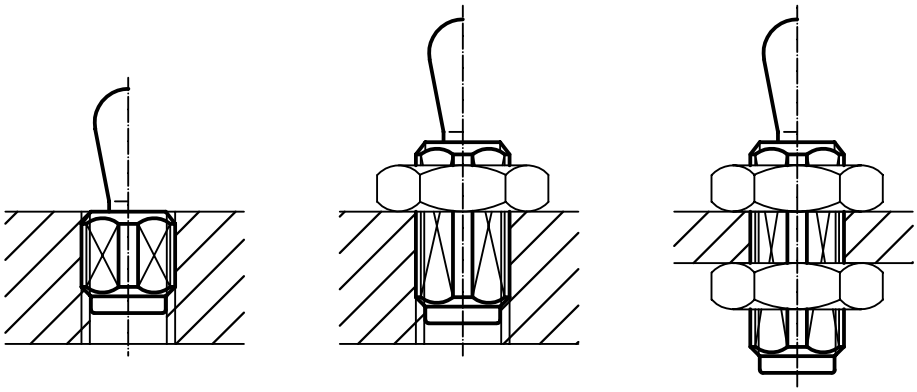
Dimensions d_1 [mm]	l_1 -2 [mm]	Spring load F max.[1) ~ [N]	d_2 [mm]	l_2 [mm]	Stroke s [mm]	WS [mm]	max. [°C]	[g]	Art. No.
pin: steel/standard spring load									
M12	**11,5**	**50**	5	6	0,8	10	110	4,1	22150.0411
	19,0	**50**	5	6	0,8	10	110	6,3	22150.0415
	26,5	**50**	5	6	0,8	10	110	8,1	22150.0419
	11,5	**75**	6	10	1,0	10	110	4,8	22150.0431
	19,0	**75**	6	10	1,0	10	110	6,9	22150.0435
	26,5	**75**	6	10	1,0	10	110	8,9	22150.0439
M18 x 1,5	**18,0**	**150**	10	16	1,6	16	110	20,0	22150.0451
	31,5	**150**	10	16	1,6	16	110	29,0	22150.0455
	45,0	**150**	10	16	1,6	16	110	40,0	22150.0459
pin: steel/heavy spring load									
M12	**11,5**	**100**	5	6	0,8	10	110	4,2	22150.0412
	19,0	**100**	5	6	0,8	10	110	6,6	22150.0416
	26,5	**100**	5	6	0,8	10	110	8,7	22150.0420
	11,5	**100**	6	10	1,0	10	110	5,4	22150.0432
	19,0	**100**	6	10	1,0	10	110	7,6	22150.0436
	26,5	**100**	6	10	1,0	10	110	10,0	22150.0440
M18 x 1,5	**18,0**	**200**	10	16	1,6	16	110	20,0	22150.0452
	31,5	**200**	10	16	1,6	16	110	29,0	22150.0456
	45,0	**200**	10	16	1,6	16	110	38,0	22150.0460
pin: thermoplastic/light spring load									
M12	**11,5**	**20**	5	6	0,8	10	80	2,6	22150.0470
	19,0	**20**	5	6	0,8	10	80	4,4	22150.0475
	26,5	**20**	5	6	0,8	10	80	6,1	22150.0483
	11,5	**40**	6	10	1,0	10	80	2,7	22150.0473
	19,0	**40**	6	10	1,0	10	80	4,5	22150.0480
	26,5	**40**	6	10	1,0	10	80	6,2	22150.0485
M18 x 1,5	**18,0**	**100**	10	16	1,6	16	80	12,0	22150.0490
	31,5	**100**	10	16	1,6	16	80	21,0	22150.0493
	45,0	**100**	10	16	1,6	16	80	30,0	22150.0495

[1) statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool			
	**M12**	76	22150.0820
	M18 x 1,5	137	22150.0822

APPLICATION EXAMPLE



Lateral Plungers • with thread, without seal, with female thread

EH 22150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting.

Material

Body
- Steel, zinc-plated

Threaded washer
- Steel, blackened

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Assembly

Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = stroke,
z = stop diameter
Calculation dimension x for workpieces:
$x = d_2/2 - s$
Lateral plungers are installed by screwing in by means of a mounting tool.

Characteristic

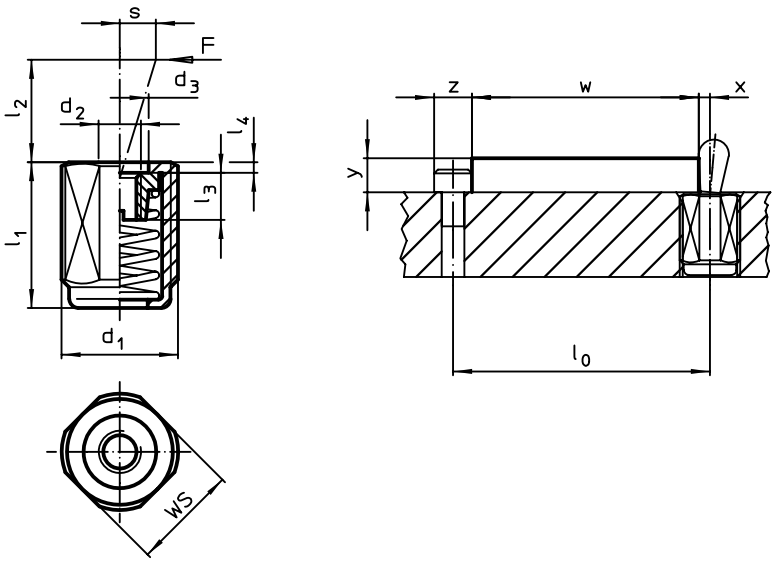
Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Notes

Individual set screws can be screwed in the plate with threaded hole.

DRAWING



ORDER INFORMATION

Dimensions d1	Dimensions l1 -2	Spring load F max.1) ~	Dimensions d2	Dimensions d3	Dimensions l2	Dimensions l3	Dimensions l4	Stroke s	WS	max.		Art. No.
[mm]		[N]	[mm]					[mm]	[mm]	[°C]	[g]	
light spring load												
M12	11,5	20	M4	6,3	4,0	4,5	1,5	1,6	10	250	3,2	22150.1310
	19,0	20	M4	6,3	4,0	4,5	1,5	1,6	10	250	5,1	22150.1314
	26,5	20	M4	6,1	4,0	4,5	1,5	1,6	10	250	6,9	22150.1318
	11,5	40	M4	6,1	7,5	4,5	1,5	2,0	10	250	3,3	22150.1330
	19,0	40	M4	6,1	7,5	4,5	1,5	2,0	10	250	5,2	22150.1334
	26,5	40	M4	6,1	7,5	4,5	1,5	2,0	10	250	6,9	22150.1338
M18 x 1,5	18,0	100	M6	10,5	11,5	7,5	1,5	3,2	16	250	14,6	22150.1350
	31,5	100	M6	10,5	11,5	7,5	1,5	3,2	16	250	23,1	22150.1354
	45,0	100	M6	10,5	11,5	7,5	1,5	3,2	16	250	31,8	22150.1358

1) statistical average value

2

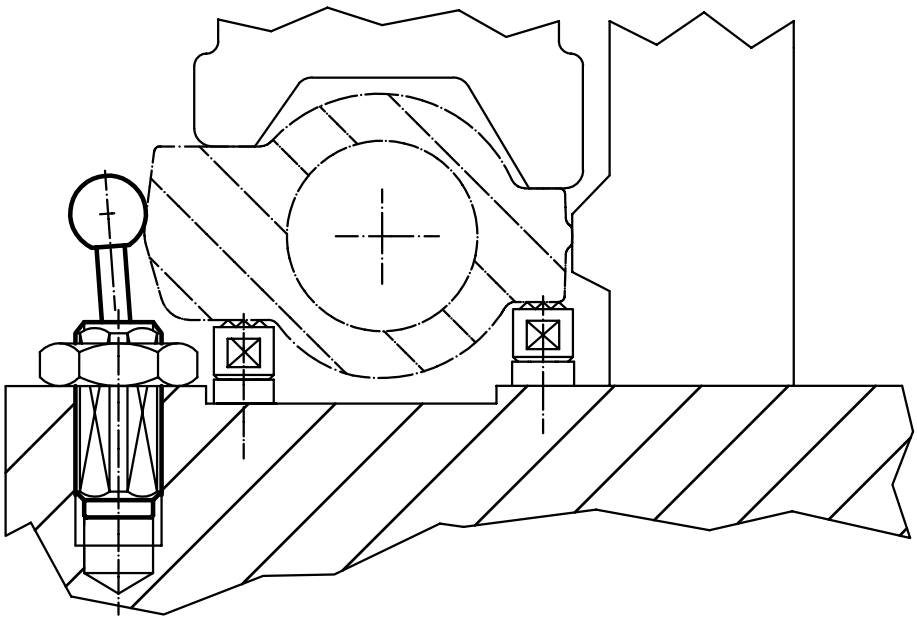
Dimensions d_1	Dimensions l_1 -2	Spring load F max.[1] ~	Dimensions d_2	d_3	l_2	l_3	l_4	Stroke s	WS	max.		Art. No.
[mm]		[N]	[mm]					[mm]	[mm]	[°C]	[g]	
standard spring load												
M12	**11,5**	**50**	M4	6,3	4,0	4,5	1,5	1,6	10	250	3,5	22150.1311
	19,0	**50**	M4	6,1	4,0	4,5	1,5	1,6	10	250	5,6	22150.1315
	26,5	**50**	M4	6,1	4,0	4,5	1,5	1,6	10	250	7,6	22150.1319
	11,5	**75**	M4	6,1	7,5	4,5	1,5	2,0	10	250	3,5	22150.1331
	19,0	**75**	M4	6,1	7,5	4,5	1,5	2,0	10	250	5,6	22150.1335
	26,5	**75**	M4	6,1	7,5	4,5	1,5	2,0	10	250	7,7	22150.1339
M18 x 1,5	**18,0**	**150**	M6	10,5	11,5	7,5	1,5	3,2	16	250	14,5	22150.1351
	31,5	**150**	M6	10,5	11,5	7,5	1,5	3,2	16	250	23,1	22150.1355
	45,0	**150**	M6	10,5	11,5	7,5	1,5	3,2	16	250	32,1	22150.1359
heavy spring load												
M12	**11,5**	**100**	M4	6,3	4,0	4,5	1,5	1,6	10	250	3,7	22150.1312
	19,0	**100**	M4	6,1	4,0	4,5	1,5	1,6	10	250	6,0	22150.1316
	26,5	**100**	M4	6,1	4,0	4,5	1,5	1,6	10	250	8,2	22150.1320
	11,5	**100**	M4	6,1	7,5	4,5	1,5	2,0	10	250	3,9	22150.1332
	19,0	**100**	M4	6,1	7,5	4,5	1,5	2,0	10	250	6,5	22150.1336
	26,5	**100**	M4	6,1	7,5	4,5	1,5	2,0	10	250	8,6	22150.1340
M18 x 1,5	**18,0**	**200**	M6	10,5	11,5	7,5	1,5	3,2	16	250	14,4	22150.1352
	31,5	**200**	M6	10,5	11,5	7,5	1,5	3,2	16	250	22,9	22150.1356
	45,0	**200**	M6	10,5	11,5	7,5	1,5	3,2	16	250	31,9	22150.1360

[1] statistical average value

ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool			
	**M12**	76	22150.0820
	M18 x 1,5	137	22150.0822

APPLICATION EXAMPLE



Lateral Plungers • with thread, with seal, with female thread

EH 22150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting. Sealed against chips and dirt.

Material

Seal
- CR

Body
- Steel, zinc-plated

Threaded washer
- Steel, blackened

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Assembly

Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = stroke,
z = stop diameter
Calculation dimension x for workpieces:
$x = d_2/2 - s$
Lateral plungers are installed by screwing in by means of a mounting tool.

Characteristic

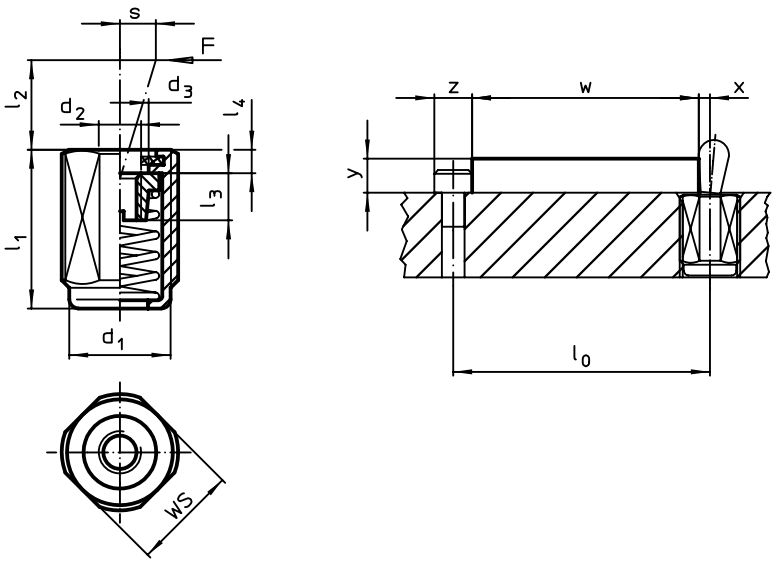
Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Notes

Individual set screws can be screwed in the plate with threaded hole.

DRAWING



ORDER INFORMATION

Dimensions d_1	Dimensions l_1 -2	Spring load F max.[1] ~	Dimensions d_2	Dimensions d_3	Dimensions l_2	Dimensions l_3	Dimensions l_4	Stroke s	WS	max.		Art. No.
[mm]		[N]	[mm]					[mm]	[mm]	[°C]	[g]	
light spring load												
M12	**11,5**	**20**	M4	6,1	4,0	4,5	2,0	1,6	10	110	3,0	22150.1410
	19,0	**20**	M4	6,1	4,0	4,5	2,0	1,6	10	110	4,9	22150.1414
	26,5	**20**	M4	6,1	4,0	4,5	2,0	1,6	10	110	6,7	22150.1418
	11,5	**40**	M4	6,1	7,5	4,5	2,0	2,0	10	110	3,1	22150.1430
	19,0	**40**	M4	6,1	7,5	4,5	2,0	2,0	10	110	5,1	22150.1434
	26,5	**40**	M4	6,1	7,5	4,5	2,0	2,0	10	110	6,8	22150.1438
M18 x 1,5	**18,0**	**100**	M6	10,1	11,5	7,5	2,3	3,2	16	110	14,6	22150.1450
	31,5	**100**	M6	10,1	11,5	7,5	2,3	3,2	16	110	23,1	22150.1454
	45,0	**100**	M6	10,1	11,5	7,5	2,3	3,2	16	110	31,9	22150.1458

[1] statistical average value

2

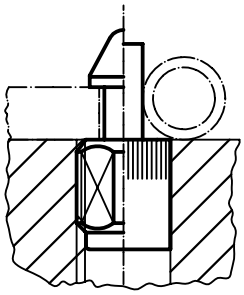
Dimensions d_1	Dimensions l_1 -2	Spring load F max.[1] ~	Dimensions d_2	d_3	l_2	l_3	l_4	Stroke s	WS	max.		Art. No.
[mm]		[N]	[mm]					[mm]	[mm]	[°C]	[g]	
standard spring load												
M12	**11,5**	**50**	M4	6,1	4,0	4,5	2,0	1,6	10	110	3,3	22150.1411
	19,0	**50**	M4	6,1	4,0	4,5	2,0	1,6	10	110	5,4	22150.1415
	26,5	**50**	M4	6,1	4,0	4,5	2,0	1,6	10	110	7,3	22150.1419
	11,5	**75**	M4	6,1	7,5	4,5	2,0	2,0	10	110	3,3	22150.1431
	19,0	**75**	M4	6,1	7,5	4,5	2,0	2,0	10	110	5,5	22150.1435
	26,5	**75**	M4	6,1	7,5	4,5	2,0	2,0	10	110	7,4	22150.1439
M18 x 1,5	**18,0**	**150**	M6	10,1	11,5	7,5	2,3	3,2	16	110	14,7	22150.1451
	31,5	**150**	M6	10,1	11,5	7,5	2,3	3,2	16	110	23,1	22150.1455
	45,0	**150**	M6	10,1	11,5	7,5	2,3	3,2	16	110	32,1	22150.1459
heavy spring load												
M12	**11,5**	**100**	M4	6,1	4,0	4,5	2,0	1,6	10	110	3,5	22150.1412
	19,0	**100**	M4	6,1	4,0	4,5	2,0	1,6	10	110	5,8	22150.1416
	26,5	**100**	M4	6,1	4,0	4,5	2,0	1,6	10	110	8,0	22150.1420
	11,5	**100**	M4	6,1	7,5	4,5	2,0	2,0	10	110	3,6	22150.1432
	19,0	**100**	M4	6,1	7,5	4,5	2,0	2,0	10	110	6,2	22150.1436
	26,5	**100**	M4	6,1	7,5	4,5	2,0	2,0	10	110	8,7	22150.1440
M18 x 1,5	**18,0**	**200**	M6	10,1	11,5	7,5	2,3	3,2	16	110	14,6	22150.1452
	31,5	**200**	M6	10,1	11,5	7,5	2,3	3,2	16	110	23,0	22150.1456
	45,0	**200**	M6	10,1	11,5	7,5	2,3	3,2	16	110	32,0	22150.1460

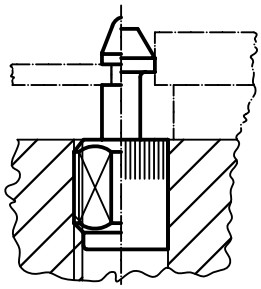
[1] statistical average value

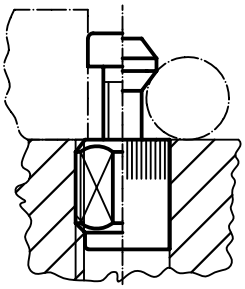
ACCESSORIES

	Dimensions d_1 [mm]	[g]	Art. No.
assembly tool			
	**M12**	76	22150.0820
	M18 x 1,5	137	22150.0822

APPLICATION EXAMPLE







Lateral Spring Plungers • with spring steel sheet

EH 22160.





PRODUCT DESCRIPTION

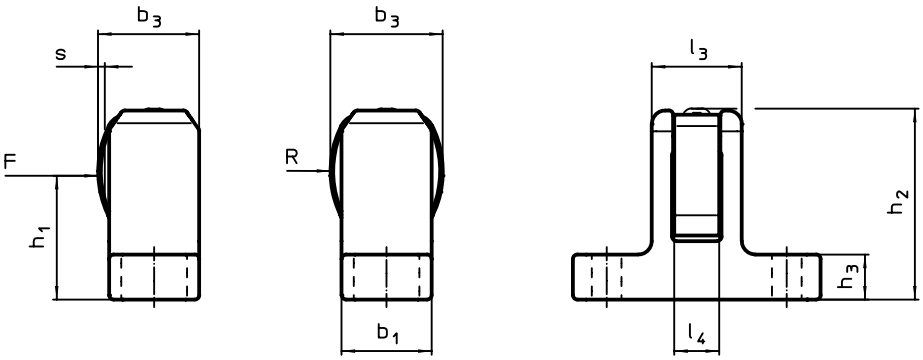
The lateral spring plunger with spring steel sheet guarantees a simple and secure positioning of workpieces or components at stops or fixture plates, e.g. in board mounting or before the clamping process in the jig and fixture construction.
The double-sided version allows for serial clamping.
Below h_1 is resulting a down hold effect.

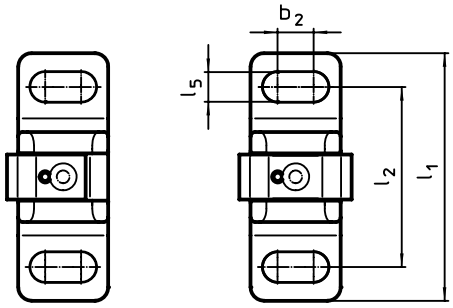
Material

Spring element
- Stainless steel

Body
- Steel, black

DRAWING





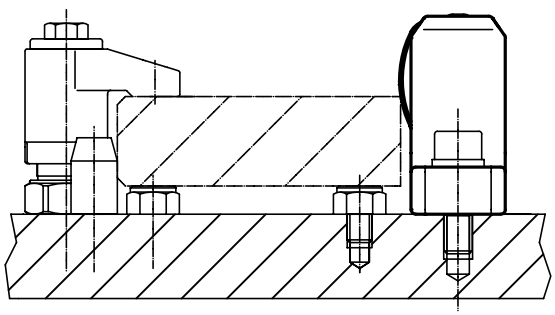
picture 1 picture 2

ORDER INFORMATION

Dimensions												Stroke s	For screw	Spring load F max.[1] ~	max.		Art. No.
l_1 ±1	l_2	l_3	l_4	l_5	b_1 ±0,5	b_2	b_3 ~	h_1	h_2 ±1	h_3	R						
[mm]												[mm]	[mm]	[N]	[°C]	[g]	
one-sided – picture 1																	
55	40	20	10	6,6	20	8	22,5	28,5	43,0	10	22,5	1,5	M 6	55	250	130	22160.0006
72	50	23	12	13,5	25	6	29,0	40,5	61,5	15	32,8	1,5	M12	170	250	255	22160.0012
double-sided – picture 2																	
55	40	20	10	6,6	20	8	25,0	28,5	42,5	10	22,5	1,5	M 6	55	250	135	22160.0206
72	50	23	12	13,5	25	6	33,5	40,5	61,5	15	32,8	1,5	M12	170	250	260	22160.0212

[1] statistical average value

APPLICATION EXAMPLE

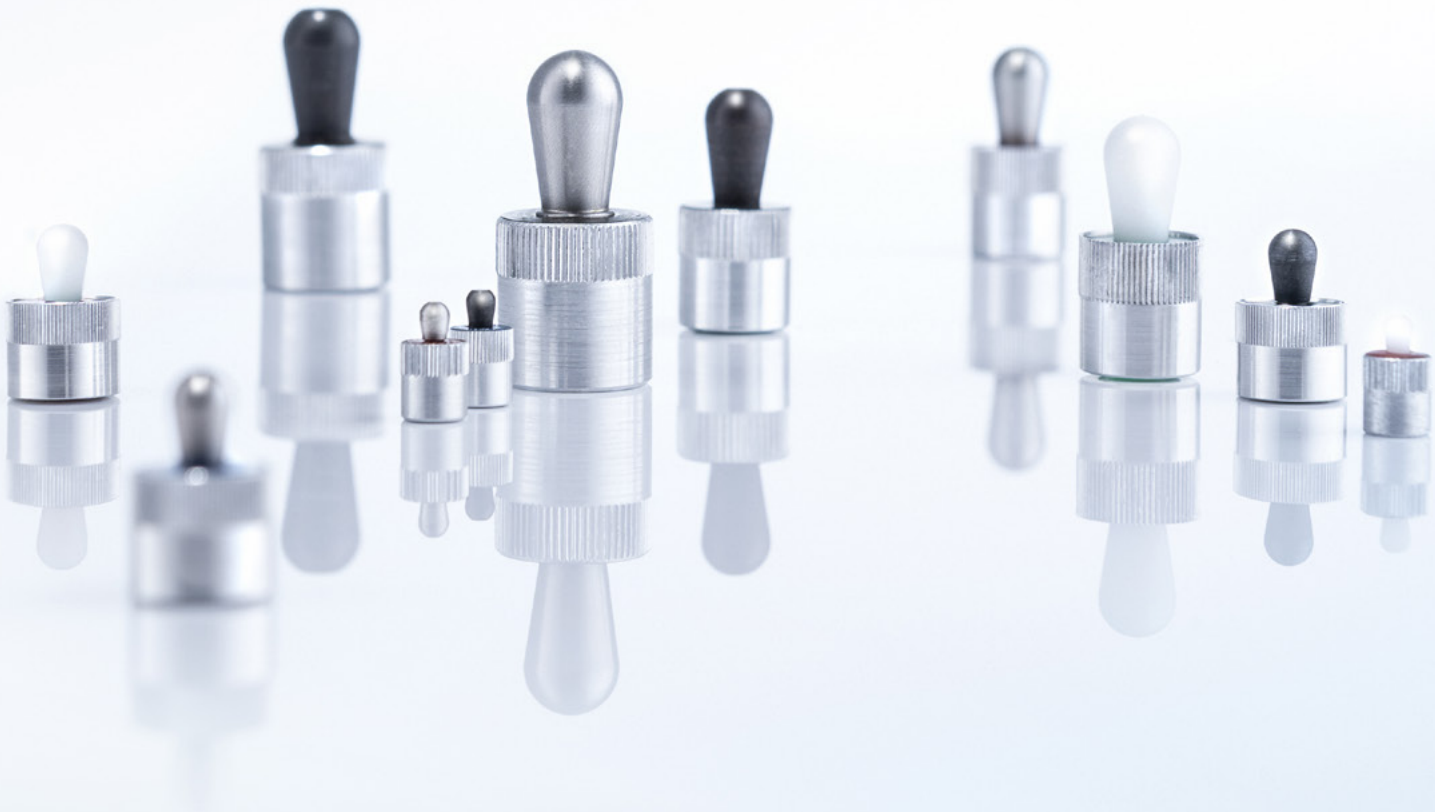


2

LATERAL PLUNGERS

INCH MODELS

Our premium-grade lateral plungers are also available as imperial versions. These models are available as press-in versions.



Lateral Plungers • smooth, without seal - INCH

EH 2B150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting.

Material

Body
- Aluminium Al

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Pin
- Steel, case-hardened, zinc-plated by galvanization
- Thermoplastic POM, white

Assembly

Installation by pressing in.
Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = coordinate dimension,
s = stroke,
z = stop diameter
Calculation dimension x:
y greater than or equal to $l_2 - d_2/2$, then
$x = d_2/2 - s$
or
y smaller than $l_2 - d_2/2$, then
$x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0{,}123]$

Characteristic

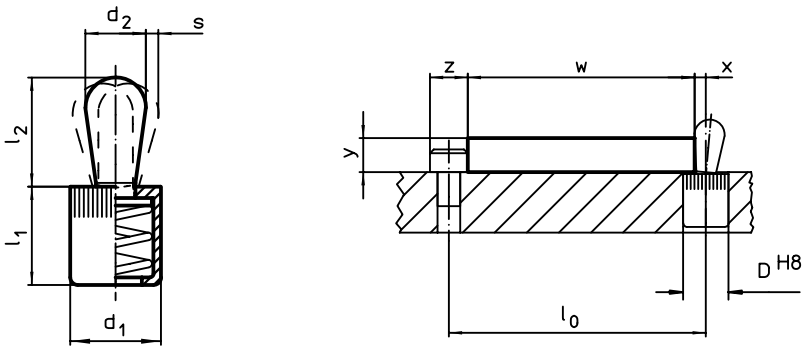
Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth - INCH . . . . . → p. 173

DRAWING



ORDER INFORMATION

Dimensions d_1 [inch]	Dimensions d_2 [inch]	Spring load F max.[1) ~ [lb]	Dimensions l_1 -0,08 [inch]	Dimensions l_2 [inch]	Stroke s [inch]	Location hole D H8 [inch]	max. [°F]	[oz]	Art. No.
pin: steel/light spring load									
1/4	**0,118**	**2,2**	0,275	0,157	0,04	1/4	482	0,023	**2B150.0010**
7/16	**0,197**	**4,5**	0,433	0,263	0,06	7/16	482	0,107	**2B150.0020**
	0,236	**9,0**	0,433	0,421	0,08	7/16	482	0,139	**2B150.0025**
1/2	**0,315**	**11,2**	0,525	0,535	0,09	1/2	482	0,260	**2B150.0030**
5/8	**0,393**	**22,5**	0,669	0,657	0,12	5/8	482	0,535	**2B150.0040**
pin: steel/standard spring load									
1/4	**0,118**	**4,5**	0,275	0,157	0,04	1/4	482	0,023	**2B150.0011**
7/16	**0,197**	**11,2**	0,433	0,263	0,06	7/16	482	0,117	**2B150.0021**
	0,236	**16,9**	0,433	0,421	0,08	7/16	482	0,142	**2B150.0026**
1/2	**0,315**	**22,5**	0,525	0,535	0,09	1/2	482	0,282	**2B150.0031**
5/8	**0,393**	**34,0**	0,669	0,657	0,12	5/8	482	0,535	**2B150.0041**
pin: steel/heavy spring load									
1/4	**0,118**	**9,0**	0,275	0,157	0,04	1/4	482	0,025	**2B150.0012**
7/16	**0,197**	**21,5**	0,433	0,263	0,06	7/16	482	0,124	**2B150.0022**
	0,236	**22,5**	0,433	0,421	0,08	7/16	482	0,157	**2B150.0027**
1/2	**0,315**	**34,0**	0,525	0,535	0,09	1/2	482	0,296	**2B150.0032**
5/8	**0,393**	**45,0**	0,669	0,657	0,12	5/8	482	0,571	**2B150.0042**

[1) statistical average value

2

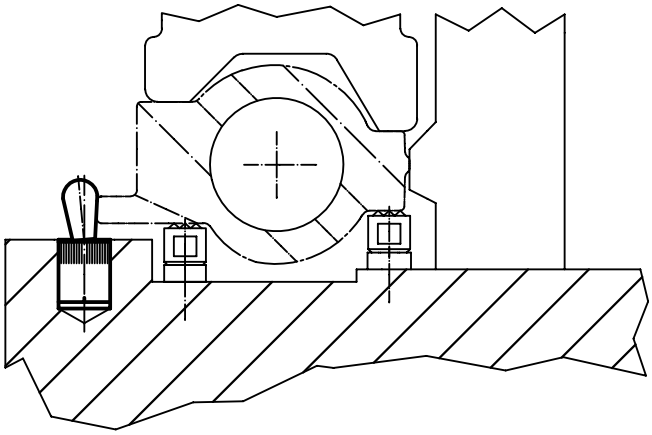
Dimensions d_1 [inch]	Dimensions d_2 [inch]	Spring load F max.[1) ~ [lb]	Dimensions l_1 -0,08 [inch]	Dimensions l_2 [inch]	Stroke s [inch]	Location hole D H8 [inch]	max. [°F]	[oz]	Art. No.
pin: thermoplastic/light spring load									
1/4	**0,118**	**2,2**	0,275	0,157	0,04	1/4	176	0,014	**2B150.0050**
7/16	**0,197**	**4,5**	0,433	0,263	0,06	7/16	176	0,064	**2B150.0060**
	0,236	**9,0**	0,433	0,421	0,08	7/16	176	0,071	**2B150.0065**
1/2	**0,315**	**11,2**	0,525	0,547	0,09	1/2	176	0,117	**2B150.0070**
5/8	**0,393**	**22,5**	0,669	0,657	0,12	5/8	176	0,249	**2B150.0080**

[1) statistical average value

ACCESSORIES

	Dimensions d_1 [inch]	[oz]	Art. No.
assembly tool			
	**1/4**	0,678	**22150.0830**
	7/16	1,749	**22150.0831**
	1/2	2,321	**22150.0832**
	5/8	3,749	**22150.0833**

APPLICATION EXAMPLE



Lateral Plungers • smooth, with seal - INCH

EH 2B150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting. Sealed against chips and dirt.

Material

Seal
- CR

Body
- Aluminium Al

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Pin
- Steel, case-hardened, zinc-plated by galvanization
- Thermoplastic POM, white

Assembly

Installation by pressing in.
Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = coordinate dimension,
s = stroke,
z = stop diameter
Calculation dimension x:
y greater than or equal to $l_2 - d_2/2$, then
$x = d_2/2 - s$
or
y smaller than $l_2 - d_2/2$, then
$x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0{,}123]$

Characteristic

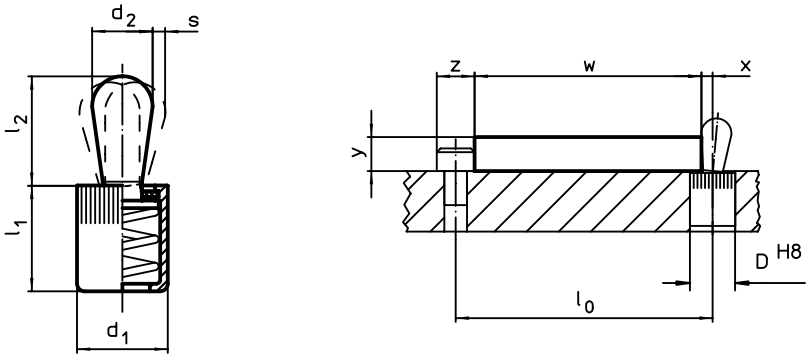
Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth - INCH . . . . . → p. 173

DRAWING



ORDER INFORMATION

Dimensions d_1 [inch]	Dimensions d_2 [inch]	Spring load F max.[1] ~ [lb]	Dimensions l_1 -0,08 [inch]	Dimensions l_2 [inch]	Stroke s [inch]	Location hole D H8 [inch]	max. [°F]	[oz]	Art. No.
pin: steel/light spring load									
1/4	**0,118**	**2,2**	0,275	0,157	0,04	1/4	230	0,024	**2B150.0110**
7/16	**0,197**	**4,5**	0,430	0,236	0,06	7/16	230	0,111	**2B150.0120**
	0,236	**9,0**	0,430	0,393	0,08	7/16	230	0,139	**2B150.0125**
1/2	**0,315**	**11,2**	0,551	0,511	0,09	1/2	230	0,261	**2B150.0130**
5/8	**0,393**	**22,5**	0,708	0,646	0,12	5/8	230	0,571	**2B150.0140**
pin: steel/standard spring load									
1/4	**0,118**	**4,5**	0,275	0,157	0,04	1/4	230	0,024	**2B150.0111**
7/16	**0,197**	**11,2**	0,430	0,236	0,06	7/16	230	0,117	**2B150.0121**
	0,236	**16,9**	0,430	0,393	0,08	7/16	230	0,149	**2B150.0126**
1/2	**0,315**	**22,5**	0,551	0,511	0,09	1/2	230	0,278	**2B150.0131**
5/8	**0,393**	**34,0**	0,708	0,646	0,12	5/8	230	0,535	**2B150.0141**
pin: steel/heavy spring load									
1/4	**0,118**	**9,0**	0,275	0,157	0,04	1/4	230	0,026	**2B150.0112**
7/16	**0,197**	**21,5**	0,430	0,236	0,06	7/16	230	0,124	**2B150.0122**
	0,236	**22,5**	0,430	0,393	0,08	7/16	230	0,161	**2B150.0127**
1/2	**0,315**	**34,0**	0,551	0,511	0,09	1/2	230	0,292	**2B150.0132**
5/8	**0,393**	**45,0**	0,708	0,646	0,12	5/8	230	0,535	**2B150.0142**

[1] statistical average value →

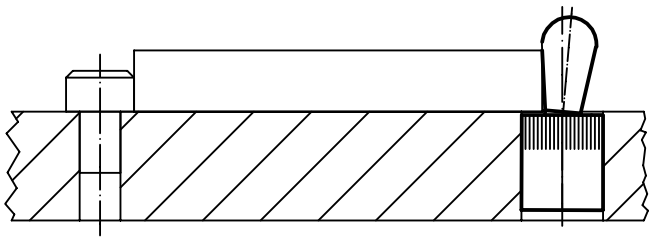
Dimensions d_1 [inch]	Dimensions d_2 [inch]	Spring load F max.[1) ~ [lb]	Dimensions l_1 -0,08 [inch]	Dimensions l_2 [inch]	Stroke s [inch]	Location hole D H8 [inch]	max. [°F]	[oz]	Art. No.
pin: thermoplastic/light spring load									
1/4	**0,118**	**2,2**	0,275	0,157	0,04	1/4	176	0,014	2B150.0150
7/16	**0,197**	**4,5**	0,430	0,236	0,06	7/16	176	0,064	2B150.0160
	0,236	**9,0**	0,393	0,472	0,08	7/16	176	0,074	2B150.0165
1/2	**0,315**	**11,2**	0,551	0,531	0,09	1/2	176	0,114	2B150.0170
5/8	**0,393**	**22,5**	0,708	0,646	0,12	5/8	176	0,299	2B150.0180

[1) statistical average value

ACCESSORIES

	Dimensions d_1 [inch]	[oz]	Art. No.
assembly tool			
	**1/4**	0,678	22150.0830
	7/16	1,749	22150.0831
	1/2	2,321	22150.0832
	5/8	3,749	22150.0833

APPLICATION EXAMPLE



Lateral Plungers • with plastic spring and pin - INCH

EH 2B150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting.

Material

Body
- Aluminium Al

Spring
- Plastic

Pin
- Steel, case-hardened, blackened
- Stainless steel
- Thermoplastic POM, white

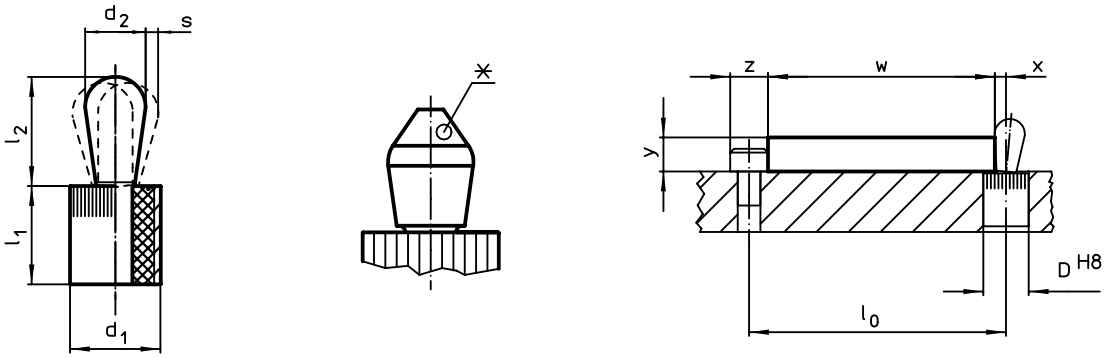
Assembly

Installation by pressing in.
Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = coordinate dimension,
s = stroke,
z = stop diameter
Calculation dimension x:
y greater than or equal to $l_2 - d_2/2$, then
$x = d_2/2 - s$
or
y smaller than $l_2 - d_2/2$, then
$x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0{,}123]$

Characteristic

Light spring load = blue spring
Standard spring load = red spring
Heavy spring load = green spring

DRAWING



*some sizes (see chart) have a deviating pin shape

ORDER INFORMATION

Dimensions d_1 [inch]	Dimensions d_2 [inch]	Spring load F max.[1] ~ [lb]	Dimensions l_1 -0,03 [inch]	Dimensions l_2 ±0,02 [inch]	Stroke s [inch]	Location hole D H8 [inch]	max. [°F]	[oz]	Art. No.
pin: steel/light spring load									
1/4	**0,118**	**2,2**	0,295	0,145	0,016	0,250	212	0,021	**2B150.0210**[2]
7/16	**0,197**	**6,7**	0,374	0,287	0,032	0,438	212	0,096	**2B150.0220**
	0,236	**4,4**	0,374	0,406	0,040	0,438	212	0,121	**2B150.0225**
pin: steel/standard spring load									
1/4	**0,118**	**4,4**	0,295	0,145	0,016	0,250	212	0,021	**2B150.0211**[2]
7/16	**0,197**	**13,5**	0,374	0,287	0,032	0,438	212	0,092	**2B150.0221**
	0,236	**6,7**	0,374	0,406	0,040	0,438	212	0,121	**2B150.0226**
1/2	**0,315**	**11,1**	0,553	0,515	0,048	0,500	212	0,264	**2B150.0230**
5/8	**0,394**	**18,0**	0,675	0,678	0,062	0,625	212	0,535	**2B150.0240**
pin: steel/heavy spring load									
7/16	**0,197**	**20,0**	0,374	0,287	0,032	0,438	212	0,096	**2B150.0222**
	0,236	**13,5**	0,374	0,406	0,040	0,438	212	0,124	**2B150.0227**
1/2	**0,315**	**22,2**	0,553	0,515	0,048	0,500	212	0,267	**2B150.0231**
5/8	**0,394**	**36,0**	0,675	0,678	0,062	0,625	212	0,535	**2B150.0241**

[1] statistical average value
[2] deviating pin shape (see drawing)

→

Dimensions d_1 [inch]	Dimensions d_2 [inch]	Spring load F max.[1] ~ [lb]	Dimensions l_1 -0,03 [inch]	Dimensions l_2 ±0,02 [inch]	Stroke s [inch]	Location hole D H8 [inch]	max. [°F]	[oz]	Art. No.
pin: stainless steel/light spring load									
1/4	**0,118**	**2,2**	0,295	0,145	0,016	0,250	212	0,021	2B150.0310[2]
7/16	**0,197**	**6,7**	0,374	0,287	0,032	0,438	212	0,096	2B150.0320
	0,236	**4,4**	0,374	0,406	0,040	0,438	212	0,124	2B150.0325
pin: stainless steel/standard spring load									
1/4	**0,118**	**4,4**	0,295	0,145	0,016	0,250	212	0,021	2B150.0311[2]
7/16	**0,197**	**13,5**	0,374	0,287	0,032	0,438	212	0,092	2B150.0321
	0,236	**6,7**	0,374	0,406	0,040	0,438	212	0,124	2B150.0326
1/2	**0,315**	**11,1**	0,553	0,515	0,048	0,500	212	0,246	2B150.0330
5/8	**0,394**	**18,0**	0,675	0,678	0,062	0,625	212	0,571	2B150.0340
pin: stainless steel/heavy spring load									
7/16	**0,197**	**20,0**	0,374	0,287	0,032	0,438	212	0,092	2B150.0322
	0,236	**13,5**	0,374	0,406	0,040	0,438	212	0,124	2B150.0327
1/2	**0,315**	**22,2**	0,553	0,515	0,048	0,500	212	0,264	2B150.0331
5/8	**0,394**	**36,0**	0,675	0,678	0,062	0,625	212	0,571	2B150.0341
pin: thermoplastic/light spring load									
1/4	**0,118**	**2,2**	0,295	0,145	0,016	0,250	176	0,012	2B150.0410[2]
7/16	**0,197**	**6,7**	0,374	0,287	0,032	0,438	176	0,053	2B150.0420
	0,236	**4,4**	0,374	0,406	0,040	0,438	176	0,061	2B150.0425
pin: thermoplastic/standard spring load									
1/4	**0,118**	**4,4**	0,295	0,145	0,016	0,250	176	0,012	2B150.0411[2]
7/16	**0,197**	**13,5**	0,374	0,287	0,032	0,438	176	0,053	2B150.0421
	0,236	**6,7**	0,374	0,406	0,040	0,438	176	0,057	2B150.0426
1/2	**0,315**	**11,1**	0,553	0,515	0,048	0,500	176	0,107	2B150.0430
5/8	**0,394**	**18,0**	0,675	0,678	0,062	0,625	176	0,199	2B150.0440
pin: thermoplastic/heavy spring load									
7/16	**0,197**	**20,0**	0,374	0,287	0,032	0,438	176	0,053	2B150.0422
	0,236	**13,5**	0,374	0,406	0,040	0,438	176	0,061	2B150.0427
1/2	**0,315**	**22,2**	0,553	0,515	0,048	0,500	176	0,107	2B150.0431
5/8	**0,394**	**36,0**	0,675	0,678	0,062	0,625	176	0,203	2B150.0441

[1] statistical average value
[2] deviating pin shape (see drawing)

ACCESSORIES

	Dimensions d_1 [inch]	[oz]	Art. No.
assembly tool			
	**1/4**	0,678	22150.0830
	7/16	1,749	22150.0831
	1/2	2,321	22150.0832
	5/8	3,749	22150.0833

Lateral Plungers • smooth, without seal, with female thread - INCH

EH 2B150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting.

Material

Body
- Aluminium Al

Threaded washer
- Steel, blackened

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Assembly

Formula for calculating the center distance for the mounting hole:
$l_0 = z/2 + w + x$,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = stroke,
z = stop diameter

Calculation dimension x for workpieces:
$x = d_2/2 - s$
Installation by pressing in.

Characteristic

Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

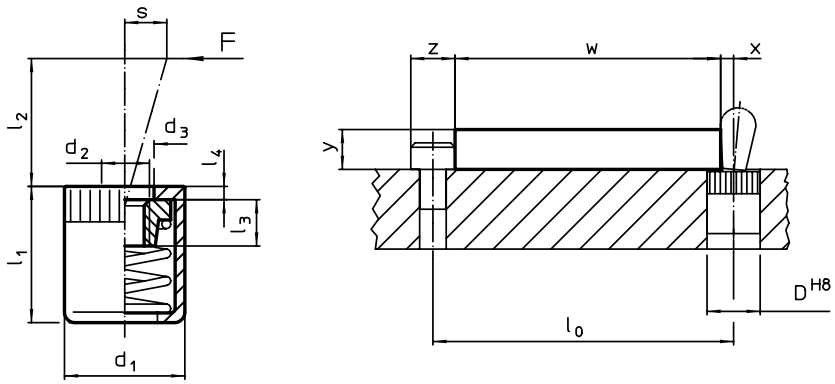
Notes

Individual set screws can be screwed in the plate with threaded hole.

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth - INCH . . . . . → p. 173

DRAWING



ORDER INFORMATION

Dimensions d_1 [inch]	Dimensions d_2	Spring load F max.[1) ~ [lb]	Dimensions d_3 +0,008 [inch]	Dimensions l_1 -0,08 [inch]	Dimensions l_2 [inch]	Dimensions l_3 [inch]	Dimensions l_4 [inch]	Stroke s [inch]	Location hole D H8 [inch]	max. [°F]	[oz]	Art. No.
light spring load												
7/16	**8-32**	**4,5**	0,248	0,433	0,1000	0,177	0,047	0,063	7/16	482	0,082	2B150.1020
		9,0	0,248	0,433	0,2950	0,177	0,047	0,079	7/16	482	0,082	2B150.1025
5/8	**1/4-20**	**22,5**	0,409	0,669	0,4530	0,295	0,067	0,126	5/8	482	0,357	2B150.1040
standard spring load												
7/16	**8-32**	**11,2**	0,248	0,433	0,1000	0,177	0,047	0,063	7/16	482	0,089	2B150.1021
		16,9	0,248	0,433	0,2950	0,177	0,047	0,079	7/16	482	0,092	2B150.1026
5/8	**1/4-20**	**34,0**	0,409	0,669	0,4530	0,295	0,067	0,126	5/8	482	0,321	2B150.1041
heavy spring load												
7/16	**8-32**	**22,5**	0,248	0,433	0,1000	0,177	0,047	0,063	7/16	482	0,096	2B150.1022
		34,0	0,248	0,433	0,2950	0,177	0,047	0,079	7/16	482	0,099	2B150.1027
5/8	**1/4-20**	**45,0**	0,409	0,669	0,4563	0,295	0,067	0,126	5/8	482	0,346	2B150.1042

[1) statistical average value

ACCESSORIES

	Dimensions d_1 [inch]	[oz]	Art. No.
assembly tool			
	**7/16**	1,749	22150.0831
	5/8	3,749	22150.0833

Lateral Plungers • smooth, with seal, with female thread - INCH

EH 2B150.



PRODUCT DESCRIPTION

To be used for positioning and applying pressure, e.g. during painting and sandblasting. Sealed against chips and dirt.

Material

Seal
- CR

Body
- Aluminium Al

Threaded washer
- Steel, blackened

Spring
- Stainless steel
- Steel, blackened
- Steel, zinc-plated by galvanization

Assembly

Formula for calculating the center distance for the mounting hole:
l_0 = z/2 + w + x,
l_0 = center distance,
y = workpiece height,
w = workpiece length,
x = stroke,
z = stop diameter
Calculation dimension x for workpieces:
$x = d_2/2 - s$
Installation by pressing in.

Characteristic

Light spring load = spring from stainless steel
Standard spring load = spring from steel, blackened
Heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

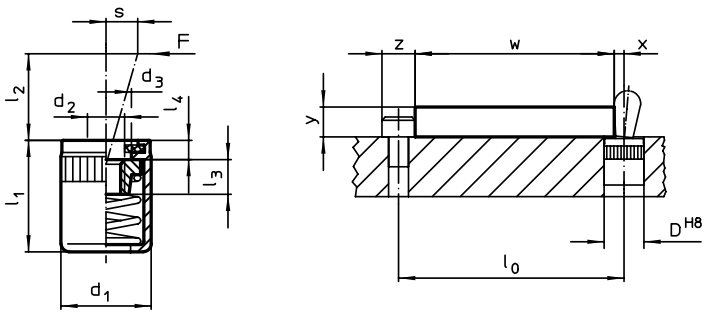
Notes

Individual set screws can be screwed in the plate with threaded hole.

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth - INCH . . . . . → p. 173

DRAWING



ORDER INFORMATION

Dimensions d_1 [inch]	Dimensions d_2	Spring load F max.[1] ~ [lb]	Dimensions d_3 +0,008 [mm]	l_1 -0,08 [inch]	l_2 [inch]	l_3 [inch]	l_4 [inch]	Stroke s [inch]	Location hole D H8 [inch]	max. [°F]	[oz]	Art. No.
light spring load												
7/16	**8-32**	**4,5**	0,248	0,430	0,100	0,177	0,063	0,063	7/16	230	0,082	2B150.1120
		9,0	0,248	0,430	0,295	0,177	0,063	0,079	7/16	230	0,085	2B150.1125
5/8	**1/4-20**	**22,5**	0,401	0,709	0,453	0,295	0,079	0,126	5/8	230	0,357	2B150.1140
standard spring load												
7/16	**8-32**	**11,2**	0,248	0,430	0,100	0,177	0,063	0,063	7/16	230	0,089	2B150.1121
		16,9	0,248	0,430	0,295	0,177	0,063	0,079	7/16	230	0,096	2B150.1126
5/8	**1/4-20**	**34,0**	0,401	0,709	0,453	0,295	0,079	0,126	5/8	230	0,317	2B150.1141
heavy spring load												
7/16	**8-32**	**22,5**	0,248	0,430	0,100	0,177	0,063	0,063	7/16	230	0,096	2B150.1122
		34,0	0,248	0,430	0,295	0,177	0,063	0,079	7/16	230	0,107	2B150.1127
5/8	**1/4-20**	**45,0**	0,401	0,709	0,453	0,295	0,079	0,126	5/8	230	0,339	2B150.1142

[1] statistical average value

ACCESSORIES

	Dimensions d_1 [inch]	[oz]	Art. No.
assembly tool			
	**7/16**	1,749	22150.0831
	5/8	3,749	22150.0833

Eccentric Mounting Bushings • for lateral plungers, smooth - INCH

EH 2B150.



PRODUCT DESCRIPTION

The eccentric mounting bushing is used in conjunction with smooth lateral plungers EH 22150. for positioning or clamping workpieces with large tolerances.

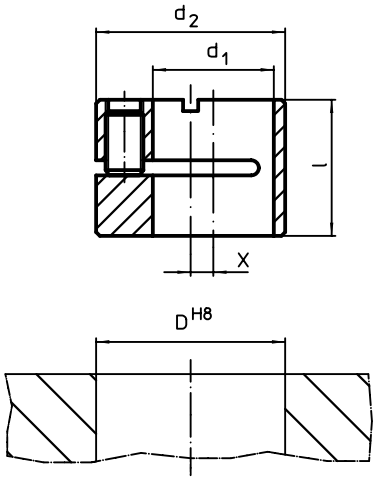
Material

Body
- Steel, blackened

Assembly

Mounting and position determination by means of clamping with threaded pin.

DRAWING



ORDER INFORMATION

Dimensions				Location hole D H8		Art. No.
d_1	d_2	l	x			
[inch]				[inch]	[oz]	
1/4	1/2	0,390	0,079	1/2	0,214	2B150.0806
7/16	11/16	0,469	0,079	11/16	0,392	2B150.0810
1/2	3/4	0,547	0,079	3/4	0,499	2B150.0812
5/8	1	0,705	0,118	1	1,285	2B150.0816

2

Spring-Loaded Catches • DIN 6310 catches with spring

EH 22200.

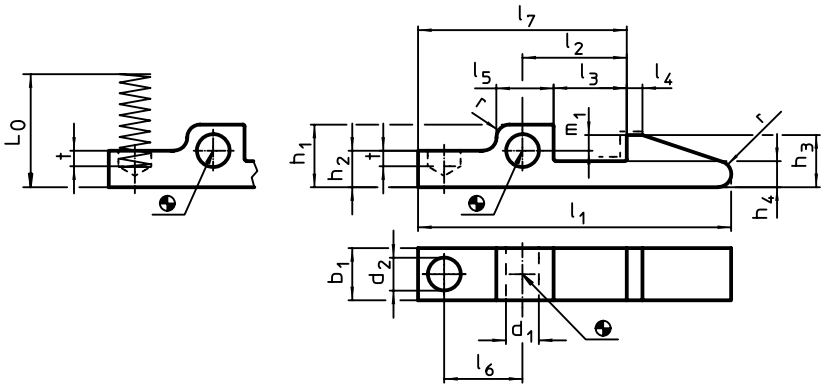


PRODUCT DESCRIPTION

Material

- Heat-treated steel, blackened. Hardened where shown by _ _ _ line.

DRAWING

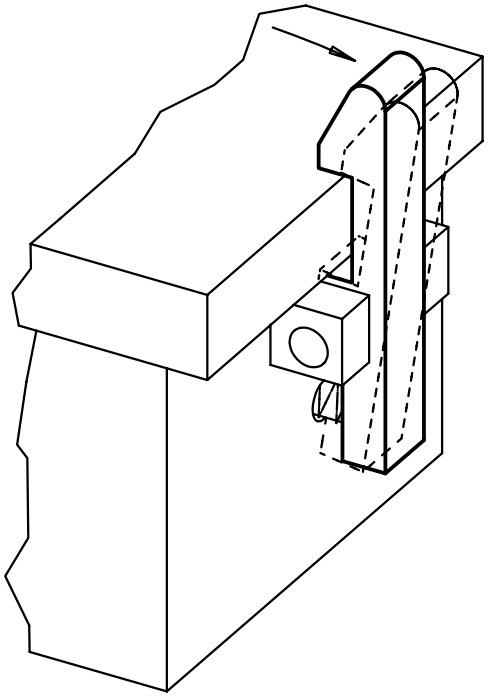


Hardened where shown by _ _ _ line.

ORDER INFORMATION

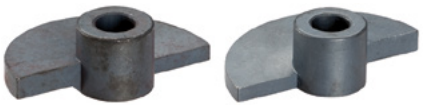
Dimensions																		Spring rate R ~		Art. No.
l_1	b_1 -0,2	d_1 E9	d_2	h_1	h_2	h_3	h_4	l_2 ±0,1	l_3	l_4	l_5	l_6	l_7	m_1	t	r	L_0 ~			
[mm]																		[N/mm]	[g]	
45	8	4	5,0	9,5	5,5	8	4	15	10	2	9	11	30	2,5	1,5	1,6	17,8	3,0	15	22200.0045
60	10	5	6,3	12,0	7,0	10	5	20	14	3	11	15	40	3,0	3,0	2,5	21,2	4,0	32	22200.0060
80	14	6	8,0	15,0	9,0	14	7	30	22	5	14	23	60	5,0	5,0	4,0	25,1	4,8	80	22200.0080

APPLICATION EXAMPLE



Door Catches

EH 22260.

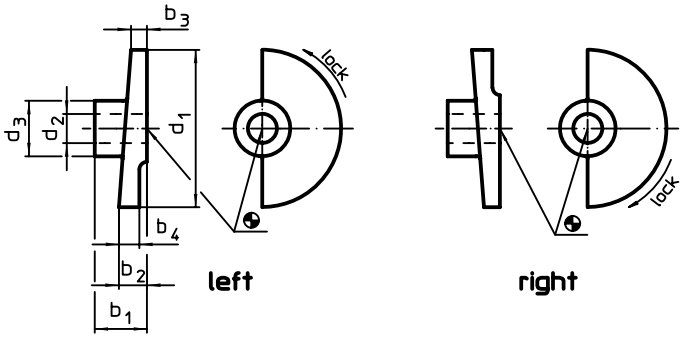


PRODUCT DESCRIPTION

Material
- Sintered steel

Assembly
Not suitable for fastening by welded connection. Secure by using pins.

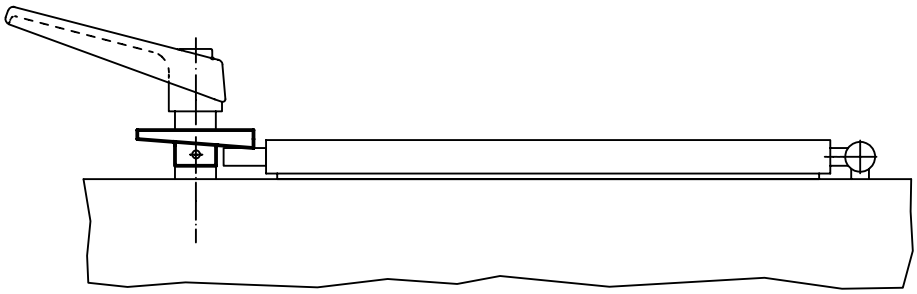
DRAWING



ORDER INFORMATION

Dimensions								Art. No.
d_1	d_2 H8	d_3	b_1	b_2	b_3	b_4		
			[mm]				[g]	
locking by turning to the right								
35	**8**	18	15	7	3	7,0	33	22260.0008
	10	18	15	7	3	7,0	31	22260.0010
65	**12**	23	20	10	5	7,2	103	22260.0012
80	**16**	27	24	12	6	8,8	174	22260.0016
locking by turning to the left								
35	**8**	18	15	7	3	7,0	34	22260.0108
	10	18	15	7	3	7,0	31	22260.0110
65	**12**	23	20	10	5	7,2	103	22260.0112
80	**16**	27	24	12	6	8,8	175	22260.0116

APPLICATION EXAMPLE



2

Clamping Catches

EH 22260.



PRODUCT DESCRIPTION

Clamping catches have a round running taper surface and enable fast and safe clamping and releasing with a relatively large adjustment range and high tensioning force. Due to the small gradient angle of the taper surface, the clamping catch is self-locking.

Material

Body
- Steel, case-hardened, blackened
- Stainless steel 1.4305, nickel-plated

Screw
- Steel, nitrided
- Stainless steel 1.4021, heat-treated, nickel-plated

Gear lever handle
- Steel, ground, blackened
- Stainless steel 1.4305, dull blasted

Ball knob
- Thermosetting plastic PF 31, black, DIN 319

Assembly

Fix with screw bolt M 10 (WS 6). Ensure a tightening torque of max. 40 Nm.

Operation

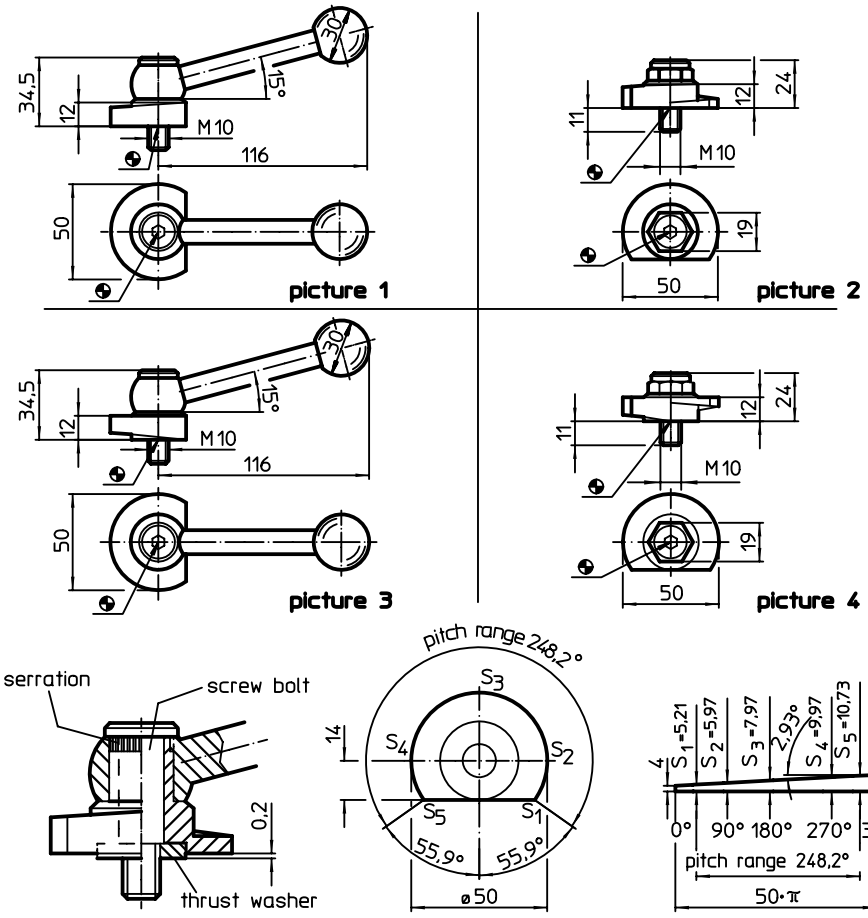
The screw bolt and the washer are adjustable. Once screwed in, the clamping catch can easily be turned to the desired position. For Art. No. 22260.0250 / .0251 and 22260.0450 / .0451, the serration helps to put the clamping lever to the preferred position.

MORE INFORMATION

Notes

Left turn type can be supplied on request.

DRAWING

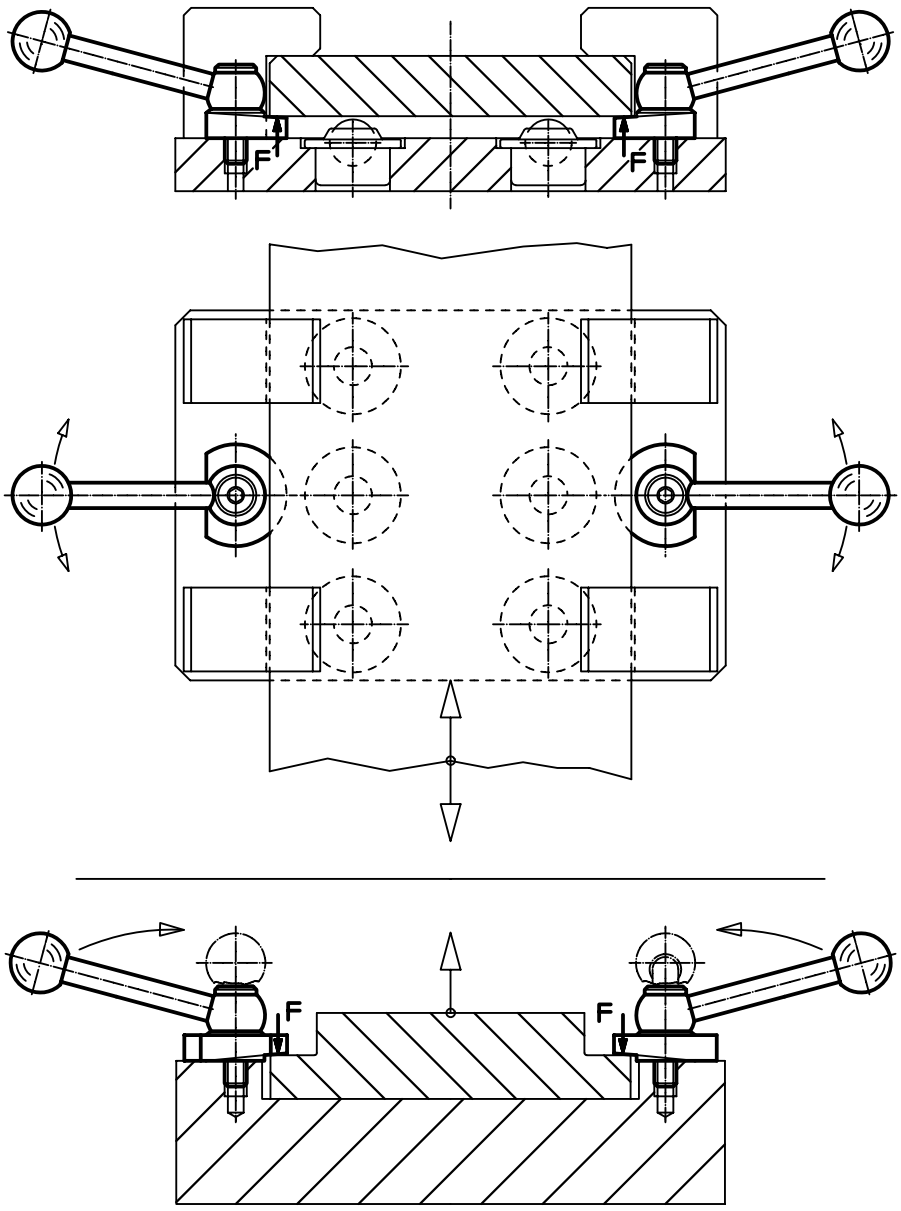


ORDER INFORMATION

Tightening torque max. [Nm]	[g]	Art. No. steel	Art. No. stainless steel
with adjustable clamping lever, pitch opposite to bearing surface – picture 1			
40	304	22260.0250	22260.0251
with clamping screw, pitch opposite to bearing surface – picture 2			
40	154	22260.0350	22260.0351

Tightening torque max. [Nm]	[g]	Art. No. steel	Art. No. stainless steel
with adjustable clamping lever, pitch on bearing surface – picture 3			
40	302	22260.0450	22260.0451
with clamping screw, pitch on bearing surface – picture 4			
40	154	22260.0550	22260.0551

APPLICATION EXAMPLE



2

Shaft-End Washers

EH 22270.

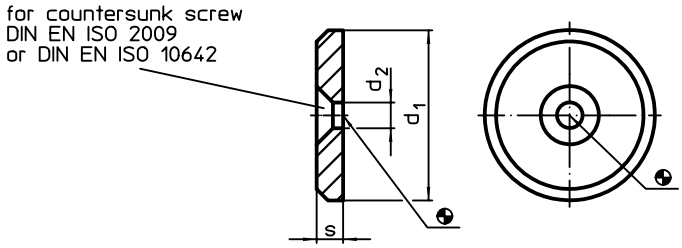


PRODUCT DESCRIPTION

Material

- Free cutting steel, unhardened, blackened
- Stainless steel 1.4305

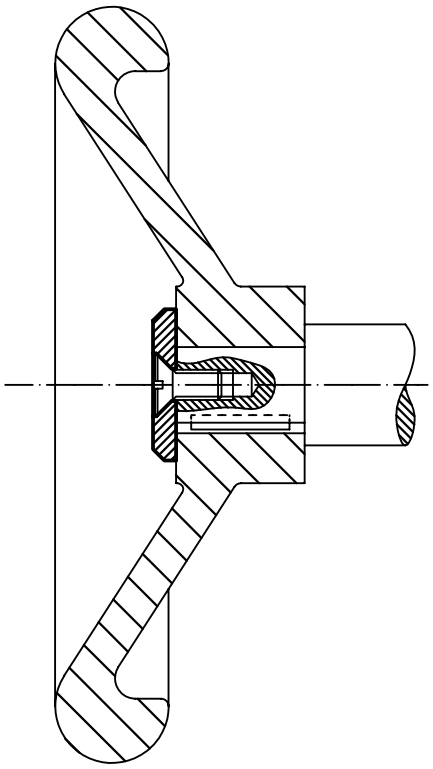
DRAWING



ORDER INFORMATION

Dimensions				Art. No.	
d_1	d_2	s		free cutting steel	stainless steel
	[mm]		[g]		
16	4,5	3,0	3,6	22270.0016	22270.0116
20	4,5	3,0	6,1	22270.0020	22270.0120
22	5,5	3,5	8,1	22270.0022	22270.0122
25	5,5	3,5	11,0	22270.0025	22270.0125
28	5,5	3,5	14,0	22270.0028	22270.0128
32	6,6	4,0	22,0	22270.0032	22270.0132
36	6,6	4,0	28,0	22270.0036	22270.0136
40	6,6	5,0	44,0	22270.0040	22270.0140
45	6,6	6,0	68,0	22270.0045	22270.0145
52	6,6	6,0	92,0	22270.0052	22270.0152

APPLICATION EXAMPLE



Captive C-Washers • DIN 6371 with countersunk screw DIN 923

EH 22280.



PRODUCT DESCRIPTION

Material

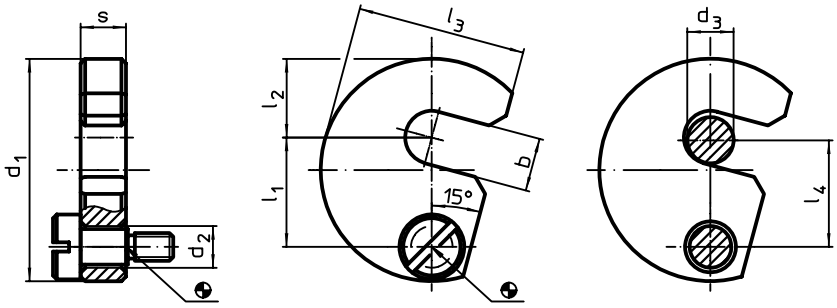
Countersunk screw
- Steel, blackened, quality 5.8

Captive C-Washer
- Heat-treated steel, tempered, blackened

Assembly

The captive C-washers can be installed on both sides using the included bolt. You can select either clockwise or anti-clockwise rotation.

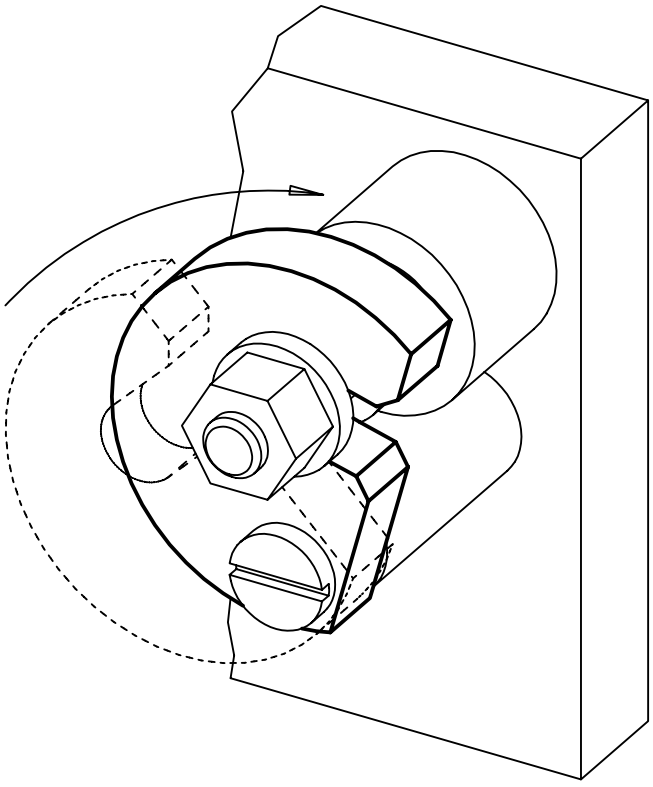
DRAWING



ORDER INFORMATION

Nominal size d_3	Dimensions								Suitable screw		Art. No.
	b	d_1	d_2	l_1	l_2	l_3	l_4	s -0,2			
[mm]	[mm]								[mm]	[g]	
6	7,5	38	9	19,6	11	29,0	19	9,8	M6 x 10	66	22280.0006
8	9,5	43	9	21,6	14	32,5	21	9,8	M6 x 10	81	22280.0008
10	11,5	48	9	23,6	17	36,5	23	9,8	M6 x 10	99	22280.0010
12	13,5	61	11	29,6	22	45,0	29	11,8	M8 x 12	194	22280.0012
16	17,5	68	11	33,6	25	50,0	33	11,8	M8 x 12	229	22280.0016
20	21,5	74	11	36,6	28	55,0	36	11,8	M8 x 12	265	22280.0020
24	25,5	82	11	40,6	32	62,0	40	15,8	M8 x 16	430	22280.0024
30	32,0	97	11	49,0	39	73,0	48	15,8	M8 x 16	584	22280.0030

APPLICATION EXAMPLE



2

C-Washers • DIN 6372

EH 22290.

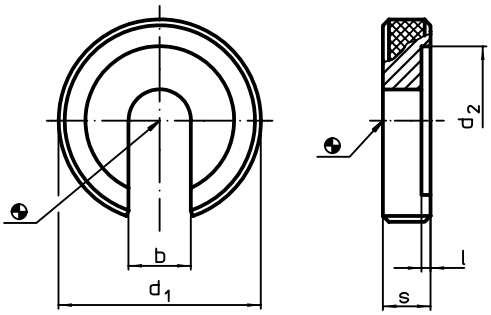


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, blackened

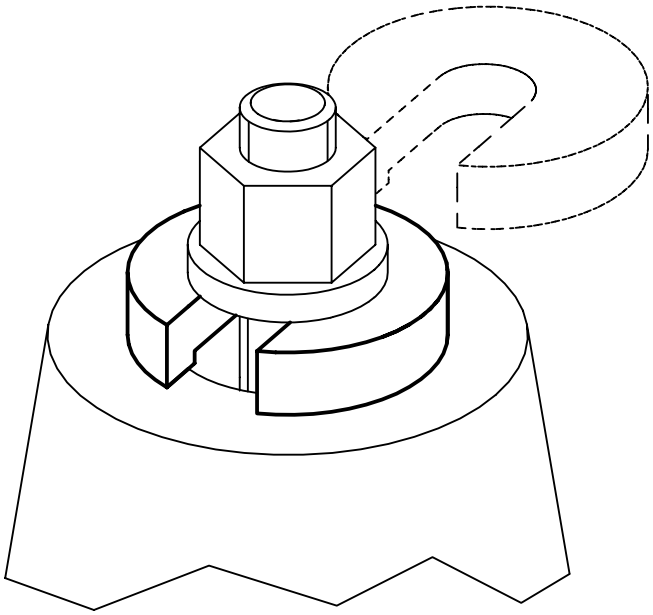
DRAWING



ORDER INFORMATION

Nominal size [mm]	Dimensions b	d_1	d_2	l	s [mm]	[g]	Art. No.
6	6,4	22	16	0,8	6	13	22290.0006
8	8,4	28	21	1,0	7	23	22290.0008
10	10,5	34	25	1,2	8	38	22290.0010
12	13,0	40	30	1,8	9	56	22290.0012
16	17,0	56	37	1,8	12	164	22290.0016
20	21,0	64	45	2,0	14	241	22290.0020
24	25,0	75	52	2,0	16	376	22290.0024
30	31,0	90	65	2,0	18	610	22290.0030
36	37,0	100	75	2,5	20	796	22290.0036

APPLICATION EXAMPLE



Ball Lock Connectors • self-locking, with holder

EH 22330.



PRODUCT DESCRIPTION

Parts can be connected fast and easily with the ball lock connector in combination with the locating bushings.
The locating bushings are made from stainless steel. There are two versions available that can be mounted into wood (picture 2 and picture 4) and one version that can be mounted into plastic (picture 3). Both bushings (picture 2 and picture 3) allow an interlock of 4x90°.
The bushing (picture 4) enables a 360° rotation in the locked state.
As a robust tool, the item is made from stainless steel. The ball lock connector is maintenance-free, soundless and secured against loss.

Material

Pin part
- Stainless steel 1.4305

Sling swivel ports
- Stainless steel 1.4305

Ball
- Stainless steel

Spring
- Stainless steel

Assembly

Mounting into wood (picture 2 and picture 4)
1. Insert location hole and pilot hole for safety bolt according to specifications
2. Optionally recommended is the use of adhesive for securing
3. Press in bushing
4. Secure bushing with a screw

Note: The bore diameter (D_2) for the pilot hole of the safety bolt depends on the screw used.

Mounting into plastic (picture 3)
1. Insert location hole according specifications
2. Optionally recommended is the use of adhesive for securing
3. Screw in bushing

Note: The bore diameter to be chosen for the location hole depends on the hardness of the plastic.

Operation

The balls are unlocked by pressing the knob.

Characteristic

At l_1 or l_2: marking line

MORE INFORMATION

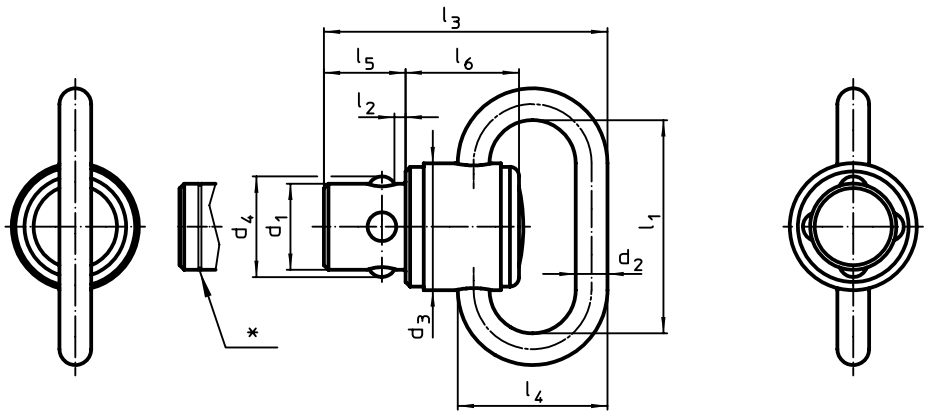
Notes

Special types on request.

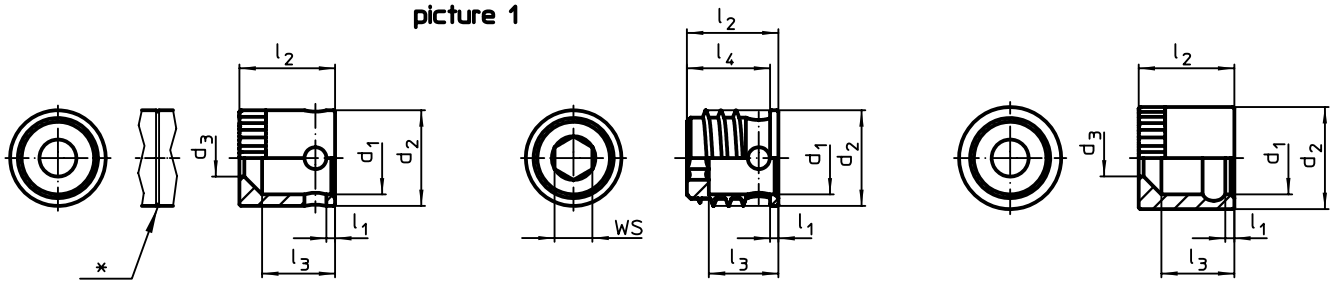
Further products

Ball Lock Connectors, self-locking, with holder, compact construction. . . . . → p. 183
Ball Lock Connectors, self-locking, with holding rings . . . . . → p. 185

DRAWING



picture 1





picture 2

picture 3

picture 4

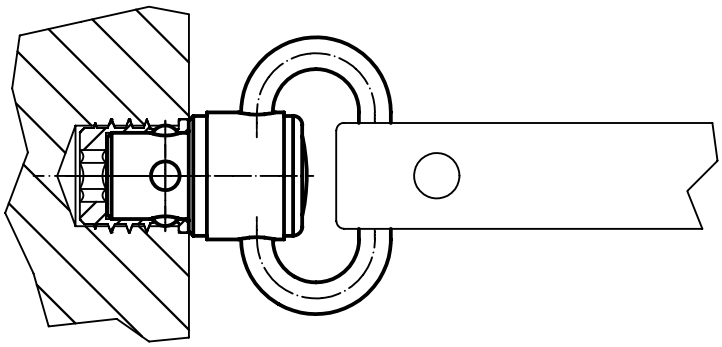
* For l_1 or l_2 = 1,5 with marking.

2

ORDER INFORMATION

Nominal diameter d_1	Dimensions l_1	l_2	d_2	d_3	d_4	l_3	l_4	l_5	l_6	Load capacity max.	min.	max.		Art. No.
[mm]	[mm]									[kN]	[°C]		[g]	
ball lock connector – picture 1														
9,50	**23,0**	**1,00**	3,50	14,0	11,1	31,30	16,5	9	12,5	1,2	-50	150	21,0	**22330.0110**
		1,50	3,50	14,0	11,1	31,30	16,5	9	12,5	1,2	-50	150	21,0	**22330.0111**
	40,0	**1,00**	4,50	14,0	11,1	36,60	23,0	9	12,5	2,0	-50	150	34,0	**22330.0120**
		1,50	4,50	14,0	11,1	36,60	23,0	9	12,5	2,0	-50	150	34,0	**22330.0121**
bushing, mounting in wood – picture 2														
9,55	**1,0**	**12,65**	12,65	4,9	–	9,65	–	–	–	–	-50	150	7,0	**22330.0305**
	1,5	**12,65**	12,65	4,9	–	9,65	–	–	–	–	-50	150	7,0	**22330.0306**
bushing, mounting in plastic – picture 3														
9,55	**1,0**	**12,10**	12,65	–	10,7	9,20	11,0	–	–	–	-50	150	5,0	**22330.0310**
	1,5	**12,10**	12,65	–	10,7	9,20	11,0	–	–	–	-50	150	5,0	**22330.0311**
bushing, mounting in wood, 360° function – picture 4														
9,55	**1,0**	**12,65**	13,50	4,9	–	9,65	–	–	–	–	-50	150	8,5	**22330.0315**
	1,5	**12,65**	13,50	4,9	–	9,65	–	–	–	–	-50	150	8,5	**22330.0316**

APPLICATION EXAMPLE



Ball Lock Connectors • self-locking, with holder, compact construction

EH 22330.



PRODUCT DESCRIPTION

Parts can be connected fast and easily with the ball lock connector in combination with the locating bushings.
The locating bushings are made from stainless steel. There are two versions available that can be mounted into wood (picture 2 and picture 4) and one version that can be mounted into plastic (picture 3). Both bushings (picture 2 and picture 3) allow an interlock of 4x90°.
The bushing (picture 4) enables a 360° rotation in the locked state.
As a robust tool, the item is made from stainless steel. The ball lock connector is maintenance-free, soundless and secured against loss.

Material

Pin part
- Stainless steel 1.4542

Sling swivel ports
- Stainless steel 1.4305

Ball
- Stainless steel

Spring
- Stainless steel

Assembly

Mounting into wood (picture 2 and picture 4)
1. Insert location hole and pilot hole for safety bolt according to specifications
2. Optionally recommended is the use of adhesive for securing
3. Press in bushing
4. Secure bushing with a screw

Note: The bore diameter (D_2) for the pilot hole of the safety bolt depends on the screw used.

Mounting into plastic (picture 3)
1. Insert location hole according specifications
2. Optionally recommended is the use of adhesive for securing
3. Screw in bushing

Note: The bore diameter to be chosen for the location hole depends on the hardness of the plastic.

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

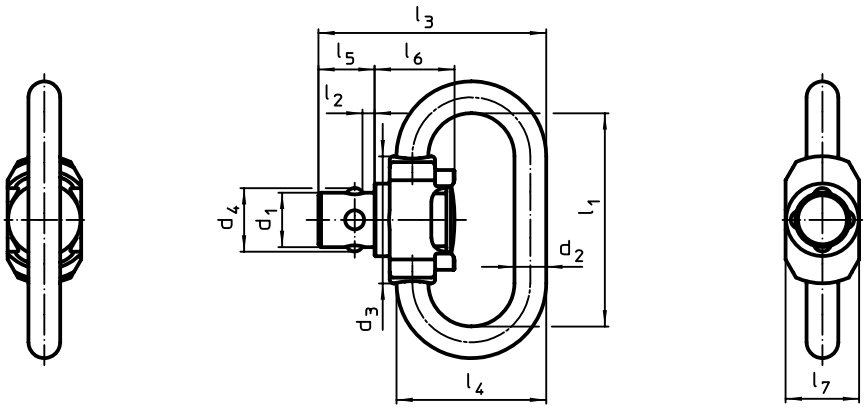
Notes

Special types on request.

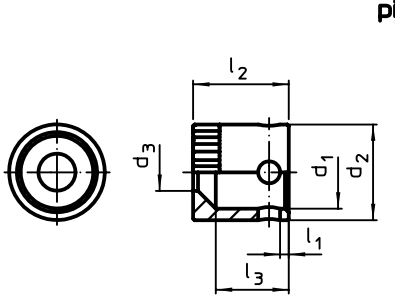
Further products

Ball Lock Connectors, self-locking, with holder. . . . . → p. 181
Ball Lock Connectors, self-locking, with holding rings . . . . . → p. 185

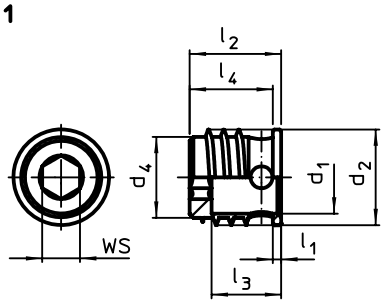
MASSZEICHNUNG



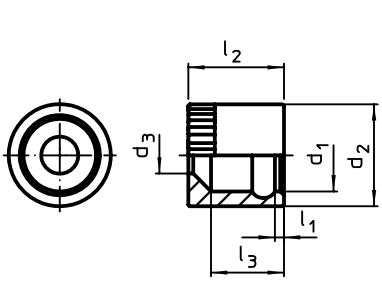
picture 1



picture 2



picture 3



picture 4

2

ORDER INFORMATION

Nominal diameter d_1	Dimensions										Load capacity max.				Art. No.
	l_1	l_2	d_2	d_3	d_4	l_3	l_4	l_5	l_6	l_7		min.	max.		
[mm]	[mm]										[kN]	[°C]		[g]	
ball lock connector – picture 1															
6,00	**23**	**1**	3,50	14,0	7,0	22,0	16,5	6,2	8,8	8,1	1,5	-50	150	10,0	**22330.0402**
bushing, mounting in wood – picture 2															
6,05	**1**	**9**	8,15	3,1	–	6,5	–	–	–	–	–	-50	150	1,7	**22330.0405**
bushing, mounting in plastic – picture 3															
6,05	**1**	**9**	10,00	–	8,2	6,5	8,2	–	–	–	–	-50	150	2,1	**22330.0407**
bushing, mounting in wood, 360° function – picture 4															
6,05	**1**	**9**	9,15	3,1	–	6,5	–	–	–	–	–	-50	150	2,6	**22330.0409**

Ball Lock Connectors • self-locking, with holding rings

EH 22340.



PRODUCT DESCRIPTION

With the ball connector, parts and tools can be secured or connected quickly and easily.

Material

Pin
- Stainless steel 1.4305

Bushing
- Stainless steel 1.4305

Rings
- Stainless steel

Spring
- Stainless steel

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

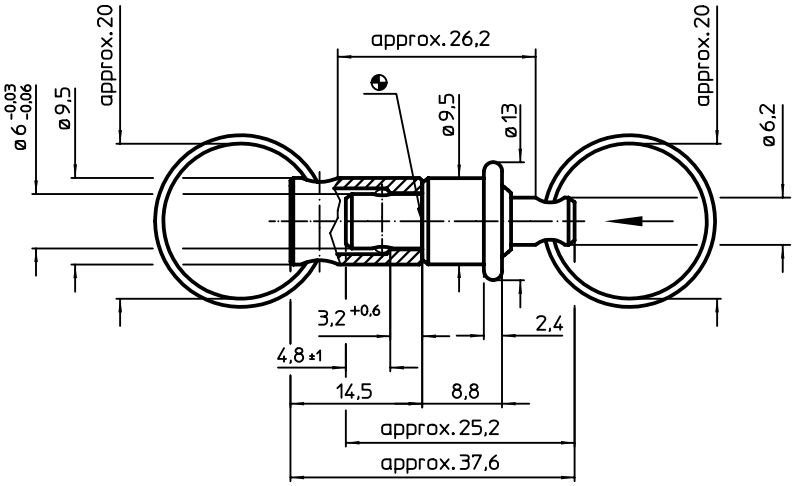
Notes

Pin and bushing separately on request.

Further products

Ball Lock Connectors, self-locking, with holder. . . . . → p. 181
Ball Lock Connectors, self-locking, with holder, compact construction. . . . . → p. 183

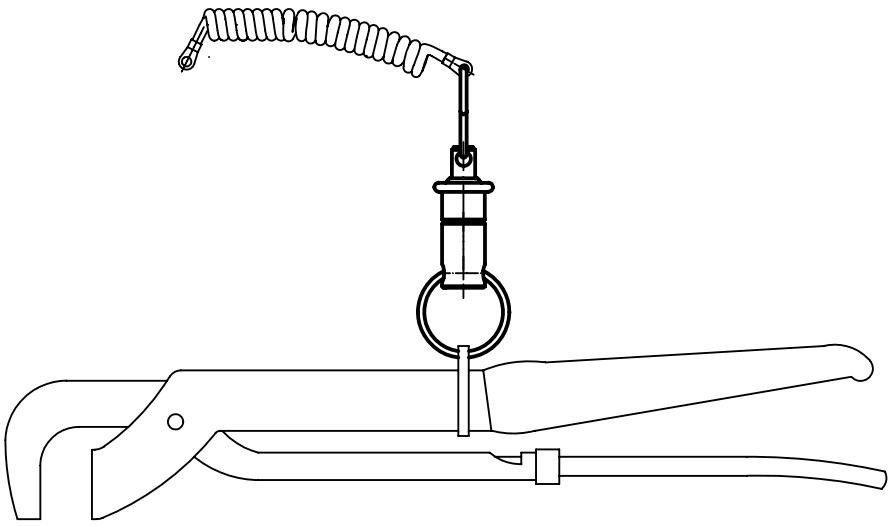
DRAWING



ORDER INFORMATION

Load capacity max. [N]	max. [°C]	[g]	Art. No.
30	250	15	22340.0905

APPLICATION EXAMPLE



2

SELF-LOCKING LIFTING PINS

READY TO SUPPORT ANY LOAD

LIFTING CAPACITY OF UP TO 1,000 KG

Aside from delivering an exceptional lifting capacity, our lifting pins require next to no effort as they are in no need of a thread. Better still, they ensure maximum safety during use.

The assortment was also extended by a variant with manual handle. This allows easy, safe and reliable manual lifting and transport of unhandy components.

www.halder.com/
LiftingPins-Video



Lifting Pins • self-locking

EH 22350.



PRODUCT DESCRIPTION

Heavy-duty lifting element for quick and easy use, with moveable shackle and locking stud to provide protection against unintentional unlocking. Special lifting devices, e.g. threads for ring bolts, are no longer required on the workpiece.
All versions are corrosion-resistant.

Material

Pin part
- Heat-treated steel, tempered, manganese phosphated

Press button
- Aluminium, red anodised

Shackle
- Heat-treated steel, tempered, manganese phosphated

Spring
- Stainless steel

Assembly

Simple H11 boreholes are sufficient.
Each lifting pin contains an instruction manual with an EC Declaration of Conformity.

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

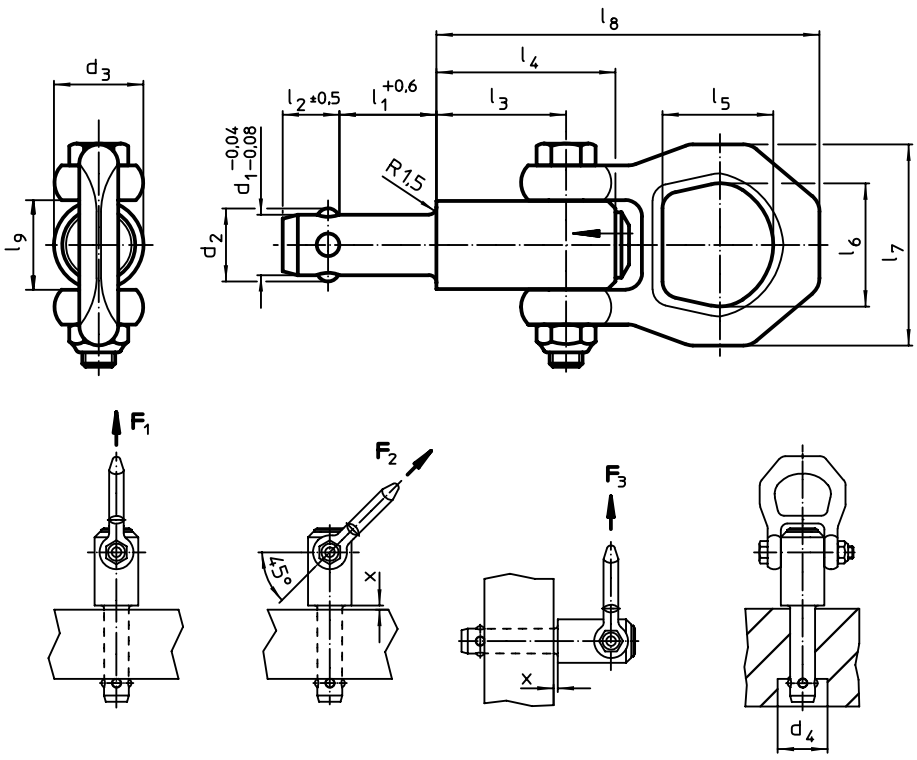
Accessories

As accessories, we offer matching locating bushings for d_1 = 8, 10, 12, 16 and 20

Further products

Lifting Pins, self-locking, stainless steel . . . . . → p. 189
Locating Bushings, for lifting pins . . . . → p. 191
Locating Bushings, plain, for lifting pins . . . . . → p. 193
Locating Bushings with Seal, plain, for lifting pins. . . . . → p. 195
Threaded Lifting Pins, self-locking. . . . → p. 199

DRAWING



ORDER INFORMATION

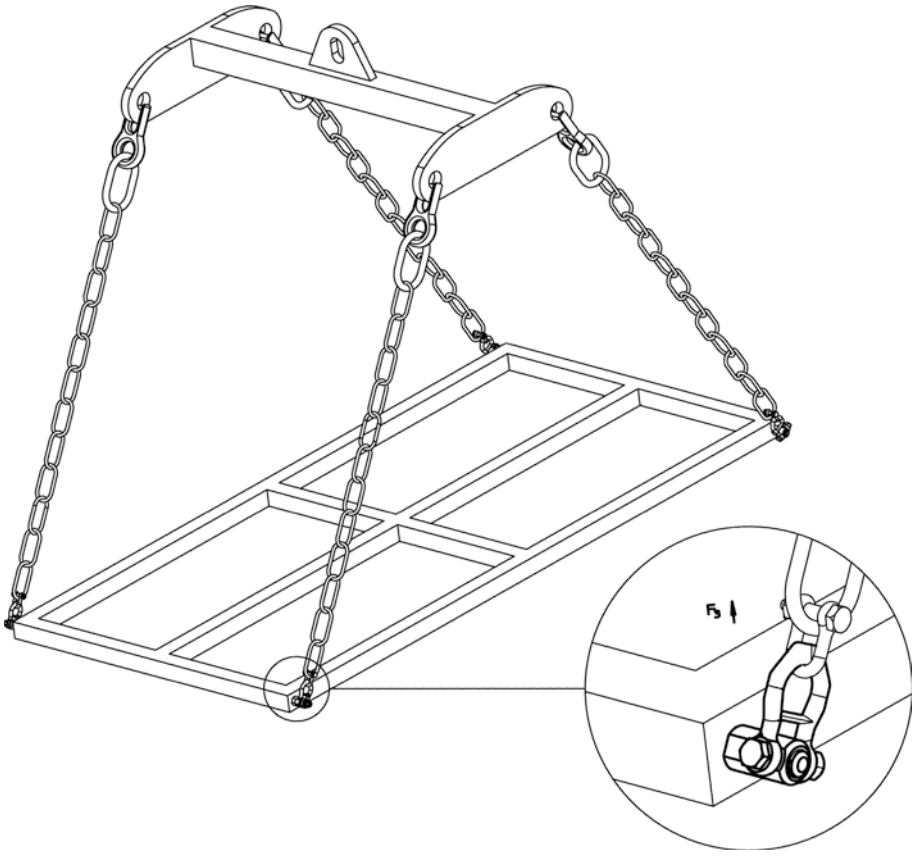
Dimensions													Carrying force[1]			x		Location hole H11	max.		Art. No.
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4 min.	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	F_1	F_2	F_3	[1] min.	max.				
[mm]													[kN]			[mm]		[mm]	[°C]	[g]	
8,0	10	9,35	21,5	9,85	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	5	8,0	250	218	22350.0601
	15	9,35	21,5	9,85	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	10	8,0	250	220	22350.0602
	25	9,35	21,5	9,85	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	15	8,0	250	223	22350.0604
	35	9,35	21,5	9,85	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	15	8,0	250	226	22350.0606

[1] for a 5-fold safety against breakage →

Dimensions													Carrying force[1]			x		Location hole H11	max.		Art. No.
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4 min.	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	F_1	F_2	F_3	[1] min.	max.				
[mm]													[kN]			[mm]		[mm]	[°C]	[g]	
8,3	10	9,65	21,5	10,05	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	5	8,3	250	218	22350.0611
	15	9,65	21,5	10,05	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	10	8,3	250	219	22350.0612
	25	9,65	21,5	10,05	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	15	8,3	250	223	22350.0614
	35	9,65	21,5	10,05	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	15	8,3	250	228	22350.0616
10,0	15	11,70	21,5	12,20	10,20	25,7	36,0	27,0	30	49	87,5	21,5	2,7	2,4	2,1	1,5	10	10,0	250	226	22350.0621
	25	11,70	21,5	12,20	10,20	25,7	36,0	27,0	30	49	87,5	21,5	2,7	2,4	2,1	1,5	10	10,0	250	238	22350.0623
	35	11,70	21,5	12,20	10,20	25,7	36,0	27,0	30	49	87,5	21,5	2,7	2,4	2,1	1,5	10	10,0	250	244	22350.0625
	50	11,70	21,5	12,20	10,20	25,7	36,0	27,0	30	49	87,5	21,5	2,7	2,4	2,1	1,5	10	10,0	250	252	22350.0627
12,0	15	14,20	21,5	14,70	11,00	25,7	36,0	27,0	30	49	87,5	21,5	3,5	3,2	2,8	1,5	10	12,0	250	238	22350.0631
	25	14,20	21,5	14,70	11,00	25,7	36,0	27,0	30	49	87,5	21,5	3,5	3,2	2,8	1,5	15	12,0	250	243	22350.0633
	35	14,20	21,5	14,70	11,00	25,7	36,0	27,0	30	49	87,5	21,5	3,5	3,2	2,8	1,5	15	12,0	250	251	22350.0635
	50	14,20	21,5	14,70	11,00	25,7	36,0	27,0	30	49	87,5	21,5	3,5	3,2	2,8	1,5	15	12,0	250	268	22350.0637
13,8	25	16,20	21,5	16,70	13,00	25,7	36,0	27,0	30	49	87,5	21,5	3,8	3,5	2,8	1,5	15	13,8	250	251	22350.0651
	50	16,20	21,5	16,70	13,00	25,7	36,0	27,0	30	49	87,5	21,5	3,8	3,5	2,8	1,5	35	13,8	250	279	22350.0653
	75	16,20	21,5	16,70	13,00	25,7	36,0	27,0	30	49	87,5	21,5	3,8	3,5	2,8	1,5	35	13,8	250	309	22350.0655
16,0	25	18,60	25,0	19,20	15,10	31,0	44,5	27,0	30	49	92,8	21,5	4,8	4,5	4,1	1,5	15	16,0	250	312	22350.0641
	50	18,60	25,0	19,20	15,10	31,0	44,5	27,0	30	49	92,8	21,5	4,8	4,5	4,1	1,5	35	16,0	250	353	22350.0643
	75	18,60	25,0	19,20	15,10	31,0	44,5	27,0	30	49	92,8	21,5	4,8	4,5	4,1	1,5	40	16,0	250	388	22350.0645
20,0	50	24,50	30,0	25,00	19,70	36,5	52,0	32,6	36	56	114,0	26,0	10,0	8,5	6,5	1,5	25	20,0	250	607	22350.0673
	75	24,50	30,0	25,00	19,70	36,5	52,0	32,6	36	56	114,0	26,0	10,0	8,5	6,5	1,5	30	20,0	250	666	22350.0675

[1] for a 5-fold safety against breakage

APPLICATION EXAMPLE



Lifting Pins • self-locking, stainless steel

EH 22350.



PRODUCT DESCRIPTION

Heavy-duty lifting element for quick and easy use, with moveable shackle and locking stud to provide protection against unintentional unlocking. Special lifting devices, e.g. threads for ring bolts, are no longer required on the workpiece.
Corrosion and weathering resistant, thus also suitable for outdoor application. Very solid, precipitation-hardened pin with an extreme load capacity.

Material

Pin part
- Stainless steel 1.4542, precipitation-hardened

Press button
- Aluminium, red anodised

Shackle
- Stainless steel 1.4571

Spring
- Stainless steel

Assembly

Simple H11 boreholes are sufficient.
Each lifting pin contains an instruction manual with an EC Declaration of Conformity.

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

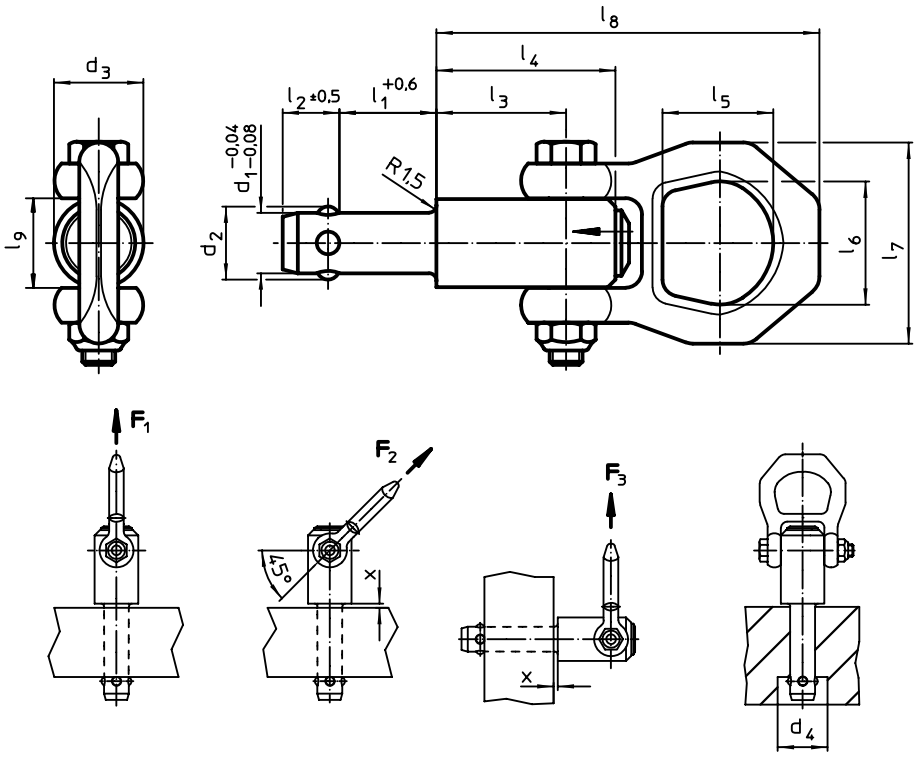
Accessories

As accessories, we offer matching locating bushings for d_1 = 8, 10, 12, 16 and 20

Further products

Lifting Pins, self-locking . . . . . → p. 187
Locating Bushings, for lifting pins . . . . → p. 191
Locating Bushings, plain, for lifting pins . . . . . → p. 193
Locating Bushings with Seal, plain, for lifting pins. . . . . → p. 195
Threaded Lifting Pins, self-locking. . . . → p. 199

DRAWING



ORDER INFORMATION

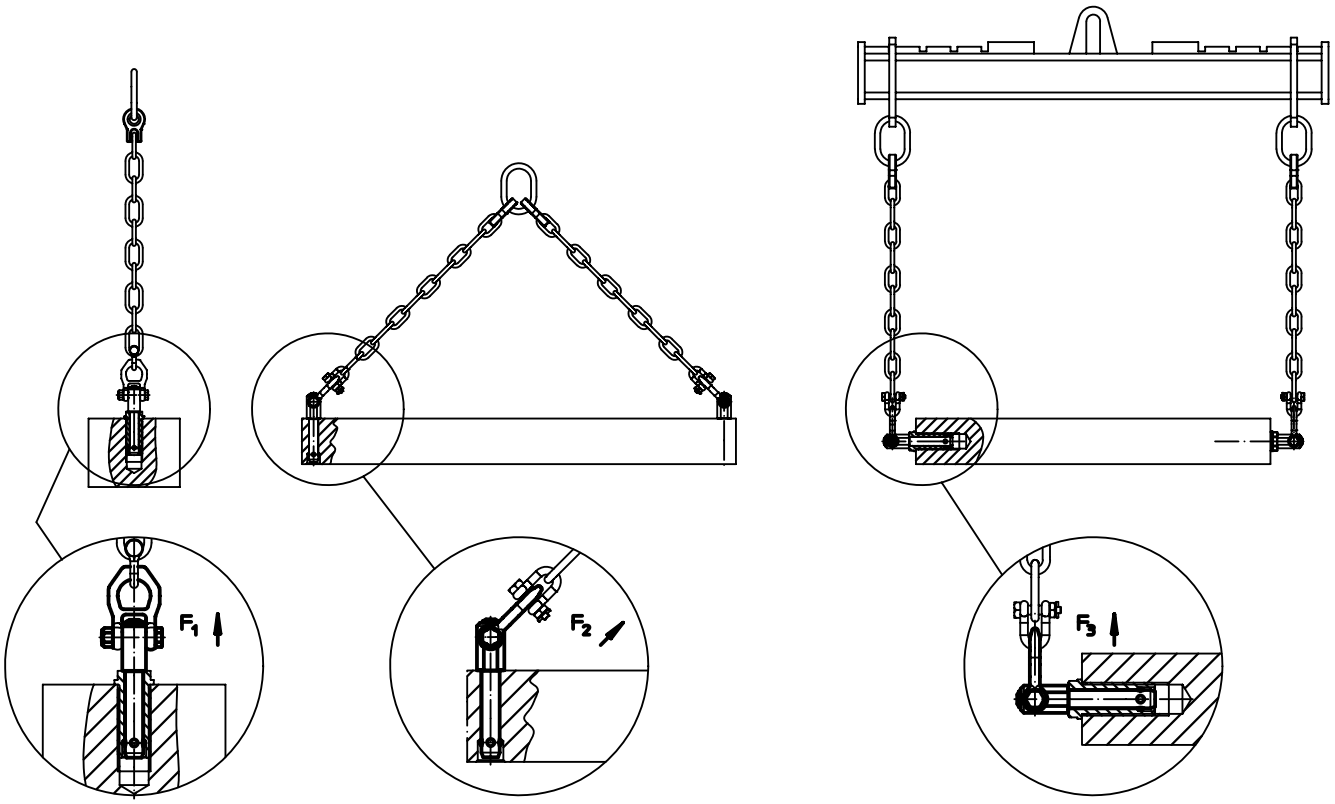
Dimensions													Carrying force[1]			x		Location hole H11	max.		Art. No.
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4 min.	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	F_1	F_2	F_3	[1] min.	max.				
[mm]													[kN]			[mm]		[mm]	[°C]	[g]	
8,0	10	9,35	21,5	9,85	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	5	8,0	250	221	22350.0701
	15	9,35	21,5	9,85	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	10	8,0	250	222	22350.0702
	25	9,35	21,5	9,85	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	15	8,0	250	225	22350.0704
	35	9,35	21,5	9,85	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	15	8,0	250	229	22350.0706

[1] for a 5-fold safety against breakage →

Dimensions													Carrying force[1]			x		Location hole H11	max.		Art. No.
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4 min.	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	F_1	F_2	F_3	[1] min.	max.				
[mm]													[kN]			[mm]		[mm]	[°C]	[g]	
8,3	10	9,65	21,5	10,05	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	5	8,3	250	222	22350.0711
	15	9,65	21,5	10,05	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	10	8,3	250	223	22350.0712
	25	9,65	21,5	10,05	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	15	8,3	250	225	22350.0714
	35	9,65	21,5	10,05	8,75	25,7	36,0	27,0	30	49	87,5	21,5	1,5	1,2	0,5	1,5	15	8,3	250	231	22350.0716
10,0	15	11,70	21,5	12,20	10,20	25,7	36,0	27,0	30	49	87,5	21,5	2,7	2,4	2,1	1,5	10	10,0	250	233	22350.0721
	25	11,70	21,5	12,20	10,20	25,7	36,0	27,0	30	49	87,5	21,5	2,7	2,4	2,1	1,5	10	10,0	250	243	22350.0723
	35	11,70	21,5	12,20	10,20	25,7	36,0	27,0	30	49	87,5	21,5	2,7	2,4	2,1	1,5	10	10,0	250	250	22350.0725
	50	11,70	21,5	12,20	10,20	25,7	36,0	27,0	30	49	87,5	21,5	2,7	2,4	2,1	1,5	10	10,0	250	257	22350.0727
12,0	15	14,20	21,5	14,70	11,00	25,7	36,0	27,0	30	49	87,5	21,5	3,5	3,2	2,8	1,5	10	12,0	250	246	22350.0731
	25	14,20	21,5	14,70	11,00	25,7	36,0	27,0	30	49	87,5	21,5	3,5	3,2	2,8	1,5	15	12,0	250	255	22350.0733
	35	14,20	21,5	14,70	11,00	25,7	36,0	27,0	30	49	87,5	21,5	3,5	3,2	2,8	1,5	15	12,0	250	265	22350.0735
	50	14,20	21,5	14,70	11,00	25,7	36,0	27,0	30	49	87,5	21,5	3,5	3,2	2,8	1,5	15	12,0	250	273	22350.0737
13,8	25	16,20	21,5	16,70	13,00	25,7	36,0	27,0	30	49	87,5	21,5	3,8	3,5	2,8	1,5	15	13,8	250	255	22350.0751
	50	16,20	21,5	16,70	13,00	25,7	36,0	27,0	30	49	87,5	21,5	3,8	3,5	2,8	1,5	35	13,8	250	283	22350.0753
	75	16,20	21,5	16,70	13,00	25,7	36,0	27,0	30	49	87,5	21,5	3,8	3,5	2,8	1,5	35	13,8	250	311	22350.0755
16,0	25	18,60	25,0	19,20	15,10	31,0	44,5	27,0	30	49	92,8	21,5	4,8	4,5	4,1	1,5	15	16,0	250	313	22350.0741
	50	18,60	25,0	19,20	15,10	31,0	44,5	27,0	30	49	92,8	21,5	4,8	4,5	4,1	1,5	35	16,0	250	367	22350.0743
	75	18,60	25,0	19,20	15,10	31,0	44,5	27,0	30	49	92,8	21,5	4,8	4,5	4,1	1,5	40	16,0	250	403	22350.0745
20,0	50	24,50	30,0	25,00	19,70	36,5	52,0	32,6	36	56	114,0	26,0	10,0	8,5	6,5	1,5	25	20,0	250	607	22350.0773
	75	24,50	30,0	25,00	19,70	36,5	52,0	32,6	36	56	114,0	26,0	10,0	8,5	6,5	1,5	30	20,0	250	666	22350.0775

[1] for a 5-fold safety against breakage

APPLICATION EXAMPLE



Locating Bushings • for lifting pins

EH 22350.



PRODUCT DESCRIPTION

Locating bushings are used for quick and safe locating of lifting pins EH 22350. / EH 22351.
Corrosion and abrasion resistant.

Material

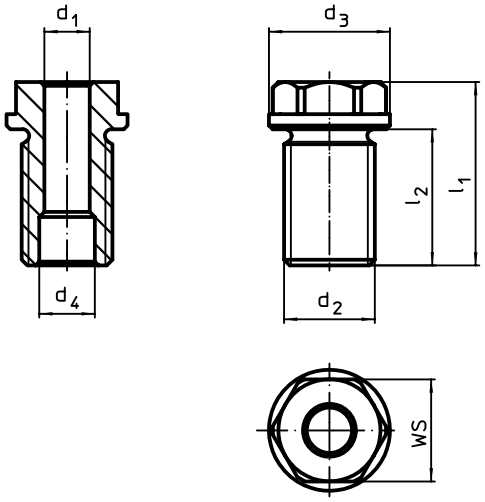
- Stainless steel 1.4542, precipitation-hardened

Easily incorporated into different materials.
Can be mounted in blind holes.
For thin-walled parts, lock nuts are used for assembly.

Assembly

Safe tolerances and consistent function.

DRAWING



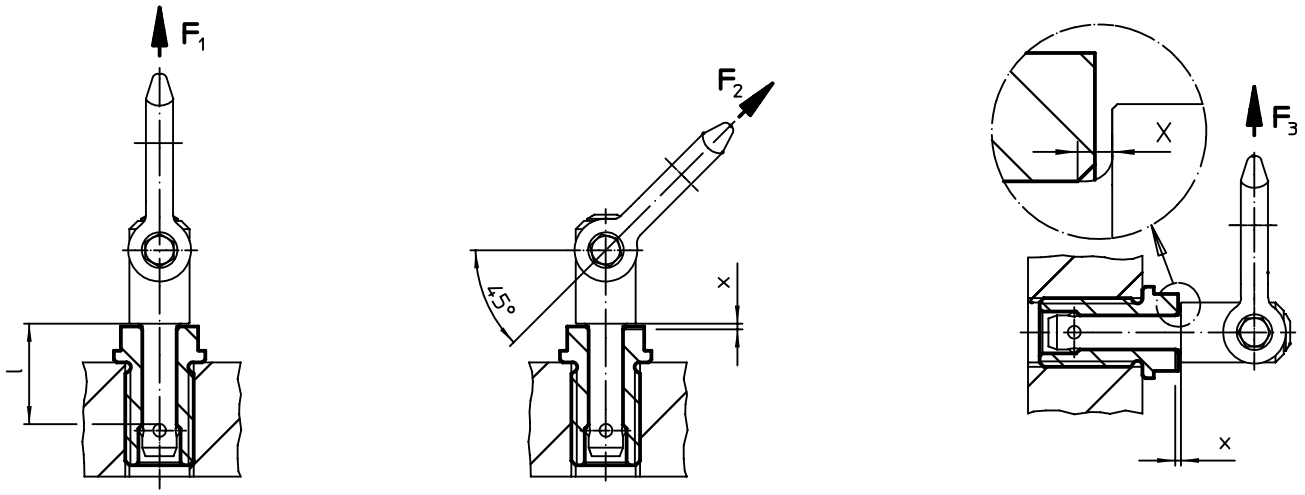
ORDER INFORMATION

Dimensions d_1 H11	Dimensions d_2	For nominal length l	Dimensions d_3 -0,2	Dimensions d_4 +0,3	Dimensions l_1	Dimensions l_2	WS	Tightening torque max.	x[1]	Carrying force[1] F_1	Carrying force[1] F_2	Carrying force[1] F_3	For lifting pin		Art. No.
[mm]		[mm]	[mm]				[mm]	[Nm]	[mm]	[kN]				[g]	
8	M16 x 1,5	10	24	9,8	27,5	20	19	90	1,5	1,5	1,2	0,5	22350.0601 / .0701	32	22350.0900
		15	24	9,8	27,5	20	19	90	1,5	1,5	1,2	0,5	22350.0602 / .0702	33	22350.0902
	M16	25	24	9,8	37,5	25	19	75	1,5	1,5	1,2	0,5	22350.0604 / .0704	46	22350.0904
		35	24	9,8	47,5	35	19	75	1,5	1,5	1,2	0,5	22350.0606 / .0706	55	22350.0906
10	M20 x 1,5	15	28	12,2	35,5	24	24	145	1,5	2,7	2,4	2,1	22350.0621 / .0721	70	22350.0910
		25	28	12,2	35,5	24	24	145	1,5	2,7	2,4	2,1	22350.0623 / .0723	73	22350.0912
	M20	35	28	12,2	46,0	29	24	130	1,5	2,7	2,4	2,1	22350.0625 / .0725	93	22350.0914
		50	28	12,2	65,0	49	24	130	1,5	2,7	2,4	2,1	22350.0627 / .0727	117	22350.0916
12	M24 x 1,5	15	32	14,7	35,5	24	27	220	1,5	3,5	3,2	2,8	22350.0631 / .0731	94	22350.0920
		25	32	14,7	36,5	24	27	220	1,5	3,5	3,2	2,8	22350.0633 / .0733	102	22350.0922
	M24	35	32	14,7	48,5	36	27	200	1,5	3,5	3,2	2,8	22350.0635 / .0735	119	22350.0924
		50	32	14,7	72,5	60	27	200	1,5	3,5	3,2	2,8	22350.0637 / .0737	164	22350.0926
16	M30 x 2	25	39	19,2	44,0	29	30	440	1,5	4,8	4,5	4,1	22350.0641 / .0741	163	22350.0930
	M30	50	39	19,2	66,0	44	30	400	1,5	4,8	4,5	4,1	22350.0643 / .0743	236	22350.0934
		75	39	19,2	96,0	74	30	400	1,5	4,8	4,5	4,1	22350.0645 / .0745	323	22350.0936
20	M36 x 2	50	43	26,0	70,0	55	36	440	1,5	10,0	8,5	6,5	22350.0673 / .0773	366	22350.0954
		75	43	26,0	95,0	80	36	440	1,5	10,0	8,5	6,5	22350.0675 / .0775	503	22350.0956

[1] for a 5-fold safety against breakage

2

APPLICATION EXAMPLE



Locating Bushings, plain • for lifting pins

EH 22350.



PRODUCT DESCRIPTION

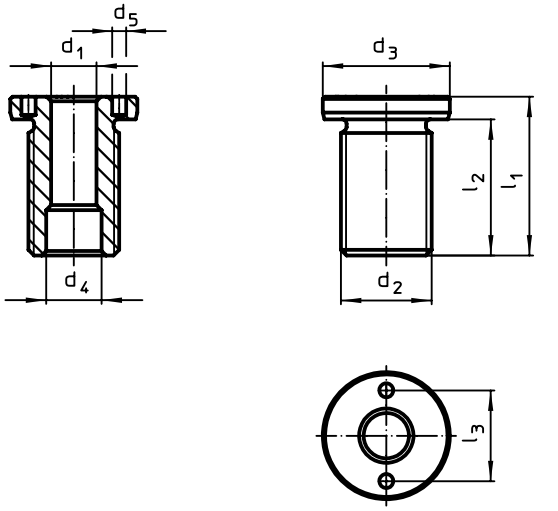
Locating bushings are used for quick and safe locating of lifting pins EH 22350. / EH 22351.
This design is suitable for applications which require installation flush to the surface.
A face wrench is required for installation. As an accessory, we offer a standard adjustable face wrench, offset, and a face and socket wrench. In combination with a socket-wrench/ screwdriver, the face and socket wrench is especially suitable for use if space is restricted.
Corrosion and abrasion resistant.

Material
- Stainless steel 1.4542, precipitation-hardened

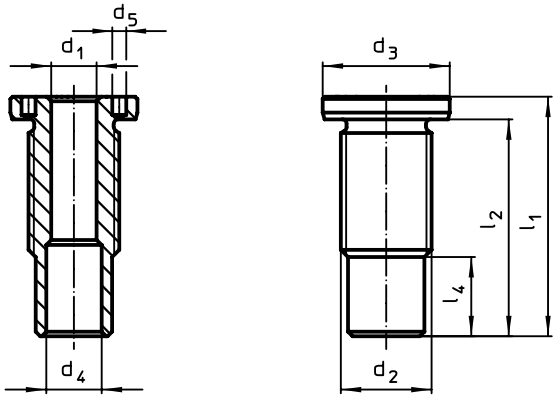
Assembly
Safe tolerances and consistent function.

Easily incorporated into different materials.
Bush can be easily installed via optional assembly tool.
Can be mounted in blind holes.
For thin-walled parts, lock nuts are used for assembly.

DRAWING



size M16/M16x1,5/M20
M20x1,5/M24x1,5/M30x2



size M24/M30/M36x2

ORDER INFORMATION

Dimensions d_1 H11 [mm]	Dimensions d_2 [mm]	For nominal length l [mm]	Dimensions d_3 -0,2 [mm]	d_4 +0,3 [mm]	d_5 +0,1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	Tightening torque max. [Nm]	x[1] [mm]	Carrying force[1] F_1 [kN]	F_2 [kN]	F_3 [kN]	For lifting pin	[g]	Art. No.
8	M16 x 1,5	10	24	9,8	3,1	25	20	16	–	75	1,5	1,5	1,2	0,5	22350.0601 / .0701	33	22350.1900
		15	24	9,8	3,1	25	20	16	–	75	1,5	1,5	1,2	0,5	22350.0602 / .0702	33	22350.1902
	M16	25	24	9,8	3,1	35	30	16	–	75	1,5	1,5	1,2	0,5	22350.0604 / .0704	33	22350.1904
		35	24	9,8	3,1	45	40	16	–	75	1,5	1,5	1,2	0,5	22350.0606 / .0706	33	22350.1906
10	M20 x 1,5	15	28	12,2	5,1	30	24	20	–	100	1,5	2,7	2,4	2,1	22350.0621 / .0721	70	22350.1910
		25	28	12,2	5,1	35	29	20	–	100	1,5	2,7	2,4	2,1	22350.0623 / .0723	70	22350.1912
	M20	35	28	12,2	5,1	45	39	20	–	100	1,5	2,7	2,4	2,1	22350.0625 / .0725	70	22350.1914
		50	28	12,2	5,1	60	54	20	–	100	1,5	2,7	2,4	2,1	22350.0627 / .0727	70	22350.1916
12	M24 x 1,5	15	32	14,7	5,1	32	26	22	–	150	1,5	3,5	3,2	2,8	22350.0631 / .0731	94	22350.1920
		25	32	14,7	5,1	40	34	22	–	150	1,5	3,5	3,2	2,8	22350.0633 / .0733	94	22350.1922
	M24	35	32	14,7	5,1	50	44	22	3,8	150	1,5	3,5	3,2	2,8	22350.0635 / .0735	94	22350.1924
		50	32	14,7	5,1	65	59	22	18,8	150	1,5	3,5	3,2	2,8	22350.0637 / .0737	94	22350.1926
16	M30 x 2	25	39	19,2	5,1	45	39	30	–	200	1,5	4,8	4,5	4,1	22350.0641 / .0741	163	22350.1930
	M30	50	39	19,2	5,1	65	59	30	6,0	200	1,5	4,8	4,5	4,1	22350.0643 / .0743	163	22350.1934
		75	39	19,2	5,1	90	84	30	31,0	200	1,5	4,8	4,5	4,1	22350.0645 / .0745	163	22350.1936
20	M36 x 2	50	43	26,0	5,1	70	63	30	3,5	200	1,5	10,0	8,5	6,5	22350.0673 / .0773	340	22350.1954
		75	43	26,0	5,1	95	88	30	28,5	200	1,5	10,0	8,5	6,5	22350.0675 / .0775	340	22350.1956

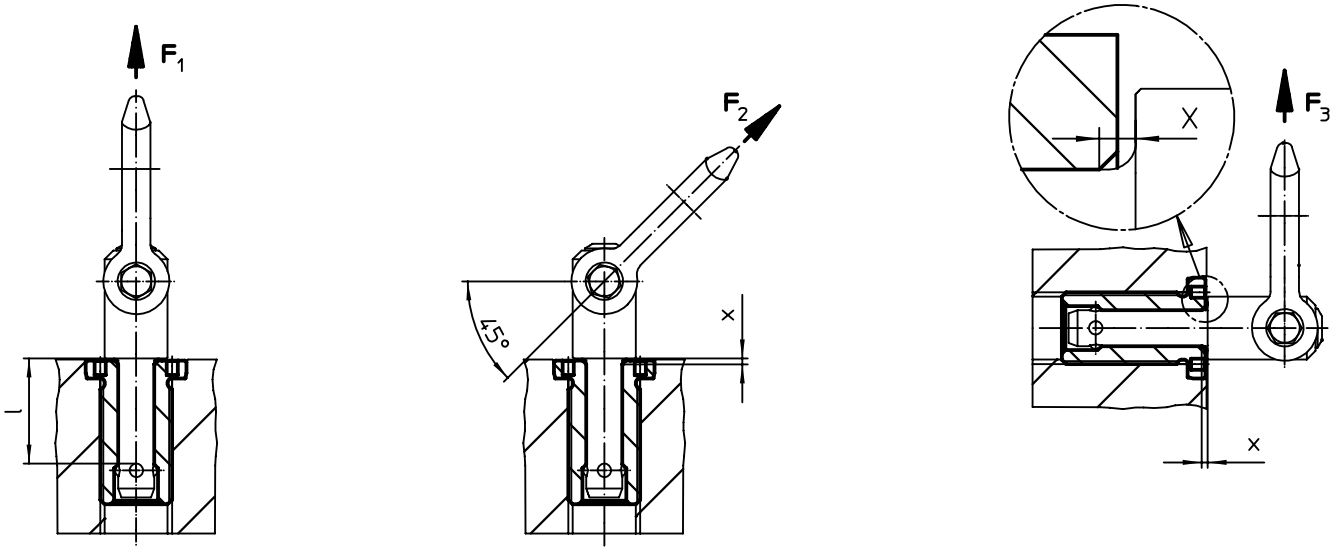
[1] for a 5-fold safety against breakage

2

ACCESSORIES

	Suitable for size d_1 [mm]	Pin spacing ±0,1 [mm]	Pin diameter -0,1 [mm]	Square drive [inch]	[g]	Art. No.
adjustable face wrench, offset						
	**8/10/12**	–	3		121	22350.1990
	16/20/25	–	5		309	22350.1991
face wrench (socket wrench insert)						
	**8**	16	3	1/2	116	22350.1995
	10	20	5	1/2	136	22350.1996
	12	22	5	1/2	185	22350.1997
	16/20	30	5	1/2	243	22350.1998

APPLICATION EXAMPLE



Locating Bushings with Seal, plain • for lifting pins

EH 22350.



PRODUCT DESCRIPTION

The seal prevents the penetration of liquid and dirt. The bushing is therefore especially suitable for use in the open air.
Locating bushings are used for quick and safe locating of lifting pins EH 22350. / EH 22351.
This design is suitable for applications which require installation flush to the surface.
A face wrench is required for installation. As an accessory, we offer a standard adjustable face wrench, offset, and a face and socket wrench. In combination with a socket-wrench/ screwdriver, the face and socket wrench is especially suitable for use if space is restricted.
Corrosion and abrasion resistant.

Material

Bushing
- Stainless steel 1.4542, precipitation-hardened

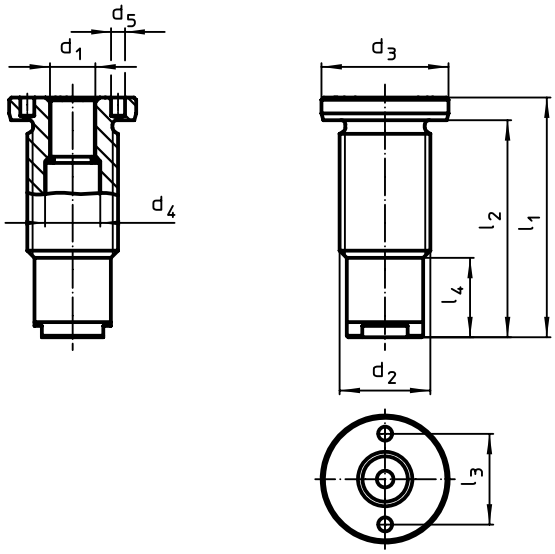
O-ring
- NBR

Spring
- Stainless steel

Assembly

Safe tolerances and consistent function.
Easily incorporated into different materials.
Bush can be easily installed via optional assembly tool.
Can be mounted in blind holes.
For thin-walled parts, lock nuts are used for assembly.

DRAWING



ORDER INFORMATION

Dimensions		For nominal length	Dimensions							Tightening torque max.	x[1]	Carrying force[1]			For lifting pin		Art. No.
d_1 H11	d_2	l	d_3 -0,2	d_4 +0,1	d_5 +0,1	l_1	l_2	l_3	l_4			F_1	F_2	F_3			
[mm]		[mm]	[mm]							[Nm]	[mm]	[kN]				[g]	
8	**M16 x 1,5**	**10**	24	9,9	3,1	37,5	32,5	16	12,5	75	1,5	1,5	1,2	0,5	22350.0601 / .0701	40	**22350.1960**
10	**M20 x 1,5**	**15**	28	12,3	5,1	51,0	45,0	20	21,0	100	1,5	2,7	2,4	2,1	22350.0621 / .0721	82	**22350.1961**
12	**M24 x 1,5**	**15**	32	14,4	5,1	53,0	47,0	22	21,0	150	1,5	3,5	0,2	2,8	22350.0631 / .0731	125	**22350.1962**
16	**M30 x 2**	**25**	39	19,3	5,1	78,0	72,0	30	33,0	200	1,5	4,8	4,5	4,1	22350.0641 / .0741	253	**22350.1963**

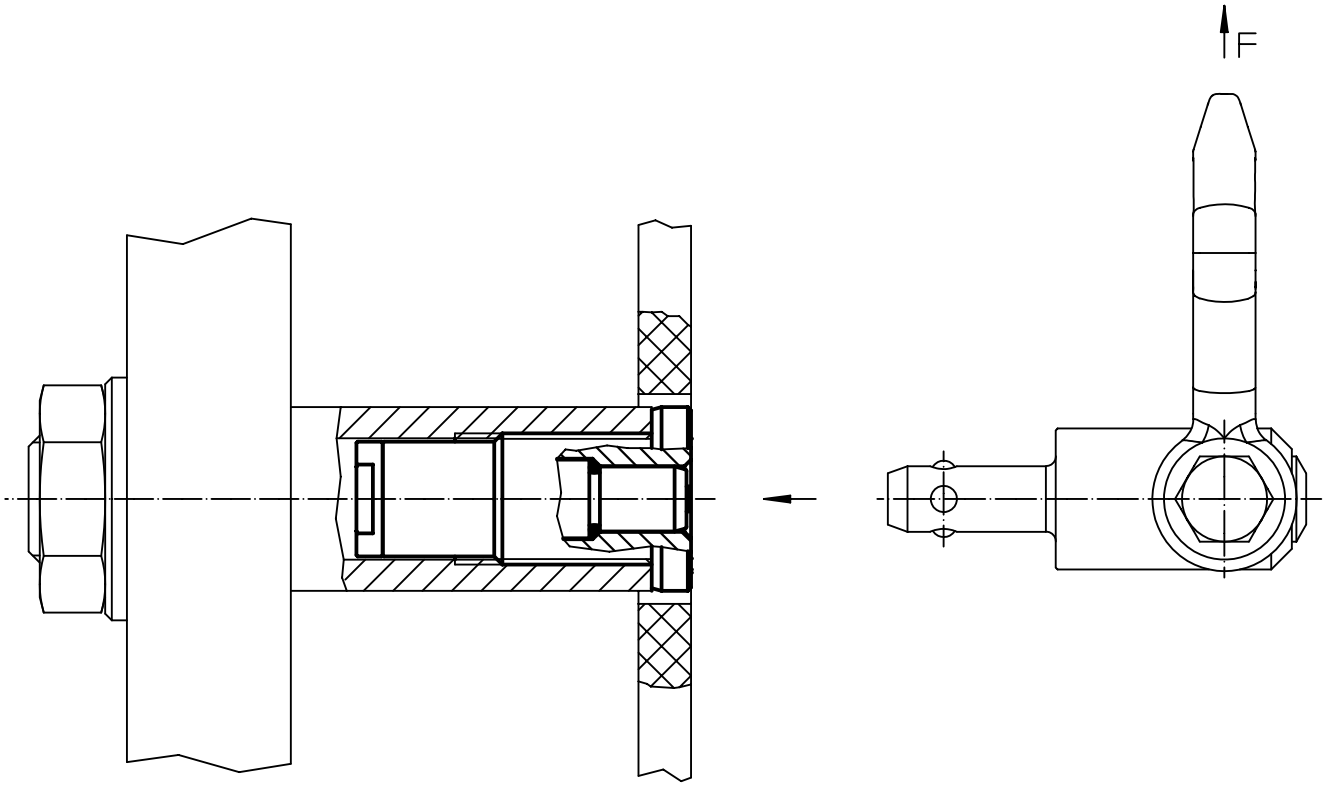
[1] for a 5-fold safety against breakage

2

ACCESSORIES

	Suitable for size d_1 [mm]	Pin spacing ±0,1 [mm]	Pin diameter -0,1 [mm]	Square drive [inch]	[g]	Art. No.
adjustable face wrench, offset						
	**8/10/12**	–	3		121	22350.1990
	16/20/25	–	5		309	22350.1991
face wrench (socket wrench insert)						
	**8**	16	3	1/2	116	22350.1995
	10	20	5	1/2	136	22350.1996
	12	22	5	1/2	185	22350.1997
	16/20	30	5	1/2	243	22350.1998

APPLICATION EXAMPLE



Lifting Pins • self-locking, with handle

EH 22351.



PRODUCT DESCRIPTION

The T-handled grip can be used to move or transport workpieces via hand, e.g. part finished components, workholding systems, speakers and other containers.
Corrosion and weathering resistant, thus also suitable for outdoor application. Very solid, precipitation-hardened pin with an extreme load capacity.

Material

Pin part
- Stainless steel 1.4542, precipitation-hardened

Handle
- Aluminium, blue anodised

Press button
- Aluminium, blue anodised

Spring
- Stainless steel

Assembly

Simple H11 boreholes are sufficient.
Each lifting pin contains an instruction manual with an EC Declaration of Conformity.

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

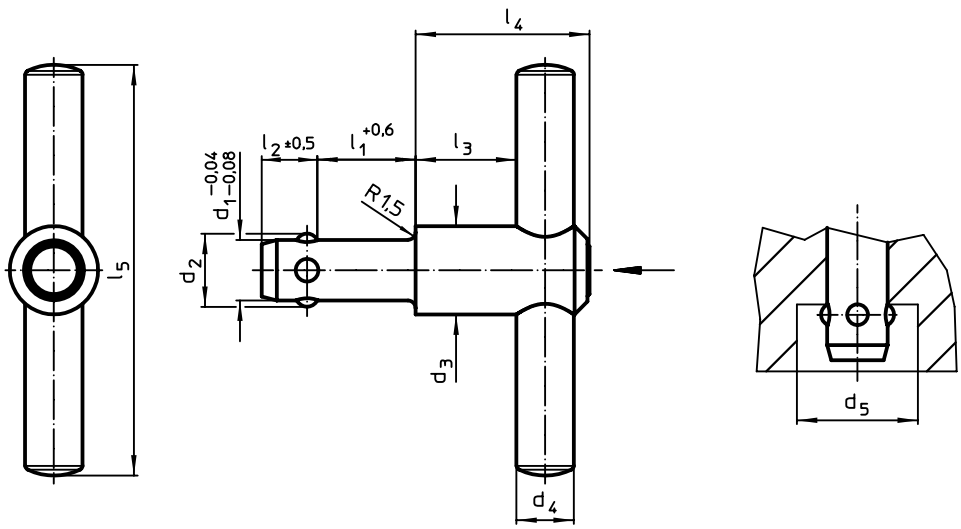
Accessories

As accessories, we offer matching locating bushings for d_1 = 8, 10 and 12

Further products

Locating Bushings, for lifting pins . . . . → p. 191
Locating Bushings, plain, for lifting pins . . . . . → p. 193
Locating Bushings with Seal, plain, for lifting pins. . . . . → p. 195

DRAWING



ORDER INFORMATION

Dimensions										Carrying force	Location hole			Art. No.
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	d_5 min.	l_2	l_3	l_4	l_5	F_1	H11	max.		
[mm]										[N]	[mm]	[°C]	[g]	
8,0	**35**	9,35	21,5	14	9,85	8,75	18,7	36,0	100	500	8,0	250	141	22351.0005
8,3	**35**	9,65	21,5	14	10,05	8,75	18,7	36,0	100	500	8,3	250	142	22351.0010
10,0	**50**	11,70	21,5	14	12,20	10,20	18,7	36,5	100	500	10,0	250	159	22351.0015
12,0	**50**	14,20	21,5	14	14,70	11,00	18,7	36,5	100	500	12,0	250	177	22351.0020

2

THREADED LIFTING PINS

ORANGE IS THE NEW THREAD

Lifting elements that need to fit on threads often require additional connectors. Halder's latest new product helps save time: the threated lifting pins come with the mating thread directly built in. The different versions are fun to handle and offer tremendous savings potential. Better still, the release with the press of a button allows for installation with exceptional ease.

www.halder.com/
ThreadedLiftingPins-Video



Threaded Lifting Pins • self-locking

EH 22352.



PRODUCT DESCRIPTION

Heavy-duty lifting element for quick and easy use, with moveable shackle and locking stud to provide protection against unintentional unlocking. For lifting loads, the threaded lifting pin is inserted into a threaded hole. In contrast to a ringbolt, time-consuming screwing in and out is therefore unnecessary.
All versions are corrosion-protected. The version made from stainless steel is also resistant to corrosion and weathering, so it is also suitable for external use. In addition, the high-strength, precipitation-hardened pin makes extreme loads possible.

Material

Pin part
- Heat-treated steel, tempered, manganese phosphated
- Stainless steel 1.4542, precipitation-hardened

Press button
- Aluminium, orange, anodised

Threaded element
- Stainless steel 1.4542, precipitation-hardened

Shackle
- Heat-treated steel, tempered, manganese phosphated
- Stainless steel 1.4571

Spring
- Stainless steel

Assembly

For insertion into threads.
Each lifting pin contains an instruction manual with an EC Declaration of Conformity.

Operation

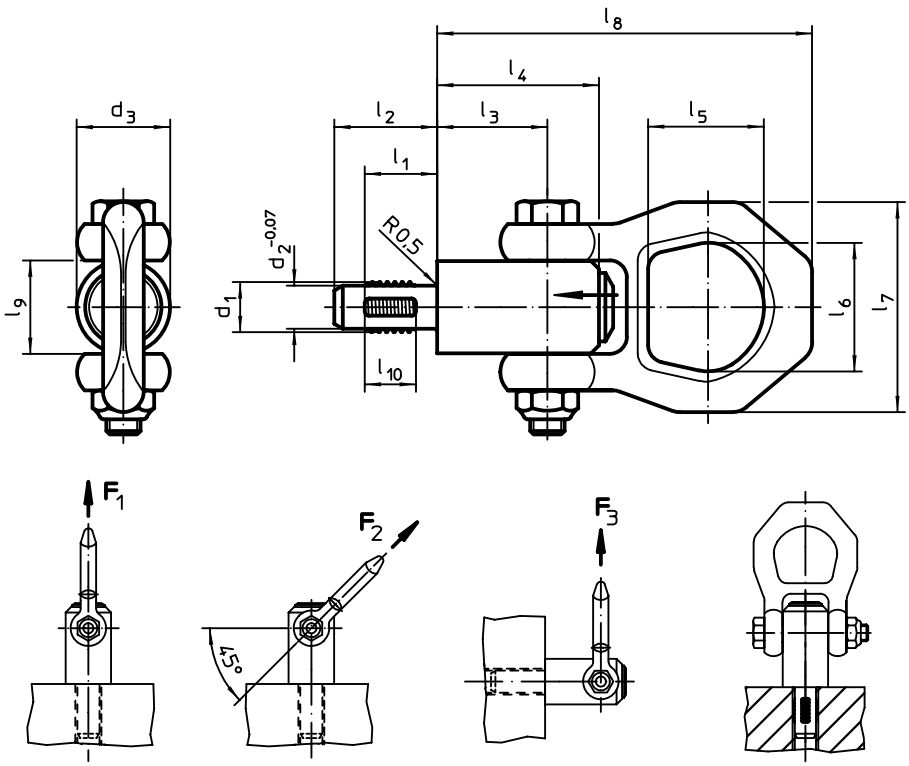
The threaded elements are unlocked by pressing the button.

MORE INFORMATION

Further products

Lifting Pins, self-locking . . . . . → p. 187
Lifting Pins, self-locking, stainless steel . . . . . → p. 189

DRAWING



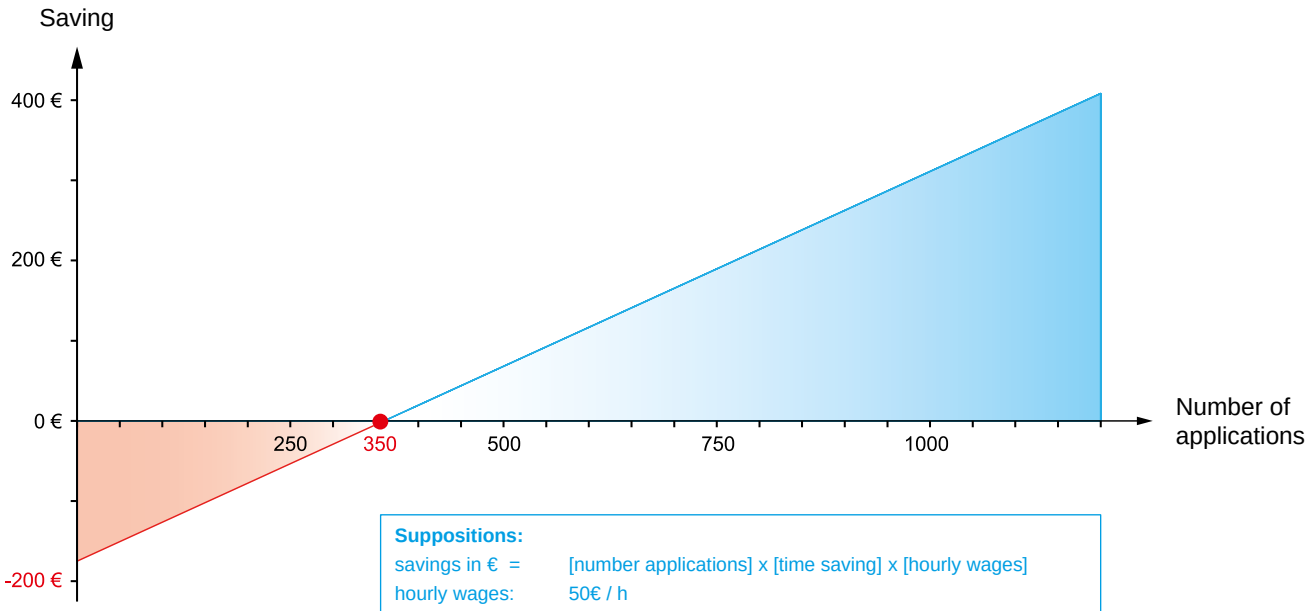
ORDER INFORMATION

Dimensions													Carrying force			Female thread			Art. No.	
d_1	l_1	d_2 -0,07	d_3	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	F_1 [1]	F_2	F_3		max.		heat-treated steel	stainless steel
[mm]													[kN]			[mm]	[°C]	[g]		
M10	**14**	8,35	21,5	20	25,7	36	27	30	49	87,5	21,5	10	3,9	1,5	1,5	M10	250	218	22352.0010	22352.1010
M12	**17**	10,07	21,5	24	25,7	36	27	30	49	87,5	21,5	12	6,2	2,5	2,3	M12	250	220	22352.0012	22352.1012
M16	**17**	13,80	21,5	24	25,7	36	27	30	49	87,5	21,5	12	8,4	4,5	4,2	M16	250	223	22352.0016	22352.1016

[1] for a 5-fold safety against breakage

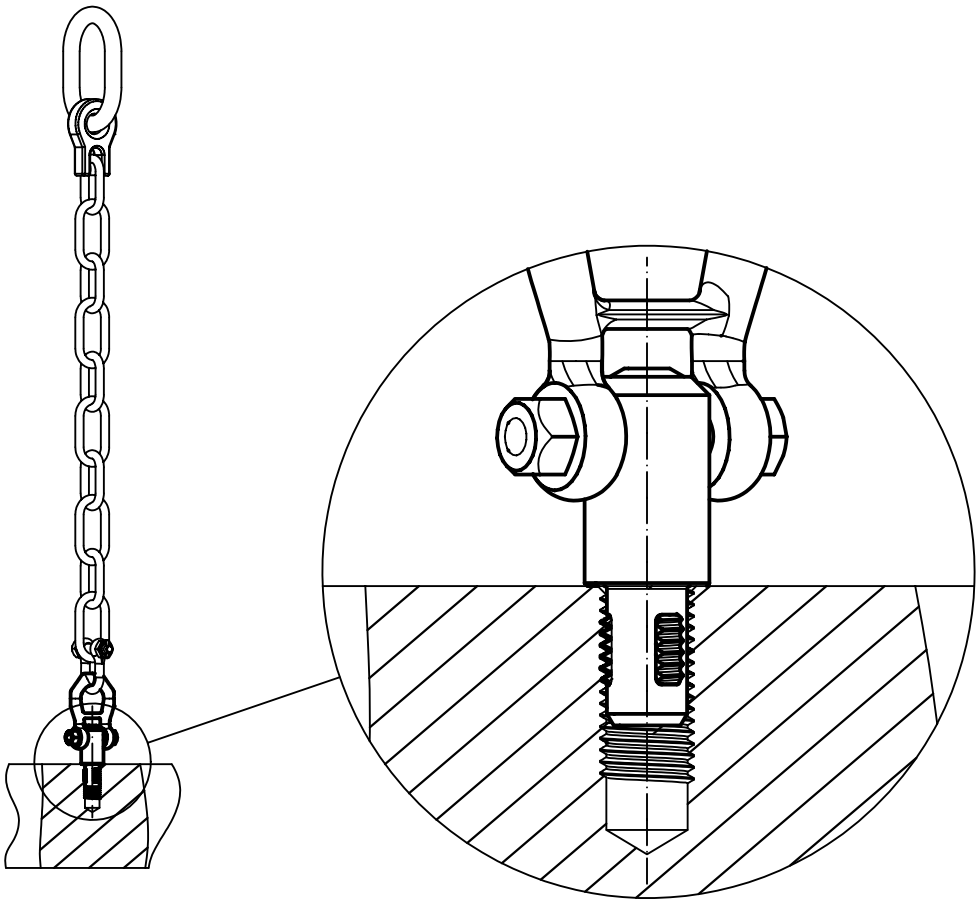
2

APPLICATION EXAMPLE



Suppositions:

savings in € =	[number applications] x [time saving] x [hourly wages]
hourly wages:	50€ / h
time saving:	35s / application



2

BALL LOCK PINS

LEADERS IN THE METRIC RANGE: THE CHOICE IS YOURS

We offer more than 2,000 different variants including matching accessories, the selection is enormous.

The applications the products can be used for are almost as manifold as our product selection. Fixing, locking, connecting, adjusting and quickly changing different positions. Better yet, all of these operations are self-locking and do not require additional tools. Other key benefits of ball lock pins are their unique ability to withstand enormous shearing loads and their perfect resistance to corrosion and, thus, wear.

www.halder.com/
BallLockPins-Video



Ball Lock Pins • self-locking, with T-handle

EH 22340. /EH 22350.

2



PRODUCT DESCRIPTION

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
All versions are corrosion resistant. When using stainless steel 1.4542: high-strength, hardened, abrasion resistant pin with high load capacity.
Version with ergonomic grip.

Material

Pin part
- Stainless steel 1.4305
- Stainless steel 1.4542, precipitation-hardened

Handle
- Aluminium, black similar to RAL 9005

Press button
- Stainless steel, black

Spring
- Stainless steel

Operation

The balls are unlocked by pressing the knob.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.
- This product is also available in INCH dimensions.

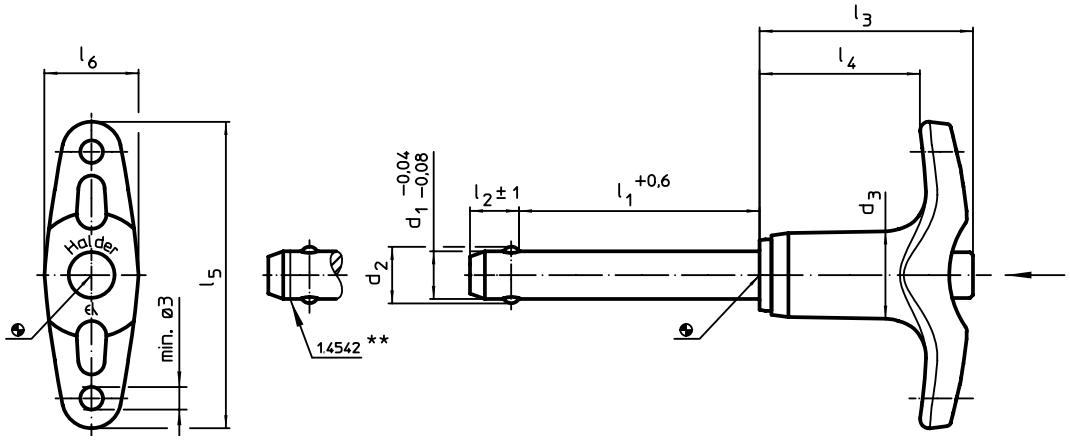
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404
Ball Lock Pins with T-Handle, single acting - complies with NASM / MS 17985. . . . . → p. 247

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3	l_4	l_5	l_6		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
5	10	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	19	14	22340.0012	24	22350.0012
	15	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	20	14	22340.0013	24	22350.0013
	20	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	20	14	22340.0014	24	22350.0014
	25	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	21	14	22340.0015	24	22350.0015
	30	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	22	14	22340.0016	24	22350.0016
	35	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	24	14	22340.0017	24	22350.0017
	40	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	24	14	22340.0018	24	22350.0018
	45	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	25	14	22340.0007	24	22350.0007
	50	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	26	14	22340.0008	24	22350.0008
	60	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	27	14	22340.0009	24	22350.0009
	70	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	29	14	22340.0010	24	22350.0010
	80	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	-30	150	30	14	22340.0011	24	22350.0011

[1] shearing resistance similar to DIN 50141 →

Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3	l_4	l_5	l_6		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
6	10	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	20	21	22340.0022	35	22350.0022
	15	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	21	21	22340.0023	35	22350.0023
	20	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	22	21	22340.0024	35	22350.0024
	25	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	23	21	22340.0025	35	22350.0025
	30	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	24	21	22340.0026	35	22350.0026
	35	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	25	21	22340.0027	35	22350.0027
	40	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	26	21	22340.0028	35	22350.0028
	45	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	27	21	22340.0029	35	22350.0029
	50	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	28	21	22340.0030	35	22350.0030
	60	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	31	21	22340.0019	35	22350.0019
	70	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	33	21	22340.0020	35	22350.0020
	80	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	-30	150	35	21	22340.0021	35	22350.0021
8	10	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	33	38	22340.0032	63	22350.0032
	15	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	35	38	22340.0033	63	22350.0033
	20	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	37	38	22340.0034	63	22350.0034
	25	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	39	38	22340.0035	63	22350.0035
	30	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	41	38	22340.0036	63	22350.0036
	35	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	43	38	22340.0037	63	22350.0037
	40	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	44	38	22340.0038	63	22350.0038
	45	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	46	38	22340.0039	63	22350.0039
	50	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	48	38	22340.0040	63	22350.0040
	60	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	52	38	22340.0031	63	22350.0031
	70	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	56	38	22340.0041	63	22350.0041
	80	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	60	38	22340.0042	63	22350.0042
	90	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	63	38	22340.0043	63	22350.0043
	100	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	-30	150	67	38	22340.0051	63	22350.0051
10	15	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	40	60	22340.0059	100	22350.0059
	20	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	44	60	22340.0044	100	22350.0044
	25	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	47	60	22340.0045	100	22350.0045
	30	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	49	60	22340.0046	100	22350.0046
	35	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	52	60	22340.0047	100	22350.0047
	40	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	55	60	22340.0048	100	22350.0048
	45	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	58	60	22340.0049	100	22350.0049
	50	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	61	60	22340.0050	100	22350.0050
	60	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	67	60	22340.0052	100	22350.0052
	70	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	73	60	22340.0053	100	22350.0053
	80	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	79	60	22340.0054	100	22350.0054
	90	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	85	60	22340.0055	100	22350.0055
	100	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	91	60	22340.0056	100	22350.0056
	110	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	97	60	22340.0057	100	22350.0057
	120	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	-30	150	103	60	22340.0058	100	22350.0058
12	20	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	68	87	22340.0064	144	22350.0064
	25	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	73	87	22340.0065	144	22350.0065
	30	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	77	87	22340.0066	144	22350.0066
	35	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	81	87	22340.0067	144	22350.0067
	40	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	86	87	22340.0068	144	22350.0068
	45	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	90	87	22340.0069	144	22350.0069
	50	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	94	87	22340.0070	144	22350.0070
	60	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	103	87	22340.0072	144	22350.0072
	70	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	111	87	22340.0074	144	22350.0074
	80	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	119	87	22340.0076	144	22350.0076
	90	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	127	87	22340.0060	144	22350.0060
	100	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	136	87	22340.0061	144	22350.0061
	110	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	144	87	22340.0062	144	22350.0062
	120	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	-30	150	153	87	22340.0063	144	22350.0063

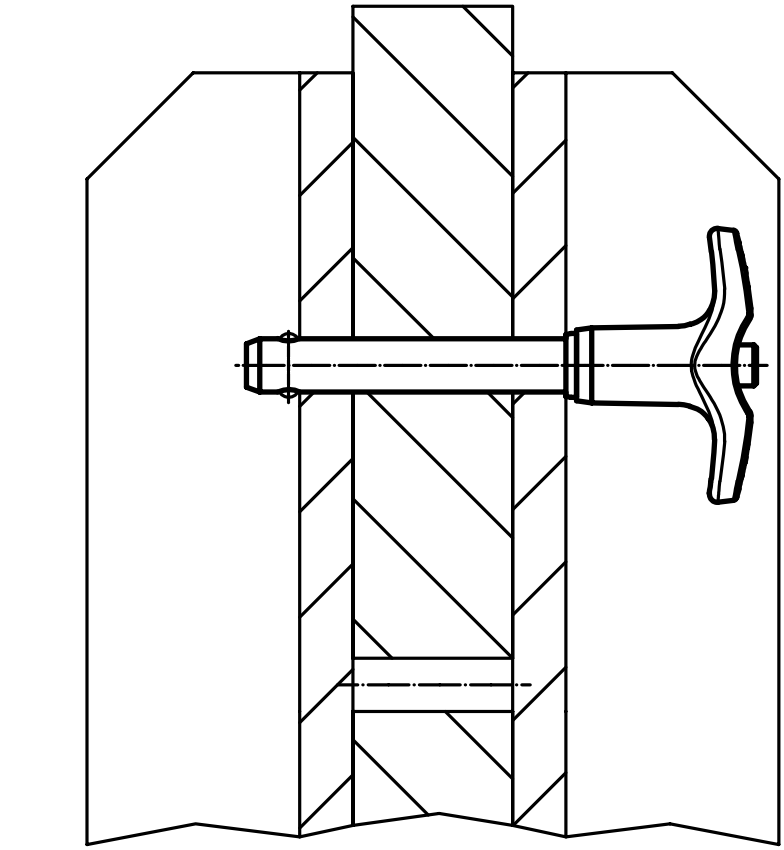
[1] shearing resistance similar to DIN 50141

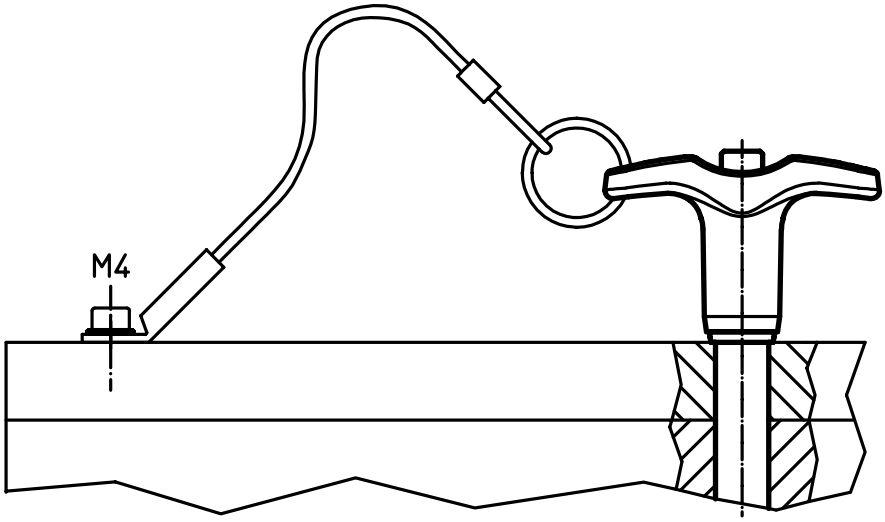
→

Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3	l_4	l_5	l_6		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
	30	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	150	155	22340.0071	257	22350.0071
	35	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	157	155	22340.0073	257	22350.0073
	40	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	165	155	22340.0075	257	22350.0075
	45	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	173	155	22340.0077	257	22350.0077
	50	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	180	155	22340.0078	257	22350.0078
	60	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	196	155	22340.0079	257	22350.0079
	70	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	211	155	22340.0080	257	22350.0080
16	**80**	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	226	155	22340.0081	257	22350.0081
	90	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	242	155	22340.0082	257	22350.0082
	100	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	257	155	22340.0083	257	22350.0083
	110	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	272	155	22340.0084	257	22350.0084
	120	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	288	155	22340.0085	257	22350.0085
	130	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	303	155	22340.0086	257	22350.0086
	140	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	319	155	22340.0087	257	22350.0087
	150	19,0	23,4	14,0	42,2	29,8	74,8	24,7	16	-30	150	334	155	22340.0088	257	22350.0088
	50	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	241	244	22340.0089	403	22350.0089
	60	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	265	244	22340.0090	403	22350.0090
	70	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	289	244	22340.0091	403	22350.0091
	80	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	313	244	22340.0092	403	22350.0092
	90	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	337	244	22340.0093	403	22350.0093
20	**100**	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	361	244	22340.0094	403	22350.0094
	110	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	385	244	22340.0095	403	22350.0095
	120	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	409	244	22340.0096	403	22350.0096
	130	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	433	244	22340.0097	403	22350.0097
	140	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	457	244	22340.0098	403	22350.0098
	150	24,8	23,4	17,0	43,1	29,8	74,8	24,7	20	-30	150	481	244	22340.0099	403	22350.0099
	50	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	447	386	22340.0100	631	22350.0100
	60	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	484	386	22340.0101	631	22350.0101
	70	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	522	386	22340.0102	631	22350.0102
	80	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	560	386	22340.0103	631	22350.0103
	90	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	598	386	22340.0104	631	22350.0104
25	**100**	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	636	386	22340.0001	631	22350.0001
	110	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	674	386	22340.0002	631	22350.0002
	120	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	712	386	22340.0003	631	22350.0003
	130	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	750	386	22340.0004	631	22350.0004
	140	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	788	386	22340.0005	631	22350.0005
	150	31,0	30,4	22,0	54,8	37,5	88,7	33,2	25	-30	150	825	386	22340.0006	631	22350.0006

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE





Ball Lock Pins • self-locking, with L-handle

EH 22340. /EH 22350.

2



PRODUCT DESCRIPTION

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
All versions are corrosion resistant. When using stainless steel 1.4542: high-strength, hardened, abrasion resistant pin with high load capacity.
Version with ergonomic grip.

Material

Pin part
- Stainless steel 1.4305
- Stainless steel 1.4542, precipitation-hardened

Handle
- Aluminium, black similar to RAL 9005

Press button
- Stainless steel, black

Spring
- Stainless steel

Operation

The balls are unlocked by pressing the knob.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.
- This product is also available in INCH dimensions.

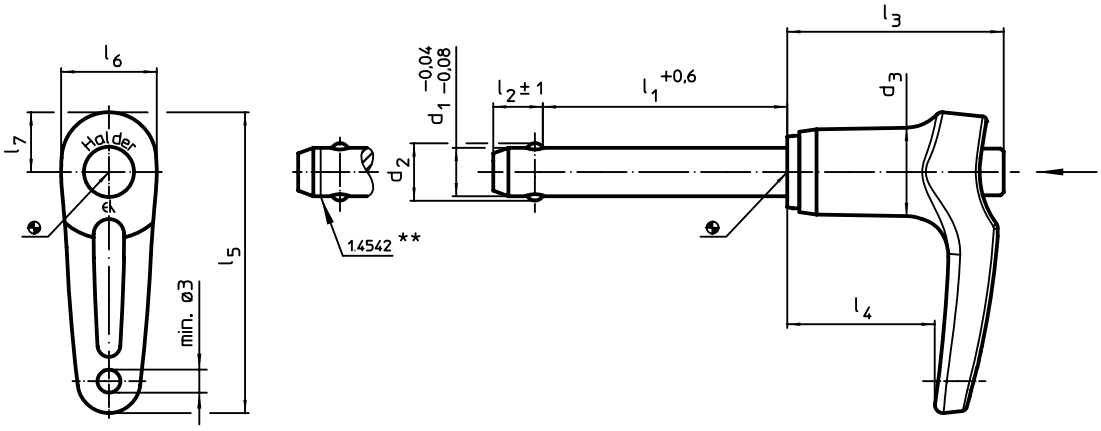
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404
Ball Lock Pins with L-Handle, single acting - complies with NASM / MS 17986. . . . . → p. 250

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions										Location hole H11	Temperature			Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3	l_4	l_5	l_6	l_7		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]										[mm]	[°C]		[g]	[kN]		[kN]	
5	10	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	20	14	22340.0112	24	22350.0112
	15	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	21	14	22340.0113	24	22350.0113
	20	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	21	14	22340.0114	24	22350.0114
	25	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	22	14	22340.0115	24	22350.0115
	30	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	23	14	22340.0116	24	22350.0116
	35	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	18	14	22340.0117	24	22350.0117
	40	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	19	14	22340.0118	24	22350.0118
	45	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	20	14	22340.0107	24	22350.0107
	50	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	21	14	22340.0108	24	22350.0108
	60	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	22	14	22340.0109	24	22350.0109
	70	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	24	14	22340.0110	24	22350.0110
	80	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	-30	150	25	14	22340.0111	24	22350.0111

[1] shearing resistance similar to DIN 50141 →

Dimensions										Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3	l_4	l_5	l_6	l_7		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]										[mm]	[°C]		[g]	[kN]		[kN]	
6	10	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	21	21	22340.0122	35	22350.0122
	15	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	22	21	22340.0123	35	22350.0123
	20	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	23	21	22340.0124	35	22350.0124
	25	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	24	21	22340.0125	35	22350.0125
	30	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	25	21	22340.0126	35	22350.0126
	35	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	26	21	22340.0127	35	22350.0127
	40	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	27	21	22340.0128	35	22350.0128
	45	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	28	21	22340.0129	35	22350.0129
	50	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	29	21	22340.0130	35	22350.0130
	60	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	26	21	22340.0119	35	22350.0119
	70	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	28	21	22340.0120	35	22350.0120
	80	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	-30	150	30	21	22340.0121	35	22350.0121
8	10	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	33	38	22340.0132	63	22350.0132
	15	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	35	38	22340.0133	63	22350.0133
	20	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	37	38	22340.0134	63	22350.0134
	25	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	39	38	22340.0135	63	22350.0135
	30	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	41	38	22340.0136	63	22350.0136
	35	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	43	38	22340.0137	63	22350.0137
	40	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	45	38	22340.0138	63	22350.0138
	45	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	46	38	22340.0139	63	22350.0139
	50	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	48	38	22340.0140	63	22350.0140
	60	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	52	38	22340.0131	63	22350.0131
	70	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	56	38	22340.0141	63	22350.0141
	80	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	60	38	22340.0142	63	22350.0142
	90	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	64	38	22340.0143	63	22350.0143
	100	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	-30	150	67	38	22340.0151	63	22350.0151
10	15	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	42	60	22340.0159	100	22350.0159
	20	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	44	60	22340.0144	100	22350.0144
	25	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	47	60	22340.0145	100	22350.0145
	30	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	50	60	22340.0146	100	22350.0146
	35	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	53	60	22340.0147	100	22350.0147
	40	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	56	60	22340.0148	100	22350.0148
	45	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	58	60	22340.0149	100	22350.0149
	50	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	62	60	22340.0150	100	22350.0150
	60	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	67	60	22340.0152	100	22350.0152
	70	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	74	60	22340.0153	100	22350.0153
	80	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	80	60	22340.0154	100	22350.0154
	90	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	86	60	22340.0155	100	22350.0155
	100	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	92	60	22340.0156	100	22350.0156
	110	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	98	60	22340.0157	100	22350.0157
	120	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	-30	150	104	60	22340.0158	100	22350.0158
12	20	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	69	87	22340.0164	144	22350.0164
	25	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	73	87	22340.0165	144	22350.0165
	30	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	77	87	22340.0166	144	22350.0166
	35	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	82	87	22340.0167	144	22350.0167
	40	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	86	87	22340.0168	144	22350.0168
	45	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	90	87	22340.0169	144	22350.0169
	50	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	94	87	22340.0170	144	22350.0170
	60	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	103	87	22340.0172	144	22350.0172
	70	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	111	87	22340.0174	144	22350.0174
	80	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	120	87	22340.0176	144	22350.0176
	90	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	128	87	22340.0160	144	22350.0160
	100	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	137	87	22340.0161	144	22350.0161
	110	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	145	87	22340.0162	144	22350.0162
	120	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	-30	150	154	87	22340.0163	144	22350.0163

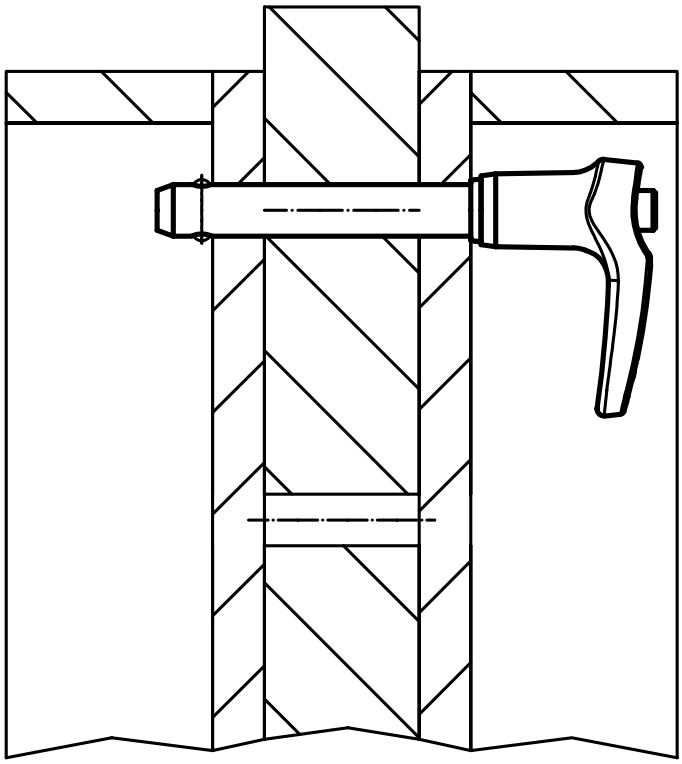
[1] shearing resistance similar to DIN 50141

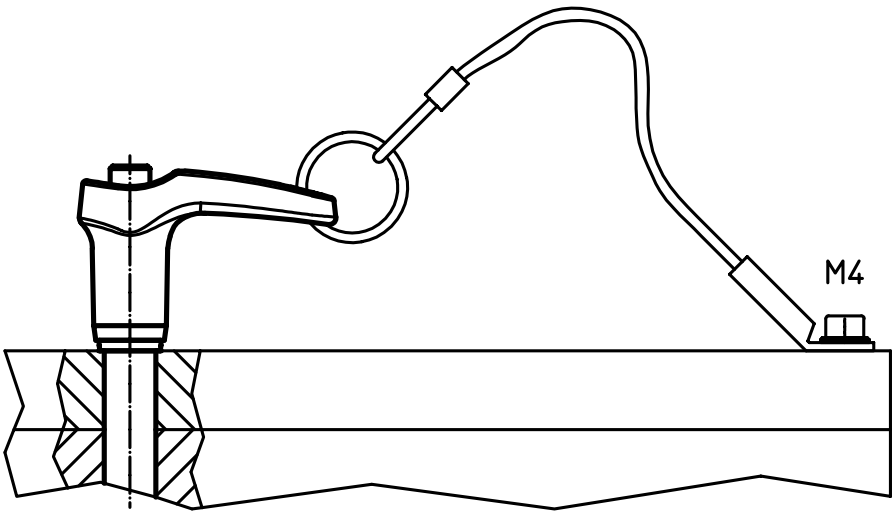
→

Dimensions										Location hole H11			Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3	l_4	l_5	l_6	l_7		min.	max.	Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]										[mm]	[°C]		[g]	[kN]		[kN]	
	30	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	149	155	22340.0171	257	22350.0171
	35	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	157	155	22340.0173	257	22350.0173
	40	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	165	155	22340.0175	257	22350.0175
	45	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	172	155	22340.0177	257	22350.0177
	50	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	180	155	22340.0178	257	22350.0178
	60	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	195	155	22340.0179	257	22350.0179
	70	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	211	155	22340.0180	257	22350.0180
16	**80**	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	226	155	22340.0181	257	22350.0181
	90	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	241	155	22340.0182	257	22350.0182
	100	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	257	155	22340.0183	257	22350.0183
	110	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	272	155	22340.0184	257	22350.0184
	120	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	287	155	22340.0185	257	22350.0185
	130	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	303	155	22340.0186	257	22350.0186
	140	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	318	155	22340.0187	257	22350.0187
	150	19,0	23,4	14,0	42,2	27,3	67,6	24,7	15,1	16	-30	150	333	155	22340.0188	257	22350.0188
	50	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	241	244	22340.0189	403	22350.0189
	60	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	265	244	22340.0190	403	22350.0190
	70	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	289	244	22340.0191	403	22350.0191
	80	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	313	244	22340.0192	403	22350.0192
	90	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	337	244	22340.0193	403	22350.0193
20	**100**	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	361	244	22340.0194	403	22350.0194
	110	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	385	244	22340.0195	403	22350.0195
	120	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	409	244	22340.0196	403	22350.0196
	130	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	433	244	22340.0197	403	22350.0197
	140	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	457	244	22340.0198	403	22350.0198
	150	24,8	23,4	17,0	43,1	27,3	67,6	24,7	15,1	20	-30	150	481	244	22340.0199	403	22350.0199
	50	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	449	386	22340.0200	631	22350.0200
	60	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	487	386	22340.0201	631	22350.0201
	70	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	525	386	22340.0202	631	22350.0202
	80	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	563	386	22340.0203	631	22350.0203
	90	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	601	386	22340.0204	631	22350.0204
25	**100**	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	639	386	22340.0205	631	22350.0205
	110	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	677	386	22340.0206	631	22350.0206
	120	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	714	386	22340.0207	631	22350.0207
	130	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	752	386	22340.0208	631	22350.0208
	140	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	790	386	22340.0105	631	22350.0105
	150	31,0	30,4	22,0	54,8	34,2	83,9	33,3	20,1	25	-30	150	828	386	22340.0106	631	22350.0106

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE





Ball Lock Pins • self-locking, with button handle

EH 22340. /EH 22350.

2



PRODUCT DESCRIPTION

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
All versions are corrosion resistant. When using stainless steel 1.4542: high-strength, hardened, abrasion resistant pin with high load capacity.
Compact design with button handle.

Material

Pin part
- Stainless steel 1.4305
- Stainless steel 1.4542, precipitation hardened

Handle
- Aluminium, black similar to RAL 9005

Press button
- Stainless steel, black

Spring
- Stainless steel

Operation

The balls are unlocked by pressing the knob.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.

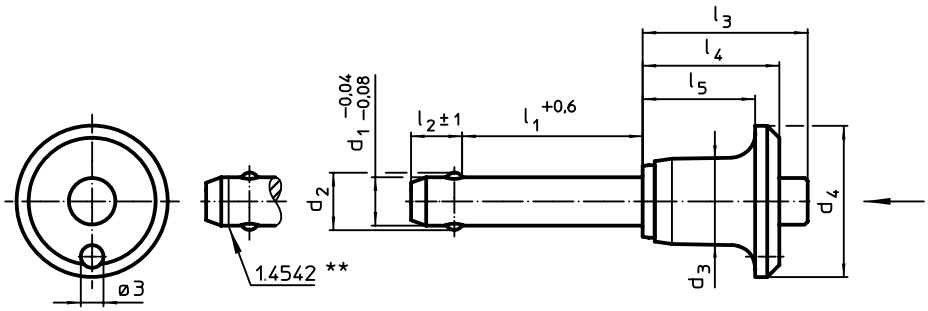
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404
Ball Lock Pins with Button Handle, single acting - complies with NASM / MS 17984 . . . . . → p. 242

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4	l_5		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
5	10	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	12	14	22340.0212	24	22350.0212
	15	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	12	14	22340.0213	24	22350.0213
	20	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	13	14	22340.0214	24	22350.0214
	25	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	14	14	22340.0215	24	22350.0215
	30	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	15	14	22340.0216	24	22350.0216
	35	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	15	14	22340.0217	24	22350.0217
	40	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	16	14	22340.0218	24	22350.0218
	45	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	17	14	22340.0311	24	22350.0311
	50	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	18	14	22340.0312	24	22350.0312
	60	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	19	14	22340.0209	24	22350.0209
	70	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	21	14	22340.0210	24	22350.0210
	80	5,5	11,3	20	6,0	20,7	17,6	14,6	5	-30	150	22	14	22340.0211	24	22350.0211

[1] shearing resistance similar to DIN 50141 →

Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4	l_5		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
6	10	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	13	21	22340.0222	35	22350.0222
	15	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	14	21	22340.0223	35	22350.0223
	20	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	15	21	22340.0224	35	22350.0224
	25	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	16	21	22340.0225	35	22350.0225
	30	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	17	21	22340.0226	35	22350.0226
	35	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	18	21	22340.0227	35	22350.0227
	40	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	19	21	22340.0228	35	22350.0228
	45	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	20	21	22340.0229	35	22350.0229
	50	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	21	21	22340.0230	35	22350.0230
	60	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	23	21	22340.0219	35	22350.0219
	70	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	25	21	22340.0220	35	22350.0220
	80	7,0	11,3	20	7,0	20,7	17,6	14,6	6	-30	150	27	21	22340.0221	35	22350.0221
8	10	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	25	38	22340.0232	63	22350.0232
	15	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	27	38	22340.0233	63	22350.0233
	20	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	28	38	22340.0234	63	22350.0234
	25	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	30	38	22340.0235	63	22350.0235
	30	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	32	38	22340.0236	63	22350.0236
	35	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	34	38	22340.0237	63	22350.0237
	40	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	36	38	22340.0238	63	22350.0238
	45	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	38	38	22340.0239	63	22350.0239
	50	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	40	38	22340.0240	63	22350.0240
	60	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	44	38	22340.0231	63	22350.0231
	70	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	47	38	22340.0241	63	22350.0241
	80	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	51	38	22340.0242	63	22350.0242
	90	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	55	38	22340.0243	63	22350.0243
	100	9,5	14,1	25	8,2	27,3	22,6	18,6	8	-30	150	58	38	22340.0251	63	22350.0251
10	15	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	32	60	22340.0259	100	22350.0259
	20	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	35	60	22340.0244	100	22350.0244
	25	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	38	60	22340.0245	100	22350.0245
	30	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	40	60	22340.0246	100	22350.0246
	35	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	44	60	22340.0247	100	22350.0247
	40	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	47	60	22340.0248	100	22350.0248
	45	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	50	60	22340.0249	100	22350.0249
	50	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	53	60	22340.0250	100	22350.0250
	60	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	59	60	22340.0252	100	22350.0252
	70	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	65	60	22340.0253	100	22350.0253
	80	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	71	60	22340.0254	100	22350.0254
	90	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	76	60	22340.0255	100	22350.0255
	100	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	83	60	22340.0256	100	22350.0256
	110	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	89	60	22340.0257	100	22350.0257
	120	12,0	14,1	25	9,6	27,3	22,6	18,6	10	-30	150	95	60	22340.0258	100	22350.0258
12	20	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	65	87	22340.0264	144	22350.0264
	25	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	69	87	22340.0265	144	22350.0265
	30	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	73	87	22340.0266	144	22350.0266
	35	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	78	87	22340.0267	144	22350.0267
	40	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	82	87	22340.0268	144	22350.0268
	45	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	86	87	22340.0269	144	22350.0269
	50	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	90	87	22340.0270	144	22350.0270
	60	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	99	87	22340.0272	144	22350.0272
	70	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	108	87	22340.0274	144	22350.0274
	80	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	116	87	22340.0276	144	22350.0276
	90	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	124	87	22340.0260	144	22350.0260
	100	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	133	87	22340.0261	144	22350.0261
	110	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	141	87	22340.0262	144	22350.0262
	120	14,5	17,7	35	10,6	33,2	27,3	22,3	12	-30	150	150	87	22340.0263	144	22350.0263

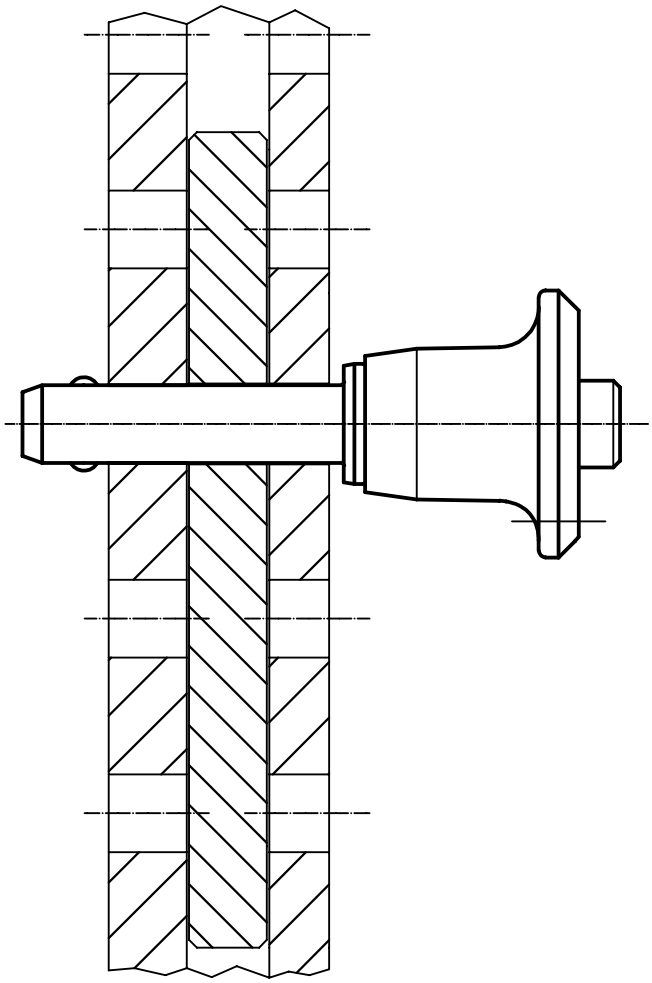
[1] shearing resistance similar to DIN 50141

→

Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4	l_5		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
	30	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	145	155	22340.0271	257	22350.0271
	35	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	153	155	22340.0273	257	22350.0273
	40	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	161	155	22340.0275	257	22350.0275
	45	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	168	155	22340.0277	257	22350.0277
	50	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	176	155	22340.0278	257	22350.0278
	60	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	191	155	22340.0279	257	22350.0279
	70	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	207	155	22340.0280	257	22350.0280
16	**80**	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	222	155	22340.0281	257	22350.0281
	90	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	237	155	22340.0282	257	22350.0282
	100	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	253	155	22340.0283	257	22350.0283
	110	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	268	155	22340.0284	257	22350.0284
	120	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	283	155	22340.0285	257	22350.0285
	130	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	299	155	22340.0286	257	22350.0286
	140	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	314	155	22340.0287	257	22350.0287
	150	19,0	23,4	40	14,0	42,2	34,5	28,5	16	-30	150	329	155	22340.0288	257	22350.0288
	50	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	236	244	22340.0289	403	22350.0289
	60	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	261	244	22340.0290	403	22350.0290
	70	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	285	244	22340.0291	403	22350.0291
	80	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	309	244	22340.0292	403	22350.0292
	90	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	333	244	22340.0293	403	22350.0293
20	**100**	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	357	244	22340.0294	403	22350.0294
	110	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	381	244	22340.0295	403	22350.0295
	120	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	405	244	22340.0296	403	22350.0296
	130	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	429	244	22340.0297	403	22350.0297
	140	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	453	244	22340.0298	403	22350.0298
	150	24,8	23,4	40	17,0	43,1	34,5	28,5	20	-30	150	477	244	22340.0299	403	22350.0299
	50	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	433	386	22340.0300	631	22350.0300
	60	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	471	386	22340.0301	631	22350.0301
	70	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	509	386	22340.0302	631	22350.0302
	80	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	547	386	22340.0303	631	22350.0303
	90	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	585	386	22340.0304	631	22350.0304
25	**100**	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	622	386	22340.0305	631	22350.0305
	110	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	660	386	22340.0306	631	22350.0306
	120	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	698	386	22340.0307	631	22350.0307
	130	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	736	386	22340.0308	631	22350.0308
	140	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	774	386	22340.0309	631	22350.0309
	150	31,0	30,4	50	22,0	54,8	43,5	36,5	25	-30	150	812	386	22340.0310	631	22350.0310

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



Ball Lock Pins • self-locking, with safety handle

EH 22340. /EH 22350.

2



PRODUCT DESCRIPTION

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
All versions are corrosion resistant. When using stainless steel 1.4542: high-strength, hardened, abrasion resistant pin with high load capacity.
Robust safety handle (press button not overlaying). Shape of grip protects from unintentional use of the press button.

Material

Pin part
- Stainless steel 1.4305
- Stainless steel 1.4542, precipitation hardened

Handle
- Stainless steel

Press button
- Stainless steel

Spring
- Stainless steel

Operation

The balls are unlocked by pressing the knob.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.

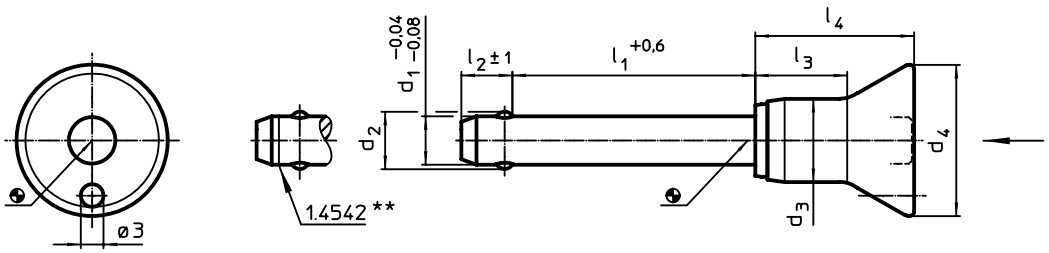
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions								Location hole H11	max.		Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4				Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]								[mm]	[°C]	[g]	[kN]		[kN]	
5	**10**	5,5	10,3	20	6,0	11,6	21,0	5	250	18	14	22340.1012	24	22350.1012
	15	5,5	10,3	20	6,0	11,6	21,0	5	250	19	14	22340.1013	24	22350.1013
	20	5,5	10,3	20	6,0	11,6	21,0	5	250	20	14	22340.1014	24	22350.1014
	25	5,5	10,3	20	6,0	11,6	21,0	5	250	21	14	22340.1015	24	22350.1015
	30	5,5	10,3	20	6,0	11,6	21,0	5	250	21	14	22340.1016	24	22350.1016
	35	5,5	10,3	20	6,0	11,6	21,0	5	250	22	14	22340.1017	24	22350.1017
	40	5,5	10,3	20	6,0	11,6	21,0	5	250	23	14	22340.1018	24	22350.1018
	45	5,5	10,3	20	6,0	11,6	21,0	5	250	24	14	22340.1007	24	22350.1007
	50	5,5	10,3	20	6,0	11,6	21,0	5	250	25	14	22340.1008	24	22350.1008
	60	5,5	10,3	20	6,0	11,6	21,0	5	250	26	14	22340.1009	24	22350.1009
	70	5,5	10,3	20	6,0	11,6	21,0	5	250	27	14	22340.1010	24	22350.1010
	80	5,5	10,3	20	6,0	11,6	21,0	5	250	29	14	22340.1011	24	22350.1011

[1] shearing resistance similar to DIN 50141 →

Dimensions								Location hole H11	max.		Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4				Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]								[mm]	[°C]	[g]	[kN]		[kN]	
6	10	7,0	10,3	20	7,0	11,6	21,0	6	250	19	21	22340.1022	35	22350.1022
	15	7,0	10,3	20	7,0	11,6	21,0	6	250	20	21	22340.1023	35	22350.1023
	20	7,0	10,3	20	7,0	11,6	21,0	6	250	22	21	22340.1024	35	22350.1024
	25	7,0	10,3	20	7,0	11,6	21,0	6	250	23	21	22340.1025	35	22350.1025
	30	7,0	10,3	20	7,0	11,6	21,0	6	250	24	21	22340.1026	35	22350.1026
	35	7,0	10,3	20	7,0	11,6	21,0	6	250	25	21	22340.1027	35	22350.1027
	40	7,0	10,3	20	7,0	11,6	21,0	6	250	26	21	22340.1028	35	22350.1028
	45	7,0	10,3	20	7,0	11,6	21,0	6	250	27	21	22340.1029	35	22350.1029
	50	7,0	10,3	20	7,0	11,6	21,0	6	250	28	21	22340.1030	35	22350.1030
	60	7,0	10,3	20	7,0	11,6	21,0	6	250	30	21	22340.1019	35	22350.1019
	70	7,0	10,3	20	7,0	11,6	21,0	6	250	32	21	22340.1020	35	22350.1020
	80	7,0	10,3	20	7,0	11,6	21,0	6	250	34	21	22340.1021	35	22350.1021
8	10	9,5	13,3	24	8,2	17,4	27,5	8	250	36	38	22340.1032	63	22350.1032
	15	9,5	13,3	24	8,2	17,4	27,5	8	250	38	38	22340.1033	63	22350.1033
	20	9,5	13,3	24	8,2	17,4	27,5	8	250	40	38	22340.1034	63	22350.1034
	25	9,5	13,3	24	8,2	17,4	27,5	8	250	41	38	22340.1035	63	22350.1035
	30	9,5	13,3	24	8,2	17,4	27,5	8	250	43	38	22340.1036	63	22350.1036
	35	9,5	13,3	24	8,2	17,4	27,5	8	250	45	38	22340.1037	63	22350.1037
	40	9,5	13,3	24	8,2	17,4	27,5	8	250	47	38	22340.1038	63	22350.1038
	45	9,5	13,3	24	8,2	17,4	27,5	8	250	49	38	22340.1039	63	22350.1039
	50	9,5	13,3	24	8,2	17,4	27,5	8	250	51	38	22340.1040	63	22350.1040
	60	9,5	13,3	24	8,2	17,4	27,5	8	250	54	38	22340.1031	63	22350.1031
	70	9,5	13,3	24	8,2	17,4	27,5	8	250	39	38	22340.1041	63	22350.1041
	80	9,5	13,3	24	8,2	17,4	27,5	8	250	41	38	22340.1042	63	22350.1042
	90	9,5	13,3	24	8,2	17,4	27,5	8	250	43	38	22340.1043	63	22350.1043
	100	9,5	13,3	24	8,2	17,4	27,5	8	250	69	38	22340.1051	63	22350.1051
10	15	12,0	13,3	24	9,6	17,4	27,5	10	250	43	60	22340.1059	100	22350.1059
	20	12,0	13,3	24	9,6	17,4	27,5	10	250	46	60	22340.1044	100	22350.1044
	25	12,0	13,3	24	9,6	17,4	27,5	10	250	49	60	22340.1045	100	22350.1045
	30	12,0	13,3	24	9,6	17,4	27,5	10	250	52	60	22340.1046	100	22350.1046
	35	12,0	13,3	24	9,6	17,4	27,5	10	250	55	60	22340.1047	100	22350.1047
	40	12,0	13,3	24	9,6	17,4	27,5	10	250	58	60	22340.1048	100	22350.1048
	45	12,0	13,3	24	9,6	17,4	27,5	10	250	61	60	22340.1049	100	22350.1049
	50	12,0	13,3	24	9,6	17,4	27,5	10	250	64	60	22340.1050	100	22350.1050
	60	12,0	13,3	24	9,6	17,4	27,5	10	250	70	60	22340.1052	100	22350.1052
	70	12,0	13,3	24	9,6	17,4	27,5	10	250	76	60	22340.1053	100	22350.1053
	80	12,0	13,3	24	9,6	17,4	27,5	10	250	82	60	22340.1054	100	22350.1054
	90	12,0	13,3	24	9,6	17,4	27,5	10	250	88	60	22340.1055	100	22350.1055
	100	12,0	13,3	24	9,6	17,4	27,5	10	250	93	60	22340.1056	100	22350.1056
	110	12,0	13,3	24	9,6	17,4	27,5	10	250	99	60	22340.1057	100	22350.1057
	120	12,0	13,3	24	9,6	17,4	27,5	10	250	105	60	22340.1058	100	22350.1058
12	20	14,5	16,5	28	10,6	23,1	33,5	12	250	72	87	22340.1064	144	22350.1064
	25	14,5	16,5	28	10,6	23,1	33,5	12	250	77	87	22340.1065	144	22350.1065
	30	14,5	16,5	28	10,6	23,1	33,5	12	250	82	87	22340.1066	144	22350.1066
	35	14,5	16,5	28	10,6	23,1	33,5	12	250	86	87	22340.1067	144	22350.1067
	40	14,5	16,5	28	10,6	23,1	33,5	12	250	90	87	22340.1068	144	22350.1068
	45	14,5	16,5	28	10,6	23,1	33,5	12	250	94	87	22340.1069	144	22350.1069
	50	14,5	16,5	28	10,6	23,1	33,5	12	250	99	87	22340.1070	144	22350.1070
	60	14,5	16,5	28	10,6	23,1	33,5	12	250	107	87	22340.1072	144	22350.1072
	70	14,5	16,5	28	10,6	23,1	33,5	12	250	116	87	22340.1074	144	22350.1074
	80	14,5	16,5	28	10,6	23,1	33,5	12	250	124	87	22340.1076	144	22350.1076
	90	14,5	16,5	28	10,6	23,1	33,5	12	250	131	87	22340.1060	144	22350.1060
	100	14,5	16,5	28	10,6	23,1	33,5	12	250	140	87	22340.1061	144	22350.1061
	110	14,5	16,5	28	10,6	23,1	33,5	12	250	149	87	22340.1062	144	22350.1062
	120	14,5	16,5	28	10,6	23,1	33,5	12	250	157	87	22340.1063	144	22350.1063

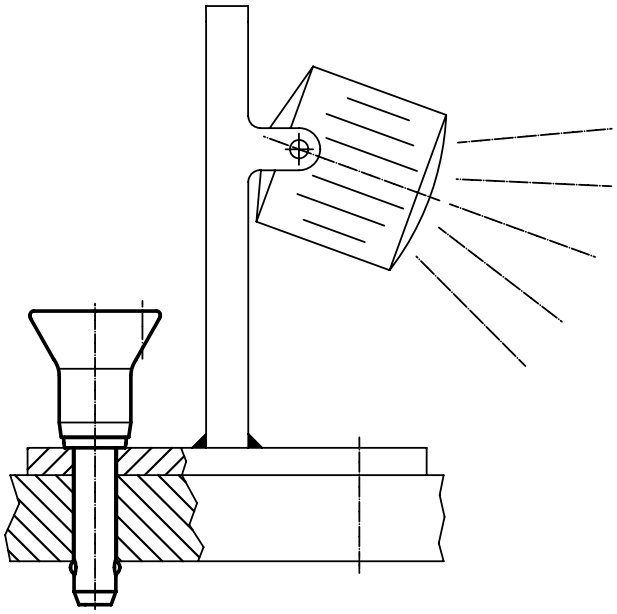
[1] shearing resistance similar to DIN 50141

→

Dimensions								Location hole H11			Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4		max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]								[mm]	[°C]	[g]	[kN]		[kN]	
16	30	19,0	23,4	38	14,0	29,5	43,1	16	250	187	155	22340.1071	257	22350.1071
	35	19,0	23,4	38	14,0	29,5	43,1	16	250	194	155	22340.1073	257	22350.1073
	40	19,0	23,4	38	14,0	29,5	43,1	16	250	202	155	22340.1075	257	22350.1075
	45	19,0	23,4	38	14,0	29,5	43,1	16	250	210	155	22340.1077	257	22350.1077
	50	19,0	23,4	38	14,0	29,5	43,1	16	250	217	155	22340.1078	257	22350.1078
	60	19,0	23,4	38	14,0	29,5	43,1	16	250	233	155	22340.1079	257	22350.1079
	70	19,0	23,4	38	14,0	29,5	43,1	16	250	248	155	22340.1080	257	22350.1080
	80	19,0	23,4	38	14,0	29,5	43,1	16	250	263	155	22340.1081	257	22350.1081
	90	19,0	23,4	38	14,0	29,5	43,1	16	250	279	155	22340.1082	257	22350.1082
	100	19,0	23,4	38	14,0	29,5	43,1	16	250	294	155	22340.1083	257	22350.1083
	110	19,0	23,4	38	14,0	29,5	43,1	16	250	309	155	22340.1084	257	22350.1084
	120	19,0	23,4	38	14,0	29,5	43,1	16	250	325	155	22340.1085	257	22350.1085
	130	19,0	23,4	38	14,0	29,5	43,1	16	250	340	155	22340.1086	257	22350.1086
	140	19,0	23,4	38	14,0	29,5	43,1	16	250	355	155	22340.1087	257	22350.1087
	150	19,0	23,4	38	14,0	29,5	43,1	16	250	371	155	22340.1088	257	22350.1088
20	50	24,8	23,4	38	17,0	29,5	43,1	20	250	278	244	22340.1089	406	22350.1089
	60	24,8	23,4	38	17,0	29,5	43,1	20	250	302	244	22340.1090	406	22350.1090
	70	24,8	23,4	38	17,0	29,5	43,1	20	250	326	244	22340.1091	403	22350.1091
	80	24,8	23,4	38	17,0	29,5	43,1	20	250	350	244	22340.1092	403	22350.1092
	90	24,8	23,4	38	17,0	29,5	43,1	20	250	374	244	22340.1093	403	22350.1093
	100	24,8	23,4	38	17,0	29,5	43,1	20	250	398	244	22340.1094	403	22350.1094
	110	24,8	23,4	38	17,0	29,5	43,1	20	250	422	244	22340.1095	403	22350.1095
	120	24,8	23,4	38	17,0	29,5	43,1	20	250	446	244	22340.1096	403	22350.1096
	130	24,8	23,4	38	17,0	29,5	43,1	20	250	470	244	22340.1097	403	22350.1097
	140	24,8	23,4	38	17,0	29,5	43,1	20	250	494	244	22340.1098	403	22350.1098
	150	24,8	23,4	38	17,0	29,5	43,1	20	250	518	244	22340.1099	403	22350.1099
25	50	31,0	30,4	50	22,0	36,8	54,8	25	250	519	386	22340.1100	631	22350.1100
	60	31,0	30,4	50	22,0	36,8	54,8	25	250	557	386	22340.1101	631	22350.1101
	70	31,0	30,4	50	22,0	36,8	54,8	25	250	595	386	22340.1102	631	22350.1102
	80	31,0	30,4	50	22,0	36,8	54,8	25	250	633	386	22340.1103	631	22350.1103
	90	31,0	30,4	50	22,0	36,8	54,8	25	250	671	386	22340.1104	631	22350.1104
	100	31,0	30,4	50	22,0	36,8	54,8	25	250	709	386	22340.1105	631	22350.1105
	110	31,0	30,4	50	22,0	36,8	54,8	25	250	746	386	22340.1106	631	22350.1106
	120	31,0	30,4	50	22,0	36,8	54,8	25	250	784	386	22340.1107	631	22350.1107
	130	31,0	30,4	50	22,0	36,8	54,8	25	250	822	386	22340.1108	631	22350.1108
	140	31,0	30,4	50	22,0	36,8	54,8	25	250	860	386	22340.1109	631	22350.1109
	150	31,0	30,4	50	22,0	36,8	54,8	25	250	898	386	22340.1110	631	22350.1110

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



Clamping Pins • self-locking, with span compensation

EH 22360.



PRODUCT DESCRIPTION

Used for fixing and simultaneously tightly connecting thin walled plates. Clamping distance of 5 mm for clamping of sheets for welding work, for protection, coverings, to close doors etc.
All versions are corrosion resistant.
Version with ergonomic grip.

Material

Pin part
- Stainless steel 1.4305

Handle
- Thermoplastic PA 6, grey

Spring
- Stainless steel

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

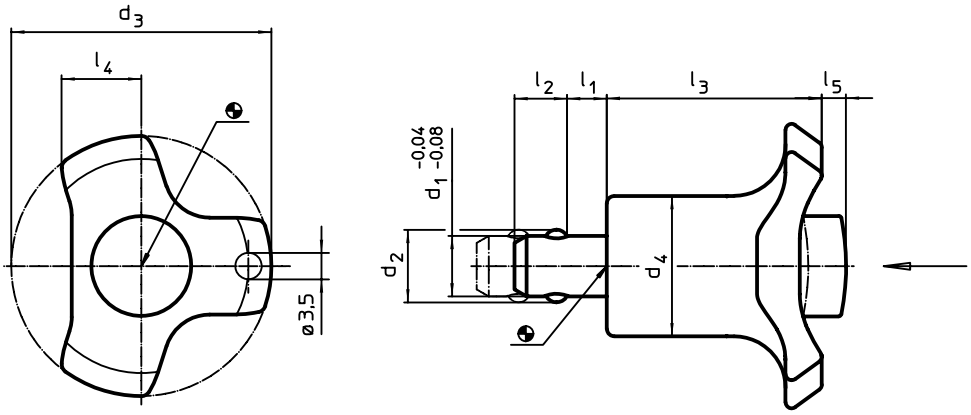
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237

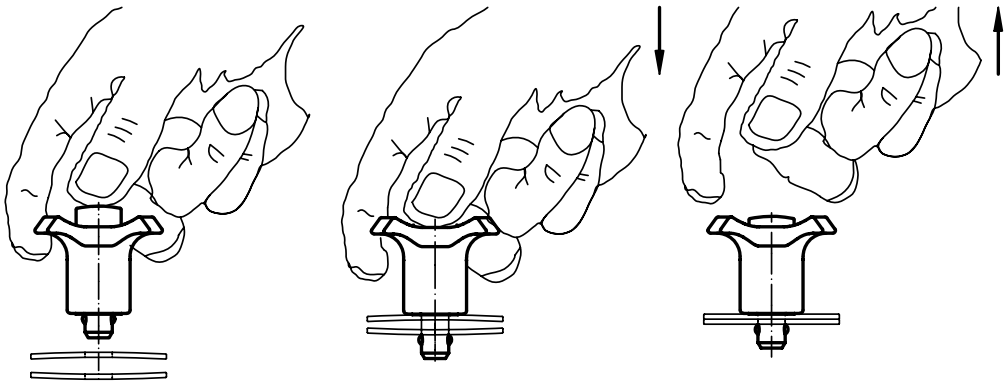
DRAWING



ORDER INFORMATION

Dimensions									Location hole H11	Clamping force max.	Temperature min.	Temperature max.	Weight	Art. No.
d_1 -0,04 -0,08	l_1	d_2	d_3	d_4	l_2	l_3	l_4	l_5 Un-clamped						
[mm]									[mm]	[N]	[°C]		[g]	
6	0 – 5	7,0	38	17,5	5,0	30,2	11,0	3	6	16	-30	80	19	22360.0010
	5 – 10	7,0	38	17,5	5,0	30,2	11,0	3	6	18	-30	80	23	22360.0012
8	0 – 5	9,5	38	17,5	6,5	30,2	11,0	3	8	16	-30	80	22	22360.0020
	5 – 10	9,5	38	17,5	6,5	30,2	11,0	3	8	18	-30	80	25	22360.0022
10	0 – 5	12,0	47	23,0	8,7	36,0	11,0	4	10	21	-30	80	45	22360.0030
	5 – 10	12,0	47	23,0	8,7	36,0	11,0	4	10	23	-30	80	47	22360.0032
12	0 – 5	14,0	47	23,0	9,4	36,0	13,5	4	12	21	-30	80	47	22360.0040
	5 – 10	14,0	47	23,0	9,4	36,0	13,5	4	12	23	-30	80	54	22360.0042

APPLICATION EXAMPLE



Ball Lock Pins • self-locking, with standard handle

EH 22370. /EH 22380.

2



PRODUCT DESCRIPTION

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
All versions are corrosion resistant. When using stainless steel 1.4542: high-strength, hardened, abrasion resistant pin with high load capacity.
Compact design with standard handle.

Material

Pin part
- Stainless steel 1.4305
- Stainless steel 1.4542, precipitation hardened

Spring
- Stainless steel

Operation

The balls are unlocked by pressing the knob.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

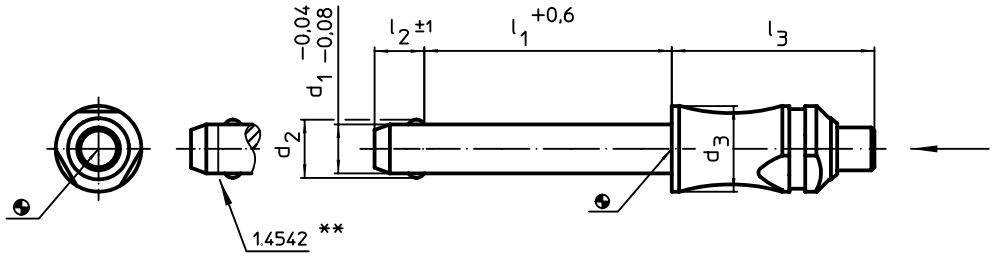
Ball Lock Pins, self-locking, with standard handle, titanium . . . . . → p. 222
Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404

MORE INFORMATION

Notes

Special types on request.

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions						Location hole H11			Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3		max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]						[mm]	[°C]	[g]	[kN]		[kN]	
5	**10**	5,5	10	6,0	26,2	5	250	10	14	22370.0012	24	22380.0012
	15	5,5	10	6,0	26,2	5	250	11	14	22370.0013	24	22380.0013
	20	5,5	10	6,0	26,2	5	250	12	14	22370.0014	24	22380.0014
	25	5,5	10	6,0	26,2	5	250	13	14	22370.0015	24	22380.0015
	30	5,5	10	6,0	26,2	5	250	13	14	22370.0016	24	22380.0016
	35	5,5	10	6,0	26,2	5	250	14	14	22370.0017	24	22380.0017
	40	5,5	10	6,0	26,2	5	250	15	14	22370.0018	24	22380.0018
	45	5,5	10	6,0	26,2	5	250	15	14	22370.0007	24	22380.0007
	50	5,5	10	6,0	26,2	5	250	16	14	22370.0008	24	22380.0008
	60	5,5	10	6,0	26,2	5	250	17	14	22370.0009	24	22380.0009
	70	5,5	10	6,0	26,2	5	250	19	14	22370.0010	24	22380.0010
	80	5,5	10	6,0	26,2	5	250	20	14	22370.0011	24	22380.0011

[1] shearing resistance similar to DIN 50141 →

Dimensions						Location hole H11			Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3		max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]						[mm]	[°C]	[g]	[kN]		[kN]	
6	10	7,0	10	7,0	26,2	6	250	11	21	22370.0022	35	22380.0022
	15	7,0	10	7,0	26,2	6	250	12	21	22370.0023	35	22380.0023
	20	7,0	10	7,0	26,2	6	250	13	21	22370.0024	35	22380.0024
	25	7,0	10	7,0	26,2	6	250	14	21	22370.0025	35	22380.0025
	30	7,0	10	7,0	26,2	6	250	15	21	22370.0026	35	22380.0026
	35	7,0	10	7,0	26,2	6	250	16	21	22370.0027	35	22380.0027
	40	7,0	10	7,0	26,2	6	250	17	21	22370.0028	35	22380.0028
	45	7,0	10	7,0	26,2	6	250	18	21	22370.0029	35	22380.0029
	50	7,0	10	7,0	26,2	6	250	19	21	22370.0030	35	22380.0030
	60	7,0	10	7,0	26,2	6	250	21	21	22370.0019	35	22380.0019
	70	7,0	10	7,0	26,2	6	250	23	21	22370.0020	35	22380.0020
	80	7,0	10	7,0	26,2	6	250	25	21	22370.0021	35	22380.0021
8	10	9,6	14	8,2	33,1	8	250	29	38	22370.0032	63	22380.0032
	15	9,6	14	8,2	33,1	8	250	31	38	22370.0033	63	22380.0033
	20	9,6	14	8,2	33,1	8	250	33	38	22370.0034	63	22380.0034
	25	9,6	14	8,2	33,1	8	250	34	38	22370.0035	63	22380.0035
	30	9,6	14	8,2	33,1	8	250	36	38	22370.0036	63	22380.0036
	35	9,6	14	8,2	33,1	8	250	38	38	22370.0037	63	22380.0037
	40	9,6	14	8,2	33,1	8	250	40	38	22370.0038	63	22380.0038
	45	9,6	14	8,2	33,1	8	250	42	38	22370.0039	63	22380.0039
	50	9,6	14	8,2	33,1	8	250	44	38	22370.0040	63	22380.0040
	60	9,6	14	8,2	33,1	8	250	47	38	22370.0031	63	22380.0031
	70	9,6	14	8,2	33,1	8	250	51	38	22370.0041	63	22380.0041
	80	9,6	14	8,2	33,1	8	250	55	38	22370.0042	63	22380.0042
	90	9,6	14	8,2	33,1	8	250	58	38	22370.0043	63	22380.0043
	100	9,6	14	8,2	33,1	8	250	62	38	22370.0051	63	22380.0051
10	15	12,0	14	9,6	33,1	10	250	36	60	22370.0059	100	22380.0059
	20	12,0	14	9,6	33,1	10	250	39	60	22370.0044	100	22380.0044
	25	12,0	14	9,6	33,1	10	250	42	60	22370.0045	100	22380.0045
	30	12,0	14	9,6	33,1	10	250	45	60	22370.0046	100	22380.0046
	35	12,0	14	9,6	33,1	10	250	48	60	22370.0047	100	22380.0047
	40	12,0	14	9,6	33,1	10	250	51	60	22370.0048	100	22380.0048
	45	12,0	14	9,6	33,1	10	250	54	60	22370.0049	100	22380.0049
	50	12,0	14	9,6	33,1	10	250	57	60	22370.0050	100	22380.0050
	60	12,0	14	9,6	33,1	10	250	63	60	22370.0052	100	22380.0052
	70	12,0	14	9,6	33,1	10	250	69	60	22370.0053	100	22380.0053
	80	12,0	14	9,6	33,1	10	250	74	60	22370.0054	100	22380.0054
	90	12,0	14	9,6	33,1	10	250	80	60	22370.0055	100	22380.0055
	100	12,0	14	9,6	33,1	10	250	86	60	22370.0056	100	22380.0056
	110	12,0	14	9,6	33,1	10	250	92	60	22370.0057	100	22380.0057
	120	12,0	14	9,6	33,1	10	250	98	60	22370.0058	100	22380.0058
12	20	14,5	20	10,6	39,5	12	250	80	87	22370.0064	144	22380.0064
	25	14,5	20	10,6	39,5	12	250	84	87	22370.0065	144	22380.0065
	30	14,5	20	10,6	39,5	12	250	88	87	22370.0066	144	22380.0066
	35	14,5	20	10,6	39,5	12	250	92	87	22370.0067	144	22380.0067
	40	14,5	20	10,6	39,5	12	250	96	87	22370.0068	144	22380.0068
	45	14,5	20	10,6	39,5	12	250	101	87	22370.0069	144	22380.0069
	50	14,5	20	10,6	39,5	12	250	105	87	22370.0070	144	22380.0070
	60	14,5	20	10,6	39,5	12	250	113	87	22370.0072	144	22380.0072
	70	14,5	20	10,6	39,5	12	250	122	87	22370.0074	144	22380.0074
	80	14,5	20	10,6	39,5	12	250	130	87	22370.0076	144	22380.0076
	90	14,5	20	10,6	39,5	12	250	139	87	22370.0060	144	22380.0060
	100	14,5	20	10,6	39,5	12	250	148	87	22370.0061	144	22380.0061
	110	14,5	20	10,6	39,5	12	250	157	87	22370.0062	144	22380.0062
	120	14,5	20	10,6	39,5	12	250	165	87	22370.0063	144	22380.0063

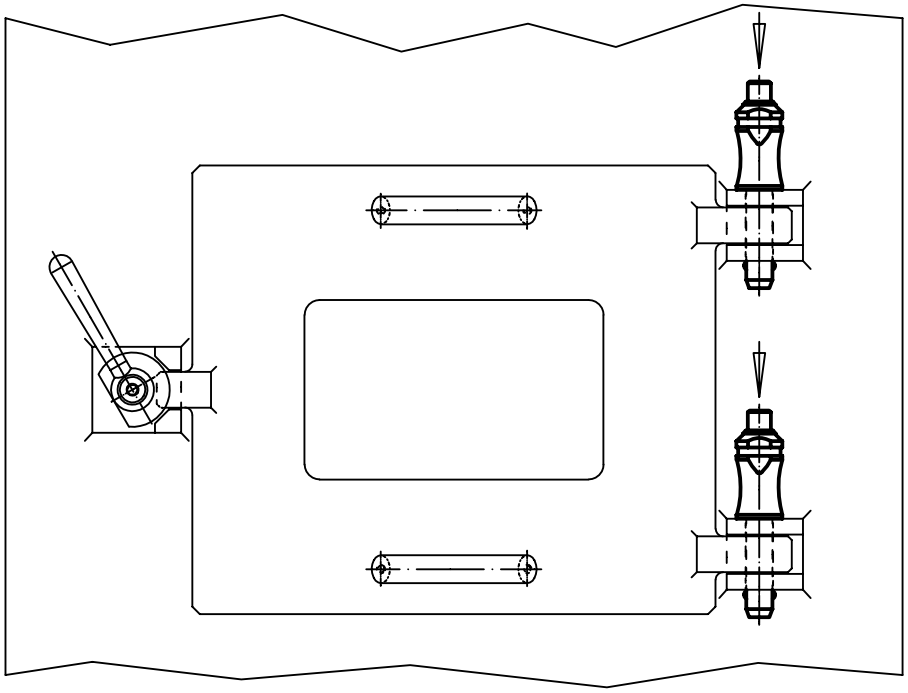
[1] shearing resistance similar to DIN 50141

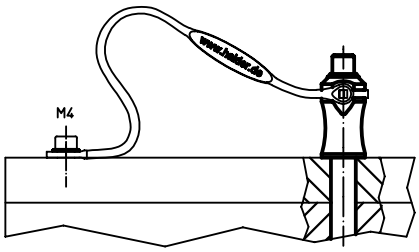
→

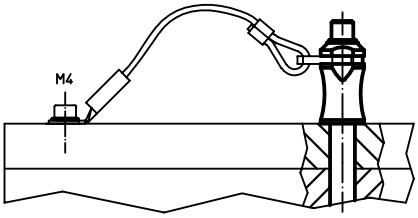
Dimensions						Location hole H11			Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3		max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]						[mm]	[°C]	[g]	[kN]		[kN]	
	30	19,0	20	14,0	39,5	16	250	120	155	22370.0086	257	22380.0086
	35	19,0	20	14,0	39,5	16	250	127	155	22370.0087	257	22380.0087
	40	19,0	20	14,0	39,5	16	250	135	155	22370.0088	257	22380.0088
	45	19,0	20	14,0	39,5	16	250	143	155	22370.0089	257	22380.0089
	50	19,0	20	14,0	39,5	16	250	150	155	22370.0090	257	22380.0090
	60	19,0	20	14,0	39,5	16	250	166	155	22370.0092	257	22380.0092
	70	19,0	20	14,0	39,5	16	250	181	155	22370.0094	257	22380.0094
16	**80**	19,0	20	14,0	39,5	16	250	196	155	22370.0096	257	22380.0096
	90	19,0	20	14,0	39,5	16	250	216	155	22370.0097	257	22380.0097
	100	19,0	20	14,0	39,5	16	250	233	155	22370.0098	257	22380.0098
	110	19,0	20	14,0	39,5	16	250	248	155	22370.0099	257	22380.0099
	120	19,0	20	14,0	39,5	16	250	263	155	22370.0100	257	22380.0100
	130	19,0	20	14,0	39,5	16	250	279	155	22370.0101	257	22380.0101
	140	19,0	20	14,0	39,5	16	250	295	155	22370.0102	257	22380.0102
	150	19,0	20	14,0	39,5	16	250	310	155	22370.0103	257	22380.0103
	50	25,0	28	20,5	49,9	20	250	303	244	22370.0111	403	22380.0111
	60	25,0	28	20,5	49,9	20	250	322	244	22370.0112	403	22380.0112
	70	25,0	28	20,5	49,9	20	250	351	244	22370.0113	403	22380.0113
	80	25,0	28	20,5	49,9	20	250	370	244	22370.0116	403	22380.0116
	90	25,0	28	20,5	49,9	20	250	400	244	22370.0117	403	22380.0117
20	**100**	25,0	28	20,5	49,9	20	250	414	244	22370.0120	403	22380.0120
	110	25,0	28	20,5	49,9	20	250	448	244	22370.0121	403	22380.0121
	120	25,0	28	20,5	49,9	20	250	466	244	22370.0124	403	22380.0124
	130	25,0	28	20,5	49,9	20	250	497	244	22370.0125	403	22380.0125
	140	25,0	28	20,5	49,9	20	250	520	244	22370.0126	403	22380.0126
	150	25,0	28	20,5	49,9	20	250	545	244	22370.0127	403	22380.0127
	50	30,8	28	22,0	49,9	25	250	395	386	22370.0129	631	22380.0129
	60	30,8	28	22,0	49,9	25	250	432	386	22370.0130	631	22380.0130
	70	30,8	28	22,0	49,9	25	250	470	386	22370.0131	631	22380.0131
	80	30,8	28	22,0	49,9	25	250	507	386	22370.0132	631	22380.0132
	90	30,8	28	22,0	49,9	25	250	545	386	22370.0133	631	22380.0133
25	**100**	30,8	28	22,0	49,9	25	250	582	386	22370.0134	631	22380.0134
	110	30,8	28	22,0	49,9	25	250	620	386	22370.0135	631	22380.0135
	120	30,8	28	22,0	49,9	25	250	657	386	22370.0136	631	22380.0136
	130	30,8	28	22,0	49,9	25	250	695	386	22370.0137	631	22380.0137
	140	30,8	28	22,0	49,9	25	250	732	386	22370.0138	631	22380.0138
	150	30,8	28	22,0	49,9	25	250	770	386	22370.0139	631	22380.0139

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE







2

Ball Lock Pins • self-locking, with standard handle, titanium

EH 22390.



PRODUCT DESCRIPTION

Ball lock pins made from titanium stand out due to the following positive material features:
- Over 40% lighter weight compared to a steel variant
- Absolutely corrosion resistant.

The version made from titanium is used in areas such as lightweight construction, maritime environments and chemical manufacturing.
For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
Compact design with standard handle.

Material

Pin part
- Titanium

Ball
- Ceramic

Spring
- Corrosion resistant alloy

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

Notes

Special types on request.

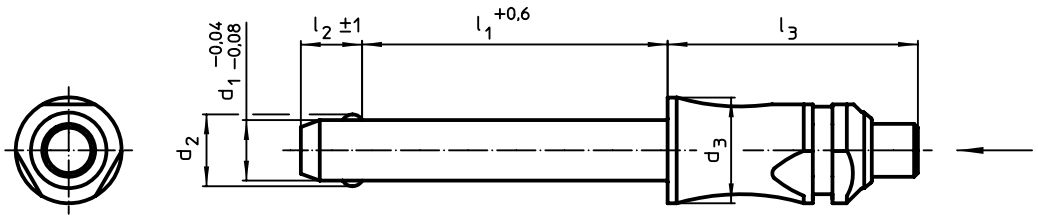
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Ball Lock Pins, self-locking, with standard handle . . . . . → p. 218
Retaining Cables . . . . . → p. 237

DRAWING



ORDER INFORMATION

Dimensions						Location hole H11	Shearing resistance, double[1] min.	max.		Art. No.
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	l_2 ±1	l_3					
[mm]						[mm]	[kN]	[°C]	[g]	
6	10	7,0	10	7,0	26,2	6	23	400	7	22390.0022
	20	7,0	10	7,0	26,2	6	23	400	8	22390.0024
	30	7,0	10	7,0	26,2	6	23	400	9	22390.0026
	40	7,0	10	7,0	26,2	6	23	400	10	22390.0028
	50	7,0	10	7,0	26,2	6	23	400	11	22390.0030
8	20	9,6	14	8,2	33,1	8	43	400	19	22390.0034
	30	9,6	14	8,2	33,1	8	43	400	21	22390.0036
	40	9,6	14	8,2	33,1	8	43	400	23	22390.0038
	50	9,6	14	8,2	33,1	8	43	400	25	22390.0040
10	20	12,0	14	9,6	33,1	10	43	400	23	22390.0044
	30	12,0	14	9,6	26,2	10	69	400	26	22390.0046
	40	12,0	14	9,6	26,2	10	69	400	29	22390.0048
	50	12,0	14	9,6	26,2	10	69	400	32	22390.0050
	60	12,0	14	9,6	26,2	10	69	400	36	22390.0052

[1] shearing resistance similar to DIN 50141 (determined by tests)

Ball Lock Pins • self-locking, with elastic grip

EH 22370. /EH 22380.



PRODUCT DESCRIPTION

For quick fastening, locking, adjusting, changing and securing. Various applications in different sectors, e.g. sports, leisure, medical healing and remedial instruments and apparatuses, machine construction and engineering etc. Quickly and easily unlockable for frequently repeated connections.
All versions are corrosion resistant. When using stainless steel 1.4542: high-strength, hardened, abrasion resistant pin with high load capacity.
Elastic and ergonomic grip with integrated reset (locking). New, modern, patented design.

Material

Pin part
- Stainless steel 1.4305
- Stainless steel 1.4542, precipitation hardened

Handle
- Thermoplastic (PBT/TPE), grey / orange

Operation

The balls are unlocked by pressing the knob.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.

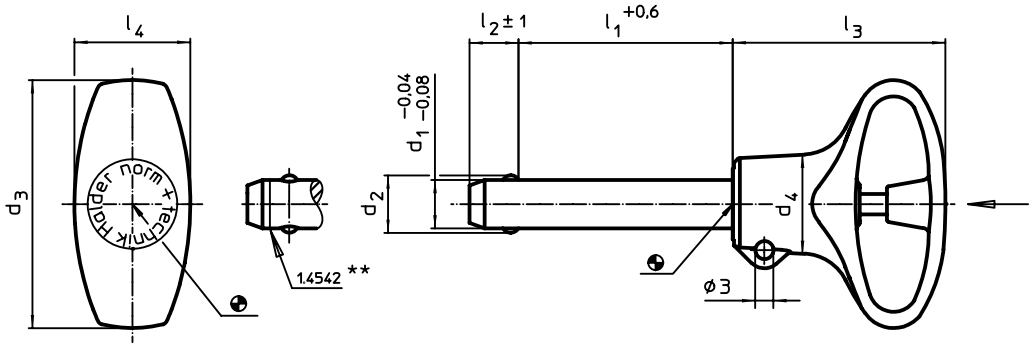
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

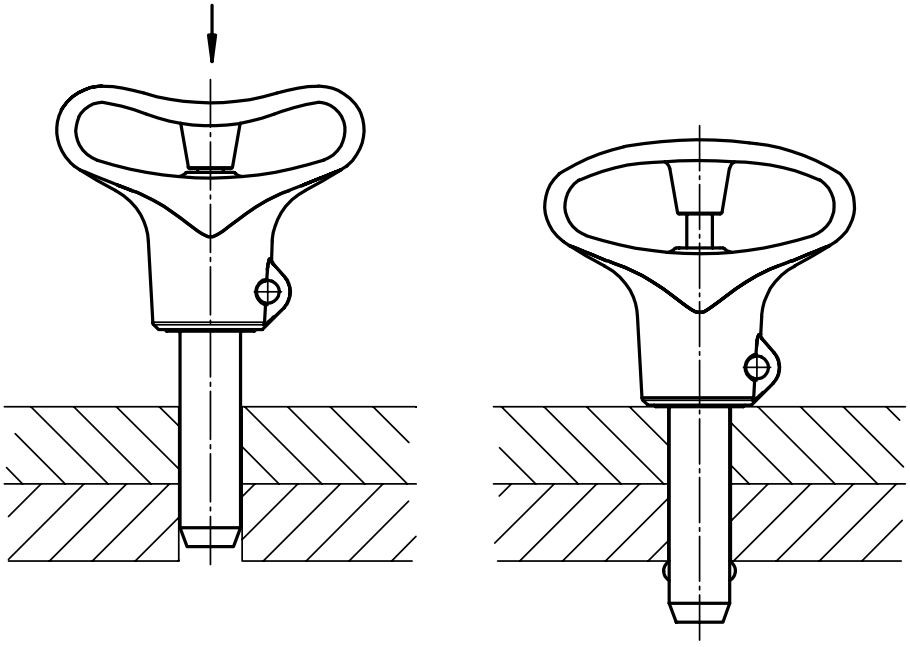
Dimensions								Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]								[mm]	[°C]		[g]	[kN]		[kN]	
5	10	5,5	36	12,7	6,0	31,0	15,9	5	-30	80	9	14	22370.0712	24	22380.0712
	15	5,5	36	12,7	6,0	31,0	15,9	5	-30	80	10	14	22370.0713	24	22380.0713
	20	5,5	36	12,7	6,0	31,0	15,9	5	-30	80	11	14	22370.0714	24	22380.0714
	25	5,5	36	12,7	6,0	31,0	15,9	5	-30	80	11	14	22370.0715	24	22380.0715
	30	5,5	36	12,7	6,0	31,0	15,9	5	-30	80	12	14	22370.0716	24	22380.0716
6	10	7,0	36	12,7	7,0	31,0	15,9	6	-30	80	10	21	22370.0722	35	22380.0722
	15	7,0	36	12,7	7,0	31,0	15,9	6	-30	80	11	21	22370.0723	35	22380.0723
	20	7,0	36	12,7	7,0	31,0	15,9	6	-30	80	12	21	22370.0724	35	22380.0724
	25	7,0	36	12,7	7,0	31,0	15,9	6	-30	80	13	21	22370.0725	35	22380.0725
	30	7,0	36	12,7	7,0	31,0	15,9	6	-30	80	14	21	22370.0726	35	22380.0726
	35	7,0	36	12,7	7,0	31,0	15,9	6	-30	80	15	21	22370.0727	35	22380.0727
	40	7,0	36	12,7	7,0	31,0	15,9	6	-30	80	16	21	22370.0728	35	22380.0728
	45	7,0	36	12,7	7,0	31,0	15,9	6	-30	80	18	21	22370.0729	35	22380.0729
	50	7,0	36	12,7	7,0	31,0	15,9	6	-30	80	18	21	22370.0730	35	22380.0730

[1] shearing resistance similar to DIN 50141 →

Dimensions								Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]								[mm]	[°C]		[g]	[kN]		[kN]	
8	20	9,6	41	16,4	8,2	34,8	19,2	8	-30	80	23	38	22370.0734	63	22380.0734
	25	9,6	41	16,4	8,2	34,8	19,2	8	-30	80	25	38	22370.0735	63	22380.0735
	30	9,6	41	16,4	8,2	34,8	19,2	8	-30	80	26	38	22370.0736	63	22380.0736
	35	9,6	41	16,4	8,2	34,8	19,2	8	-30	80	28	38	22370.0737	63	22380.0737
	40	9,6	41	16,4	8,2	34,8	19,2	8	-30	80	30	38	22370.0738	63	22380.0738
	45	9,6	41	16,4	8,2	34,8	19,2	8	-30	80	32	38	22370.0739	63	22380.0739
	50	9,6	41	16,4	8,2	34,8	19,2	8	-30	80	34	38	22370.0740	63	22380.0740
10	20	12,0	41	16,4	9,6	34,8	19,2	10	-30	80	30	60	22370.0744	100	22380.0744
	25	12,0	41	16,4	9,6	34,8	19,2	10	-30	80	32	60	22370.0745	100	22380.0745
	30	12,0	41	16,4	9,6	34,8	19,2	10	-30	80	35	60	22370.0746	100	22380.0746
	35	12,0	41	16,4	9,6	34,8	19,2	10	-30	80	38	60	22370.0747	100	22380.0747
	40	12,0	41	16,4	9,6	34,8	19,2	10	-30	80	41	60	22370.0748	100	22380.0748
	45	12,0	41	16,4	9,6	34,8	19,2	10	-30	80	44	60	22370.0749	100	22380.0749
	50	12,0	41	16,4	9,6	34,8	19,2	10	-30	80	47	60	22370.0750	100	22380.0750
	60	12,0	41	16,4	9,6	34,8	19,2	10	-30	80	53	60	22370.0752	100	22380.0752
12	25	14,5	49	21,2	10,6	40,5	24,8	12	-30	80	54	87	22370.0765	144	22380.0765
	30	14,5	49	21,2	10,6	40,5	24,8	12	-30	80	59	87	22370.0766	144	22380.0766
	35	14,5	49	21,2	10,6	40,5	24,8	12	-30	80	63	87	22370.0767	144	22380.0767
	40	14,5	49	21,2	10,6	40,5	24,8	12	-30	80	67	87	22370.0768	144	22380.0768
	45	14,5	49	21,2	10,6	40,5	24,8	12	-30	80	71	87	22370.0769	144	22380.0769
	50	14,5	49	21,2	10,6	40,5	24,8	12	-30	80	75	87	22370.0770	144	22380.0770
	60	14,5	49	21,2	10,6	40,5	24,8	12	-30	80	84	87	22370.0772	144	22380.0772
	70	14,5	49	21,2	10,6	40,5	24,8	12	-30	80	93	87	22370.0774	144	22380.0774
	80	14,5	49	21,2	10,6	40,5	24,8	12	-30	80	101	87	22370.0776	144	22380.0776
16	30	19,0	49	21,2	14,0	40,5	24,8	16	-30	80	91	155	22370.0786	257	22380.0786
	35	19,0	49	21,2	14,0	40,5	24,8	16	-30	80	98	155	22370.0787	257	22380.0787
	40	19,0	49	21,2	14,0	40,5	24,8	16	-30	80	106	155	22370.0788	257	22380.0788
	45	19,0	49	21,2	14,0	40,5	24,8	16	-30	80	114	155	22370.0789	257	22380.0789
	50	19,0	49	21,2	14,0	40,5	24,8	16	-30	80	121	155	22370.0790	257	22380.0790
	60	19,0	49	21,2	14,0	40,5	24,8	16	-30	80	137	155	22370.0792	257	22380.0792
	70	19,0	49	21,2	14,0	40,5	24,8	16	-30	80	152	155	22370.0794	257	22380.0794
	80	19,0	49	21,2	14,0	40,5	24,8	16	-30	80	167	155	22370.0796	257	22380.0796

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



Ball Lock Pins • self-locking, with combination handle

EH 22370.



PRODUCT DESCRIPTION

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
All versions are corrosion resistant.
Ergonomic grip, different colour combinations available. The grip design provides protection of unintentional unlocking.

Material

Pin part
- Stainless steel 1.4305

Handle
- Thermoplastic PA 6 grey / orange
- Thermoplastic PA 6 grey / grey
- Thermoplastic PA 6 grey / blue
- Thermoplastic PA 6 black / black

Spring
- Stainless steel

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

Notes

Special types on request.

References

Stainless steel 1.4542, see EH 22380.

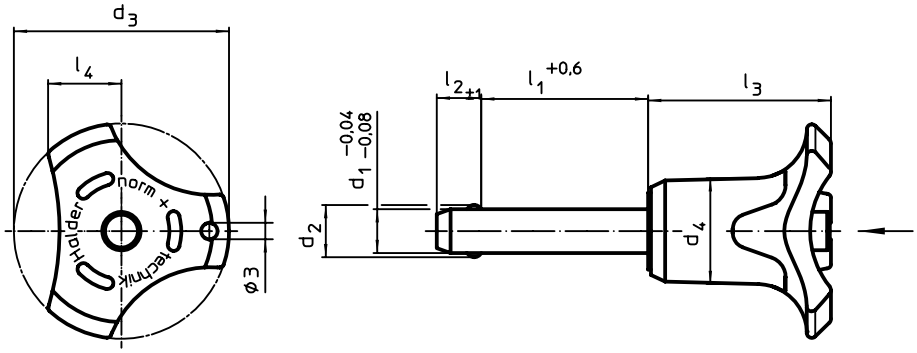
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Ball Lock Pins, self-locking, with combination handle, precipitation-hardened . → p. 228
Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404

DRAWING



ORDER INFORMATION

Dimensions								Location hole H11	Shearing resistance, double[1] min.				Art. No.			
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4			min.	max.		orange	grey	blue	black
[mm]								[mm]	[kN]	[°C]		[g]				
5	10	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	15	22370.0152	22370.0292	22370.0432	22370.0812
	15	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	15	22370.0153	22370.0293	22370.0433	22370.0813
	20	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	16	22370.0154	22370.0294	22370.0434	22370.0814
	25	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	17	22370.0155	22370.0295	22370.0435	22370.0815
	30	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	18	22370.0156	22370.0296	22370.0436	22370.0816
	35	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	19	22370.0145	22370.0285	22370.0425	22370.0805
	40	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	20	22370.0146	22370.0286	22370.0426	22370.0806
	45	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	21	22370.0147	22370.0287	22370.0427	22370.0807
	50	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	23	22370.0148	22370.0288	22370.0428	22370.0808
	60	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	24	22370.0149	22370.0289	22370.0429	22370.0809
	70	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	18	22370.0150	22370.0290	22370.0430	22370.0810
	80	5,5	33,2	14,5	6,0	26,7	10,8	5	14	-30	80	19	22370.0151	22370.0291	22370.0431	22370.0811

[1] shearing resistance similar to DIN 50141 →

Dimensions								Location hole H11	Shearing resistance, double[1] min.				Art. No.			
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4			min.	max.		orange	grey	blue	black
[mm]								[mm]	[kN]	[°C]		[g]				
6	10	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	16	22370.0162	22370.0302	22370.0442	22370.0822
	15	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	17	22370.0163	22370.0303	22370.0443	22370.0823
	20	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	18	22370.0164	22370.0304	22370.0444	22370.0824
	25	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	19	22370.0165	22370.0305	22370.0445	22370.0825
	30	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	20	22370.0166	22370.0306	22370.0446	22370.0826
	35	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	21	22370.0167	22370.0307	22370.0447	22370.0827
	40	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	22	22370.0168	22370.0308	22370.0448	22370.0828
	45	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	23	22370.0169	22370.0309	22370.0449	22370.0829
	50	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	24	22370.0170	22370.0310	22370.0450	22370.0830
	60	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	26	22370.0157	22370.0297	22370.0437	22370.0817
	70	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	28	22370.0158	22370.0298	22370.0438	22370.0818
	80	7,0	33,2	14,5	7,0	26,7	10,8	6	21	-30	80	30	22370.0159	22370.0299	22370.0439	22370.0819
8	10	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	38	22370.0172	22370.0312	22370.0452	22370.0832
	15	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	58	22370.0173	22370.0313	22370.0453	22370.0833
	20	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	39	22370.0174	22370.0314	22370.0454	22370.0834
	25	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	42	22370.0175	22370.0315	22370.0455	22370.0835
	30	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	44	22370.0176	22370.0316	22370.0456	22370.0836
	35	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	46	22370.0177	22370.0317	22370.0457	22370.0837
	40	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	47	22370.0178	22370.0318	22370.0458	22370.0838
	45	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	49	22370.0179	22370.0319	22370.0459	22370.0839
	50	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	51	22370.0180	22370.0320	22370.0460	22370.0840
	60	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	62	22370.0181	22370.0321	22370.0461	22370.0841
	70	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	65	22370.0182	22370.0322	22370.0462	22370.0842
	80	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	69	22370.0183	22370.0323	22370.0463	22370.0843
	90	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	36	22370.0171	22370.0311	22370.0451	22370.0831
	100	9,6	39,2	18,4	8,2	33,3	13,4	8	38	-30	80	54	22370.0161	22370.0301	22370.0441	22370.0821
10	15	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	86	22370.0191	22370.0331	22370.0471	22370.0851
	20	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	47	22370.0184	22370.0324	22370.0464	22370.0844
	25	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	49	22370.0185	22370.0325	22370.0465	22370.0845
	30	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	53	22370.0186	22370.0326	22370.0466	22370.0846
	35	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	55	22370.0187	22370.0327	22370.0467	22370.0847
	40	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	57	22370.0188	22370.0328	22370.0468	22370.0848
	45	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	61	22370.0189	22370.0329	22370.0469	22370.0849
	50	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	64	22370.0190	22370.0330	22370.0470	22370.0850
	60	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	70	22370.0192	22370.0332	22370.0472	22370.0852
	70	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	91	22370.0193	22370.0333	22370.0473	22370.0853
	80	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	97	22370.0194	22370.0334	22370.0474	22370.0854
	90	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	103	22370.0195	22370.0335	22370.0475	22370.0855
	100	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	109	22370.0196	22370.0336	22370.0476	22370.0856
	110	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	115	22370.0197	22370.0337	22370.0477	22370.0857
	120	12,0	39,2	18,4	9,6	33,3	13,4	10	60	-30	80	53	22370.0198	22370.0338	22370.0478	22370.0858
12	20	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	156	22370.0204	22370.0344	22370.0484	22370.0864
	25	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	96	22370.0205	22370.0345	22370.0485	22370.0865
	30	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	100	22370.0206	22370.0346	22370.0486	22370.0866
	35	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	105	22370.0207	22370.0347	22370.0487	22370.0867
	40	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	109	22370.0208	22370.0348	22370.0488	22370.0868
	45	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	113	22370.0209	22370.0349	22370.0489	22370.0869
	50	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	117	22370.0210	22370.0350	22370.0490	22370.0870
	60	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	126	22370.0212	22370.0352	22370.0492	22370.0872
	70	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	134	22370.0214	22370.0354	22370.0494	22370.0874
	80	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	143	22370.0216	22370.0356	22370.0496	22370.0876
	90	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	165	22370.0217	22370.0357	22370.0497	22370.0877
	100	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	173	22370.0218	22370.0358	22370.0498	22370.0878
	110	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	182	22370.0219	22370.0359	22370.0499	22370.0879
	120	14,5	47,6	25,2	10,6	39,7	16,7	12	87	-30	80	177	22370.0220	22370.0360	22370.0500	22370.0880

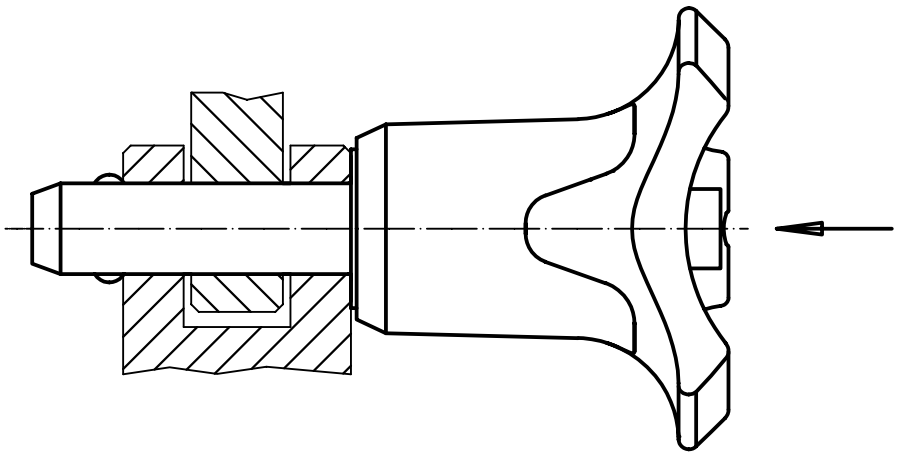
[1] shearing resistance similar to DIN 50141

→

Dimensions								Location hole H11	Shearing resistance, double[1] min.				Art. No.			
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4			min.	max.		orange	grey	blue	black
[mm]								[mm]	[kN]	[°C]		[g]				
	30	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	132	22370.0226	22370.0366	22370.0506	22370.0886
	35	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	140	22370.0227	22370.0367	22370.0507	22370.0887
	40	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	148	22370.0228	22370.0368	22370.0508	22370.0888
	45	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	155	22370.0229	22370.0369	22370.0509	22370.0889
	50	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	168	22370.0230	22370.0370	22370.0510	22370.0890
	60	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	178	22370.0232	22370.0372	22370.0512	22370.0892
	70	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	194	22370.0234	22370.0374	22370.0514	22370.0894
16	**80**	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	208	22370.0236	22370.0376	22370.0516	22370.0896
	90	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	234	22370.0237	22370.0377	22370.0517	22370.0897
	100	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	251	22370.0238	22370.0378	22370.0518	22370.0898
	110	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	266	22370.0239	22370.0379	22370.0519	22370.0899
	120	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	281	22370.0240	22370.0380	22370.0520	22370.0900
	130	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	297	22370.0241	22370.0381	22370.0521	22370.0901
	140	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	313	22370.0242	22370.0382	22370.0522	22370.0902
	150	19,0	47,6	25,2	14,0	39,7	16,7	16	155	-30	80	328	22370.0243	22370.0383	22370.0523	22370.0903
	50	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	329	22370.0251	22370.0391	22370.0531	22370.0905
	60	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	343	22370.0252	22370.0392	22370.0532	22370.0904
	70	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	377	22370.0253	22370.0393	22370.0533	22370.0906
	80	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	392	22370.0256	22370.0396	22370.0536	22370.0908
	90	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	426	22370.0257	22370.0397	22370.0537	22370.0909
20	**100**	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	440	22370.0260	22370.0400	22370.0540	22370.0912
	110	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	474	22370.0261	22370.0401	22370.0541	22370.0913
	120	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	488	22370.0264	22370.0404	22370.0544	22370.0916
	130	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	523	22370.0265	22370.0405	22370.0545	22370.0917
	140	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	546	22370.0266	22370.0406	22370.0546	22370.0918
	150	25,0	57,1	33,8	20,5	50,7	21,5	20	244	-30	80	571	22370.0267	22370.0407	22370.0547	22370.0919
	50	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	415	22370.0269	22370.0409	22370.0549	22370.0921
	60	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	453	22370.0270	22370.0410	22370.0550	22370.0922
	70	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	490	22370.0271	22370.0411	22370.0551	22370.0923
	80	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	528	22370.0272	22370.0412	22370.0552	22370.0924
	90	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	565	22370.0273	22370.0413	22370.0553	22370.0925
25	**100**	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	603	22370.0274	22370.0414	22370.0554	22370.0926
	110	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	640	22370.0275	22370.0415	22370.0555	22370.0927
	120	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	690	22370.0276	22370.0416	22370.0556	22370.0928
	130	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	715	22370.0277	22370.0417	22370.0557	22370.0929
	140	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	753	22370.0278	22370.0418	22370.0558	22370.0930
	150	30,8	57,1	33,8	22,0	50,7	21,5	25	386	-30	80	790	22370.0279	22370.0419	22370.0559	22370.0931

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



Ball Lock Pins • self-locking, with combination handle, precipitation-hardened

EH 22380.

2



PRODUCT DESCRIPTION

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
All versions are corrosion resistant. When using stainless steel 1.4542: high-strength, hardened, abrasion resistant pin with high load capacity.
Ergonomic grip, different colour combinations available. The grip design provides protection of unintentional unlocking.

Material

Pin part
- Stainless steel 1.4542, precipitation hardened

Handle
- Thermoplastic PA 6 grey / orange
- Thermoplastic PA 6 grey / grey
- Thermoplastic PA 6 grey / blue
- Thermoplastic PA 6 black / black

Spring
- Stainless steel

Operation

The balls are unlocked by pressing the knob.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.

References

Stainless steel 1.4305, see EH 22370.

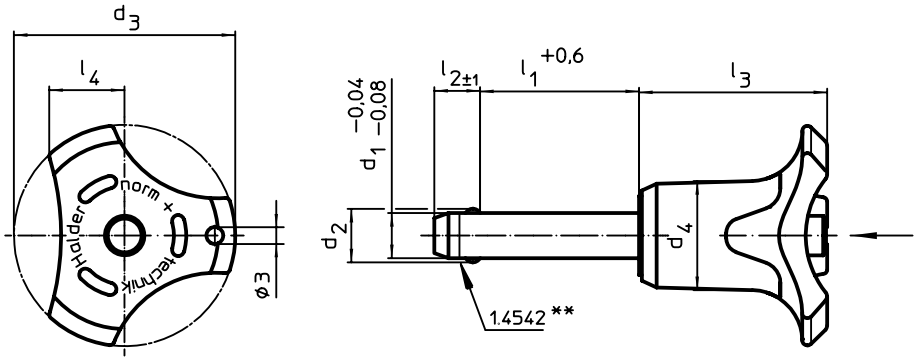
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Ball Lock Pins, self-locking, with combination handle . . . . . → p. 225
Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions								Location hole H11	Shearing resistance, double[1] min.				Art. No.			
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4			min.	max.		orange	grey	blue	black
[mm]								[mm]	[kN]	[°C]		[g]				
5	10	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	15	22380.0152	22380.0292	22380.0432	22380.0812
	15	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	15	22380.0153	22380.0293	22380.0433	22380.0813
	20	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	16	22380.0154	22380.0294	22380.0434	22380.0814
	25	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	17	22380.0155	22380.0295	22380.0435	22380.0815
	30	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	18	22380.0156	22380.0296	22380.0436	22380.0816
	35	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	19	22380.0145	22380.0285	22380.0425	22380.0805
	40	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	20	22380.0146	22380.0286	22380.0426	22380.0806
	45	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	21	22380.0147	22380.0287	22380.0427	22380.0807
	50	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	23	22380.0148	22380.0288	22380.0428	22380.0808
	60	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	24	22380.0149	22380.0289	22380.0429	22380.0809
	70	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	18	22380.0150	22380.0290	22380.0430	22380.0810
	80	5,5	33,2	14,5	6,0	26,7	10,8	5	24	-30	80	19	22380.0151	22380.0291	22380.0431	22380.0811

[1] shearing resistance similar to DIN 50141 →

Dimensions								Location hole H11	Shearing resistance, double[1] min.				Art. No.			
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4			min.	max.		orange	grey	blue	black
[mm]								[mm]	[kN]	[°C]		[g]				
6	10	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	16	22380.0162	22380.0302	22380.0442	22380.0822
	15	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	17	22380.0163	22380.0303	22380.0443	22380.0823
	20	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	18	22380.0164	22380.0304	22380.0444	22380.0824
	25	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	19	22380.0165	22380.0305	22380.0445	22380.0825
	30	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	20	22380.0166	22380.0306	22380.0446	22380.0826
	35	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	21	22380.0167	22380.0307	22380.0447	22380.0827
	40	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	22	22380.0168	22380.0308	22380.0448	22380.0828
	45	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	23	22380.0169	22380.0309	22380.0449	22380.0829
	50	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	24	22380.0170	22380.0310	22380.0450	22380.0830
	60	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	26	22380.0157	22380.0297	22380.0437	22380.0817
	70	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	28	22380.0158	22380.0298	22380.0438	22380.0818
	80	7,0	33,2	14,5	7,0	26,7	10,8	6	35	-30	80	30	22380.0159	22380.0299	22380.0439	22380.0819
8	10	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	38	22380.0172	22380.0312	22380.0452	22380.0832
	15	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	58	22380.0173	22380.0313	22380.0453	22380.0833
	20	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	40	22380.0174	22380.0314	22380.0454	22380.0834
	25	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	42	22380.0175	22380.0315	22380.0455	22380.0835
	30	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	44	22380.0176	22380.0316	22380.0456	22380.0836
	35	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	46	22380.0177	22380.0317	22380.0457	22380.0837
	40	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	47	22380.0178	22380.0318	22380.0458	22380.0838
	45	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	49	22380.0179	22380.0319	22380.0459	22380.0839
	50	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	51	22380.0180	22380.0320	22380.0460	22380.0840
	60	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	62	22380.0181	22380.0321	22380.0461	22380.0841
	70	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	65	22380.0182	22380.0322	22380.0462	22380.0842
	80	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	69	22380.0183	22380.0323	22380.0463	22380.0843
	90	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	36	22380.0171	22380.0311	22380.0451	22380.0831
	100	9,6	39,2	18,4	8,2	33,3	13,4	8	63	-30	80	54	22380.0161	22380.0301	22380.0441	22380.0821
10	15	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	86	22380.0191	22380.0331	22380.0471	22380.0851
	20	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	47	22380.0184	22380.0324	22380.0464	22380.0844
	25	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	49	22380.0185	22380.0325	22380.0465	22380.0845
	30	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	51	22380.0186	22380.0326	22380.0466	22380.0846
	35	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	55	22380.0187	22380.0327	22380.0467	22380.0847
	40	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	58	22380.0188	22380.0328	22380.0468	22380.0848
	45	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	61	22380.0189	22380.0329	22380.0469	22380.0849
	50	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	64	22380.0190	22380.0330	22380.0470	22380.0850
	60	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	70	22380.0192	22380.0332	22380.0472	22380.0852
	70	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	91	22380.0193	22380.0333	22380.0473	22380.0853
	80	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	97	22380.0194	22380.0334	22380.0474	22380.0854
	90	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	103	22380.0195	22380.0335	22380.0475	22380.0855
	100	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	109	22380.0196	22380.0336	22380.0476	22380.0856
	110	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	115	22380.0197	22380.0337	22380.0477	22380.0857
	120	12,0	39,2	18,4	9,6	33,3	13,4	10	100	-30	80	53	22380.0198	22380.0338	22380.0478	22380.0858
12	20	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	156	22380.0204	22380.0344	22380.0484	22380.0864
	25	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	96	22380.0205	22380.0345	22380.0485	22380.0865
	30	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	100	22380.0206	22380.0346	22380.0486	22380.0866
	35	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	105	22380.0207	22380.0347	22380.0487	22380.0867
	40	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	109	22380.0208	22380.0348	22380.0488	22380.0868
	45	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	113	22380.0209	22380.0349	22380.0489	22380.0869
	50	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	117	22380.0210	22380.0350	22380.0490	22380.0870
	60	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	126	22380.0212	22380.0352	22380.0492	22380.0872
	70	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	134	22380.0214	22380.0354	22380.0494	22380.0874
	80	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	143	22380.0216	22380.0356	22380.0496	22380.0876
	90	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	165	22380.0217	22380.0357	22380.0497	22380.0877
	100	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	173	22380.0218	22380.0358	22380.0498	22380.0878
	110	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	182	22380.0219	22380.0359	22380.0499	22380.0879
	120	14,5	47,6	25,2	10,6	39,7	16,7	12	144	-30	80	177	22380.0220	22380.0360	22380.0500	22380.0880

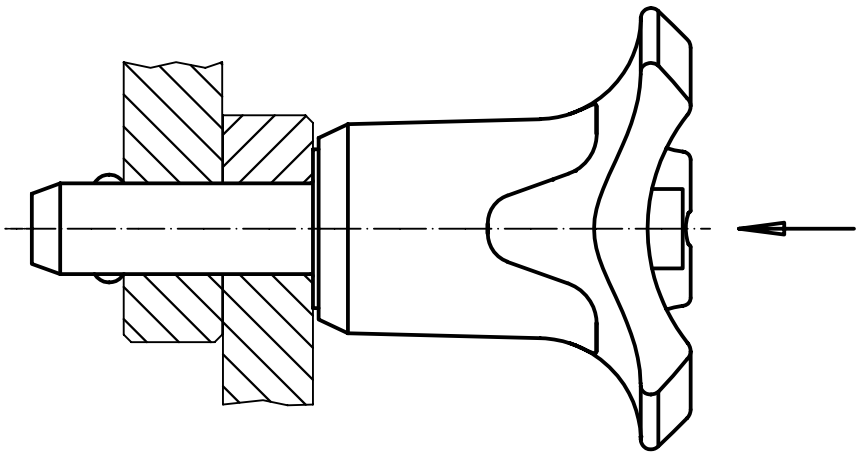
[1] shearing resistance similar to DIN 50141

→

Dimensions								Location hole H11	Shearing resistance, double[1] min.				Art. No.			
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4			min.	max.		orange	grey	blue	black
[mm]								[mm]	[kN]	[°C]		[g]				
	30	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	132	22380.0226	22380.0366	22380.0506	22380.0886
	35	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	140	22380.0227	22380.0367	22380.0507	22380.0887
	40	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	148	22380.0228	22380.0368	22380.0508	22380.0888
	45	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	155	22380.0229	22380.0369	22380.0509	22380.0889
	50	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	168	22380.0230	22380.0370	22380.0510	22380.0890
	60	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	178	22380.0232	22380.0372	22380.0512	22380.0892
	70	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	194	22380.0234	22380.0374	22380.0514	22380.0894
16	80	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	208	22380.0236	22380.0376	22380.0516	22380.0896
	90	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	234	22380.0237	22380.0377	22380.0517	22380.0897
	100	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	251	22380.0238	22380.0378	22380.0518	22380.0898
	110	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	266	22380.0239	22380.0379	22380.0519	22380.0899
	120	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	281	22380.0240	22380.0380	22380.0520	22380.0900
	130	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	297	22380.0241	22380.0381	22380.0521	22380.0901
	140	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	313	22380.0242	22380.0382	22380.0522	22380.0902
	150	19,0	47,6	25,2	14,0	39,7	16,7	16	257	-30	80	328	22380.0243	22380.0383	22380.0523	22380.0903
	50	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	329	22380.0251	22380.0391	22380.0531	22380.0905
	60	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	343	22380.0252	22380.0392	22380.0532	22380.0904
	70	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	377	22380.0253	22380.0393	22380.0533	22380.0906
	80	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	392	22380.0256	22380.0396	22380.0536	22380.0908
	90	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	426	22380.0257	22380.0397	22380.0537	22380.0909
20	100	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	440	22380.0260	22380.0400	22380.0540	22380.0912
	110	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	474	22380.0261	22380.0401	22380.0541	22380.0913
	120	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	488	22380.0264	22380.0404	22380.0544	22380.0916
	130	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	523	22380.0265	22380.0405	22380.0545	22380.0917
	140	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	546	22380.0266	22380.0406	22380.0546	22380.0918
	150	25,0	57,1	33,8	20,5	50,7	21,5	20	403	-30	80	571	22380.0267	22380.0407	22380.0547	22380.0919
	50	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	415	22380.0269	22380.0409	22380.0549	22380.0921
	60	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	453	22380.0270	22380.0410	22380.0550	22380.0922
	70	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	490	22380.0271	22380.0411	22380.0551	22380.0923
	80	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	528	22380.0272	22380.0412	22380.0552	22380.0924
	90	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	565	22380.0273	22380.0413	22380.0553	22380.0925
25	100	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	603	22380.0274	22380.0414	22380.0554	22380.0926
	110	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	640	22380.0275	22380.0415	22380.0555	22380.0927
	120	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	678	22380.0276	22380.0416	22380.0556	22380.0928
	130	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	715	22380.0277	22380.0417	22380.0557	22380.0929
	140	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	753	22380.0278	22380.0418	22380.0558	22380.0930
	150	30,8	57,1	33,8	22,0	50,7	21,5	25	631	-30	80	790	22380.0279	22380.0419	22380.0559	22380.0931

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



Ball Lock Pins • self-locking, with adjustable handle

EH 22370. /EH 22380.



PRODUCT DESCRIPTION

Used for mounting or clamping workpieces, remove remaining play or slack via variable locknuts.
All versions are corrosion resistant. When using stainless steel 1.4542: high-strength, hardened, abrasion resistant pin with high load capacity.

Material

Pin part
- Stainless steel 1.4305
- Stainless steel 1.4542, precipitation hardened

Lock nut
- Thermoplastic, black

Spring
- Stainless steel

Adjusting nut
- Thermoplastic, silver

Operation

The balls are unlocked by pressing the knob.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.

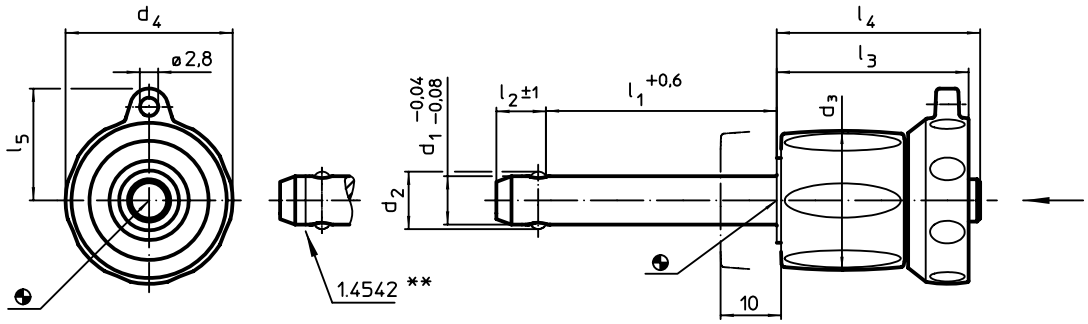
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404

DRAWING



** types from stainless steel 1.4542 with marking.

ORDER INFORMATION

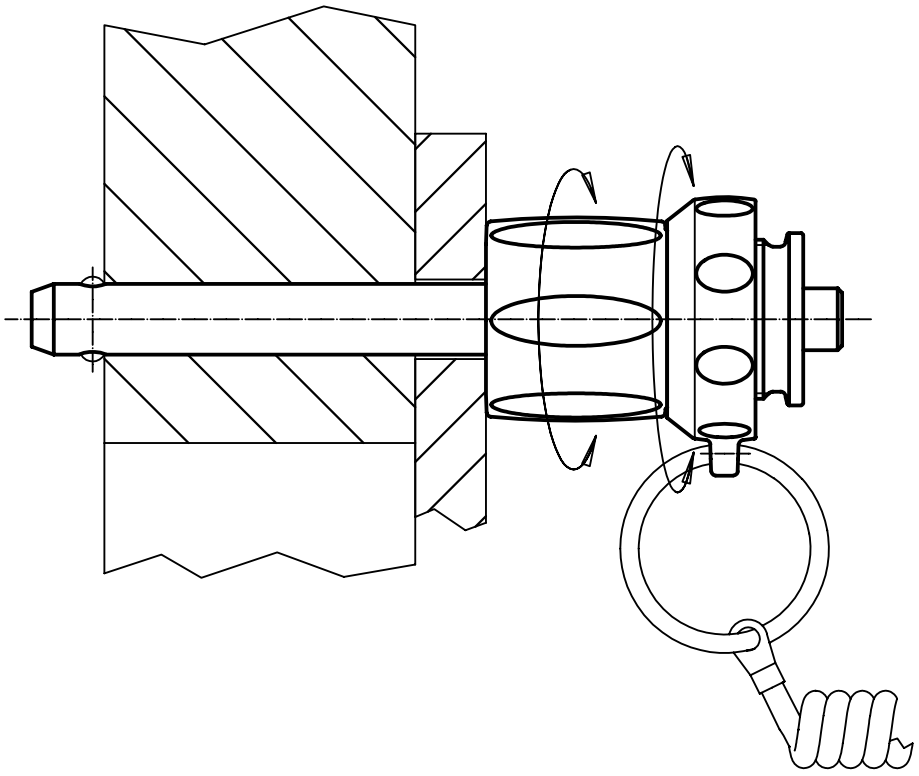
Dimensions									Location hole H11	Temperature		Weight	Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4	l_5		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
5	0 – 10	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	-30	80	24	14	22370.0592	24	22380.0592
	5 – 15	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	-30	80	25	14	22370.0593	24	22380.0593
	10 – 20	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	-30	80	26	14	22370.0594	24	22380.0594
	15 – 25	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	-30	80	27	14	22370.0595	24	22380.0595
	20 – 30	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	-30	80	27	14	22370.0596	24	22380.0596
6	0 – 10	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	-30	80	25	21	22370.0602	35	22380.0602
	5 – 15	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	-30	80	26	21	22370.0603	35	22380.0603
	10 – 20	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	-30	80	27	21	22370.0604	35	22380.0604
	15 – 25	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	-30	80	28	21	22370.0605	35	22380.0605
	20 – 30	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	-30	80	29	21	22370.0606	35	22380.0606
	25 – 35	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	-30	80	30	21	22370.0607	35	22380.0607
	30 – 40	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	-30	80	31	21	22370.0608	35	22380.0608
	35 – 45	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	-30	80	32	21	22370.0609	35	22380.0609
	40 – 50	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	-30	80	33	21	22370.0610	35	22380.0610

[1] shearing resistance similar to DIN 50141 →

Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4	l_5		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
8	10 – 20	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	-30	80	57	38	22370.0614	63	22380.0614
	15 – 25	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	-30	80	58	38	22370.0615	63	22380.0615
	20 – 30	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	-30	80	60	38	22370.0616	63	22380.0616
	25 – 35	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	-30	80	62	38	22370.0617	63	22380.0617
	30 – 40	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	-30	80	64	38	22370.0618	63	22380.0618
	35 – 45	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	-30	80	66	38	22370.0619	63	22380.0619
	40 – 50	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	-30	80	68	38	22370.0620	63	22380.0620
10	10 – 20	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	-30	80	63	60	22370.0624	100	22380.0624
	15 – 25	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	-30	80	66	60	22370.0625	100	22380.0625
	20 – 30	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	-30	80	69	60	22370.0626	100	22380.0626
	25 – 35	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	-30	80	72	60	22370.0627	100	22380.0627
	30 – 40	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	-30	80	75	60	22370.0628	100	22380.0628
	35 – 45	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	-30	80	78	60	22370.0629	100	22380.0629
	40 – 50	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	-30	80	81	60	22370.0630	100	22380.0630
	50 – 60	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	-30	80	87	60	22370.0632	100	22380.0632
12	15 – 25	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	-30	80	123	87	22370.0635	144	22380.0635
	20 – 30	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	-30	80	127	87	22370.0636	144	22380.0636
	25 – 35	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	-30	80	131	87	22370.0637	144	22380.0637
	30 – 40	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	-30	80	135	87	22370.0638	144	22380.0638
	35 – 45	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	-30	80	140	87	22370.0639	144	22380.0639
	40 – 50	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	-30	80	144	87	22370.0640	144	22380.0640
	50 – 60	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	-30	80	152	87	22370.0642	144	22380.0642
	60 – 70	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	-30	80	161	87	22370.0644	144	22380.0644
	70 – 80	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	-30	80	169	87	22370.0646	144	22380.0646
16	20 – 30	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	-30	80	159	155	22370.0656	257	22380.0656
	25 – 35	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	-30	80	166	155	22370.0657	257	22380.0657
	30 – 40	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	-30	80	174	155	22370.0658	257	22380.0658
	35 – 45	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	-30	80	182	155	22370.0659	257	22380.0659
	40 – 50	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	-30	80	189	155	22370.0660	257	22380.0660
	50 – 60	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	-30	80	205	155	22370.0662	257	22380.0662
	60 – 70	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	-30	80	220	155	22370.0664	257	22380.0664
	70 – 80	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	-30	80	235	155	22370.0666	257	22380.0666

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



Socket Pins • with spring-loaded balls

EH 22400.



PRODUCT DESCRIPTION

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
All versions are corrosion resistant.
Version with ergonomic grip.

Material

Pin part
- Stainless steel 1.4305

Handle
- Thermoplastic PA 6, grey

Spring
- Stainless steel

MORE INFORMATION

Notes

Security Note: balls are spring-loaded and not locked as in article groups EH 22340., EH 22350., EH 22360., EH 22370. and EH 22380.

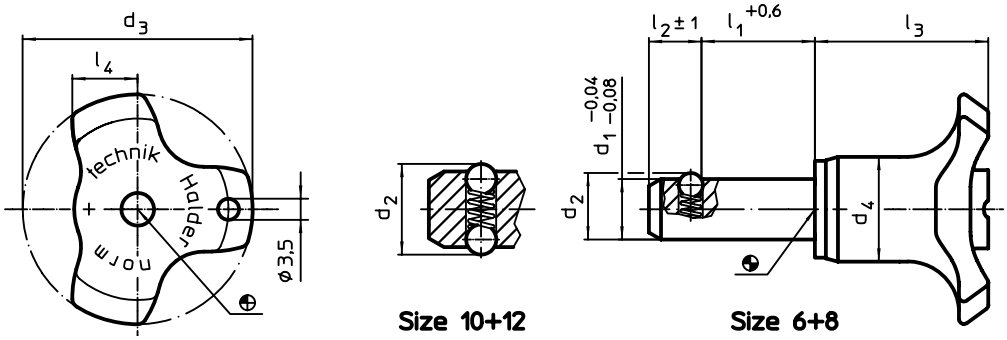
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins . . . . . → p. 234
Locating Bushings, with flange, for ball lock pins and socket pins. . . . . → p. 236
Retaining Cables . . . . . → p. 237
Positioning Bushings, with collar, DIN 172 A . . . . . → p. 401
Positioning Bushings, without collar, DIN 179 A . . . . . → p. 404

DRAWING



ORDER INFORMATION

Dimensions								Location hole H11	Shearing resistance, double	Tensile force max.				Art. No.
d_1 -0,04 -0,08	l_1 +0,6	d_2	d_3	d_4	l_2 ±1	l_3	l_4			unlubricated	min.	max.		
[mm]								[mm]	[kN]	[N]	[°C]		[g]	
6	10	6,5	38	17,3	5,0	27,0	10,8	6	22	8	-30	80	14	22400.0062
	15	6,5	38	17,3	5,0	27,0	10,8	6	22	8	-30	80	16	22400.0064
	20	6,5	38	17,3	5,0	27,0	10,8	6	22	8	-30	80	16	22400.0066
	25	6,5	38	17,3	5,0	27,0	10,8	6	22	8	-30	80	17	22400.0068
	30	6,5	38	17,3	5,0	27,0	10,8	6	22	8	-30	80	18	22400.0070
	50	6,5	38	17,3	5,0	27,0	10,8	6	22	8	-30	80	23	22400.0075
8	15	8,7	38	17,3	6,3	28,6	10,8	8	40	15	-30	80	21	22400.0084
	20	8,7	38	17,3	6,3	28,6	10,8	8	40	15	-30	80	22	22400.0086
	25	8,7	38	17,3	6,3	28,6	10,8	8	40	15	-30	80	25	22400.0088
	30	8,7	38	17,3	6,3	28,6	10,8	8	40	15	-30	80	27	22400.0090
	50	8,7	38	17,3	6,3	28,6	10,8	8	40	15	-30	80	33	22400.0095
10	15	12,0	38	17,3	8,7	28,6	10,8	10	62	30	-30	80	32	22400.0104
	20	12,0	38	17,3	8,7	28,6	10,8	10	62	30	-30	80	35	22400.0106
	25	12,0	38	17,3	8,7	28,6	10,8	10	62	30	-30	80	38	22400.0108
	30	12,0	38	17,3	8,7	28,6	10,8	10	62	30	-30	80	39	22400.0110
	50	12,0	38	17,3	8,7	28,6	10,8	10	62	30	-30	80	53	22400.0115
12	20	14,5	38	17,3	9,5	28,6	10,8	12	90	32	-30	80	43	22400.0122
	30	14,5	38	17,3	9,5	28,6	10,8	12	90	32	-30	80	52	22400.0124
	40	14,5	38	17,3	9,5	28,6	10,8	12	90	32	-30	80	61	22400.0126
	50	14,5	38	17,3	9,5	28,6	10,8	12	90	32	-30	80	68	22400.0128

2

Locating Bushings • for ball lock pins and socket pins

EH 22400.



PRODUCT DESCRIPTION

This design with holes on the front face (picture 2) is suitable for applications which require installation flush to the surface.
Locating bushings are used for quick and safe locating of ball lock pins EH 22340., EH 22350., EH 22370. and EH 22380. and socket pins EH 22400.
Optimised centering due to precise collar (e.g. quick mounting of plates and components).
All versions are corrosion and abrasion resistant.

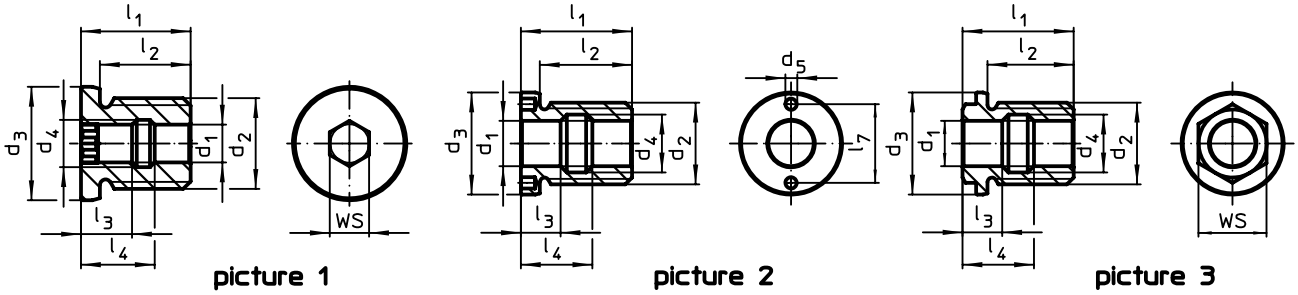
Material

- Stainless steel 1.4305

Assembly

This design with holes on the front face (picture 2) can be installed via a cranked pin face wrench or alternatively via a pin faced socket wrench.
Ensure safe tolerances and consistent function. Easily incorporable into different materials. Can be used in thin-walled pieces. Application from both sides.

DRAWING



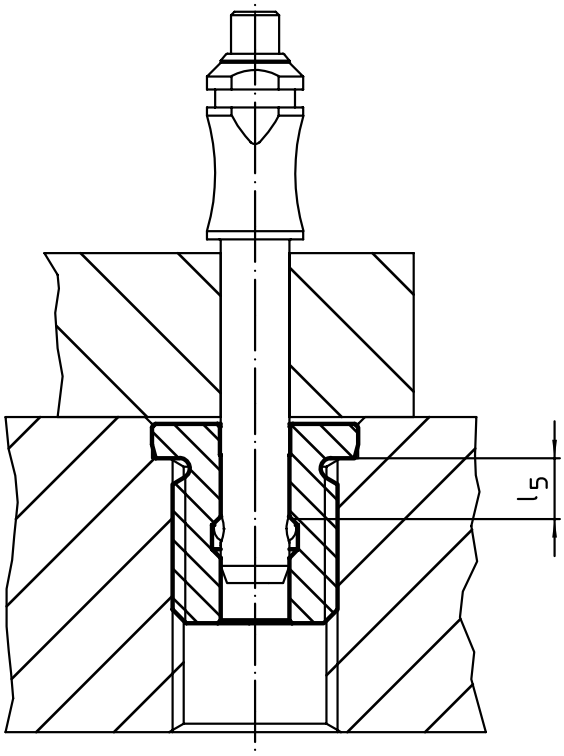
ORDER INFORMATION

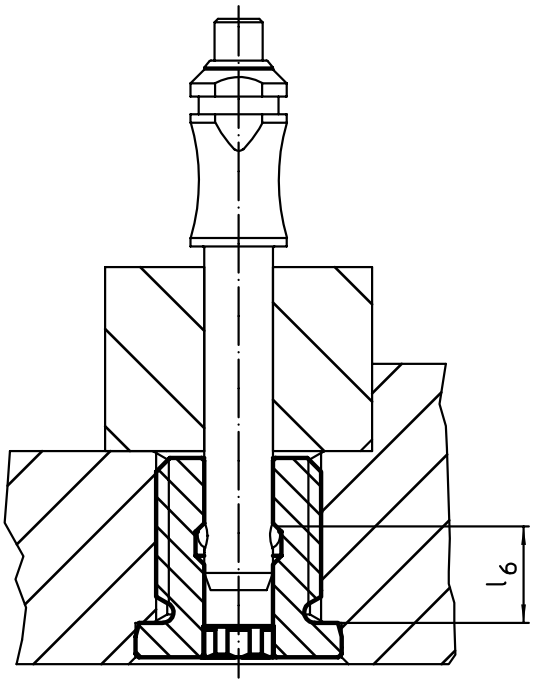
Dimensions												WS		Art. No.
d_1 H11	d_2	d_3 h9	d_4	d_5 +0,1	l_1	l_2	l_3	l_4	l_5	l_6	l_7			
[mm]												[mm]	[g]	
with internal hexagon – picture 1														
5	**M12**	18	6,0	–	19	15	9,0	13,0	5,1	9,0	–	5	15	22400.0905
6	**M12**	18	7,5	–	19	15	9,4	13,0	5,6	8,8	–	6	13	22400.0906
8	**M16**	22	10,0	–	25	20	12,0	17,0	7,3	11,7	–	8	29	22400.0908
10	**M24**	30	12,5	–	29	24	13,5	19,5	8,9	14,1	–	10	75	22400.0910
12	**M24**	30	15,0	–	29	24	14,0	20,0	9,6	14,4	–	12	66	22400.0912
plain, with face hole – picture 2														
16	**M30**	39	19,5	5,1	39	33	15,5	23,5	10,4	16,6	30	–	160	22400.0925
20	**M36**	43	25,5	5,1	49	42	17,5	31,5	11,9	23,1	30	–	257	22400.0926
25	**M42**	50	32,0	5,1	65	57	26,5	38,5	13,3	21,8	36	–	434	22400.0927
with outer hexagon – picture 3														
16	**M30**	36	19,5	–	39	29	15,5	23,5	6,1	12,8	–	24	124	22400.0916
20	**M36**	45	25,5	–	49	38	17,5	31,5	7,7	19,3	–	30	208	22400.0920
25	**M42**	50	32,0	–	65	50	26,5	38,5	13,3	21,8	–	36	415	22400.0924

ACCESSORIES

	Suitable for size d_1 [mm]	For finish picture	Pin spacing ±0,1 [mm]	Pin diameter -0,1 [mm]	Square drive [inch]	[g]	Art. No.
adjustable face wrench, offset							
	**16/20/25**	2	–	5		309	22350.1991
face wrench (socket wrench insert)							
	**16/20**	2	30	5	1/2	243	22350.1998
	25	2	36	5	1/2	363	22350.1999

APPLICATION EXAMPLE





2

Locating Bushings • with flange, for ball lock pins and socket pins

EH 22400.



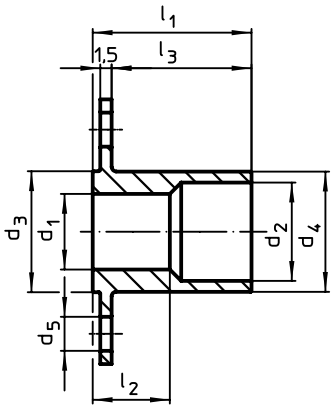
PRODUCT DESCRIPTION

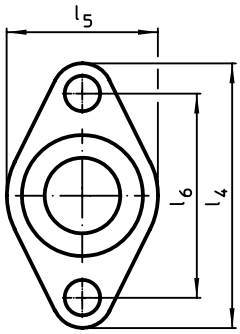
Used for thin sheet materials, e.g. in vehicle construction, apparatus engineering, container construction and the aviation industry.
Locating bushings are used for quick and safe locating of ball lock pins EH 22340., EH 22350., EH 22370. and EH 22380. and socket pins EH 22400.
The contact surface of the flange ensures optimum force distribution at components with thin walls.
All versions are corrosion and abrasion resistant.

Material

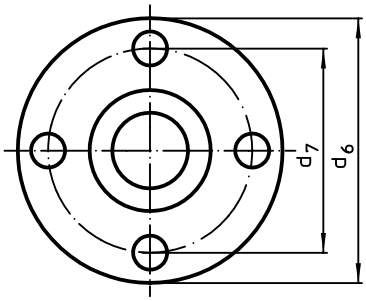
- Stainless steel 1.4305

DRAWING





picture 1

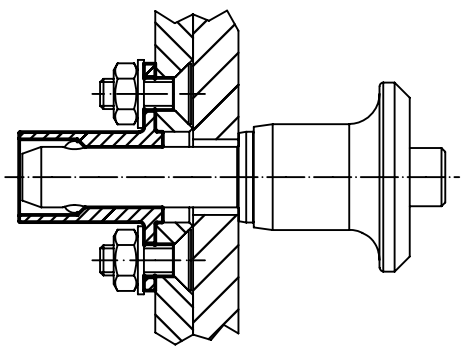


picture 2

ORDER INFORMATION

Dimensions														Art. No.
d_1 H11	d_2	d_3 -0,05	d_4 -0,1	d_5	d_6	d_7	l_1	l_2	l_3	l_4	l_5	l_6	[g]	
					[mm]									
with oval flange – picture 1														
5	**8**	10	9,9	3,4	–	–	12	5,4	9,5	25	15	19	6	22400.0305
6	**8**	10	9,9	3,4	–	–	13	5,3	10,5	25	15	19	6	22400.0306
8	**10**	12	11,9	4,5	–	–	19	10,3	16,5	30	18	22	10	22400.0308
10	**13**	16	15,9	4,5	–	–	21	10,2	18,5	35	20	27	19	22400.0310
12	**15**	19	18,9	4,5	–	–	27	15,2	24,5	40	24	30	34	22400.0312
16	**20**	24	23,9	5,5	–	–	30	15,3	27,5	50	30	40	52	22400.0316
with round flange – picture 2														
5	**8**	10	9,9	3,4	25	19	12	5,4	9,5	–	–	–	9	22400.0405
6	**8**	10	9,9	3,4	25	19	13	5,3	10,5	–	–	–	9	22400.0406
8	**10**	12	11,9	4,5	30	22	19	10,3	16,5	–	–	–	14	22400.0408
10	**13**	16	15,9	4,5	35	27	21	10,2	18,5	–	–	–	24	22400.0410
12	**15**	19	18,9	4,5	40	30	27	15,2	24,5	–	–	–	41	22400.0412
16	**20**	24	23,9	5,5	50	40	30	15,3	27,5	–	–	–	63	22400.0416

APPLICATION EXAMPLE



Retaining Cables

EH 22400.



PRODUCT DESCRIPTION

These retaining cables secure the single-acting ball lock pin EH 22340., EH 22350., EH 22370. and EH 22380., as well as clamping pin EH 22360., and socket pin EH 22400. against possible loss.

Material

Attaching ring
- Stainless steel

Ring
- Stainless steel
- Brass, tin-plated

Retaining cable
- Stainless steel
- Thermoplastic PA 6, grey
- Thermoplastic PUR, black, with filling thread

Coating retaining cable
- Without coating
- Thermoplastic PA 6 coated, black
- Thermoplastic PA 6 coated, clear
- Thermoplastic PVC coated, green (transparent)
- Thermoplastic PA 6, grey
- Thermoplastic PUR, black

Assembly

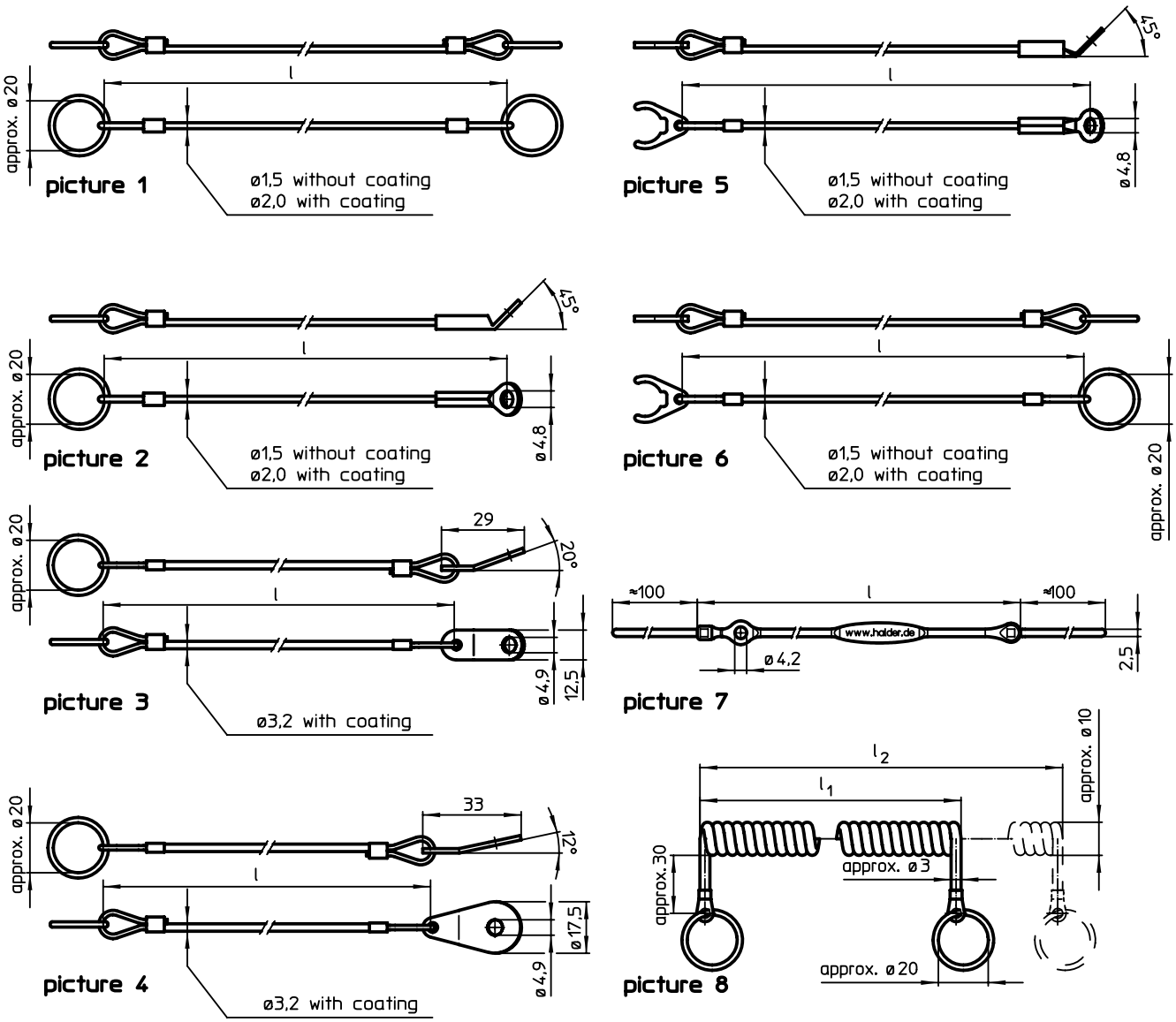
Attached holding clips (picture 5/6) to the ball lock pin with a soft-face mallet. Disassemble via levering it with a screw driver. Thermoplastic version (picture 7): cut-off projecting ends without burr after being fastened.
Spiral form design (picture 8) with very high effective working length.

MORE INFORMATION

Notes

Special types on request.
Models picture 3 and picture 4 correspond to MIL-DTL-83420.

DRAWING



2

ORDER INFORMATION

Dimensions			Suitable for size	max.		Art. No.					
l	l_1	l_2 max.				Thermo-plastic PA 6 coated, black	Thermo-plastic PA 6 coated, clear	Without coating	Thermo-plastic PVC coated, green (trans-parent)	Thermo-plastic PA 6, grey	Thermo-plastic PUR, black
[mm]			[mm]	[°C]	[g]						
stainless steel, with 2 holding rings – picture 1											
150	–	–	–	80	6,5	22400.0940[1]	22400.0950[1]	–	–	–	–
				250	6,5	–	–	22400.0930[1]	–	–	–
200	–	–	–	80	6,4	22400.0941[1]	22400.0952[1]	–	–	–	–
				250	6,4	–	–	22400.0931[1]	–	–	–
300	–	–	–	80	7,5	22400.0943[1]	22400.0956[1]	–	–	–	–
				250	7,5	–	–	22400.0933[1]	–	–	–
stainless steel, with holding ring and loop to be screwed – picture 2											
150	–	–	–	80	6,9	22400.0945[1]	22400.0960[1]	–	–	–	–
				250	6,9	–	–	22400.0935[1]	–	–	–
200	–	–	–	80	7,6	22400.0946[1]	22400.0962[1]	–	–	–	–
				250	7,6	–	–	22400.0936[1]	–	–	–
300	–	–	–	80	8,6	22400.0948[1]	22400.0966[1]	–	–	–	–
				250	8,6	–	–	22400.0938[1]	–	–	–
stainless steel, with fixing tab, rectangular and attaching ring – picture 3											
150	–	–	–	80	13,0	–	–	–	22400.1301[1]	–	–
200	–	–	–	80	14,0	–	–	–	22400.1302[1]	–	–
300	–	–	–	80	16,0	–	–	–	22400.1303[1]	–	–
stainless steel, with fixing tab in drop shape and attaching ring – picture 4											
150	–	–	–	80	13,0	–	–	–	22400.1311[1]	–	–
200	–	–	–	80	14,0	–	–	–	22400.1312[1]	–	–
300	–	–	–	80	16,0	–	–	–	22400.1313[1]	–	–
stainless steel, with holding clip and eyelet – picture 5											
150	–	–	5/ 6	80	6,0	22400.1101[2]	22400.1001[2]	–	–	–	–
				250	6,0	–	–	22400.1201[2]	–	–	–
			8/10	80	7,0	22400.1121[2]	22400.1021[2]	–	–	–	–
				250	7,0	–	–	22400.1221[2]	–	–	–
			12/16	80	8,0	22400.1141[2]	22400.1041[2]	–	–	–	–
				250	8,0	–	–	22400.1241[2]	–	–	–
			20/25	80	12,0	22400.1161[2]	22400.1061[2]	–	–	–	–
				250	12,0	–	–	22400.1261[2]	–	–	–
200	–	–	5/ 6	80	7,0	22400.1102[2]	22400.1002[2]	–	–	–	–
				250	7,0	–	–	22400.1202[2]	–	–	–
			8/10	80	8,0	22400.1122[2]	22400.1022[2]	–	–	–	–
				250	8,0	–	–	22400.1222[2]	–	–	–
			12/16	80	9,0	22400.1142[2]	22400.1042[2]	–	–	–	–
				250	9,0	–	–	22400.1242[2]	–	–	–
			20/25	80	13,0	22400.1162[2]	22400.1062[2]	–	–	–	–
				250	13,0	–	–	22400.1262[2]	–	–	–
300	–	–	5/ 6	80	8,0	22400.1103[2]	22400.1003[2]	–	–	–	–
				250	8,0	–	–	22400.1203[2]	–	–	–
			8/10	80	9,0	22400.1123[2]	22400.1023[2]	–	–	–	–
				250	9,0	–	–	22400.1223[2]	–	–	–
			12/16	80	10,0	22400.1143[2]	22400.1043[2]	–	–	–	–
				250	10,0	–	–	22400.1243[2]	–	–	–
			20/25	80	14,0	22400.1163[2]	22400.1063[2]	–	–	–	–
				250	14,0	–	–	22400.1263[2]	–	–	–

[1] not for ball-lock pins, basic type
[2] for ball lock pins, basic type

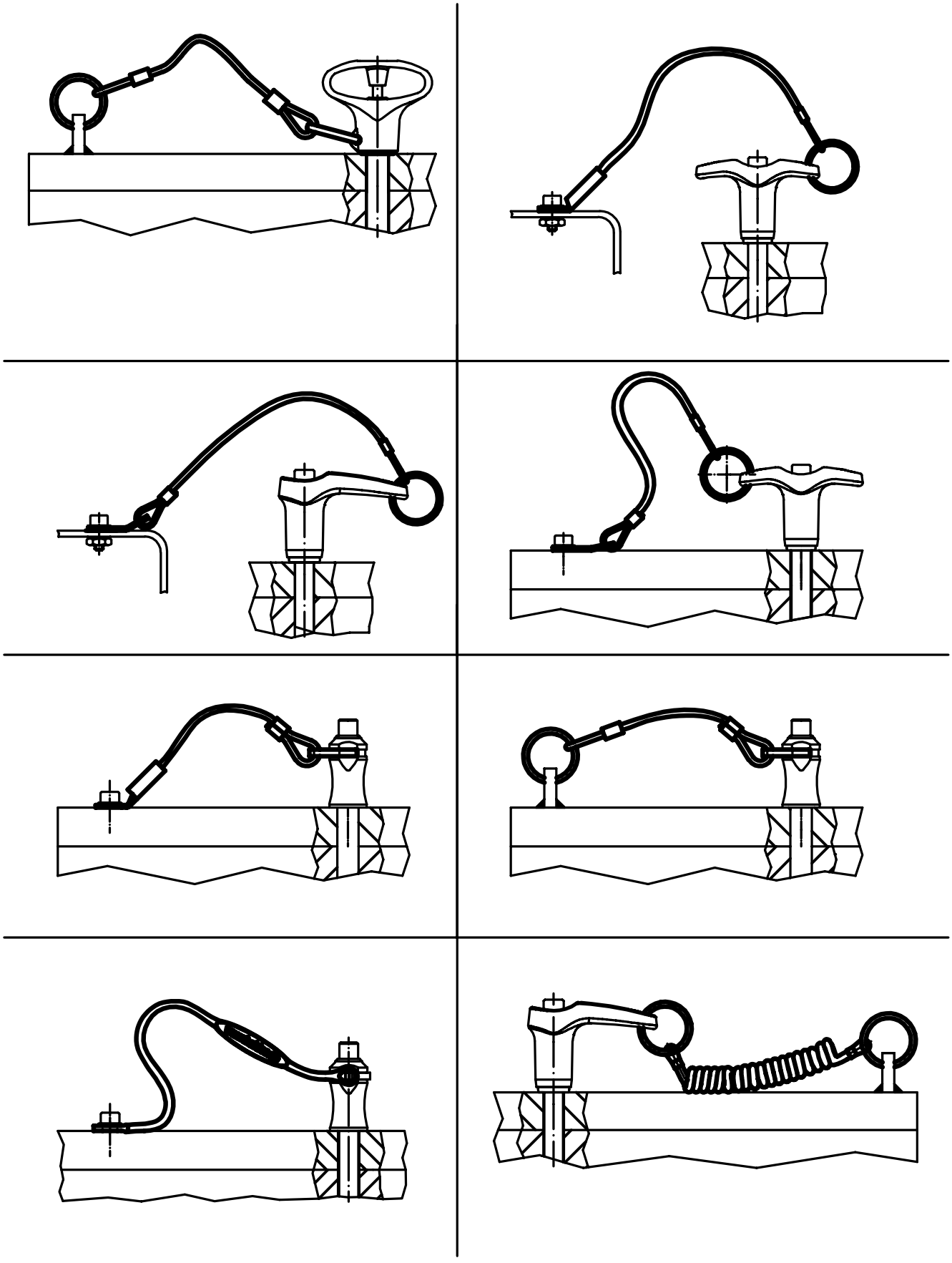
→

Dimensions			Suitable for size	max.		Art. No.					
l	l_1	l_2 max.				Thermo-plastic PA 6 coated, black	Thermo-plastic PA 6 coated, clear	Without coating	Thermo-plastic PVC coated, green (trans-parent)	Thermo-plastic PA 6, grey	Thermo-plastic PUR, black
[mm]			[mm]	[°C]	[g]						
stainless steel, with holding clip and retaining ring – picture 6											
150	–	–	5/ 6	80	6,0	22400.1111[2]	22400.1011[2]	–	–	–	–
				250	6,0	–	–	22400.1211[2]	–	–	–
			8/10	80	7,0	22400.1131[2]	22400.1031[2]	–	–	–	–
				250	7,0	–	–	22400.1231[2]	–	–	–
			12/16	80	8,0	22400.1151[2]	22400.1051[2]	–	–	–	–
				250	8,0	–	–	22400.1251[2]	–	–	–
			20/25	80	12,0	22400.1171[2]	22400.1071[2]	–	–	–	–
				250	12,0	–	–	22400.1271[2]	–	–	–
200	–	–	5/ 6	80	7,0	22400.1112[2]	22400.1012[2]	–	–	–	–
				250	7,0	–	–	22400.1212[2]	–	–	–
			8/10	80	8,0	22400.1132[2]	22400.1032[2]	–	–	–	–
				250	8,0	–	–	22400.1232[2]	–	–	–
			12/16	80	9,0	22400.1152[2]	22400.1052[2]	–	–	–	–
				250	9,0	–	–	22400.1252[2]	–	–	–
			20/25	80	13,0	22400.1172[2]	22400.1072[2]	–	–	–	–
				250	13,0	–	–	22400.1272[2]	–	–	–
300	–	–	5/ 6	80	8,0	22400.1113[2]	22400.1013[2]	–	–	–	–
				250	8,0	–	–	22400.1213[2]	–	–	–
			8/10	80	9,0	22400.1133[2]	22400.1033[2]	–	–	–	–
				250	9,0	–	–	22400.1233[2]	–	–	–
			12/16	80	10,0	22400.1153[2]	22400.1053[2]	–	–	–	–
				250	10,0	–	–	22400.1253[2]	–	–	–
			20/25	80	14,0	22400.1173[2]	22400.1073[2]	–	–	–	–
				250	14,0	–	–	22400.1273[2]	–	–	–
with double sided clamping/indexing mechanism – picture 7											
150	–	–	–	80	2,1	–	–	–	–	22400.0970	–
250	–	–	–	80	2,7	–	–	–	–	22400.0974	–
spiral form, with fastening rings – picture 8											
–	**100**	**600**	–	80	11,5	–	–	–	–	–	22400.0980[1]
	200	**1200**	–	80	17,4	–	–	–	–	–	22400.0982[1]

[1] not for ball-lock pins, basic type
[2] for ball lock pins, basic type

2

APPLICATION EXAMPLE



Clamp Lock Pins • with button handle

EH 22410. /EH 22420.



PRODUCT DESCRIPTION

For rapid fastening, locking, adjusting, replacing, and securing in blind holes (H11) without additional locating bushings.
Quick and easy to release for connections which are made repeatedly. Flexible use because the balls are clamped between bolt and hole.
All versions are corrosion resistant. When using stainless steel 1.4542: high-strength, hardened, abrasion resistant pin with high load capacity.

Material

Pin part
- Stainless steel 1.4305
- Stainless steel 1.4542, precipitation-hardened

Handle
- Aluminium, black similar to RAL 9005

Press button
- Stainless steel, yellow similar to RAL 1016

Spring
- Stainless steel

Assembly

Simple H11 boreholes are sufficient.

MORE INFORMATION

Notes

Special types on request.
The clamp lock pin must not be used for lifting loads.

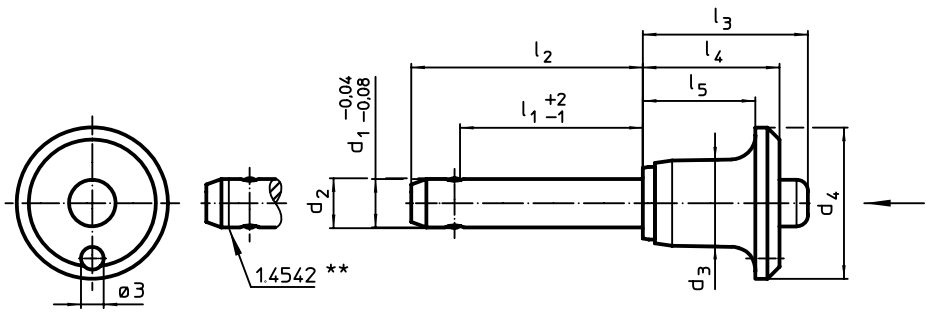
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Retaining Cables . . . . . → p. 237

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 +0,08	l_1 +2 +2	d_2 +0,1 -0,05	d_3	d_4	l_2 ±	l_3	l_4	l_5		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
6	10	6,2	11,3	20	17,4	20,7	17,6	14,6	6	-30	150	13	21	22410.0022	35	22420.0022
	20	6,2	11,3	20	27,4	20,7	17,6	14,6	6	-30	150	15	21	22410.0024	35	22420.0024
	40	6,2	11,3	20	47,4	20,7	17,6	14,6	6	-30	150	19	21	22410.0028	35	22420.0028
	60	6,2	11,3	20	67,4	20,7	17,6	14,6	6	-30	150	23	21	22410.0032	35	22420.0032
8	10	8,3	14,1	25	18,6	27,3	22,6	18,6	8	-30	150	25	38	22410.0042	63	22420.0042
	20	8,3	14,1	25	28,6	27,3	22,6	18,6	8	-30	150	28	38	22410.0044	63	22420.0044
	40	8,3	14,1	25	48,6	27,3	22,6	18,6	8	-30	150	36	38	22410.0048	63	22420.0048
	60	8,3	14,1	25	68,6	27,3	22,6	18,6	8	-30	150	43	38	22410.0052	63	22420.0052
	80	8,3	14,1	25	88,6	27,3	22,6	18,6	8	-30	150	51	38	22410.0056	63	22420.0056
10	20	10,3	14,1	25	30,0	27,3	22,6	18,6	10	-30	150	35	60	22410.0062	100	22420.0062
	40	10,3	14,1	25	50,0	27,3	22,6	18,6	10	-30	150	47	60	22410.0066	100	22420.0066
	60	10,3	14,1	25	70,0	27,3	22,6	18,6	10	-30	150	58	60	22410.0070	100	22420.0070
	80	10,3	14,1	25	100,0	27,3	22,6	18,6	10	-30	150	70	60	22410.0072	100	22420.0072
	100	10,3	14,1	25	120,0	27,3	22,6	18,6	10	-30	150	83	60	22410.0074	100	22420.0074

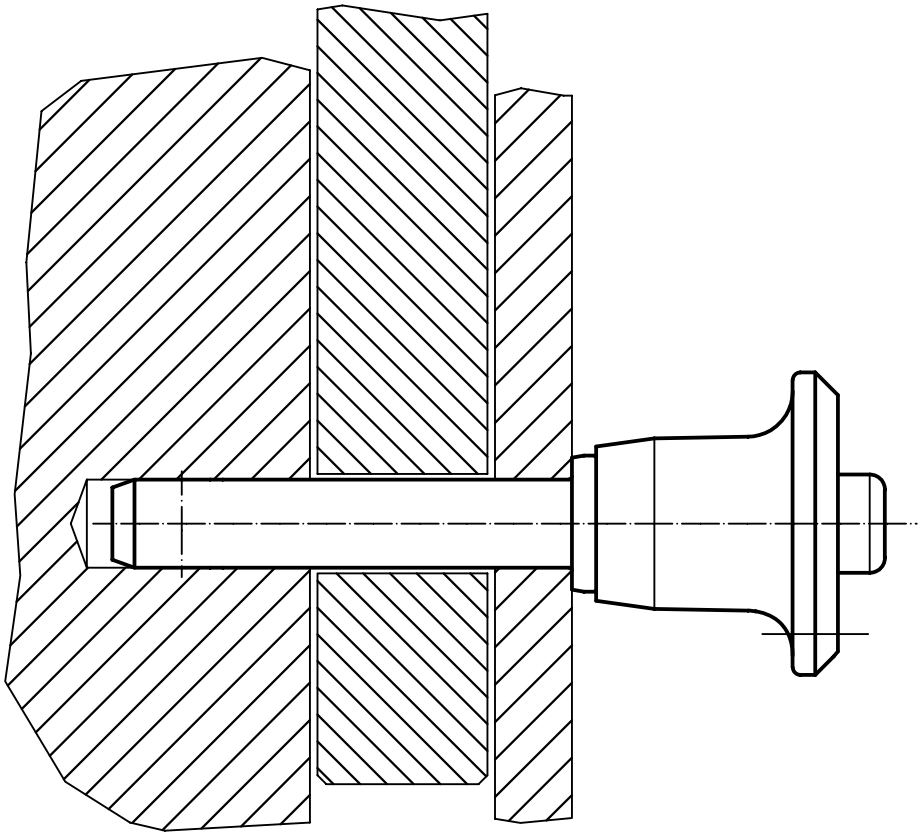
[1] shearing resistance similar to DIN 50141

→

Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0,04 +0,08	l_1 +2 +2	d_2 +0,1 -0,05	d_3	d_4	l_2 ±	l_3	l_4	l_5		min.	max.		Shearing resistance, double[1] min.	Art. No.	Shearing resistance, double[1] min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
12	20	12,3	17,7	35	51,0	33,2	27,3	22,3	12	-30	150	64	87	22410.0082	144	22420.0082
	40	12,3	17,7	35	71,0	33,2	27,3	22,3	12	-30	150	81	87	22410.0086	144	22420.0086
	60	12,3	17,7	35	91,0	33,2	27,3	22,3	12	-30	150	98	87	22410.0090	144	22420.0090
	80	12,3	17,7	35	111,0	33,2	27,3	22,3	12	-30	150	115	87	22410.0092	144	22420.0092
	100	12,3	17,7	35	131,0	33,2	27,3	22,3	12	-30	150	132	87	22410.0094	144	22420.0094
16	30	16,5	23,4	40	44,4	42,2	34,5	28,5	16	-30	150	144	155	22410.0102	257	22420.0102
	60	16,5	23,4	40	74,4	42,2	34,5	28,5	16	-30	150	190	155	22410.0107	257	22420.0107
	90	16,5	23,4	40	104,4	42,2	34,5	28,5	16	-30	150	236	155	22410.0110	257	22420.0110
	120	16,5	23,4	40	134,4	42,2	34,5	28,5	16	-30	150	282	155	22410.0113	257	22420.0113

[1] shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



2

BALL LOCK PINS

SPECIAL TYPES

Almost all branches and sectors of industry rely on the power of ball lock pins - anywhere where connections need to be released and established again frequently and quickly.
With special solutions developed in-house, the requirements of various branches can be met, e.g. in motor sports, aviation or medical engineering.

www.halder.com/
BallLockPins-Video



2

BALL LOCK PINS

INCH PORTFOLIO – MOST CERTAINLY.

The aviation industry is one of the fastest growing markets on the planet. The factors of durability and safety play a key role in the manufacturing of aircraft components. Their long years of experience have turned Erwin Halder KG into the ideal partner of the aviation industry.

Keep track of our ongoing expansions by logging on to www.halder.aero.



Ball Lock Pins • single acting - complies with NASM / MS17984

EH 4210.



PRODUCT DESCRIPTION

Ball lock pins according to NASM (former norm: MS) are used for quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
Ball lock pins (quick release pins) are produced according to Aviation Norm NASM (former norm: MS) and tested to NAS 1332.

Material

Pin ①
- Stainless steel, precipitation-hardened, passivated

Press bolt ②
- Stainless steel, precipitation-hardened, passivated

Spring ③
- Stainless steel, passivated

Handle ④
- Aluminium, black anodised

Attaching ring ⑤
- Stainless steel, passivated

Ball ⑥
- Stainless steel, precipitation-hardened, passivated

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

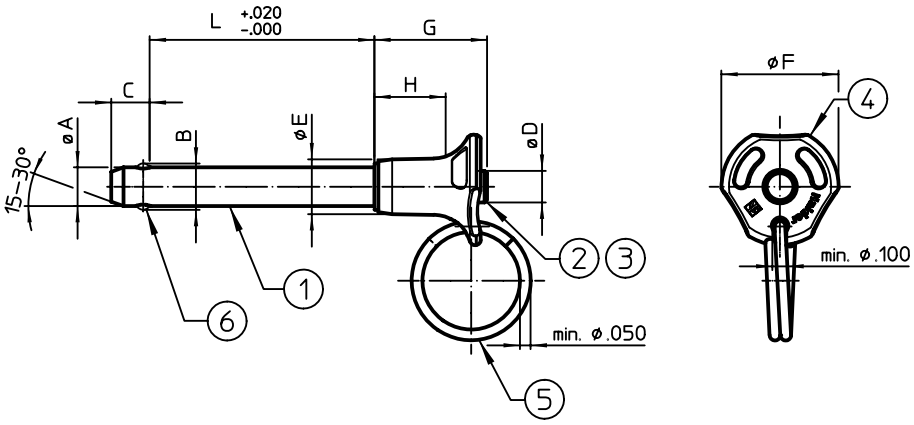
Notes

All further dimensions are available on request.
Special types on request.
- This product is manufactured in INCH dimensions.

References

A conversion table can be found in the technical data following these product information pages.

DRAWING



ORDER INFORMATION

Nominal diameter A	Clamping length L +0,02 0	Dimensions B ±0,005	C 0 -0,04	D max.	E max.	F max.	G max.	H min.	Location hole max.	Shearing resistance, double[1] min.	min.	max.		Art. No.
[inch]	[inch]	[inch]							[inch]	[lb]	[°F]		[g]	
	0,5	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	17	4210.A05
	0,6	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	17	4210.A06
	0,7	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	17	4210.A07
	0,8	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	18	4210.A08
	1,0	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	18	4210.A10
3/16	**1,1**	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	19	4210.A11
	1,3	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	19	4210.A13
	1,5	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	20	4210.A15
	1,8	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	21	4210.A18
	2,0	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	20	4210.A20
	2,8	0,220	0,26	0,31	0,44	0,800	0,83	0,48	0,1940	5.150	-65	200	24	4210.A28

[1] shearing resistance similar to DIN 50141

→

Nominal diameter A	Clamping length L +0,02 0	Dimensions							Location hole max.	Shearing resistance, double[1] min.				Art. No.
		B ±0,005	C 0 -0,04	D max.	E max.	F max.	G max.	H min.			min.	max.		
[inch]	[inch]	[inch]							[inch]	[lb]	[°F]		[g]	
1/4	0,5	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	19	4210.B05
	0,7	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	20	4210.B07
	0,8	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	18	4210.B08
	1,0	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	22	4210.B10
	1,1	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	22	4210.B11
	1,2	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	23	4210.B12
	1,4	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	24	4210.B14
	1,8	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	26	4210.B18
	1,9	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	27	4210.B19
	2,0	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	27	4210.B20
	2,3	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	29	4210.B23
	2,5	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	30	4210.B25
	2,8	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	32	4210.B28
	2,9	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	33	4210.B29
	6,4	0,289	0,29	0,31	0,44	0,800	0,89	0,48	0,2540	9.200	-65	200	59	4210.B64
5/16	0,8	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	25	4210.C08
	1,0	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	27	4210.C10
	1,2	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	29	4210.C12
	1,4	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	31	4210.C14
	1,6	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	33	4210.C16
	1,7	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	35	4210.C17
	1,9	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	33	4210.C19
	2,0	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	36	4210.C20
	2,2	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	38	4210.C22
	2,3	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	39	4210.C23
	2,5	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	43	4210.C25
	2,9	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	46	4210.C29
	3,0	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	47	4210.C30
	3,6	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	53	4210.C36
	4,9	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	990	4210.C49
	6,2	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	73	4210.C62
	6,7	0,375	0,33	0,31	0,49	1,135	0,93	0,48	0,3165	14.400	-65	200	85	4210.C67
3/8	1,8	0,440	0,36	0,39	0,57	1,135	1,04	0,62	0,3790	20.600	-65	200	60	4210.D18
	2,0	0,440	0,36	0,39	0,57	1,135	1,04	0,62	0,3790	20.600	-65	200	50	4210.D20
1/2	2,0	0,594	0,46	0,56	0,72	1,400	1,19	0,72	0,5050	36.800	-65	200	93	4210.F20
	6,0	0,594	0,46	0,56	0,72	1,400	1,19	0,72	0,5050	36.800	-65	200	197	4210.F60

[1] shearing resistance similar to DIN 50141

Ball Lock Pins • single acting - complies with NASM / MS17985

EH 4211.



PRODUCT DESCRIPTION

Ball lock pins according to NASM (former norm: MS) are used for quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
Ball lock pins (quick release pins) are produced according to Aviation Norm NASM (former norm: MS) and tested to NAS 1332.

Material

Pin ①
- Stainless steel, precipitation-hardened, passivated

Press bolt ②
- Stainless steel, precipitation-hardened, passivated

Spring ③
- Stainless steel, passivated

Handle ④
- Aluminium, black anodised

Attaching ring ⑤
- Stainless steel, passivated

Ball ⑥
- Stainless steel, precipitation-hardened, passivated

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

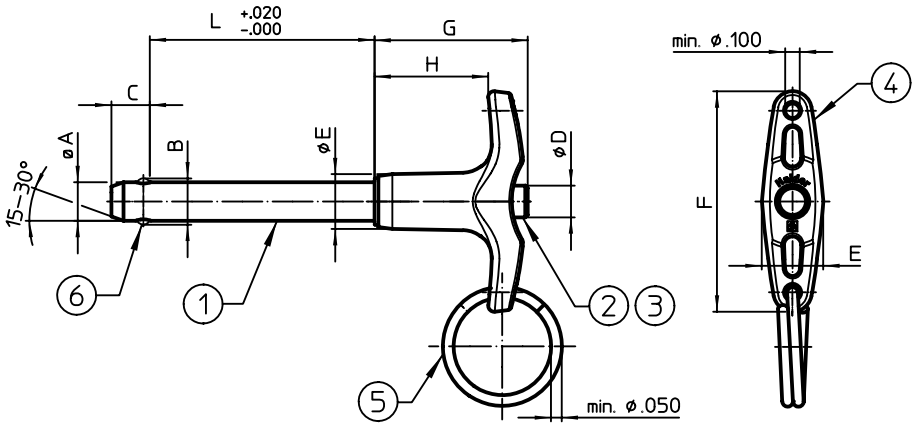
Notes

Special types on request.
All further dimensions are available on request.
- This product is manufactured in INCH dimensions.

References

A conversion table can be found in the technical data following these product information pages.

DRAWING



ORDER INFORMATION

Nominal diameter A	Clamping length L +0,02 0	Dimensions B ±0,005	C 0 -0,04	D max.	E max.	F max.	G max.	H min.	Location hole max.	Shearing resistance, double[1] min.	°F min.	°F max.	g	Art. No.
[inch]	[inch]	[inch]							[inch]	[lb]	[°F]		[g]	
3/16	**2,3**	0,220	0,260	0,310	0,500	1,815	1,27	0,800	0,1940	5.150	-65	200	30	4211.A23
	0,3	0,220	0,260	0,310	0,500	1,815	1,27	0,800	0,1940	5.150	-65	200	24	4211.A03
	0,5	0,220	0,260	0,310	0,500	1,815	1,27	0,800	0,1940	5.150	-65	200	24	4211.A05
	0,8	0,220	0,260	0,310	0,500	1,815	1,27	0,800	0,1940	5.150	-65	200	25	4211.A08
	1,2	0,220	0,260	0,310	0,500	1,815	1,27	0,800	0,1940	5.150	-65	200	26	4211.A12
	1,3	0,220	0,260	0,310	0,500	1,815	1,27	0,800	0,1940	5.150	-65	200	27	4211.A13
	1,4	0,220	0,260	0,310	0,500	1,815	1,27	0,800	0,1940	5.150	-65	200	27	4211.A14
	2,6	0,220	0,260	0,310	0,500	1,815	1,27	0,800	0,1940	5.150	-65	200	33	4211.A26

[1] shearing resistance similar to DIN 50141

→

Nominal diameter A	Clamping length L +0,02 0	Dimensions							Location hole max.	Shearing resistance, double[1] min.				Art. No.
		B ±0,005	C 0 -0,04	D max.	E max.	F max.	G max.	H min.			min.	max.		
[inch]	[inch]	[inch]							[inch]	[lb]	[°F]		[g]	
1/4	0,5	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	26	4211.B05
	0,7	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	28	4211.B07
	0,9	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	29	4211.B09
	1,0	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	29	4211.B10
	1,1	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	30	4211.B11
	1,2	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	31	4211.B12
	1,3	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	31	4211.B13
	1,5	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	32	4211.B15
	1,6	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	33	4211.B16
	2,1	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	36	4211.B21
	2,6	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	40	4211.B26
	2,8	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	41	4211.B28
	4,0	0,289	0,290	0,310	0,500	1,815	1,27	0,800	0,2540	9.200	-65	200	48	4211.B40
5/16	0,3	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	27	4211.C03
	0,6	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	30	4211.C06
	0,9	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	33	4211.C09
	1,0	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	34	4211.C10
	1,1	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	35	4211.C11
	1,3	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	36	4211.C13
	1,5	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	38	4211.C15
	1,6	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	39	4211.C16
	1,8	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	41	4211.C18
	2,0	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	44	4211.C20
	2,3	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	47	4211.C23
	2,9	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	53	4211.C29
	3,0	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	53	4211.C30
	3,3	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	56	4211.C33
	4,0	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	62	4211.C40
	5,0	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	75	4211.C50
	6,4	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	89	4211.C64
	7,0	0,375	0,330	0,310	0,500	1,815	1,27	0,800	0,3165	14.400	-65	200	93	4211.C70
3/8	0,5	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	43	4211.D05
	1,0	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	48	4211.D10
	1,2	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	55	4211.D12
	1,5	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	57	4211.D15
	1,6	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	58	4211.D16
	2,0	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	64	4211.D20
	2,4	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	69	4211.D24
	2,5	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	71	4211.D25
	2,6	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	72	4211.D26
	2,8	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	72	4211.D28
	3,1	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	79	4211.D31
	3,2	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	80	4211.D32
	3,5	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	84	4211.D35
	4,0	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	95	4211.D40
	4,5	0,440	0,365	0,390	0,625	2,065	1,45	0,850	0,3790	20.700	-65	200	100	4211.D45
7/16	3,6	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	106	4211.E36
	1,2	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	60	4211.E12
	1,8	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	73	4211.E18
	2,3	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	82	4211.E23
	2,4	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	80	4211.E24
	2,6	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	90	4211.E26
	2,9	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	93	4211.E29
	4,0	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	113	4211.E40
	4,2	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	117	4211.E42
	5,5	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	145	4211.E55
	5,6	0,509	0,380	0,390	0,625	2,065	1,47	0,850	0,4425	28.500	-65	200	145	4211.E56

[1] shearing resistance similar to DIN 50141

→

Nominal diameter A	Clamping length L +0,02 0	Dimensions							Location hole max.	Shearing resistance, double[1] min.				Art. No.
		B ±0,005	C 0 -0,04	D max.	E max.	F max.	G max.	H min.			min.	max.		
[inch]	[inch]	[inch]							[inch]	[lb]	[°F]		[g]	
1/2	7,2	0,594	0,460	0,390	0,625	2,345	1,60	0,850	0,5050	36.900	-65	200	176	4211.E72
	1,0	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	82	4211.F10
	1,2	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	87	4211.F12
	1,4	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	93	4211.F14
	1,5	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	94	4211.F15
	1,7	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	101	4211.F17
	1,9	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	106	4211.F19
	2,0	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	108	4211.F20
	2,4	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	118	4211.F24
	2,5	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	117	4211.F25
	2,9	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	130	4211.F29
	3,1	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	135	4211.F31
	3,6	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	147	4211.F36
	3,7	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	146	4211.F37
	4,0	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	156	4211.F40
	4,7	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	177	4211.F47
	4,8	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	180	4211.F48
	5,0	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	185	4211.F50
	6,4	0,594	0,460	0,565	0,800	2,345	1,60	0,885	0,5050	36.900	-65	200	217	4211.F64
9/16	1,7	0,666	0,510	0,565	0,800	2,345	1,60	0,885	0,5675	46.700	-65	200	120	4211.G17
	3,2	0,666	0,510	0,565	0,800	2,345	1,60	0,885	0,5675	46.700	-65	200	160	4211.G32
	3,6	0,666	0,510	0,565	0,800	2,345	1,60	0,885	0,5675	46.700	-65	200	176	4211.G36
	4,0	0,666	0,510	0,565	0,800	2,345	1,60	0,885	0,5675	46.700	-65	200	190	4211.G40
	6,1	0,666	0,510	0,565	0,800	2,345	1,60	0,885	0,5675	46.700	-65	200	252	4211.G61

[1] shearing resistance similar to DIN 50141

Ball Lock Pins • single acting - complies with NASM / MS17986

EH 4212.



PRODUCT DESCRIPTION

Ball lock pins according to NASM (former norm: MS) are used for quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
Ball lock pins (quick release pins) are produced according to Aviation Norm NASM (former norm: MS) and tested to NAS 1332.

Material

Pin ①
- Stainless steel, precipitation-hardened, passivated

Press bolt ②
- Stainless steel, precipitation-hardened, passivated

Spring ③
- Stainless steel, passivated

Handle ④
- Aluminium, black anodised

Attaching ring ⑤
- Stainless steel, passivated

Ball ⑥
- Stainless steel, precipitation-hardened, passivated

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

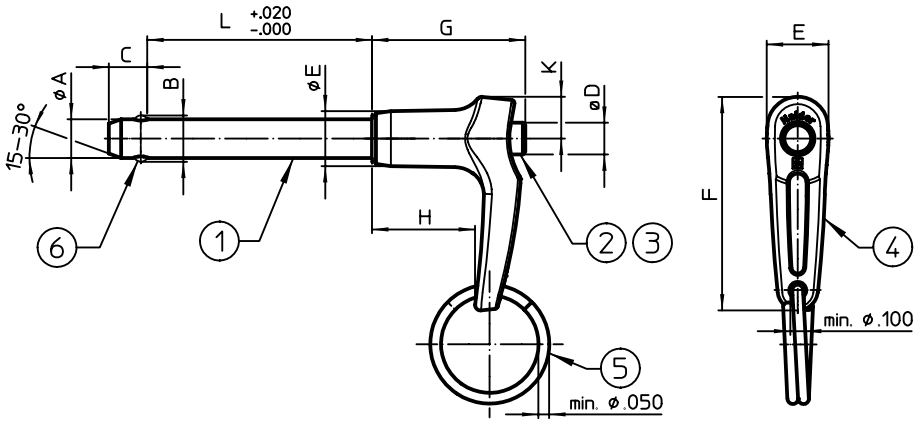
Notes

Special types on request.
All further dimensions are available on request.
- This product is manufactured in INCH dimensions.

References

A conversion table can be found in the technical data following these product information pages.

DRAWING



ORDER INFORMATION

Nominal diameter A	Clamping length L +0,02 0	Dimensions B ±0,005	C +0,1 -0,04	D max.	E max.	F max.	G max.	H min.	K max.	Location hole max.	Shearing resistance, double[1] min.	min.	max.		Art. No.
[inch]	[inch]	[inch]								[inch]	[lb]	[°F]		[g]	
3/16	**0,5**	0,220	0,260	0,310	0,500	1,80	1,27	0,76	0,34	0,1940	5.150	-65	200	25	4212.A05
	0,8	0,220	0,260	0,310	0,500	1,80	1,27	0,76	0,34	0,1940	5.150	-65	200	26	4212.A08
	1,0	0,220	0,260	0,310	0,500	1,80	1,27	0,76	0,34	0,1940	5.150	-65	200	27	4212.A10
	1,3	0,220	0,260	0,310	0,500	1,80	1,27	0,76	0,34	0,1940	5.150	-65	200	28	4212.A13
	1,4	0,220	0,260	0,310	0,500	1,80	1,27	0,76	0,34	0,1940	5.150	-65	200	31	4212.A14
	1,7	0,220	0,260	0,310	0,500	1,80	1,27	0,76	0,34	0,1940	5.150	-65	200	27	4212.A17
1/4	**0,5**	0,289	0,290	0,310	0,500	1,80	1,27	0,76	0,34	0,2540	9.200	-65	200	27	4212.B05
	1,2	0,289	0,290	0,310	0,500	1,80	1,27	0,76	0,34	0,2540	9.200	-65	200	31	4212.B12
	1,5	0,289	0,290	0,310	0,500	1,80	1,27	0,76	0,34	0,2540	9.200	-65	200	33	4212.B15
	1,6	0,289	0,290	0,310	0,500	1,80	1,27	0,76	0,34	0,2540	9.200	-65	200	33	4212.B16
	1,7	0,289	0,290	0,310	0,500	1,80	1,27	0,76	0,34	0,2540	9.200	-65	200	34	4212.B17
	2,0	0,289	0,290	0,310	0,500	1,80	1,27	0,76	0,34	0,2540	9.200	-65	200	35	4212.B20
	2,1	0,289	0,290	0,310	0,500	1,80	1,27	0,76	0,34	0,2540	9.200	-65	200	36	4212.B21

[1] shearing resistance similar to DIN 50141

→

Nominal diameter A	Clamping length L +0,020	Dimensions								Location hole max.	Shearing resistance, double[1] min.				Art. No.
		B ±0,005	C +0,1 -0,04	D max.	E max.	F max.	G max.	H min.	K max.			min.	max.		
[inch]	[inch]	[inch]								[inch]	[lb]	[°F]		[g]	
5/16	0,4	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	29	4212.C04
	0,6	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	31	4212.C06
	1,0	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	34	4212.C10
	1,3	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	37	4212.C13
	1,6	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	39	4212.C16
	1,8	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	43	4212.C18
	2,0	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	41	4212.C20
	2,3	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	46	4212.C23
	2,9	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	54	4212.C29
	3,0	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	53	4212.C30
	3,3	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	57	4212.C33
	3,6	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	60	4212.C36
	4,0	0,375	0,330	0,310	0,500	1,80	1,27	0,76	0,34	0,3165	14.400	-65	200	64	4212.C40
3/8	1,0	0,440	0,365	0,390	0,625	2,03	1,45	0,85	0,39	0,3790	20.700	-65	200	49	4212.D10
	1,5	0,440	0,365	0,390	0,625	2,03	1,45	0,85	0,39	0,3790	20.700	-65	200	59	4212.D15
	1,8	0,440	0,365	0,390	0,625	2,03	1,45	0,85	0,39	0,3790	20.700	-65	200	61	4212.D18
	2,0	0,440	0,365	0,390	0,625	2,03	1,45	0,85	0,39	0,3790	20.700	-65	200	65	4212.D20
	2,4	0,440	0,365	0,390	0,625	2,03	1,45	0,85	0,39	0,3790	20.700	-65	200	71	4212.D24
	2,6	0,440	0,365	0,390	0,625	2,03	1,45	0,85	0,39	0,3790	20.700	-65	200	73	4212.D26
	3,0	0,440	0,365	0,390	0,625	2,03	1,45	0,85	0,39	0,3790	20.700	-65	200	78	4212.D30
	6,0	0,440	0,365	0,390	0,625	2,03	1,45	0,85	0,39	0,3790	20.700	-65	200	122	4212.D60
7/16	1,2	0,509	0,380	0,390	0,625	2,03	1,47	0,85	0,39	0,4425	28.500	-65	200	61	4212.E12
	3,5	0,509	0,380	0,390	0,625	2,03	1,47	0,85	0,39	0,4425	28.500	-65	200	104	4212.E35
	4,0	0,509	0,380	0,390	0,625	2,03	1,47	0,85	0,39	0,4425	28.500	-65	200	113	4212.E40
	5,5	0,509	0,380	0,390	0,625	2,03	1,47	0,85	0,39	0,4425	28.500	-65	200	146	4212.E55
1/2	1,0	0,594	0,460	0,565	0,800	2,36	1,60	0,85	0,50	0,5050	36.900	-65	200	83	4212.F10
	1,5	0,594	0,460	0,565	0,800	2,36	1,60	0,85	0,50	0,5050	36.900	-65	200	96	4212.F15
	1,9	0,594	0,460	0,565	0,800	2,36	1,60	0,85	0,50	0,5050	36.900	-65	200	103	4212.F19
	3,4	0,594	0,460	0,565	0,800	2,36	1,60	0,85	0,50	0,5050	36.900	-65	200	143	4212.F34
	4,2	0,594	0,460	0,565	0,800	2,36	1,60	0,85	0,50	0,5050	36.900	-65	200	166	4212.F42
	4,5	0,594	0,460	0,565	0,800	2,36	1,60	0,85	0,50	0,5050	36.900	-65	200	172	4212.F45
9/16	1,7	0,666	0,510	0,565	0,800	2,36	1,60	0,85	0,50	0,5675	46.700	-65	200	116	4212.G17
	2,5	0,666	0,510	0,565	0,800	2,36	1,60	0,85	0,50	0,5675	46.700	-65	200	140	4212.G25
	4,0	0,666	0,510	0,565	0,800	2,36	1,60	0,85	0,50	0,5675	46.700	-65	200	189	4212.G40
	5,0	0,666	0,510	0,565	0,800	2,36	1,60	0,85	0,50	0,5675	46.700	-65	200	219	4212.G50
	6,0	0,666	0,510	0,565	0,800	2,36	1,60	0,85	0,50	0,5675	46.700	-65	200	249	4212.G60
	7,5	0,666	0,510	0,565	0,800	2,36	1,60	0,85	0,50	0,5675	46.700	-65	200	298	4212.G75

[1] shearing resistance similar to DIN 50141

2

Ball Lock Pins • single acting - complies with NASM / MS17987

EH 4213.



PRODUCT DESCRIPTION

Ball lock pins according to NASM (former norm: MS) are used for quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.
Ball lock pins (quick release pins) are produced according to Aviation Norm NASM (former norm: MS) and tested to NAS 1332.

Material

Pin ①
- Stainless steel, precipitation-hardened, passivated

Press bolt ②
- Stainless steel, precipitation-hardened, passivated

Spring ③
- Stainless steel, passivated

Handle ④
- Stainless steel, passivated

Attaching ring ⑤
- Stainless steel, passivated

Ball ⑥
- Stainless steel, precipitation-hardened, passivated

Operation

The balls are unlocked by pressing the knob.

MORE INFORMATION

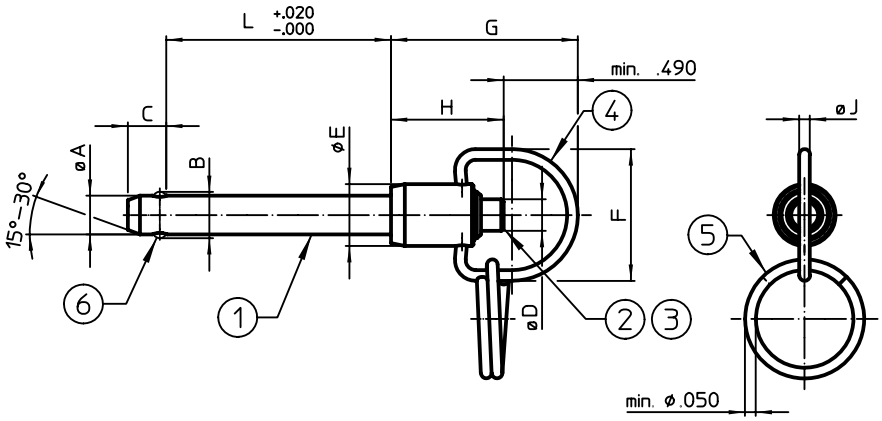
Notes

Special types on request.
All further dimensions are available on request.
- This product is manufactured in INCH dimensions.

References

A conversion table can be found in the technical data following these product information pages.

DRAWING



ORDER INFORMATION

Nominal diameter A	Clamping length L +0,02 0	Dimensions B ±0,005	C 0 -0,04	D max.	E max.	G max.	H min.	J min.	Location hole max.	Shearing resistance, double[1] min.	min.	max.		Art. No.
[inch]	[inch]	[inch]							[inch]	[lb]	[°F]		[g]	
3/16	**0,8**	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	24	4213.A08
	0,9	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	24	4213.A09
	1,0	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	24	4213.A10
	1,1	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	25	4213.A11
	1,2	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	25	4213.A12
	1,5	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	26	4213.A15
	1,6	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	26	4213.A16
	1,7	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	27	4213.A17
	2,5	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	29	4213.A31
	3,1	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	33	4213.A31
	4,3	0,220	0,260	0,310	0,53	1,45	0,73	0,08	0,1940	5.150	-65	200	36	4213.A43

[1] shearing resistance similar to DIN 50141

Nominal diameter A	Clamping length L +0,02 0	Dimensions							Location hole max.	Shearing resistance, double[1] min.				Art. No.
		B ±0,005	C 0 -0,04	D max.	E max.	G max.	H min.	J min.			min.	max.		
[inch]	[inch]	[inch]							[inch]	[lb]	[°F]		[g]	
1/4	0,4	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	24	4213.B04
	0,5	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	25	4213.B05
	0,6	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	25	4213.B06
	0,7	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	26	4213.B07
	0,8	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	26	4213.B08
	0,9	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	27	4213.B09
	1,0	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	27	4213.B10
	1,1	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	28	4213.B11
	1,2	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	29	4213.B12
	1,3	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	30	4213.B13
	1,4	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	30	4213.B14
	1,5	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	31	4213.B15
	1,7	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	32	4213.B17
	1,8	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	32	4213.B18
	1,9	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	33	4213.B19
	2,0	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	34	4213.B20
	2,1	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	34	4213.B21
	2,2	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	35	4213.B22
	2,4	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	36	4213.B24
	2,5	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	36	4213.B25
	2,9	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	40	4213.B29
	3,0	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	39	4213.B30
	4,0	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	47	4213.B40
	4,7	0,289	0,290	0,310	0,53	1,50	0,78	0,08	0,2540	9.200	-65	200	50	4213.B47
5/16	0,6	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	30	4213.C06
	0,7	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	31	4213.C07
	0,8	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	33	4213.C08
	0,9	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	34	4213.C09
	1,1	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	35	4213.C11
	1,2	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	36	4213.C12
	1,3	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	37	4213.C13
	1,5	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	39	4213.C15
	1,6	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	40	4213.C16
	1,8	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	41	4213.C18
	1,9	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	42	4213.C19
	2,0	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	43	4213.C20
	2,3	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	46	4213.C23
	2,6	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	48	4213.C26
	3,3	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	56	4213.C33
	3,5	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	59	4213.C35
	6,0	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	85	4213.C60
	6,7	0,375	0,330	0,310	0,59	1,65	0,83	0,08	0,3165	14.400	-65	200	92	4213.C67
3/8	0,8	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	49	4213.D08
	0,9	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	50	4213.D09
	1,0	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	51	4213.D10
	1,1	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	53	4213.D11
	1,2	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	54	4213.D12
	1,3	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	55	4213.D13
	1,4	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	55	4213.D14
	1,5	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	58	4213.D15
	1,6	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	59	4213.D16
	1,8	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	62	4213.D18
	2,6	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	73	4213.D26
	3,0	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	80	4213.D30
	3,1	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	82	4213.D31
	4,3	0,440	0,365	0,390	0,65	1,65	0,94	0,08	0,3790	20.700	-65	200	97	4213.D43

[1] shearing resistance similar to DIN 50141

→

Nominal diameter A	Clamping length L +0,02 0	Dimensions							Location hole max.	Shearing resistance, double[1] min.				Art. No.
		B ±0,005	C 0 -0,04	D max.	E max.	G max.	H min.	J min.			min.	max.		
[inch]	[inch]	[inch]							[inch]	[lb]	[°F]		[g]	
7/16	**0,8**	0,509	0,380	0,390	0,71	1,85	0,98	0,08	0,4425	28.500	-65	200	56	4213.E08
	1,2	0,509	0,380	0,390	0,71	1,85	0,98	0,08	0,4425	28.500	-65	200	65	4213.E12
	1,4	0,509	0,380	0,390	0,71	1,85	0,98	0,08	0,4425	28.500	-65	200	68	4213.E14
	1,5	0,509	0,380	0,390	0,71	1,85	0,98	0,08	0,4425	28.500	-65	200	70	4213.E15
	1,9	0,509	0,380	0,390	0,71	1,85	0,98	0,08	0,4425	28.500	-65	200	78	4213.E19
	2,0	0,509	0,380	0,390	0,71	1,85	0,98	0,08	0,4425	28.500	-65	200	81	4213.E20
	2,2	0,509	0,380	0,390	0,71	1,85	0,98	0,08	0,4425	28.500	-65	200	81	4213.E22
	2,4	0,509	0,380	0,390	0,71	1,85	0,98	0,08	0,4425	28.500	-65	200	88	4213.E24
	2,6	0,509	0,380	0,390	0,71	1,85	0,98	0,08	0,4425	28.500	-65	200	92	4213.E26
1/2	**1,1**	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	88	4213.F11
	1,2	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	91	4213.F12
	1,3	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	93	4213.F13
	1,4	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	96	4213.F14
	1,5	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	98	4213.F15
	2,0	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	109	4213.F20
	2,3	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	117	4213.F23
	3,3	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	141	4213.F33
	3,5	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	146	4213.F35
	3,9	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	160	4213.F39
	4,5	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	160	4213.F45
	5,0	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	187	4213.F50
	5,3	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	193	4213.F53
	6,5	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	215	4213.F65
	8,0	0,594	0,460	0,565	0,80	1,85	1,14	0,08	0,5050	36.900	-65	200	263	4213.F80
9/16	**1,3**	0,666	0,510	0,565	0,84	2,03	1,14	0,08	0,5675	46.700	-65	200	120	4213.G13
	2,5	0,666	0,510	0,565	0,84	2,03	1,14	0,08	0,5675	46.700	-65	200	150	4213.G25
	3,0	0,666	0,510	0,565	0,84	2,03	1,14	0,08	0,5675	46.700	-65	200	166	4213.G30
	3,7	0,666	0,510	0,565	0,84	2,03	1,14	0,08	0,5675	46.700	-65	200	187	4213.G37
	5,5	0,666	0,510	0,565	0,84	2,03	1,14	0,08	0,5675	46.700	-65	200	245	4213.G55

[1] shearing resistance similar to DIN 50141

Grub Screws • DIN 6332 with thrust point

EH 22540.



PRODUCT DESCRIPTION

For combination with thrust pads with snap ring DIN 6311 form S (EH 22560.) and clamping screws DIN 6332.

Material

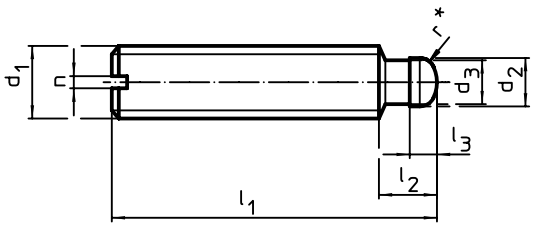
- Steel, blackened, quality 5.8, thrust point hardened
- Stainless steel

MORE INFORMATION

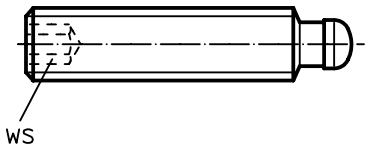
Further products

Thrust Pads, DIN 6311 and low model → p. 257

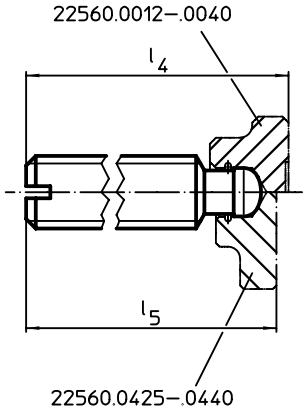
DRAWING



picture 1



picture 2



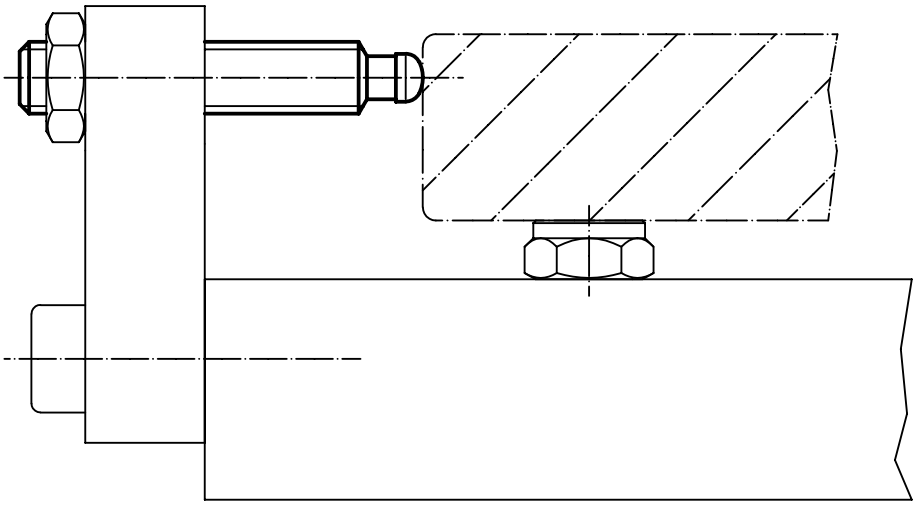
* to ease assembly the DIN 6332 specification has been completed by r

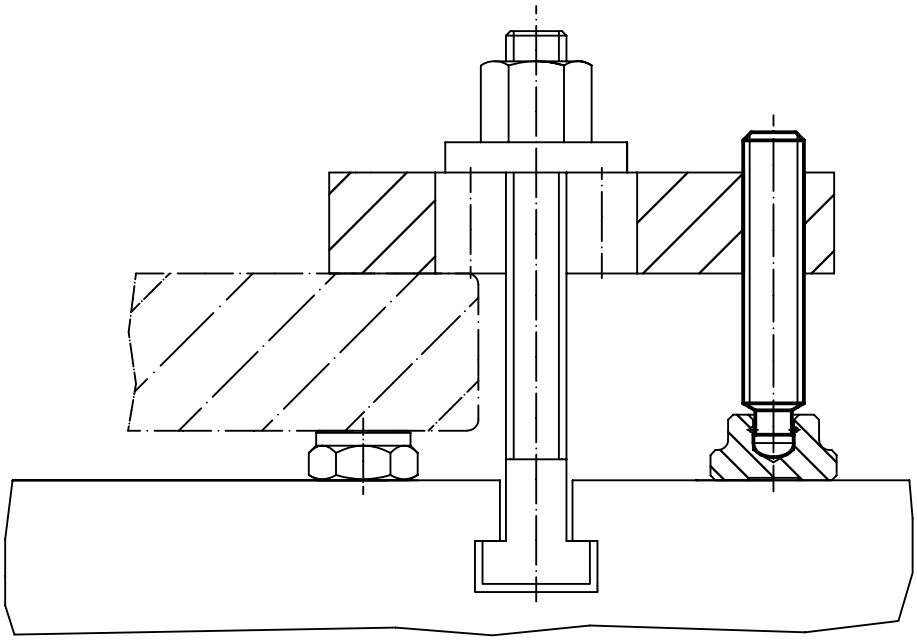
ORDER INFORMATION

Dimensions									WS		Art. No.	
d_1	l_1	d_2 h11	d_3	z_2	z_3	l_2 ~	l_3 ~	n			steel	stainless steel
		[mm]							[mm]	[g]		
slotted (S) – picture 1												
M 6	**30**	4,5	4,0	6,0	2,5	32,1	–	1,0	–	4,5	22540.0061	22540.1061
	50	4,5	4,0	6,0	2,5	52,1	–	1,0	–	7,8	22540.0062	22540.1062
M 8	**40**	6,0	5,4	7,5	3,0	43,0	42,5	1,2	–	11,0	22540.0081	22540.1081
	60	6,0	5,4	7,5	3,0	63,0	62,5	1,2	–	17,0	22540.0082	22540.1082
M10	**60**	8,0	7,2	9,0	4,5	63,6	62,6	1,6	–	27,0	22540.0101	22540.1101
	80	8,0	7,2	9,0	4,5	83,6	82,6	1,6	–	37,0	22540.0102	22540.1102
M12	**60**	8,0	7,2	10,0	4,5	64,6	62,6	2,0	–	38,0	22540.0121	22540.1121
	80	8,0	7,2	10,0	4,5	84,6	82,6	2,0	–	51,0	22540.0122	22540.1122
	100	8,0	7,2	10,0	4,5	104,6	102,6	2,0	–	65,0	22540.0123	22540.1123
M16	**80**	12,0	11,0	12,0	5,0	85,4	82,9	2,5	–	100,0	22540.0161	22540.1161
	100	12,0	11,0	12,0	5,0	105,4	102,9	2,5	–	126,0	22540.0162	22540.1162
	125	12,0	11,0	12,0	5,0	130,4	127,9	2,5	–	160,0	22540.0163	22540.1163
M20	**100**	15,5	14,4	14,0	5,5	105,5	–	3,0	–	190,0	22540.0201	22540.1201
	125	15,5	14,4	14,0	5,5	130,5	–	3,0	–	240,0	22540.0202	22540.1202
	150	15,5	14,4	14,0	5,5	155,5	–	3,0	–	290,0	22540.0203	22540.1203
with internal hexagon (IS) – picture 2												
M 6	**30**	4,5	4,0	6,0	2,5	32,1	–	–	3	4,3	22540.0361	22540.1361
	50	4,5	4,0	6,0	2,5	52,1	–	–	3	7,6	22540.0362	22540.1362
M 8	**40**	6,0	5,4	7,5	3,0	43,0	42,5	–	4	11,0	22540.0381	22540.1381
	60	6,0	5,4	7,5	3,0	63,0	62,5	–	4	17,0	22540.0382	22540.1382
M10	**60**	8,0	7,2	9,0	4,5	63,6	62,6	–	5	26,0	22540.0401	22540.1401
	80	8,0	7,2	9,0	4,5	83,6	82,6	–	5	36,0	22540.0402	22540.1402
M12	**60**	8,0	7,2	10,0	4,5	64,6	62,6	–	6	36,0	22540.0421	22540.1421
	80	8,0	7,2	10,0	4,5	84,6	82,6	–	6	50,0	22540.0422	22540.1422
	100	8,0	7,2	10,0	4,5	104,6	102,6	–	6	64,0	22540.0423	22540.1423
M16	**80**	12,0	11,0	12,0	5,0	85,4	82,9	–	8	91,0	22540.0461	22540.1461
	100	12,0	11,0	12,0	5,0	105,4	102,9	–	8	118,0	22540.0462	22540.1462
	125	12,0	11,0	12,0	5,0	130,4	127,9	–	8	150,0	22540.0463	22540.1463
M20	**100**	15,5	14,4	14,0	5,5	105,5	–	–	10	182,0	22540.0501	22540.1501
	125	15,5	14,4	14,0	5,5	130,5	–	–	10	233,0	22540.0502	22540.1502
	150	15,5	14,4	14,0	5,5	155,5	–	–	10	284,0	22540.0503	22540.1503

2

APPLICATION EXAMPLE





Thrust Pads • DIN 6311 and low model

EH 22560.



PRODUCT DESCRIPTION

Combinable with grub screws DIN 6332 with thrust point EH 22540.

Material

- Steel, case-hardened, blackened. Snap ring inlayed.
- Stainless steel

Assembly

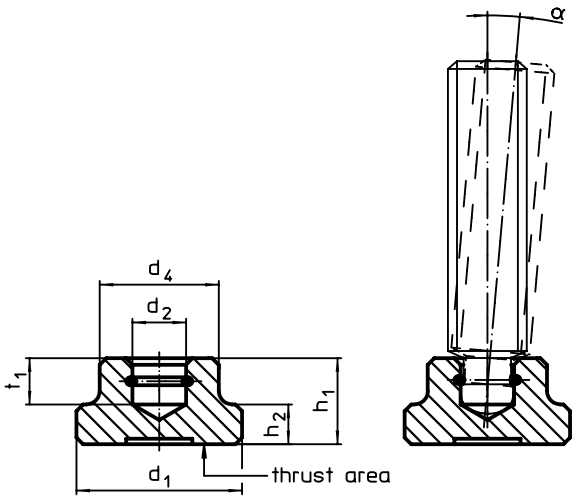
The thrust pad is to be held the way the spring retainer lies in the recess with its open side at the bottom. The grub screw is inclined as far as possible in the direction of the open side of the ring and pressed in.

MORE INFORMATION

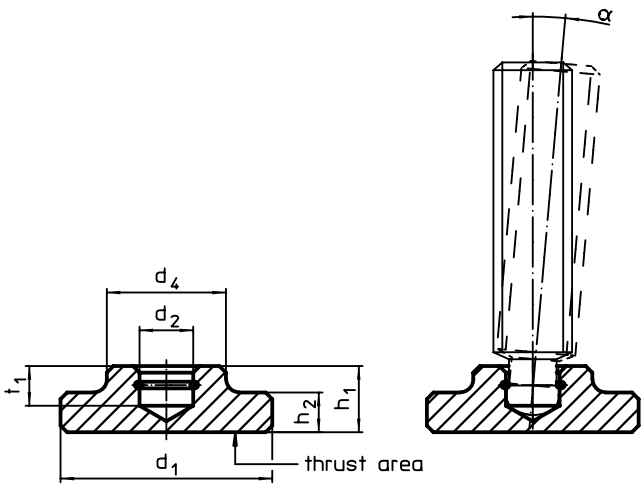
Further products

Grub Screws, DIN 6332 with thrust point . . . . . → p. 255

DRAWING



picture 1

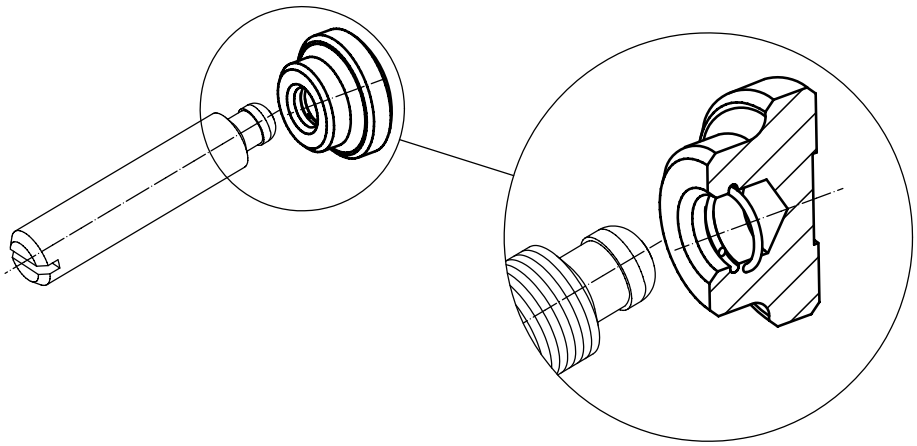


picture 2

ORDER INFORMATION

Dimensions						For grub screws with thrust point DIN 6332	α min.		Art. No.	
d_1	d_2 H12	d_4	h_1	h_2	t_1				steel	stainless steel
[mm]						[mm]		[g]		
DIN 6311 with snap ring, form S – picture 1										
12	4,6	10	7	2,5	4,0	M 6	7°	4,3	22560.0012	22560.0112
16	6,1	12	9	4,0	5,0	M 8	4°	9,4	22560.0016	22560.0116
20	8,1	15	11	5,0	6,0	M10	3°	18,0	22560.0020	22560.0120
25	8,1	18	13	6,0	7,0	M12	3°	30,0	22560.0025	22560.0125
32	12,1	22	15	7,0	7,5	M16	5°	59,0	22560.0032	22560.0132
40	15,6	28	16	9,0	8,0	M20	4°	105,0	22560.0040	22560.0140
low model, with increased thrust area and spring retainer – picture 2										
25	6,1	12	8	4,0	4,5	M 8	4°	18,0	22560.0425	22560.1425
32	8,1	18	10	6,0	6,0	M10/M12	3°	43,0	22560.0432	22560.1432
40	12,1	22	12	7,0	7,0	M16	5°	75,0	22560.0440	22560.1440

APPLICATION EXAMPLE



2

Thrust Pads • plastic

EH 22570.



PRODUCT DESCRIPTION

For combination with ball-headed grub screws EH 22570.

Material

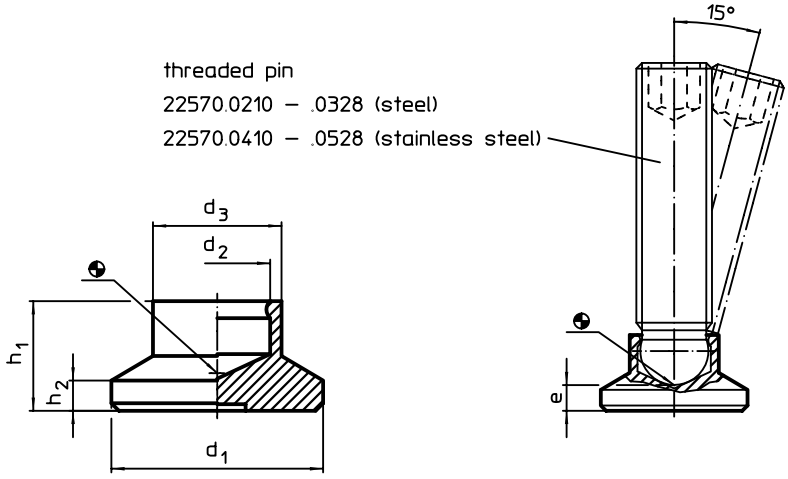
- Thermoplastic POM, black, dull

MORE INFORMATION

Further products

Grub Screws, ball-headed . . . . . → p. 259

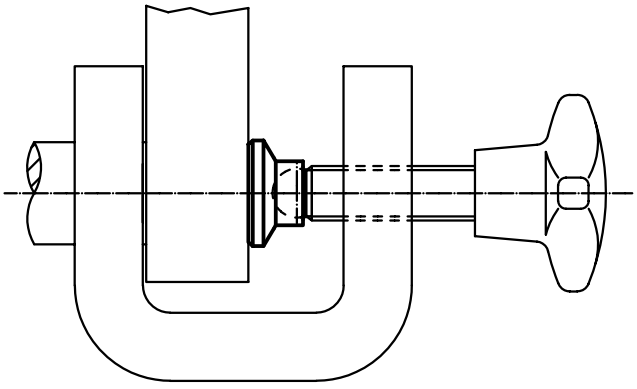
DRAWING



ORDER INFORMATION

Dimensions						Load capacity for static load max.	For grub screws EH 22570.				Art. No.
d_1	d_2	d_3	e ~	h_1	h_2			min.	max.		
[mm]						[kN]	[mm]	[°C]		[g]	
15	**4,5**	8,6	3,6	7,6	2,5	3,5	M 6	-30	80	1,1	22570.0014
	6,1	8,6	2,5	7,6	2,5	3,5	M 8	-30	80	1,0	22570.0015
18	**6,1**	10,8	4,2	9,2	2,5	3,5	M 8	-30	80	1,7	22570.0017
	7,8	10,8	3,4	9,2	2,5	3,5	M10	-30	80	2,0	22570.0018
21	**6,1**	12,8	5,0	10,0	3,0	3,5	M 8	-30	80	3,0	22570.0019
	7,8	12,8	4,3	10,0	3,0	3,5	M10	-30	80	2,6	22570.0020
	9,4	12,8	3,4	10,0	3,0	3,5	M12	-30	80	2,4	22570.0021
25	**6,1**	13,0	5,5	10,5	3,0	3,5	M 8	-30	80	4,0	22570.0023
	7,8	13,0	4,6	10,5	3,0	3,5	M10	-30	80	3,6	22570.0024
	9,4	13,0	3,6	10,5	3,0	3,5	M12	-30	80	3,4	22570.0025
32	**6,1**	14,0	6,0	11,0	3,0	3,5	M 8	-30	80	5,0	22570.0032
	7,8	14,0	5,0	11,0	3,0	3,5	M10	-30	80	5,0	22570.0033
	9,4	14,0	4,2	11,0	3,0	3,5	M12	-30	80	5,0	22570.0034
40	**6,1**	16,0	8,0	13,0	4,0	3,5	M 8	-30	80	11,0	22570.0040
	7,8	16,0	7,0	13,0	4,0	3,5	M10	-30	80	10,0	22570.0041
	9,4	16,0	6,2	13,0	4,0	3,5	M12	-30	80	10,0	22570.0042

APPLICATION EXAMPLE



Grub Screws • ball-headed

EH 22570.



PRODUCT DESCRIPTION

For combination with plastic thrust pads EH 22570.

Material

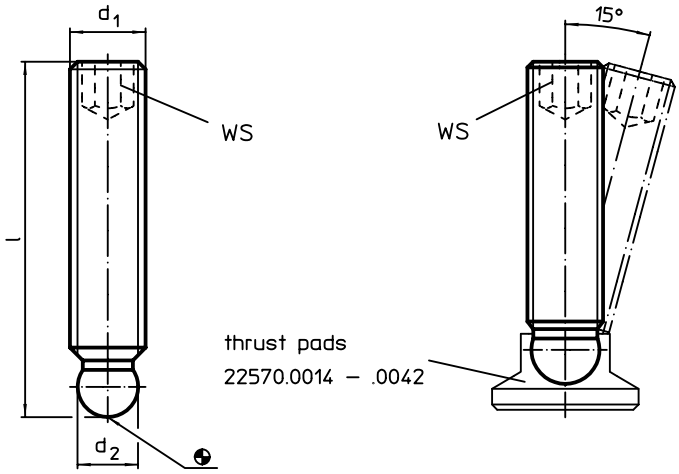
- Free cutting steel, quality 5.8, blackened
- Stainless steel 1.4305

MORE INFORMATION

Further products

Thrust Pads, plastic . . . . . → p. 258

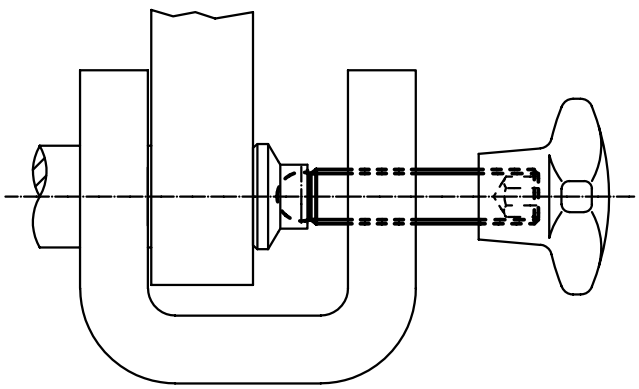
DRAWING



ORDER INFORMATION

Dimensions			WS		Art. No.	
d_1	l	d_2 +0,05			free cutting steel	stainless steel
	[mm]		[mm]	[g]		
M 6	30	4,47	3	5,1	22570.0210	22570.0410
	40	4,47	3	5,9	22570.0214	22570.0414
	50	4,47	3	7,6	22570.0218	22570.0418
M 8	25	6,10	4	5,8	22570.0219	22570.0419
	40	6,10	4	11,0	22570.0220	22570.0420
	50	6,10	4	14,0	22570.0224	22570.0424
	63	6,10	4	18,0	22570.0228	22570.0428
M10	40	7,80	5	16,0	22570.0248	22570.0448
	50	7,80	5	21,0	22570.0250	22570.0450
	63	7,80	5	27,0	22570.0254	22570.0454
	80	7,80	5	36,0	22570.0258	22570.0458
M12	40	9,40	6	23,0	22570.0316	22570.0516
	63	9,40	6	39,0	22570.0320	22570.0520
	80	9,40	6	51,0	22570.0324	22570.0524
	100	9,40	6	65,0	22570.0328	22570.0528

APPLICATION EXAMPLE



2

Mounting Pads

EH 22590.



PRODUCT DESCRIPTION

Mounting pads can be used as foot or thrust pad. Not parallel bearing surfaces up to 15° degrees can be compensated.

Material

Ball element
- Heat-treated steel, tempered, blackened
- Stainless steel 1.4305

Ball element with bolt
- Heat-treated steel, tempered, blackened
- Stainless steel 1.4305

Lock nut
- Steel, blackened, ISO 4032
- Steel, blackened, DIN 934
- Stainless Steel A2, ISO 4032
- Stainless Steel A2, DIN 934

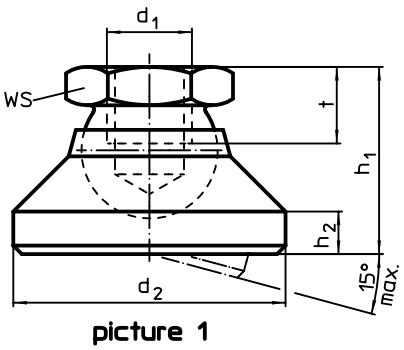
Pad
- Heat-treated steel, blackened
- Stainless steel 1.4305
- Thermoplastic POM, white

MORE INFORMATION

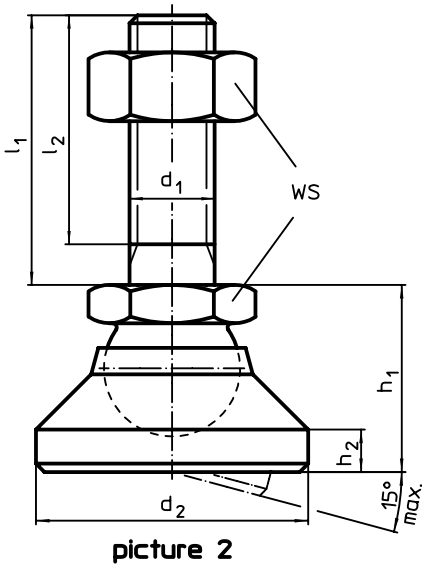
Notes

For the versions d_1 = M10 and M12 the lock nut conforms to DIN 934.

DRAWING



picture 1



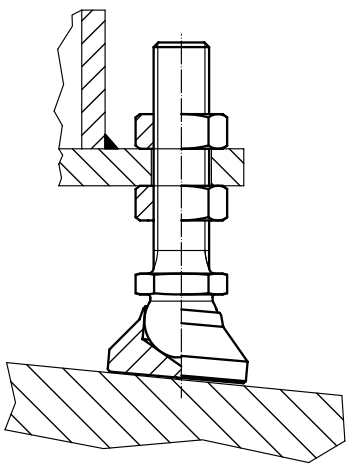
picture 2

ORDER INFORMATION

Dimensions							WS	Load capacity for static load max.				Art. No.		
d_1	l_1	d_2	l_2	h_1 ~	h_2	t			min.	max.		heat-treated steel	stainless steel	thermo-plastic
[mm]							[mm]	[kN]	[°C]		[g]			
pad and ball element – picture 1														
M 6	–	20	–	14	2,5	5,0	10	10	–	250	15	22590.0006	–	–
								8	–	250	15	–	22590.0206	–
M 8	–	25	–	18	4,0	7,0	13	18	–	250	33	22590.0008	–	–
								14	–	250	33	–	22590.0208	–
M10	–	32	–	22	5,0	9,0	17	20	–	250	66	22590.0010	–	–
								16	–	250	66	–	22590.0210	–
M12	–	40	–	26	6,0	11,0	19	35	–	250	112	22590.0012	–	–
								28	–	250	112	–	22590.0212	–
M16	–	50	–	32	7,0	13,5	24	45	–	250	220	22590.0016	–	–
								36	–	250	220	–	22590.0216	–
M20	–	60	–	42	8,0	17,0	30	55	–	250	413	22590.0020	–	–
								44	–	250	413	–	22590.0220	–
M24	–	60	–	45	9,5	19,0	36	65	–	250	462	22590.0024	–	–
								52	–	250	462	–	22590.0224	–

Dimensions							WS	Load capacity for static load max.				Art. No.		
d_1	l_1	d_2	l_2	h_1 ~	h_2	t			min.	max.		heat-treated steel	stainless steel	thermo-plastic
[mm]							[mm]	[kN]	[°C]		[g]			
pad from thermoplastic, ball element from stainless steel – picture 1														
M 6	–	20	–	14	2,5	5,0	10	4	-30	80	6	–	–	22590.0106
M 8	–	25	–	18	4,0	7,0	13	7	-30	80	13	–	–	22590.0108
M10	–	32	–	22	5,0	9,0	17	10	-30	80	26	–	–	22590.0110
M12	–	40	–	26	6,0	11,0	19	18	-30	80	40	–	–	22590.0112
M16	–	50	–	32	7,0	13,5	24	20	-30	80	75	–	–	22590.0116
M20	–	60	–	42	8,0	17,0	30	22	-30	80	150	–	–	22590.0120
M24	–	60	–	45	9,5	19,0	36	25	-30	80	184	–	–	22590.0124
pad and ball element with bolt from steel – picture 2														
M 6	60	20	57,0	14	2,5	–	10	10	–	250	29	22590.0410	–	–
								8	–	250	29	–	22590.0610	–
M 8	80	25	76,0	18	4,0	–	13	18	–	250	66	22590.0422	–	–
								14	–	250	66	–	22590.0622	–
M10	100	32	95,5	22	5,0	–	17	20	–	250	133	22590.0438	–	–
								16	–	250	133	–	22590.0638	–
	150	32	145,5	22	5,0	–	17	20	–	250	159	22590.0442	–	–
								16	–	250	159	–	22590.0642	–
M12	100	40	94,5	26	6,0	–	19	35	–	250	211	22590.0452	–	–
								28	–	250	211	–	22590.0652	–
	150	40	144,5	26	6,0	–	19	35	–	250	247	22590.0456	–	–
								28	–	250	247	–	22590.0656	–
M16	100	50	94,0	32	7,0	–	24	45	–	250	407	22590.0468	–	–
								36	–	250	407	–	22590.0668	–
	200	50	194,0	32	7,0	–	24	45	–	250	540	22590.0472	–	–
								36	–	250	540	–	22590.0672	–
M20	100	60	92,5	42	8,0	–	30	55	–	250	722	22590.0482	–	–
								44	–	250	722	–	22590.0682	–
	200	60	192,5	42	8,0	–	30	55	–	250	924	22590.0488	–	–
								44	–	250	924	–	22590.0688	–
M24	100	60	91,0	45	9,5	–	36	65	–	250	935	22590.0495	–	–
								52	–	250	935	–	22590.0695	–
	200	60	191,0	45	9,5	–	36	65	–	250	1231	22590.0498	–	–
								52	–	250	1231	–	22590.0698	–
pad from thermoplastic, ball element with bolt from stainless steel – picture 2														
M 6	60	20	57,0	14	2,5	–	10	4	-30	80	20	–	–	22590.0510
M 8	80	25	76,0	18	4,0	–	13	7	-30	80	46	–	–	22590.0522
M10	100	32	95,5	22	5,0	–	17	10	-30	80	92	–	–	22590.0538
	150	32	145,5	22	5,0	–	17	10	-30	80	118	–	–	22590.0542
M12	100	40	94,5	26	6,0	–	19	18	-30	80	139	–	–	22590.0552
	150	40	144,5	26	6,0	–	19	18	-30	80	173	–	–	22590.0556
M16	100	50	94,0	32	7,0	–	24	20	-30	80	264	–	–	22590.0568
	200	50	194,0	32	7,0	–	24	20	-30	80	393	–	–	22590.0572
M20	100	60	92,5	42	8,0	–	30	22	-30	80	463	–	–	22590.0582
	200	60	192,5	42	8,0	–	30	22	-30	80	664	–	–	22590.0588
M24	100	60	91,0	45	9,5	–	36	25	-30	80	662	–	–	22590.0595
	200	60	191,0	45	9,5	–	36	25	-30	80	960	–	–	22590.0598

APPLICATION EXAMPLE



2

Mounting Pads • protected against slipping

EH 22590.



PRODUCT DESCRIPTION

Mounting pads can be used as foot or thrust pad. Not parallel bearing surfaces up to 15° degrees can be compensated.
The plastic cover on the mounting pad prevents slipping.

Material

Ball element
- Free cutting steel, induction-hardened, blackened.
- Stainless steel 1.4305

Ball element with bolt
- Heat-treated steel, blackened
- Stainless steel 1.4305

Rubber cab
- Rubber, black

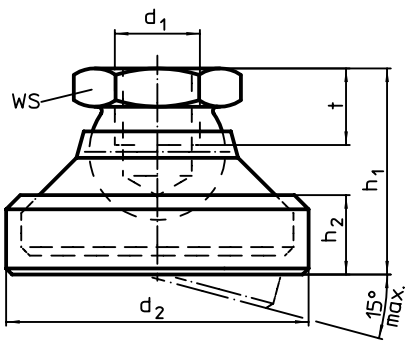
Pad
- Heat-treated steel, tempered, blackened
- Stainless steel 1.4305
- Thermoplastic POM, white

MORE INFORMATION

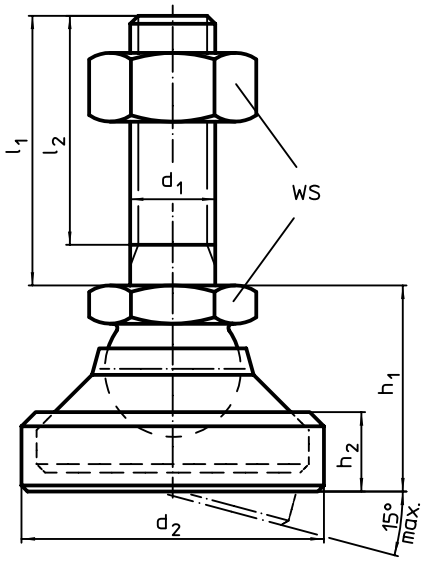
Notes

For the versions d_1 = M10 and M12 the lock nut conforms to DIN 934.

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions							WS	Load capacity for static load max.		Art. No.		
d_1	l_1	d_2	l_2	h_1 ~	h_2	t				heat-treated steel	stainless steel	thermo-plastic
[mm]							[mm]	[kN]	[g]			
pad and ball element – picture 1												
M 6	–	22,5	–	16,5	6,4	5,0	10	10	16	22590.1006	–	–
								8	16	–	22590.1206	–
M 8	–	28,0	–	20,6	8,3	7,0	13	18	36	22590.1008	–	–
								14	36	–	22590.1208	–
M10	–	36,0	–	26,0	11,0	9,0	17	20	72	22590.1010	–	–
								16	72	–	22590.1210	–
M12	–	45,0	–	30,5	13,2	11,0	19	35	123	22590.1012	–	–
								28	123	–	22590.1212	–
M16	–	56,0	–	37,5	15,5	13,5	24	45	241	22590.1016	–	–
								36	241	–	22590.1216	–
M20	–	67,0	–	49,5	19,5	17,0	30	55	453	22590.1020	–	–
								44	453	–	22590.1220	–
M24	–	69,0	–	55,0	24,0	19,0	36	65	518	22590.1024	–	–
								52	517	–	22590.1224	–

Dimensions							WS	Load capacity for static load max.		Art. No.		
d_1	l_1	d_2	l_2	h_1 ~	h_2	t				heat-treated steel	stainless steel	thermo-plastic
[mm]							[mm]	[kN]	[g]			
pad from thermoplastic, ball element from stainless steel – picture 1												
M 6	–	22,5	–	16,5	6,4	5,0	10	4	7	–	–	22590.1106
M 8	–	28,0	–	20,6	8,3	7,0	13	7	16	–	–	22590.1108
M10	–	36,0	–	26,0	11,0	9,0	17	10	32	–	–	22590.1110
M12	–	45,0	–	30,5	13,2	11,0	19	18	51	–	–	22590.1112
M16	–	56,0	–	37,5	15,5	13,5	24	20	96	–	–	22590.1116
M20	–	67,0	–	49,5	19,5	17,0	30	22	190	–	–	22590.1120
M24	–	69,0	–	55,0	24,0	19,0	36	25	240	–	–	22590.1124
pad and ball element with bolt from steel – picture 2												
M 6	**60**	22,5	57,0	16,5	6,4	–	10	10	30	22590.1410	–	–
								8	30	–	22590.1610	–
M 8	**80**	28,0	76,0	20,6	8,3	–	13	18	69	22590.1422	–	–
								14	69	–	22590.1622	–
M10	**100**	36,0	95,5	26,0	11,0	–	17	20	139	22590.1438	–	–
								16	139	–	22590.1638	–
	150	36,0	145,5	26,0	11,0	–	17	20	165	22590.1442	–	–
								16	165	–	22590.1642	–
M12	**100**	45,0	94,5	30,5	13,2	–	19	35	222	22590.1452	–	–
								28	222	–	22590.1652	–
	150	45,0	144,5	30,5	13,2	–	19	35	258	22590.1456	–	–
								28	258	–	22590.1656	–
M16	**100**	56,0	94,0	37,5	15,5	–	24	45	428	22590.1468	–	–
								36	428	–	22590.1668	–
	200	56,0	194,0	37,5	15,5	–	24	45	561	22590.1472	–	–
								36	561	–	22590.1672	–
M20	**100**	67,0	92,5	49,5	19,5	–	30	55	762	22590.1482	–	–
								44	762	–	22590.1682	–
	200	67,0	192,5	49,5	19,5	–	30	55	964	22590.1488	–	–
								44	964	–	22590.1688	–
M24	**100**	69,0	91,0	55,0	24,0	–	36	65	990	22590.1495	–	–
								52	991	–	22590.1695	–
	200	69,0	191,0	55,0	24,0	–	36	65	1287	22590.1498	–	–
								52	1287	–	22590.1698	–
pad from thermoplastic, ball element with bolt from stainless steel – picture 2												
M 6	**60**	22,5	57,0	16,5	6,4	–	10	4	21	–	–	22590.1510
M 8	**80**	28,0	76,0	20,6	8,3	–	13	7	49	–	–	22590.1522
M10	**100**	36,0	95,5	26,0	11,0	–	17	10	98	–	–	22590.1538
	150	36,0	145,5	26,0	11,0	–	17	10	124	–	–	22590.1542
M12	**100**	45,0	94,5	30,5	13,2	–	19	18	150	–	–	22590.1552
	150	45,0	144,5	30,5	13,2	–	19	18	184	–	–	22590.1556
M16	**100**	56,0	94,0	37,5	15,5	–	24	20	285	–	–	22590.1568
	200	56,0	194,0	37,5	15,5	–	24	20	414	–	–	22590.1572
M20	**100**	67,0	92,5	49,5	19,5	–	30	22	503	–	–	22590.1582
	200	67,0	192,5	49,5	19,5	–	30	22	704	–	–	22590.1588
M24	**100**	69,0	91,0	55,0	24,0	–	36	25	718	–	–	22590.1595
	200	69,0	191,0	55,0	24,0	–	36	25	1016	–	–	22590.1598

2

Mounting Pads • with fastening holes

EH 22590.



PRODUCT DESCRIPTION

Mounting pads can be used as foot or thrust pad. Not parallel bearing surfaces up to 15° degrees can be compensated.
Including two fastening holes in pad.

Material

Ball element
- Stainless steel 1.4305

Ball element with bolt
- Stainless steel 1.4305

Lock nut
- Stainless Steel A2, ISO 4032
- Stainless Steel A2, DIN 934

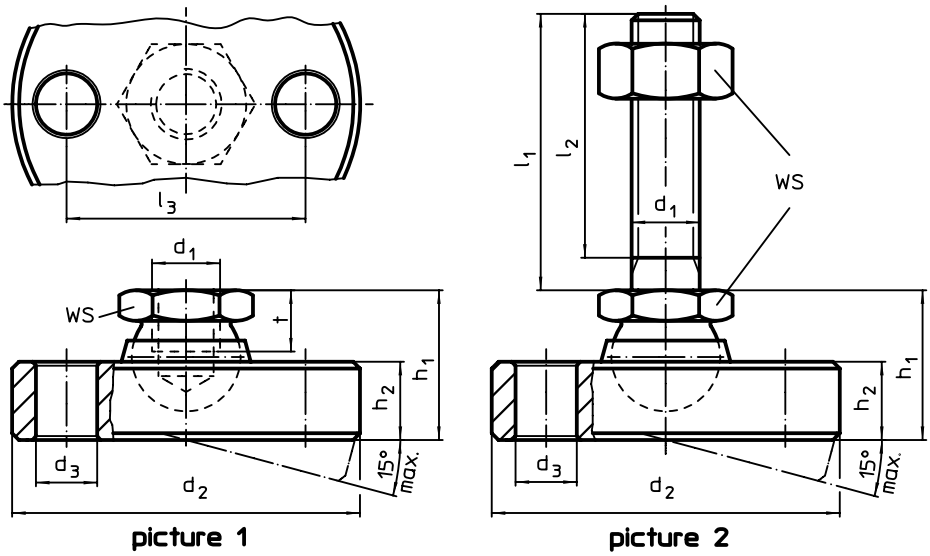
Pad
- Stainless steel 1.4305

MORE INFORMATION

Notes

For the versions d_1 = M10 and M12 the lock nut conforms to DIN 934.

DRAWING



ORDER INFORMATION

d_1	l_1	d_2 -0,5	d_3	l_2	l_3	h_1 ~	h_2	t	WS	Load capacity for static load max.		Art. No.
Dimensions [mm]									[mm]	[kN]	[g]	
pad and ball element from stainless steel – picture 1												
M 6	–	45	6,6	–	32	14	6,5	5,0	10	8	79	22590.0706
M 8	–	50	6,6	–	38	18	8,5	7,0	13	14	130	22590.0708
M10	–	60	9,0	–	44	22	11,5	9,0	17	16	250	22590.0710
M12	–	65	9,0	–	48	26	12,5	11,0	19	28	326	22590.0712
M16	–	70	9,0	–	54	32	13,5	13,5	24	36	427	22590.0716
M20	–	80	9,0	–	64	42	16,5	17,0	30	44	718	22590.0720
M24	–	100	11,0	–	78	45	20,5	19,0	36	52	1304	22590.0724
pad and ball element with bolt from stainless steel – picture 2												
M 6	**60**	45	6,6	57,0	32	14	6,5	–	10	8	93	22590.0810
M 8	**80**	50	6,6	76,0	38	18	8,5	–	13	14	163	22590.0822
M10	**100**	60	9,0	95,5	44	22	11,5	–	17	16	318	22590.0838
	150	60	9,0	145,5	44	22	11,5	–	17	16	341	22590.0842
M12	**100**	65	9,0	94,5	48	26	12,5	–	19	28	423	22590.0852
	150	65	9,0	144,5	48	26	12,5	–	19	28	459	22590.0856
M16	**100**	70	9,0	94,0	54	32	13,5	–	24	36	615	22590.0868
	200	70	9,0	194,0	54	32	13,5	–	24	36	746	22590.0872
M20	**100**	80	9,0	92,5	64	42	16,5	–	30	44	1034	22590.0882
	200	80	9,0	192,5	64	42	16,5	–	30	44	1231	22590.0888
M24	**100**	100	11,0	91,0	78	45	20,5	–	36	52	1775	22590.0895
	200	100	11,0	191,0	78	45	20,5	–	36	52	2075	22590.0898

Fulcrum Screws

EH 22591.



PRODUCT DESCRIPTION

Can be used as screw-in foot or thrust pad.
Compact design for simple levelling by means of the spanner flat at the bushing or preferably by means of an internal hexagon.

Material

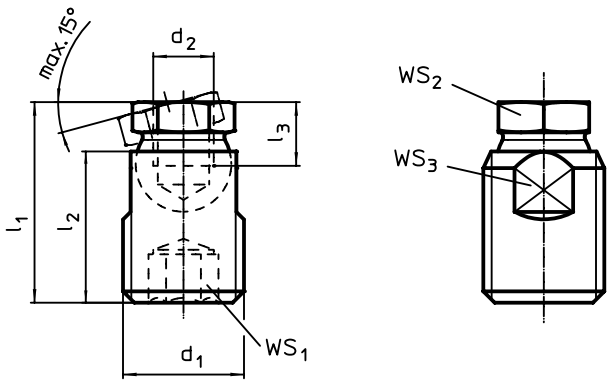
Body
- Heat-treated steel, tempered, blackened
- Stainless steel 1.4305

Ball element
- Heat-treated steel, tempered, blackened
- Stainless steel 1.4305

MORE INFORMATION

Notes
The fulcrum screws may exclusively be exposed to static loading.

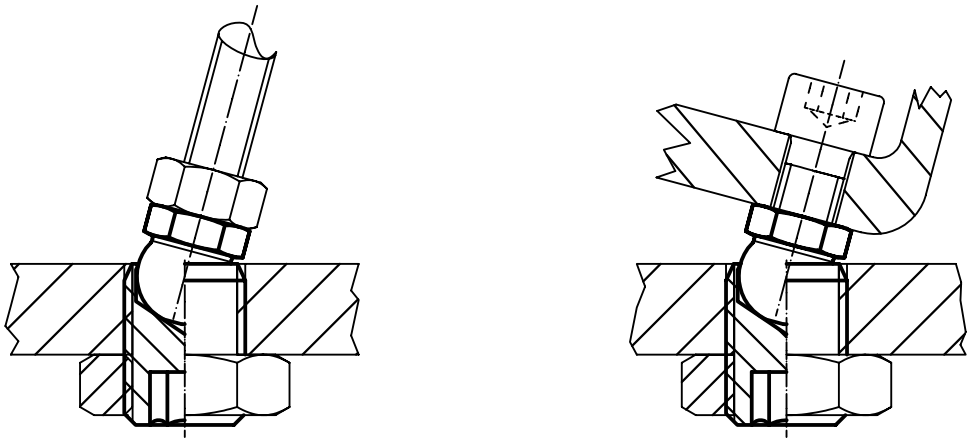
DRAWING



ORDER INFORMATION

Dimensions					WS_1	WS_2	WS_3	Load capacity for static load max.		Art. No.
d_1	d_2	l_1 ±0,5	l_2	l_3 min.						
		[mm]			[mm]	[mm]	[mm]	[kN]	[g]	
steel										
M12	**M 6**	21,2	16	5,0	6	9	10	10	11	22591.0006
M16	**M 8**	26,5	20	7,0	8	12	14	18	24	22591.0008
M24	**M10**	39,9	30	9,0	12	19	20	35	87	22591.0010
	M12	39,9	30	11,0	12	19	20	35	82	22591.0012
M30 x 2	**M16**	47,4	36	13,5	12	24	27	45	165	22591.0016
stainless steel										
M12	**M 6**	21,2	16	5,0	6	9	10	8	11	22591.0206
M16	**M 8**	26,5	20	7,0	8	12	14	14	24	22591.0208
M24	**M10**	39,9	30	9,0	12	19	20	28	87	22591.0210
	M12	39,9	30	11,0	12	19	20	28	82	22591.0212
M30 x 2	**M16**	47,4	36	13,5	12	24	27	36	165	22591.0216

APPLICATION EXAMPLE



Support Legs

EH 22593.



PRODUCT DESCRIPTION

The support legs are universally usable as adjustable legs.
The plate is screwed to the threaded pin and nut by a stainless steel fastening screw, and is also glued.

Material

Threaded pin
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4305

Nut
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4305

Lock nut
- Steel, zinc-coated by galvanisation, passivated, ISO 4032
- Stainless Steel A2, ISO 4032

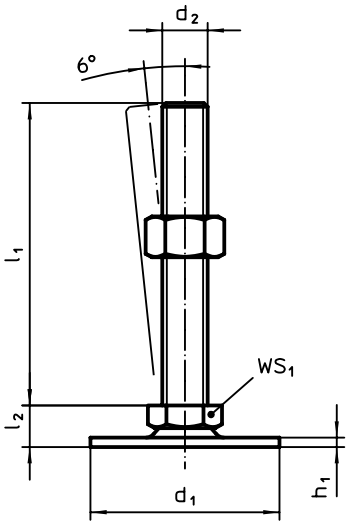
Pad
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4301, vibratory ground

MORE INFORMATION

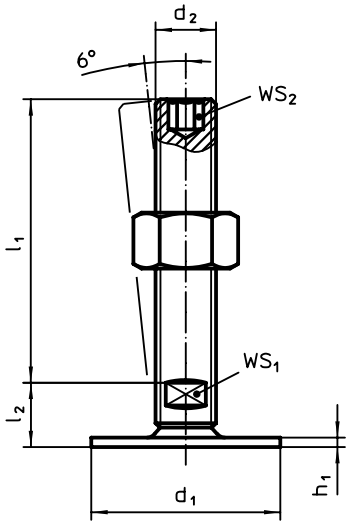
Further products

Support Legs, with non-slip . . . . . → p. 269

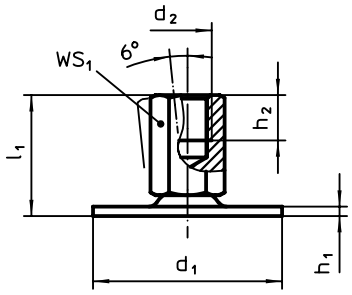
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

Dimensions						WS1	WS2		Art. No.	
d1	d2	l1	h1	h2	l2				steel	stainless steel
[mm]						[mm]	[mm]	[g]		
with screw – picture 1										
40	M 8	40	2,0	–	11	17	–	47	22593.0005	22593.1505
		50	2,0	–	11	17	–	51	22593.0010	22593.1510
		63	2,0	–	11	17	–	55	22593.0015	22593.1515
	M10	50	2,0	–	11	17	–	64	22593.0020	22593.1520
		60	2,0	–	11	17	–	67	22593.0025	22593.1525
		80	2,0	–	11	17	–	76	22593.0030	22593.1530
		100	2,0	–	11	17	–	87	22593.0035	22593.1535
	M12	60	2,0	–	11	17	–	83	22593.0040	22593.1540
		80	2,0	–	11	17	–	103	22593.0045	22593.1545
		100	2,0	–	11	17	–	118	22593.0050	22593.1550
		125	2,0	–	11	17	–	140	22593.0055	22593.1555

→

Dimensions						WS$_1$	WS$_2$		Art. No.	
d$_1$	d$_2$	l$_1$	h$_1$	h$_2$	l$_2$				steel	stainless steel
[mm]						[mm]	[mm]	[g]		
50	M 8	40	2,5	–	11	17	–	62	22593.0060	22593.1560
		50	2,5	–	11	17	–	69	22593.0065	22593.1565
		63	2,5	–	11	17	–	72	22593.0070	22593.1570
	M10	50	2,5	–	11	17	–	82	22593.0075	22593.1575
		60	2,5	–	11	17	–	88	22593.0080	22593.1580
		80	2,5	–	11	17	–	98	22593.0085	22593.1585
		100	2,5	–	11	17	–	108	22593.0090	22593.1590
	M12	60	2,5	–	11	17	–	106	22593.0095	22593.1595
		80	2,5	–	11	17	–	119	22593.0100	22593.1600
		100	2,5	–	11	17	–	137	22593.0105	22593.1605
		125	2,5	–	11	17	–	153	22593.0110	22593.1610
60	M 8	40	2,5	–	11	17	–	84	22593.0115	22593.1615
		50	2,5	–	11	17	–	83	22593.0120	22593.1620
		63	2,5	–	11	17	–	100	22593.0125	22593.1625
	M10	50	2,5	–	11	17	–	100	22593.0130	22593.1630
		60	2,5	–	11	17	–	104	22593.0135	22593.1635
		80	2,5	–	11	17	–	115	22593.0140	22593.1640
		100	2,5	–	11	17	–	125	22593.0145	22593.1645
	M12	60	2,5	–	11	17	–	121	22593.0150	22593.1650
		80	2,5	–	11	17	–	136	22593.0155	22593.1655
		100	2,5	–	11	17	–	151	22593.0160	22593.1660
		125	2,5	–	11	17	–	167	22593.0165	22593.1665
80	M 8	40	3,0	–	12	17	–	144	22593.0170	22593.1670
		50	3,0	–	12	17	–	60	22593.0175	22593.1675
		63	3,0	–	12	17	–	152	22593.0180	22593.1680
	M10	50	3,0	–	12	17	–	166	22593.0185	22593.1685
		60	3,0	–	12	17	–	180	22593.0190	22593.1690
		80	3,0	–	12	17	–	181	22593.0195	22593.1695
		100	3,0	–	12	17	–	187	22593.0200	22593.1700
	M12	60	3,0	–	12	17	–	187	22593.0205	22593.1705
		80	3,0	–	12	17	–	201	22593.0210	22593.1710
		100	3,0	–	12	17	–	215	22593.0215	22593.1715
		125	3,0	–	12	17	–	233	22593.0220	22593.1720
with screw – picture 2										
40	M16	75	2,0	–	17	12	8	153	22593.0605	22593.2105
		100	2,0	–	17	12	8	192	22593.0610	22593.2110
		125	2,0	–	17	12	8	215	22593.0615	22593.2115
		150	2,0	–	17	12	8	251	22593.0620	22593.2120
		200	2,0	–	17	12	8	320	22593.0625	22593.2125
50	M16	75	2,5	–	17	12	8	176	22593.0630	22593.2130
		100	2,5	–	17	12	8	205	22593.0635	22593.2135
		125	2,5	–	17	12	8	236	22593.0640	22593.2140
		150	2,5	–	17	12	8	262	22593.0645	22593.2145
		200	2,5	–	17	12	8	331	22593.0650	22593.2150
60	M16	75	2,5	–	17	12	8	195	22593.0655	22593.2155
		100	2,5	–	17	12	8	225	22593.0660	22593.2160
		125	2,5	–	17	12	8	259	22593.0665	22593.2165
		150	2,5	–	17	12	8	283	22593.0670	22593.2170
		200	2,5	–	17	12	8	348	22593.0675	22593.2175
80	M16	75	3,0	–	18	12	8	252	22593.0680	22593.2180
		100	3,0	–	18	12	8	300	22593.0685	22593.2185
		125	3,0	–	18	12	8	319	22593.0690	22593.2190
		150	3,0	–	18	12	8	360	22593.0695	22593.2195
		200	3,0	–	18	12	8	414	22593.0700	22593.2200
	M20	75	3,0	–	19	15	10	347	22593.0705	22593.2205
		100	3,0	–	19	15	10	390	22593.0710	22593.2210
		125	3,0	–	19	15	10	450	22593.0715	22593.2215
		150	3,0	–	19	15	10	494	22593.0720	22593.2220
		200	3,0	–	19	15	10	595	22593.0725	22593.2225
	M24	100	3,0	–	22	19	12	542	22593.0730	22593.2230
		125	3,0	–	22	19	12	612	22593.0735	22593.2235
		150	3,0	–	22	19	12	650	22593.0740	22593.2240
		200	3,0	–	22	19	12	820	22593.0745	22593.2245

→

Dimensions						WS_1	WS_2		Art. No.	
d_1	d_2	l_1	h_1	h_2	l_2				steel	stainless steel
[mm]						[mm]	[mm]	[g]		
with female thread – picture 3										
40	**M 8**	**25**	2,0	8	–	14	–	41	22593.1005	22593.2505
	M10	**28**	2,0	10	–	14	–	40	22593.1010	22593.2510
	M12	**31**	2,0	12	–	17	–	68	22593.1015	22593.2515
	M16	**37**	2,0	16	–	22	–	100	22593.1020	22593.2520
50	**M 8**	**25**	2,5	8	–	14	–	60	22593.1025	22593.2525
	M10	**28**	2,5	10	–	14	–	60	22593.1030	22593.2530
	M12	**32**	2,5	12	–	17	–	81	22593.1035	22593.2535
	M16	**37**	2,5	16	–	22	–	120	22593.1040	22593.2540
60	**M 8**	**25**	2,5	8	–	14	–	80	22593.1045	22593.2545
	M10	**28**	2,5	10	–	14	–	79	22593.1050	22593.2550
	M12	**32**	2,5	12	–	17	–	97	22593.1055	22593.2555
	M16	**37**	2,5	16	–	22	–	130	22593.1060	22593.2560
80	**M 8**	**26**	3,0	8	–	14	–	141	22593.1065	22593.2565
	M10	**29**	3,0	10	–	14	–	152	22593.1070	22593.2570
	M12	**32**	3,0	12	–	17	–	160	22593.1075	22593.2575
	M16	**38**	3,0	16	–	22	–	194	22593.1080	22593.2580
	M20	**45**	3,0	20	–	27	–	260	22593.1085	22593.2585

Support Legs • protected against slipping

EH 22593.



PRODUCT DESCRIPTION

The support legs are universally usable as adjustable legs.
In this version with a rubber cap, sensitive support surfaces are protected, and slipping is prevented.
The plate is screwed to the threaded pin and nut by a stainless steel fastening screw, and is also glued.

Material

Threaded pin
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4305

Rubber cab
- Rubber, black

Nut
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4305

Lock nut
- Steel, zinc-coated by galvanisation, passivated, ISO 4032
- Stainless Steel A2, ISO 4032

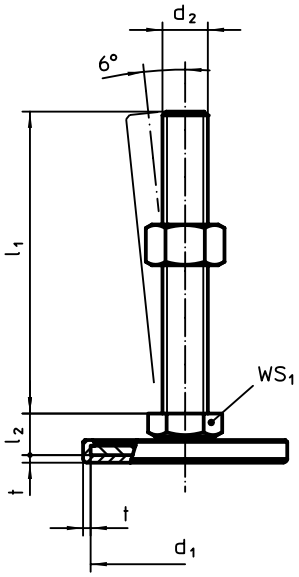
Pad
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4301, vibratory ground

MORE INFORMATION

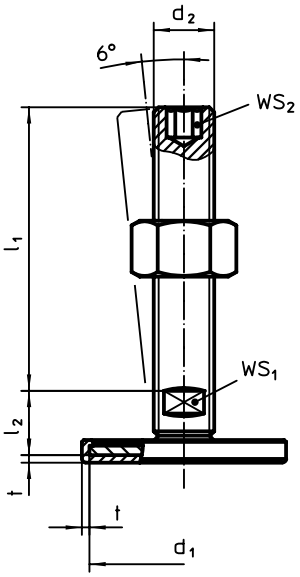
Further products

Support Legs . . . . . → p. 266

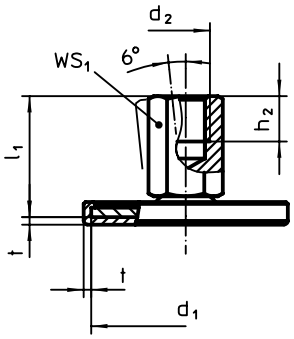
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

Dimensions						WS1	WS2		Art. No.	
d1	d2	l1	h2	l2	t				steel	stainless steel
[mm]						[mm]	[mm]	[g]		
with screw – picture 1										
40	M 8	40	–	11	1,5	17	–	50	22593.0305	22593.1805
		50	–	11	1,5	17	–	54	22593.0310	22593.1810
		63	–	11	1,5	17	–	57	22593.0315	22593.1815
	M10	50	–	11	1,5	17	–	67	22593.0320	22593.1820
		60	–	11	1,5	17	–	73	22593.0325	22593.1825
		80	–	11	1,5	17	–	82	22593.0330	22593.1830
		100	–	11	1,5	17	–	88	22593.0335	22593.1835
	M12	60	–	11	1,5	17	–	91	22593.0340	22593.1840
		80	–	11	1,5	17	–	105	22593.0345	22593.1845
		100	–	11	1,5	17	–	120	22593.0350	22593.1850
		125	–	11	1,5	17	–	140	22593.0355	22593.1855

→

Dimensions						WS_1	WS_2		Art. No.	
d_1	d_2	l_1	h_2	l_2	t				steel	stainless steel
[mm]						[mm]	[mm]	[g]		
50	M 8	40	–	11	2,0	17	–	71	22593.0360	22593.1860
		50	–	11	2,0	17	–	72	22593.0365	22593.1865
		63	–	11	2,0	17	–	79	22593.0370	22593.1870
	M10	50	–	11	2,0	17	–	87	22593.0375	22593.1875
		60	–	11	2,0	17	–	91	22593.0380	22593.1880
		80	–	11	2,0	17	–	103	22593.0385	22593.1885
		100	–	11	2,0	17	–	113	22593.0390	22593.1890
	M12	60	–	11	2,0	17	–	112	22593.0395	22593.1895
		80	–	11	2,0	17	–	120	22593.0400	22593.1900
		100	–	11	2,0	17	–	140	22593.0405	22593.1905
		125	–	11	2,0	17	–	160	22593.0410	22593.1910
60	M 8	40	–	11	2,0	17	–	91	22593.0415	22593.1915
		50	–	11	2,0	17	–	95	22593.0420	22593.1920
		63	–	11	2,0	17	–	100	22593.0425	22593.1925
	M10	50	–	11	2,0	17	–	110	22593.0430	22593.1930
		60	–	11	2,0	17	–	110	22593.0435	22593.1935
		80	–	11	2,0	17	–	122	22593.0440	22593.1940
		100	–	11	2,0	17	–	132	22593.0445	22593.1945
	M12	60	–	11	2,0	17	–	129	22593.0450	22593.1950
		80	–	11	2,0	17	–	150	22593.0455	22593.1955
		100	–	11	2,0	17	–	158	22593.0460	22593.1960
		125	–	11	2,0	17	–	180	22593.0465	22593.1965
80	M 8	40	–	12	2,0	17	–	158	22593.0470	22593.1970
		50	–	12	2,0	17	–	164	22593.0475	22593.1975
		63	–	12	2,0	17	–	166	22593.0480	22593.1980
	M10	50	–	12	2,0	17	–	176	22593.0485	22593.1985
		60	–	12	2,0	17	–	181	22593.0490	22593.1990
		80	–	12	2,0	17	–	192	22593.0495	22593.1995
		100	–	12	2,0	17	–	200	22593.0500	22593.2000
	M12	60	–	12	2,0	17	–	199	22593.0505	22593.2005
		80	–	12	2,0	17	–	213	22593.0510	22593.2010
		100	–	12	2,0	17	–	230	22593.0515	22593.2015
		125	–	12	2,0	17	–	245	22593.0520	22593.2020
with screw – picture 2										
40	M16	75	–	17	1,5	12	8	157	22593.0805	22593.2305
		100	–	17	1,5	12	8	180	22593.0810	22593.2310
		125	–	17	1,5	12	8	220	22593.0815	22593.2315
		150	–	17	1,5	12	8	254	22593.0820	22593.2320
		200	–	17	1,5	12	8	300	22593.0825	22593.2325
50	M16	75	–	17	2,0	12	8	177	22593.0830	22593.2330
		100	–	17	2,0	12	8	213	22593.0835	22593.2335
		125	–	17	2,0	12	8	241	22593.0840	22593.2340
		150	–	17	2,0	12	8	280	22593.0845	22593.2345
		200	–	17	2,0	12	8	340	22593.0850	22593.2350
60	M16	75	–	17	2,0	12	8	200	22593.0855	22593.2355
		100	–	17	2,0	12	8	220	22593.0860	22593.2360
		125	–	17	2,0	12	8	260	22593.0865	22593.2365
		150	–	17	2,0	12	8	290	22593.0870	22593.2370
		200	–	17	2,0	12	8	360	22593.0875	22593.2375
80	M16	75	–	18	2,0	12	8	270	22593.0880	22593.2380
		100	–	18	2,0	12	8	299	22593.0885	22593.2385
		125	–	18	2,0	12	8	332	22593.0890	22593.2390
		150	–	18	2,0	12	8	380	22593.0895	22593.2395
		200	–	18	2,0	12	8	400	22593.0900	22593.2400
	M20	75	–	19	2,0	15	10	360	22593.0905	22593.2405
		100	–	19	2,0	15	10	400	22593.0910	22593.2410
		125	–	19	2,0	15	10	459	22593.0915	22593.2415
		150	–	19	2,0	15	10	507	22593.0920	22593.2420
		200	–	19	2,0	15	10	614	22593.0925	22593.2425
	M24	100	–	22	2,0	19	12	560	22593.0930	22593.2430
		125	–	22	2,0	19	12	620	22593.0935	22593.2435
		150	–	22	2,0	19	12	700	22593.0940	22593.2440
		200	–	22	2,0	19	12	860	22593.0945	22593.2445

→

Dimensions						WS_1	WS_2		Art. No.	
d_1	d_2	l_1	h_2	l_2	t				steel	stainless steel
[mm]						[mm]	[mm]	[g]		
with female thread – picture 3										
40	**M 8**	**25**	8	–	1,5	14	–	49	22593.1105	22593.2605
	M10	**28**	10	–	1,5	14	–	47	22593.1110	22593.2610
	M12	**31**	12	–	1,5	17	–	60	22593.1115	22593.2615
	M16	**37**	16	–	1,5	22	–	91	22593.1120	22593.2620
50	**M 8**	**25**	8	–	2,0	14	–	65	22593.1125	22593.2625
	M10	**28**	10	–	2,0	14	–	65	22593.1130	22593.2630
	M12	**32**	12	–	2,0	17	–	86	22593.1135	22593.2635
	M16	**37**	16	–	2,0	22	–	120	22593.1140	22593.2640
60	**M 8**	**25**	8	–	2,0	14	–	90	22593.1145	22593.2645
	M10	**28**	10	–	2,0	14	–	84	22593.1150	22593.2650
	M12	**32**	12	–	2,0	17	–	100	22593.1155	22593.2655
	M16	**37**	16	–	2,0	22	–	138	22593.1160	22593.2660
80	**M 8**	**26**	8	–	2,0	14	–	155	22593.1165	22593.2665
	M10	**29**	10	–	2,0	14	–	160	22593.1170	22593.2670
	M12	**32**	12	–	2,0	17	–	180	22593.1175	22593.2675
	M16	**38**	16	–	2,0	22	–	220	22593.1180	22593.2680
	M20	**45**	20	–	2,0	27	–	300	22593.1185	22593.2685

2

Support Legs • impact cushioning

EH 22594.



PRODUCT DESCRIPTION

The support legs are universally usable as adjustable legs.
These support legs with a rubber foot have a damping, noise-reducing effect, and prevent damage to the support surface.

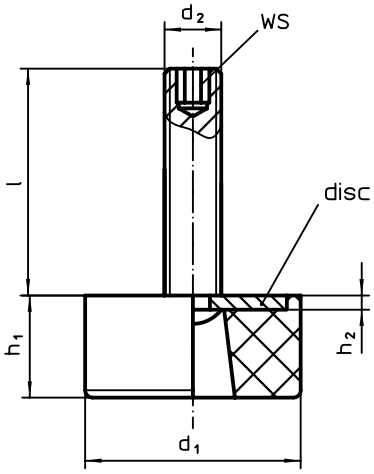
Material

Body
- NBR

Screw
- Steel, zinc-plated by galvanization

disc
- Steel, zinc-plated by galvanization

DRAWING



ORDER INFORMATION

Dimensions						Load capacity for static load max.				Art. No.
d_1	l	d_2	h_1	h_2	WS		min.	max.		
[mm]						[N]	[°C]		[g]	
19	**30**	M 6	14	1,5	3	240	-30	120	12	22594.0005
	45	M 6	14	1,5	3	240	-30	120	14	22594.0010
25	**30**	M 6	16	1,5	3	540	-30	120	20	22594.0015
	45	M 6	16	1,5	3	540	-30	120	22	22594.0020
32	**40**	M 8	18	2,0	4	840	-30	120	37	22594.0025
	65	M 8	18	2,0	4	840	-30	120	40	22594.0030
38	**40**	M 8	20	2,0	4	920	-30	120	52	22594.0035
	65	M 8	20	2,0	4	920	-30	120	57	22594.0040
50	**45**	M10	22	2,5	5	2500	-30	120	100	22594.0045
	70	M10	22	2,5	5	2500	-30	120	110	22594.0050
64	**45**	M10	26	2,5	5	3700	-30	120	150	22594.0055
	70	M10	26	2,5	5	3700	-30	120	177	22594.0060

Seating Elements • with plastic contact surface, orienting

EH 22600.



PRODUCT DESCRIPTION

Can be used as a screw-in foot or thrust pad.
The plastic coating is gentle and protects high-quality surfaces. In addition, the oscillating seating is suitable for non-parallel surfaces.

Material

Ball element
- Stainless steel 1.4305

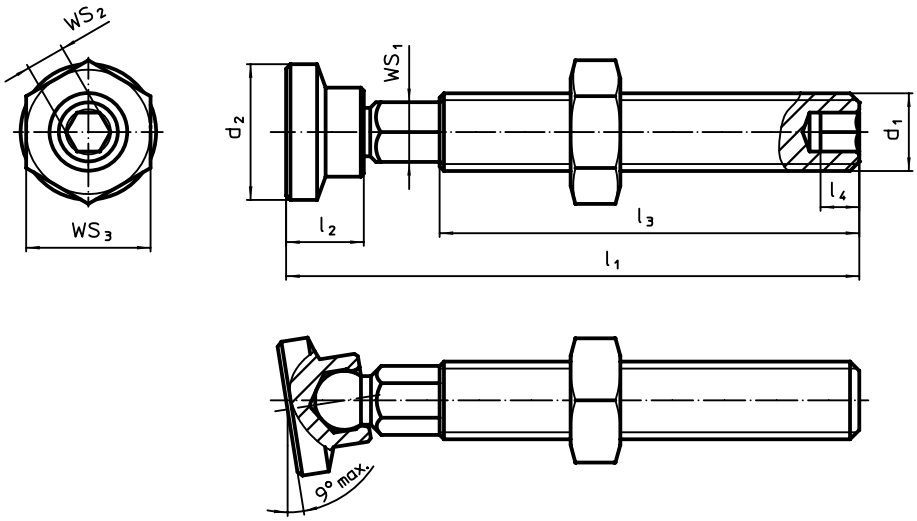
Nut
- Stainless steel A2

Pad
- Plastic (PEEK), blue

MORE INFORMATION

Notes
Special types on request.

DRAWING



ORDER INFORMATION

Dimensions						WS1	WS2	WS3	min.	max.		Art. No.
d1	l1 ±1	d2	l2	l3	l4							
[mm]						[mm]	[mm]	[mm]	[°C]		[g]	
M 5	**37,0**	8,5	5,0	27,0	2,5	4,0	2,5	8	-60	250	6	22600.0005
M 6	**44,0**	8,5	5,0	31,5	3,0	4,5	3,0	10	-60	250	9	22600.0006
M 8	**63,3**	12,5	8,7	49,0	4,0	6,0	4,0	13	-60	250	25	22600.0008
M10	**73,3**	12,5	8,7	68,9	5,0	8,0	5,0	17	-60	250	48	22600.0010
M12	**84,4**	16,8	12,0	64,3	6,0	9,0	6,0	19	-60	250	74	22600.0012
M16	**84,4**	16,8	12,0	64,0	8,0	11,0	8,0	24	-60	250	125	22600.0016

2

Grippers round/square • with hard metal insert, ribbed

EH 22620.



PRODUCT DESCRIPTION

Basic element to be mounted into clamping devices, clamping jaws, clamping arms, claw feed systems and so forth.
For transmission of high turning moments and holding forces, e.g. on cast and forged pieces.

Material

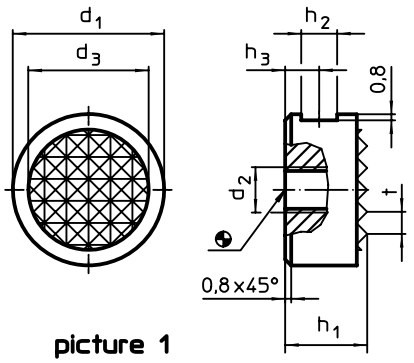
Body
- Tool steel, blackened

Ribbing
- Hard metal plate, brazed-in

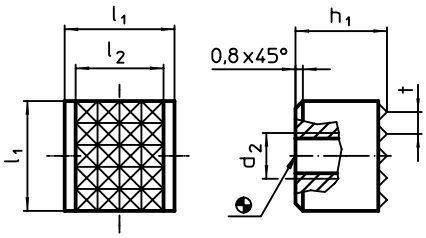
Assembly

Square type suitable for alignments, thus providing a bearing surface for high holding forces.

DRAWING



picture 1

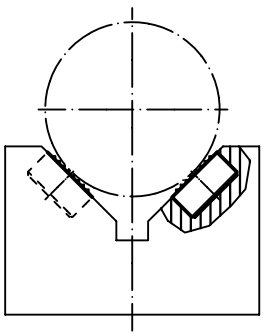


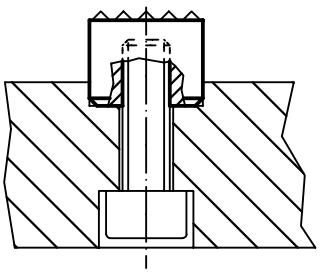
picture 2

ORDER INFORMATION

Dimensions										Art. No.
d_1 -0,13	h_1 -0,13	l_1 -0,13	d_2	d_3	h_2	h_3	l_2	t	[g]	
				[mm]						
round – picture 1										
10	**10**	–	M5	7,9	4,75	4,5	–	2,3	5	22620.0010
	12	–	M5	7,9	4,75	6,0	–	2,3	6	22620.0012
12	**10**	–	M5	9,5	4,75	4,5	–	3,0	8	22620.0020
	12	–	M5	9,5	4,75	6,0	–	3,0	9	22620.0022
16	**10**	–	M6	12,7	4,75	4,5	–	3,0	14	22620.0060
	12	–	M6	12,7	4,75	6,0	–	3,0	17	22620.0062
20	**10**	–	M6	15,9	4,75	4,5	–	3,0	23	22620.0080
	12	–	M6	15,9	4,75	6,0	–	3,0	27	22620.0082
25	**10**	–	M6	19,0	4,75	4,5	–	3,0	36	22620.0100
	12	–	M6	19,0	4,75	6,0	–	3,0	43	22620.0102
square – picture 2										
–	**10**	**12**	M5	–	–	–	10,3	3,0	11	22620.0152
	12	**12**	M5	–	–	–	10,3	3,0	12	22620.0154

APPLICATION EXAMPLE





Hard Metal Inserts • for locating hole

EH 22620.



PRODUCT DESCRIPTION

Basic element to be mounted into clamping devices, clamping jaws, clamping arms, claw feed systems and so forth.
Zero play transmission of high holding forces, e.g. on cast or forged pieces.

Material

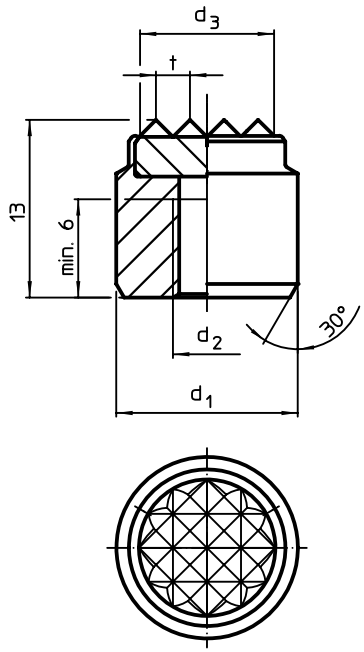
Insert
- Hard metal, ribbed
- Hard metal, pointed

Body
- Heat-treated steel, tempered, phosphated

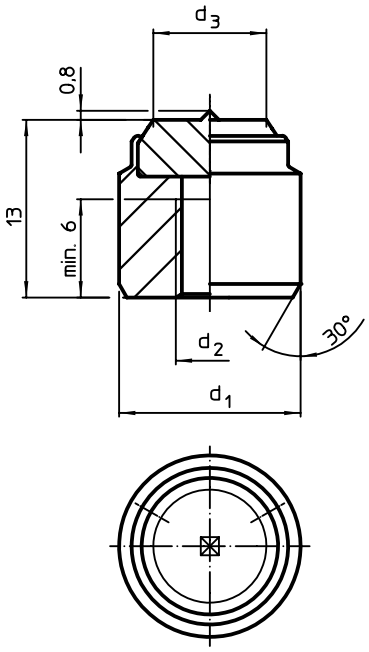
Assembly

Assembly via a locating hole, the insert can be fastened by means of a screw.

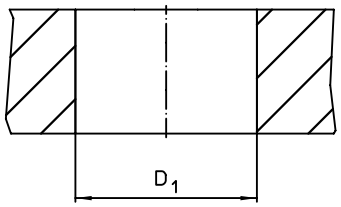
DRAWING



picture 1



picture 2



ORDER INFORMATION

d_1 n6	Dimensions d_2	d_3 ~	t	Location hole D_1 H7		Art. No.
	[mm]			[mm]	[g]	
ribbed – picture 1						
10	M5	7,7	2	10	8,0	22620.0208
14	M6	10,6	2	14	15,0	22620.0211
16	M6	11,9	3	16	20,0	22620.0213
20	M6	16,0	3	20	32,0	22620.0215
25	M6	21,0	3	25	51,0	22620.0217
pointed – picture 2						
10	M5	6,3	–	10	7,8	22620.0228
14	M6	9,3	–	14	16,0	22620.0231
16	M6	10,0	–	16	20,0	22620.0233

2

Hard Metal Inserts • front mounting

EH 22620.



PRODUCT DESCRIPTION

Basic element to be mounted into clamping devices, clamping jaws, clamping arms, claw feed systems and so forth.
The model with front installation is a particularly good option for applications that cannot be mounted from the rear.

Material

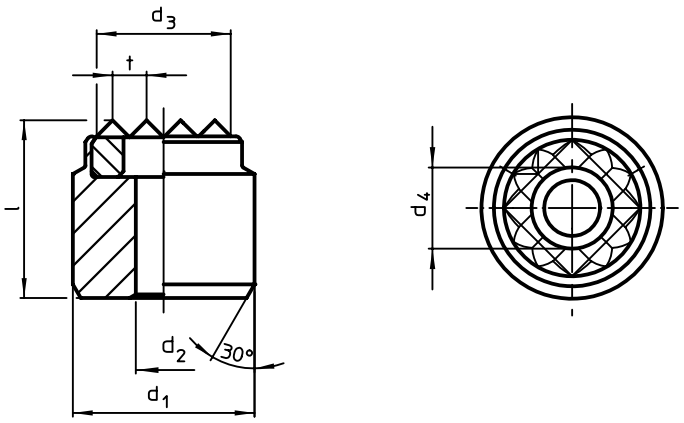
Insert
- Hard metal, ribbed

Body
- Heat-treated steel, tempered, phosphated

Assembly

Installation is performed using a locating hole, and the insert can be fastened from the front using a cap screw.

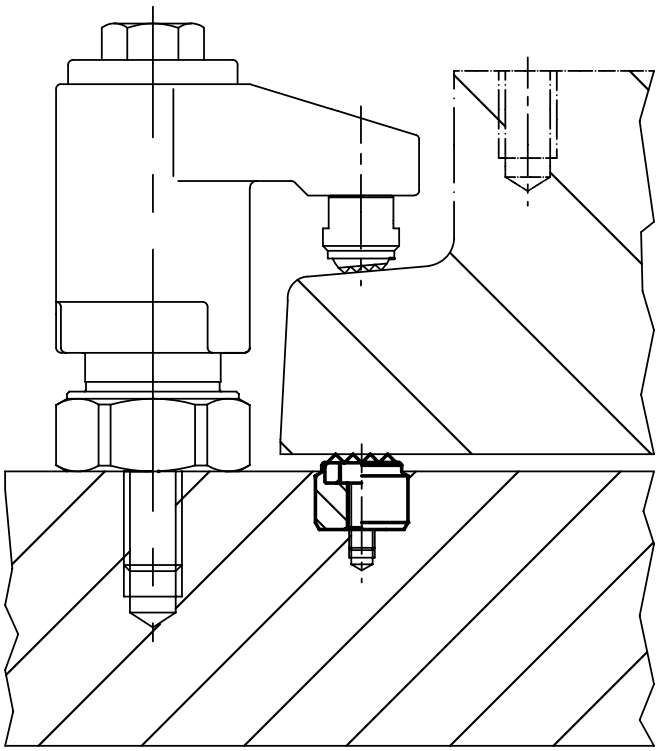
DRAWING



ORDER INFORMATION

Dimensions						For screws		Art. No.
d_1 n6	d_2	d_3 ~	d_4	l	t			
[mm]						[mm]	[g]	
20	4,5	16	7,5	13	3	M4	29	22620.0415
25	4,5	21	7,5	13	3	M4	49	22620.0417

APPLICATION EXAMPLE



Hard Metal Inserts

EH 22620.



PRODUCT DESCRIPTION

Basic element to be mounted into clamping devices, clamping jaws, clamping arms, claw feed systems and so forth.
For an abrasion-proof transmission of high holding forces, e. g. on cast or forged pieces.

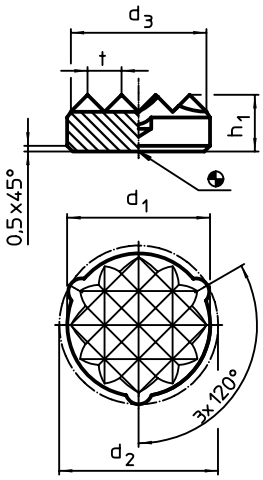
Material

Insert
- Hard metal, ribbed
- Hard metal, pointed

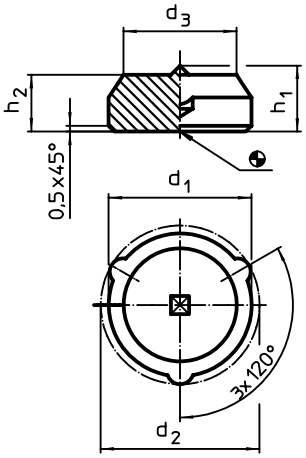
Assembly

Mounting can take place by either soldering, glueing or pressing in. The three positioning tabs guarantee exact centering and when being glued or pressed in, article is secured against rotating. Depending on the individual element choose a mounting diameter between d_1 and d_2.

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions							Art. No.
d_1	d_2 ±0,2	d_3 ~	h_1	h_2	t		
[mm]						[g]	
ribbed – picture 1							
8,3 ±0,10	9,1	7,7	5,0	–	2	3,3	22620.0608
11,3 ±0,10	12,1	10,6	5,0	–	2	6,1	22620.0611
12,6 ±0,10	13,4	11,9	5,0	–	3	7,1	22620.0613
16,6 ±0,15	17,4	16,0	5,0	–	3	12,0	22620.0615
21,6 ±0,15	22,4	21,0	5,0	–	3	20,0	22620.0617
pointed – picture 2							
8,3 ±0,10	9,1	6,3	5,8	5	–	3,3	22620.0628
11,3 ±0,10	12,1	9,3	5,8	5	–	6,7	22620.0631
12,6 ±0,10	13,4	10,0	5,8	5	–	8,2	22620.0633

2

Locating and Seating Pins • DIN 6321

EH 22630.



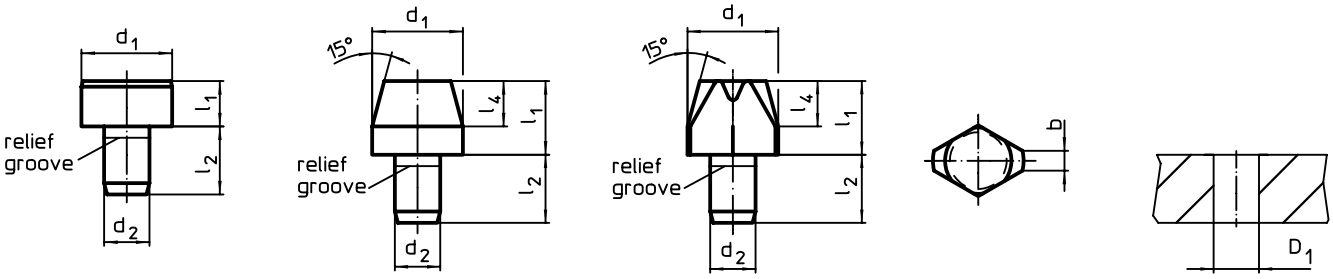
PRODUCT DESCRIPTION

Cylindric locating pins for locating workpieces in toleranced holes and also to be used as stops and feet.
Flattened locating pin used to overcome differences in tolerances, between holes or to position an element in one direction only.
The contact surface of the seating pin has no centre (picture 1)

Material

- Tool steel, hardened, ground

DRAWING



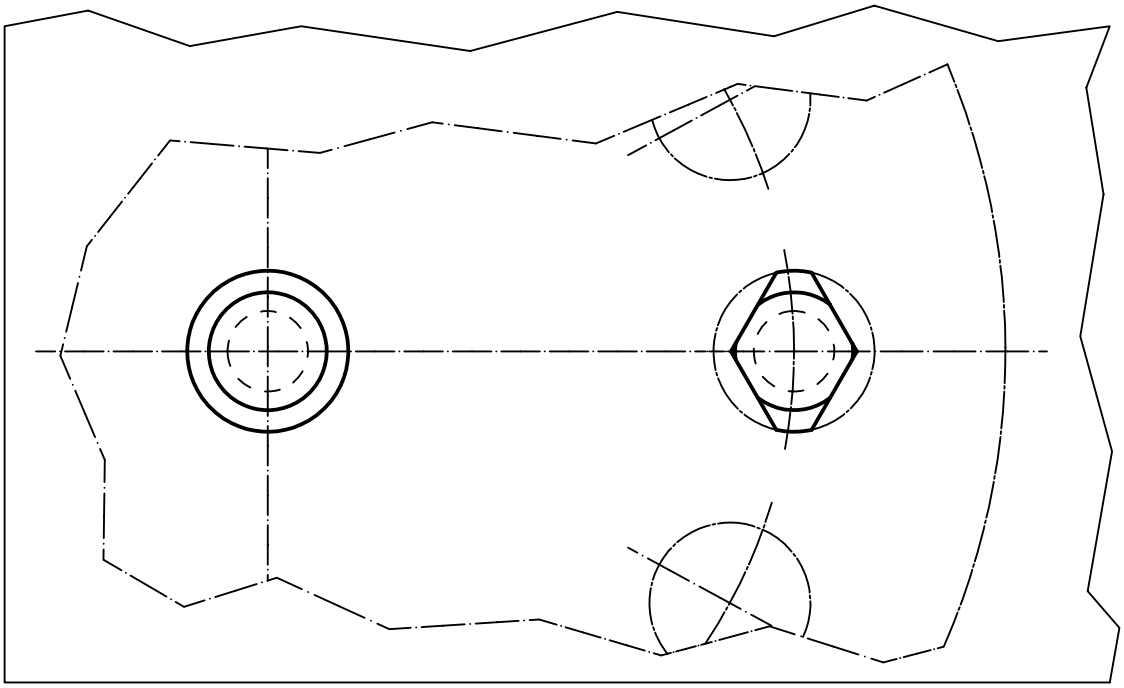
ORDER INFORMATION

Dimensions						Location hole		Art. No.
d_1 g6	l_1	b	d_2 n6	l_2	l_4	D_1 H7		
[mm]						[mm]	[g]	
seating pin, DIN 6321 form A, tolerance l_1 = h9 – picture 1								
6	**5**	–	4	6	–	4	1,8	**22630.0011**
10	**6**	–	6	9	–	6	5,7	**22630.0012**
16	**8**	–	8	12	–	8	17,0	**22630.0013**
25	**10**	–	12	18	–	12	50,0	**22630.0014**
locating pin, cylindric, DIN 6321, form B – picture 2								
6	**7**	–	4	6	4	4	2,2	**22630.0020**
	12	–	4	6	4	4	3,0	**22630.0021**
8	**10**	–	6	9	6	6	5,4	**22630.0022**
	16	–	6	9	6	6	8,0	**22630.0023**
10	**10**	–	6	9	6	6	7,4	**22630.0024**
	18	–	6	9	6	6	12,0	**22630.0025**
12	**10**	–	6	9	6	6	10,0	**22630.0026**
	18	–	6	9	6	6	17,0	**22630.0027**
16	**13**	–	8	12	8	8	23,0	**22630.0028**
	22	–	8	12	8	8	36,0	**22630.0029**
20	**15**	–	12	18	9	12	47,0	**22630.0030**
	25	–	12	18	9	12	72,0	**22630.0031**
25	**15**	–	12	18	9	12	66,0	**22630.0032**
	25	–	12	18	9	12	106,0	**22630.0033**

→

Dimensions						Location hole		Art. No.
d_1 g6	l_1	b	d_2 n6	l_2	l_4	D_1 H7		
[mm]						[mm]	[g]	
locating pin, flattened, DIN 6321, form C – picture 3								
6	**7**	1,0	4	6	4	4	1,8	22630.0040
	12	1,0	4	6	4	4	2,0	22630.0041
8	**10**	1,6	6	9	6	6	4,5	22630.0042
	16	1,6	6	9	6	6	6,0	22630.0043
10	**10**	2,5	6	9	6	6	6,0	22630.0044
	18	2,5	6	9	6	6	9,0	22630.0045
12	**10**	2,5	6	9	6	6	7,0	22630.0046
	18	2,5	6	9	6	6	11,0	22630.0047
16	**13**	3,5	8	12	8	8	17,0	22630.0048
	22	3,5	8	12	8	8	26,0	22630.0049
20	**15**	5,0	12	18	9	12	39,0	22630.0050
	25	5,0	12	18	9	12	55,0	22630.0051
25	**15**	5,0	12	18	9	12	49,0	22630.0052
	25	5,0	12	18	9	12	72,0	22630.0053

APPLICATION EXAMPLE



2

Seating Pins • partially DIN 6321 (old norm)

EH 22630.



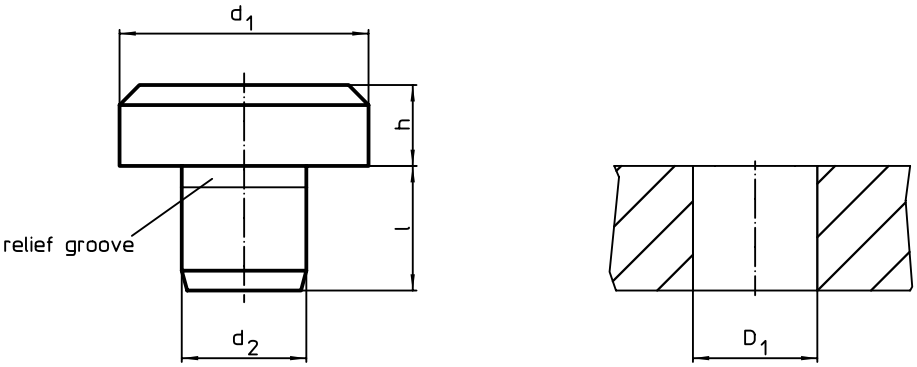
PRODUCT DESCRIPTION

To be used as feet and bearings.
Load bearing surface without distortion.

Material

- Tool steel, hardened, ground

DRAWING



ORDER INFORMATION

d_1	Dimensions h h9 [mm]	d_2 n6 [mm]	l	Location hole D_1 H7 [mm]	[g]	Art. No.
DIN 6321 old norm						
6	**5,0**	4	6,0	4	1,8	22630.0001
10	**8,0**	6	8,0	6	6,5	22630.0002
16	**5,0**	8	10,0	8	11,0	22630.0003
	13,0	8	10,0	8	24,0	22630.0004
25	**8,0**	12	14,0	12	41,0	22630.0005
	20,0	12	14,0	12	88,0	22630.0006
40	**13,0**	20	20,0	20	171,0	22630.0007
	32,0	20	20,0	20	358,0	22630.0008
intermediate sizes						
6	**2,5**	4	6,5	4	1,2	22630.0110
	4,5	4	8,5	4	1,9	22630.0112
8	**4,0**	5	8,0	5	3,1	22630.0116
	7,0	5	8,0	5	4,2	22630.0118
10	**4,5**	6	8,5	6	4,4	22630.0120
12	**6,0**	6	10,0	6	7,6	22630.0124
	10,0	6	10,0	6	11,0	22630.0126
20	**6,0**	10	12,0	10	21,0	22630.0130
	12,0	10	12,0	10	36,0	22630.0132
25	**30,0**	12	14,0	12	125,0	22630.0135
30	**25,0**	16	20,0	16	164,0	22630.0137
	40,0	16	20,0	16	248,0	22630.0140
	50,0	16	20,0	16	305,0	22630.0144
	65,0	16	20,0	16	385,0	22630.0148
	80,0	20	20,0	20	485,0	22630.0152
	100,0	20	20,0	20	594,0	22630.0156

Locating Pins • with bore hole similar to DIN 6321

EH 22630.



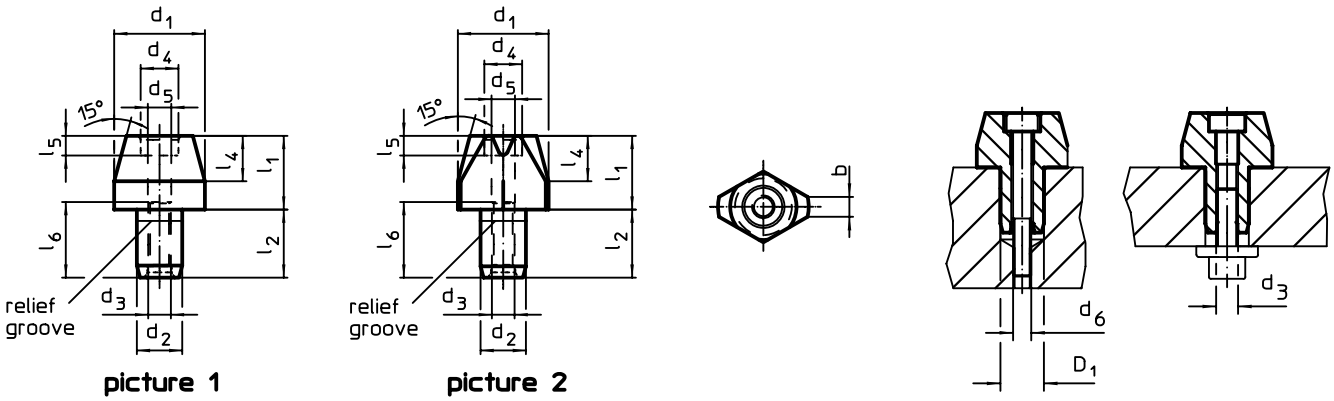
PRODUCT DESCRIPTION

Cylindric locating pins for locating workpieces in toleranced holes and also to be used as stops and feet.
Flattened locating pins used to overcome differences in tolerances, between holes or to position an element in one direction only.
Apart from size 6 additional safety by fastening possibilities from up and down (can be used also for dismounting). The outer dimensions are similar to DIN 6321.

Material

- Case-hardened steel, case-hardened, blackened and ground

DRAWING



ORDER INFORMATION

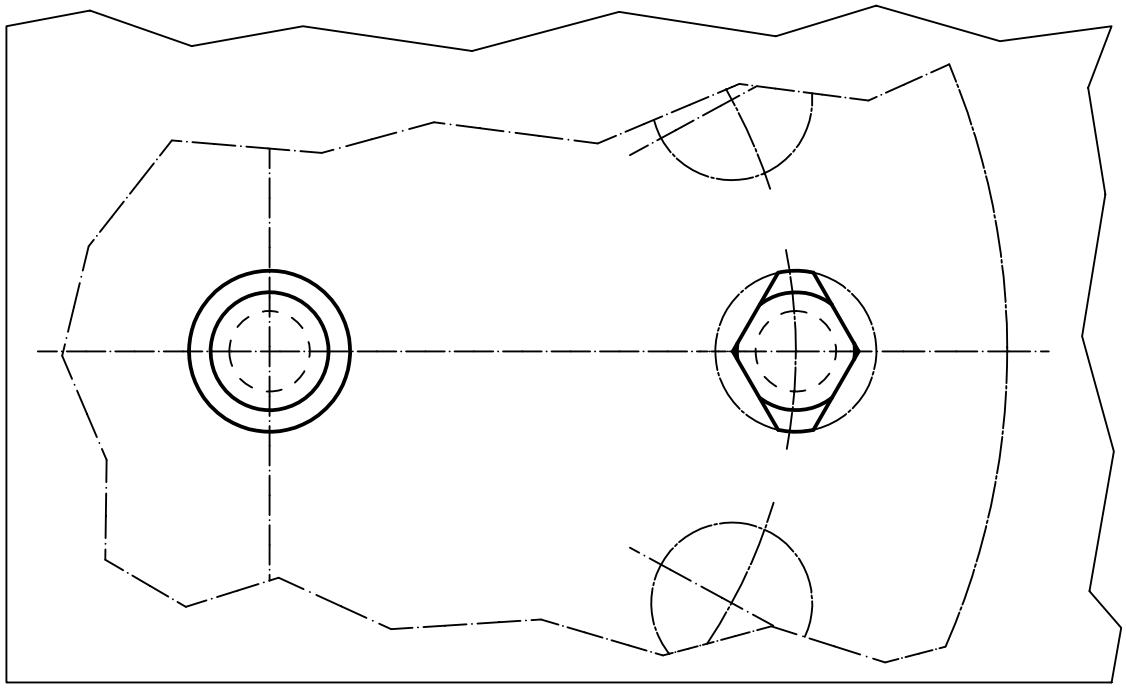
Dimensions												Location hole		Art. No.
d_1 g6	l_1	b	d_2 k6	l_2	d_3	d_4	l_4	d_5	l_5	d_6	l_6	D_1 H7		
[mm]												[mm]	[g]	
locating pin, cylindric, with bore hole – picture 1														
6	**7**	–	4	6	–	–	4	2,1	–	M2	–	4	1,2	22630.0220[1)]
	12	–	4	6	–	–	4	2,1	–	M2	–	4	2,9	22630.0221[1)]
8	**10**	–	6	9	M3	–	6	2,6	–	M2,5	10	6	4,2	22630.0222
	16	–	6	9	M3	–	6	2,6	–	M2,5	10	6	6,4	22630.0223
10	**10**	–	6	9	M3	5,0	6	2,6	2,6	M2,5	10	6	6,1	22630.0224
	18	–	6	9	M3	5,0	6	2,6	2,6	M2,5	10	6	10,0	22630.0225
12	**10**	–	6	9	M3	5,0	6	2,6	2,6	M2,5	10	6	8,0	22630.0226
	18	–	6	9	M3	5,0	6	2,6	2,6	M2,5	10	6	15,0	22630.0227
16	**13**	–	8	12	M4	6,5	8	3,3	3,1	M3	13	8	19,0	22630.0228
	22	–	8	12	M4	6,5	8	3,3	3,1	M3	13	8	32,0	22630.0229
20	**15**	–	12	18	M6	10,0	9	5,2	5,1	M5	19	12	38,0	22630.0230
	25	–	12	18	M6	10,0	9	5,2	5,1	M5	19	12	60,0	22630.0231
25	**15**	–	12	18	M6	10,0	9	5,2	5,1	M5	19	12	58,0	22630.0232
	25	–	12	18	M6	10,0	9	5,2	5,1	M5	19	12	96,0	22630.0233

[1)] can only be mounted from the top →

Dimensions												Location hole		Art. No.
d_1 g6	l_1	b	d_2 k6	l_2	d_3	d_4	l_4	d_5	l_5	d_6	l_6	D_1 H7		
[mm]												[mm]	[g]	
locating pin, flattened, with bore hole – picture 2														
6	**7**	1,0	4	6	–	–	4	2,1	–	M2	–	4	1,0	22630.0240[1)]
	12	1,0	4	6	–	–	4	2,1	–	M2	–	4	1,9	22630.0241[1)]
8	**10**	1,6	6	9	M3	–	6	2,6	–	M2,5	10	6	3,4	22630.0242
	16	1,6	6	9	M3	–	6	2,6	–	M2,5	10	6	4,4	22630.0243
10	**10**	2,5	6	9	M3	5,0	6	2,6	2,6	M2,5	10	6	4,6	22630.0244
	18	2,5	6	9	M3	5,0	6	2,6	2,6	M2,5	10	6	7,3	22630.0245
12	**10**	2,5	6	9	M3	5,0	6	2,6	2,6	M2,5	10	6	6,1	22630.0246
	18	2,5	6	9	M3	5,0	6	2,6	2,6	M2,5	10	6	10,0	22630.0247
16	**13**	3,5	8	12	M4	6,5	8	3,3	3,1	M3	13	8	15,0	22630.0248
	22	3,5	8	12	M4	6,5	8	3,3	3,1	M3	13	8	22,0	22630.0249
20	**15**	5,0	12	18	M6	10,0	9	5,2	5,1	M5	19	12	30,0	22630.0250
	25	5,0	12	18	M6	10,0	9	5,2	5,1	M5	19	12	44,0	22630.0251
25	**15**	5,0	12	18	M6	10,0	9	5,2	5,1	M5	19	12	41,0	22630.0252
	25	5,0	12	18	M6	10,0	9	5,2	5,1	M5	19	12	62,0	22630.0253

[1)] can only be mounted from the top

APPLICATION EXAMPLE



Locating Pins • with ball end

EH 22630.



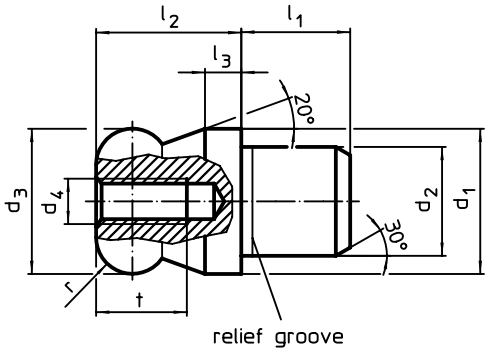
PRODUCT DESCRIPTION

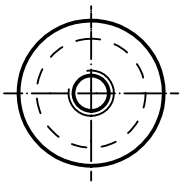
Ball ended locating pins facilitate easy inserting and removing avoiding clamping inclination.

Material

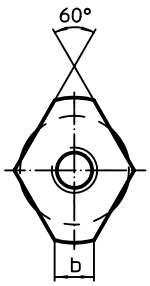
- Tool steel, hardened, blackened and ground
- Stainless steel 1.4305, ground, surface heat-treated

DRAWING

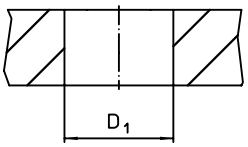


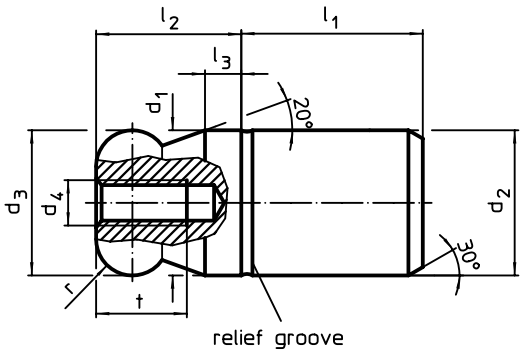


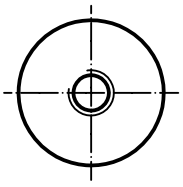
picture 1



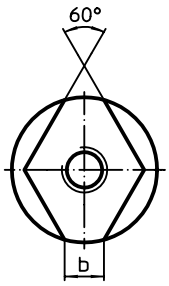
picture 2







picture 3



picture 4

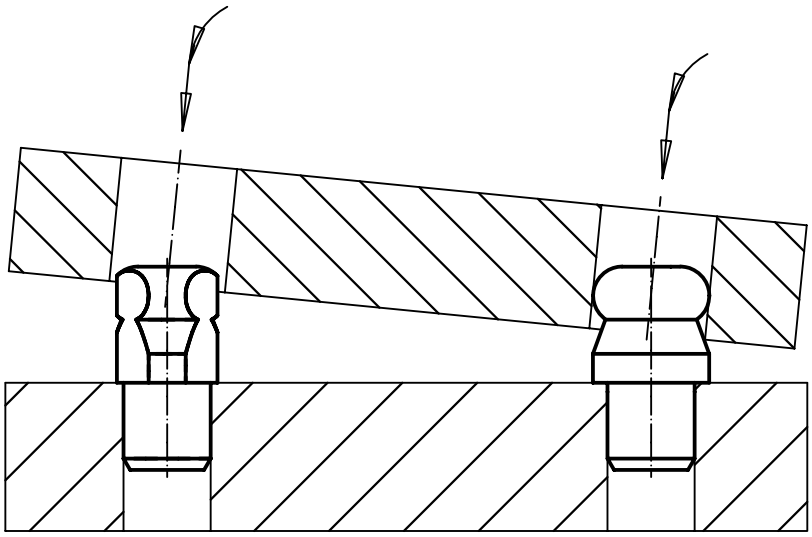
ORDER INFORMATION

Dimensions										Location hole		Art. No.	
d_1 g6	d_2 n6	d_3 -0,01 -0,05	d_4	l_1	l_2	l_3	t	r	b	D_1 H7		tool steel	stainless steel
[mm]										[mm]	[g]		
with ball end plain – picture 1													
10	**7**	10	M3	7	10	2,5	6	2,5	–	7	7	22630.0310	22630.0350
12	**8**	12	M4	8	12	3,0	8	3,0	–	8	11	22630.0312	22630.0352
16	**12**	16	M5	12	16	4,0	10	4,0	–	12	31	22630.0316	22630.0356
20	**14**	20	M5	14	20	5,0	10	5,0	–	14	58	22630.0320	22630.0360
22	**16**	22	M5	16	22	5,5	10	5,5	–	16	81	22630.0322	–
25	**18**	25	M5	18	25	6,0	10	6,0	–	18	118	22630.0325	–
with ball end flattened – picture 2													
10	**7**	10	M3	7	10	2,5	6	2,5	2,5	7	5	22630.0410	22630.0450
12	**8**	12	M4	8	12	3,0	8	3,0	2,5	8	8	22630.0412	22630.0452
16	**12**	16	M5	12	16	4,0	10	4,0	4,3	12	25	22630.0416	22630.0456
20	**14**	20	M5	14	20	5,0	10	5,0	5,0	14	46	22630.0420	22630.0460
22	**16**	22	M5	16	22	5,5	10	5,5	5,0	16	63	22630.0422	–
25	**18**	25	M5	18	25	6,0	10	6,0	5,6	18	92	22630.0425	–

→

Dimensions										Location hole		Art. No.	
d_1 g6	d_2 n6	d_3 -0,01 -0,05	d_4	l_1	l_2	l_3	t	r	b	D_1 H7		tool steel	stainless steel
[mm]										[mm]	[g]		
with ball end plain, not stepped – picture 3													
8	**8**	8	M3	10	8	2,0	6	2,0	–	8	6	22630.0508	22630.0568
10	**10**	10	M3	13	10	2,5	6	2,5	–	10	12	22630.0510	22630.0570
12	**12**	12	M4	15	12	3,0	8	3,0	–	12	21	22630.0512	22630.0572
16	**16**	16	M5	20	16	4,0	10	4,0	–	16	51	22630.0516	22630.0576
20	**20**	20	M5	25	20	5,0	10	5,0	–	20	101	22630.0520	22630.0580
25	**25**	25	M5	25	25	6,0	10	6,0	–	25	176	22630.0525	–
30	**30**	30	M6	30	30	8,0	12	8,0	–	30	307	22630.0530	–
40	**40**	40	M6	40	40	10,0	12	10,0	–	40	729	22630.0540	–
50	**50**	50	M6	50	50	12,0	12	12,0	–	50	1422	22630.0550	–
with ball end flattened, not stepped – picture 4													
8	**8**	8	M3	10	8	2,0	6	2,0	1,9	8	5	22630.0608	22630.0668
10	**10**	10	M3	13	10	2,5	6	2,5	2,5	10	11	22630.0610	22630.0670
12	**12**	12	M4	15	12	3,0	8	3,0	2,5	12	17	22630.0612	22630.0672
16	**16**	16	M5	20	16	4,0	10	4,0	4,3	16	44	22630.0616	22630.0676
20	**20**	20	M5	25	20	5,0	10	5,0	5,0	20	88	22630.0620	22630.0680
25	**25**	25	M5	25	25	6,0	10	6,0	5,6	25	149	22630.0625	–
30	**30**	30	M6	30	30	8,0	12	8,0	8,8	30	270	22630.0630	–
40	**40**	40	M6	40	40	10,0	12	10,0	12,8	40	657	22630.0640	–
50	**50**	50	M6	50	50	12,0	12	12,0	16,7	50	1243	22630.0650	–

APPLICATION EXAMPLE



Feet • DIN 6320 with threaded shank

EH 22640.



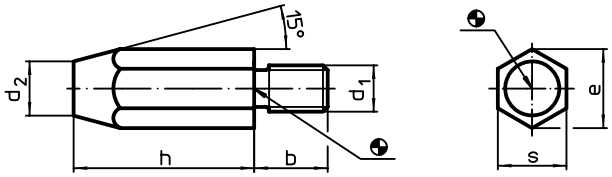
PRODUCT DESCRIPTION

Feet can be used both as a foot and as a seating element and stop.
Load bearing surface without distortion.

Material

- Heat-treated steel, unhardened, blackened

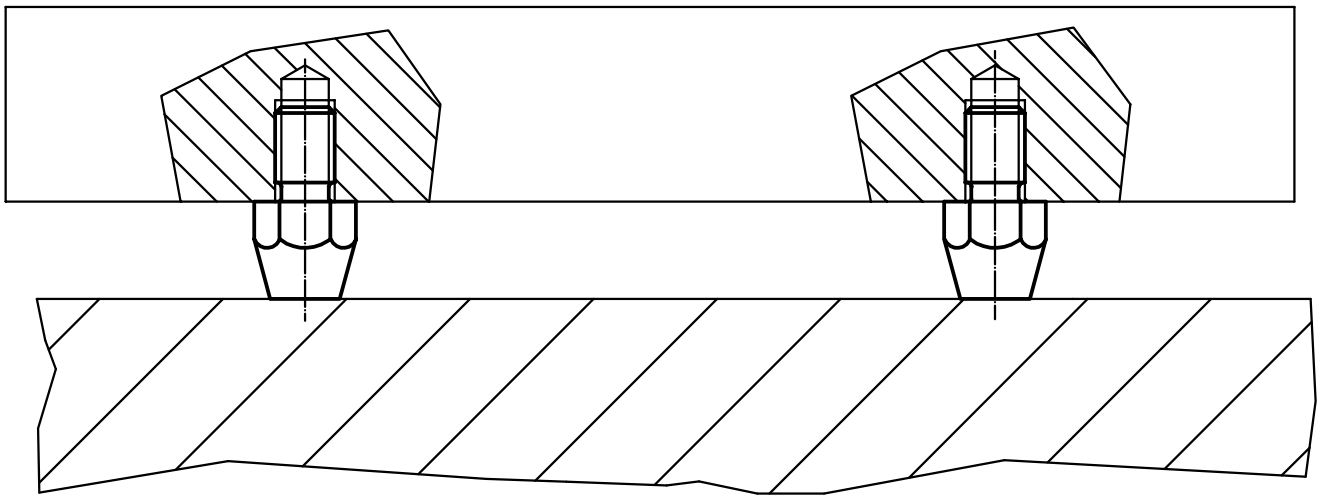
DRAWING



ORDER INFORMATION

Dimensions						Tightening torque max.		Art. No.
h	d_1	b	d_2	e	s			
[mm]						[Nm]	[g]	
10	**M 6**	11	8	11,5	10	7	8	22640.0061
20	**M 6**	11	6	11,5	10	7	13	22640.0062
15	**M 8**	13	10	15,0	13	7	19	22640.0081
30	**M 8**	13	9	15,0	13	18	35	22640.0082
20	**M10**	16	13	19,6	17	32	41	22640.0101
40	**M10**	16	13	19,6	17	32	81	22640.0102
25	**M12**	20	15	21,9	19	60	70	22640.0121
50	**M12**	20	15	21,9	19	60	129	22640.0122

APPLICATION EXAMPLE



2

Seating Pins • ribbed or pointed

EH 22680.



PRODUCT DESCRIPTION

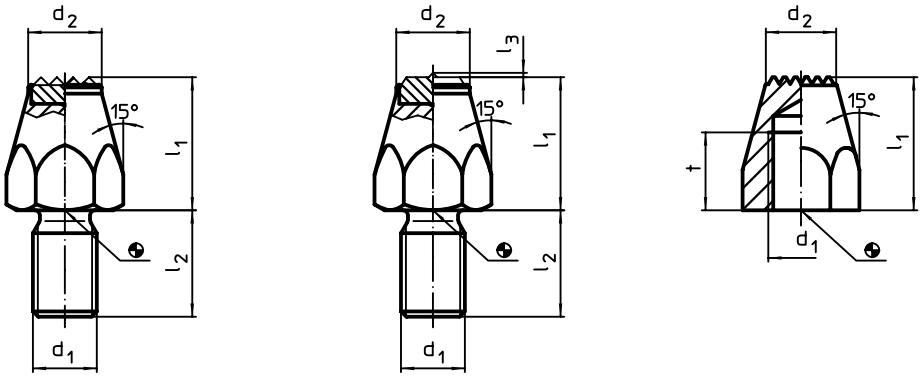
For workpieces showing a rough surface. Pointed type especially suitable for cast parts.

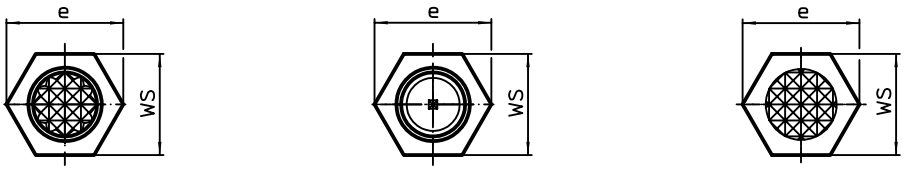
Material

Insert
- Hard metal, ribbed
- Hard metal, pointed

Body
- Heat-treated steel, tempered, blackened
- Free cutting steel, case-hardened, blackened

DRAWING





picture 1 picture 2 picture 3

ORDER INFORMATION

Dimensions							WS	Tightening torque max.		Art. No.
l_1	d_1	l_2	l_3	t	d_2	e	[mm]	[Nm]	[g]	
with hard metal insert, ribbed, and threaded shank – picture 1										
10	**M 6**	11	–	–	9,5	11,5	10	7	9	22680.0061
15	**M 8**	13	–	–	12,5	15,0	13	18	22	22680.0081
20	**M10**	15	–	–	12,5	19,6	17	32	40	22680.0101
25	**M12**	20	–	–	13,8	21,9	19	60	64	22680.0121
with hard metal insert, pointed, and threaded shank – picture 2										
10	**M 6**	11	0,8	–	9,5	11,5	10	7	9	22680.0063
15	**M 8**	13	0,8	–	12,5	15,0	13	18	23	22680.0083
20	**M10**	15	0,8	–	12,5	19,6	17	32	40	22680.0103
25	**M12**	20	0,8	–	13,8	21,9	19	60	65	22680.0123
case-hardened, ribbed, with female thread – picture 3										
20	**M 8**	–	–	10	9,0	15,0	13	18	14	22680.0142
25	**M 8**	–	–	10	9,0	15,0	13	18	20	22680.0144
	M10	–	–	13	12,5	19,6	17	32	31	22680.0164
30	**M10**	–	–	13	12,5	19,6	17	32	40	22680.0166
40	**M10**	–	–	13	12,5	19,6	17	32	60	22680.0168
25	**M12**	–	–	15	13,0	21,9	19	60	33	22680.0184
30	**M12**	–	–	15	13,0	21,9	19	60	44	22680.0186
40	**M12**	–	–	15	13,0	21,9	19	60	69	22680.0188

Seating Pins • pin shape

EH 22680.



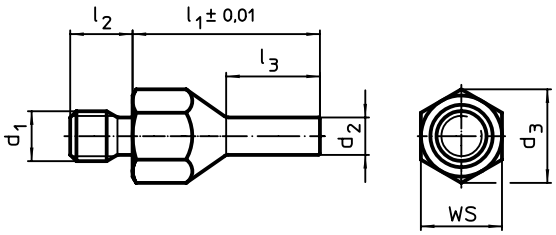
PRODUCT DESCRIPTION

To be used as solid and precise seat and stop. The pin-shaped form of this locating pin allows an application in components with narrow seating points.
Surface induction hardened and ground.

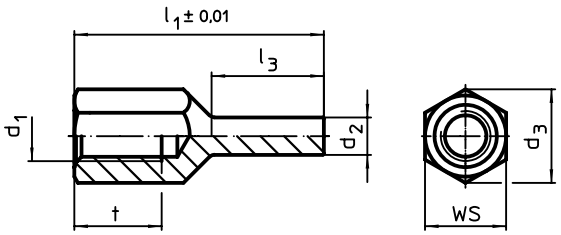
Material

- Heat-treated steel, tempered, blackened

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions							WS	Tightening torque max.		Art. No.
l_1 ±0,01	d_1	d_2	l_2	l_3	t	d_3				
[mm]							[mm]	[Nm]	[g]	
with male thread – picture 1										
20	M 6	4	8	10,0	–	11,0	10	7	8	22680.0402
30	M 6	4	8	15,0	–	11,0	10	7	12	22680.0404
	M 8	4	10	15,0	–	14,4	13	18	17	22680.0412
40	M 8	4	10	20,0	–	14,4	13	18	23	22680.0414
30	M 8	6	10	15,0	–	14,4	13	18	20	22680.0416
40	M 8	6	10	20,0	–	14,4	13	18	27	22680.0418
30	M10	6	14	15,0	–	19,0	17	32	30	22680.0422
50	M10	6	14	25,0	–	19,0	17	32	51	22680.0424
30	M10	8	14	15,0	–	19,0	17	32	35	22680.0426
50	M10	8	14	25,0	–	19,0	17	32	58	22680.0428
40	M12	6	14	20,0	–	21,2	19	60	48	22680.0432
60	M12	6	14	30,0	–	21,2	19	60	75	22680.0434
40	M12	8	14	20,0	–	21,2	19	60	56	22680.0436
60	M12	8	14	30,0	–	21,2	19	60	83	22680.0438
with female thread – picture 2										
20	M 6	4	–	8,5	6	11,0	10	7	6	22680.0452
30	M 6	4	–	13,5	9	11,0	10	7	9	22680.0454
	M 8	4	–	13,0	10	14,4	13	18	13	22680.0462
40	M 8	4	–	18,0	14	14,4	13	18	18	22680.0464
30	M 8	6	–	13,0	10	14,4	13	18	16	22680.0466
40	M 8	6	–	18,0	14	14,4	13	18	21	22680.0468
30	M10	6	–	12,0	10	19,0	17	32	24	22680.0472
50	M10	6	–	25,0	15	19,0	17	32	38	22680.0474
30	M10	8	–	12,0	10	19,0	17	32	28	22680.0476
50	M10	8	–	25,0	15	19,0	17	32	44	22680.0478
40	M12	6	–	18,0	12	21,2	19	60	36	22680.0482
60	M12	6	–	28,0	18	21,2	19	60	56	22680.0484
40	M12	8	–	18,0	12	21,2	19	60	41	22680.0486
60	M12	8	–	28,0	18	21,2	19	60	63	22680.0488

2

Pins

EH 22690.



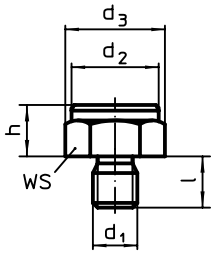
PRODUCT DESCRIPTION

To be used as seats, stops and thrust pads.

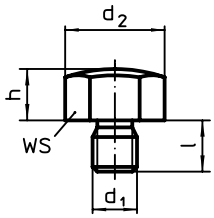
Material

- Steel, case-hardened, blackened

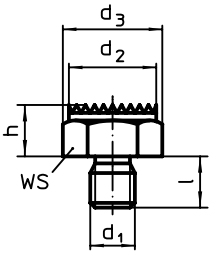
DRAWING



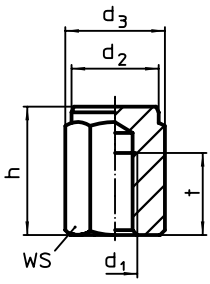
picture 1



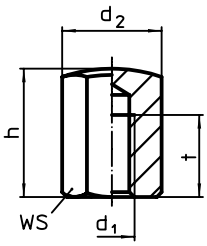
picture 2



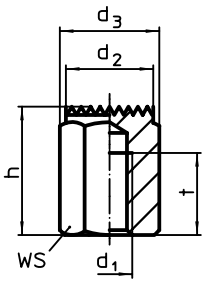
picture 3



picture 4



picture 5



picture 6

ORDER INFORMATION

h	Dimensions d_1	d_2	d_3	l	t	WS	Tightening torque max.		Art. No.
	[mm]					[mm]	[Nm]	[g]	
with male thread and plain surface – picture 1									
10 ±0,01	**M 8**	19,4	19,4	10	–	17	18	21	22690.0021
	M10	21,9	21,9	12	–	19	32	28	22690.0031
15 ±0,01	**M10**	21,9	21,9	12	–	19	32	40	22690.0032
10 ±0,01	**M12**	25,2	25,2	14	–	22	60	34	22690.0001
15 ±0,01	**M12**	25,2	25,2	14	–	22	60	56	22690.0002
	M16	33,0	33,0	19	–	30	140	110	22690.0042
20 ±0,01	**M16**	33,0	33,0	19	–	30	140	140	22690.0043
	M20	40,0	40,0	24	–	36	290	214	22690.0052
25 ±0,01	**M20**	40,0	40,0	24	–	36	290	257	22690.0053
20 ±0,01	**M24**	46,0	46,0	29	–	41	498	300	22690.0062
25 ±0,01	**M24**	46,0	46,0	29	–	41	498	356	22690.0063
30 ±0,01	**M24**	46,0	46,0	29	–	41	498	412	22690.0064

[1] The tightening torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length.

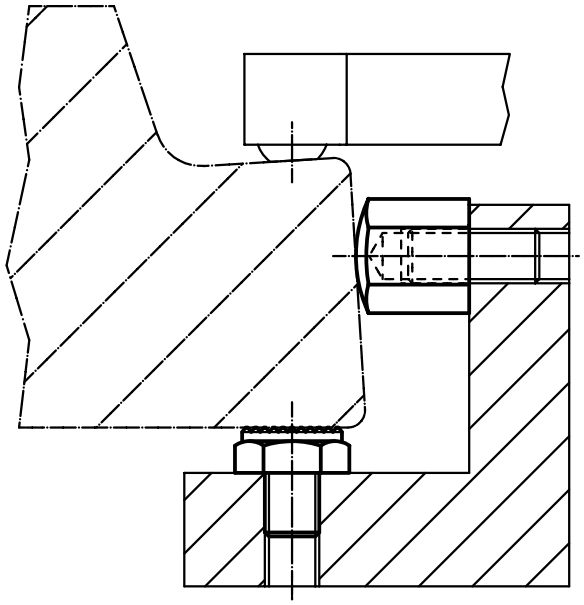
h	Dimensions d_1	d_2	d_3	l	t	WS	Tightening torque max.		Art. No.
		[mm]				[mm]	[Nm]	[g]	
with male thread and spherical surface – picture 2									
10 ±0,10	**M 8**	19,4	19,4	10	–	17	18	20	22690.0121
	M10	21,9	21,9	12	–	19	32	27	22690.0131
15 ±0,10	**M10**	21,9	21,9	12	–	19	32	40	22690.0132
10 ±0,10	**M12**	25,2	25,2	14	–	22	60	37	22690.0101
15 ±0,10	**M12**	25,2	25,2	14	–	22	60	53	22690.0102
	M16	33,0	33,0	19	–	30	140	105	22690.0142
20 ±0,10	**M16**	33,0	33,0	19	–	30	140	135	22690.0143
	M20	40,0	40,0	24	–	36	290	206	22690.0152
25 ±0,10	**M20**	40,0	40,0	24	–	36	290	249	22690.0153
20 ±0,10	**M24**	46,0	46,0	29	–	41	498	258	22690.0162
25 ±0,10	**M24**	46,0	46,0	29	–	41	498	342	22690.0163
30 ±0,10	**M24**	46,0	46,0	29	–	41	498	398	22690.0164
with male thread and ribbed surface – picture 3									
10 ±0,10	**M 8**	19,4	19,4	10	–	17	18	20	22690.0221
	M10	21,9	21,9	12	–	19	32	27	22690.0231
15 ±0,10	**M10**	21,9	21,9	12	–	19	32	39	22690.0232
10 ±0,10	**M12**	25,2	25,2	14	–	22	60	38	22690.0201
15 ±0,10	**M12**	25,2	25,2	14	–	22	60	54	22690.0202
	M16	33,0	33,0	19	–	30	140	106	22690.0242
20 ±0,10	**M16**	33,0	33,0	19	–	30	140	136	22690.0243
	M20	40,0	40,0	24	–	36	290	210	22690.0252
25 ±0,10	**M20**	40,0	40,0	24	–	36	290	253	22690.0253
20 ±0,10	**M24**	46,0	46,0	29	–	41	498	297	22690.0262
25 ±0,10	**M24**	46,0	46,0	29	–	41	498	353	22690.0263
30 ±0,10	**M24**	46,0	46,0	29	–	41	498	410	22690.0264
with female thread and plain surface tolerance l_1 = ±0,01 – picture 4									
15 ±0,01	**M 8**	19,4	19,4	15	6	17	25[1)]	25	22690.0321
25 ±0,01	**M 8**	19,4	19,4	25	12	17	25[1)]	42	22690.0323
20 ±0,01	**M10**	21,9	21,9	20	10	19	46[1)]	40	22690.0333
30 ±0,01	**M10**	21,9	21,9	30	15	19	46[1)]	61	22690.0335
40 ±0,01	**M10**	21,9	21,9	40	15	19	46[1)]	85	22690.0337
20 ±0,01	**M12**	25,2	25,2	20	10	22	82[1)]	52	22690.0301
25 ±0,01	**M12**	25,2	25,2	25	15	22	82[1)]	65	22690.0302
30 ±0,01	**M12**	25,2	25,2	30	18	22	82[1)]	79	22690.0303
40 ±0,01	**M12**	25,2	25,2	40	18	22	82[1)]	111	22690.0304
50 ±0,01	**M12**	25,2	25,2	50	18	22	82[1)]	142	22690.0305
30 ±0,01	**M16**	33,0	33,0	30	20	30	206[1)]	140	22690.0343
50 ±0,01	**M16**	33,0	33,0	50	24	30	206[1)]	257	22690.0345
40 ±0,01	**M20**	40,0	40,0	40	26	36	407[1)]	279	22690.0353
60 ±0,01	**M20**	40,0	40,0	60	38	36	407[1)]	431	22690.0355
40 ±0,01	**M24**	46,0	46,0	40	26	41	698[1)]	341	22690.0363
60 ±0,01	**M24**	46,0	46,0	60	38	41	698[1)]	530	22690.0365
with female thread and spherical surface – picture 5									
15 ±0,10	**M 8**	19,4	19,4	15	6	17	25[1)]	24	22690.0421
25 ±0,10	**M 8**	19,4	19,4	25	12	17	25[1)]	41	22690.0423
20 ±0,10	**M10**	21,9	21,9	20	10	19	46[1)]	38	22690.0433
30 ±0,10	**M10**	21,9	21,9	30	15	19	46[1)]	60	22690.0435
40 ±0,10	**M10**	21,9	21,9	40	15	19	46[1)]	84	22690.0437
20 ±0,10	**M12**	25,2	25,2	20	10	22	82[1)]	50	22690.0401
25 ±0,10	**M12**	25,2	25,2	25	15	22	82[1)]	62	22690.0402
30 ±0,10	**M12**	25,2	25,2	30	18	22	82[1)]	76	22690.0403
40 ±0,10	**M12**	25,2	25,2	40	18	22	82[1)]	109	22690.0404
50 ±0,10	**M12**	25,2	25,2	50	18	22	82[1)]	141	22690.0405
30 ±0,10	**M16**	33,0	33,0	30	20	30	206[1)]	136	22690.0443
50 ±0,10	**M16**	33,0	33,0	50	24	30	206[1)]	252	22690.0445
40 ±0,10	**M20**	40,0	40,0	40	26	36	407[1)]	272	22690.0453
60 ±0,10	**M20**	40,0	40,0	60	38	36	407[1)]	423	22690.0455
40 ±0,10	**M24**	46,0	46,0	40	26	41	698[1)]	340	22690.0463
60 ±0,10	**M24**	46,0	46,0	60	38	41	698[1)]	530	22690.0465

[1)] The tightening torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length. →

Dimensions						WS	Tightening torque max.		Art. No.
h	d_1	d_2	d_3	l	t				
[mm]						[mm]	[Nm]	[g]	
with female thread and ribbed surface – picture 6									
15 ±0,10	**M 8**	19,4	19,4	15	6	17	25[1)]	24	**22690.0521**
25 ±0,10	**M 8**	19,4	19,4	25	12	17	25[1)]	41	**22690.0523**
20 ±0,10	**M10**	21,9	21,9	20	10	19	46[1)]	38	**22690.0533**
30 ±0,10	**M10**	21,9	21,9	30	15	19	46[1)]	60	**22690.0535**
40 ±0,10	**M10**	21,9	21,9	40	15	19	46[1)]	84	**22690.0537**
20 ±0,10	**M12**	25,2	25,2	20	10	22	82[1)]	50	**22690.0501**
25 ±0,10	**M12**	25,2	25,2	25	15	22	82[1)]	63	**22690.0502**
30 ±0,10	**M12**	25,2	25,2	30	18	22	82[1)]	77	**22690.0503**
40 ±0,10	**M12**	25,2	25,2	40	18	22	82[1)]	109	**22690.0504**
50 ±0,10	**M12**	25,2	25,2	50	18	22	82[1)]	141	**22690.0505**
30 ±0,10	**M16**	33,0	33,0	30	20	30	206[1)]	137	**22690.0543**
50 ±0,10	**M16**	33,0	33,0	50	24	30	206[1)]	254	**22690.0545**
40 ±0,10	**M20**	40,0	40,0	40	26	36	407[1)]	266	**22690.0553**
60 ±0,10	**M20**	40,0	40,0	60	38	36	407[1)]	418	**22690.0555**
40 ±0,10	**M24**	46,0	46,0	40	26	41	698[1)]	338	**22690.0563**
60 ±0,10	**M24**	46,0	46,0	60	38	41	698[1)]	528	**22690.0565**

[1)] The tightening torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length.

APPLICATION EXAMPLE



Seating Pins • adjustable

EH 22690.



PRODUCT DESCRIPTION

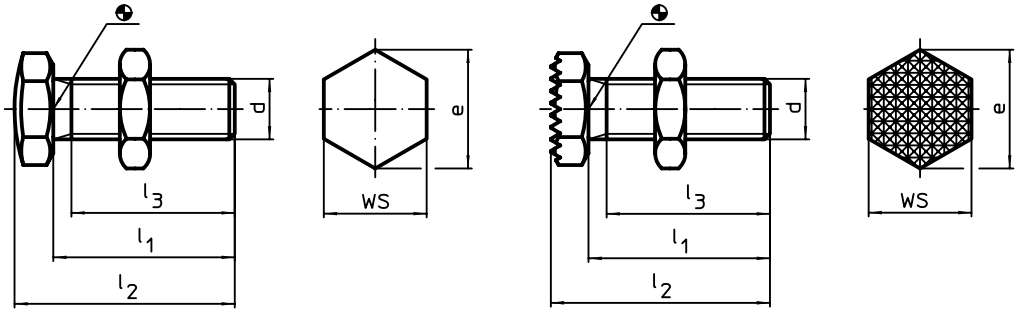
The adjustable seating pins can be used as seats and stops.

Material

Seating pins
- Heat-treated steel, tempered, quality 10.9, blackened / surface induction hardened

Nut
- Heat-treated steel, tempered, quality 8.8 (ISO 4035), blackened

DRAWING



picture 1 picture 2

ORDER INFORMATION

d	Dimensions l_1 ±1,5	l_2 ±1,5	l_3 min.	e	WS		Art. No.
		[mm]			[mm]	[g]	
spherical surface – picture 1							
M 6	**20**	23,5	19,0	11,5	10	6,8	22690.0606
M 8	**25**	30,0	21,0	14,5	13	15,0	22690.0608
M10	**30**	36,0	25,5	19,6	17	31,0	22690.0610
M12	**35**	42,0	29,7	21,9	19	47,0	22690.0612
M16	**40**	49,5	34,0	27,7	24	99,0	22690.0616
M20	**45**	57,0	37,0	34,6	30	179,0	22690.0620
M24	**50**	64,0	40,0	41,6	36	294,0	22690.0624
ribbed surface – picture 2							
M 6	**20**	23,5	19,0	11,5	10	6,7	22690.0626
M 8	**25**	30,0	21,0	14,5	13	15,0	22690.0628
M10	**30**	36,0	25,5	19,6	17	32,0	22690.0630
M12	**35**	42,0	29,7	21,9	19	49,0	22690.0632
M16	**40**	49,5	34,0	27,7	24	100,0	22690.0636
M20	**45**	57,0	37,0	34,6	30	177,0	22690.0640
M24	**50**	64,0	40,0	41,6	36	296,0	22690.0644

2

Pins • with plastic contact surface

EH 22691.



PRODUCT DESCRIPTION

Pins with plastic contact surface can be used as protective supports, stops, and thrust pads. This protects high-quality surfaces from damage.

Material

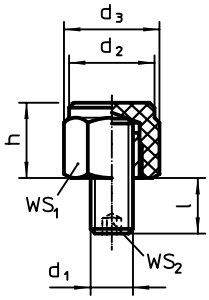
Insert
- Plastic (PEEK), blue

Threaded bushing
- Stainless steel

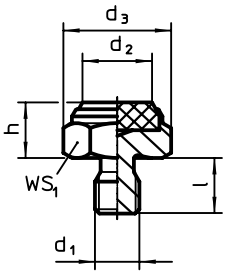
Threaded pin
- Stainless steel

Body
- Plastic (PEEK), blue
- Stainless steel 1.4305

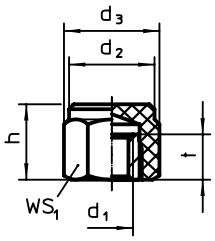
DRAWING



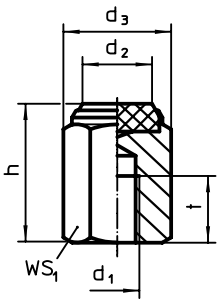
picture 1



picture 2



picture 3



picture 4

ORDER INFORMATION

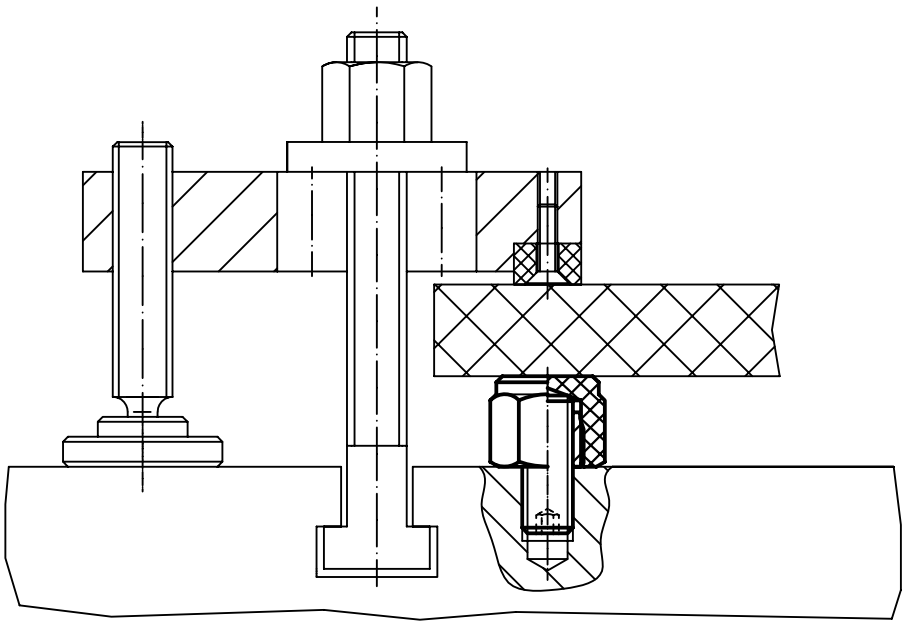
Dimensions						WS_1	WS_2	Load capacity for static load max.	Tightening torque max.	min.	max.		Art. No.
h ±0,1	d_1	d_2	d_3	l	t								
[mm]						[mm]	[mm]	[kN]	[Nm]	[°C]		[g]	
with male thread, body made of plastic (PEEK), plain surface – picture 1													
15	**M 8**	17,0	19,0	8 ±1	–	17	4	2,1	10	-60	250	12	22691.0122
20	**M10**	19,0	21,5	10 ±1	–	19	5	2,4	10	-60	250	18	22691.0133
	M12	22,0	25,0	14 ±1	–	22	6	3,4	10	-60	250	24	22691.0143
with male thread, plastic insert, plain surface – picture 2													
10	**M 8**	12,5	19,4	10	–	17	–	2,8	18	-60	250	15	22691.0021
	M10	14,5	21,9	12	–	19	–	3,8	32	-60	250	21	22691.0031
15	**M10**	14,5	21,9	12	–	19	–	3,8	32	-60	250	33	22691.0032
10	**M12**	17,5	25,2	14	–	22	–	5,5	60	-60	250	30	22691.0041
15	**M12**	17,5	25,2	14	–	22	–	5,5	60	-60	250	46	22691.0042

[1] The tightening torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length. →

Dimensions						WS_1	WS_2	Load capacity for static load max.	Tightening torque max.	min.	max.		Art. No.
h ±0,1	d_1	d_2	d_3	l	t								
[mm]						[mm]	[mm]	[kN]	[Nm]	[°C]		[g]	
with female thread, body made of plastic (PEEK), plain surface – picture 3													
15	**M 8**	17,0	19,0	–	9	–	–	2,1	10	-60	250	7	**22691.0222**
20	**M10**	19,0	21,5	–	10	–	–	2,4	10	-60	250	11	**22691.0233**
	M12	22,0	25,0	–	12	–	–	3,4	10	-60	250	16	**22691.0243**
with female thread, plastic insert (PEEK), plain surface – picture 4													
25	**M 8**	12,5	19,4	–	12	17	–	2,8	18[1)]	-60	250	36	**22691.0324**
30	**M10**	14,5	21,9	–	15	19	–	3,8	32[1)]	-60	250	54	**22691.0335**
	M12	17,5	25,2	–	18	22	–	5,5	60[1)]	-60	250	71	**22691.0345**

[1)] The tightening torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length.

APPLICATION EXAMPLE



2

BALL-ENDED THRUST SCREWS FOR CLAMPING NON-PARALLEL SURFACES

MAKE THE SLANT BALL ITS EYES OUT

Whether sporting a fine-pitch thread for pin-point adjustments or a regular thread – they are the preferred tool for fastening, clamping, positioning or supporting non-parallel surfaces.

A particular highlight of these ball-ended thrust screws is their internal hexagon drive. It provides for optimum force transmission by channelling the driving forces through surfaces rather than edges (contrary to, for instance, an internal hexagon). This optimised force transmission keeps tool wear at a minimum, extending the service life of the tool. This reduces tool wear and increases tool service life.



Ball-Ended Thrust Screws • headed, ball protected against rotating

EH 22700.



PRODUCT DESCRIPTION

For clamping and supporting of surfaces that are not exactly parallel.
Maximised load transmission due to moveable ball.

Material

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

Ball protected against rotating.
Special types on request.

References

Thread lock on request, please refer to appendix - Technical Data -

Further products

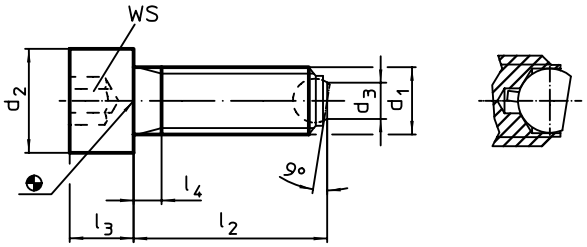
Ball-Ended Thrust Screws, headed, flat-faced ball . . . . . → p. 300

MORE INFORMATION

Notes

Note: Thread runout l_4 !

DRAWING



ORDER INFORMATION

Dimensions							WS	Load capacity for static load[1] max.		Art. No.	
d_1	l_2	d_2	d_3	l_3	l_4	Ball				heat-treated steel	stainless steel
			[mm]				[mm]	[kN]	[g]		
flat-faced ball, plain surface											
M 6	**20**	10	3,2	6	3,0	4,0	5	6	6,1	22700.0062	22700.0302
	30	10	3,2	6	3,0	4,0	5	6	7,7	22700.0064	22700.0304
	40	10	3,2	6	16,0	4,0	5	6	10,0	22700.0066	22700.0306
M 8	**20**	13	4,5	8	3,5	5,5	6	9	13,0	22700.0082	22700.0312
	35	13	4,5	8	3,5	5,5	6	9	17,0	22700.0084	22700.0314
	50	13	4,5	8	22,0	5,5	6	9	23,0	22700.0086	22700.0316
M10	**25**	16	6,0	10	4,5	7,0	8	12	24,0	22700.0102	22700.0322
	40	16	6,0	10	4,5	7,0	8	12	31,0	22700.0104	22700.0324
	60	16	6,0	10	28,0	7,0	8	12	44,0	22700.0106	22700.0326
M12	**30**	18	7,2	12	5,0	8,5	10	18	38,0	22700.0122	22700.0332
	50	18	7,2	12	5,0	8,5	10	18	52,0	22700.0124	22700.0334
	80	18	7,2	12	44,0	8,5	10	18	80,0	22700.0126	22700.0336
M16	**40**	24	10,7	16	6,0	12,0	14	36	92,0	22700.0162	22700.0342
	60	24	10,7	16	6,0	12,0	14	36	118,0	22700.0164	22700.0344
	80	24	10,7	16	36,0	12,0	14	36	153,0	22700.0166	22700.0346
M20	**50**	30	13,5	20	7,5	15,0	17	60	181,0	22700.0172	–
	80	30	13,5	20	28,0	15,0	17	60	255,0	22700.0174	–
	100	30	13,5	20	48,0	15,0	17	60	304,0	22700.0176	–
M24	**60**	36	15,8	24	9,0	18,0	19	80	325,0	22700.0182	–
	90	36	15,8	24	30,0	18,0	19	80	430,0	22700.0184	–
	120	36	15,8	24	60,0	18,0	19	80	535,0	22700.0186	–

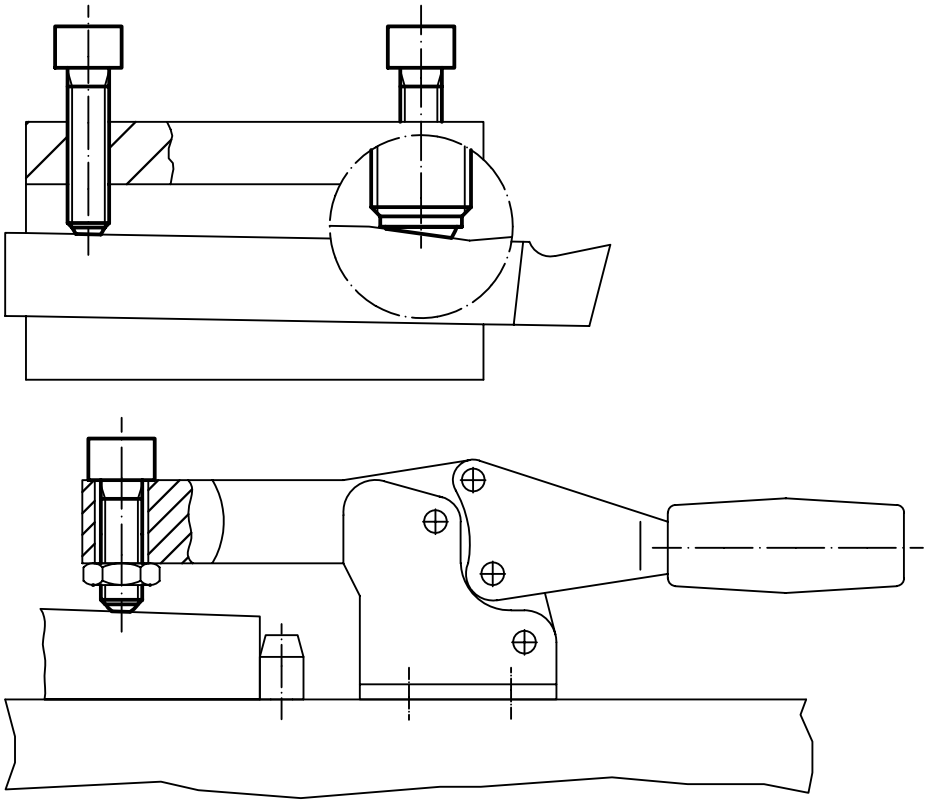
[1] Statements on load capacity are not valid for the stainless steel type. →

2

Dimensions							WS	Load capacity for static load[1] max.		Art. No.	
d_1	l_2	d_2	d_3	l_3	l_4	Ball				heat-treated steel	stainless steel
[mm]							[mm]	[kN]	[g]		
flat-faced ball, ribbed surface											
M 8	**20**	13	4,5	8	3,5	5,5	6	9	13,0	22700.0192	–
	35	13	4,5	8	3,5	5,5	6	9	17,0	22700.0194	–
	50	13	4,5	8	22,0	5,5	6	9	23,0	22700.0196	–
M10	**25**	16	6,0	10	4,5	7,0	8	12	24,0	22700.0202	–
	40	16	6,0	10	4,5	7,0	8	12	31,0	22700.0204	–
	60	16	6,0	10	28,0	7,0	8	12	43,0	22700.0206	–
M12	**30**	18	7,2	12	5,0	8,5	10	18	39,0	22700.0222	–
	50	18	7,2	12	5,0	8,5	10	18	52,0	22700.0224	–
	80	18	7,2	12	44,0	8,5	10	18	80,0	22700.0226	–
M16	**40**	24	10,7	16	6,0	12,0	14	36	94,0	22700.0262	–
	60	24	10,7	16	6,0	12,0	14	36	119,0	22700.0264	–
	80	24	10,7	16	36,0	12,0	14	36	154,0	22700.0266	–
M20	**50**	30	13,5	20	7,5	15,0	17	60	181,0	22700.0272	–
	80	30	13,5	20	28,0	15,0	17	60	251,0	22700.0274	–
	100	30	13,5	20	48,0	15,0	17	60	298,0	22700.0276	–
M24	**60**	36	15,8	24	9,0	18,0	19	80	325,0	22700.0282	–
	90	36	15,8	24	30,0	18,0	19	80	427,0	22700.0284	–
	120	36	15,8	24	60,0	18,0	19	80	535,0	22700.0286	–

[1] Statements on load capacity are not valid for the stainless steel type.

APPLICATION EXAMPLE



Ball-Ended Thrust Screws • headless, ball protected against rotating

EH 22700.



PRODUCT DESCRIPTION

For clamping and supporting of surfaces that are not exactly parallel.
Maximised load transmission due to moveable ball.

Material

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

MORE INFORMATION

Notes

Ball protected against rotating.
Special types on request.

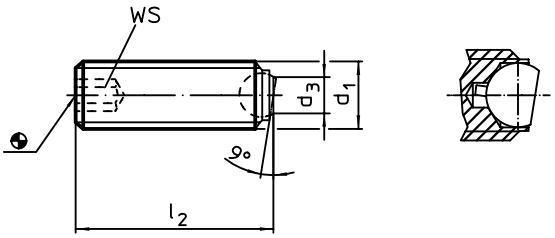
References

Thread lock on request, please refer to appendix - Technical Data -

Further products

Ball-Ended Thrust Screws, headless, flat-faced ball . . . . . → p. 304
Ball-Ended Thrust Screws, headless, with fine-pitch thread . . . . . → p. 307
Ball-Ended Thrust Screws, headless, flat-faced ball and hexalobular socket . → p. 310

DRAWING



ORDER INFORMATION

Dimensions				WS	Load capacity for static load[1] max.		Art. No.	
d_1	l_2	d_3	Ball				heat-treated steel	stainless steel
[mm]				[mm]	[kN]	[g]		
flat-faced ball, plain surface								
M 6	12	3,2	4,0	3	6	1,6	22700.0563	22700.0803
	16	3,2	4,0	3	6	2,3	22700.0564	22700.0804
	20	3,2	4,0	3	6	2,9	22700.0565	22700.0805
	25	3,2	4,0	3	6	3,8	22700.0566	22700.0806
M 8	16	4,5	5,5	4	9	3,7	22700.0583	22700.0813
	20	4,5	5,5	4	9	5,1	22700.0584	22700.0814
	25	4,5	5,5	4	9	6,5	22700.0585	22700.0815
	30	4,5	5,5	4	9	8,1	22700.0586	22700.0816
M10	20	6,0	7,0	5	12	7,6	22700.0603	22700.0823
	25	6,0	7,0	5	12	10,0	22700.0604	22700.0824
	35	6,0	7,0	5	12	15,0	22700.0606	22700.0826
	40	6,0	7,0	5	12	17,0	22700.0608	22700.0828
M12	20	7,2	8,5	6	18	11,0	22700.0622	22700.0832
	30	7,2	8,5	6	18	18,0	22700.0624	22700.0834
	40	7,2	8,5	6	18	24,0	22700.0626	22700.0836
	50	7,2	8,5	6	18	32,0	22700.0628	22700.0838
M16	20	10,7	12,0	8	36	22,0	22700.0661	22700.0841
	25	10,7	12,0	8	36	28,0	22700.0662	22700.0842
	35	10,7	12,0	8	36	38,0	22700.0664	22700.0844
	50	10,7	12,0	8	36	60,0	22700.0666	22700.0846
M20	30	13,5	15,0	10	60	52,0	22700.0672	–
	40	13,5	15,0	10	60	70,0	22700.0674	–
	50	13,5	15,0	10	60	90,0	22700.0675	–
	60	13,5	15,0	10	60	111,0	22700.0676	–
M24	35	15,8	18,0	12	80	86,0	22700.0682	–
	50	15,8	18,0	12	80	125,0	22700.0684	–
	80	15,8	18,0	12	80	216,0	22700.0686	–

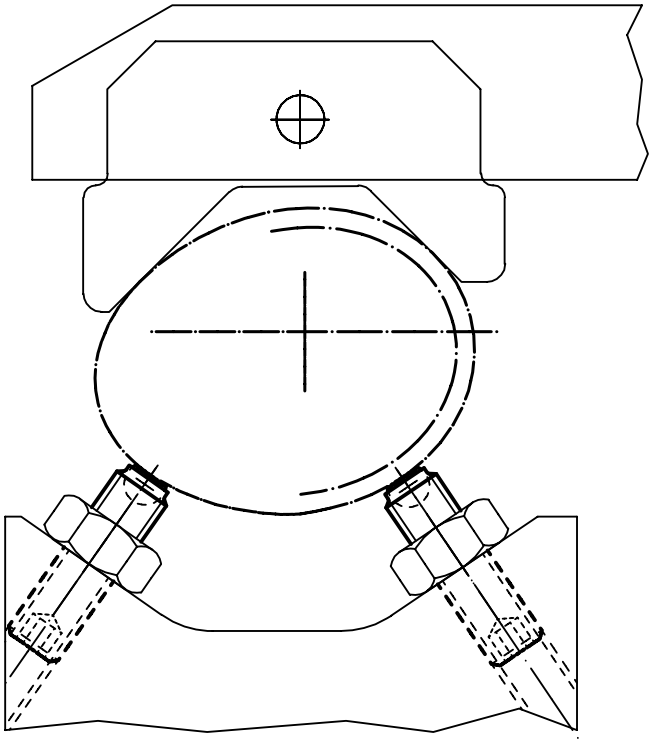
[1] Statements on load capacity are not valid for the stainless steel type. →

2

Dimensions				WS	Load capacity for static load[1] max.		Art. No.	
d_1	l_2	d_3	Ball				heat-treated steel	stainless steel
[mm]				[mm]	[kN]	[g]		
flat-faced ball, ribbed surface								
M 8	**16**	4,5	5,5	4	9	3,7	22700.0693	–
	20	4,5	5,5	4	9	4,9	22700.0694	–
	25	4,5	5,5	4	9	6,6	22700.0695	–
	30	4,5	5,5	4	9	8,0	22700.0696	–
M10	**20**	6,0	7,0	5	12	7,5	22700.0703	–
	25	6,0	7,0	5	12	9,9	22700.0704	–
	35	6,0	7,0	5	12	15,0	22700.0706	–
	40	6,0	7,0	5	12	17,0	22700.0708	–
M12	**20**	7,2	8,5	6	18	11,0	22700.0722	–
	30	7,2	8,5	6	18	18,0	22700.0724	–
	40	7,2	8,5	6	18	24,0	22700.0726	–
	50	7,2	8,5	6	18	32,0	22700.0728	–
M16	**20**	10,7	12,0	8	36	22,0	22700.0761	–
	25	10,7	12,0	8	36	27,0	22700.0762	–
	35	10,7	12,0	8	36	38,0	22700.0764	–
	50	10,7	12,0	8	36	60,0	22700.0766	–
M20	**30**	13,5	15,0	10	60	51,0	22700.0772	–
	40	13,5	15,0	10	60	69,0	22700.0774	–
	50	13,5	15,0	10	60	90,0	22700.0775	–
	60	13,5	15,0	10	60	110,0	22700.0776	–
M24	**35**	15,8	18,0	12	80	84,0	22700.0782	–
	50	15,8	18,0	12	80	128,0	22700.0784	–
	80	15,8	18,0	12	80	215,0	22700.0786	–

[1] Statements on load capacity are not valid for the stainless steel type.

APPLICATION EXAMPLE



Ball-Ended Thrust Screws • headed, round ball

EH 22710.



PRODUCT DESCRIPTION

Also for positioning, clamping, tightening or supporting of surfaces that are not exactly parallel.

Material

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

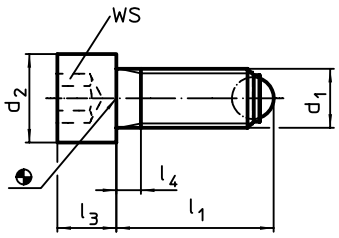
Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

MORE INFORMATION

Notes
Special types on request.

References
Thread lock on request, please refer to appendix - Technical Data -

DRAWING



ORDER INFORMATION

Dimensions						WS	Load capacity for static load[1] max.		Art. No.	
d_1	l_1	d_2	l_3	l_4	Ball				heat-treated steel	stainless steel
[mm]						[mm]	[kN]	[g]		
round ball										
M 6	**20,8**	10	6	3,0	4,0	5	9	6,2	22710.0062	22710.0752
	30,8	10	6	3,0	4,0	5	9	8,0	22710.0064	22710.0754
	40,8	10	6	16,0	4,0	5	9	10,0	22710.0066	22710.0756
M 8	**21,2**	13	8	3,5	5,5	6	15	13,0	22710.0082	22710.0762
	36,2	13	8	3,5	5,5	6	15	17,0	22710.0084	22710.0764
	51,2	13	8	22,0	5,5	6	15	24,0	22710.0086	22710.0766
M10	**26,7**	16	10	4,5	7,0	8	20	24,0	22710.0102	22710.0772
	41,7	16	10	4,5	7,0	8	20	31,0	22710.0104	22710.0774
	61,7	16	10	28,0	7,0	8	20	44,0	22710.0106	22710.0776
M12	**32,0**	18	12	5,0	8,5	10	30	38,0	22710.0122	22710.0782
	52,0	18	12	5,0	8,5	10	30	52,0	22710.0124	22710.0784
	82,0	18	12	44,0	8,5	10	30	79,0	22710.0126	22710.0786
M16	**43,3**	24	16	6,0	12,0	14	60	94,0	22710.0162	22710.0792
	63,3	24	16	6,0	12,0	14	60	119,0	22710.0164	22710.0794
	83,3	24	16	36,0	12,0	14	60	156,0	22710.0166	22710.0796
M20	**54,2**	30	20	7,5	15,0	17	90	183,0	22710.0202	–
	84,2	30	20	28,0	15,0	17	90	254,0	22710.0204	–
	104,2	30	20	48,0	15,0	17	90	307,0	22710.0206	–
M24	**64,7**	36	24	9,0	18,0	19	120	331,0	22710.0242	–
	94,7	36	24	30,0	18,0	19	120	430,0	22710.0244	–
	124,7	36	24	60,0	18,0	19	120	537,0	22710.0246	–

[1] Statements on load capacity are not valid for the stainless steel type.

2

Ball-Ended Thrust Screws • headed, flat-faced ball

EH 22710.



PRODUCT DESCRIPTION

For clamping and supporting of surfaces that are not exactly parallel.
Maximised load transmission due to moveable ball.

Material

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

Special types on request.

References

Thread lock on request, please refer to appendix - Technical Data -

Further products

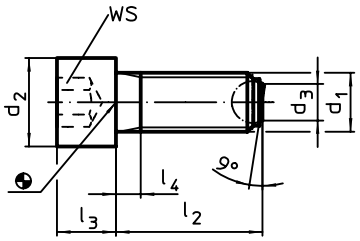
Ball-Ended Thrust Screws, headed, ball protected against rotating . . . . . → p. 295

MORE INFORMATION

Notes

Fully rotating ball.

DRAWING



ORDER INFORMATION

Dimensions							WS	Load capacity for static load[1] max.		Art. No.	
d_1	l_2	d_2	d_3	l_3	l_4	Ball				heat-treated steel	stainless steel
			[mm]				[mm]	[kN]	[g]		
plain surface											
M 6	**20**	10	3,2	6	3,0	4,0	5	9	6,1	22710.0562	22710.0832
	30	10	3,2	6	3,0	4,0	5	9	7,6	22710.0564	22710.0834
	40	10	3,2	6	16,0	4,0	5	9	10,0	22710.0566	22710.0836
M 8	**20**	13	4,5	8	3,5	5,5	6	15	13,0	22710.0582	22710.0842
	35	13	4,5	8	3,5	5,5	6	15	17,0	22710.0584	22710.0844
	50	13	4,5	8	22,0	5,5	6	15	23,0	22710.0586	22710.0846
M10	**25**	16	6,0	10	4,5	7,0	8	20	24,0	22710.0602	22710.0852
	40	16	6,0	10	4,5	7,0	8	20	31,0	22710.0604	22710.0854
	60	16	6,0	10	28,0	7,0	8	20	44,0	22710.0606	22710.0856
M12	**30**	18	7,2	12	5,0	8,5	10	30	38,0	22710.0622	22710.0862
	50	18	7,2	12	5,0	8,5	10	30	52,0	22710.0624	22710.0864
	80	18	7,2	12	44,0	8,5	10	30	79,0	22710.0626	22710.0866
M16	**40**	24	10,7	16	6,0	12,0	14	60	92,0	22710.0662	22710.0872
	60	24	10,7	16	6,0	12,0	14	60	120,0	22710.0664	22710.0874
	80	24	10,7	16	36,0	12,0	14	60	155,0	22710.0666	22710.0876
M20	**50**	30	13,5	20	7,5	15,0	17	90	182,0	22710.0702	–
	80	30	13,5	20	28,0	15,0	17	90	255,0	22710.0704	–
	100	30	13,5	20	48,0	15,0	17	90	305,0	22710.0706	–
M24	**60**	36	15,8	24	9,0	18,0	19	120	325,0	22710.0742	–
	90	36	15,8	24	30,0	18,0	19	120	422,0	22710.0744	–
	120	36	15,8	24	60,0	18,0	19	120	534,0	22710.0746	–

[1] Statements on load capacity are not valid for the stainless steel type. →

Dimensions							WS	Load capacity for static load[1] max.		Art. No.	
d_1	l_2	d_2	d_3	l_3	l_4	Ball				heat-treated steel	stainless steel
[mm]							[mm]	[kN]	[g]		
ribbed surface											
M 8	**20**	13	4,5	8	3,5	5,5	6	15	12,0	22710.0892	–
	35	13	4,5	8	3,5	5,5	6	15	17,0	22710.0894	–
	50	13	4,5	8	22,0	5,5	6	15	23,0	22710.0896	–
M10	**25**	16	6,0	10	4,5	7,0	8	20	24,0	22710.0902	–
	40	16	6,0	10	4,5	7,0	8	20	31,0	22710.0904	–
	60	16	6,0	10	28,0	7,0	8	20	44,0	22710.0906	–
M12	**30**	18	7,2	12	5,0	8,5	10	30	39,0	22710.0922	–
	50	18	7,2	12	5,0	8,5	10	30	53,0	22710.0924	–
	80	18	7,2	12	44,0	8,5	10	30	79,0	22710.0926	–
M16	**40**	24	10,7	16	6,0	12,0	14	60	92,0	22710.0962	–
	60	24	10,7	16	6,0	12,0	14	60	118,0	22710.0964	–
	80	24	10,7	16	36,0	12,0	14	60	155,0	22710.0966	–
M20	**50**	30	13,5	20	7,5	15,0	17	90	180,0	22710.0972	–
	80	30	13,5	20	28,0	15,0	17	90	254,0	22710.0974	–
	100	30	13,5	20	48,0	15,0	17	90	303,0	22710.0976	–
M24	**60**	36	15,8	24	9,0	18,0	19	120	324,0	22710.0982	–
	90	36	15,8	24	30,0	18,0	19	120	427,0	22710.0984	–
	120	36	15,8	24	60,0	18,0	19	120	536,0	22710.0986	–

[1] Statements on load capacity are not valid for the stainless steel type.

2

Ball-Ended Thrust Screws • headless, round ball

EH 22720.



PRODUCT DESCRIPTION

Ball-ended thrust screws with thermoplastic ball are used for pressure sensitive pieces. Also for positioning, clamping, tightening or supporting of surfaces that are not exactly parallel.

Material

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened
- Thermoplastic POM, white

Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

Special types on request.

References

Thread lock on request, please refer to appendix - Technical Data -

Further products

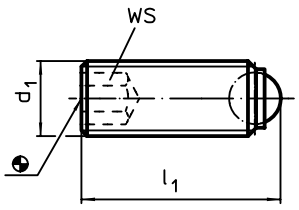
Ball-Ended Thrust Screws, headless, with fine-pitch thread . . . . . → p. 307
Ball-Ended Thrust Screws, headless, round ball and hexalobular socket. . . . → p. 309

MORE INFORMATION

Notes

Fully rotating ball.

DRAWING



ORDER INFORMATION

Dimensions			WS	Load capacity for static load[1] max.				Art. No.	
d_1	l_1	Ball			min.	max.		heat-treated steel	stainless steel
[mm]			[mm]	[kN]	[°C]		[g]		
round ball									
M 3	**5,0**	1,5	1,5	2,5	–	250	0,15	22720.0032	22720.0747
	7,5	1,5	1,5	2,5	–	250	0,22	22720.0033	22720.0748
	10,0	1,5	1,5	2,5	–	250	0,33	22720.0034	22720.0749
M 4	**6,0**	2,5	2,0	3,5	–	250	0,54	22720.0042	22720.0750
	8,0	2,5	2,0	3,5	–	250	0,61	22720.0043	22720.0752
	10,0	2,5	2,0	3,5	–	250	0,80	22720.0044	22720.0754
	12,0	2,5	2,0	3,5	–	250	0,69	22720.0045	22720.0756
	16,0	2,5	2,0	3,5	–	250	1,20	22720.0046	22720.0758
M 5	**8,0**	3,0	2,5	4,5	–	250	0,80	22720.0052	22720.0760
	10,0	3,0	2,5	4,5	–	250	1,06	22720.0053	22720.0761
	12,0	3,0	2,5	4,5	–	250	1,30	22720.0054	22720.0762
	16,0	3,0	2,5	4,5	–	250	1,53	22720.0055	22720.0763
	20,0	3,0	2,5	4,5	–	250	2,20	22720.0056	22720.0764
	25,0	3,0	2,5	4,5	–	250	2,80	22720.0058	22720.0765
M 6	**10,8**	4,0	3,0	9,0	–	250	1,53	22720.0062	22720.0770
	12,8	4,0	3,0	9,0	–	250	1,86	22720.0063	22720.0772
	16,8	4,0	3,0	9,0	–	250	2,50	22720.0064	22720.0774
	20,8	4,0	3,0	9,0	–	250	3,30	22720.0065	22720.0775
	25,8	4,0	3,0	9,0	–	250	4,00	22720.0066	22720.0776
M 8	**11,2**	5,5	4,0	15,0	–	250	2,60	22720.0081	22720.0780
	13,2	5,5	4,0	15,0	–	250	3,00	22720.0082	22720.0782
	17,2	5,5	4,0	15,0	–	250	4,20	22720.0083	22720.0783
	21,2	5,5	4,0	15,0	–	250	5,40	22720.0084	22720.0784
	26,2	5,5	4,0	15,0	–	250	6,90	22720.0085	22720.0785
	31,2	5,5	4,0	15,0	–	250	8,40	22720.0086	22720.0786

[1] Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls). →

Dimensions			WS	Load capacity for static load[1] max.				Art. No.	
d_1	l_1	Ball			min.	max.		heat-treated steel	stainless steel
	[mm]		[mm]	[kN]	[°C]		[g]		
M10	13,7	7,0	5,0	20,0	–	250	4,80	22720.0101	22720.0790
	17,7	7,0	5,0	20,0	–	250	6,20	22720.0102	22720.0792
	21,7	7,0	5,0	20,0	–	250	8,10	22720.0103	22720.0793
	26,7	7,0	5,0	20,0	–	250	11,00	22720.0104	22720.0794
	31,7	7,0	5,0	20,0	–	250	13,00	22720.0105	22720.0795
	36,7	7,0	5,0	20,0	–	250	15,00	22720.0106	22720.0796
	41,7	7,0	5,0	20,0	–	250	15,00	22720.0108	22720.0798
M12	18,0	8,5	6,0	30,0	–	250	9,30	22720.0121	22720.0800
	22,0	8,5	6,0	30,0	–	250	11,00	22720.0122	22720.0802
	27,0	8,5	6,0	30,0	–	250	15,00	22720.0123	22720.0803
	32,0	8,5	6,0	30,0	–	250	18,00	22720.0124	22720.0804
	42,0	8,5	6,0	30,0	–	250	25,00	22720.0126	22720.0806
	52,0	8,5	6,0	30,0	–	250	32,50	22720.0128	22720.0808
M16	23,3	12,0	8,0	60,0	–	250	22,00	22720.0161	22720.0810
	28,3	12,0	8,0	60,0	–	250	27,00	22720.0162	22720.0812
	38,3	12,0	8,0	60,0	–	250	40,00	22720.0164	22720.0814
	53,3	12,0	8,0	60,0	–	250	62,00	22720.0166	22720.0816
M20	34,2	15,0	10,0	90,0	–	250	52,00	22720.0202	–
	44,2	15,0	10,0	90,0	–	250	72,00	22720.0204	–
	54,2	15,0	10,0	90,0	–	250	93,00	22720.0205	–
	64,2	15,0	10,0	90,0	–	250	115,00	22720.0206	–
M24	39,7	18,0	12,0	120,0	–	250	87,00	22720.0242	–
	54,7	18,0	12,0	120,0	–	250	129,00	22720.0244	–
	84,7	18,0	12,0	120,0	–	250	222,00	22720.0246	–
round ball from thermoplastic									
M 4	6,0	2,5	2,0	0,3	-30	80	0,23	22720.0342	22720.0252
	8,0	2,5	2,0	0,3	-30	80	0,35	22720.0343	22720.0253
	10,0	2,5	2,0	0,3	-30	80	0,70	22720.0344	22720.0254
	12,0	2,5	2,0	0,3	-30	80	0,85	22720.0345	22720.0255
	16,0	2,5	2,0	0,3	-30	80	1,05	22720.0346	22720.0256
M 5	8,0	3,0	2,5	0,5	-30	80	0,76	22720.0352	22720.0262
	10,0	3,0	2,5	0,5	-30	80	0,75	22720.0353	22720.0263
	12,0	3,0	2,5	0,5	-30	80	1,20	22720.0354	22720.0264
	16,0	3,0	2,5	0,5	-30	80	1,43	22720.0355	22720.0265
	20,0	3,0	2,5	0,5	-30	80	1,90	22720.0356	22720.0266
	25,0	3,0	2,5	0,5	-30	80	2,50	22720.0358	22720.0267
M 6	10,8	4,0	3,0	0,9	-30	80	1,10	22720.0362	22720.0272
	12,8	4,0	3,0	0,9	-30	80	1,43	22720.0363	22720.0273
	16,8	4,0	3,0	0,9	-30	80	2,09	22720.0364	22720.0274
	20,8	4,0	3,0	0,9	-30	80	2,74	22720.0365	22720.0275
	25,8	4,0	3,0	0,9	-30	80	3,80	22720.0366	22720.0276
M 8	11,2	5,5	4,0	1,5	-30	80	1,92	22720.0381	22720.0281
	13,2	5,5	4,0	1,5	-30	80	2,40	22720.0382	22720.0282
	17,2	5,5	4,0	1,5	-30	80	3,60	22720.0383	22720.0283
	21,2	5,5	4,0	1,5	-30	80	4,60	22720.0384	22720.0284
	26,2	5,5	4,0	1,5	-30	80	6,30	22720.0385	22720.0285
	31,2	5,5	4,0	1,5	-30	80	7,80	22720.0386	22720.0286
M10	13,7	7,0	5,0	2,0	-30	80	3,50	22720.0401	22720.0291
	17,7	7,0	5,0	2,0	-30	80	4,80	22720.0402	22720.0292
	21,7	7,0	5,0	2,0	-30	80	6,80	22720.0403	22720.0293
	26,7	7,0	5,0	2,0	-30	80	9,40	22720.0404	22720.0294
	31,7	7,0	5,0	2,0	-30	80	12,00	22720.0405	22720.0295
	36,7	7,0	5,0	2,0	-30	80	14,00	22720.0406	22720.0296
	41,7	7,0	5,0	2,0	-30	80	17,00	22720.0408	22720.0297
M12	18,0	8,5	6,0	3,0	-30	80	6,80	22720.0421	22720.0301
	22,0	8,5	6,0	3,0	-30	80	9,20	22720.0422	22720.0302
	27,0	8,5	6,0	3,0	-30	80	12,00	22720.0423	22720.0303
	32,0	8,5	6,0	3,0	-30	80	16,00	22720.0424	22720.0304
	42,0	8,5	6,0	3,0	-30	80	23,00	22720.0426	22720.0306
	52,0	8,5	6,0	3,0	-30	80	30,00	22720.0428	22720.0308

[1] Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).

2

Ball-Ended Thrust Screws • headless, flat-faced ball

EH 22720.



PRODUCT DESCRIPTION

Ball-ended thrust screws with thermoplastic ball are used for pressure sensitive pieces.
For clamping and supporting of surfaces that are not exactly parallel.
Maximised load transmission due to moveable ball.

Material

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened
- Thermoplastic POM, red

Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

MORE INFORMATION

Notes

Fully rotating ball.
Special types on request.

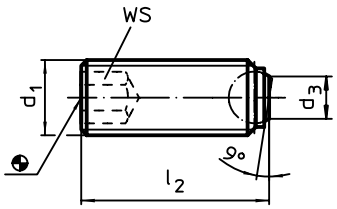
References

Thread lock on request, please refer to appendix - Technical Data -

Further products

Ball-Ended Thrust Screws, headless, ball protected against rotating . . . . . → p. 297
Ball-Ended Thrust Screws, headless, with fine-pitch thread . . . . . → p. 307
Ball-Ended Thrust Screws, headless, short. . . . . → p. 308
Ball-Ended Thrust Screws, headless, flat-faced ball and hexalobular socket . → p. 310

DRAWING



ORDER INFORMATION

Dimensions				WS	Load capacity for static load[1] max.				Art. No.	
d_1	l_2	d_3	Ball			min.	max.		heat-treated steel	stainless steel
[mm]				[mm]	[kN]	[°C]		[g]		
plain surface										
M 4	**5,6**	1,8	2,5	2,0	3,5	–	250	0,30	22720.0542	22720.0827
	7,6	1,8	2,5	2,0	3,5	–	250	0,40	22720.0543	22720.0828
	9,6	1,8	2,5	2,0	3,5	–	250	0,54	22720.0544	22720.0829
	11,6	1,8	2,5	2,0	3,5	–	250	0,91	22720.0545	22720.0830
	15,6	1,8	2,5	2,0	3,5	–	250	0,97	22720.0546	22720.0832
M 5	**7,5**	2,2	3,0	2,5	4,5	–	250	0,62	22720.0552	22720.0833
	9,5	2,2	3,0	2,5	4,5	–	250	0,84	22720.0553	22720.0834
	11,5	2,2	3,0	2,5	4,5	–	250	1,10	22720.0554	22720.0835
	15,5	2,2	3,0	2,5	4,5	–	250	1,70	22720.0555	22720.0836
	19,5	2,2	3,0	2,5	4,5	–	250	2,20	22720.0556	22720.0837
	24,5	2,2	3,0	2,5	4,5	–	250	2,60	22720.0558	22720.0838
M 6	**10,0**	3,2	4,0	3,0	9,0	–	250	1,50	22720.0562	22720.0840
	12,0	3,2	4,0	3,0	9,0	–	250	1,60	22720.0563	22720.0842
	16,0	3,2	4,0	3,0	9,0	–	250	2,50	22720.0564	22720.0844
	20,0	3,2	4,0	3,0	9,0	–	250	3,20	22720.0565	22720.0845
	25,0	3,2	4,0	3,0	9,0	–	250	3,80	22720.0566	22720.0846
M 8	**10,0**	4,5	5,5	4,0	15,0	–	250	2,60	22720.0581	22720.0850
	12,0	4,5	5,5	4,0	15,0	–	250	2,90	22720.0582	22720.0852
	16,0	4,5	5,5	4,0	15,0	–	250	4,00	22720.0583	22720.0853
	20,0	4,5	5,5	4,0	15,0	–	250	5,30	22720.0584	22720.0854
	25,0	4,5	5,5	4,0	15,0	–	250	6,80	22720.0585	22720.0855
	30,0	4,5	5,5	4,0	15,0	–	250	8,40	22720.0586	22720.0856

[1] Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls). →

Dimensions				WS	Load capacity for static load[1] max.				Art. No.	
d_1	l_2	d_3	Ball			min.	max.		heat-treated steel	stainless steel
[mm]				[mm]	[kN]	[°C]		[g]		
M10	12,0	6,0	7,0	5,0	20,0	–	250	4,70	22720.0601	22720.0860
	16,0	6,0	7,0	5,0	20,0	–	250	6,10	22720.0602	22720.0862
	20,0	6,0	7,0	5,0	20,0	–	250	7,90	22720.0603	22720.0863
	25,0	6,0	7,0	5,0	20,0	–	250	10,00	22720.0604	22720.0864
	30,0	6,0	7,0	5,0	20,0	–	250	13,00	22720.0605	22720.0865
	35,0	6,0	7,0	5,0	20,0	–	250	15,00	22720.0606	22720.0866
	40,0	6,0	7,0	5,0	20,0	–	250	18,00	22720.0608	22720.0868
M12	16,0	7,2	8,5	6,0	30,0	–	250	9,10	22720.0621	22720.0870
	20,0	7,2	8,5	6,0	30,0	–	250	11,00	22720.0622	22720.0872
	25,0	7,2	8,5	6,0	30,0	–	250	14,00	22720.0623	22720.0873
	30,0	7,2	8,5	6,0	30,0	–	250	18,00	22720.0624	22720.0874
	40,0	7,2	8,5	6,0	30,0	–	250	25,00	22720.0626	22720.0876
	50,0	7,2	8,5	6,0	30,0	–	250	32,00	22720.0628	22720.0878
M16	20,0	10,7	12,0	8,0	60,0	–	250	21,00	22720.0661	22720.0880
	25,0	10,7	12,0	8,0	60,0	–	250	26,00	22720.0662	22720.0882
	35,0	10,7	12,0	8,0	60,0	–	250	39,00	22720.0664	22720.0884
	50,0	10,7	12,0	8,0	60,0	–	250	60,00	22720.0666	22720.0886
M20	30,0	13,5	15,0	10,0	90,0	–	250	49,00	22720.0702	–
	40,0	13,5	15,0	10,0	90,0	–	250	70,00	22720.0704	–
	50,0	13,5	15,0	10,0	90,0	–	250	90,00	22720.0705	–
	60,0	13,5	15,0	10,0	90,0	–	250	111,00	22720.0706	–
M24	35,0	15,8	18,0	12,0	120,0	–	250	86,00	22720.0742	–
	50,0	15,8	18,0	12,0	120,0	–	250	128,00	22720.0744	–
	80,0	15,8	18,0	12,0	120,0	–	250	219,00	22720.0746	–
flat-faced ball from thermoplastic, plain surface (protected against rotating)										
M 4	5,9	1,8	2,5	2,0	0,3	-30	80	0,24	22720.0452	22720.0492
	7,9	1,8	2,5	2,0	0,3	-30	80	0,35	22720.0453	22720.0493
	9,9	1,8	2,5	2,0	0,3	-30	80	0,49	22720.0454	22720.0494
	11,9	1,8	2,5	2,0	0,3	-30	80	0,88	22720.0455	22720.0495
	15,9	1,8	2,5	2,0	0,3	-30	80	0,92	22720.0456	22720.0496
M 5	7,8	2,1	3,0	2,5	0,5	-30	80	0,80	22720.0462	22720.0502
	9,8	2,1	3,0	2,5	0,5	-30	80	0,74	22720.0463	22720.0503
	11,8	2,1	3,0	2,5	0,5	-30	80	1,23	22720.0464	22720.0504
	15,8	2,1	3,0	2,5	0,5	-30	80	1,40	22720.0465	22720.0505
	19,8	2,1	3,0	2,5	0,5	-30	80	2,00	22720.0466	22720.0506
	24,8	2,1	3,0	2,5	0,5	-30	80	2,70	22720.0467	22720.0507
M 6	10,3	3,0	4,0	3,0	0,9	-30	80	1,10	22720.0472	22720.0512
	12,3	3,0	4,0	3,0	0,9	-30	80	1,70	22720.0473	22720.0513
	16,3	3,0	4,0	3,0	0,9	-30	80	2,10	22720.0474	22720.0514
	20,3	3,0	4,0	3,0	0,9	-30	80	2,76	22720.0475	22720.0515
	25,3	3,0	4,0	3,0	0,9	-30	80	3,60	22720.0476	22720.0516
M 8	10,4	4,2	5,5	4,0	1,5	-30	80	1,80	22720.0482	22720.0522
	12,4	4,2	5,5	4,0	1,5	-30	80	2,20	22720.0483	22720.0523
	16,4	4,2	5,5	4,0	1,5	-30	80	3,40	22720.0484	22720.0524
	20,4	4,2	5,5	4,0	1,5	-30	80	4,80	22720.0485	22720.0525
	25,4	4,2	5,5	4,0	1,5	-30	80	6,10	22720.0486	22720.0526
	30,4	4,2	5,5	4,0	1,5	-30	80	7,60	22720.0487	22720.0527
ribbed surface										
M 8	10,0	4,5	5,5	4,0	15,0	–	250	2,80	22720.0891	–
	12,0	4,5	5,5	4,0	15,0	–	250	2,70	22720.0892	–
	16,0	4,5	5,5	4,0	15,0	–	250	3,90	22720.0893	–
	20,0	4,5	5,5	4,0	15,0	–	250	5,10	22720.0894	–
	25,0	4,5	5,5	4,0	15,0	–	250	6,60	22720.0895	–
	30,0	4,5	5,5	4,0	15,0	–	250	8,10	22720.0896	–
M10	12,0	6,0	7,0	5,0	20,0	–	250	4,70	22720.0901	–
	16,0	6,0	7,0	5,0	20,0	–	250	5,80	22720.0902	–
	20,0	6,0	7,0	5,0	20,0	–	250	7,70	22720.0903	–
	25,0	6,0	7,0	5,0	20,0	–	250	10,00	22720.0904	–
	30,0	6,0	7,0	5,0	20,0	–	250	13,00	22720.0905	–
	35,0	6,0	7,0	5,0	20,0	–	250	15,00	22720.0906	–
	40,0	6,0	7,0	5,0	20,0	–	250	17,00	22720.0908	–

[1] Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).

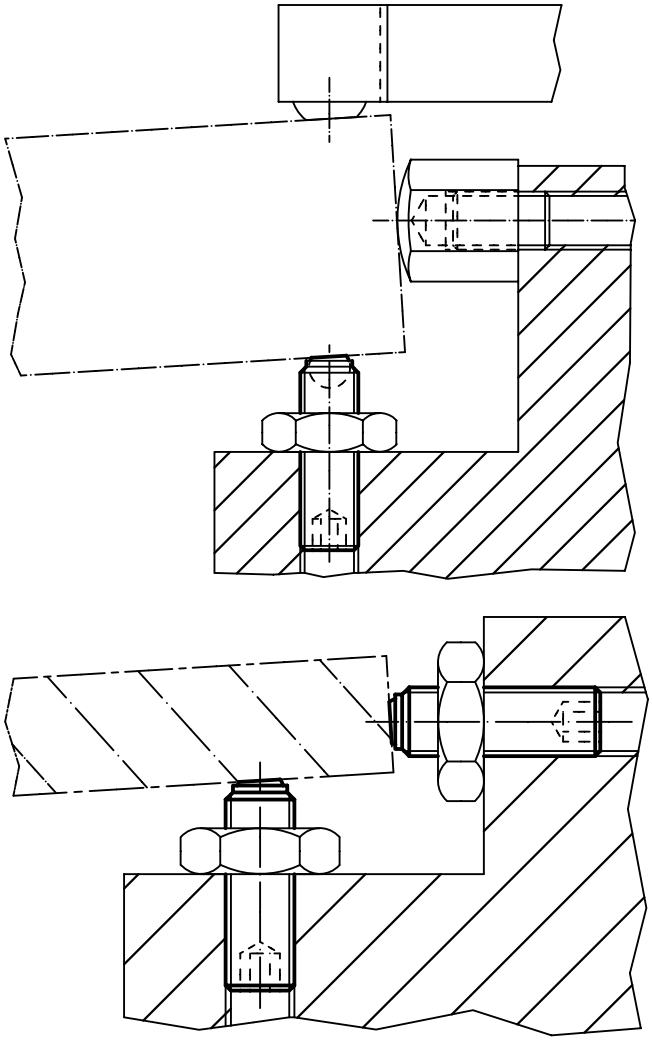
→

2

Dimensions				WS	Load capacity for static load[1] max.	min.	max.		Art. No.	
d_1	l_2	d_3	Ball						heat-treated steel	stainless steel
[mm]				[mm]	[kN]	[°C]		[g]		
M12	**16,0**	7,2	8,5	6,0	30,0	–	250	8,60	22720.0921	–
	20,0	7,2	8,5	6,0	30,0	–	250	11,00	22720.0922	–
	25,0	7,2	8,5	6,0	30,0	–	250	14,00	22720.0923	–
	30,0	7,2	8,5	6,0	30,0	–	250	18,00	22720.0924	–
	40,0	7,2	8,5	6,0	30,0	–	250	25,00	22720.0926	–
	50,0	7,2	8,5	6,0	30,0	–	250	32,00	22720.0928	–
M16	**20,0**	10,7	12,0	8,0	60,0	–	250	21,00	22720.0961	–
	25,0	10,7	12,0	8,0	60,0	–	250	26,00	22720.0962	–
	35,0	10,7	12,0	8,0	60,0	–	250	40,00	22720.0964	–
	50,0	10,7	12,0	8,0	60,0	–	250	60,00	22720.0966	–
M20	**30,0**	13,5	15,0	10,0	90,0	–	250	50,00	22720.0972	–
	40,0	13,5	15,0	10,0	90,0	–	250	70,00	22720.0974	–
	50,0	13,5	15,0	10,0	90,0	–	250	89,00	22720.0975	–
	60,0	13,5	15,0	10,0	90,0	–	250	111,00	22720.0976	–
M24	**35,0**	15,8	18,0	12,0	120,0	–	250	84,00	22720.0982	–
	50,0	15,8	18,0	12,0	120,0	–	250	125,00	22720.0984	–
	80,0	15,8	18,0	12,0	120,0	–	250	219,00	22720.0986	–

[1] Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).

APPLICATION EXAMPLE



Ball-Ended Thrust Screws • headless, with fine-pitch thread

EH 22720.



PRODUCT DESCRIPTION

Also for positioning, clamping, tightening or supporting of surfaces that are not exactly parallel.
The fine-pitch thread allows a precise adjustment.
Maximised load transmission due to moveable ball.

Material

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

MORE INFORMATION

Notes

Fully rotating ball.
Special types on request.

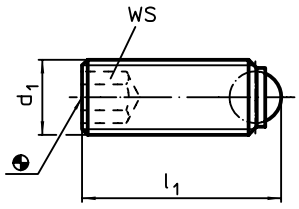
References

Thread lock on request, please refer to appendix - Technical Data -

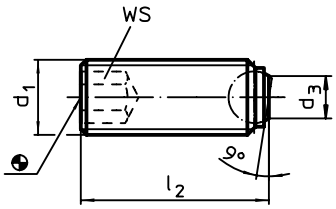
Further products

Ball-Ended Thrust Screws, headless, ball protected against rotating . . . . . → p. 297
Ball-Ended Thrust Screws, headless, round ball . . . . . → p. 302
Ball-Ended Thrust Screws, headless, flat-faced ball . . . . . → p. 304

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions					WS	Load capacity for static load[1] max.	max.		Art. No.	
d_1	l_1	l_2	d_3	Ball					heat-treated steel	stainless steel
[mm]					[mm]	[kN]	[°C]	[g]		
round ball – picture 1										
M4 x 0,35	6,0	–	–	2,5	2,0	3,5	250	0,4	22720.5030	22720.6030
	10,0	–	–	2,5	2,0	3,5	250	0,8	22720.5032	22720.6032
M4 x 0,5	6,0	–	–	2,5	2,0	3,5	250	0,4	22720.5040	22720.6040
	10,0	–	–	2,5	2,0	3,5	250	0,8	22720.5042	22720.6042
M5 x 0,5	8,0	–	–	3,0	2,5	4,5	250	0,7	22720.5050	22720.6050
	12,0	–	–	3,0	2,5	4,5	250	1,2	22720.5052	22720.6052
M6 x 0,5	10,8	–	–	4,0	3,0	9,0	250	1,3	22720.5060	22720.6060
	12,8	–	–	4,0	3,0	9,0	250	1,8	22720.5061	22720.6061
	16,8	–	–	4,0	3,0	9,0	250	2,4	22720.5062	22720.6062
	20,8	–	–	4,0	3,0	9,0	250	3,0	22720.5063	22720.6063
	25,8	–	–	4,0	3,0	9,0	250	3,0	22720.5064	22720.6064
M8 x 1	11,2	–	–	5,5	4,0	15,0	250	2,6	22720.5070	22720.6070
	21,2	–	–	5,5	4,0	15,0	250	5,4	22720.5073	22720.6073
flat-faced ball, plain surface – picture 2										
M4 x 0,35	–	5,6	1,3	2,5	2,0	3,5	250	0,4	22720.5230	22720.6230
		9,6	1,3	2,5	2,0	3,5	250	0,8	22720.5232	22720.6232
M4 x 0,5	–	5,6	1,3	2,5	2,0	3,5	250	0,4	22720.5240	22720.6240
		9,6	1,3	2,5	2,0	3,5	250	0,8	22720.5242	22720.6242
M5 x 0,5	–	7,5	2,2	3,0	2,5	4,5	250	0,7	22720.5250	22720.6250
		11,5	2,2	3,0	2,5	4,5	250	1,2	22720.5252	22720.6252
M6 x 0,5	–	10,0	3,2	4,0	3,0	9,0	250	1,3	22720.5260	22720.6260
		12,0	3,2	4,0	3,0	9,0	250	1,8	22720.5261	22720.6261
		16,0	3,2	4,0	3,0	9,0	250	2,4	22720.5262	22720.6262
		20,0	3,2	4,0	3,0	9,0	250	3,0	22720.5263	22720.6263
		25,0	3,2	4,0	3,0	9,0	250	3,0	22720.5264	22720.6264
M8 x 1	–	10,0	4,5	5,5	4,0	15,0	250	2,6	22720.5270	22720.6270
		20,0	4,5	5,5	4,0	15,0	250	5,3	22720.5273	22720.6273

[1] Statements on load capacity are not valid for the stainless steel type.

Ball-Ended Thrust Screws • headless, short

EH 22720.

2



PRODUCT DESCRIPTION

Ball-ended thrust screws, short execution, are particularly suitable for parallel shanks DIN 1835 E in combination, for instance, with Whistle Notch and Weldon Tool Holding Fixtures. For clamping and supporting of surfaces that are not exactly parallel.
Maximised load transmission due to moveable ball.

Material

Ball
- Ball-bearing steel, hardened

Screw
- Heat-treated steel, 1200 ±100 N/mm²

MORE INFORMATION

Notes

Fully rotating ball.

Special types on request.

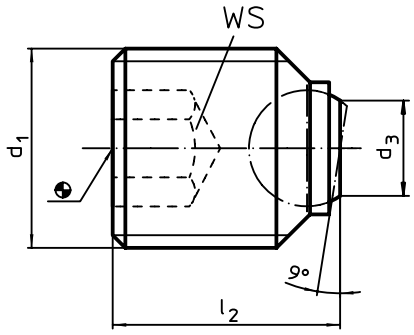
References

Thread lock on request, please refer to appendix - Technical Data -

Further products

Ball-Ended Thrust Screws, headless, flat-faced ball . . . . . → p. 304

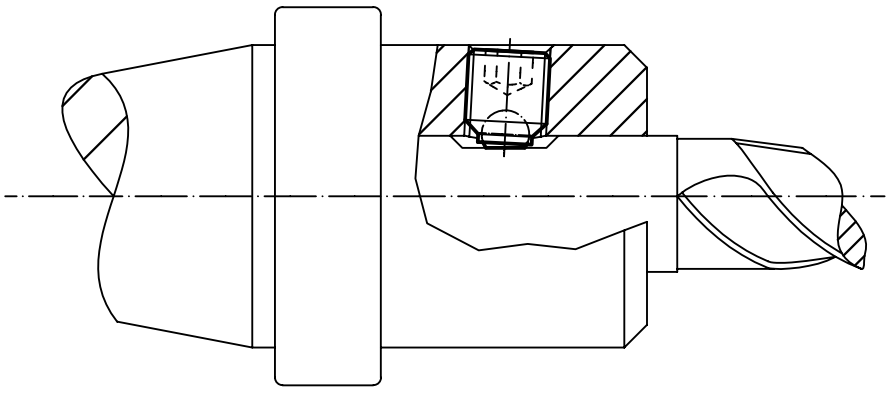
DRAWING



ORDER INFORMATION

Dimensions d1	l2	d3	Ball [mm]	WS [mm]	Load capacity for static load max. [kN]	[g]	Art. No.
flat-faced ball, plain surface, for parallel shanks DIN 1835 E							
M14	**16**	7,2	8,5	6	30	13	**22720.0641**
M16	**16**	7,2	8,5	8	30	16	**22720.0660**
M18 x 2	**20**	10,7	12,0	10	60	25	**22720.0682**
M20 x 2	**20**	10,7	12,0	10	60	32	**22720.0692**
	25	10,7	12,0	10	60	42	**22720.0693**
M24 x 2	**25**	13,5	15,0	12	90	59	**22720.0730**

APPLICATION EXAMPLE



Ball-Ended Thrust Screws • headless, round ball and hexalobular socket

EH 22720.



PRODUCT DESCRIPTION

Also for positioning, clamping, tightening or supporting of surfaces that are not exactly parallel.
The hexalobular drive enables an optimal load transmission. The driving forces are not transmitted by edges (e.g. with the internal hexagon) but by surfaces. Due to the optimal load transmission, the tool wear is reduced and, as a result of this, the tool life is increased.

Material

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

Special types on request.

References

Thread lock on request, please refer to appendix - Technical Data -

Further products

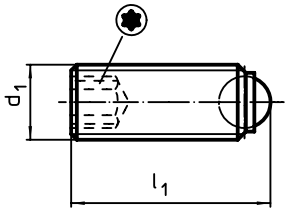
Ball-Ended Thrust Screws, headless, round ball . . . . . → p. 302

MORE INFORMATION

Notes

Fully rotating ball.

DRAWING



ORDER INFORMATION

Dimensions				Load capacity for static load[1] max.	max.		Art. No.	
d_1	l_1	Ball					heat-treated steel	stainless steel
[mm]				[kN]	[°C]	[g]		
round ball								
M4	**6,0**	2,5	8	3,5	250	0,5	22720.1042	22720.2042
	10,0	2,5	8	3,5	250	0,6	22720.1044	22720.2044
M5	**8,0**	3,0	10	4,5	250	0,8	22720.1052	22720.2052
	12,0	3,0	10	4,5	250	1,3	22720.1054	22720.2054
M6	**10,8**	4,0	15	9,0	250	1,5	22720.1062	22720.2062
	16,8	4,0	15	9,0	250	1,9	22720.1064	22720.2064

[1] Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).

2

Ball-Ended Thrust Screws • headless, flat-faced ball and hexalobular socket

EH 22720.



PRODUCT DESCRIPTION

For clamping and supporting of surfaces that are not exactly parallel.
The hexalobular drive enables an optimal load transmission. The driving forces are not transmitted by edges (e.g. with the internal hexagon) but by surfaces. Due to the optimal load transmission, the tool wear is reduced and, as a result of this, the tool life is increased.

Material

Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

Special types on request.

References

Thread lock on request, please refer to appendix - Technical Data -

Further products

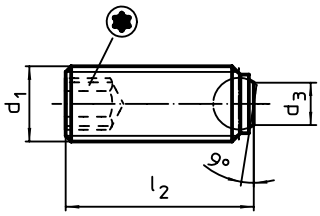
Ball-Ended Thrust Screws, headless, ball protected against rotating . . . . . → p. 297
Ball-Ended Thrust Screws, headless, flat-faced ball . . . . . → p. 304

MORE INFORMATION

Notes

Fully rotating ball.

DRAWING



ORDER INFORMATION

Dimensions					Load capacity for static load[1] max.	max.		Art. No.	
d_1	l_2	d_3	Ball					heat-treated steel	stainless steel
[mm]					[kN]	[°C]	[g]		
flat-faced ball, plain surface									
M4	**5,6**	1,8	2,5	8	3,5	250	0,5	22720.1542	22720.2542
	9,6	1,8	2,5	8	3,5	250	0,5	22720.1544	22720.2544
M5	**7,5**	2,2	3,0	10	4,5	250	0,6	22720.1552	22720.2552
	11,5	2,2	3,0	10	4,5	250	1,1	22720.1554	22720.2554
M6	**10,0**	3,2	4,0	15	9,0	250	1,5	22720.1562	22720.2562
	16,0	3,2	4,0	15	9,0	250	2,5	22720.1564	22720.2564

[1] Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).

Thrust Screws • with brass pad

EH 22760.



PRODUCT DESCRIPTION

Thrust screws can be used for a gentle clamping or pressing of thread spindles, axes, shafts and surface treated parts.

Material

Pad
- Brass

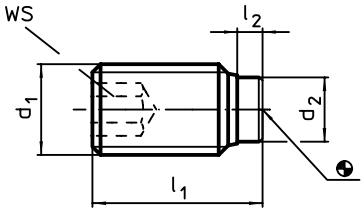
Screw
- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

MORE INFORMATION

Further products

Thrust Screws, with plastic pad . . . . . → p. 312

DRAWING



ORDER INFORMATION

Dimensions				WS	max.		Art. No.	
d_1	l_1	l_2	d_2				heat-treated steel	stainless steel
[mm]				[mm]	[°C]	[g]		
M 3	5,0	1,0	1,5	1,5	250	0,2	22760.0032	22760.0432
	7,5	1,0	1,5	1,5	250	0,3	22760.0034	22760.0434
	10,0	1,0	1,5	1,5	250	0,5	22760.0036	22760.0436
M 4	5,0	1,0	2,5	2,0	250	0,3	22760.0040	–
	6,5	1,2	2,5	2,0	250	0,3	22760.0042	22760.0442
	10,5	1,2	2,5	2,0	250	0,8	22760.0044	22760.0444
	16,5	1,2	2,5	2,0	250	1,2	22760.0046	22760.0446
M 5	6,0	1,0	3,0	2,5	250	0,6	22760.0050	–
	8,5	1,3	3,0	2,5	250	0,9	22760.0052	22760.0452
	12,5	1,3	3,0	2,5	250	1,4	22760.0054	22760.0454
	20,5	1,3	3,0	2,5	250	2,1	22760.0056	22760.0456
M 6	6,0	1,0	4,0	3,0	250	0,9	22760.0060	–
	11,5	1,9	4,0	3,0	250	1,7	22760.0062	22760.0462
	17,5	1,9	4,0	3,0	250	2,7	22760.0064	22760.0464
	26,5	1,9	4,0	3,0	250	4,2	22760.0066	22760.0466
M 8	8,0	1,4	5,5	4,0	250	2,2	22760.0080	–
	12,0	2,5	5,5	4,0	250	3,0	22760.0082	22760.0482
	22,0	2,5	5,5	4,0	250	5,8	22760.0086	22760.0486
	32,0	2,5	5,5	4,0	250	8,9	22760.0088	22760.0488
M10	10,0	1,5	7,0	5,0	250	4,3	22760.0100	–
	14,0	2,7	7,0	5,0	250	5,6	22760.0102	22760.0502
	18,0	2,7	7,0	5,0	250	6,7	22760.0104	22760.0504
	27,0	2,7	7,0	5,0	250	11,0	22760.0106	22760.0506
	37,0	2,7	7,0	5,0	250	16,0	22760.0108	22760.0508
M12	12,0	1,5	8,5	6,0	250	7,5	22760.0120	–
	18,5	3,4	8,5	6,0	250	10,0	22760.0122	22760.0522
	22,5	3,4	8,5	6,0	250	12,0	22760.0124	22760.0524
	32,5	3,4	8,5	6,0	250	20,0	22760.0126	22760.0526
	42,5	3,4	8,5	6,0	250	27,0	22760.0128	22760.0528

2

Thrust Screws • with plastic pad

EH 22760.



PRODUCT DESCRIPTION

Thrust screws can be used for a gentle clamping or pressing of thread spindles, axes, shafts and surface treated parts.

Material

Pad
- Thermoplastic POM, white

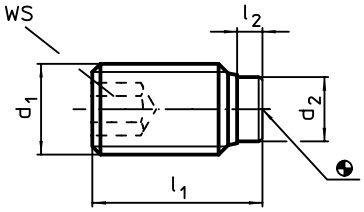
Screw
- Steel, blackened
- Stainless steel 1.4305

MORE INFORMATION

Further products

Thrust Screws, with brass pad . . . . . → p. 311

DRAWING



ORDER INFORMATION

Dimensions				WS				Art. No.	
d_1	l_1 ~	l_2 ~	d_2		min.	max.		stainless steel	steel
[mm]				[mm]	[°C]		[g]		
M 3	3,8	0,8	1,5	1,5	-30	80	0,2	22760.0632	–
	5,8	0,8	1,5	1,5	-30	80	0,3	22760.0634	–
	8,8	0,8	1,5	1,5	-30	80	0,4	22760.0636	–
	10,8	0,8	1,5	1,5	-30	80	0,5	22760.0638	–
M 4	7,0	1,0	2,0	2,0	-30	80	0,3	22760.0642	22760.0242
	9,0	1,0	2,0	2,0	-30	80	0,4	22760.0643	22760.0243
	11,0	1,0	2,0	2,0	-30	80	0,6	22760.0644	22760.0244
	13,0	1,0	2,0	2,0	-30	80	0,7	22760.0645	22760.0245
	17,0	1,0	2,0	2,0	-30	80	1,0	22760.0646	22760.0246
	21,0	1,0	2,0	2,0	-30	80	1,3	–	22760.0247
M 5	9,0	1,0	3,0	2,5	-30	80	0,7	22760.0652	22760.0252
	11,0	1,0	3,0	2,5	-30	80	0,8	22760.0653	22760.0253
	13,0	1,0	3,0	2,5	-30	80	1,0	22760.0654	22760.0254
	17,0	1,0	3,0	2,5	-30	80	1,2	22760.0655	22760.0255
	21,0	1,0	3,0	2,5	-30	80	2,0	22760.0656	22760.0256
	26,0	1,0	3,0	2,5	-30	80	2,6	–	22760.0257
M 6	11,3	1,3	3,5	3,0	-30	80	1,2	22760.0662	22760.0262
	13,3	1,3	3,5	3,0	-30	80	1,5	22760.0663	22760.0263
	17,3	1,3	3,5	3,0	-30	80	2,2	22760.0664	22760.0264
	21,3	1,3	3,5	3,0	-30	80	2,8	22760.0665	22760.0265
	26,3	1,3	3,5	3,0	-30	80	3,8	22760.0666	22760.0266
	33,3	1,3	3,5	3,0	-30	80	4,9	22760.0667	22760.0267
	41,3	1,3	3,5	3,0	-30	80	6,3	–	22760.0268
	51,3	1,3	3,5	3,0	-30	80	7,9	–	22760.0270
M 8	13,6	1,6	5,0	4,0	-30	80	2,6	22760.0682	22760.0282
	17,6	1,6	5,0	4,0	-30	80	3,6	22760.0683	22760.0283
	21,6	1,6	5,0	4,0	-30	80	5,0	22760.0684	22760.0284
	26,6	1,6	5,0	4,0	-30	80	6,4	22760.0685	22760.0285
	33,6	1,6	5,0	4,0	-30	80	8,5	22760.0686	22760.0286
	41,6	1,6	5,0	4,0	-30	80	11,0	22760.0687	22760.0287
	51,6	1,6	5,0	4,0	-30	80	14,0	–	22760.0288
	64,6	1,6	5,0	4,0	-30	80	18,0	–	22760.0290

→

Dimensions				WS				Art. No.	
d_1	l_1 ~	l_2 ~	d_2		min.	max.		stainless steel	steel
[mm]				[mm]	[°C]		[g]		
M10	**17,9**	1,9	6,5	5,0	-30	80	5,2	22760.0702	22760.0302
	21,9	1,9	6,5	5,0	-30	80	7,1	22760.0703	22760.0303
	26,9	1,9	6,5	5,0	-30	80	9,9	22760.0704	22760.0304
	33,9	1,9	6,5	5,0	-30	80	13,0	22760.0705	22760.0305
	41,9	1,9	6,5	5,0	-30	80	17,0	22760.0706	22760.0306
	51,9	1,9	6,5	5,0	-30	80	22,0	22760.0707	22760.0307
	64,9	1,9	6,5	5,0	-30	80	28,0	–	22760.0308
	81,9	1,9	6,5	5,0	-30	80	36,0	–	22760.0310
M12	**22,1**	2,1	8,0	6,0	-30	80	9,0	22760.0722	22760.0322
	27,1	2,1	8,0	6,0	-30	80	10,0	22760.0723	22760.0323
	34,1	2,1	8,0	6,0	-30	80	19,0	22760.0724	22760.0324
	42,1	2,1	8,0	6,0	-30	80	24,0	22760.0725	22760.0325
	52,1	2,1	8,0	6,0	-30	80	31,0	22760.0726	22760.0326
	65,1	2,1	8,0	6,0	-30	80	40,0	22760.0727	22760.0327
	82,1	2,1	8,0	6,0	-30	80	51,0	–	22760.0330
	102,1	2,1	8,0	6,0	-30	80	66,0	–	22760.0332

SELF-ALIGNING PADS

NO TRICK TO PARALLEL

Offering maximum versatility, a self-aligning pad can handle the most varied applications across a wide range of industries: fastening, clamping or supporting all sorts of surfaces - including non-parallel ones.
A self-aligning pad is used as a stop, support, plunger and can also be installed in clamping elements.The extensive product range includes various types ex stock:

www.halder.com/
SelfAligningPads-Video

SELF-ALIGNING PADS

- ribbed / plain ball
- with hard metall ball, ribbed
- adjustable, with ribbed / plain ball
- made from steel or stainless steel
- optionally self-resetting



Self-Aligning Pads

EH 22730.



PRODUCT DESCRIPTION

Self-aligning pads are used as stop, support and thrust pad and are suitable for installation in clamping elements.

Material

Ball
- Ball-bearing steel, hardened, bright
- Stainless steel 1.3541, nickel-plated

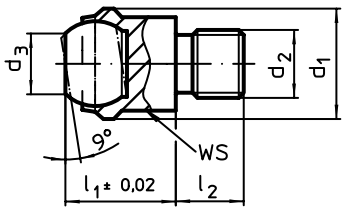
Body
- Heat-treated steel, tempered, phosphated
- Stainless steel 1.4057, heat-treated

MORE INFORMATION

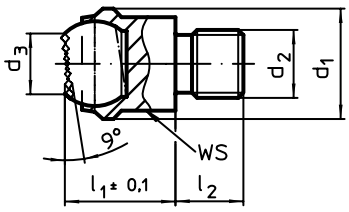
Notes

Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.

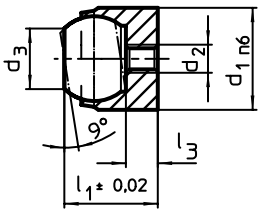
DRAWING



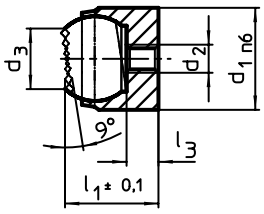
picture 1



picture 2



picture 3



picture 4

ORDER INFORMATION

Dimensions							Location hole		WS	Load capacity for static load max.	Tightening torque max.		Art. No.	
d_1	d_2	d_3	l_1	l_2 -0,5	l_3 max.	Ball	Ø H7	Depth min.					heat-treated steel	stainless steel
[mm]							[mm]		[mm]	[kN]	[Nm]	[g]		
with male thread, flat-faced ball, plain surface – picture 1														
13	M 6	7,2	13	8	–	10	–	–	11	10	10,0	12	22730.0012	22730.0112
	M 8	7,2	13	8	–	10	–	–	11	10	25,0	13	22730.0013	22730.0113
20	M 8	10,5	18	10	–	16	–	–	17	25	25,0	39	22730.0018	22730.0118
	M10	10,5	18	10	–	16	–	–	17	25	46,0	41	22730.0019	22730.0119
	M12	10,5	18	12	–	16	–	–	17	25	82,0	44	22730.0020	22730.0120
30	M16	20,0	27	16	–	25	–	–	27	90	206,0	151	22730.0030	22730.0130
50	M20	34,5	35	20	–	40	–	–	41	165	407,0	490	22730.0050	22730.0150
	M24	34,5	35	24	–	40	–	–	41	165	698,0	526	22730.0060	22730.0160
with male thread, flat-faced ball, ribbed surface – picture 2														
13	M 6	7,2	13	8	–	10	–	–	11	10	10,0	12	22730.0312	–
	M 8	7,2	13	8	–	10	–	–	11	10	25,0	13	22730.0313	–
20	M 8	10,5	18	10	–	16	–	–	17	25	25,0	38	22730.0318	–
	M10	10,5	18	10	–	16	–	–	17	25	46,0	40	22730.0319	–
	M12	10,5	18	12	–	16	–	–	17	25	82,0	43	22730.0320	–
30	M16	20,0	27	16	–	25	–	–	27	90	206,0	150	22730.0330	–
50	M20	34,5	35	20	–	40	–	–	41	165	407,0	486	22730.0350	–
	M24	34,5	35	24	–	40	–	–	41	165	698,0	521	22730.0360	–
with locating hole, flat-faced ball, plain surface – picture 3														
12 n6	M 3	7,2	11	–	3,2	10	12	6	–	10[1)]	1,3	8	22730.0412	22730.0452
18 n6	M 4	10,5	17	–	4,0	16	18	8	–	25[1)]	2,9	29	22730.0418	22730.0458
28 n6	M 5	20,0	25	–	5,5	25	28	13	–	90[1)]	6,0	109	22730.0428	22730.0468
for locating hole, flat-faced ball, ribbed surface – picture 4														
12 n6	M 3	7,2	11	–	3,2	10	12	6	–	10[1)]	1,3	8	22730.0712	–
18 n6	M 4	10,5	17	–	4,0	16	18	8	–	25[1)]	2,9	29	22730.0718	–
28 n6	M 5	20,0	25	–	5,5	25	28	13	–	90[1)]	6,0	108	22730.0728	–

[1)] Applies only when the minimum bore depth is kept to.

2

Self-Aligning Pads • with hard metal ball, ribbed

EH 22730.



PRODUCT DESCRIPTION

Especially designed for cast parts (hard casting crust). To be used as support, thrust pad and for build into clamping elements.

Material

Ball
- Hard metal, ribbed, nickel-plated

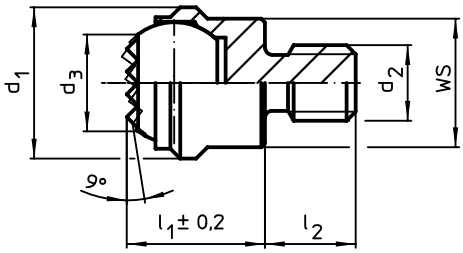
Body
- Heat-treated steel, tempered, phosphated
- Stainless steel 1.4057, heat-treated

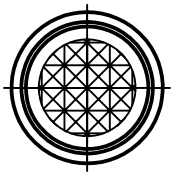
MORE INFORMATION

Notes

Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.

DRAWING

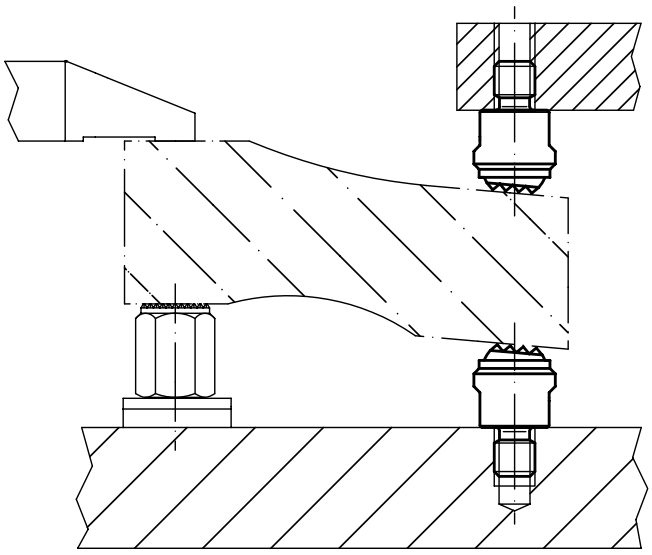




ORDER INFORMATION

Dimensions						WS	Load capacity for static load max.	Tightening torque max.		Art. No.	
d_1	d_2	d_3	l_1 ±0,2	l_2 -0,5	Ball					heat-treated steel	stainless steel
[mm]						[mm]	[kN]	[Nm]	[g]		
with male thread, flat-faced ball, ribbed surface											
13	**M 6**	8,3	13	8	10	11	10	10	14	22730.0362	22730.0390
	M 8	8,3	13	8	10	11	10	25	16	22730.0363	22730.0392
20	**M 8**	13,2	18	10	16	17	25	25	49	22730.0378	22730.0394
	M10	13,2	18	10	16	17	25	46	51	22730.0379	22730.0396
	M12	13,2	18	12	16	17	25	82	54	22730.0380	22730.0398
30	**M16**	20,0	27	16	25	27	90	206	190	22730.0381	22730.0399
50	**M20**	34,5	35	20	40	41	165	407	639	22730.0382	22730.0400
	M24	34,5	35	24	40	41	165	698	673	22730.0383	22730.0401

APPLICATION EXAMPLE



Self-Aligning Pads • self-resetting

EH 22731.



PRODUCT DESCRIPTION

Self-aligning pads are used as stop, support and thrust pad and are suitable for installation in clamping elements.
By resetting to the parallel position the contact point of the self-aligning pad provides a defined initial position, thus preventing the pad clamping in an oblique position when inserting the workpiece.

Material

Spring element
- Thermoplastic PUR

Ball
- Ball-bearing steel, hardened, bright
- Stainless steel 1.3541, nickel-plated

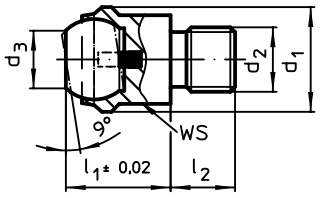
Body
- Heat-treated steel, tempered, phosphated
- Stainless steel 1.4057, heat-treated

MORE INFORMATION

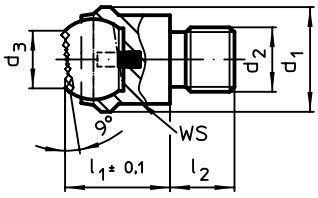
Notes

Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.

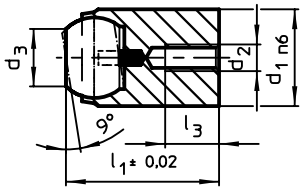
DRAWING



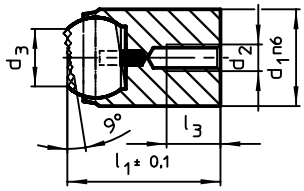
picture 1



picture 2



picture 3



picture 4

ORDER INFORMATION

Dimensions							Location hole		WS	Load capacity for static load max.	Tightening torque max.		Art. No.	
d_1	d_2	d_3	l_1	l_2 -0,5	l_3 max.	Ball	Ø H7	Depth min.					heat-treated steel	stainless steel
[mm]							[mm]		[mm]	[kN]	[Nm]	[g]		
with male thread, flat-faced ball, plain surface – picture 1														
13	M 6	7,2	13	8	–	10	–	–	11	10	10,0	13	22731.0012	22731.0112
	M 8	7,2	13	8	–	10	–	–	11	10	25,0	14	22731.0013	22731.0113
20	M 8	10,5	18	10	–	16	–	–	17	25	25,0	39	22731.0018	22731.0118
	M10	10,5	18	10	–	16	–	–	17	25	46,0	40	22731.0019	22731.0119
	M12	10,5	18	12	–	16	–	–	17	25	82,0	44	22731.0020	22731.0120
30	M16	20,0	27	16	–	25	–	–	27	90	206,0	153	22731.0030	22731.0130
50	M20	34,5	35	20	–	40	–	–	41	165	407,0	491	22731.0050	22731.0150
	M24	34,5	35	24	–	40	–	–	41	165	698,0	526	22731.0060	22731.0160
with male thread, flat-faced ball, ribbed surface – picture 2														
13	M 6	7,2	13	8	–	10	–	–	11	10	10,0	13	22731.0312	–
	M 8	7,2	13	8	–	10	–	–	11	10	25,0	14	22731.0313	–
20	M 8	10,5	18	10	–	16	–	–	17	25	25,0	39	22731.0318	–
	M10	10,5	18	10	–	16	–	–	17	25	46,0	40	22731.0319	–
	M12	10,5	18	12	–	16	–	–	17	25	82,0	44	22731.0320	–
30	M16	20,0	27	16	–	25	–	–	27	90	206,0	152	22731.0330	–
50	M20	34,5	35	20	–	40	–	–	41	165	407,0	487	22731.0350	–
	M24	34,5	35	24	–	40	–	–	41	165	698,0	521	22731.0360	–

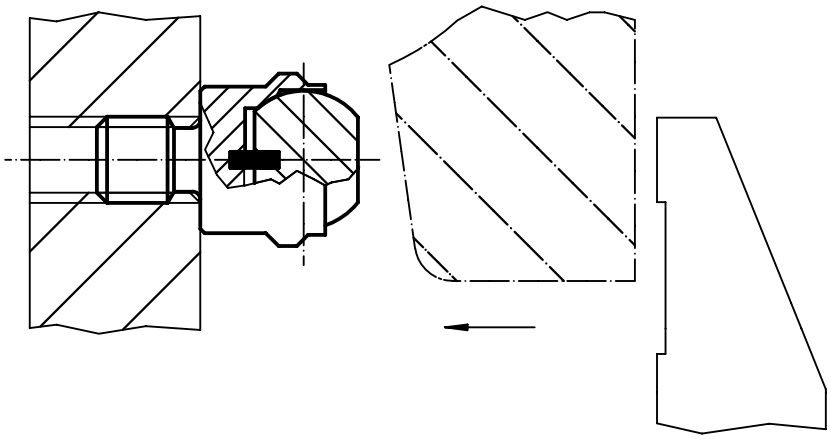
[1] Applies only when the minimum bore depth is kept to.

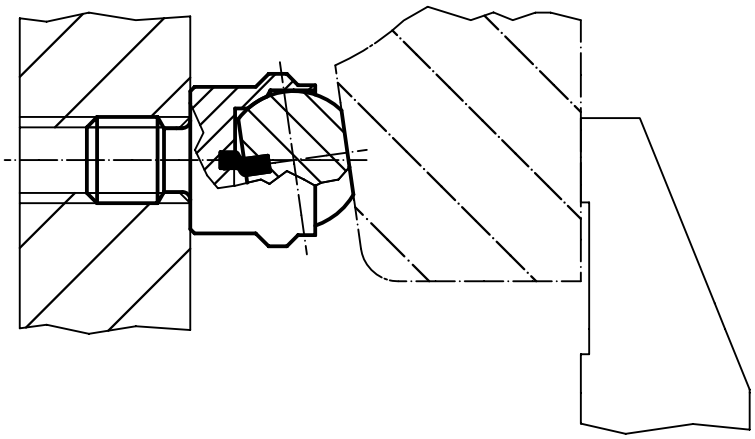
→

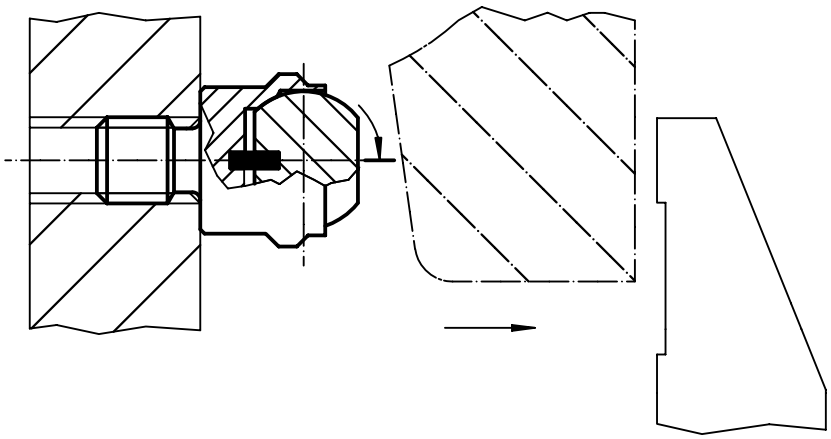
Dimensions							Location hole		WS	Load capacity for static load max.	Tightening torque max.		Art. No.	
d_1	d_2	d_3	l_1	l_2 -0,5	l_3 max.	Ball	Ø H7	Depth min.					heat-treated steel	stainless steel
[mm]							[mm]		[mm]	[kN]	[Nm]	[g]		
with locating hole, flat-faced ball, plain surface – picture 3														
12 n6	**M 3**	7,2	17	–	3,2	10	12	12	–	10[1)]	1,3	14	22731.0412	22731.0452
18 n6	**M 4**	10,5	23	–	4,0	16	18	14	–	25[1)]	2,9	40	22731.0418	22731.0458
28 n6	**M 5**	20,0	34	–	6,0	25	28	22	–	90[1)]	6,0	150	22731.0428	22731.0468
for locating hole, flat-faced ball, ribbed surface – picture 4														
12 n6	**M 3**	7,2	17	–	3,2	10	12	12	–	10[1)]	1,3	14	22731.0712	–
18 n6	**M 4**	10,5	23	–	4,0	16	18	14	–	25[1)]	2,9	40	22731.0718	–
28 n6	**M 5**	20,0	34	–	6,0	25	28	22	–	90[1)]	6,0	150	22731.0728	–

[1)] Applies only when the minimum bore depth is kept to.

APPLICATION EXAMPLE







Self-Aligning Pads • with hard metal ball, ribbed and self-resetting

EH 22731.



PRODUCT DESCRIPTION

Especially designed for cast parts (hard casting crust). To be used as support, thrust pad and for build into clamping elements.
By resetting to the parallel position the contact point of the self-aligning pad provides a defined initial position, thus preventing the pad clamping in an oblique position when inserting the workpiece.

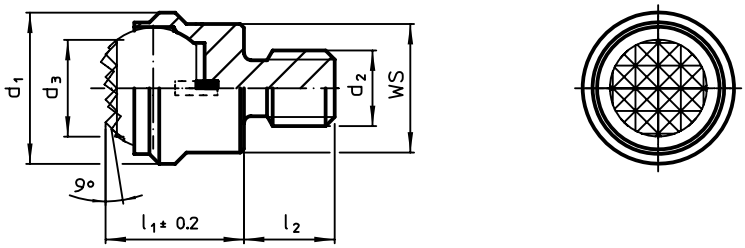
Material

Spring element
- Thermoplastic PUR

Ball
- Hard metal, ribbed, nickel-plated

Body
- Heat-treated steel, tempered, phosphated
- Stainless steel 1.4057, heat-treated

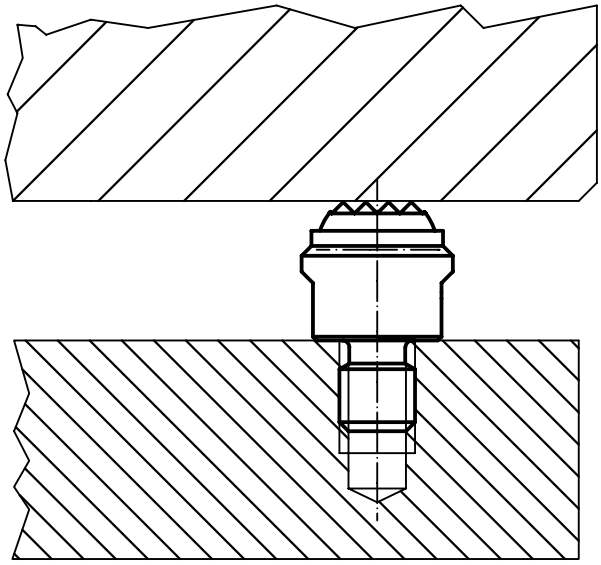
DRAWING



ORDER INFORMATION

Dimensions						WS	Load capacity for static load max.	Tightening torque max.		Art. No.	
d_1	d_2	d_3	l_1 ±0,2	l_2 -0,5	Ball					heat-treated steel	stainless steel
[mm]						[mm]	[kN]	[Nm]	[g]		
with male thread, flat-faced ball, ribbed surface											
13	M 6	8,3	13	8	10	11	10	10	14	22731.0362	22731.0390
	M 8	8,3	13	8	10	11	10	25	16	22731.0363	22731.0392
20	M 8	13,2	18	10	16	17	25	25	48	22731.0378	22731.0394
	M10	13,2	18	10	16	17	25	46	50	22731.0379	22731.0396
	M12	13,2	18	12	16	17	25	82	54	22731.0380	22731.0398
30	M16	20,0	27	16	25	27	90	206	190	22731.0381	22731.0399
50	M20	34,5	35	20	40	41	165	407	639	22731.0382	22731.0400
	M24	34,5	35	24	40	41	165	698	673	22731.0383	22731.0401

APPLICATION EXAMPLE



2

Self-Aligning Pads • adjustable

EH 22740.



PRODUCT DESCRIPTION

Self-aligning pads are used as stop, support and thrust pad and are suitable for installation in clamping elements.

Material

Ball
- Ball-bearing steel, hardened, bright
- Stainless steel 1.3541, nickel-plated

Body
- Heat-treated steel, tempered, phosphated
- Stainless steel 1.4057, heat-treated

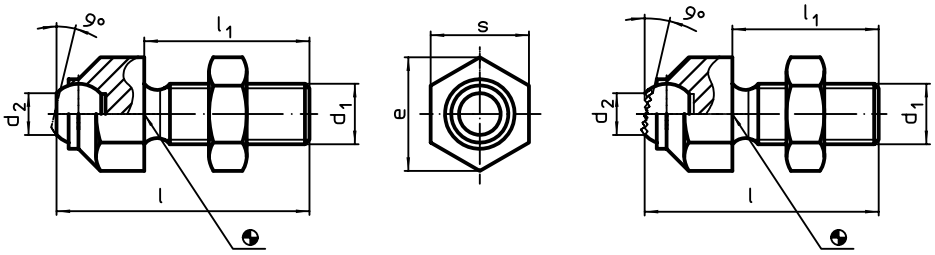
Nut
- Steel, blackened (ISO 4035)
- Stainless steel

MORE INFORMATION

Notes

Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.
Special types on request.

DRAWING

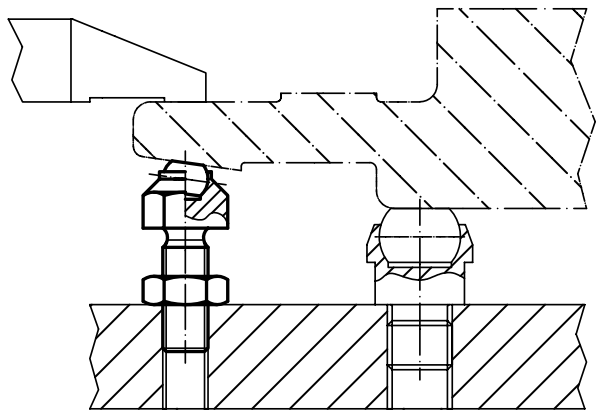


picture 1 picture 2

ORDER INFORMATION

Dimensions							Load capacity for static load max.	Tightening torque max.		Art. No.	
s	d_1	l	l_1	d_2	e	Ball				heat-treated steel	stainless steel
[mm]							[kN]	[Nm]	[g]		
with flat-faced ball, plain surface – picture 1											
13	**M 8**	36,6	25	5,8	14,5	8,5	8	25	20	22740.0013	22740.0113
17	**M10**	45,7	30	8,6	19,0	12,0	8	46	44	22740.0016	22740.0116
	M12	50,7	35	8,6	19,0	12,0	15	82	56	22740.0017	22740.0117
24	**M16**	60,7	40	10,5	27,0	16,0	25	206	128	22740.0024	22740.0124
30	**M20**	77,3	50	20,0	33,0	25,0	90	407	275	22740.0030	22740.0130
36	**M24**	100,0	70	20,0	40,0	25,0	90	698	472	22740.0036	22740.0136
46	**M30 x 1,5**	100,0	65	34,6	51,0	40,0	165	1355	772	22740.0046	22740.0146
with flat-faced ball, ribbed surface – picture 2											
13	**M 8**	36,6	25	5,8	14,5	8,5	8	25	20	22740.0313	–
17	**M10**	45,7	30	8,6	19,0	12,0	8	46	44	22740.0316	–
	M12	50,7	35	8,6	19,0	12,0	15	82	56	22740.0317	–
24	**M16**	60,7	40	10,5	27,0	16,0	25	206	128	22740.0324	–
30	**M20**	77,3	50	20,0	33,0	25,0	90	407	274	22740.0330	–
36	**M24**	100,0	70	20,0	40,0	25,0	90	698	435	22740.0336	–
46	**M30 x 1,5**	100,0	65	34,6	51,0	40,0	165	1355	772	22740.0346	–

APPLICATION EXAMPLE



Self-Aligning Pads • adjustable, self-resetting

EH 22741.



PRODUCT DESCRIPTION

Self-aligning pads are used as stop, support and thrust pad and are suitable for installation in clamping elements.
By resetting to the parallel position the contact point of the self-aligning pad provides a defined initial position, thus preventing the pad clamping in an oblique position when inserting the workpiece.

Material

Spring element
- Thermoplastic PUR

Ball
- Ball-bearing steel, hardened, bright
- Stainless steel 1.3541, nickel-plated

Body
- Heat-treated steel, tempered, phosphated
- Stainless steel 1.4057, heat-treated

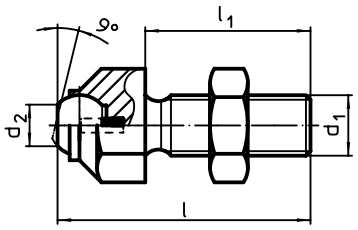
Nut
- Steel, blackened (ISO 4035)
- Stainless steel

MORE INFORMATION

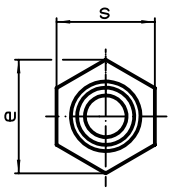
Notes

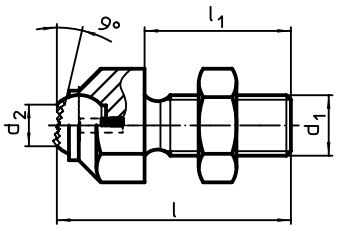
Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.
Special types on request.

DRAWING



picture 1





picture 2

ORDER INFORMATION

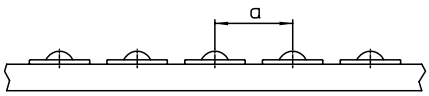
Dimensions							Load capacity for static load max.	Tightening torque max.		Art. No.	
s	d_1	l	l_1	d_2	e	Ball				heat-treated steel	stainless steel
[mm]							[kN]	[Nm]	[g]		
with flat-faced ball, plain surface – picture 1											
13	M 8	36,6	25	5,8	14,5	8,5	8	25	19	22741.0013	22741.0113
17	M10	45,7	30	8,6	19,0	12,0	8	46	43	22741.0016	22741.0116
	M12	50,7	35	8,6	19,0	12,0	15	82	55	22741.0017	22741.0117
24	M16	60,7	40	10,5	27,0	16,0	25	206	124	22741.0024	22741.0124
30	M20	77,3	50	20,0	33,0	25,0	90	407	267	22741.0030	22741.0130
36	M24	100,0	70	20,0	40,0	25,0	90	698	457	22741.0036	22741.0136
46	M30 x 1,5	100,0	65	34,6	51,0	40,0	165	1355	797	22741.0046	22741.0146
with flat-faced ball, ribbed surface – picture 2											
13	M 8	36,6	25	5,8	14,5	8,5	8	25	19	22741.0313	–
17	M10	45,7	30	8,6	19,0	12,0	8	46	43	22741.0316	–
	M12	50,7	35	8,6	19,0	12,0	15	82	55	22741.0317	–
24	M16	60,7	40	10,5	27,0	16,0	25	206	124	22741.0324	–
30	M20	77,3	50	20,0	33,0	25,0	90	407	267	22741.0330	–
36	M24	100,0	70	20,0	40,0	25,0	90	698	457	22741.0336	–
46	M30 x 1,5	100,0	65	34,6	51,0	40,0	165	1355	797	22741.0346	–







TECHNICAL DATA



ARRANGEMENT OF BALL TRANSFER UNITS

How the ball transfer units should be arranged depends on the under-surface of the load to be transported. For loads with a uniform, even bottom surface, e.g. packing cases, the distance between the ball transfer units is calculated by dividing the smallest dimension by 2.5.

Example: under-surface of the load to be transported = 500 x 1000 mm
Distance between ball transfer units:

$$a = \frac{500\ \text{mm}}{2{,}5} = 200\ \text{mm}$$

CONVEYING SPEED AND LOAD CAPACITY

The maximum conveying speed allowed amounts to 2 m/s. The load capacities specified apply to any mounting position and are based on 106 rotations of the load ball.
With the units being used over a longer time at speeds exceeding 1 m/s, an increase in temperature as well as a reduction in travel life must be expected depending on the load, in particular with sizes 22750.0016/22750.0036.

Computation of Travel Life

$$L = \left(\frac{C}{F}\right)^3 10^6\ \text{rotations}$$

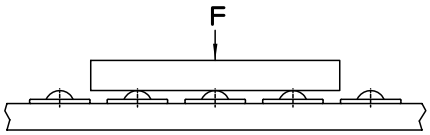
L = Travel life
C = Load capacity (N)
F = Load (N)

TEMPERATURE RESISTANCE

Ball transfer units with felt seals are temperatureresistant up to a permanent operating temperature of 100 °C.
At temperatures exceeding 100 °C, only non-galvanized ball transfer units with steel load ball and without felt seal should be used. Observe the reduction in load capacity! The load capacity should be multiplied with the temperature factor (see table).

Attention:
Only use high-temperature lubricants!
Observe the manufacturers' instructions!
If necessary, wash-off any present lubricating oil.

Temperature	Temperature Factor
°C	fT
125	0,9
150	0,8
175	0,7
200	0,5



LOAD DETERMINATION OF BALL TRANSFER UNITS

To determine the load of a ball transfer unit, the weight of the article to be conveyed should be divided by 3.
If the height tolerance of the load balls is good and the surface of the workpiece to be conveyed suitable, the calculation can be based on the number of ball transfer units under load.

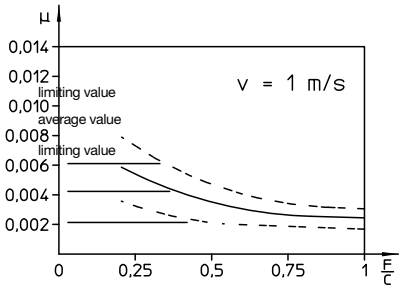
Example:
Weight of the article to be conveyed = 300 kg

Ball transfer unit load

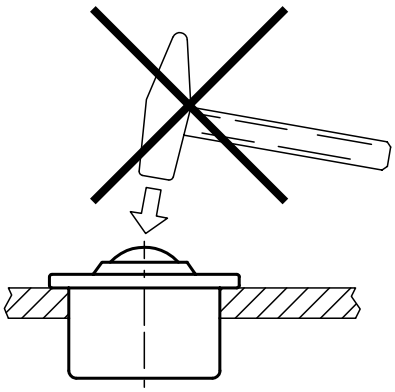
$$a = \frac{300\ \text{kg}}{3} = 100\ \text{kg}$$

FRICTION

The diagram shows the friction values as a function of load and speed for ball transfer units. These approximate values apply to all mounting positions with operation on a hardened steel plate.



ASSEMBLY INSTRUCTIONS



Note:
Information is valid for former steel designs.

Ball Casters • with sheet steel housing

EH 22750.



PRODUCT DESCRIPTION

Ball casters are modules for transport systems, conveyances, to working and packing facilities.
For example, parts can be easily moved, turned and controlled.
As from d_1 = 36 fitted with an oil drenched felt seal to protect against dirt.

Material

Cap
- Steel, zinc-plated by galvanization
- Stainless steel

Housing
- Steel, zinc-plated by galvanization
- Stainless steel

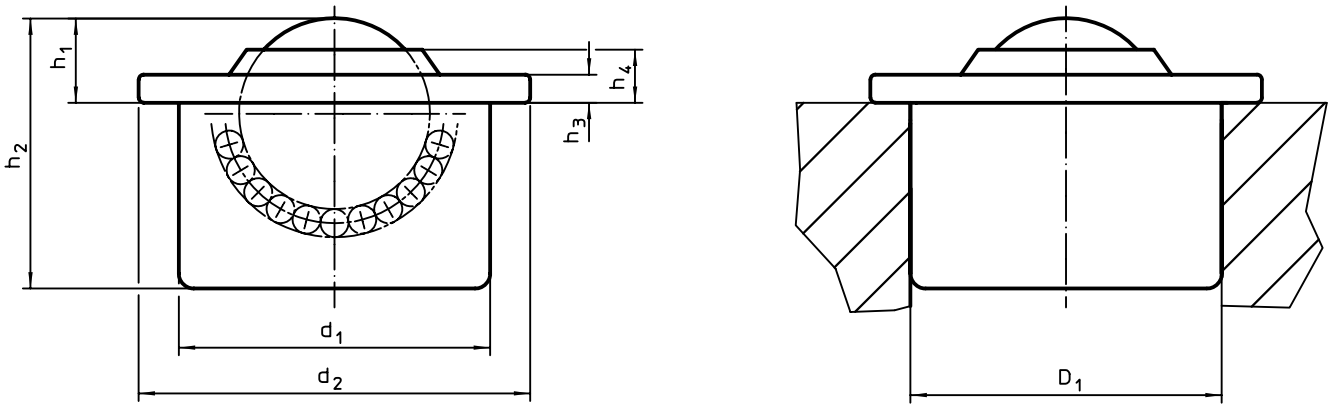
Ball
- Ball-bearing steel
- Stainless steel

MORE INFORMATION

Further products

Tolerance Rings . . . . . → p. 324

DRAWING



ORDER INFORMATION

d_1	Ball Ø	d_2	Dimensions h_1	h_2	h_3	h_4	Location hole D_1 [1]	Carrying figure C		Art. No.
			[mm]				[mm]	[N]	[g]	
cap and housing zinc-plated										
12,6 ±0,055	8	17	4,8 ±0,15	11,2	1,8	3,2	12,57 +0,03	100	7	22750.0000 [2]
18,0 ±0,055	12	23	7,4 ±0,15	15,5	2,0	4,3	17,97 +0,03	250	18	22750.0002 [2]
24,0 ±0,065	15	31	9,5 ±0,20	21,5	2,5	6,1	23,95 +0,05	500	40	22750.0004 [2]
36,0 ±0,080	22	45	9,8 ±0,20	29,5	2,9	5,7	35,90 +0,05	1300	134	22750.0008
45,0 ±0,080	30	55	13,8 ±0,30	37,5	3,7	7,9	44,85 +0,05	2500	277	22750.0012
62,0 ±0,095	45	75	19,0 ±0,40	53,7	4,2	10,3	61,83 +0,07	6000	741	22750.0016
all parts zinc-plated, ball from stainless steel										
12,6 ±0,055	8	17	4,8 ±0,15	11,2	1,8	3,2	12,57 +0,03	70	7	22750.0020 [2]
18,0 ±0,055	12	23	7,4 ±0,15	15,5	2,0	4,3	17,97 +0,03	180	18	22750.0022 [2]
24,0 ±0,065	15	31	9,5 ±0,20	21,5	2,5	6,1	23,95 +0,05	370	40	22750.0024 [2]
36,0 ±0,080	22	45	9,8 ±0,20	29,5	2,9	5,7	35,90 +0,05	970	132	22750.0028
45,0 ±0,080	30	55	13,8 ±0,30	37,5	3,7	7,9	44,85 +0,05	1900	273	22750.0032
62,0 ±0,095	45	75	19,0 ±0,40	53,7	4,2	10,3	61,83 +0,07	4500	739	22750.0036
all parts from stainless steel										
12,6 ±0,055	8	17	4,8 ±0,15	11,2	1,8	3,2	12,57 +0,03	70	7	22750.0040 [2]
18,0 ±0,055	12	23	7,4 ±0,15	15,5	2,0	4,3	17,97 +0,03	180	18	22750.0042 [2]
24,0 ±0,065	15	31	9,5 ±0,20	21,5	2,5	6,1	23,95 +0,05	370	39	22750.0044 [2]
36,0 ±0,080	22	45	9,8 ±0,20	29,5	2,9	5,7	35,90 +0,05	970	133	22750.0048
45,0 ±0,080	30	55	13,8 ±0,30	37,5	3,7	7,9	44,85 +0,05	1900	272	22750.0052

[1] Reference value for 2 mm sheet steel/ 5 mm aluminium (force fit)
[2] without felt seal

2

Tolerance Rings

EH 22750.



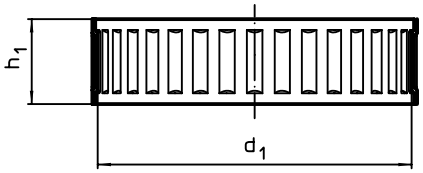
PRODUCT DESCRIPTION

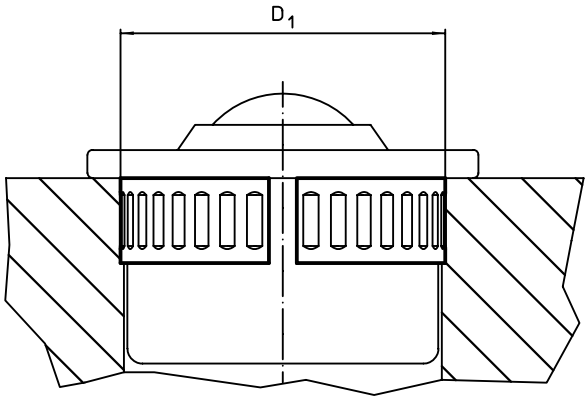
The use of tolerance rings (for ball casters with sheet steel housing) allows larger tolerances between the parts to be connected.

Material

- Spring steel strip

DRAWING

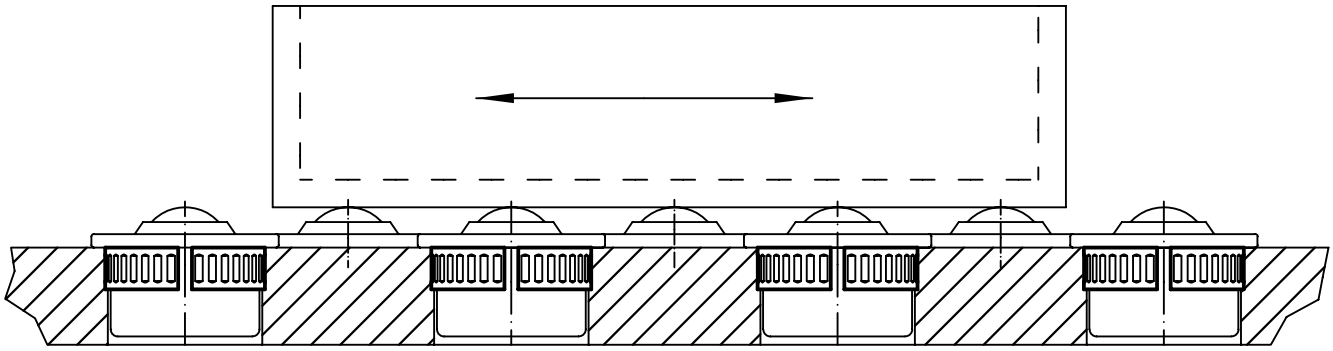




ORDER INFORMATION

Dimensions d_1 [mm]	h_1 +0,2 [mm]	Location hole D_1 [mm]	[g]	Art. No.
12,6	6,1	13,87 +0,15	0,4	22750.0060
18,0	6,1	19,70 +0,20	0,9	22750.0062
24,0	7,1	25,70 +0,20	1,4	22750.0064
36,0	12,1	37,70 +0,20	4,3	22750.0068
45,0	12,1	46,70 +0,20	5,3	22750.0072
62,0	15,1	64,10 +0,30	12,0	22750.0076

APPLICATION EXAMPLE



Ball Casters • with mounting elements

EH 22750.



PRODUCT DESCRIPTION

Material

Cap
- Steel, zinc-plated by galvanization

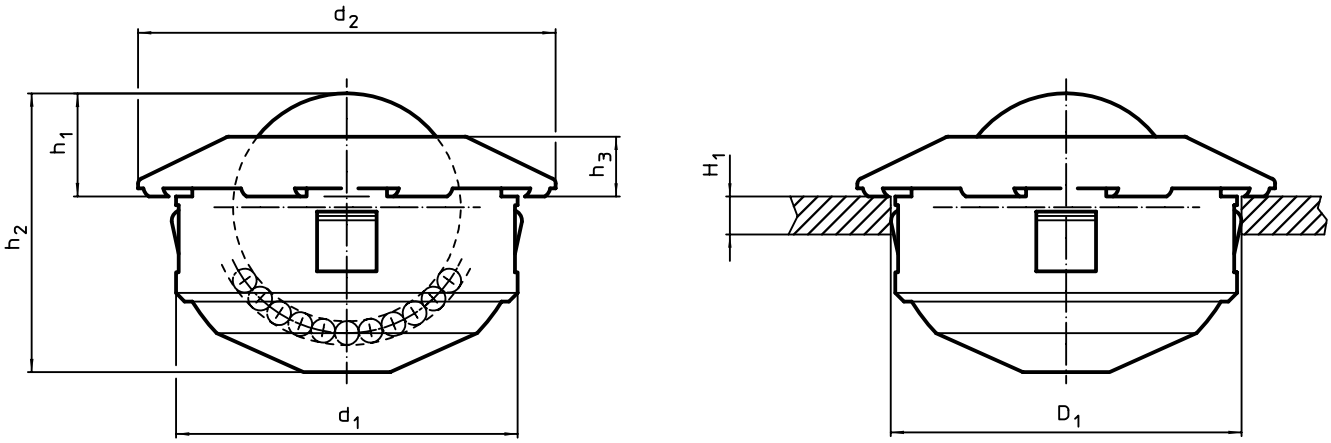
Housing
- Steel, zinc-plated by galvanization

Ball
- Ball-bearing steel
- Stainless steel

Assembly

Mounting is carried-out by means of spring-loaded claws allowing big tolerances in the location hole.
The ball casters can easily be mounted and disassembled from their functional side.
Due to the inclined cap form, the assembly mandrel EH 22750. should be used.

DRAWING



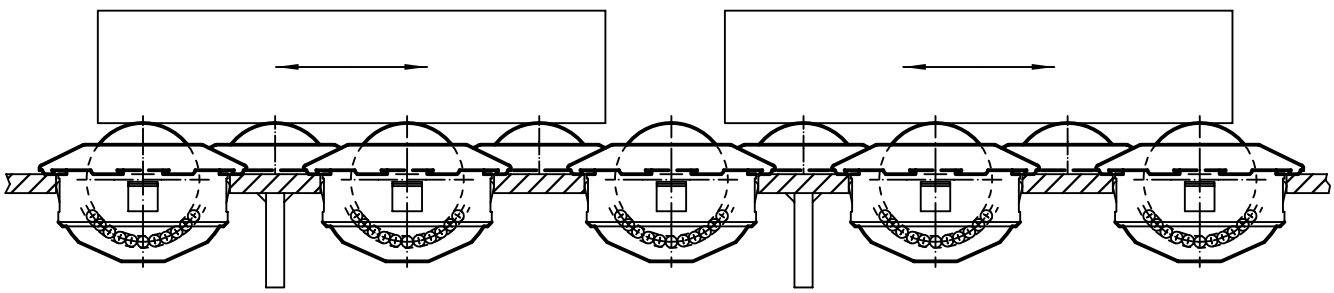
ORDER INFORMATION

Dimensions						H_1 min.	Location hole D_1	Carrying figure C		Art. No.
d_1	Ball Ø	d_2	h_1	h_2	h_3					
[mm]						[mm]	[mm]	[N]	[g]	
ball from ball-bearing steel										
24 -0,13	15	31	9,5 ±0,2	20,5	5,5	1,5	24	500	42	22750.0104
36 -0,16	22	45	9,8 ±0,2	28,6	6,0	2,0	36	1300	144	22750.0108
45 -0,16	30	55	13,8 ±0,3	37,5	8,0	2,5	45	2500	292	22750.0112
ball from stainless steel										
24 -0,13	15	31	9,5 ±0,2	20,5	5,5	1,5	24	370	42	22750.0124
36 -0,16	22	45	9,8 ±0,2	28,6	6,0	2,0	36	970	143	22750.0128
45 -0,16	30	55	13,8 ±0,3	37,5	8,0	2,5	45	1900	290	22750.0132

ACCESSORIES

	Suitable for ball caster [mm]	[g]	Art. No.
assembly tool			
	**24**	451	22750.0144
	36	480	22750.0148
	45	503	22750.0152

APPLICATION EXAMPLE



2

Ball Casters • plastic

EH 22751.



PRODUCT DESCRIPTION

Ball casters are module for transport systems, conveyances, to working and packing facilities.
For example, parts can be easily moved, turned and controlled.
Thanks to the technical properties of the plastic, the component does not require maintenance or lubrication and is also resistant to abrasion. In contrast to the steel model, the plastic model offers additional benefits such as electrical insulation and anti-magnetic characteristics thanks to the properties of its material.

Material

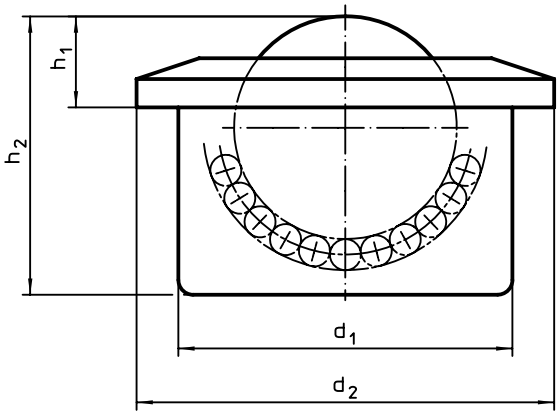
Cap
- Plastic, white

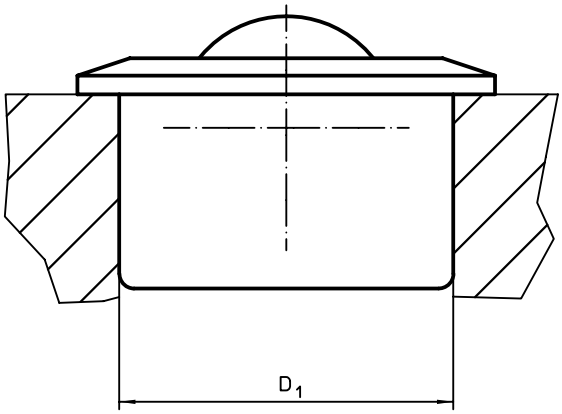
Housing
- Plastic, white

Ball
- Thermoplastic POM, white

Bearing ball
- Plastic
- Stainless steel

DRAWING





ORDER INFORMATION

Dimensions					Location hole	Carrying figure				Art. No.
d_1	Ball Ø	d_2	h_1	h_2	D_1 H7	C	min.	max.		
[mm]					[mm]	[N]	[°C]		[g]	
bearing ball: plastic										
24	16	31	9,8	21	23,95	80	-40	80	11	22751.0015
36	24	45	9,8	30	35,95	110	-40	80	28	22751.0022
bearing ball: stainless steel										
24	16	31	9,8	21	23,95	300	-40	80	12	22751.0115
36	24	45	9,8	30	35,95	500	-40	80	27	22751.0122

Ball Casters • screwable, plain bearing

EH 22752.



PRODUCT DESCRIPTION

For positioning and aligning of workpieces.
Because of the slide bearing, the ball can roll permanently, and the surface of the workpiece is protected.
At temperatures > 20°C, the carrying figure decreases linearly. (Example: at 90°C the load bearing capacity is max. 60%)

Material

Bearing
- Plastic

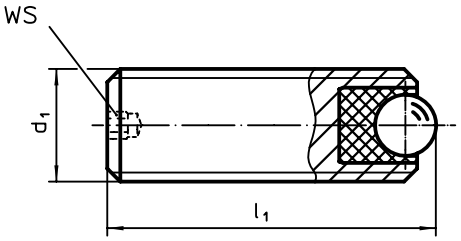
Ball
- Ball-bearing steel, hardened
- Stainless steel, hardened

Screw
- Free cutting steel, blackened
- Stainless steel 1.4305

MORE INFORMATION

Notes
Special types on request.

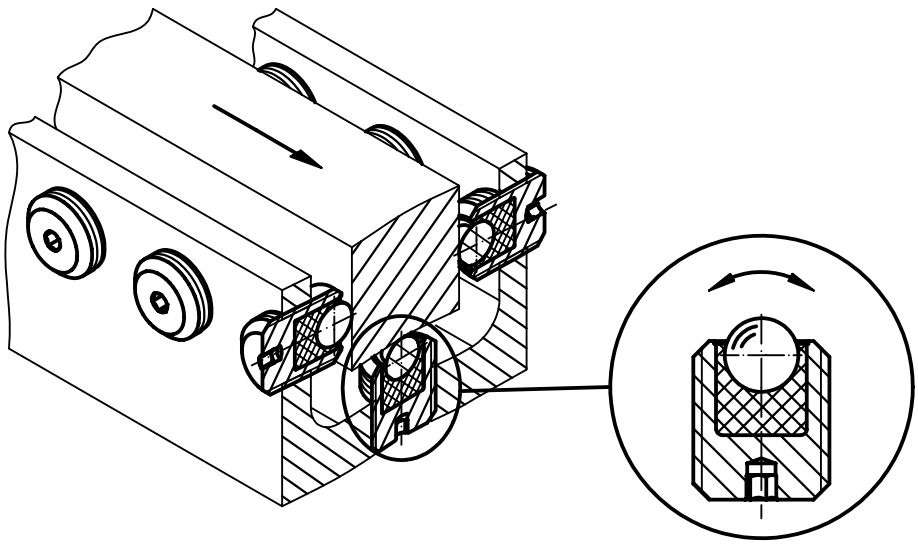
DRAWING



ORDER INFORMATION

Dimensions			WS	Load capacity for static load max.	Tightening torque max.				Art. No.	
d_1	l_1	Ball				min.	max.		free cutting steel	stainless steel
[mm]			[mm]	[N]	[Nm]	[°C]		[g]		
M 6	8	2,5	1,5	172	0,11	-50	90	1	22752.0061	22752.0561
	16	2,5	1,5	172	0,11	-50	90	3	22752.0064	22752.0564
M 8	10	3,5	1,5	336	0,28	-50	90	3	22752.0081	22752.0581
	20	3,5	1,5	336	0,28	-50	90	7	22752.0084	22752.0584
M10	12	4,5	2,0	556	0,58	-50	90	5	22752.0101	22752.0601
	25	4,5	2,0	556	0,58	-50	90	13	22752.0104	22752.0604
M12	16	6,5	2,5	1161	1,44	-50	90	10	22752.0121	22752.0621
	35	6,5	2,5	1161	1,44	-50	90	27	22752.0124	22752.0624
M16	20	8,5	3,0	1986	3,21	-50	90	24	22752.0161	22752.0661
	50	8,5	3,0	1986	3,21	-50	90	71	22752.0166	22752.0666

APPLICATION EXAMPLE



2

Ball Casters • plain bearing

EH 22753.



PRODUCT DESCRIPTION

Ball casters are module for transport systems, conveyances, to working and packing facilities.
For example, parts can be easily moved, turned and controlled.
The ball casters are maintenance-free.
At temperatures > 20°C, the carrying figure decreases linearly. (Example: at 90°C the load bearing capacity is max. 60%)

Material

Housing
- Stainless steel

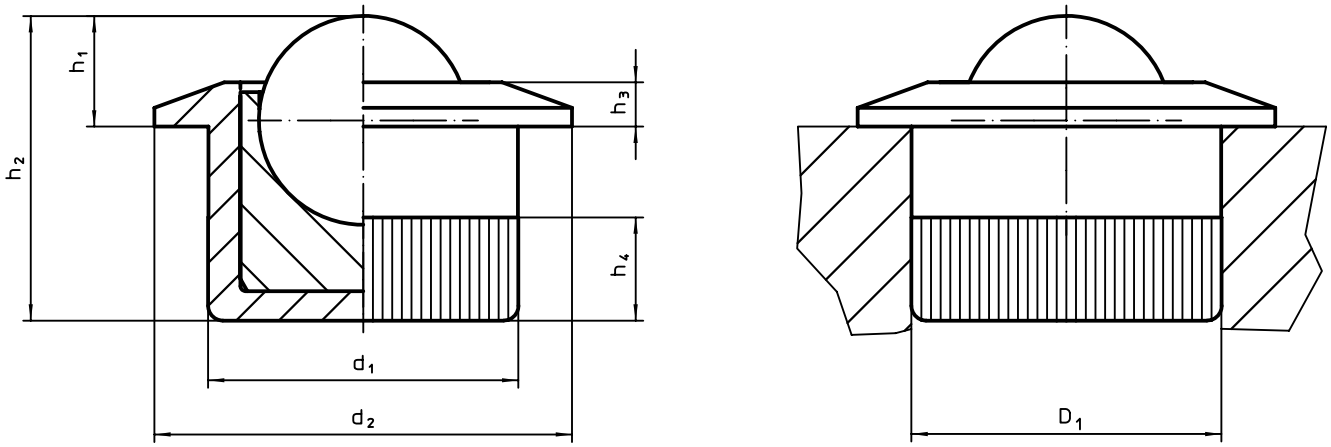
Bearing
- Plastic

Ball
- Stainless steel, hardened

Assembly

Locking in place is achieved by pressing-in the knurled contour ball caster. Ball casters can be mounted from the functional side, using the assembly tool.
Knurling on the external contour allows installation into bore holes without additional preparatory steps.

DRAWING



ORDER INFORMATION

Dimensions							Location hole D_1 H7	Carrying figure C	Temperature		Weight	Art. No.
d_1	Ball Ø	d_2	h_1	h_2	h_3	h_4			min.	max.		
[mm]							[mm]	[N]	[°C]		[g]	
10,0	6,5	13	3,2	11,2	1,2	4,2	10,0	1161	-50	90	4	22753.0065
12,6	8,5	17	4,5	12,4	1,8	4,2	12,6	1986	-50	90	8	22753.0085

ACCESSORIES

	Suitable for ball caster [mm]	[g]	Art. No.
assembly tool			
	**6,5**	118	22753.9965
	8,5	118	22753.9985

Positioning Sensors • pneumatic

EH 22800.



PRODUCT DESCRIPTION

Used in jigs and fixtures as positioning control for pre-machined workpieces.
Sensitivity accuracy is 0.015-0.075 mm, depending on the workpiece surface.
Contact control is achieved through compressed air backwash and is indicated on the monitoring unit.

Material

Seating pins
- Tool steel, hardened, ground

Seal
- PVC

Screw
- Steel, zinc-plated by galvanization, quality 4.8 (ISO 1207)

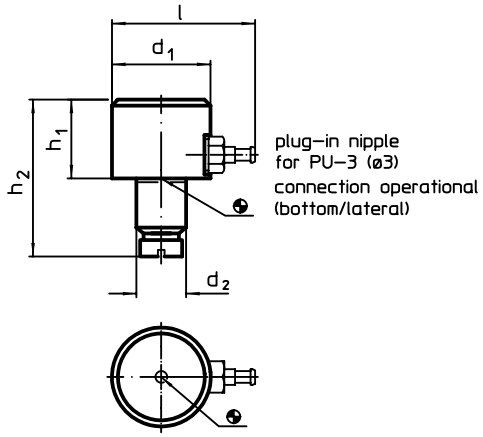
Plug-in nipple
- Brass

MORE INFORMATION

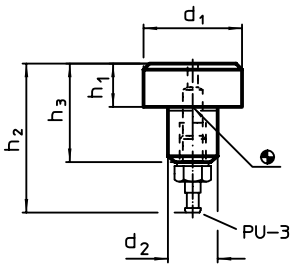
Notes
Further information on request.

Further products
Monitoring Units for Positioning Sensors, pneumatic . . . . . → p. 333

DRAWING



picture 1

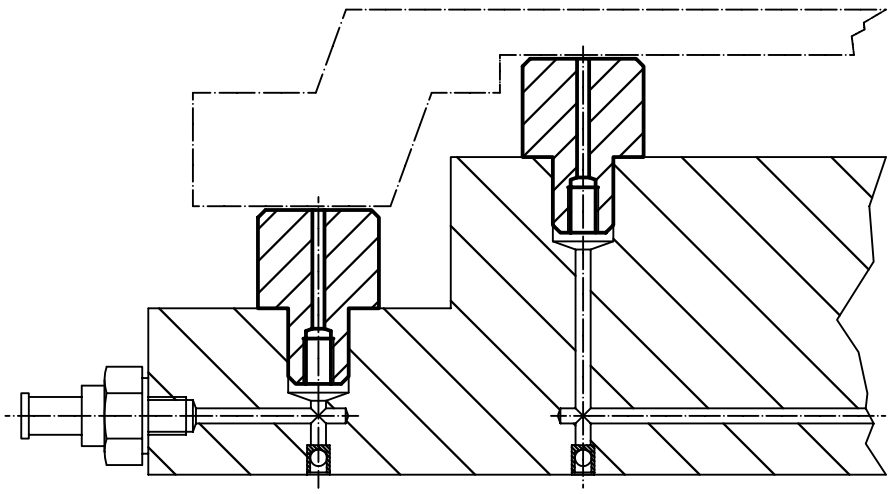


picture 2

ORDER INFORMATION

Dimensions							Art. No.
d_1	h_1 h9	d_2 n6	h_2	h_3	l	[g]	
		[mm]					
bottom/lateral connection – picture 1							
16	**13**	8	27,0	–	28,0	32	**22800.0010**
25	**20**	12	39,0	–	36,5	93	**22800.0020**
bottom connection – picture 2							
16	**5**	8	28,5	15	–	11	**22800.0100**

APPLICATION EXAMPLE



2

Positioning Sensors • pneumatic

EH 22800.



PRODUCT DESCRIPTION

Used in jigs and fixtures as positioning control for pre-machined workpieces.
Sensitivity accuracy is 0.015-0.075 mm, depending on the workpiece surface.
Contact control is achieved through compressed air backwash and is indicated on the monitoring unit.

Material

Seating pins
- Tool steel, hardened, ground

Seal
- PVC

Supporting bar
- Steel, blackened

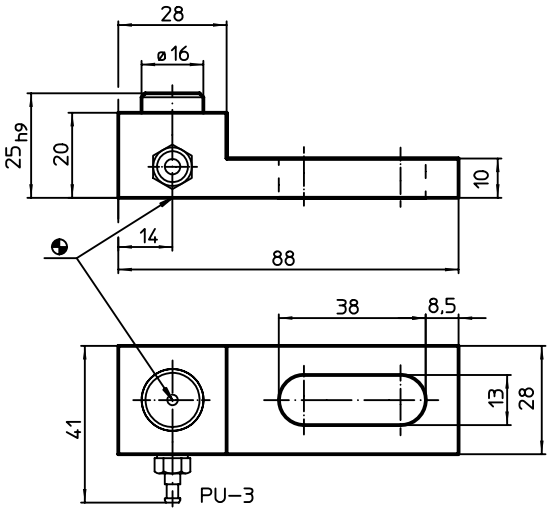
Plug-in nipple
- Brass

MORE INFORMATION

Notes
Further information on request.

Further products
Monitoring Units for Positioning Sensors, pneumatic . . . . . → p. 333

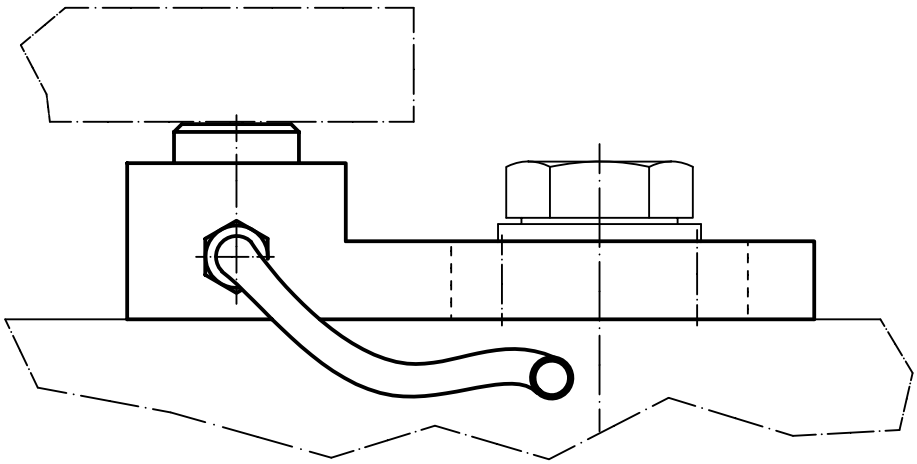
DRAWING



ORDER INFORMATION

[g]	Art. No.
with holding bar	
237	22800.0400

APPLICATION EXAMPLE



Positioning Sensors • self-aligning, pneumatic

EH 22800.



PRODUCT DESCRIPTION

Used in jigs and fixtures as positioning control for raw workpieces.
Contact control is achieved through compressed air backwash and is indicated on the monitoring unit.

Material

Ball
- Ball-bearing steel, hardened

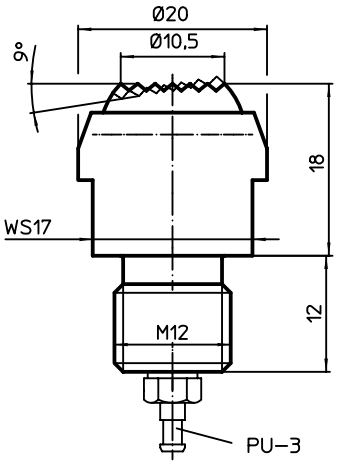
Body
- Heat-treated steel, tempered, phosphated

MORE INFORMATION

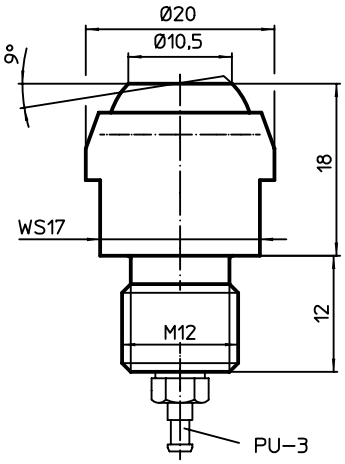
Notes
Further information on request.

Further products
Monitoring Units for Positioning Sensors, pneumatic . . . . . → p. 333

DRAWING



picture 1

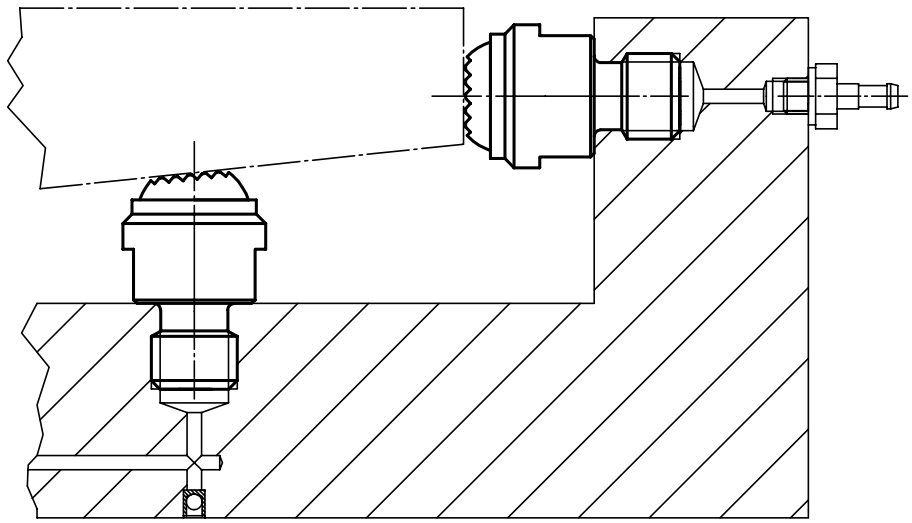


picture 2

ORDER INFORMATION

Load capacity for static load max. [kN]	[g]	Art. No.
flat-faced ball, ribbed surface		
15	42	22800.0220
flat-faced ball, plain surface		
15	42	22800.0320

APPLICATION EXAMPLE



2

Positioning Sensors • self-aligning, pneumatic

EH 22800.



PRODUCT DESCRIPTION

Used in jigs and fixtures as positioning control for raw workpieces.
The response accuracy is constantly at 0,005 mm and can be achieved with a working pressure of 2,5 bar.
The system is monitored by the compressed-air backwash which indicated on the monitoring unit (Art. No. 22800.0612).

Material

Seal
- PVC

Supporting bar
- Steel, blackened

Ball
- Ball-bearing steel, hardened

Body
- Heat-treated steel, tempered, phosphated

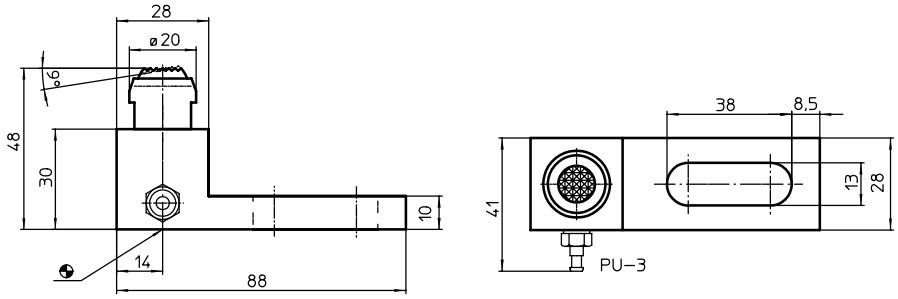
Plug-in nipple
- Brass

MORE INFORMATION

Notes
Further information on request.

Further products
Monitoring Units for Positioning Sensors, pneumatic . . . . . → p. 333

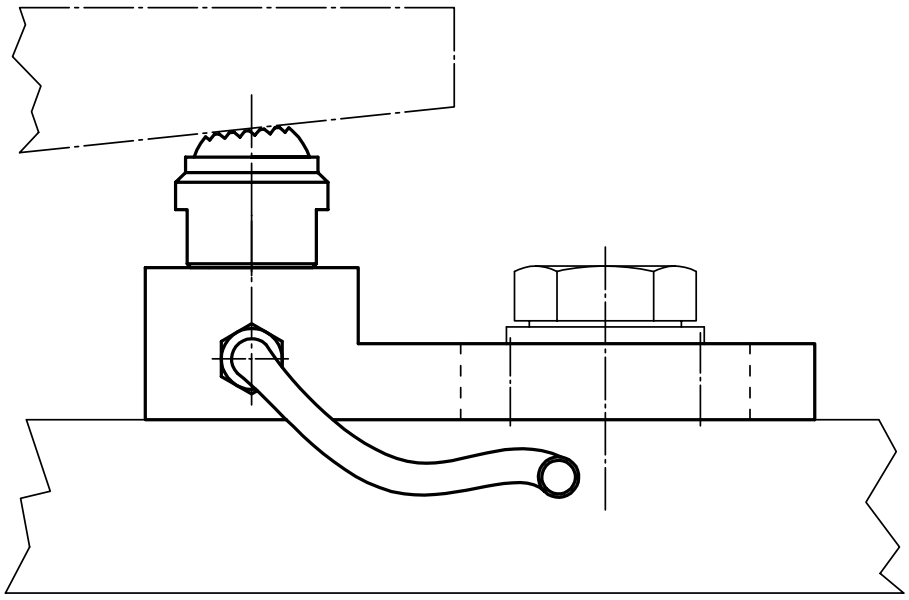
DRAWING



ORDER INFORMATION

Load capacity for static load max. [kN]	[g]	Art. No.
with holding bar		
15	321	22800.0410

APPLICATION EXAMPLE



Monitoring Units for Positioning Sensors • pneumatic

EH 22800.



PRODUCT DESCRIPTION

The monitoring unit is used in combination with positioning sensors (EH 22800.). Together with the positioning sensors, the backwash pressure sensor makes it possible to poll the correct workpiece positioning.

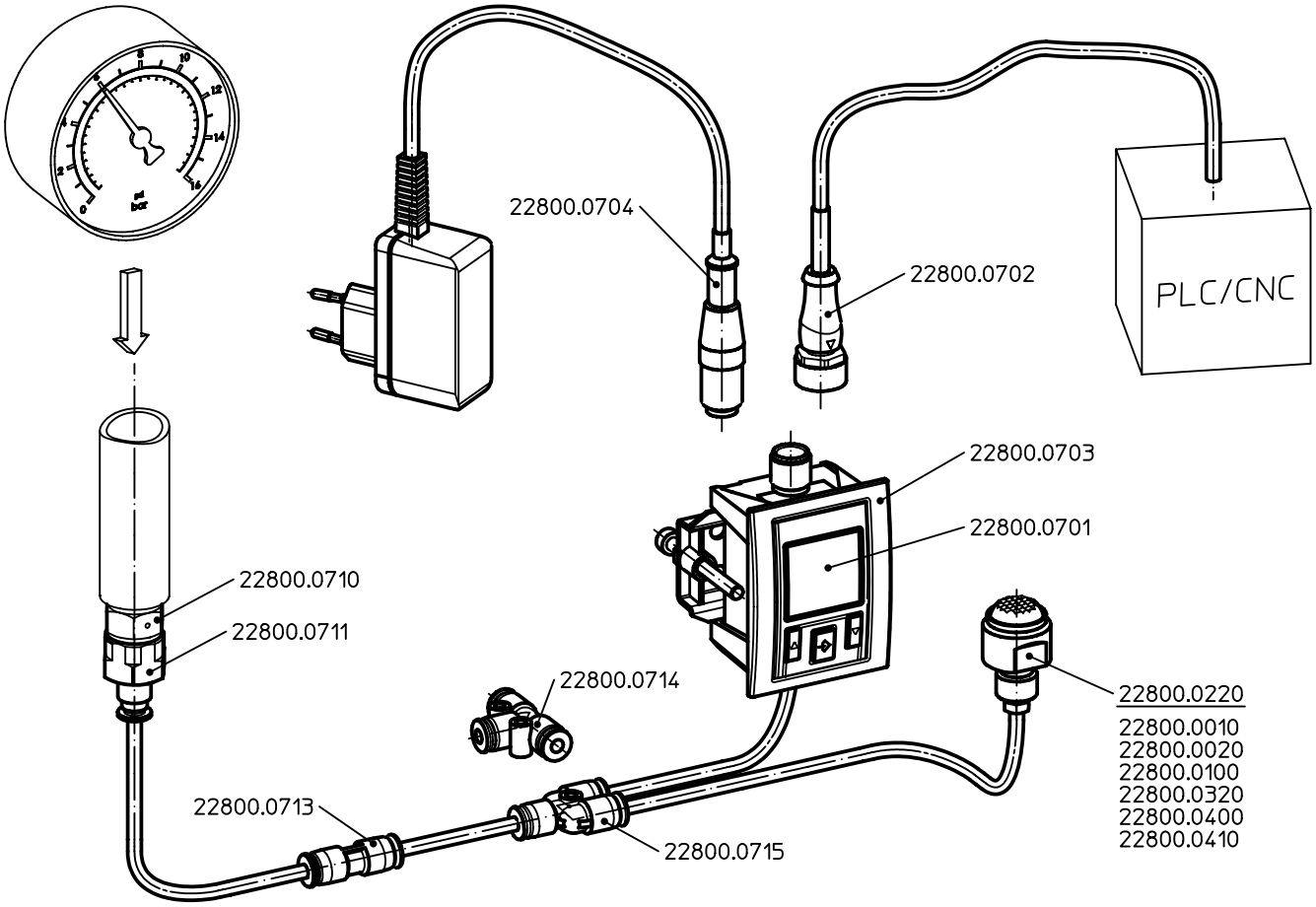
Material

Housing
- Plastic

MORE INFORMATION

Notes
Further information on request.

DRAWING



ORDER INFORMATION

Working pressure [bar]	[g]	Art. No.
backwash pressure sensor with LCD display, Ø 4 mm pneumatic hose connection, analogue and digital output signals		
0 – 10	167	**22800.0701**

2

ACCESSORIES

	L [mm]	D [mm]	[g]	Art. No.
circular connector cable for connecting backwash pressure sensor to control / bus system, M12 connection on free cable end (4-pin)				
	2000	–	84	22800.0702
installation frame for backwash pressure sensor, for installation into a control panel (max. wall thickness 5 mm)				
	–	–	26	22800.0703
plug-in power supply, input 100-240 V AC / output 24 V DC 500 mA, with M12 plug socket				
	1500	–	100	22800.0704
pressure regulator, max. input pressure 12 bar / output pressure 2 bar, 1/4" male thread two-sided				
	–	–	22	22800.0710
connection piece for connecting pressure regulator and pneumatic hose, 1/4" female thread on push-in connector (pneumatic hose Ø 4 mm)				
	–	–	17	22800.0711
pneumatic hose Ø 4 mm				
	5000	4	43	22800.0712
push-in connector, for pneumatic hose Ø 4 mm				
	–	–	5	22800.0713
T-push-in connector for pneumatic hose Ø 4 mm				
	–	–	8	22800.0714
Y-push-in connector for pneumatic hose Ø 4 mm				
	–	–	8	22800.0715

Polling Units

EH 22810.

The monitoring unit is used to verify the position of a workpiece. The unit can be easily installed and removed from a fixture in combination with other seating elements. A compact sensor checks whether a workpiece makes contact at specific positions.

The system can be extended to monitor multiple positions. The information is output via an electrical signal. The signal can be transmitted both via a hard-wired connection or via radio signal. The wireless connection requires an additional transceiver unit including antenna.





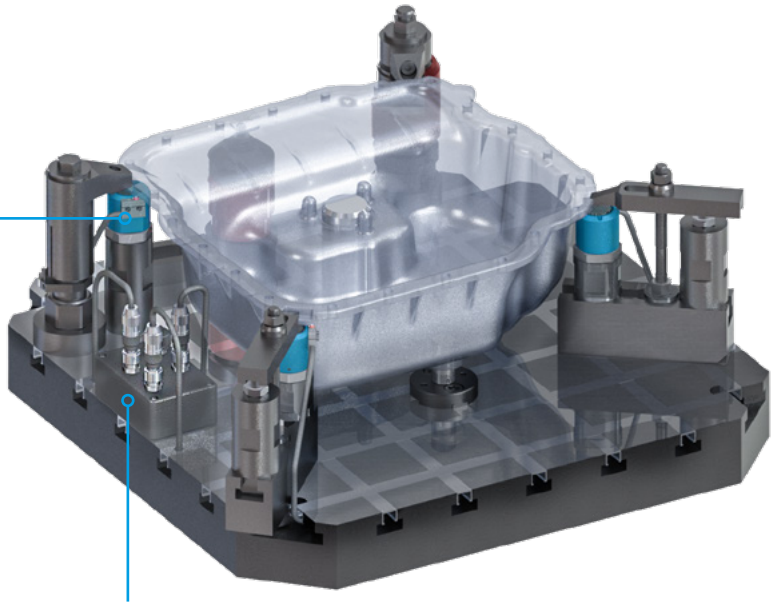


PRODUCT BENEFITS AT A GLANCE

- Improved process reliability
- Automatic workpiece monitoring
- Enhanced error detection
- Option to connect to a machine control
- Optional wireless monitoring



Monitoring unit with sensor



Wireless transmitter





Wireless receiver (antenna + receiver)

You will find further information as well as your contact persons under: www.halder.com/MonitoringUnits

2

Polling Units • with sensor

EH 22810.



PRODUCT DESCRIPTION

For polling a workpiece on a seating element.
The polling unit is always built into a seating element as a single system. By means of a simple plug-in connection, it transmits whether a part is located at a specific position, as an electrical signal.
The polling unit can be used in combination with various seating elements. For example, the EH 22690. pins from the Halder standard parts are suitable.
Data is transferred via a cable connection. Optionally, the polling signal can be transferred by radio.
The interrogation unit meets the requirements of protection class IP6K7 (highly temperature-resistant and robust).

Material

Cable
- Silicone

Sensor
- Plastic, black

Plug
- Metal

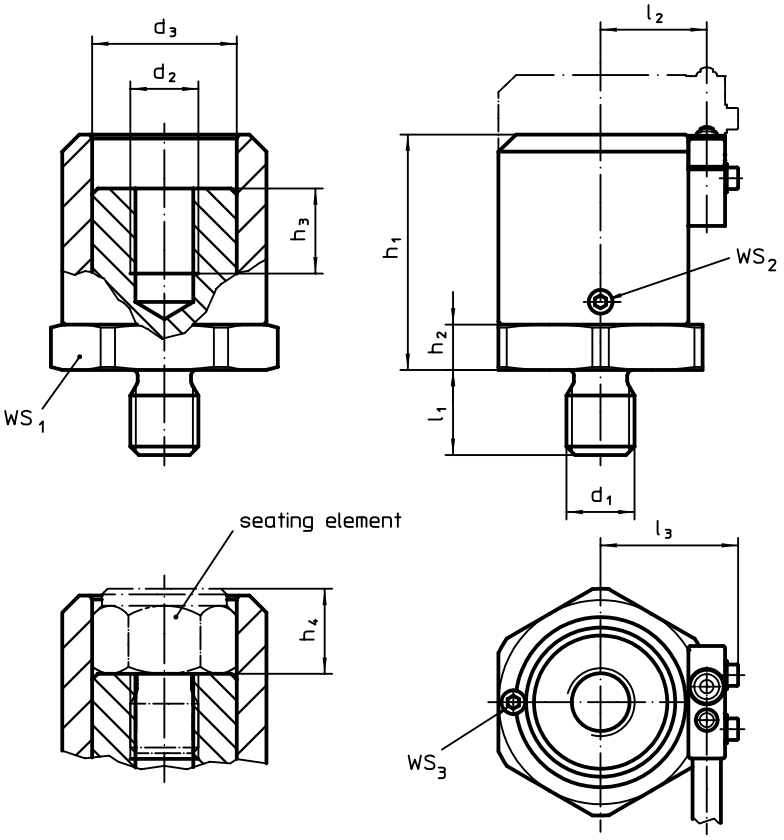
Body
- Aluminium, blue anodised

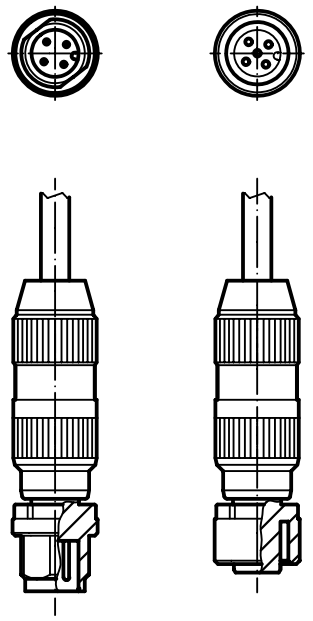
Body
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Notes
Further information on request.

DRAWING





picture 1 picture 2

ORDER INFORMATION

Dimensions												WS						Art. No.
d_1	d_2	d_3	l_1	l_2	l_3	h_1 min.	h_1 max.	h_2	h_3	h_4 min.	h_4 max.	WS_1	WS_2	WS_3	min.	max.	[g]	
[mm]												[mm]			[°C]			
polling unit with bushing – picture 1																		
M 8	M 8	20,3	12	15,8	21,4	30,5	40,5	5	12	10	20,0	30	1,5	1,5	-25	85	180	22810.0008
M12	M12	25,5	15	18,7	24,3	41,5	59,0	8	15	10	27,5	36	2,0	2,0	-25	85	300	22810.0012
polling unit with plug – picture 2																		
M 8	M 8	20,3	12	15,8	21,4	30,5	40,5	5	12	10	20,0	30	1,5	1,5	-25	85	180	22810.1008
M12	M12	25,5	15	18,7	24,3	41,5	59,0	8	15	10	27,5	36	2,0	2,0	-25	85	300	22810.1012

ACCESSORIES

	[g]	Art. No.
sensor with bush and silicone cable		
	75	22810.9001
sensor with plug and silicone cable		
	75	22810.9002

2

Radio Transmitters • for polling unit

EH 22810.



PRODUCT DESCRIPTION

For cable-free transfer of the polled signal.
The radio transmitter is installed close to the polling unit, and is connected to the plug of the polling unit. The transmitter makes the polled signal available by radio, and does not require additional cable connection. Power is supplied by a battery.
The radio transmitter meets the requirements of protection class IP 67 (robust material) and is therefore suitable for use with cooling lubricants.
Frequency: 868.3 MHz (EU, Switzerland)
Other frequencies available on request.

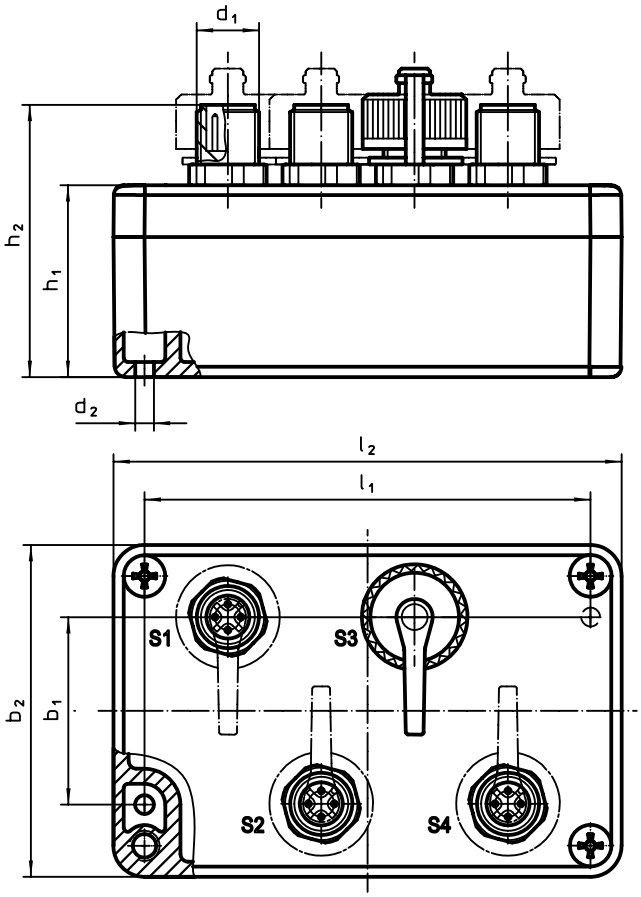
MORE INFORMATION

Further information on request.

Notes

An AA battery (3.6 V) is included in the scope of delivery.

DRAWING



ORDER INFORMATION

[g]	Art. No.
universal radio transmitter with protective caps	
191	22810.9010

ACCESSORIES

	[g]	Art. No.
protection cap		
	4	22810.9011

Radio Receivers • for polling unit

EH 22810.



PRODUCT DESCRIPTION

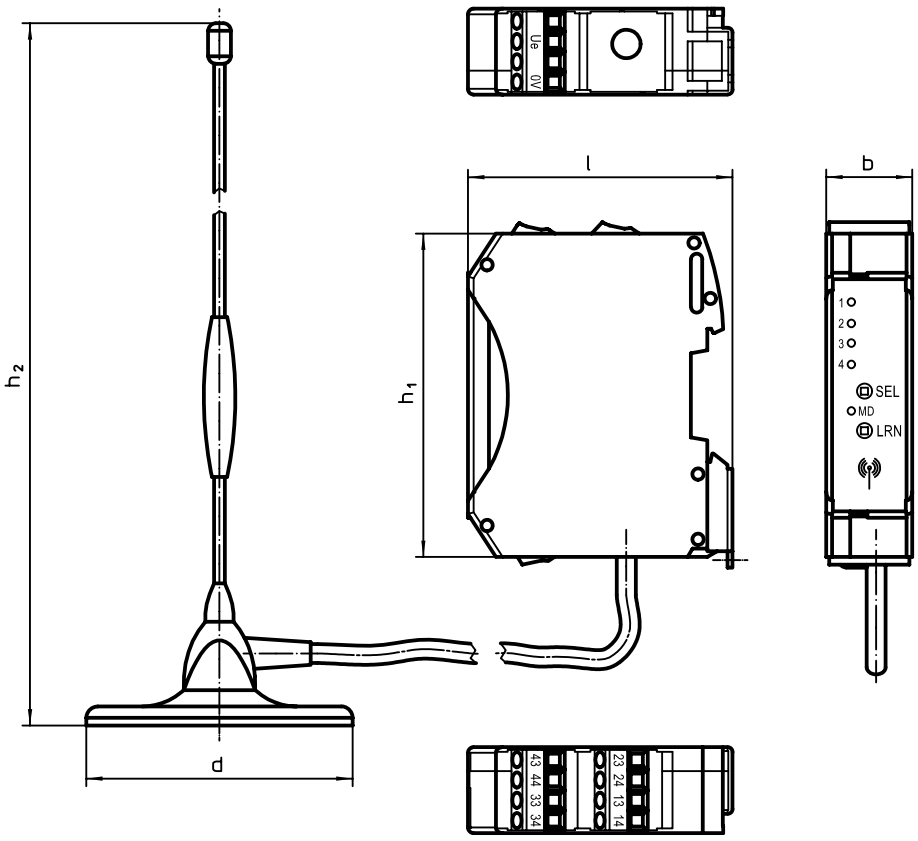
For cable-free reception of the signal from the polling unit.
The antenna receives the radio signal from the polling unit, and transmits it via a cable connection to an input for the receiver. This activates the corresponding output (the make-contact). For each receiver, a maximum of four radio channels can be received.

MORE INFORMATION

Notes

Further information on request.

DRAWING



ORDER INFORMATION

[g]	Art. No.
universal radio receiver and radio antenna	
307	22810.9020

Oil-Sight Glasses

EH 22860.

2



PRODUCT DESCRIPTION

Oil-sight glasses can be used for level control in tanks without excess pressure.

Material

Seal ring
- Resistant to oil and gasoline

Reflector
- Plastic, white

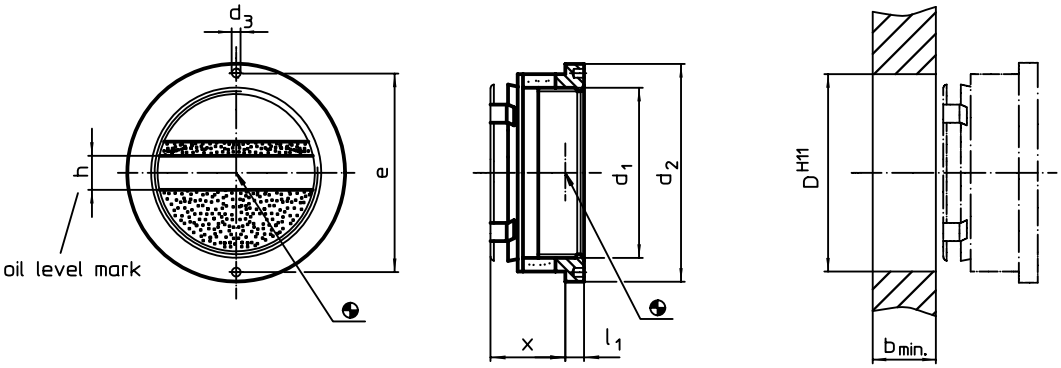
Ring nut
- Aluminium Al

Oil-sight glass
- Plexiglass (PMMA, clear)

Assembly

Can be fitted without thread in H11 bore-hole. Sealing by simply tightening the ring nut.

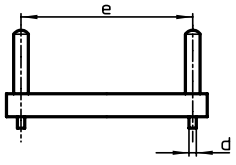
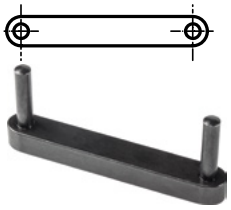
DRAWING



ORDER INFORMATION

Size (sight opening) d_1	d_2	d_3	x ~	l_1	b min.	h	e	Location hole D H11	min.	max.		Art. No.
			[mm]					[mm]	[°C]		[g]	
without oil level mark												
16	25	2,2	15	3,5	9	–	21,0	20	-20	70	9,0	22860.0016
22	35	3,0	15	4,5	10	–	30,0	28	-20	70	18,0	22860.0022
32	45	3,0	18	5,5	12	–	40,0	38	-20	70	33,0	22860.0032
50	64	3,0	22	5,5	14	–	58,5	58	-20	70	87,0	22860.0050
with oil level mark												
16	25	2,2	15	3,5	9	5	21,0	20	-20	70	8,9	22860.0116
22	35	3,0	15	4,5	10	6	30,0	28	-20	70	18,0	22860.0122
32	45	3,0	18	5,5	12	8	40,0	38	-20	70	33,0	22860.0132
50	64	3,0	22	5,5	14	10	58,5	58	-20	70	86,0	22860.0150

ACCESSORIES

	Size (sight opening) d_1	d h9	e		Art. No.
		[mm]		[g]	
assembly tool					
	**16**	2,0	21,0	16	22860.0816
	22	2,8	30,0	30	22860.0822
	**32**	2,8	40,0	36	22860.0832
	50	2,8	58,5	49	22860.0850

Expander® Sealing Plugs • body from case-hardened steel

EH 22880.



PRODUCT DESCRIPTION

Expander® sealing plugs are used for safe, quick and economic sealing of bore holes in fluid technology, e.g. hydraulic drilling holes in jig and fixture construction. Assembly is effected by pressing in the sealing plug into the drilling hole by means of the prescribed setting die. **Please refer to the technical data following these product information pages.**

Material

Body
- Case-hardened steel, zinc-plated, thick-film passivated

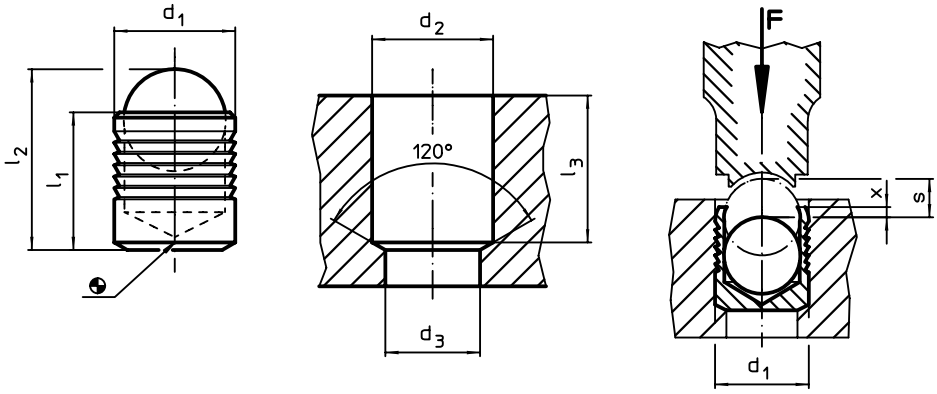
Ball
- Roller bearing steel, heat-treated, tempered

MORE INFORMATION

Further products

Setting Dies, for Expander® sealing plug . . . . . → p. 343

DRAWING



ORDER INFORMATION

Dimensions									Art. No.
d_1	l_1	l_2 ~	d_2 +0,1	d_3 max.	l_3 min.	x ±0,2	s	[g]	
			[mm]						
4	4,0	5,2	4	3,3	3,8	0,2	1,50	0,46	22880.0004
5	5,5	7,0	5	4,3	5,3	0,4	2,00	0,78	22880.0005
6	6,5	8,6	6	5,3	6,3	0,4	2,50	1,30	22880.0006
7	7,5	10,1	7	6,4	7,3	0,4	3,00	2,00	22880.0007
8	8,5	11,7	8	7,4	8,3	0,3	3,50	2,80	22880.0008
9	10,0	13,7	9	8,4	9,8	0,4	4,00	4,20	22880.0009
10	11,0	15,2	10	9,4	10,8	0,4	4,50	6,10	22880.0010
12	13,0	18,0	12	10,6	12,8	0,4	5,50	9,60	22880.0012
14	15,0	20,8	14	12,7	14,5	0,4	6,35	15,00	22880.0014
16	17,0	23,7	16	14,7	16,5	0,6	7,00	22,00	22880.0016
18	19,0	26,3	18	16,7	18,5	0,6	8,00	32,00	22880.0018
20	22,0	30,5	20	18,7	21,5	0,8	9,00	44,00	22880.0020
22	25,0	34,2	22	20,7	24,5	0,8	10,00	58,00	22880.0022

Working and control pressures for Expander® sealing plug, sleeve from case hardened steel 1.0403							
basic material	ETG-100 AISI 1144	C15Pb 1.0403	GG-25 DIN 1691	GGG-50 DIN 1693	AlCuMg2 3.1354	AlMgSiPb 3.0615	G-AlSi7Mg 3.2371
d_1 4-10 mm	p [bar]						
	350	350	350	350	350	320	320
	pTest [bar]						
	1100	1100	1100	1100	1100	1000	1000
d_1 12-22 mm	p [bar]						
	280	280	280	280	280	250	250
	pTest [bar]						
	900	900	900	900	900	800	800

Expander® Sealing Plugs • body from stainless steel

EH 22880.

2



PRODUCT DESCRIPTION

Expander® sealing plugs are used for safe, quick and economic sealing of bore holes in fluid technology, e.g. hydraulic drilling holes in jig and fixture construction. Assembly is effected by pressing in the sealing plug into the drilling hole by means of the prescribed setting die. **Please refer to the technical data following these product information pages.**

Material

Body
- Stainless steel 1.4305

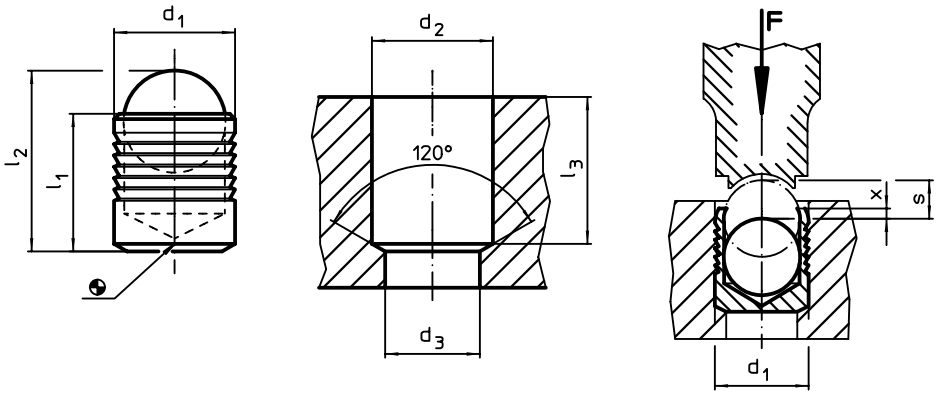
Ball
- Roller bearing steel, heat-treated, tempered

MORE INFORMATION

Further products

Setting Dies, for Expander® sealing plug . . . . . → p. 343

DRAWING



ORDER INFORMATION

Dimensions									Art. No.
d_1	l_1	l_2 ~	d_2 +0,1	d_3 max.	l_3 min.	x ±0,2	s		
[mm]								[g]	
3	3,6	4,6	3	2,2	3,4	0,4	1,20	0,17	22880.0053
4	4,0	5,2	4	3,3	3,8	0,2	1,50	0,34	22880.0054
5	5,5	7,0	5	4,3	5,3	0,4	2,00	0,70	22880.0055
6	6,5	8,6	6	5,3	6,3	0,4	2,50	1,30	22880.0056
7	7,5	10,1	7	6,4	7,3	0,4	3,00	2,40	22880.0057
8	8,5	11,7	8	7,4	8,3	0,3	3,50	3,20	22880.0058
9	10,0	13,7	9	8,4	9,8	0,4	4,00	4,50	22880.0059
10	11,0	15,2	10	9,4	10,8	0,4	4,50	6,10	22880.0060
12	13,0	18,0	12	10,6	12,8	0,4	5,50	9,70	22880.0062
14	15,0	20,8	14	12,7	14,5	0,4	6,35	15,00	22880.0064
16	17,0	23,7	16	14,7	16,5	0,6	7,00	22,00	22880.0066
18	19,0	26,3	18	16,7	18,5	0,6	8,00	31,00	22880.0068
20	22,0	30,5	20	18,7	21,5	0,8	9,00	46,00	22880.0070
22	25,0	34,2	22	20,7	24,5	0,8	10,00	58,00	22880.0072

→

Working and control pressures for Expander® sealing plug, sleeve from stainless steel 1.4305							
basic material	ETG-100 AISI 1144	C15Pb 1.0403	GG-25 DIN 1691	GGG-50 DIN 1693	AlCuMg2 3.1354	AlMgSiPb 3.0615	G-AlSi7Mg 3.2371
d_1 3-10 mm	p [bar]						
	450	450	450	450	450	380	380
	pTest [bar]						
	1400	1400	1400	1400	1400	1200	1200
d_1 12-22 mm	p [bar]						
	350	350	350	350	350	280	280
	pTest [bar]						
	1150	1150	1150	1150	1150	900	900

Setting Dies • for Expander® sealing plug

EH 22880.



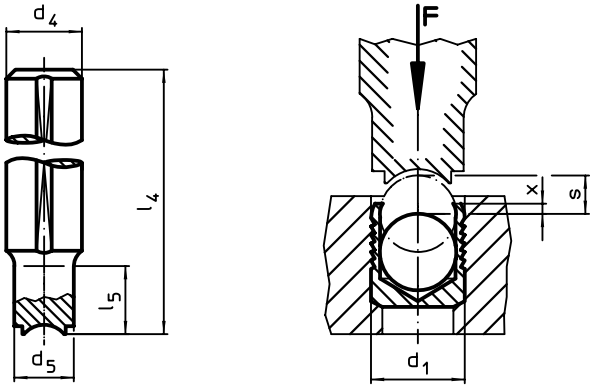
PRODUCT DESCRIPTION

Expander® sealing plugs are used for safe, quick and economic sealing of bore holes in fluid technology, e.g. hydraulic drilling holes in jig and fixture construction. Assembly is effected by pressing in the sealing plug into the drilling hole by means of the prescribed setting die. **Please refer to the technical data following these product information pages.**

Material

- Tool steel, heat-treated

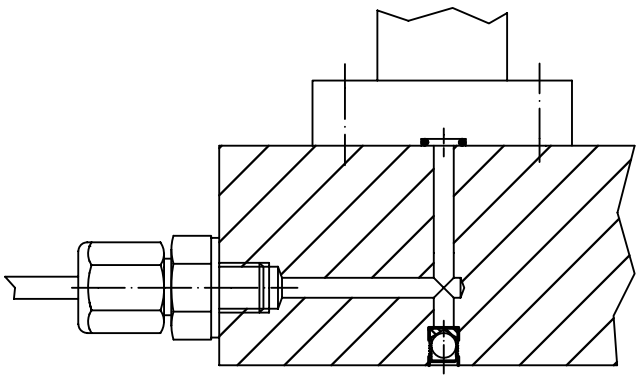
DRAWING



ORDER INFORMATION

Dimensions								Art. No.
d_1	d_4 h9	d_5	l_4	l_5	x ±0,2	s		
			[mm]				[g]	
3	10	2,8	100	10	0,4	1,20	53	22880.0153
4	10	3,8	100	10	0,2	1,50	54	22880.0154
5	10	4,8	100	12	0,4	2,00	53	22880.0155
6	10	5,8	100	15	0,4	2,50	53	22880.0156
7	10	6,8	100	18	0,4	3,00	54	22880.0157
8	10	7,8	100	20	0,3	3,50	55	22880.0158
9	14	8,8	100	22	0,4	4,00	101	22880.0159
10	14	9,8	100	25	0,4	4,50	103	22880.0160
12	14	11,7	150	30	0,4	5,50	167	22880.0162
14	20	13,7	150	35	0,4	6,35	316	22880.0164
16	20	15,7	150	40	0,6	7,00	326	22880.0166
18	20	17,7	150	45	0,6	8,00	340	22880.0168
20	25	19,7	150	50	0,8	9,00	495	22880.0170
22	25	21,7	150	55	0,8	10,00	516	22880.0172

APPLICATION EXAMPLE



2



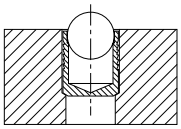


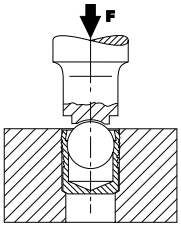
CONSTRUCTIONAL GUIDELINES, ASSEMBLY INSTRUCTIONS

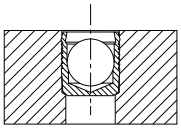
COMPONENT REQUIREMENTS (22880.0004 - 22880.0072)

Drilling Holes

- The counterbore relation d_2/d_3 has to be according to the catalogue specification.
- Roundness tolerances have to be within t = 0,05 mm.
- With hard materials (see picture 1) the drilling roughness has to be R_z=10 to 30 µm.
- Drilling tolerance d_1= + 0,1 mm.
- Longitudinal rifles and spiral grooves have to be avoided as they have a negative influence on the sealing.
- **Drilling holes have to be kept absolutely free from oil, grease and chips.**



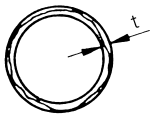




ASSEMBLY INSTRUCTIONS – MOUNTING PROCEDURE

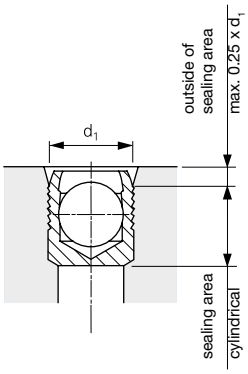
- The Expander® Sealing Plug has to be inserted into the counterbore hole with the ball facing out. The upper sleeve edge mustnot protrude the working piece. Mounting dimensions given in the catalogue have to be considered.
- When having only a small or no counterbore hole at all the sleeve bottom has to be supported sufficiently.
- Press in the ball by means of a press or setting die until the upper crown is lying underneath the sleeve edge. Respective standard values for stroke s and dimension x can be seen from the table below.

Attention
For the assembly of Expander® Sealing Plugs, please use setting dies according to the catalogue specification.



Roundness Tolerance
To achieve a secure functioning of the Expander® Sealing Plugs in respect to pressure effectiveness and sealing, a roundness tolerance of t = 0,05 mm has to be adhered to.

Drilling Tolerance
The drilling tolerance is + 0,1 mm.



Drilling Concentricity
Within the active sealing area, the drilling hole has to be cylindrical.The drilling hole entrance may be conical up to 0,25 x d_1 as this zone does not have any primary influence on the sealing function.

Galvanic Corrosion
An eventual contact corrosion has to be considered.

DISASSEMBLY PROCESS

Thanks to their strength of approx. 45 HRC, the balls can be drilled out using a drill fitted with a hard-metal bit.

- Drill out Expander sealing plugs with diameters of up to Ø 6 mm to the next larger diameter directly in a single step.
- Use multiple steps to drill out Expander sealing plugs with diameters of Ø 6 mm or more to the next larger diameter.
- Clear the hole of chips or any left-over body remnants and clean the hole (oil-free and grease-free).

Important
Always insert the sealing plug with the next larger size following disassembly.

Please refer to the technical data following these product information pages.

Expander® Sealing Plugs • with pull-anchor

EH 22880.



PRODUCT DESCRIPTION

Expander® sealing plugs are used for safe, quick and economic sealing of bore holes in fluid technology, e.g. hydraulic drilling holes in jig and fixture construction. When using sealing plugs with pull-anchor, assembly is made by means of user friendly assembly devices. Body and pin are pre-assembled and suitable for automated processing.
Please refer to the technical data following these product information pages.

Material

Body
- Case hardened steel, annealed

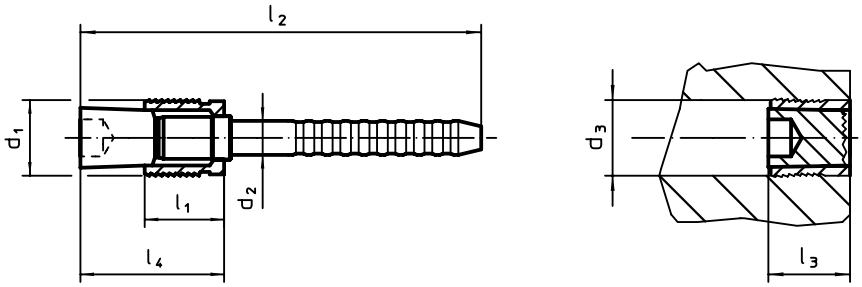
Pin
- Steel

MORE INFORMATION

Further products

Assembly Tools, for Expander® sealing plugs with pull-anchor . . . . . → p. 348

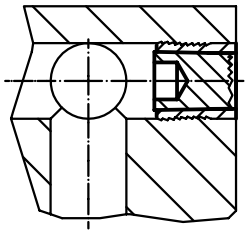
DRAWING



ORDER INFORMATION

Dimensions								Art. No.
d_1	d_2	d_3 +0,12 0	l_1	l_2	l_3 max.	l_4 max.		
[mm]							[g]	
4	2,50	4	4,5	39	6,5	9	2	22880.0404
5	3,00	5	5,5	41	7,5	10	3	22880.0405
6	3,40	6	6,5	43	8,0	12	4	22880.0406
7	4,10	7	7,5	38	9,0	14	5	22880.0407
8	4,20	8	8,5	40	10,5	15	6	22880.0408
9	4,50	9	9,5	43	11,0	17	8	22880.0409
10	4,75	10	10,5	45	12,5	19	10	22880.0410

APPLICATION EXAMPLE



Working and control pressures for Expander® sealing plug with pull-anchor							
basic material	ETG-100 AISI 1144	C15Pb 1.0403	GG-25 DIN 1691	GGG-50 DIN 1693	AlCuMg2 3.1354	AlMgSiPb 3.0615	G-AlSi7Mg 3.2371
d_1 4-10 mm	p [bar]						
	500	500	500	500	500	450	450
	pTest [bar]						
	1600	1600	1600	1600	1600	1400	1400

2

Expander® Sealing Plugs • with elongated pull-anchor

EH 22880.



PRODUCT DESCRIPTION

Expander® sealing plugs are used for safe, quick and economic sealing of bore holes in fluid technology, e.g. hydraulic drilling holes in jig and fixture construction. When using sealing plugs with elongated pull-anchor, assembly is made by means of user friendly assembly devices.
Body and pin are pre-assembled and suitable for automated processing.
ATTENTION:
If Expander® sealing plugs with pull-anchor are applied to separate grooves, the admissible working pressure at the setting side has to be reduced by 50 %!
Please refer to the technical data following these product information pages.

Material

Body
- Case hardened steel, annealed

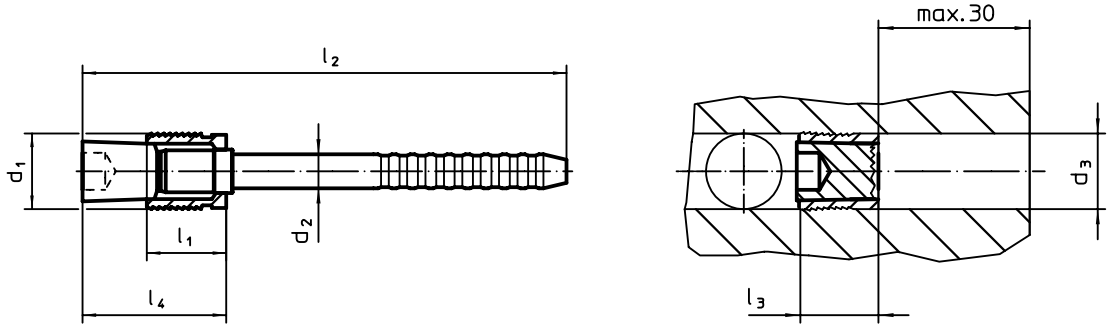
Pin
- Steel

MORE INFORMATION

Further products

Distance Bushings, for Expander® sealing plugs with elongated pull-anchor . . → p. 347
Assembly Tools, for Expander® sealing plugs with pull-anchor . . . . . → p. 348

DRAWING



ORDER INFORMATION

Dimensions								Art. No.
d_1	d_2	d_3 +0,12 0	l_1	l_2	l_3 max.	l_4 max.		
[mm]							[g]	
4	2,50	4	4,5	69	6,5	9	3	22880.0414
5	3,00	5	5,5	71	7,5	10	4	22880.0415
6	3,40	6	6,5	73	8,0	12	6	22880.0416
7	4,10	7	7,5	68	9,0	14	8	22880.0417
8	4,20	8	8,5	70	10,5	15	10	22880.0418
9	4,50	9	9,5	73	11,0	17	12	22880.0419
10	4,75	10	10,5	75	12,5	19	15	22880.0420

Working and control pressures for Expander® sealing plug with elongated pull-anchor							
basic material	ETG-100 AISI 1144	C15Pb 1.0403	GG-25 DIN 1691	GGG-50 DIN 1693	AlCuMg2 3.1354	AlMgSiPb 3.0615	G-AlSi7Mg 3.2371
d_1 4-10 mm	p [bar]						
	500	500	500	500	500	450	450
	pTest [bar]						
	1600	1600	1600	1600	1600	1400	1400

Distance Bushings • for Expander® sealing plugs with elongated pull-anchor

EH 22880.



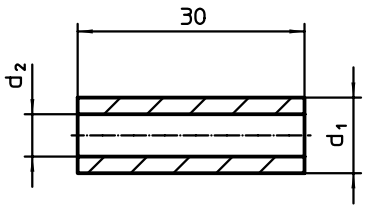
PRODUCT DESCRIPTION

To be used for Expander® sealing plugs with elongated pull-anchor.

Material

Body
- Case-hardened steel, case hardened

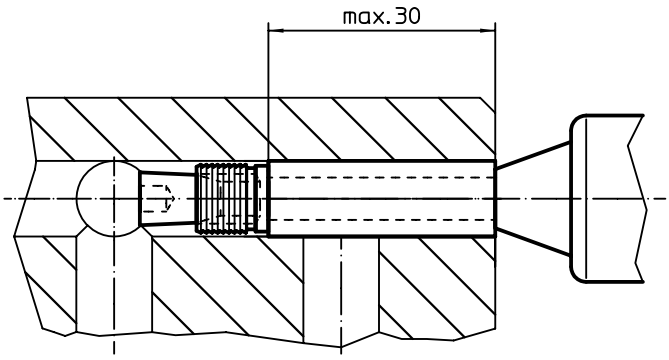
DRAWING

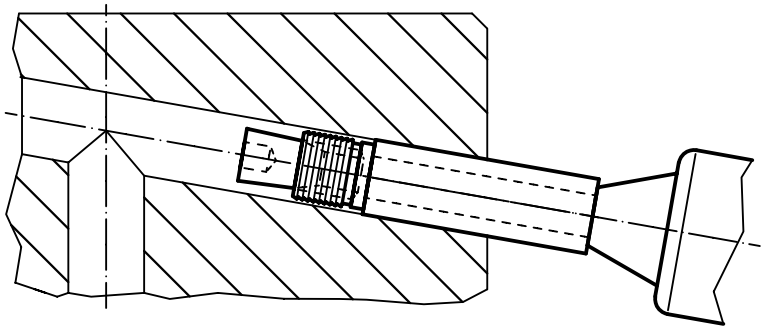


ORDER INFORMATION

Dimensions d_1 [mm]	d_2 [mm]	[g]	Art. No.
4	2,7	1,4	22880.0424
5	3,2	2,5	22880.0425
6	3,7	3,8	22880.0426
7	4,6	4,8	22880.0427
8	4,8	3,5	22880.0428
9	5,2	9,6	22880.0429
10	5,6	11,0	22880.0430

APPLICATION EXAMPLE





2

Assembly Tools • for Expander® sealing plugs with pull-anchor

EH 22880.





PRODUCT DESCRIPTION

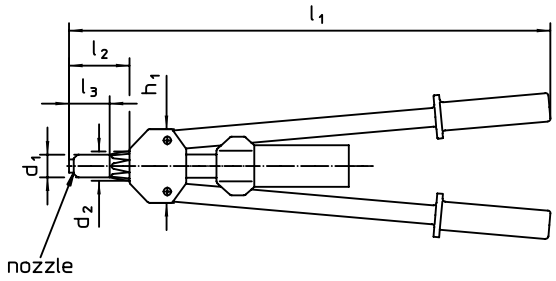
Assembly tool for the safe and easy assembly of Expander® sealing plugs with pull-anchor/ elongated pull-anchor.

Technical details of the pneumatic assembly tools:
- Working pressure min. 5 bar / max. 7 bar
- Air volume required at 5.6 bar = 3.5 l
- Working noise < 75 dB(A)
- Cycle time 2 s

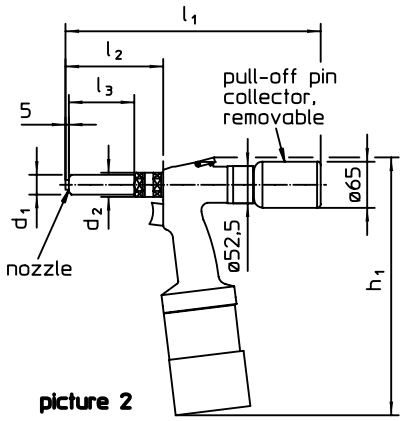
Attention: The scope of the delivery of the original equipment of both mechanical and pneumatic assembly tools includes the ram, the clamping jaws, and the housing for the clamping jaws.
Mechanical assembly tool: nozzles are also included in the original equipment. Pneumatic assembly tool: nozzles must be purchased separately.

Material
- On request

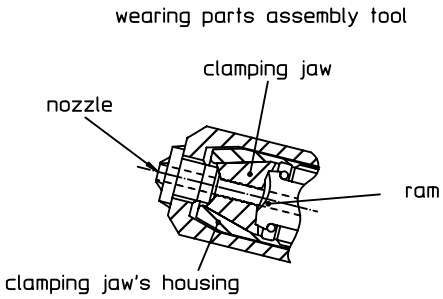
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

Tensile force	Stroke	Dimensions							Art. No.
	~	d_1 ~	d_2 ~	l_1 ~	l_2 ~	l_3 ~	h_1 ~		
[kN]	[mm]	[mm]						[g]	
assembly tool, mechanically operated (KW-008), for sizes (d_1) 4 to 6 – picture 1									
–	–	24	31	525	59	38,0	80	1950	22880.0500
assembly tool, pneumatically operated (ExTool 030), for sizes (d_1) 4 to 6 – picture 2									
19 [at 7 bar]	25	23	26	353	133	73,5	356	2500	22880.0510
assembly tool, pneumatically operated (ExTool 040-1), for sizes (d_1) 7 to 10 – picture 2									
24 [at 7 bar]	18	28	34	353	133	92,0	356	3280	22880.0520

ACCESSORIES

	Description	Dimensions Nominal size d_1 [mm]	[g]	Art. No.
KW-008 (22880.0500)				
	nozzle – picture 3	4	8,6	22880.0502
		5	8,8	22880.0503
		6	9,2	22880.0504
	clamping jaw – picture 3	–	12,0	22880.0551
ExTool 030 (22880.0510)				
	nozzle – picture 3	4	9,0	22880.0512
		5	9,3	22880.0513
		6	9,5	22880.0514
	ram – picture 3	–	13,0	22880.0560
	clamping jaw – picture 3	–	10,0	22880.0561
	clamping jaw's housing – picture 3	–	39,0	22880.0562
ExTool 040-1 (22880.0520)				
	nozzle – picture 3	7	9,3	22880.0525
		8	11,0	22880.0526
		9	9,5	22880.0527
		10	9,6	22880.0528
	ram – picture 3	–	20,0	22880.0570
	clamping jaw – picture 3	–	8,4	22880.0571
	clamping jaw's housing – picture 3	–	41,0	22880.0572

2

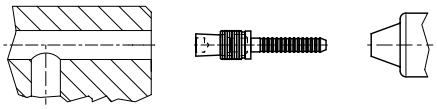
CONSTRUCTIONAL GUIDELINES, ASSEMBLY INSTRUCTIONS

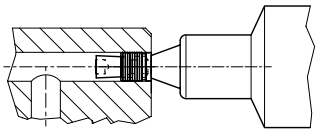


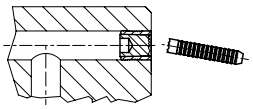
COMPONENT REQUIREMENTS (22880.0404 - 22880.0420):

Drilling Holes

- Roundness tolerances have to be within t = 0,05 mm.
- With hard materials the drilling roughness has to be R_z=10 to 30 µm.
- Drilling tolerance d_1= + 0,12 mm.
- Longitudinal rifles and spiral grooves have to be avoided as they have a negative influence on the sealing.
- **Drilling holes have to be kept absolutely free from oil, grease and chips.**







ASSEMBLY INSTRUCTIONS

Mounting Procedure

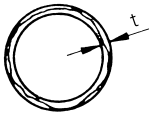
- The Expander® Sealing Plug with pull-anchor has to be flush mounted into the sleeve of the assembling tool.
- The Expander® Sealing Plug has to be mounted into the bore hole to be sealed. The assembly operation has to be activated until the pull-anchor breaks when having achieved the nominal breaking load.

Attention:

- The assembly of the Expander® Sealing Plug has to be effected only in a clean working environment.
- The anchor and sleeve of the Sealing Plug must neithe be cleaned nor greased.

Tools:

- For a failure-free assembly of the Expander® Sealing Plug the original tools and the appropriate equipment according to the technical data sheet are to be used.

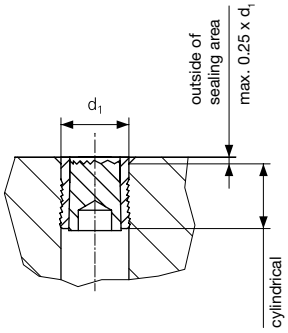


Roundness Tolerance

To achieve a secure functioning of the Expander® Sealing Plugs in respect to pressure effectiveness and sealing, a roundness tolerance of t = 0,05 mm has to be adhered to.

Drilling Tolerance

The drilling tolerance d_1 = + 0,12 mm with pull-anchor.



Drilling Conicity

Within the active sealing area, the drilling hole has to be cylindrical.The drilling hole entrance may be conical up to 0,25 x d_1 as this zone does not have any primary influence on the sealing function.

Galvanic Corrosion

An eventual contact corrosion has to be considered.

DISASSEMBLY PROCESS

For the Expander® Sealing Plug type with pull-anchor a disassembly is possible.

1. Strike back the anchor inside of the sleeve with the help of the punch.
2. Break out the sleeve and remove the struck anchor.
3. Redrill the bore hole to the Expander® Sealing Plug diameter next in size according to the standard sheet.
4. Clean the bore and free it from chips and possible leftovers of the sleeve (without oil and grease).
5. Insert new Expander® Sealing Plug (take care of point 3.).

Attention:
After the disassembly always insert the Expander® Sealing Plug diameter next in size!

Please refer to the technical data following these product information pages.

Expander® Sealing Plugs
EH 22880.

CONSTRUCTIONAL GUIDELINES, ASSEMBLY INSTRUCTIONS



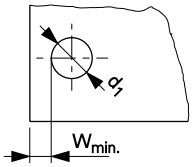

WALL THICKNESSES / EDGE DISTANCES

Drilling Holes

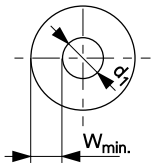
The Expander® Sealing Plug is anchored to the basic material by radial expansion of the sleeve. Depending on the basic materials' characteristics forces resulting from this type of anchorage as well as the hydraulic pressures and temperature loads will necessitate minimum wall thicknesses and edge distances.

Distance to outer profile

straight

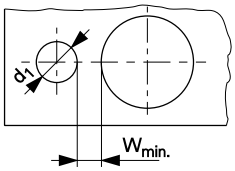


round



Wall Thickness

between drilled holes





For standard values of minimum wall thicknesses and edge distances (W_{min}) refer to table.

Calculation of standard values

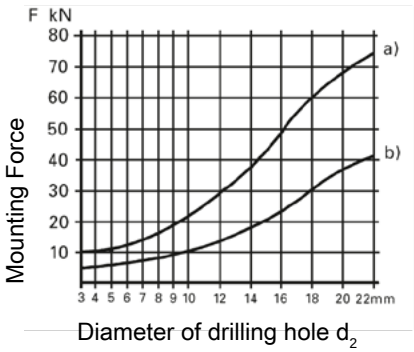
Diameter of the Expander® Sealing Plug: $d_1 \geq 4$ mm: $W_{min} = f_{min} \times d_1$

$d_1 < 4$ mm: $W_{min} = f_{min} \times d_1 + 0{,}5$

Description	ETG -100 AISI 1144	C 15 Pb 1.0403	GG - 25 DIN 1691	GGG - 50 DIN 1693	AlCuMg$_2$ 3.1354	AlMgSiPb 3.0615	G-AlSi7Mg 3.2371
Tensile strength Rm N/mm²	1000	560	250	500	480	340	300
Min. breaking elongation A5 / %	6	6	-	7	8	8	4
Average permanent elongation limit $R_{p\,0,2}$ N/mm²	865	300	-	320	380	300	250
Basic material				**Factor $f_{min.}$**			
Sleeve from stainless steel	**0,6**	**0,8**	**1,0**	**0,8**	**0,8**	**1,0**	**1,0**
Sleeve from steel	**0,5**	**0,6**	**1,0**	**0,6**	**0,6**	**1,0**	**1,0**
Type with pull-anchor	**0,5**	**0,6**	**1,0**	**0,6**	**0,6**	**1,0**	**1,0**

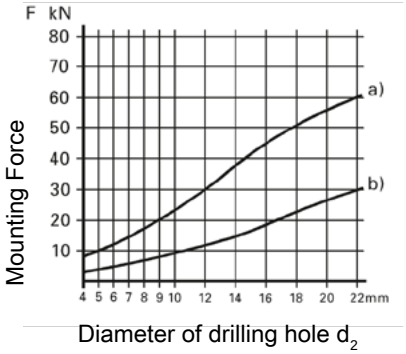
MOUNTING / ASSEMBLY FORCES

Expander® Sealing Plug sleeve from stainless steel Art. No. 22880.0053 to 22880.0072



Measured in steel having a tensile strength of Rm = 1000 N/mm². When using basic materials with lower tensile strengths values are lower.

Expander® Sealing Plug sleeve from steel Art. No. 22880.0004 to 22880.0022



a) Force at min. drilling tolerance
b) Force at max. drilling tolerance

Expander® Sealing Plugs

EH 22880.







ANCHORAGE PRINCIPLE

There is a direct connection between the necessary drilling roughness required and both, the hardness and the tensile characteristics of the basic material. Depending on the mounting combination of sealing plug and basic material, anchorage can either take place via the rifle profile of the Expander® sleeve (automatic anchorage) or via the surface roughness of the drilling hole.

Attention:
Depending on the type of Expander® Sealing Plug and the hardness of the basic material a bore roughness of Rz = 10-30 µm has to be adhered to.

Expander® Sealing Plug
Art. No. 22880.0004 to 22880.0072
Requirements to achieve maximum operation reliability

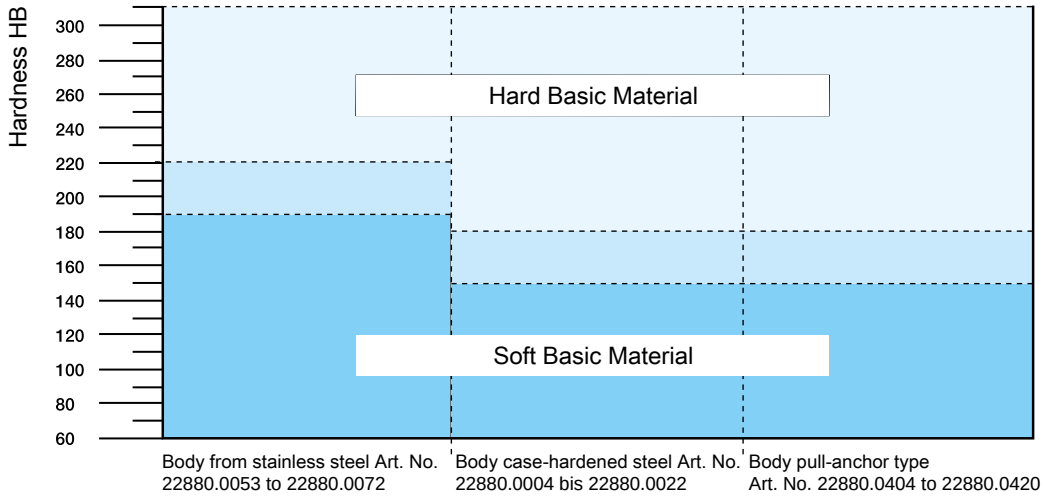
- Drilling tolerance d_1 = + 0,10 mm,
- Consideration of counterbore hole relations,
- Roundness tolerance t = 0,05 mm,
- Longitudinal rifles and spiral grooves that may have a negative influence on the sealing effectiveness have to be avoided,
- Drilling holes have to be free from oil and grease.

Expander® Sealing, type with pull-anchor
Art. No. 22880.0404 to 22880.0420
Requirements to achieve maximum operation reliability

- Drilling tolerance d_1 = + 0,12 mm,
- Roundness tolerance t = 0,05 mm,
- Longitudinal rifles and spiral grooves that may have a negative influence on the sealing effectiveness have to be avoided,
- Drilling holes have to be free from oil and grease.

Note:
In case where an automatic anchorage is not possible when building in the Expander® Sealing Plug into a hard basic material a drilling roughness of > Rz= 10-30 µm is necessary to achieve the required pressure values. When having roughness > Rz = 30 µm, leakages may occur.

Expander® Sealing Plug

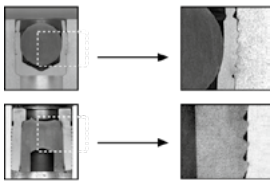


= For the allowed working pressures, the anchorage must be achieved via the drilling roughness. Roughness: Rz = 10-30 µm.

= Intermediate area: For the allowed working pressures anchorage has to be achieved via the drilling roughness of the basic material. Roughness: Rz = 10-30 µm.

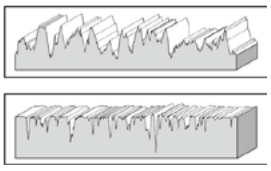
= The anchorage within the drilling hole of the basic material will automatically be achieved via the rifle profile of the Expander® sealing plug (automatic anchorage).

Picture 1 Selection Diagram



Picture. 2

Picture. 3



Picture. 4

Picture. 5

Anchorage by Rifle Profile (Automatic Anchorage)
Example (Picture 2):
Expander® Sealing Plug made from case hardened steel HB = 180
in aluminium alloy HB = 90
Example (Picture 3):
Expander® Sealing Plug, pull-anchor type from case hardened steel HB = 180
in aluminium alloy HB = 90

Anchorage by Bore Roughness:
Required Roughness Design (Picture 4):An ideal bore roughness for the anchor can be achieved by using a twist drill or countersink.

Undesirable Roughness Design
Friction will cause a smooth roughness profile that is not desired.

Swing Bolts • DIN 444, form B

EH 22980.



PRODUCT DESCRIPTION

Swing bolts similar to DIN 444 however, steel design with higher quality 8.8. The stainless steel A2-50 design has a tensile strength of min. 500 N/mm².

Material

- Heat-treated steel, tempered, quality 8.8, black
- Stainless steel 1.4301

MORE INFORMATION

Notes

Special types on request.

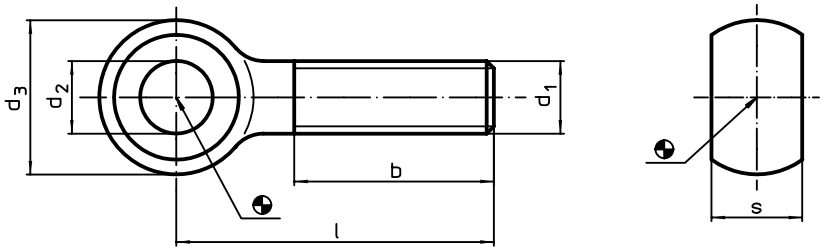
References

For torques please refer to appendix - Technical Data -

Further products

Swing Bolts, DIN 444, form B, quality 8.8 high precision design. . . . . → p. 354

DRAWING



ORDER INFORMATION

d1	l	d2 H9	d3	b	s		Art. No. heat-treated steel	Art. No. stainless steel
		[mm]				[g]		
M 5	25	5	12	16	6	5,6	22980.0202	22980.0402
	30	5	12	16	6	6,4	22980.0203	22980.0403
	35	5	12	16	6	7,1	22980.0204	22980.0404
	40	5	12	16	6	7,9	22980.0205	22980.0405
M 6	30	6	14	18	7	9,5	22980.0212	22980.0412
	40	6	14	18	7	12,0	22980.0214	22980.0414
	50	6	14	18	7	14,0	22980.0216	22980.0416
	60	6	14	18	7	16,0	22980.0218	22980.0418
	80	6	14	18	7	20,0	22980.0222	22980.0422
M 8	40	8	18	22	9	22,0	22980.0232	22980.0432
	50	8	18	22	9	25,0	22980.0234	22980.0434
	60	8	18	22	9	29,0	22980.0236	22980.0436
	80	8	18	22	9	37,0	22980.0240	22980.0440
	100	8	18	22	9	44,0	22980.0244	22980.0444
M10	50	10	20	26	12	37,0	22980.0252	22980.0452
	60	10	20	26	12	43,0	22980.0254	22980.0454
	75	10	20	26	12	52,0	22980.0257	22980.0457
	100	10	20	26	12	67,0	22980.0262	22980.0462
	120	10	20	26	12	72,0	22980.0266	22980.0466
M12	50	12	25	30	14	59,0	22980.0272	22980.0472
	60	12	25	30	14	68,0	22980.0274	22980.0474
	80	12	25	30	14	85,0	22980.0278	22980.0478
	100	12	25	30	14	102,0	22980.0282	22980.0482
	120	12	25	30	14	119,0	22980.0286	22980.0486
M16	60	16	32	38	17	128,0	22980.0292	22980.0492
	80	16	32	38	17	158,0	22980.0294	22980.0494
	100	16	32	38	17	190,0	22980.0298	22980.0498
	120	16	32	38	17	220,0	22980.0302	22980.0502
	150	16	32	44	17	265,0	22980.0308	22980.0508
M20	100	18	40	46	22	329,0	22980.0312	22980.0512
	120	18	40	46	22	371,0	22980.0316	22980.0516
	160	18	40	52	22	466,0	22980.0324	22980.0524
	200	18	40	52	22	562,0	22980.0332	22980.0532
M24	100	22	45	54	25	442,0	22980.0342	22980.0542
	120	22	45	54	25	512,0	22980.0346	22980.0546
	160	22	45	60	25	649,0	22980.0354	22980.0554
	200	22	45	60	25	787,0	22980.0362	22980.0562

Swing Bolts • DIN 444, form B, quality 8.8 high precision design

EH 22980.



PRODUCT DESCRIPTION

The high precision design swing bolts exceed the DIN Version's quality. The thread is rolled - the shaft diameter is equal to the roll diameter. The surfaces -s- are machined.
Bore tolerance d_2 = H7.

Material

- Heat-treated steel, tempered, quality 8.8, black

MORE INFORMATION

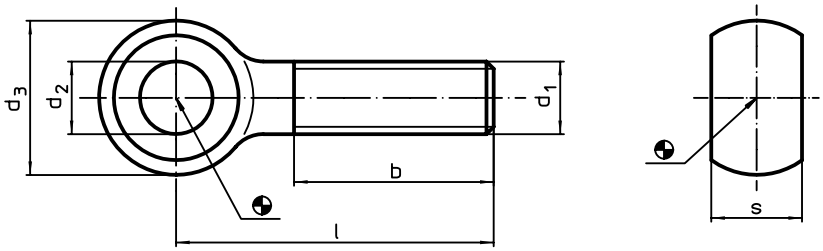
References

For torques please refer to appendix - Technical Data -

Further products

Swing Bolts, DIN 444, form B . . . . . → p. 353

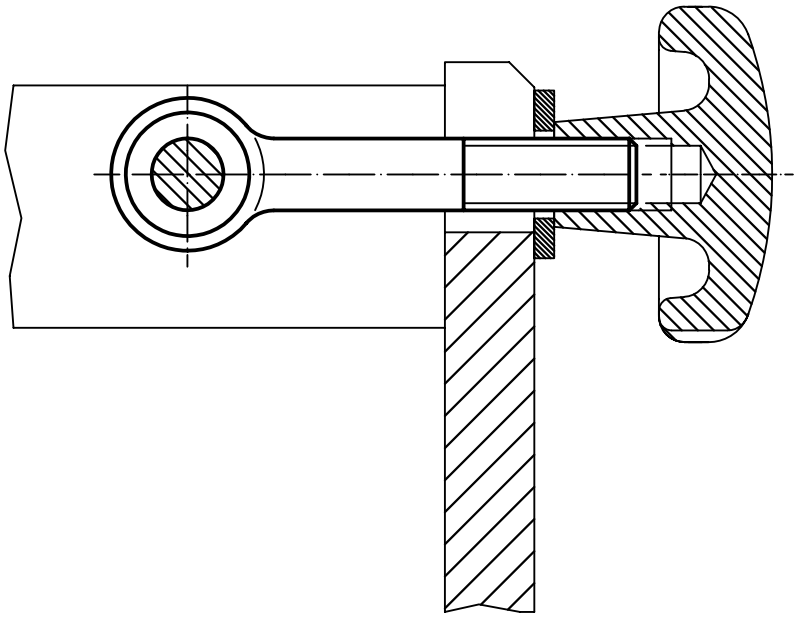
DRAWING



ORDER INFORMATION

d_1	l	d_2 H7	d_3	b	s -0,2		Art. No.
		[mm]				[g]	
M 8	40	8	18	22	9	22	22980.0081
	60	8	18	22	9	28	22980.0084
M10	50	10	20	26	12	38	22980.0103
	75	10	20	26	12	50	22980.0106
	100	10	20	26	12	62	22980.0108
M12	60	12	25	30	14	70	22980.0122
	80	12	25	30	14	84	22980.0125
	120	12	25	30	14	113	22980.0128
M16	80	16	32	38	17	153	22980.0163
	150	16	32	44	17	245	22980.0168

APPLICATION EXAMPLE



Rod Ends • DIN 12240-4, with male thread

EH 22982.



PRODUCT DESCRIPTION

Rod ends are suitable for universal use in applications subject to dynamic loads. As well as use in corrosion-risk areas, the design in stainless steel can also be used under higher dynamic loads.
Rod ends are used for bearings where movements between shaft and housing are necessary, and where the movements are not in a straight line.
Rod ends are ready-to-install elements manufactured to DIN ISO 12240-4 (dimension series K). The PTFE fabric inserted into the bearing shell means that the rod ends are maintenance-free.
Please take note of the technical information which follows these product pages.

Material

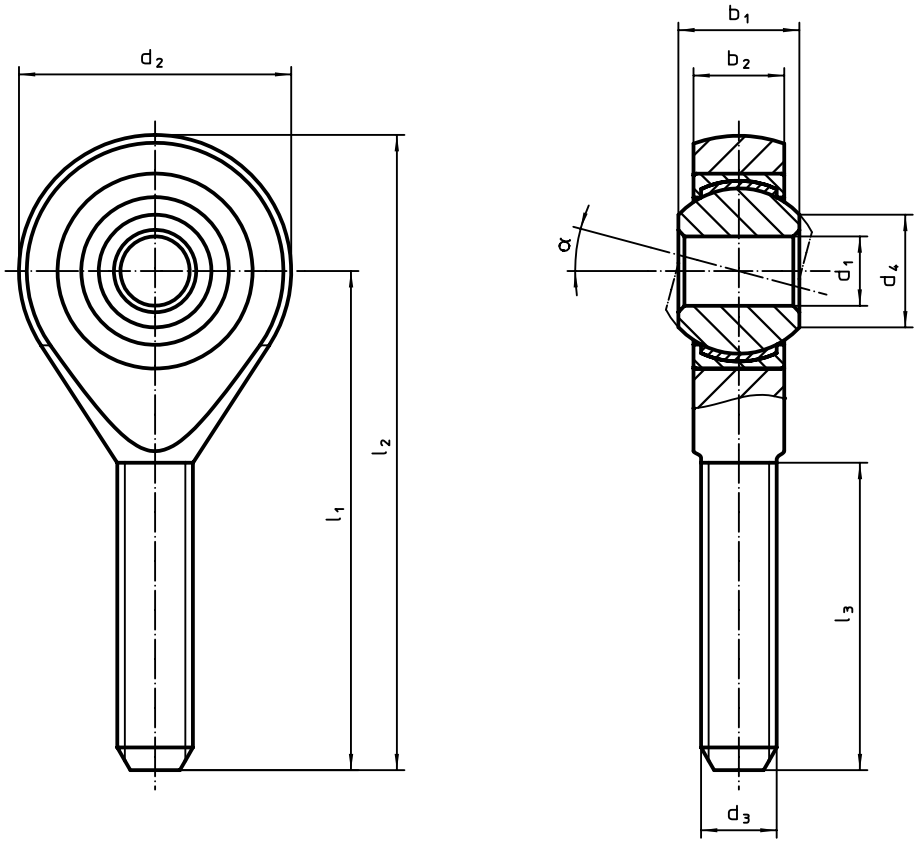
Body
- Free cutting steel, turned, zinc-plated
- Stainless steel 1.4057, forged, polished

Joint ball
- Roller bearing steel, hardened, ground, polished
- Stainless steel 1.4034, hardened, ground, polished

Bearing
- PTFE fabric

Bearing shell
- Free cutting steel, zinc-plated by galvanization
- Stainless steel 1.4571

DRAWING



ORDER INFORMATION

Dimensions										Dynamic carrying figure C	Permitted rotational speed		Free cutting steel		Stainless steel	
d_1	l_1	b_1	b_2	d_2	d_3	d_4	l_2	l_3	α				static carrying figure C_0	Art. No.	static carrying figure C_0	Art. No.
[mm]										[kN]	[U/min]	[g]	[kN]		[kN]	
right hand thread																
5	**33**	8	6,00	18	M 5	7,7	42	19	13°	7,5	600	13	4,3	22982.0102	6,2	22982.0302
6	**36**	9	6,75	20	M 6	8,9	46	21	13°	9,3	530	20	6,0	22982.0104	8,8	22982.0304
8	**42**	12	9,00	24	M 8	10,4	54	25	14°	16,7	420	33	11,0	22982.0106	16,1	22982.0306
10	**48**	14	10,50	28	M10	12,9	62	28	13°	23,4	350	56	17,4	22982.0108	25,5	22982.0308
12	**54**	16	12,00	32	M12	15,4	70	32	13°	32,0	300	87	23,5	22982.0110	34,5	22982.0310
14	**60**	19	13,50	36	M14	16,8	78	38	16°	42,0	260	129	21,0	22982.0112	39,5	22982.0312

→

Dimensions										Dynamic carrying figure C	Permitted rotational speed		Free cutting steel		Stainless steel	
d_1	l_1	b_1	b_2	d_2	d_3	d_4	l_2	l_3	α				static carrying figure C_0	Art. No.	static carrying figure C_0	Art. No.
[mm]										[kN]	[U/min]	[g]	[kN]		[kN]	
16	**66**	21	15,00	42	M16	19,3	87	40	15°	52,5	230	189	32,0	22982.0114	60,5	22982.0314
18	**72**	23	16,50	46	M18 x 1,5	21,8	95	44	15°	64,0	210	267	38,5	22982.0116	73,0	22982.0316
20	**78**	25	18,00	50	M20 x 1,5	24,3	103	47	14°	78,0	190	348	44,0	22982.0118	83,0	22982.0318
22	**84**	28	20,00	54	M22 x 1,5	25,8	111	51	15°	97,0	170	443	53,0	22982.0120	100,0	22982.0320
25	**94**	31	22,00	60	M24 x 2	29,6	124	57	15°	122,0	150	600	61,0	22982.0122	118,0	22982.0322
left hand thread																
5	**33**	8	6,00	18	M 5	7,7	42	19	13°	7,5	600	13	4,3	22982.0124	6,2	22982.0324
6	**36**	9	6,75	20	M 6	8,9	46	21	13°	9,3	530	20	6,0	22982.0126	8,8	22982.0326
8	**42**	12	9,00	24	M 8	10,4	54	25	14°	16,7	420	33	11,0	22982.0128	16,1	22982.0328
10	**48**	14	10,50	28	M10	12,9	62	28	13°	23,4	350	56	17,4	22982.0130	25,5	22982.0330
12	**54**	16	12,00	32	M12	15,4	70	32	13°	32,0	300	87	23,5	22982.0132	34,5	22982.0332
14	**60**	19	13,50	36	M14	16,8	78	38	16°	42,0	260	129	21,0	22982.0134	39,5	22982.0334
16	**66**	21	15,00	42	M16	19,3	87	40	15°	52,5	230	189	32,0	22982.0136	60,5	22982.0336
18	**72**	23	16,50	46	M18 x 1,5	21,8	95	44	15°	64,0	210	267	38,5	22982.0138	73,0	22982.0338
20	**78**	25	18,00	50	M20 x 1,5	24,3	103	47	14°	78,0	190	348	44,0	22982.0140	83,0	22982.0340
22	**84**	28	20,00	54	M22 x 1,5	25,8	111	51	15°	97,0	170	443	53,0	22982.0142	100,0	22982.0342
25	**94**	31	22,00	60	M24 x 2	29,6	124	57	15°	122,0	150	600	61,0	22982.0144	118,0	22982.0344

Rod Ends • DIN 12240-4, with female thread

EH 22982.



PRODUCT DESCRIPTION

Rod ends are suitable for universal use in applications subject to dynamic loads. As well as use in corrosion-risk areas, the design in stainless steel can also be used under higher dynamic loads.
Rod ends are used for bearings where movements between shaft and housing are necessary, and where the movements are not in a straight line.
Rod ends are ready-to-install elements manufactured to DIN ISO 12240-4 (dimension series K). The PTFE fabric inserted into the bearing shell means that the rod ends are maintenance-free.
Please take note of the technical information which follows these product pages.

Material

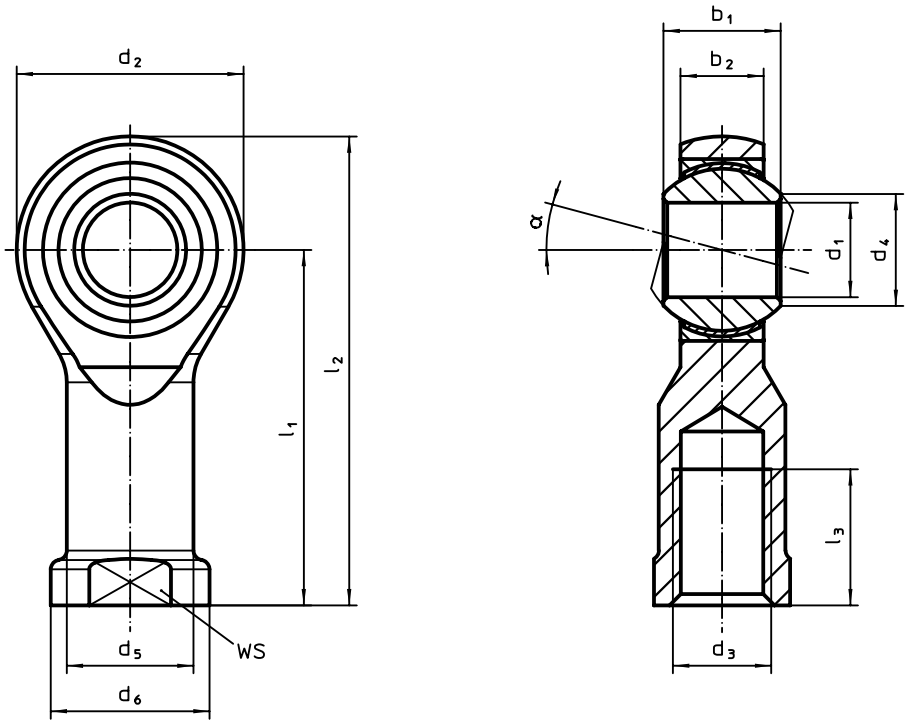
Body
- Free cutting steel, turned, zinc-plated
- Stainless steel 1.4057, forged, polished

Joint ball
- Roller bearing steel, hardened, ground, polished
- Stainless steel 1.4034, hardened, ground, polished

Bearing
- PTFE fabric

Bearing shell
- Free cutting steel, zinc-plated by galvanization
- Stainless steel 1.4571

DRAWING



ORDER INFORMATION

Dimensions												Dynamic carrying figure C	Permitted rotational speed		Free cutting steel		Stainless steel	
d_1	l_1	b_1	b_2	d_2	d_3	d_4	d_5	d_6	l_2	l_3	α				static carrying figure C_0	Art. No.	static carrying figure C_0	Art. No.
[mm]												[kN]	[U/min]	[g]	[kN]		[kN]	
right hand thread																		
5	**27**	8	6,00	18	M 5	7,7	9,0	11	36	10	13°	7,5	600	18	8,0	22982.0202	11,8	22982.0402
6	**30**	9	6,75	20	M 6	8,9	10,0	13	40	12	13°	9,3	530	27	8,9	22982.0204	13,1	22982.0404
8	**36**	12	9,00	24	M 8	10,4	12,5	16	48	16	14°	16,7	420	46	14,1	22982.0206	20,7	22982.0406
10	**43**	14	10,50	28	M10	12,9	15,0	19	57	20	13°	23,4	350	76	19,3	22982.0208	28,3	22982.0408
12	**50**	16	12,00	32	M12	15,4	17,5	22	66	22	13°	32,0	300	115	23,5	22982.0210	34,5	22982.0410
14	**57**	19	13,50	36	M14	16,8	20,0	25	75	25	16°	42,0	260	170	21,0	22982.0212	39,5	22982.0412

→

Dimensions												Dynamic carrying figure C	Permitted rotational speed		Free cutting steel		Stainless steel	
d_1	l_1	b_1	b_2	d_2	d_3	d_4	d_5	d_6	l_2	l_3	α				static carrying figure C_0	Art. No.	static carrying figure C_0	Art. No.
[mm]												[kN]	[U/min]	[g]	[kN]		[kN]	
16	**64**	21	15,00	42	M16	19,3	22,0	27	85	28	15°	52,5	230	230	32,0	22982.0214	60,5	22982.0414
18	**71**	23	16,50	46	M18 x 1,5	21,8	25,0	31	94	32	15°	64,0	210	320	38,5	22982.0216	73,0	22982.0416
20	**77**	25	18,00	50	M20 x 1,5	24,3	27,5	34	102	33	14°	78,0	190	415	44,0	22982.0218	83,0	22982.0418
22	**84**	28	20,00	54	M22 x 1,5	25,8	30,0	37	111	37	15°	97,0	170	540	53,0	22982.0220	100,0	22982.0420
25	**94**	31	22,00	60	M24 x 2	29,6	33,5	42	124	42	15°	122,0	150	750	62,0	22982.0222	118,0	22982.0422
left hand thread																		
5	**27**	8	6,00	18	M 5	7,7	9,0	11	36	10	13°	7,5	600	18	8,0	22982.0224	11,8	22982.0424
6	**30**	9	6,75	20	M 6	8,9	10,0	13	40	12	13°	9,3	530	27	8,9	22982.0226	13,1	22982.0426
8	**36**	12	9,00	24	M 8	10,4	12,5	16	48	16	14°	16,7	420	46	14,1	22982.0228	20,7	22982.0428
10	**43**	14	10,50	28	M10	12,9	15,0	19	57	20	13°	23,4	350	76	19,3	22982.0230	28,3	22982.0430
12	**50**	16	12,00	32	M12	15,4	17,5	22	66	22	13°	32,0	300	115	23,5	22982.0232	34,5	22982.0432
14	**57**	19	13,50	36	M14	16,8	20,0	25	75	25	16°	42,0	260	170	21,0	22982.0234	39,5	22982.0434
16	**64**	21	15,00	42	M16	19,3	22,0	27	85	28	15°	52,5	230	230	32,0	22982.0236	60,5	22982.0436
18	**71**	23	16,50	46	M18 x 1,5	21,8	25,0	31	94	32	15°	64,0	210	320	38,5	22982.0238	73,0	22982.0438
20	**77**	25	18,00	50	M20 x 1,5	24,3	27,5	34	102	33	14°	78,0	190	415	44,0	22982.0240	83,0	22982.0440
22	**84**	28	20,00	54	M22 x 1,5	25,8	30,0	37	111	37	15°	97,0	170	540	53,0	22982.0242	100,0	22982.0442
25	**94**	31	22,00	60	M24 x 2	29,6	33,5	42	124	42	15°	122,0	150	750	62,0	22982.0244	118,0	22982.0444

Rod Ends
EH 22982.






TECHNICAL DATA

RADIAL PLAY

Radial bearing play is a measure taken at room temperature and used to determine the degree by which the inner ring can be shifted relative to the outer ring in radial direction from one end position to the opposite end position.

	Radial play [mm]	
d_1	min.	max
5	0,005	0,030
6	0,005	0,030
8	0,005	0,030
10	0,005	0,030
12	0,005	0,035
14	0,005	0,035
16	0,005	0,035
18	0,005	0,035
20	0,005	0,045
22	0,005	0,045
25	0,005	0,045

TEMPERATURE RANGE FOR USE

The temperature range for use is -50°C to 150°C.

CARRYING FIGURES

Carrying figures are properties that are bearing-specific and derived from the material data of the material used. They are used as an aid to select rod ends. Increasing or alternating loads require that the dynamic bearing capacity of the rod end housing be considered separately.

STATIC CARRYING FIGURE C_0

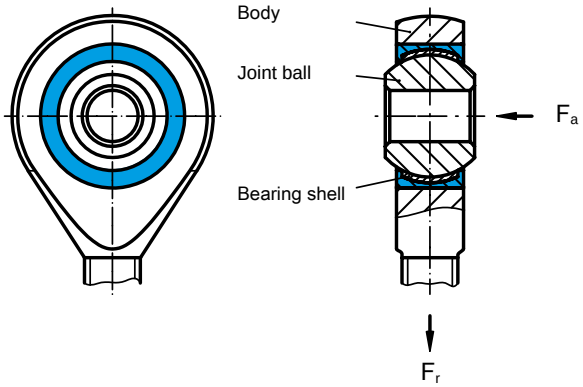
C_0 identifies the permissible radial load at standstill and with the load at rest which a rod end is capable of withstanding at the weakest cross section without deforming. The specified C_0 values are determined by way of calculation based on the respective material properties and verified by subjecting a representative quantity of rod ends to a tensile test at room temperature: each test was assuming 80% utilization of the yield strength, incorporating a 1.25 margin of safety.

The static carrying figure C_0 also serves as a means to calculate the permissible axial load, which is limited by additional bending stresses occurring at the rod shaft, but, primarily, by the axial attachment of the inner part.

Push-out tests were used to establish the maximum axial force.

$F_a = 0,4 \times C_0$

RADIAL AND AXIAL FORCES



DYNAMIC FIGURE C

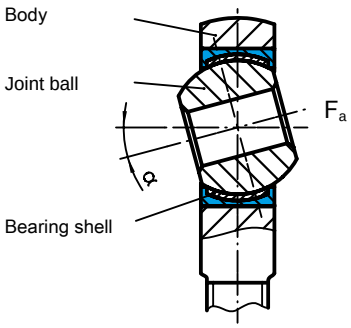
The specified dynamic carrying figures form the basis for the calculation of the service life rod ends will be able to enjoy when subjected to dynamic stresses, i.e. loads exerted by swinging or tipping. However, these figures merely refer to the bearing and can therefore not be applied to the rod end housing.

LUBRICATION

Maintenance-free rod ends must not be re-lubricated. The inner ring slides on a PTFE fabric embedded in the bearing shell.

TILT ANGLE

The tilt angle varies with every version. You will find the corresponding values in the product data table.



3 CLAMPING ELEMENTS



	Product group	Page
	Nuts for T-Slots	362
	Clamping Screws	369
	Spherical / Plain Washers	375
	Clamping Nuts	383
	Precision Slot Nuts	387
	Positioning Clamping Elements	395
	Positioning Bushings	401
	Clamps	407
	Straight Clamps, slotted	419
	Clamping Element Systems	424
	Horizontal Clamping Elements	434
	Supporting Elements	458
	Floating Clamps	462
	Push-Pull Clamps	478
	Eccentric Clamping Elements	480
	Down-Thrust Clamps	492
	Toggle Clamps	508
	Compact Clamps	536
	Centering Clamping Elements	540
	Shaft Clamps	550
	Clamping Plates	552

Nuts for T-Slots • DIN 508

EH 23010.



PRODUCT DESCRIPTION

Material

- Heat-treated steel, quality 8, bright
- Heat-treated steel, tempered, quality 10, blackened
- Stainless steel 1.4301

Assembly

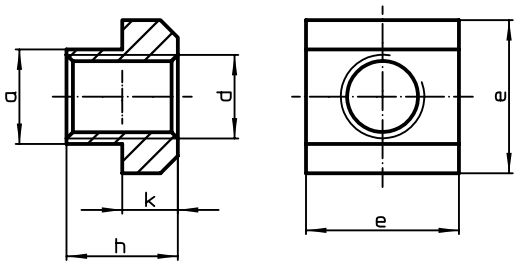
The entire loading capacity of the T-nut can only be applied if the screwing is guaranteed to be made over the total thread length of the T-nut.

MORE INFORMATION

Notes

Special types on request.

DRAWING



ORDER INFORMATION

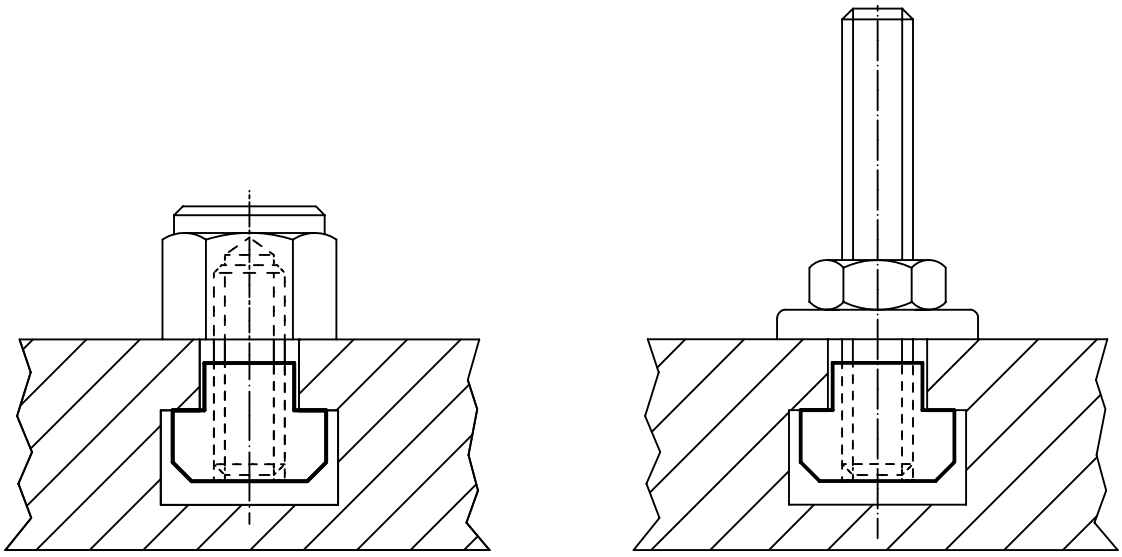
T-slot size	Dimensions					For T-slots DIN 650	Testing force to DIN 508 F min.		Art. No.		
	d	a	e	h	k				heat-treated steel, quality 8, bright	heat-treated steel, tempered, quality 10, blackened	stainless steel 1.4301
[mm]	[mm]					[mm]	[kN]	[g]			
5	M 4	4,6	9	6,5	3	5	7,0	2,3	23010.0051	23010.0052	–
6	M 5	5,6	10	8,0	4	6	11,4	3,4	23010.0061	23010.0062	–
8	M 6	7,6	13	10,0	6	8	16,0	8,3	23010.0081	23010.0082	23010.0721
10	M 6	9,6	15	12,0	6	10	16,0	14,0	23010.0103[1)]	23010.0104[1)]	–
	M 8	9,6	15	12,0	6	10	29,0	13,0	23010.0101	23010.0102	23010.0731
12	M 8	11,6	18	14,0	7	12	29,0	23,0	23010.0123[1)]	23010.0124[1)]	–
	M10	11,6	18	14,0	7	12	46,0	20,0	23010.0121	23010.0122	23010.0741
14	M 6	13,6	22	16,0	8	14	16,0	46,0	–	23010.0146[1)]	–
	M 8	13,6	22	16,0	8	14	29,0	41,0	–	23010.0145[1)]	–
	M10	13,6	22	16,0	8	14	46,0	37,0	23010.0143[1)]	23010.0144[1)]	–
	M12	13,6	22	16,0	8	14	67,0	34,0	23010.0141	23010.0142	23010.0751
16	M 8	15,6	25	18,0	9	16	29,0	62,0	–	23010.0166[1)]	–
	M10	15,6	25	18,0	9	16	46,0	59,0	–	23010.0165[1)]	–
	M12	15,6	25	18,0	9	16	67,0	54,0	23010.0163[1)]	23010.0164[1)]	–
	M14	15,6	25	18,0	9	16	–	49,0	23010.0161[1)]	23010.0162[1)]	23010.0761[1)]
18	M 8	17,6	28	20,0	10	18	29,0	89,0	–	23010.0187[1)]	–
	M10	17,6	28	20,0	10	18	46,0	85,0	–	23010.0186[1)]	–
	M12	17,6	28	20,0	10	18	67,0	80,0	–	23010.0185[1)]	–
	M14	17,6	28	20,0	10	18	–	74,0	23010.0183[1)]	23010.0184[1)]	–
	M16	17,6	28	20,0	10	18	128,0	68,0	23010.0181	23010.0182	23010.0781
20	M12	19,6	32	24,0	12	20	67,0	131,0	–	23010.0205[1)]	–
	M16	19,6	32	24,0	12	20	128,0	116,0	23010.0203[1)]	23010.0204[1)]	–
	M18	19,6	32	24,0	12	20	–	108,0	23010.0201[1)]	23010.0202[1)]	–

[1)] DIN standards do not include these dimensions.

T-slot size	Dimensions					For T-slots DIN 650	Testing force to DIN 508 F min.		Art. No.		
	d	a	e	h	k				heat-treated steel, quality 8, bright	heat-treated steel, tempered, quality 10, blackened	stainless steel 1.4301
[mm]	[mm]					[mm]	[kN]	[g]			
22	M12	21,6	35	28,0	14	22	67,0	189,0	–	23010.0225[1]	–
	M16	21,6	35	28,0	14	22	128,0	172,0	–	23010.0226[1]	–
	M18	21,6	35	28,0	14	22	–	163,0	23010.0223[1]	23010.0224[1]	–
	M20	21,6	35	28,0	14	22	196,0	149,0	23010.0221	23010.0222	–
24	M16	23,6	40	32,0	16	24	128,0	262,0	–	23010.0246[1]	–
	M20	23,6	40	32,0	16	24	196,0	237,0	23010.0243[1]	23010.0244[1]	–
	M22	23,6	40	32,0	16	24	–	221,0	23010.0241[1]	23010.0242[1]	–
28	M16	27,6	44	36,0	18	28	128,0	375,0	–	23010.0286[1]	–
	M20	27,6	44	36,0	18	28	196,0	360,0	–	23010.0284[1]	–
	M22	27,6	44	36,0	18	28	–	333,0	–	23010.0283[1]	–
	M24	27,6	44	36,0	18	28	282,0	330,0	23010.0281	23010.0282	–
32	M27	31,5	50	40,0	20	32	–	460,0	–	23010.0322[1]	–
36	M24	35,5	54	44,0	22	36	282,0	600,0	–	23010.0364[1]	–
	M30	35,5	54	44,0	22	36	448,0	585,0	23010.0361	23010.0362	–
42	M36	41,5	65	52,0	26	42	653,0	1000,0	23010.0421	23010.0422	–
48	M42	47,5	75	60,0	30	48	653,0	1500,0	23010.0481	23010.0482	–
54	M48	53,4	85	70,0	34	54	653,0	2100,0	23010.0541	23010.0542	–

[1] DIN standards do not include these dimensions.

APPLICATION EXAMPLE



Nuts for T-Slots • DIN 508, semi-finished

EH 23010.

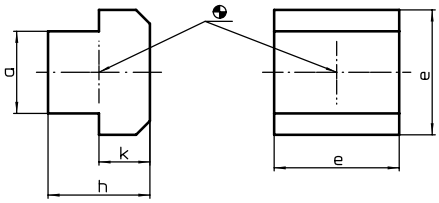


PRODUCT DESCRIPTION

Material

- Heat-treated steel, bright
- Stainless steel 1.4301

DRAWING



ORDER INFORMATION

T-slot size	Dimensions					Art. No.	
	a	e	h	k		Heat-treated steel	stainless steel
[mm]	[mm]				[g]		
6	5,6	10	8	4	4	23010.0060	–
8	7,6	13	10	6	10	23010.0080	23010.0720
10	9,6	15	12	6	17	23010.0100	23010.0730
12	11,6	18	14	7	27	23010.0120	23010.0740
14	13,6	22	16	8	46	23010.0140	23010.0750
16	15,6	25	18	9	68	23010.0160[1)]	23010.0760[1)]
18	17,6	28	20	10	95	23010.0180	23010.0780
20	19,6	32	24	12	149	23010.0200[1)]	–
22	21,6	35	28	14	210	23010.0220	–
24	23,6	40	32	16	300	23010.0240[1)]	–
28	27,6	44	36	18	430	23010.0280	–
32	31,5	50	40	20	580	23010.0320[1)]	–
36	35,5	54	44	22	800	23010.0360	–
42	41,5	65	52	26	1250	23010.0420	–
48	47,5	75	60	30	1900	23010.0480	–
54	53,4	85	70	34	2600	23010.0540	–

[1)] DIN standards do not include these dimensions.

Nuts for T-Slots • DIN 508 with slip protection

EH 23010.



PRODUCT DESCRIPTION

The spring element avoids vertical and horizontal slipping of T-nut.

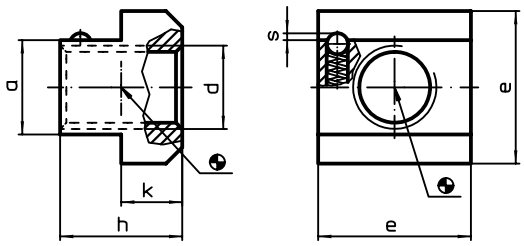
Material

Ball
- Ball-bearing steel, hardened

T-nut
- Heat-treated steel, tempered, quality 10, blackened

Spring
- Stainless steel

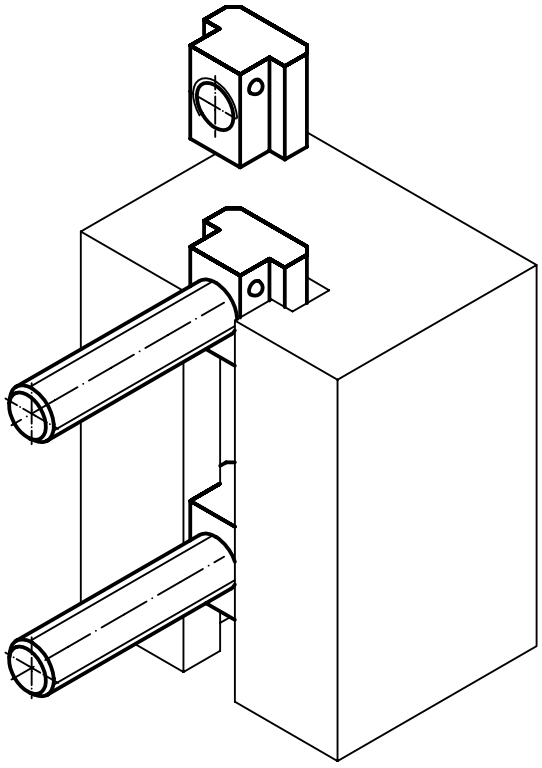
DRAWING



ORDER INFORMATION

T-slot size	Dimensions							Art. No.
	d	a	e	h	k	s		
[mm]	[mm]						[g]	
10	M 8	9,6	15	12	6	0,65	12	23010.0811
12	M10	11,6	18	14	7	0,80	20	23010.0813
14	M12	13,6	22	16	8	0,90	33	23010.0815
18	M16	17,6	28	20	10	1,00	67	23010.0819
22	M20	21,6	35	28	14	1,60	148	23010.0823

APPLICATION EXAMPLE



Nuts for T-Slots • extended

EH 23020.

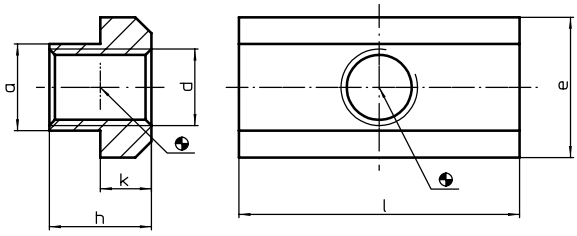


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, quality 10, blackened

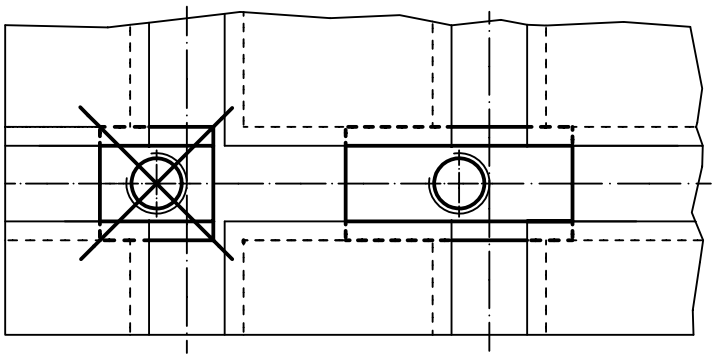
DRAWING



ORDER INFORMATION

T-slot size	Dimensions							Art. No.
	d	a	e	l	h	k		
[mm]	[mm]						[g]	
6	M 5	5,6	10	20	8	4	8	23020.0060
8	M 6	7,6	13	26	10	6	19	23020.0080
10	M 8	9,6	15	30	12	6	29	23020.0100
12	M10	11,6	18	36	14	7	48	23020.0120
14	M 6	13,6	22	44	16	8	95	23020.0146
	M12	13,6	22	44	16	8	81	23020.0140
16	M14	15,6	25	50	18	9	118	23020.0160
18	M16	17,6	28	56	20	10	164	23020.0180
20	M18	19,6	32	64	24	12	257	23020.0200
22	M20	21,6	35	70	28	14	359	23020.0220
28	M24	27,6	44	88	36	18	741	23020.0280
36	M30	35,5	54	108	44	22	1394	23020.0360

APPLICATION EXAMPLE



Nuts for T-Slots • rhombus

EH 23020.

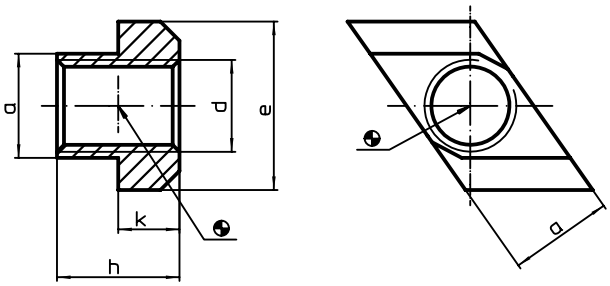


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, blackened

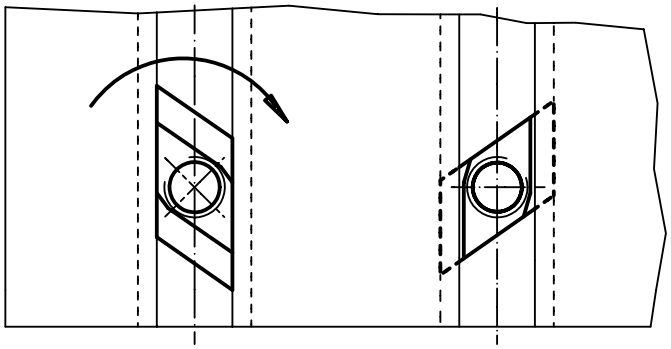
DRAWING



ORDER INFORMATION

T-slot size	Dimensions						Art. No.
	d	a	e	h	k		
[mm]			[mm]			[g]	
6	M 5	5,7	10	8	4	2,1	23020.0560
8	M 6	7,6	13	10	6	5,4	23020.0580
10	M 8	9,6	15	12	6	8,8	23020.0600
12	M10	11,6	18	14	7	14,0	23020.0620
14	M12	13,6	22	16	8	23,0	23020.0640
16	M14	15,6	25	18	9	33,0	23020.0660
18	M16	17,6	28	20	10	46,0	23020.0680
20	M18	19,6	32	24	12	69,0	23020.0700
22	M20	21,6	35	28	14	98,0	23020.0720
28	M24	27,6	44	36	18	213,0	23020.0780
36	M30	35,5	54	44	22	423,0	23020.0860
42	M36	41,5	65	52	26	676,0	23020.0920

APPLICATION EXAMPLE



Nuts for T-Slots • rhombus, semi-finished

EH 23020.

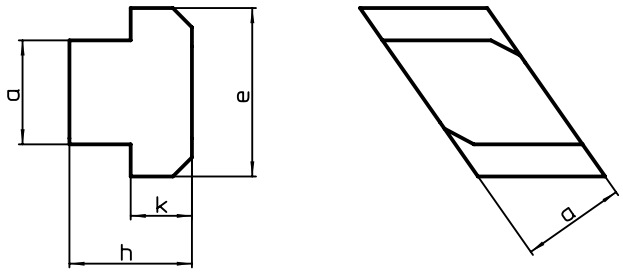


PRODUCT DESCRIPTION

Material

- Heat-treated steel, bright

DRAWING



ORDER INFORMATION

T-slot size	Dimensions					Art. No.
	a	e	h	k		
[mm]	[mm]				[g]	
6	5,7	10	8	4	3	23020.0561
8	7,6	13	10	6	7	23020.0581
10	9,6	15	12	6	13	23020.0601
12	11,6	18	14	7	21	23020.0621
14	13,6	22	16	8	35	23020.0641
16	15,6	25	18	9	52	23020.0661
18	17,6	28	20	10	73	23020.0681
20	19,6	32	24	12	110	23020.0701
22	21,6	35	28	14	158	23020.0721
28	27,6	44	36	18	324	23020.0781
36	35,5	54	44	22	635	23020.0861

T-Bolts • DIN 787

EH 23030.



PRODUCT DESCRIPTION

T-bolts when combined with DIN 6330 fixture nuts (EH 23070.) and DIN 6340 plain washers (EH 23060.) become complete clamping bolts.

Material

- Heat-treated steel, black, forged, T-slot guidance milled

MORE INFORMATION

Notes

Special types on request.

References

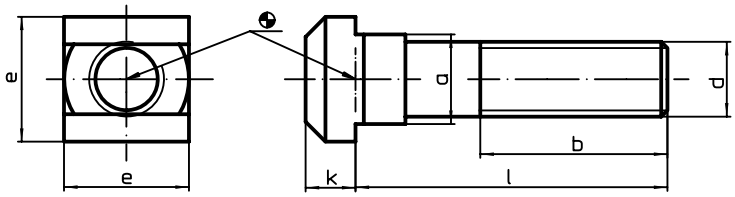
For torques and strengths please refer to appendix - Technical Data -

Further products

Shaft / Plain Washers, DIN 6340 heat-treated . . . . . → p. 380
Fixture Nuts, DIN 6330 (height 1,5 d) . → p. 383



DRAWING



ORDER INFORMATION

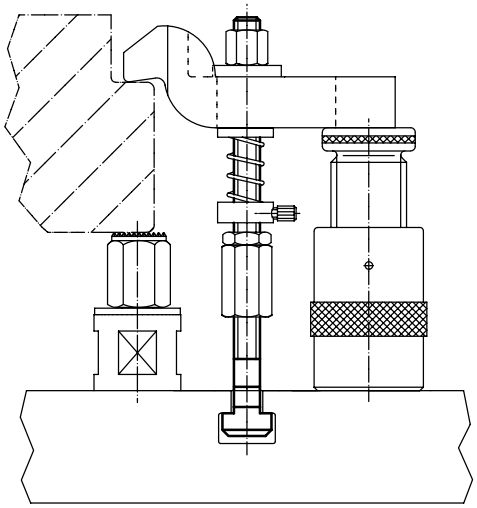
T-slot size	Dimensions							Art. No.
	d	l	a	b	e	k		
[mm]	[mm]						[g]	
quality 10.9								
6	**M 6**	**25**	5,6	15	10	4	8	23030.0061
		40	5,6	28	10	4	10	23030.0062
		63	5,6	40	10	4	14	23030.0063
8	**M 8**	**32**	7,6	22	13	6	19	23030.0081
		50	7,6	35	13	6	25	23030.0082
		80	7,6	50	13	6	34	23030.0083
10	**M10**	**40**	9,6	30	15	6	32	23030.0101
		63	9,6	45	15	6	44	23030.0102
		100	9,6	60	15	6	62	23030.0103
12	**M12**	**50**	11,6	35	18	7	57	23030.0121
		63	11,6	40	18	7	66	23030.0125[1)]
		80	11,6	55	18	7	79	23030.0122
		125	11,6	75	18	7	111	23030.0123
		160	11,6	100	18	7	136	23030.0126
		200	11,6	120	18	7	164	23030.0124
14	**M12**	**50**	13,6	35	22	8	76	23030.0141
		63	13,6	45	22	8	85	23030.0145[1)]
		80	13,6	55	22	8	97	23030.0142
		125	13,6	75	22	8	129	23030.0143
		160	13,6	100	22	8	154	23030.0146
		200	13,6	120	22	8	182	23030.0144

[1)] DIN standards do not include these dimensions.

→

T-slot size	Dimensions							Art. No.
	d	l	a	b	e	k		
[mm]	[mm]						[g]	
quality 8.8								
16	**M14**	**63**	15,6	45	25	9	118	23030.0150[1)]
		100	15,6	65	25	9	154	23030.0152[1)]
		160	15,6	100	25	9	213	23030.0154[1)]
		250	15,6	150	25	9	301	23030.0156[1)]
	M16	**63**	15,6	45	25	9	136	23030.0161[1)]
		80	15,6	55	25	9	158	23030.0165[1)]
		100	15,6	63	25	9	185	23030.0162[1)]
		160	15,6	100	25	9	263	23030.0163[1)]
		200	15,6	125	25	9	315	23030.0166[1)]
		250	15,6	150	25	9	381	23030.0164[1)]
18	**M16**	**63**	17,6	45	28	10	162	23030.0181
		80	17,6	55	28	10	184	23030.0185[1)]
		100	17,6	63	28	10	210	23030.0182
		160	17,6	100	28	10	289	23030.0183
		200	17,6	125	28	10	340	23030.0186[1)]
		250	17,6	150	28	10	407	23030.0184
20	**M20**	**80**	19,6	55	32	12	278	23030.0201[1)]
		100	19,6	65	32	12	320	23030.0205[1)]
		125	19,6	85	32	12	370	23030.0202[1)]
		160	19,6	100	32	12	442	23030.0206[1)]
		200	19,6	125	32	12	523	23030.0203[1)]
		250	19,6	150	32	12	624	23030.0207[1)]
		315	19,6	190	32	12	758	23030.0204[1)]
22	**M20**	**80**	21,6	55	35	14	330	23030.0221
		100	21,6	65	35	14	371	23030.0225[1)]
		125	21,6	85	35	14	422	23030.0222
		160	21,6	100	35	14	494	23030.0226[1)]
		200	21,6	125	35	14	576	23030.0223
		250	21,6	150	35	14	678	23030.0227[1)]
		315	21,6	190	35	14	800	23030.0224
28	**M24**	**100**	27,6	70	44	18	639	23030.0281
		125	27,6	85	44	18	713	23030.0285[1)]
		160	27,6	110	44	18	814	23030.0282
		315	27,6	190	44	18	1275	23030.0287
		250	27,6	150	44	18	1082	23030.0283
		200	27,6	125	44	18	936	23030.0286[1)]
		400	27,6	240	44	18	1496	23030.0284[1)]
36	**M30**	**125**	35,5	80	54	22	1203	23030.0361
		200	35,5	135	54	22	1562	23030.0362
		315	35,5	200	54	22	2061	23030.0363
		500	35,5	300	54	22	2959	23030.0364
42	**M36**	**160**	41,5	100	65	26	2167	23030.0421
		250	41,5	175	65	26	2779	23030.0422
		400	41,5	250	65	26	3789	23030.0423
		600	41,5	340	65	26	5500	23030.0424[1)]

[1)] DIN standards do not include these dimensions.



Studs • DIN 6379 for T-nuts

EH 23040.



PRODUCT DESCRIPTION

Studs combined with T-nuts DIN 508 (EH 23010./23020.), fixture nuts DIN 6330 (EH 23070.) and plain washers DIN 6340 (EH 23060.) become complete clamping studs.

Material

- Heat-treated steel

MORE INFORMATION

References

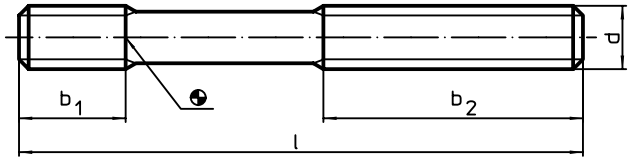
For torques and strengths please refer to appendix - Technical Data -
Studs for T-nuts with elongated dimension b_1 also available.

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362
Studs, DIN 6379 b_1 long for T-nuts . . . → p. 373
Studs, with internal hexagon, similar to DIN 6379, for T-nuts . . . . . → p. 374
Shaft / Plain Washers, DIN 6340 heat-treated . . . . . → p. 380
Fixture Nuts, DIN 6330 (height 1,5 d) . → p. 383



DRAWING



ORDER INFORMATION

d	Dimensions l	b_1	b_2	[g]	Art. No.
	[mm]				
quality 10.9					
M 6	**32**	9	16	5	23040.0061[1]
	50	9	30	8	23040.0062
	63	9	40	11	23040.0064[1]
	80	9	50	13	23040.0063
M 8	**40**	11	20	12	23040.0081
	63	11	40	19	23040.0082
	100	11	63	31	23040.0083
	160	11	100	49	23040.0084[1]
M10	**50**	13	25	24	23040.0101
	80	13	50	39	23040.0102
	100	13	75	50	23040.0106[1]
	125	13	75	61	23040.0103
	160	13	100	78	23040.0105[1]
	200	13	122[2]	98	23040.0104
M12	**50**	15	25	35	23040.0121
	63	15	32	44	23040.0122[1]
	80	15	50	56	23040.0123
	100	15	63	70	23040.0124[1]
	125	15	75	88	23040.0125
	160	15	100	112	23040.0127[1]
	200	15	122[2]	141	23040.0126

[1] DIN standards do not include these dimensions.
[2] Dimension differ from DIN standard.

→

d	Dimensions l [mm]	b_1 [mm]	b_2 [mm]	[g]	Art. No.
quality 8.8					
M14	**63**	17	32	60	23040.0141[1]
	100	17	63	96	23040.0142[1]
	160	17	100	154	23040.0143[1]
	250	17	160	241	23040.0144[1]
M16	**63**	19	32	80	23040.0161
	80	19	50	103	23040.0162[1]
	100	19	63	129	23040.0163
	125	19	75	162	23040.0164[1]
	160	19	100	207	23040.0165
	200	19	122[2]	260	23040.0167[1]
	250	19	160	325	23040.0166
	315	19	180	409	23040.0168[1]
	500	19	315	652	23040.0169[1]
M20	**80**	27	32	160	23040.0201
	125	27	70	252	23040.0202
	160	27	100	323	23040.0207[1]
	200	27	122[2]	405	23040.0203
	250	27	160	508	23040.0204[1]
	315	27	200[2]	639	23040.0205
	400	27	250	813	23040.0208[1]
	500	27	315	1019	23040.0206[1]
M24	**100**	35	45	289	23040.0241
	125	35	70[2]	380	23040.0246[1]
	160	35	100	466	23040.0242
	200	35	122[2]	585	23040.0247[1]
	250	35	160	730	23040.0243
	315	35	190	924	23040.0248[1]
	400	35	250	1171	23040.0244
	500	35	315	1466	23040.0249[1]
	630	35	315	1860	23040.0245[1]
M30	**125**	43	56	573	23040.0301
	200	43	122[2]	923	23040.0302
	315	43	200[2]	1461	23040.0303
	500	43	315	2323	23040.0304
	700	43	400	3261	23040.0305[1]
M36	**160**	51	80	1065	23040.0361
	250	51	160	1674	23040.0362
	400	51	250	2687	23040.0363
	700	51	400	5130	23040.0364[1]

[1] DIN standards do not include these dimensions.
[2] Dimension differ from DIN standard.

Studs • DIN 6379 b_1 long for T-nuts

EH 23040.



PRODUCT DESCRIPTION

Studs combined with T-nuts DIN 508 (EH 23010./23020.), fixture nuts DIN 6330 (EH 23070.) and plain washers DIN 6340 (EH 23060.) become complete clamping studs.

Material

- Heat-treated steel

MORE INFORMATION

References

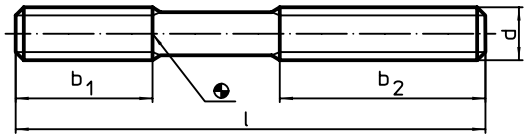
For torques and strengths please refer to appendix - Technical Data -

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362
Studs, DIN 6379 for T-nuts . . . . . → p. 371
Shaft / Plain Washers, DIN 6340 heat-treated . . . . . → p. 380
Fixture Nuts, DIN 6330 (height 1,5 d) . → p. 383



DRAWING



ORDER INFORMATION

d	Dimensions l	b_1	b_2	[g]	Art. No.
quality 10.9					
M 6	**50**	15	30	8	23040.0562
	63	15	40	11	23040.0563
	80	15	50	14	23040.0564
M 8	**63**	20	40	19	23040.0582
	100	20	63	31	23040.0583
	160	20	100	49	23040.0584
M10	**80**	25	50	39	23040.0602
	100	25	75	49	23040.0603
	125	25	75	61	23040.0604
	160	25	100	78	23040.0605[1]
	200	25	122	98	23040.0606
M12	**63**[2]	–	–	44	23040.0622
	80[2]	–	–	56	23040.0623
	100	30	63	70	23040.0624[1]
	125	30	75	88	23040.0625
	160	30	100	112	23040.0626
	200	30	122	140	23040.0627
quality 8.8					
M16	**80**[2]	–	–	103	23040.0662
	125	40	63	161	23040.0664
	160	40	75	207	23040.0665
	200	40	100	260	23040.0666[1]
	250	40	125	325	23040.0667

[1] DIN standards do not include these dimensions.
[2] Throughgoing thread

Studs • with internal hexagon, similar to DIN 6379, for T-nuts

EH 23040.



PRODUCT DESCRIPTION

Studs combined with T-nuts DIN 508 (EH 23010./23020.), fixture nuts DIN 6330 (EH 23070.) and plain washers DIN 6340 (EH 23060.) become complete clamping studs.

Material

- Heat-treated steel

Assembly

The stud has an internal hexagon additionally. This guarantees a fast and simple assembling and dismounting.

MORE INFORMATION

References

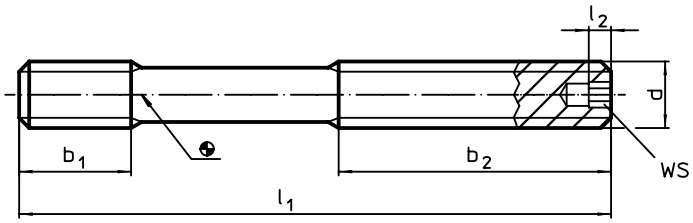
For torques and strengths please refer to appendix - Technical Data -

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362
Studs, DIN 6379 for T-nuts . . . . . → p. 371
Shaft / Plain Washers, DIN 6340 heat-treated . . . . . → p. 380
Fixture Nuts, DIN 6330 (height 1,5 d) . → p. 383

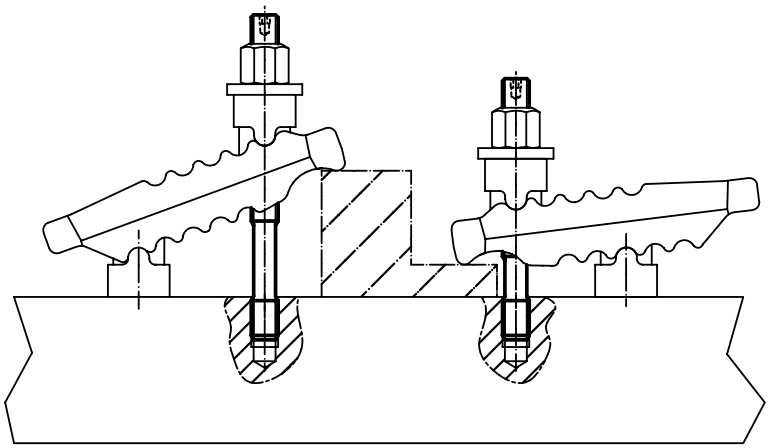


DRAWING



ORDER INFORMATION

d	Dimensions l_1	b_1 [mm]	b_2	l_2	WS [mm]	[g]	Art. No.
quality 10.9							
M12	**100**	15	63	4	4	73	23040.0724
	125	15	75	4	4	91	23040.0725
	160	15	100	4	4	115	23040.0726
quality 12.9							
M16	**125**	19	75	4	4	165	23040.0763
	160	19	100	4	4	212	23040.0764
	200	19	122	4	4	262	23040.0765
M20	**160**	27	100	5	5	327	23040.0783
	200	27	122	5	5	411	23040.0784
	250	27	160	5	5	522	23040.0785
M24	**200**	35	122	5	5	589	23040.0804
	250	35	160	5	5	745	23040.0805



Spherical Washers / Conical Seats • DIN 6319

EH 23050.



PRODUCT DESCRIPTION

Material

Conical seat

- Case-hardened steel, case-hardened, manganese phosphate treated
- Heat-treated steel, tempered, manganese phosphated

Spherical washer

- Case-hardened steel, case-hardened, manganese phosphate treated

Assembly

Conical seats form D are to be used only for plain, closed round areas.
For larger holes only use form G!

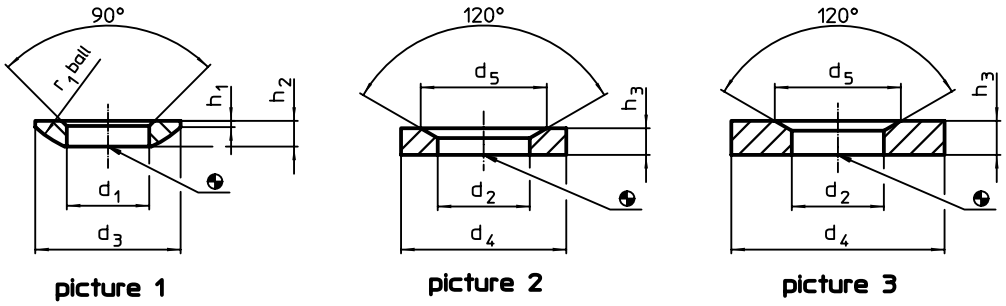
MORE INFORMATION

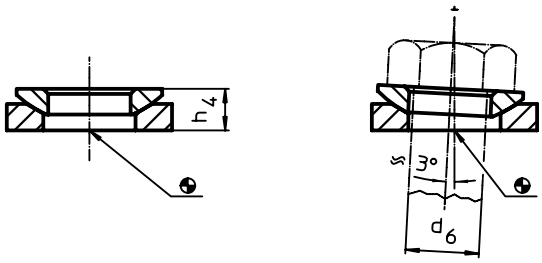
Further products

Spherical Washers / Conical Seats, similar to DIN 6319, stainless steel . . . → p. 377
Fixture Nuts, DIN 6330 (height 1,5 d) . → p. 383

3

DRAWING





ORDER INFORMATION

Dimensions											For pins d_6	For screws d_6	Load capacity for static load max.	Torque for screwed connections max.		Art. No.
d_1 H13	d_2 H13	d_3	d_4	d_5	h_1	h_2	h_3	h_4 with conical seat form D ~	h_4 with conical seat form G ~	r_1						
[mm]											[mm]	[mm]	[kN]	[Nm]	[g]	
spherical washers from case-hardened steel, form C – picture 1																
6,4	–	12	–	–	0,7	2,3	–	4,2	5,4	9,0	6	M 6	9	10[1)]	1,0	23050.0006
8,4	–	17	–	–	0,6	3,2	–	5,6	7,1	12,0	8	M 8	17	25[1)]	2,8	23050.0008
10,5	–	21	–	–	0,8	4,0	–	6,5	7,3	15,0	10	M10	26	46[1)]	5,3	23050.0010
13,0	–	24	–	–	1,1	4,6	–	8,0	9,0	17,0	12	M12	38	82[1)]	7,6	23050.0012
15,0	–	28	–	–	1,4	5,0	–	8,5	9,5	22,0	14	M14	53	130[1)]	12,0	23050.0014
17,0	–	30	–	–	1,3	5,3	–	9,6	10,4	22,0	16	M16	73	206[1)]	13,0	23050.0016
21,0	–	36	–	–	2,0	6,3	–	11,7	12,2	27,0	20	M20	117	407[1)]	23,0	23050.0020
23,0	–	40	–	–	2,5	7,6	–	13,5	–	29,5	22	M22	146	542[1)]	34,0	23050.0022[2)]
25,0	–	44	–	–	2,4	8,2	–	15,2	15,7	32,0	24	M24	168	698[1)]	45,0	23050.0024
28,0	–	50	–	–	3,3	10,2	–	17,0	–	36,0	27	M27	221	1021[1)]	74,0	23050.0027[2)]
31,0	–	56	–	–	3,6	11,2	–	19,2	19,7	41,0	30	M30	269	1355[1)]	101,0	23050.0030
34,0	–	62	–	–	4,4	13,0	–	21,8	–	45,0	33	M33	326[3)]	1969[3)1)]	150,0	23050.0033[2)]
37,0	–	68	–	–	4,6	14,0	–	23,5	–	50,0	36	M36	394	2372[1)]	190,0	23050.0036
40,0	–	75	–	–	5,6	16,0	–	26,8	–	54,0	39	M39	460[3)]	3276[3)1)]	218,0	23050.0039[2)]
43,0	–	78	–	–	6,5	17,0	–	29,0	–	58,0	42	M42	542	3802[1)]	310,0	23050.0042
50,0	–	92	–	–	8,0	21,0	–	35,5	–	67,0	48	M48	714	5730[1)]	540,0	23050.0048
54,0	–	96	–	–	9,3	22,0	–	38,3	–	72,0	52	M52	832[3)]	7876[3)1)]	620,0	23050.0052[2)]
58,0	–	103	–	–	9,8	23,0	–	39,3	–	79,0	56	M56	960[3)]	9793[3)1)]	760,0	23050.0056[2)]
62,0	–	112	–	–	11,0	25,0	–	43,6	–	86,0	60	M60	1122[3)]	12219[3)1)]	990,0	23050.0060[2)]
66,0	–	120	–	–	12,0	27,0	–	46,6	–	93,0	64	M64	1269[3)]	14762[3)1)]	1220,0	23050.0064[2)]

[1)] Torques of screws 8.8, eventual pre-loads to be conisdered, coefficient of friction μ_{total} 0,14.
[2)] DIN standards do not include these dimensions.
[3)] Figures theoretically determined

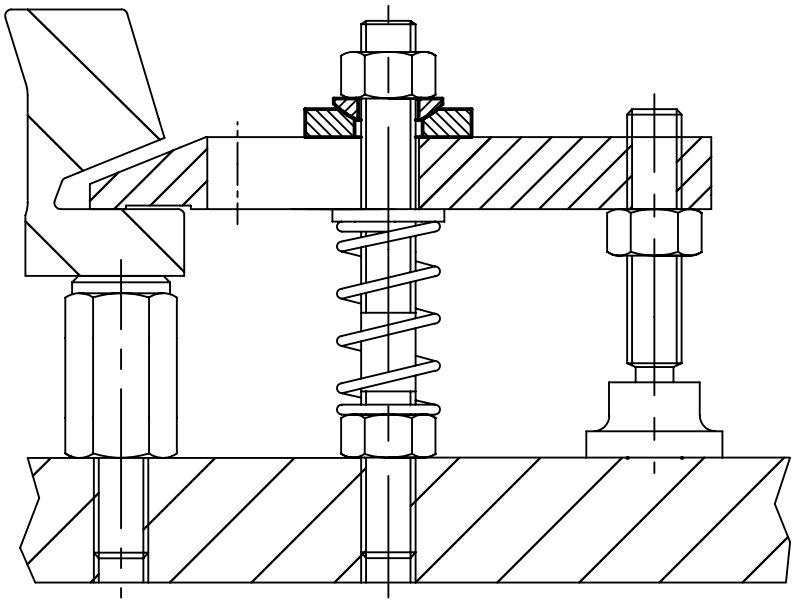
→

3

Dimensions											For pins	For screws	Load capacity for static load	Torque for screwed connections		Art. No.
d_1 H13	d_2 H13	d_3	d_4	d_5	h_1	h_2	h_3	h_4 with conical seat form D ~	h_4 with conical seat form G ~	r_1	d_6	d_6	max.	max.		
[mm]											[mm]	[mm]	[kN]	[Nm]	[g]	
conical seats from case-hardened steel, form D – picture 2																
	7,1	–	12	11,0	–	–	2,8	–	–	–	6	M 6	9	10[1]	1,4	23050.0106
	9,6	–	17	14,5	–	–	3,5	–	–	–	8	M 8	17	25[1]	3,7	23050.0108
	12,0	–	21	18,5	–	–	4,2	–	–	–	10	M10	26	46[1]	6,5	23050.0110
	14,2	–	24	20,0	–	–	5,0	–	–	–	12	M12	38	82[1]	10,0	23050.0112
	16,5	–	28	24,8	–	–	5,6	–	–	–	14	M14	53	130[1]	15,0	23050.0114
	19,0	–	30	26,0	–	–	6,2	–	–	–	16	M16	73	206[1]	18,0	23050.0116
	23,2	–	36	31,0	–	–	7,5	–	–	–	20	M20	117	407[1]	30,0	23050.0120
	26,0	–	40	34,0	–	–	8,5	–	–	–	22	M22	146	542[1]	44,0	23050.0122[2]
	28,0	–	44	37,0	–	–	9,5	–	–	–	24	M24	168	698[1]	61,0	23050.0124
–	**31,5**	–	50	43,0	–	–	10,5	–	–	–	27	M27	221	1021[1]	90,0	23050.0127[2]
	35,0	–	56	49,0	–	–	12,0	–	–	–	30	M30	269	1355[1]	124,0	23050.0130
	38,5	–	62	55,0	–	–	14,0	–	–	–	33	M33	326[3]	1969[3][1]	180,0	23050.0133[2]
	42,0	–	68	60,0	–	–	15,0	–	–	–	36	M36	394	2372[1]	230,0	23050.0136
	45,0	–	75	67,0	–	–	17,0	–	–	–	39	M39	460[3]	3276[3][1]	339,0	23050.0139[2]
	49,0	–	78	70,0	–	–	18,0	–	–	–	42	M42	542	3802[1]	360,0	23050.0142
	56,0	–	92	82,0	–	–	22,0	–	–	–	48	M48	714	5730[1]	640,0	23050.0148
	60,0	–	96	85,0	–	–	24,0	–	–	–	52	M52	832[3]	7876[3][1]	740,0	23050.0152[2]
	65,0	–	103	93,0	–	–	25,0	–	–	–	56	M56	960[3]	9793[3][1]	900,0	23050.0156[2]
	70,0	–	112	102,0	–	–	28,0	–	–	–	60	M60	1122[3]	12219[3][1]	1165,0	23050.0160[2]
	75,0	–	120	110,0	–	–	30,0	–	–	–	64	M64	1269[3]	14762[3][1]	1430,0	23050.0164[2]
conical seats from heat-treated steel, form G – picture 3																
	7,1	–	17	11,0	–	–	4,0	–	–	–	6	M 6	9	10[1]	5,6	23050.0206
	9,6	–	24	14,5	–	–	5,0	–	–	–	8	M 8	17	25[1]	14,0	23050.0208
	12,0	–	30	18,5	–	–	5,0	–	–	–	10	M10	26	46[1]	22,0	23050.0210
	14,2	–	36	20,0	–	–	6,0	–	–	–	12	M12	38	82[1]	39,0	23050.0212
–	**16,5**	–	40	24,8	–	–	6,0	–	–	–	14	M14	53	130[1]	47,0	23050.0214
	19,0	–	44	26,0	–	–	7,0	–	–	–	16	M16	73	206[1]	65,0	23050.0216
	23,2	–	50	31,0	–	–	8,0	–	–	–	20	M20	117	407[1]	93,0	23050.0220
	28,0	–	60	37,0	–	–	10,0	–	–	–	24	M24	168	698[1]	165,0	23050.0224
	35,0	–	68	49,0	–	–	12,0	–	–	–	30	M30	269	1355[1]	235,0	23050.0230

[1] Torques of screws 8.8, eventual pre-loads to be conisdered, coefficient of friction μ_{total} 0,14.
[2] DIN standards do not include these dimensions.
[3] Figures theoretically determined

APPLICATION EXAMPLE



Spherical Washers / Conical Seats • similar to DIN 6319, stainless steel

EH 23050.



PRODUCT DESCRIPTION

Material

Conical seat
- Stainless steel 1.4305
- Stainless steel A4

Spherical washer
- Stainless steel 1.4305
- Stainless steel A4

Assembly

Conical seats form D are to be used only for plain, closed round areas.
For larger holes only use form G!

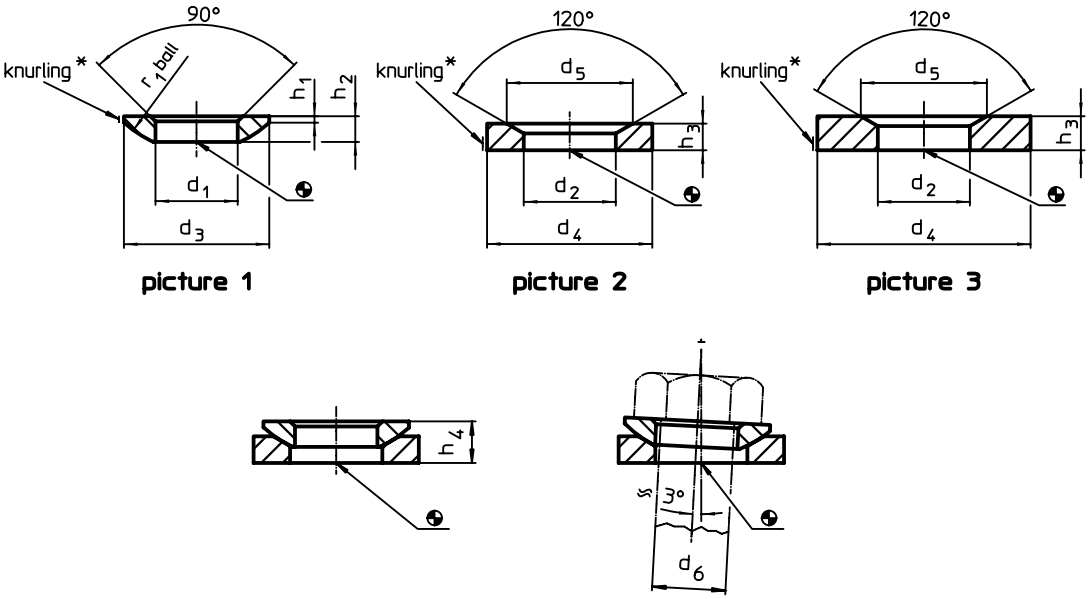
MORE INFORMATION

Further products

Spherical Washers / Conical Seats, DIN 6319 . . . . . → p. 375
Fixture Nuts, DIN 6330 (height 1,5 d) . → p. 383

3

DRAWING



* Knurling = material identification for stainless steel A4 type

ORDER INFORMATION

Dimensions											For pins	For screws	Load capacity for static load	Torque for screwed connec-tions[1]		Art. No.	
d_1 H13	d_2 H13	d_3	d_4	d_5	h_1	h_2	h_3	h_4 with conical seat form D ~	h_4 with conical seat form G ~	r_1	d_6	d_6	max.	max.		stainless steel 1.4305	stainless steel A4
[mm]											[mm]	[mm]	[kN]	[Nm]	[g]		
spherical washers from stainless steel, form C – picture 1																	
6,4	–	12	–	–	0,7	2,3	–	4,0	5,2	9	6	M 6	6	6	1,1	23050.0306	23050.0606
8,4	–	17	–	–	0,6	3,2	–	5,3	6,8	12	8	M 8	12	16	2,8	23050.0308	23050.0608
10,5	–	21	–	–	0,8	4,0	–	6,3	7,1	15	10	M10	16	32	5,2	23050.0310	23050.0610
13,0	–	24	–	–	1,1	4,6	–	7,9	8,9	17	12	M12	24	56	7,7	23050.0312	23050.0612
17,0	–	30	–	–	1,3	5,3	–	9,3	10,1	22	16	M16	45	135	13,0	23050.0316	23050.0616
21,0	–	36	–	–	2,0	6,3	–	11,6	12,1	27	20	M20	71	280	23,0	23050.0320	23050.0620
25,0	–	44	–	–	2,4	8,2	–	14,9	15,4	32	24	M24	105	455	46,0	23050.0324	23050.0624
31,0	–	56	–	–	3,6	11,2	–	18,8	18,8	41	30	M30	191	1050	104,0	23050.0330	23050.0630
37,0	–	68	–	–	4,6	14,0	–	23,4	–	50	36	M36	–	–	193,0	23050.0336	23050.0636
43,0	–	78	–	–	6,5	17,0	–	28,3	–	58	42	M42	–	–	313,0	23050.0342	23050.0642
50,0	–	92	–	–	8,0	21,0	–	35,0	–	67	48	M48	–	–	545,0	23050.0348	23050.0648

[1] Torques for screws A2-70 are provided as very rough values having only informational character. The pre-load may need to be taken into account, coefficient of friction μ_{ges} 0.12.

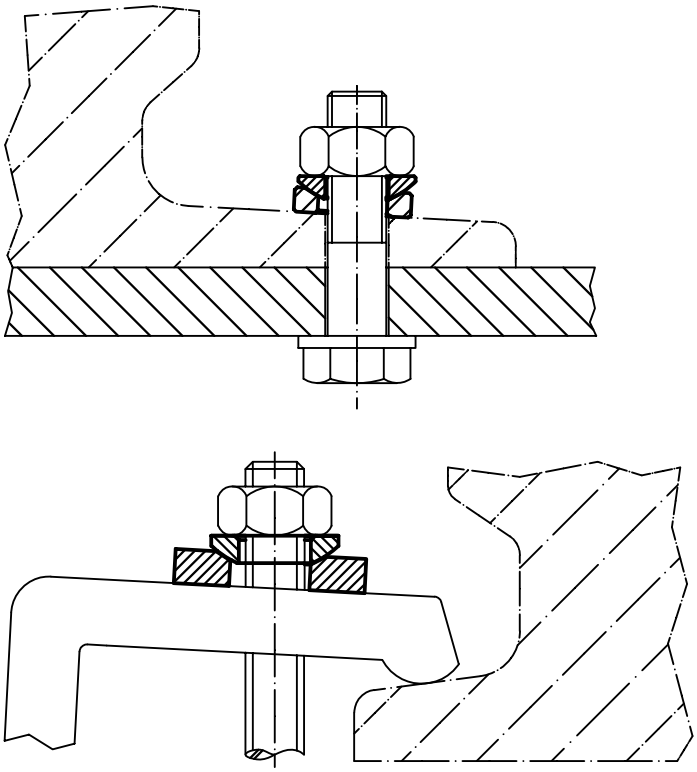
→

3

Dimensions										For pins	For screws	Load capacity for static load	Torque for screwed connec-tions[1]		Art. No.	
d_1 H13	d_2 H13	d_3	d_4	d_5	h_1	h_2	h_3	h_4 with conical seat form D ~	h_4 with conical seat form G ~	r_1	d_6	d_6	max.	max.		stainless steel 1.4305	stainless steel A4
[mm]											[mm]	[mm]	[kN]	[Nm]	[g]		
conical seats from stainless steel, form D – picture 2																	
–	**7,1**	–	12	11,0	–	–	2,8	–	–	–	6	M 6	6	6	1,4	23050.0406	23050.0666
	9,6	–	17	14,5	–	–	3,5	–	–	–	8	M 8	12	16	3,8	23050.0408	23050.0668
	12,0	–	21	18,5	–	–	4,2	–	–	–	10	M10	16	32	6,5	23050.0410	23050.0670
	14,2	–	24	20,0	–	–	5,0	–	–	–	12	M12	24	56	11,0	23050.0412	23050.0672
	19,0	–	30	26,0	–	–	6,2	–	–	–	16	M16	45	135	19,0	23050.0416	23050.0676
	23,2	–	36	31,0	–	–	7,5	–	–	–	20	M20	71	280	32,0	23050.0420	23050.0680
	28,0	–	44	37,0	–	–	9,5	–	–	–	24	M24	105	455	63,0	23050.0424	23050.0684
	35,0	–	56	49,0	–	–	12,0	–	–	–	30	M30	191	1050	127,0	23050.0430	23050.0686
	42,0	–	68	60,0	–	–	15,0	–	–	–	36	M36	–	–	234,0	23050.0436	23050.0688
	49,0	–	78	70,0	–	–	18,0	–	–	–	42	M42	–	–	362,0	23050.0442	23050.0692
	56,0	–	92	82,0	–	–	22,0	–	–	–	48	M48	–	–	642,0	23050.0448	23050.0694
conical seats from stainless steel, form G – picture 3																	
–	**7,1**	–	17	11,0	–	–	4,0	–	–	–	6	M 6	6	6	5,8	23050.0466	23050.0706
	9,6	–	24	14,5	–	–	5,0	–	–	–	8	M 8	12	16	15,0	23050.0468	23050.0708
	12,0	–	30	18,5	–	–	5,0	–	–	–	10	M10	16	32	22,0	23050.0470	23050.0710
	14,2	–	36	20,0	–	–	6,0	–	–	–	12	M12	24	56	40,0	23050.0472	23050.0712
	19,0	–	44	26,0	–	–	7,0	–	–	–	16	M16	45	135	66,0	23050.0476	23050.0716
	23,2	–	50	31,0	–	–	8,0	–	–	–	20	M20	71	280	95,0	23050.0480	23050.0720
	28,0	–	60	37,0	–	–	10,0	–	–	–	24	M24	105	455	171,0	23050.0484	23050.0724
	35,0	–	68	49,0	–	–	12,0	–	–	–	30	M30	191	1050	236,0	23050.0490	23050.0730

[1] Torques for screws A2-70 are provided as very rough values having only informational character. The pre-load may need to be taken into account, coefficient of friction μ_{ges} 0.12.

APPLICATION EXAMPLE



Compact Spherical Washers / Conical Seats • similar to DIN 6319

EH 23050.



PRODUCT DESCRIPTION

The compact spherical washer / conical seat is a permanently fastened component of spherical washer and conical seat offering the following benefits:

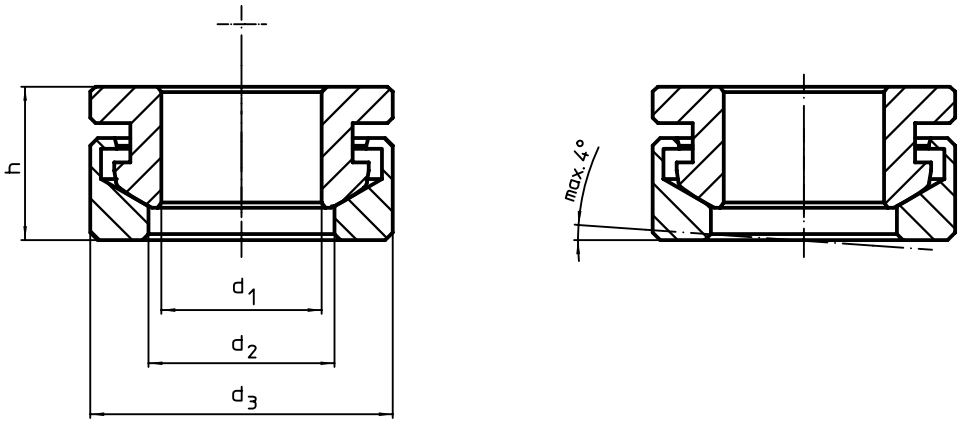
- Function-safety
- Secured against loss
- Quick and rational assembly
- Simplified stock holding
- Swiveling range max. 4°.

Material

Conical seat
- Heat-treated steel, heat treated
- Stainless steel 1.4305

Spherical washer
- Case-hardened steel, case hardened
- Stainless steel 1.4305

DRAWING

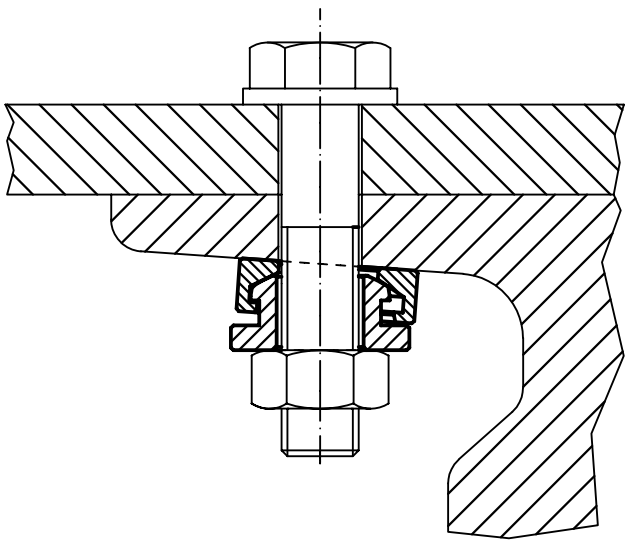


ORDER INFORMATION

Dimensions d_1 H13 [mm]	d_2 [mm]	d_3 [mm]	h [mm]	For pin d_6 [mm]	For screws d_6 [mm]	Load capacity for static load[1] max. [kN]	[g]	Art. No. heat-treated steel	Art. No. stainless steel
6,4	7,4	13	7,0	6	M 6	9	4	23050.0506	23050.0556
8,4	9,7	17	8,5	8	M 8	17	9	23050.0508	23050.0558
10,5	12,0	21	10,4	10	M10	26	17	23050.0510	23050.0560
13,0	14,8	25	13,1	12	M12	38	34	23050.0512	23050.0562
17,0	19,7	32	17,0	16	M16	73	61	23050.0516	23050.0566
21,0	24,6	40	20,3	20	M20	117	112	23050.0520	23050.0570

[1] Statements on load capacity are not valid for the stainless steel type.

APPLICATION EXAMPLE



Shaft / Plain Washers • DIN 6340 heat-treated

EH 23060.

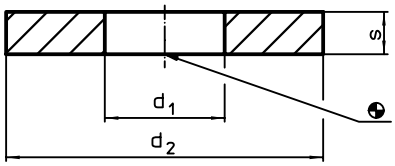


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, punched, mechanically trued, phosphatized

DRAWING

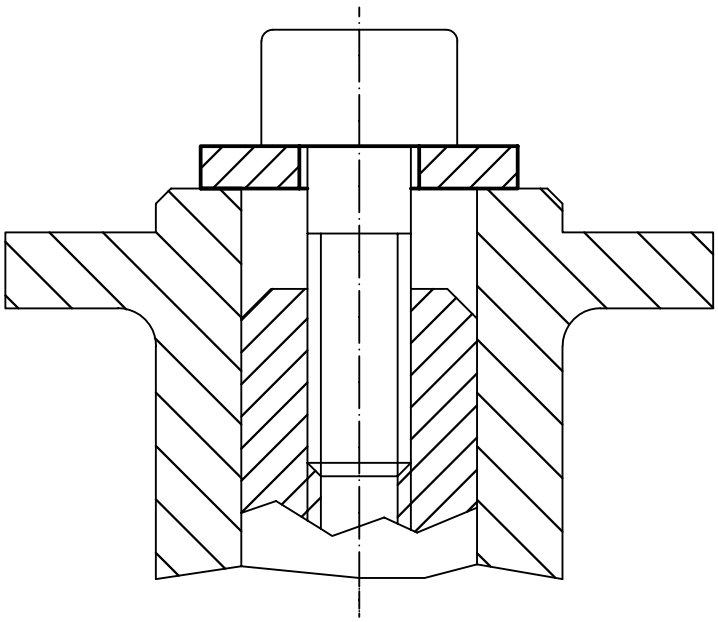


ORDER INFORMATION

Dimensions			For screws		Art. No.
d_1	d_2	s			
[mm]			[mm]	[g]	
6,4	17	3	M 6	3,8	**23060.0006**
8,4	23	4	M 8	9,8	**23060.0008**
10,5	28	4	M10	14,0	**23060.0010**
13,0	35	5	M12	28,0	**23060.0012**
15,0	40	5	M14	40,0	**23060.0014**[1)]
17,0	45	6	M16	55,0	**23060.0016**
19,0	45	6	M18	53,0	**23060.0018**[1)]
21,0	50	6	M20	71,0	**23060.0020**
23,0	50	8	M22	86,0	**23060.0022**[1)]
25,0	60	8	M24	122,0	**23060.0024**
31,0	68	10	M30	214,0	**23060.0030**
38,0	80	12	M36	360,0	**23060.0036**[1)]

[1)] DIN standards do not include these dimensions.

APPLICATION EXAMPLE



Washers • high precision design

EH 23060.



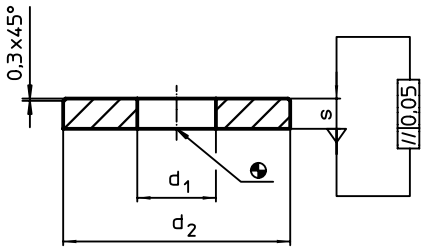
PRODUCT DESCRIPTION

The precisely manufactured washers have an allowance in parallelism of 0,05 mm.

Material

- Heat-treated steel, tempered, blackened
- Stainless steel 1.4305

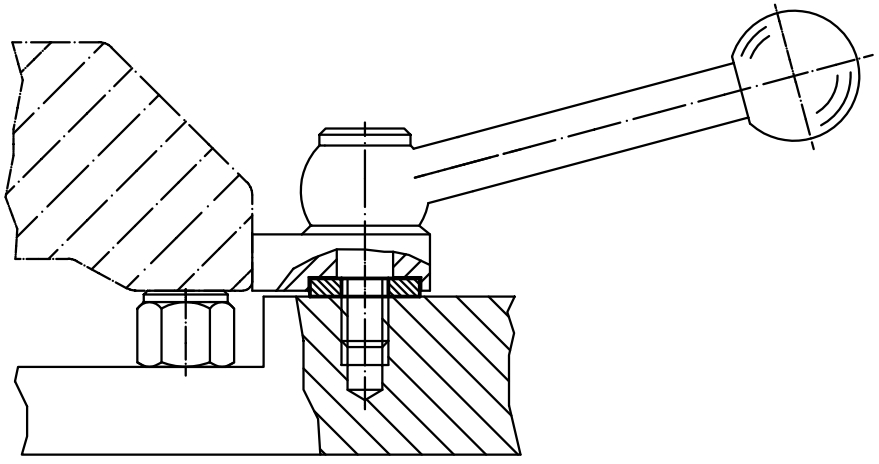
DRAWING



ORDER INFORMATION

Dimensions			For screw		Art. No.	
d_1	d_2	s			heat-treated steel	stainless steel
[mm]			[mm]	[g]		
3,2	8	2	M 3	0,7	–	23060.0153
4,2	12	2	M 4	1,5	–	23060.0154
5,3	13	3	M 5	2,5	23060.0105	23060.0155
6,4	17	3	M 6	4,5	23060.0106	23060.0156
8,4	24	4	M 8	12,0	23060.0108	23060.0158
10,5	30	4	M10	19,0	23060.0110	23060.0160
13,0	36	5	M12	34,0	23060.0113	23060.0163
17,0	45	5	M16	53,0	23060.0117	23060.0167

APPLICATION EXAMPLE



Shaft / Plain Washers

EH 23061.

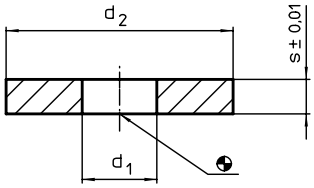


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

Dimensions				Art. No.
d_1	d_2	s ±0,01		
[mm]			[g]	
25	59,5	3	53	23061.2403
		4	71	23061.2404
		5	87	23061.2405
		10	178	23061.2410
		20	358	23061.2420

Fixture Nuts • DIN 6330 (height 1,5 d)

EH 23070.



PRODUCT DESCRIPTION

The spherical face matches DIN 6319 conical seats (EH 23050.).
This combination enables compensating for uneven surfaces.

Material

- Heat-treated steel, tempered, quality 10, phosphated
- Stainless steel 1.4305

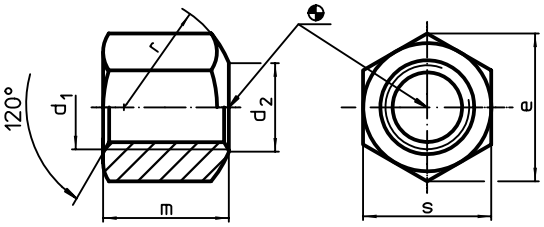
MORE INFORMATION

References

For torques and strengths please refer to appendix - Technical Data -

3

DRAWING

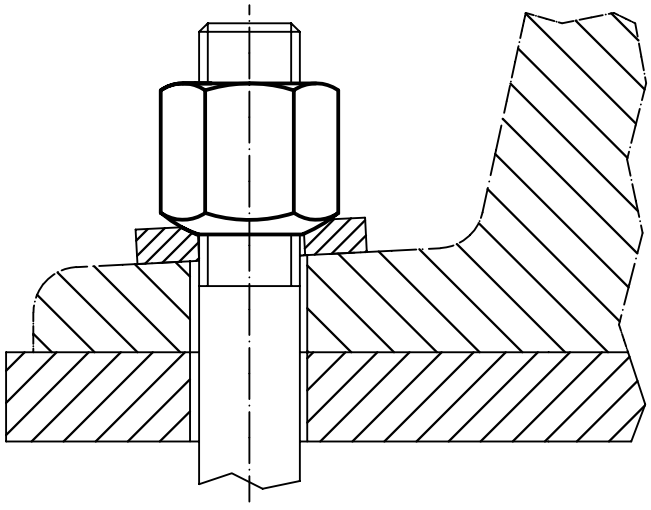


ORDER INFORMATION

Dimensions							Art. No.	
d_1	d_2	e	m	r	s		heat-treated steel	stainless steel
[mm]						[g]		
with lateral spherical bearing surface, form B								
M 6	7,0	11,5	9	9,0	10	3,8	23070.0006	–
M 8	9,0	15,0	12	11,0	13	8,4	23070.0008	23070.0108[1]
M10	11,5	18,5	15	15,0	16	17,0	23070.0010	–
					17	17,0	–	23070.0110[1]
M12	14,0	20,8	18	17,0	18	24,0	23070.0012	–
					19	24,0	–	23070.0112[1]
M14	16,0	24,2	21	20,0	21	39,0	23070.0014[2]	–
M16	18,0	27,7	24	22,0	24	55,0	23070.0016	23070.0116[1]
M18	20,0	31,2	27	24,5	27	82,0	23070.0018[2]	–
M20	22,0	34,6	30	27,0	30	110,0	23070.0020	23070.0120[1]
M22	24,0	39,3	33	29,0	34	162,0	23070.0022[2]	–
M24	26,0	41,6	36	32,0	36	192,0	23070.0024	–
M30	32,0	53,1	45	41,0	46	400,0	23070.0030	–
M36	38,0	63,5	54	50,0	55	684,0	23070.0036	–

[1] DIN standard do not include these material.
[2] DIN standards do not include these dimensions.

APPLICATION EXAMPLE



Collar Nuts • DIN 6331 (height 1,5 d)

EH 23080.



PRODUCT DESCRIPTION

Material

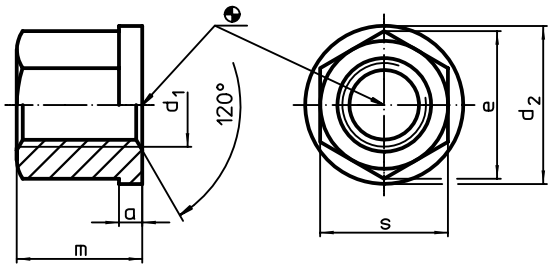
- Heat-treated steel, tempered, quality 10, phosphated
- Stainless steel 1.4305

MORE INFORMATION

References

For torques and strengths please refer to appendix - Technical Data -

DRAWING

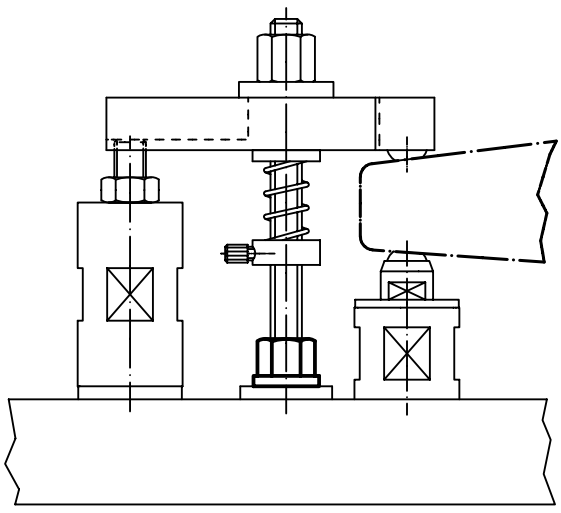


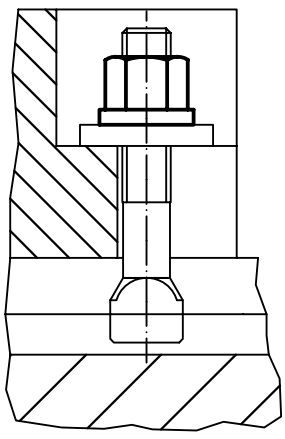
ORDER INFORMATION

Dimensions							Art. No.	
d_1	a	d_2	e	m	s		heat-treated steel	stainless steel
[mm]						[g]		
M 6	3,0	14	11,5	9	10	5	23080.0006	–
M 8	3,5	18	15,0	12	13	12	23080.0008	23080.0108[1]
M10	4,0	22	18,5	15	16	22	23080.0010	–
					17	22	–	23080.0110[1]
M12	4,0	25	20,8	18	18	30	23080.0012	–
					19	30	–	23080.0112[1]
M14	4,5	28	24,2	21	21	47	23080.0014[2]	–
M16	5,0	31	27,7	24	24	67	23080.0016	23080.0116[1]
M18	5,5	34	31,2	27	27	97	23080.0018[2]	–
M20	6,0	37	34,6	30	30	129	23080.0020	23080.0120[1]
M22	6,0	40	39,3	33	34	179	23080.0022[2]	–
M24	6,0	45	41,6	36	36	221	23080.0024	–
M30	8,0	58	53,1	45	46	468	23080.0030	–
M36	10,0	68	63,5	54	55	783	23080.0036	–

[1] DIN standard do not include these material.
[2] DIN standards do not include these dimensions.

APPLICATION EXAMPLE





Collar Nuts with Conical Seat

EH 23080.





PRODUCT DESCRIPTION

Material

Conical seat
- Heat-treated steel, tempered, blackened

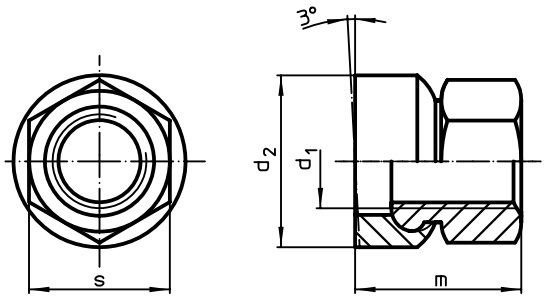
Nut
- Heat-treated steel, tempered, blackened

MORE INFORMATION

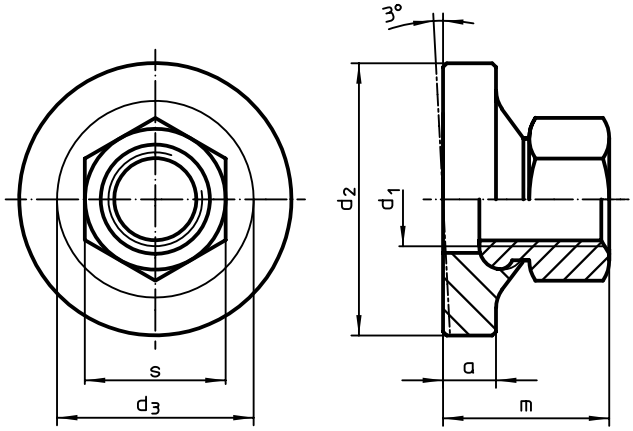
References

For torques and strengths please refer to appendix - Technical Data -

DRAWING



picture 1

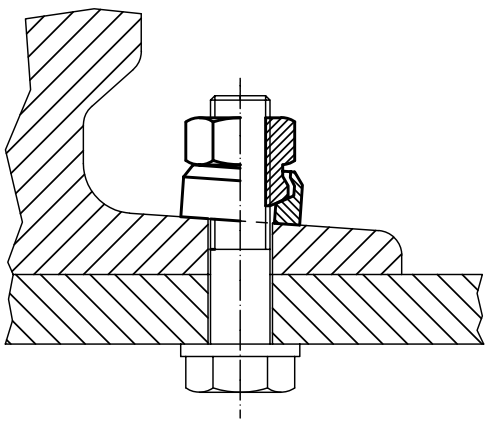


picture 2

ORDER INFORMATION

d_1	a	d_2	d_3	m ~	s		Art. No.
		[mm]			[mm]	[g]	
with small surface – picture 1							
M 8	–	17	–	14,0	13	13	23080.0508
M10	–	21	–	17,5	16	24	23080.0510
M12	–	24	–	21,5	18	38	23080.0512
M16	–	30	–	28,0	24	75	23080.0516
M20	–	36	–	35,0	30	143	23080.0520
M24	–	44	–	42,5	36	261	23080.0524
M30	–	55	–	56,0	46	557	23080.0530
with large surface – picture 2							
M 8	4,0	24	17,8	14,0	13	20	23080.0608
M10	5,5	30	21,2	17,5	16	40	23080.0610
M12	7,0	36	25,2	21,5	18	69	23080.0612
M16	8,0	44	30,9	28,0	24	126	23080.0616
M20	9,5	50	39,9	35,0	30	213	23080.0620
M24	11,0	60	49,6	42,5	36	377	23080.0624
M30	14,0	68	61,3	56,0	46	702	23080.0630

APPLICATION EXAMPLE



Extension Nuts • (height 3 d)

EH 23090.



PRODUCT DESCRIPTION

Material

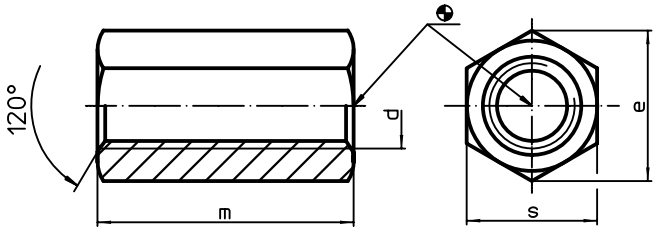
- Heat-treated steel, tempered, quality 10, phosphated

MORE INFORMATION

References

For torques and strengths please refer to appendix - Technical Data -

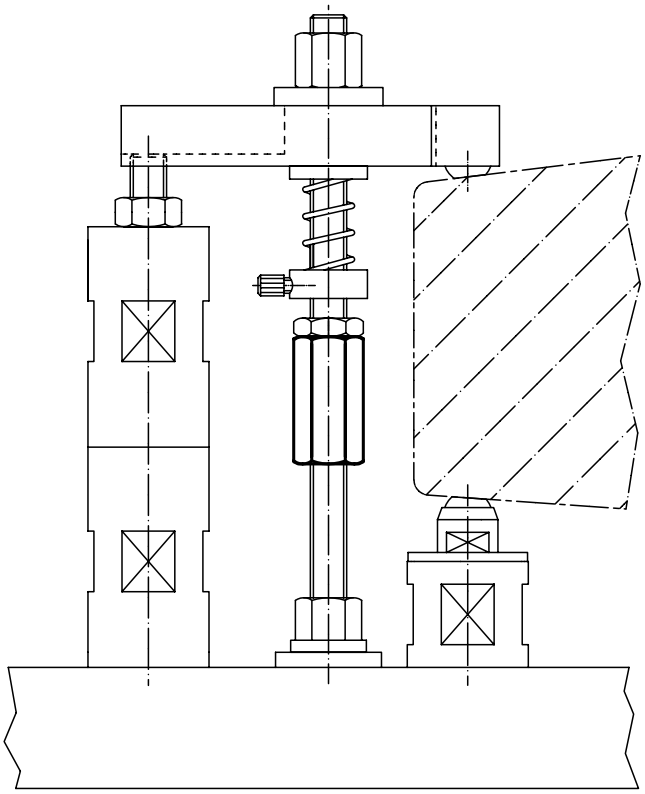
DRAWING



ORDER INFORMATION

d	Dimensions e	m	s	[g]	Art. No.
	[mm]				
M 6	11,5	18	10	9	**23090.0006**
M 8	15,0	24	13	19	**23090.0008**
M10	18,5	30	16	35	**23090.0010**
M12	20,8	36	18	49	**23090.0012**
M14	24,2	42	21	79	**23090.0014**
M16	27,7	48	24	119	**23090.0016**
M20	34,6	60	30	229	**23090.0020**
M24	41,6	72	36	403	**23090.0024**
M30	53,1	90	46	819	**23090.0030**
M36	63,5	108	55	1386	**23090.0036**

APPLICATION EXAMPLE



Drive Blocks • DIN 2079

EH 23100.

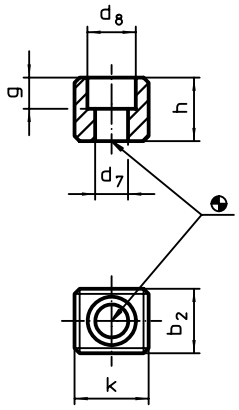


PRODUCT DESCRIPTION

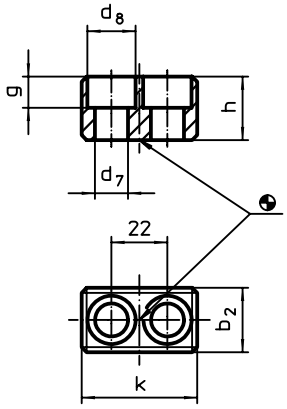
Material

- Alloyed case-hardened steel, case hardened, blackened, ground

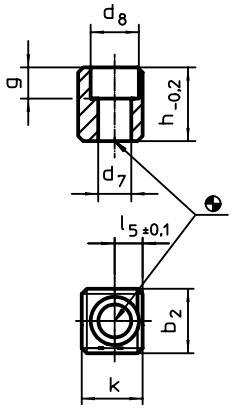
DRAWING



picture 1



picture 2

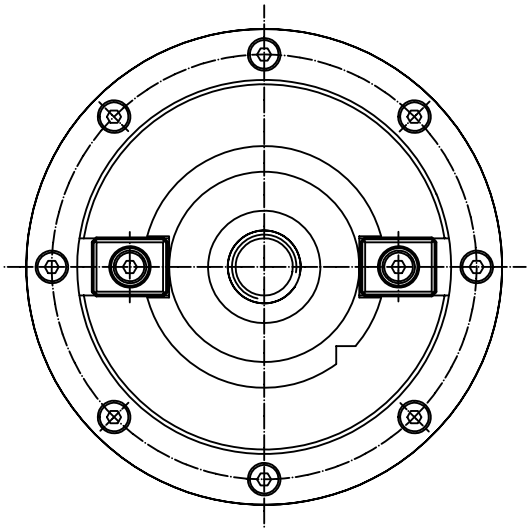


picture 3

ORDER INFORMATION

Spindle head No.	Dimensions k	b2 h5	d7	d8	g	h	l5 ±0,1	For screws ISO 4762		Art. No.
	[mm]							[mm]	[g]	
for spindle heads no. 30 to 60, form A – picture 1										
30	16,5	15,9	6,4	10,4	6,2	16,0	–	M 6 x 16	25	23100.0030
40	19,5	15,9	6,4	10,4	6,2	16,0	–	M 6 x 16	31	23100.0040
45	19,5	19,0	8,4	13,5	8,3	19,0	–	M 8 x 20	38	23100.0045
50 – 55	26,5	25,4	13,0	19,0	12,3	25,0	–	M12 x 25	85	23100.0050
60	45,5	25,4	13,0	19,0	12,3	25,0	–	M12 x 25	179	23100.0060
for spindle heads no. 60 form B – picture 2										
60	45,5	25,4	13,0	19,0	12,3	25,0	–	M12 x 25	140	23100.0160
for spindle heads no. 30 to 50, form C – picture 3										
30	13,5	15,9	6,4	10,4	6,2	24,5	5,5	M 6 x 25	30	23100.0230
40	16,5	15,9	6,4	10,4	6,2	24,5	7,0	M 6 x 25	39	23100.0240
45	17,5	19,0	8,4	13,5	10,0	26,0	7,5	M 8 x 25	47	23100.0245
50	24,0	25,4	13,0	19,0	12,3	29,0	11,0	M12 x 30	89	23100.0250

APPLICATION EXAMPLE



Fixed Slot Tenons

EH 23110.



PRODUCT DESCRIPTION

To be used for locating fixtures and clamping elements onto machine tables with T-slots to DIN 650.

Material

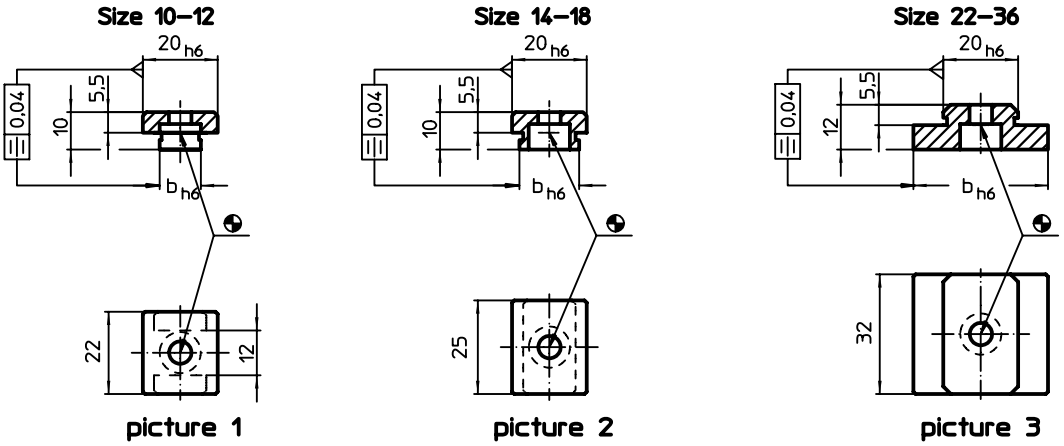
- Steel, case-hardened, blackened, ground

MORE INFORMATION

References

For size 20 refer to 23130.0020.

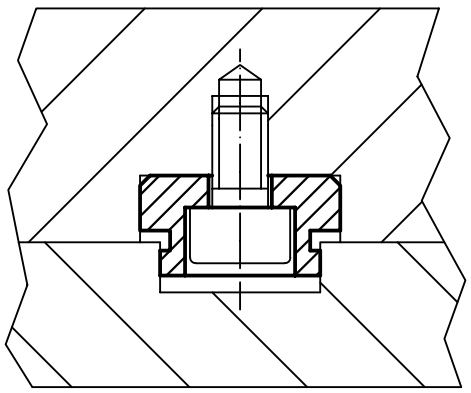
DRAWING



ORDER INFORMATION

T-slot size machine b h6 [mm]	For screws ISO 4762 [mm]	[g]	Art. No.
size 10-12 – picture 1			
10	M6	17	23110.0010
12	M6	18	23110.0012
size 14-18 – picture 2			
14	M6	26	23110.0014
16	M6	28	23110.0016
18	M6	29	23110.0018
size 22-36 – picture 3			
22	M6	53	23110.0022
24	M6	60	23110.0024
28	M6	62	23110.0028
36	M6	80	23110.0036

APPLICATION EXAMPLE



Fixed Slot Tenons • with cylindrical fastening

EH 23110.



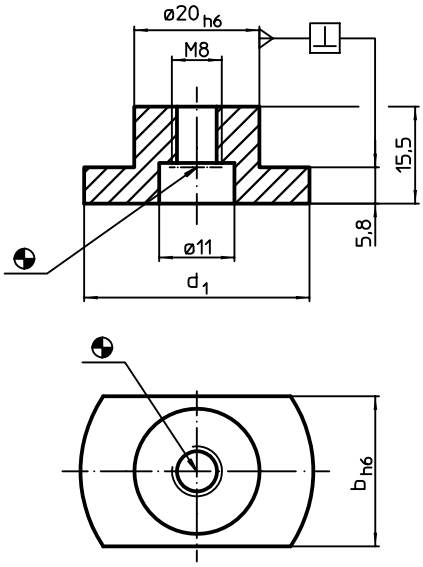
PRODUCT DESCRIPTION

To be used for locating fixtures and clamping elements onto mounting pallets or pallets with cylindrical location holes.
They can be inserted in holes as well as in slots.

Material

- Steel, case-hardened, blackened, ground

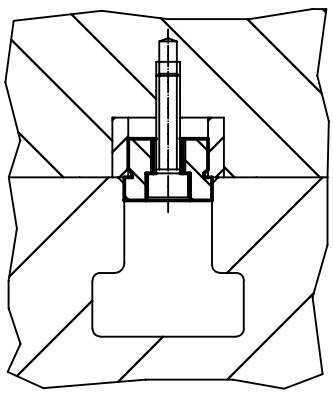
DRAWING



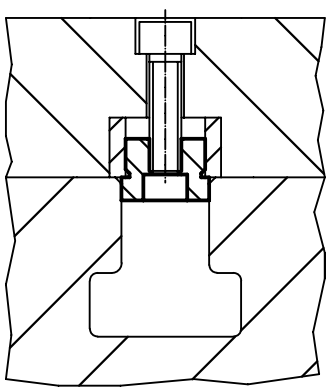
ORDER INFORMATION

T-slot size machine b h6 [mm]	Dimensions d_1 [mm]	For screws ISO 4762 (picture 1) [mm]	For screws ISO 4762 (picture 2) [mm]	[g]	Art. No.
10	30	M6	M8	28	23110.0110
12	30	M6	M8	39	23110.0112
14	30	M6	M8	41	23110.0114
16	30	M6	M8	36	23110.0116
18	30	M6	M8	45	23110.0118
20	36	M6	M8	48	23110.0120
22	40	M6	M8	54	23110.0122
28	42	M6	M8	65	23110.0128
36	48	M6	M8	86	23110.0136

APPLICATION EXAMPLE



picture 1



picture 2

Centering Pins

EH 23110.



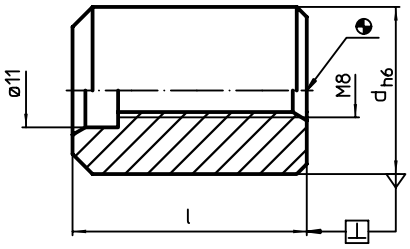
PRODUCT DESCRIPTION

The centering pins are used for centering fixtures on pallets.

Material

- Alloyed case-hardened steel, case hardened, ground

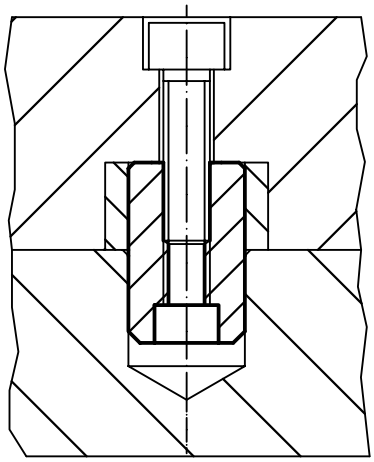
DRAWING

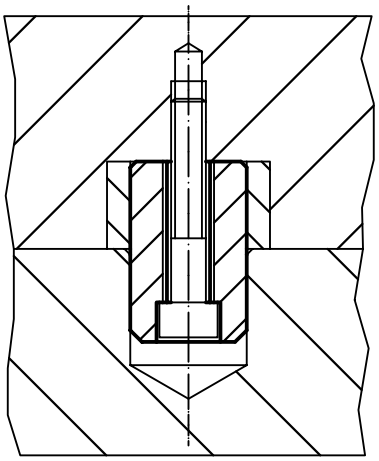


ORDER INFORMATION

Dimensions d h6 [mm]	l [mm]	[g]	Art. No.
20	**31**	70	**23110.0510**
25	**35**	118	**23110.0520**
50	**31**	473	**23110.0530**
	45	672	**23110.0540**

APPLICATION EXAMPLE





Centering Pins • stepped

EH 23110.



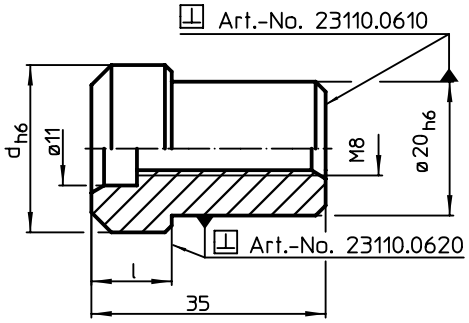
PRODUCT DESCRIPTION

The stepped centering pins are used for centering fixtures on pallets.

Material

- Alloyed case-hardened steel, case hardened, ground

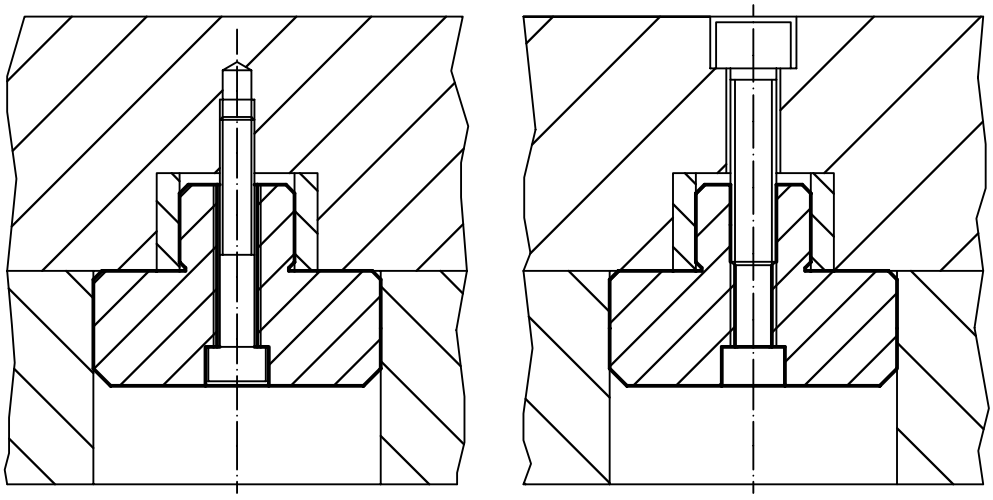
DRAWING



ORDER INFORMATION

Dimensions			Art. No.
d h6	l		
[mm]		[g]	
25	**12**	87	23110.0610
50	**20**	330	23110.0620

APPLICATION EXAMPLE



3

Loose Slot Tenons • DIN 6323

EH 23120.



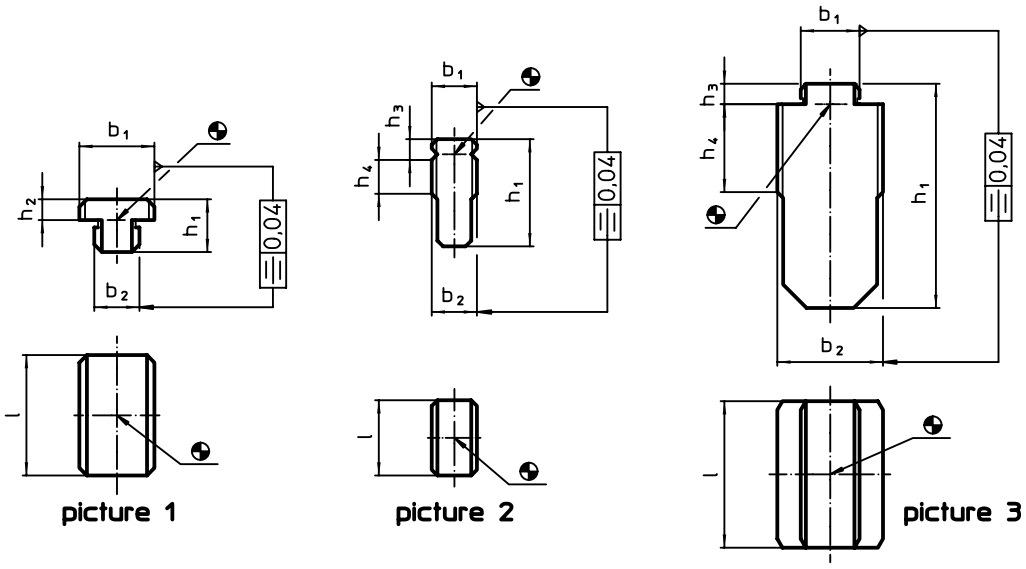
PRODUCT DESCRIPTION

To be used for locating fixtures and clamping elements onto machine tables with T-slots to DIN 650.
Being simply pushed into position after fixture or clamping element has been roughly positioned, they cannot cause damage to the machine as could protruding fixed slot tenons or low slot tenons.

Material

- Steel, case-hardened, blackened, ground

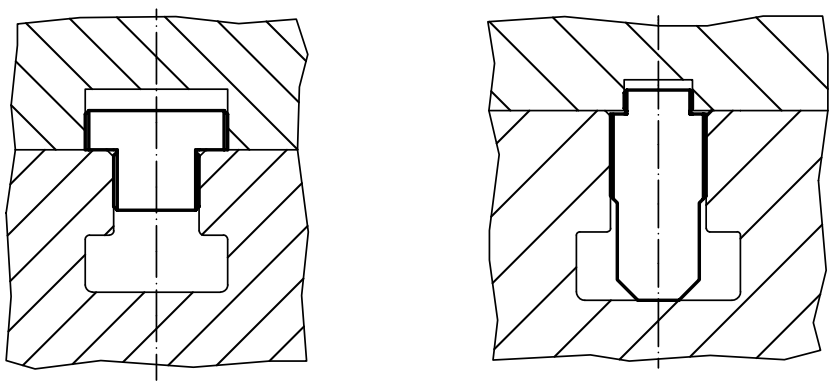
DRAWING



ORDER INFORMATION

T-slot size fixture b_1 h6 [mm]	T-slot size machine b_2 h6 [mm]	Dimensions h_1 [mm]	h_2 [mm]	h_3 [mm]	h_4 [mm]	l [mm]	[g]	Art. No.
form A, $b_1 > b_2$ – picture 1								
12	**10**	12,0	3,6	–	–	20	20	23120.0010
20	**12**	14,0	5,5	–	–	32	52	23120.0012
	14	14,0	5,5	–	–	32	56	23120.0014
	16	14,0	5,5	–	–	32	60	23120.0016
	18	14,0	5,5	–	–	32	65	23120.0018
form B, $b_1 = b_2$ – picture 2								
12	**12**	28,6	–	5,5	9	20	46	23120.0011
20	**20**	45,5	–	7,0	16	32	202	23120.0020
form C, $b_1 < b_2$ – picture 3								
20	**22**	50,5	–	7,0	18	40	302	23120.0022
	28	61,5	–	7,0	24	40	469	23120.0028
	36	76,5	–	7,0	30	50	951	23120.0036

APPLICATION EXAMPLE



Low Slot Tenons

EH 23130.



PRODUCT DESCRIPTION

To be used for locating fixtures and clamping elements onto machine tables with T-slots to DIN 650.

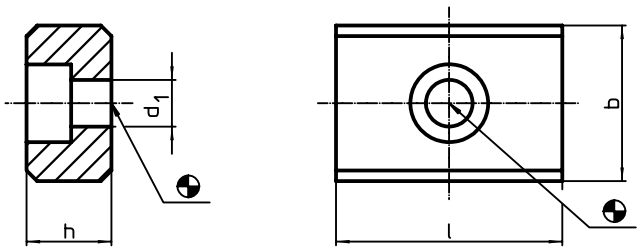
Material

- Steel, case-hardened, blackened, ground

Assembly

They are bolted into the alignment slots of the fixture. Low slot tenons are suitable for use where a fixture will only be used on machines having an identical slot width.

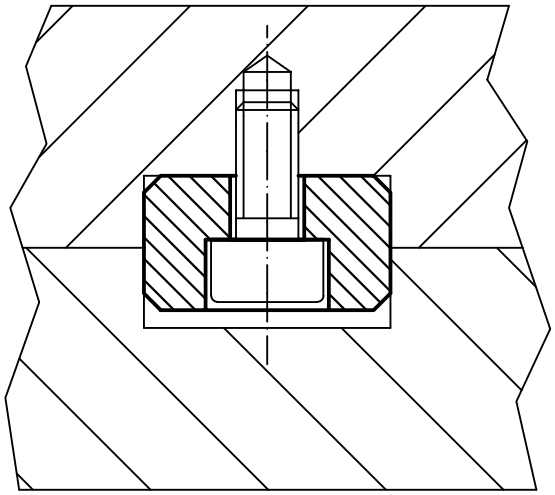
DRAWING



ORDER INFORMATION

Dimensions				For screws ISO 4762		Art. No.
b h6	h	l	d_1			
[mm]				[mm]	[g]	
10	8	20	4,5	M4	10	23130.0010
12	8	20	5,5	M5	11	23130.0012
14	10	22	6,6	M6	18	23130.0014
16	10	22	6,6	M6	22	23130.0016
18	10	22	6,6	M6	25	23130.0018
20	10	22	6,6	M6	28	23130.0020
22	12	32	6,6	M6	59	23130.0022
24	12	32	6,6	M6	64	23130.0024

APPLICATION EXAMPLE



3

POSITIONING CLAMPING PINS

QUICK AND EASY



The positioning clamping pin is centred and clamped with four balls in the locating bush by tightening the clamping bolt. The clamping bolt can be operated manually via a removable handle or using a hex key.

PRODUCT BENEFITS AT A GLANCE

- Benefits thanks to spring pre-loading:
  - Low-wear.
  - Clamping balls and locating hole are protected from being overloaded.
  - No overstressing of the clamping bolt, preventing the pin from jamming.
- Dampens vibrations during machining.
- Protection against accidental release of the pin (e.g. due to vibration).
- High repeatability of ± 0.03 mm.
- Handling facilitated during installation / disassembly thanks to spanner flats and knurls.
- Flat construction height.
- Operation by using a hex key or the optional handle.



Sample application EH 23111.
Positioning clamping pin for quick workpiece changes at the machine table.



www.halder.com/
PositioningClampingPins-Video

Positioning Clamping Pins

EH 23111.



PRODUCT DESCRIPTION

The positioning clamping pin allows fast clamping, fastening, adjusting, changing and securing of workpieces, plates, fixture systems etc.

Material

- Heat-treated steel, tempered, blackened
- Stainless steel 1.4542, precipitation-hardened

Operation

By tightening the clamping bolt, the positioning clamping pin is centred and clamped in the locating bushing by means of four balls. The clamping bolt can be operated manually via a removable handle (Art. No. 23111.0900 / .0902) or using a hexagon key.

MORE INFORMATION

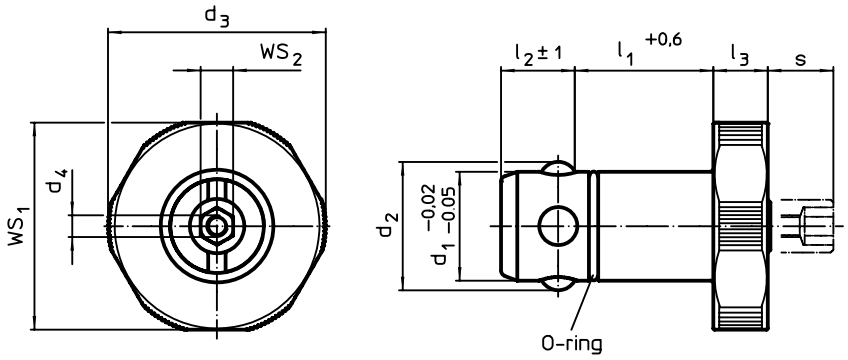
Accessories

Suitable bushings are available.

Further products

Manual Handles, for positioning clamping pins . . . . . → p. 397
Bushings, for positioning clamping pins . . . . . → p. 398
Locating Bushings, for positioning clamping pins, for press fit. . . . . → p. 399
Locating Bushings, for positioning clamping pins, for screw fit . . . . . → p. 400

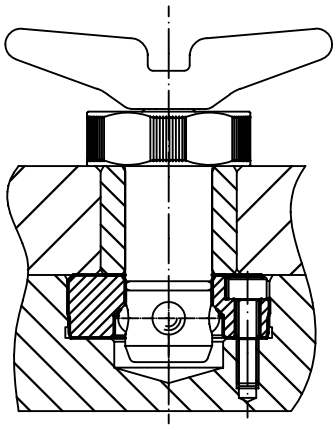
DRAWING



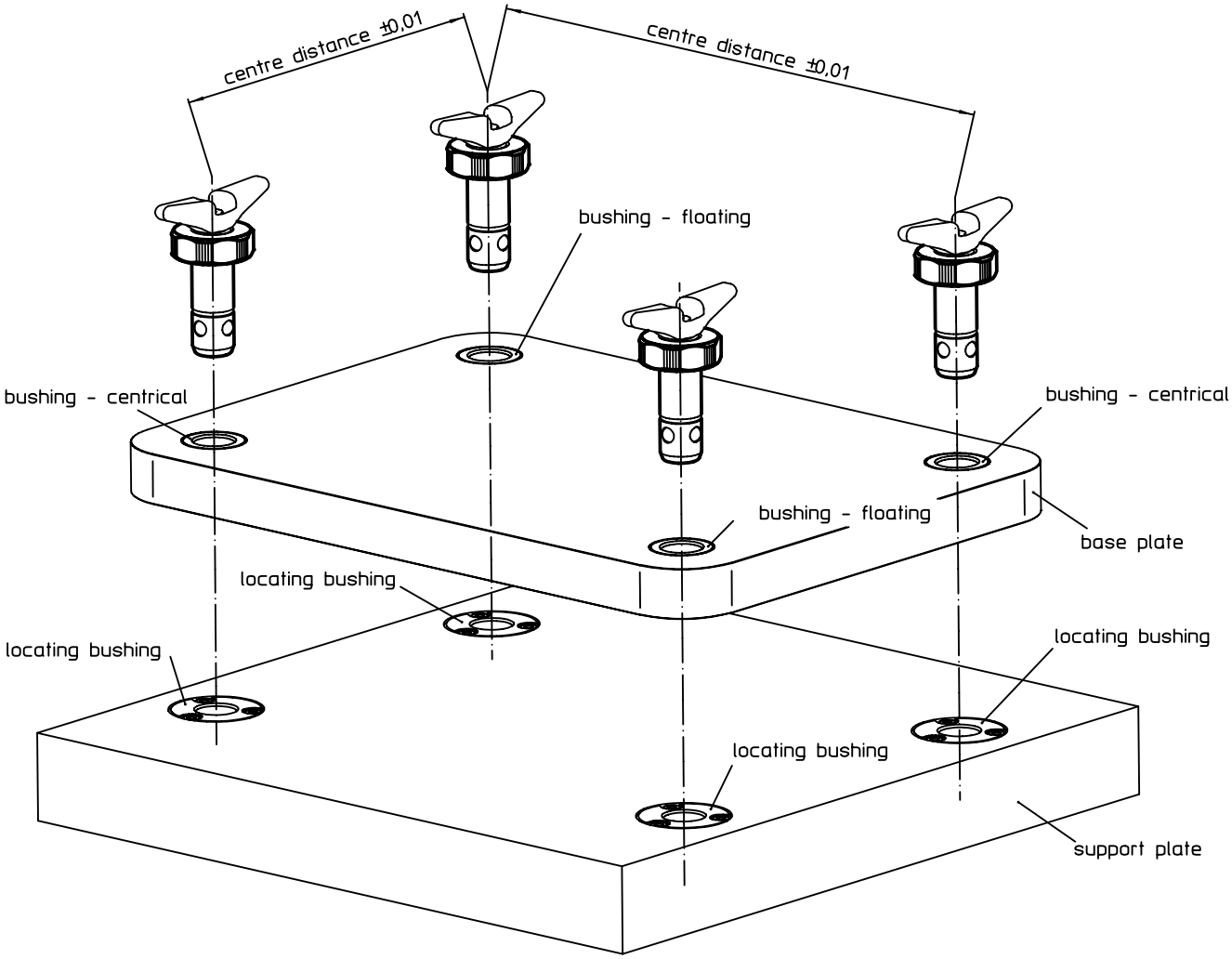
ORDER INFORMATION

Dimensions								For base plates ±0,05	WS1	WS2	Holding force		Art. No.	
d1 -0,02 -0,05	l1 +0,6	d2	d3	d4	l2 ±1	l3	s max.						heat-treated steel	stainless steel
[mm]								[mm]	[mm]	[mm]	[kN]	[g]		
16	25	18,7	32	M4	13,6	10	9	20	30	6	5	105	23111.0016	23111.0116
	30	18,7	32	M4	13,6	10	9	25	30	6	5	115	23111.0018	23111.0118
20	25	23,6	40	M4	13,6	10	9	20	38	6	6	170	23111.0020	23111.0120
	30	23,6	40	M4	13,6	10	9	25	38	6	6	185	23111.0022	23111.0122
25	25	29,0	45	M4	18,6	10	9	20	43	10	8	255	23111.0025	23111.0125
	30	29,0	45	M4	18,6	10	9	25	43	10	8	275	23111.0027	23111.0127
30	25	34,6	55	M4	18,6	10	9	20	53	10	10	375	23111.0030	23111.0130
	30	34,6	55	M4	18,6	10	9	25	53	10	10	400	23111.0032	23111.0132

APPLICATION EXAMPLE



3


centre distance ±0,01
centre distance ±0,01
bushing - floating
bushing - centrical
bushing - centrical
bushing - floating
base plate
locating bushing
locating bushing
locating bushing
locating bushing
support plate

Manual Handles • for positioning clamping pins

EH 23111.



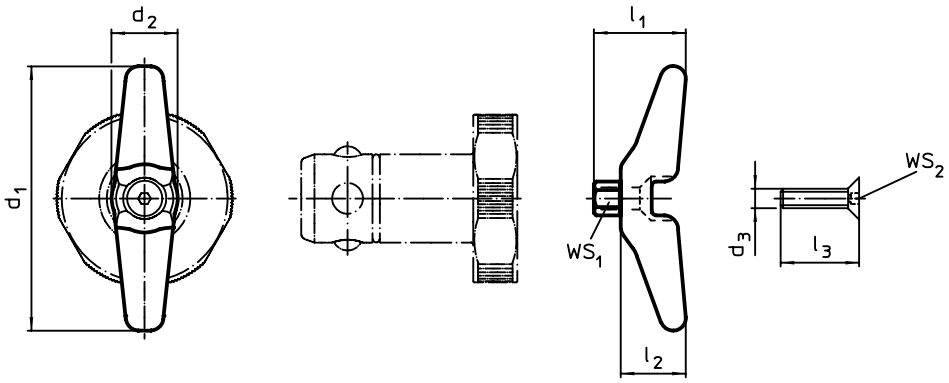
PRODUCT DESCRIPTION

The manual handle enables an easy and fast operation of the positioning clamping pin.

Material
- Stainless steel

Assembly
The handle is tightened to the positioning clamping pin with the M 4 screw included in the delivery.

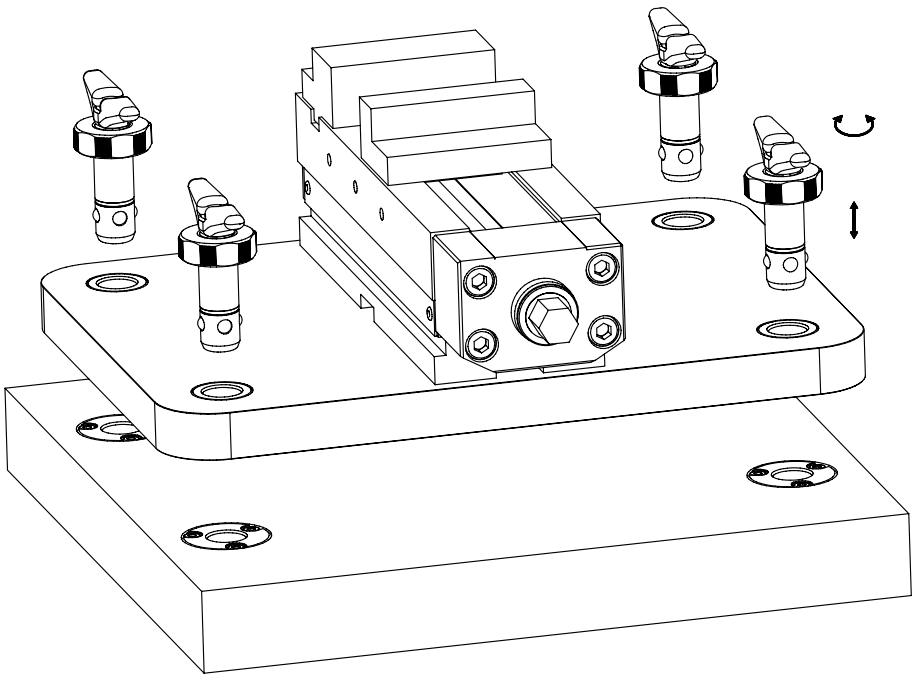
DRAWING



ORDER INFORMATION

For pin Ø	Dimensions						WS_1	WS_2		Art. No.
	d_1	d_2	d_3	l_1	l_2	l_3				
[mm]	[mm]						[mm]	[mm]	[g]	
16/20	**60**	15	M4	**20**	15	16	6	2,5	45	23111.0900
25/30	**80**	15	M4	**25**	20	20	10	2,5	80	23111.0902

APPLICATION EXAMPLE



Bushings • for positioning clamping pins

EH 23111.





PRODUCT DESCRIPTION

Material

- Case-hardened steel, case-hardened, blackened
- Stainless steel 1.4112, hardened

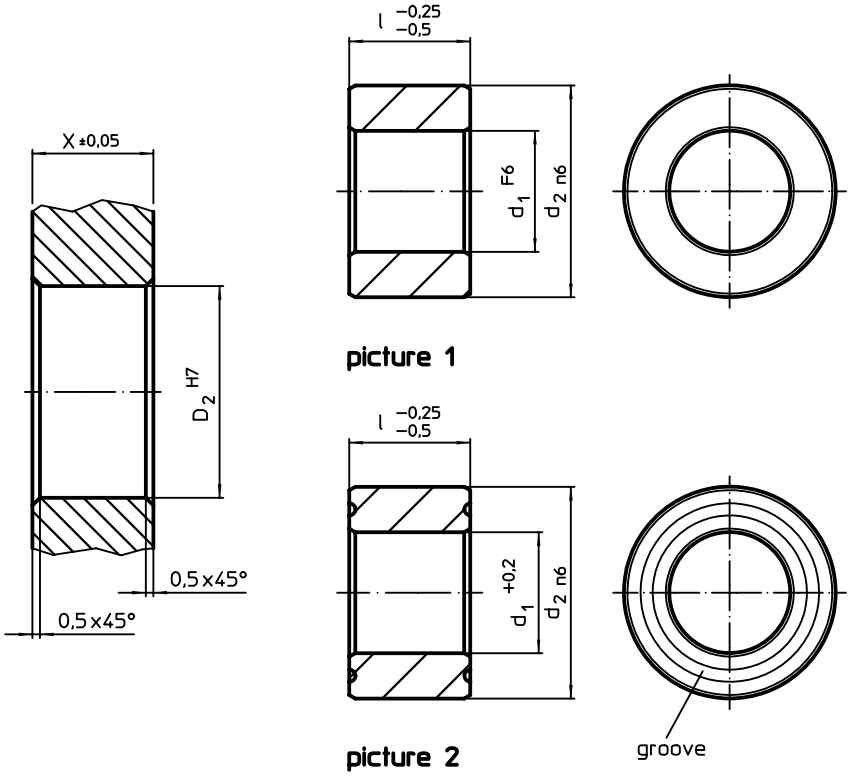
Assembly

Two centering bushes and two floating bushes are to be mounted into the plate to be clamped in order to guarantee an optimal repeatability.

Characteristic

The floating bush has a groove that serves as a differentiation mark.

DRAWING



ORDER INFORMATION

Dimensions			Location hole			Art. No.	
d_1	l -0,25 -0,5	d_2 n6	X ±0,05	D_2 H7		case-hardened steel	stainless steel
	[mm]		[mm]		[g]		
centrical – picture 1							
16,0 F6	**20**	25	20	25	45	23111.0702	23111.0802
	25	25	25	25	55	23111.0704	23111.0804
20,0 F6	**20**	35	20	35	100	23111.0706	23111.0806
	25	35	25	35	125	23111.0708	23111.0808
25,0 F6	**20**	35	20	35	75	23111.0710	23111.0810
	25	35	25	35	95	23111.0712	23111.0812
30,0 F6	**20**	45	20	45	140	23111.0714	23111.0814
	25	45	25	45	175	23111.0716	23111.0816
floating – picture 2							
16,8 +0,2	**20**	25	20	25	42	23111.0732	23111.0832
	25	25	25	25	52	23111.0734	23111.0834
20,8 +0,2	**20**	35	20	35	95	23111.0736	23111.0836
	25	35	25	35	120	23111.0738	23111.0838
25,8 +0,2	**20**	35	20	35	70	23111.0740	23111.0840
	25	35	25	35	85	23111.0742	23111.0842
30,8 +0,2	**20**	45	20	45	135	23111.0744	23111.0844
	25	45	25	45	165	23111.0746	23111.0846

Locating Bushings • for positioning clamping pins, for press fit

EH 23111.





PRODUCT DESCRIPTION

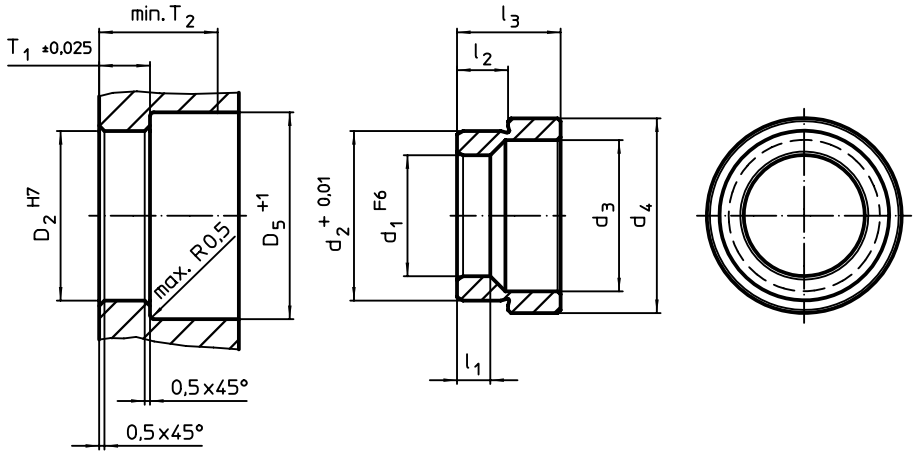
Material

- Case-hardened steel, case-hardened, blackened
- Stainless steel 1.4112, hardened

Assembly

The press fit locating bush for positioning clamping pins are inserted in the machine table or the base plate with light pressure.

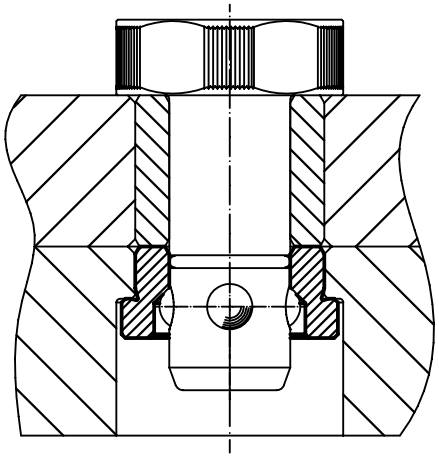
DRAWING



ORDER INFORMATION

Dimensions							Location hole					Art. No.	
d_1 F6	d_2 +0,01	d_3	d_4	l_1	l_2	l_3	D_2 h7	D_5 +1	T_1 ±0,02	T2 min.		case-hardened steel	stainless steel
[mm]							[mm]				[g]		
16	22,03	20	28,6	5,25	6,90	12,1	22	31	7,25	22	25	23111.0762	23111.0862
20	28,03	25	32,2	5,25	8,42	17,1	28	34	8,75	22	40	23111.0764	23111.0864
25	35,03	31	40,2	5,25	10,22	21,0	35	42	10,55	28	80	23111.0766	23111.0866
30	42,03	37	48,2	5,25	10,63	21,8	42	50	10,95	28	115	23111.0768	23111.0868

APPLICATION EXAMPLE



Locating Bushings • for positioning clamping pins, for screw fit

EH 23111.





PRODUCT DESCRIPTION

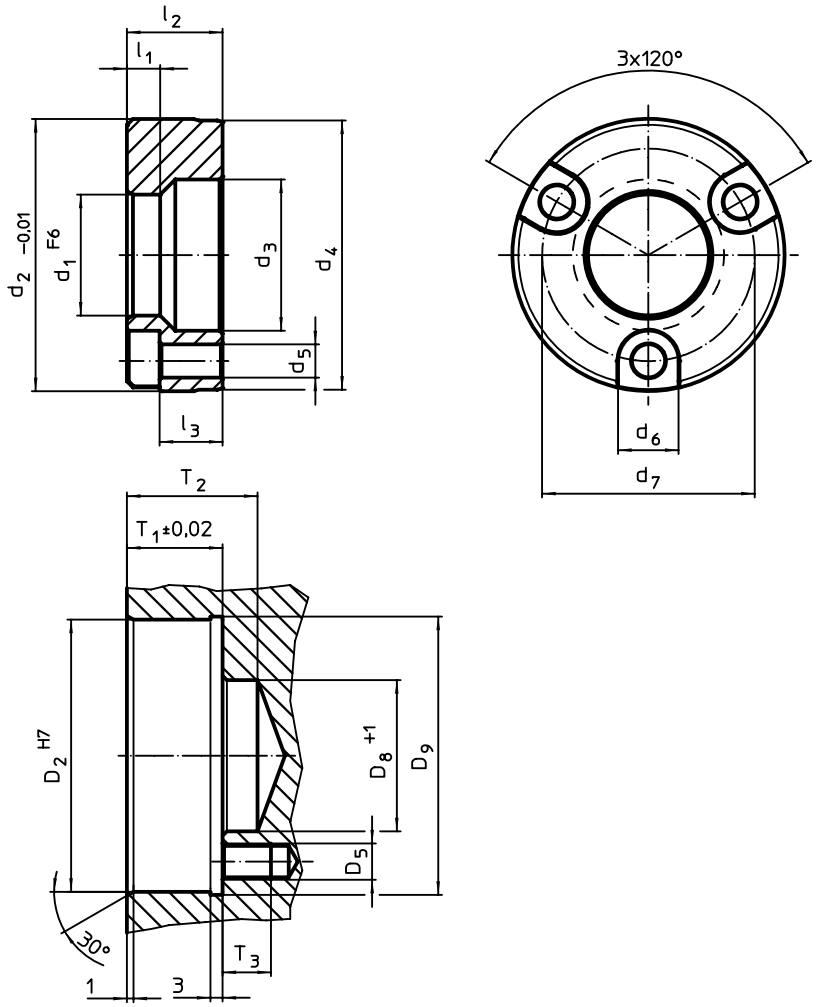
Material

- Case-hardened steel, case-hardened, blackened
- Stainless steel 1.4112, hardened

Assembly

The screw fit locating bushings for positioning clamping pins are inserted in the machine table or in the base plate and are screwed on.
Supplied with mounting screws.

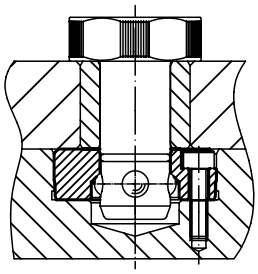
DRAWING



ORDER INFORMATION

Dimensions										Location hole								Art. No.	
d_1 F6	d_2 -0,01	d_3	d_4	d_5	d_6	d_7	l_1	l_2	l_3 ~	D_2 H7	D_5	D_8 +1	D_9	T_1 ±0,02	T2	T3		case-hardened steel	stainless steel
[mm]										[mm]							[g]		
16	36,99	20	36,5	4,5	8	29	5,25	11,56	7,0	37	M4	20	38,5	11,91	22	12	70	23111.0782	23111.0882
20	44,99	25	44,5	5,5	10	35	5,25	15,82	10,0	45	M5	25	46,5	16,21	22	12	130	23111.0784	23111.0884
25	54,99	31	54,5	6,6	11	42	5,25	19,94	13,5	55	M6	31	56,5	20,32	28	14	245	23111.0786	23111.0886
30	59,99	37	59,5	6,6	11	48	5,25	21,77	15,0	60	M6	37	61,5	22,15	28	14	300	23111.0788	23111.0888

APPLICATION EXAMPLE



Positioning Bushings • with collar, DIN 172 A

EH 23112.



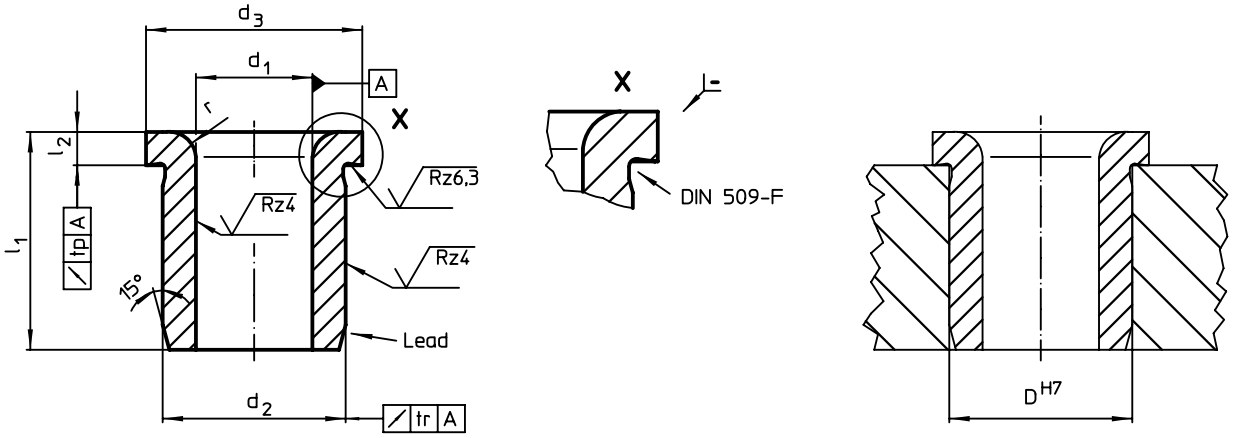
PRODUCT DESCRIPTION

Positioning or drill bushes used to drill repetitive holes in the same location to ensure repeatabililty.
The hardened and ground positioning bushings can be used as wear-resistant guide for drills, shafts etc.

Material

- Case-hardened steel, case hardened

DRAWING



ORDER INFORMATION

Dimensions						Location hole		Art. No.
d_1 F7	l_1	d_2 n6	d_3	l_2	r	D H7		
[mm]						[mm]	[g]	
2,0	6	5	8	2,0	1,0	5	1,2	23112.0020
	9	5	8	2,0	1,0	5	1,6	23112.0021
2,1	6	5	8	2,0	1,0	5	1,2	23112.0022
	9	5	8	2,0	1,0	5	1,5	23112.0023
2,5	6	5	8	2,0	1,0	5	1,1	23112.0024
	9	5	8	2,0	1,0	5	1,4	23112.0025
3,0	8	6	9	2,5	1,0	6	1,9	23112.0030
	12	6	9	2,5	1,0	6	2,6	23112.0031
	16	6	9	2,5	1,0	6	3,2	23112.0032
3,1	8	6	9	2,5	1,0	6	1,9	23112.0033
	12	6	9	2,5	1,0	6	2,5	23112.0034
	16	6	9	2,5	1,0	6	3,2	23112.0035
3,5	8	7	10	2,5	1,0	7	2,4	23112.0036
	12	7	10	2,5	1,0	7	3,4	23112.0037
	16	7	10	2,5	1,0	7	4,3	23112.0038
4,0	8	7	10	2,5	1,0	7	2,3	23112.0040
	12	7	10	2,5	1,0	7	3,1	23112.0041
	16	7	10	2,5	1,0	7	3,9	23112.0042
4,1	8	8	11	2,5	1,0	8	3,0	23112.0043
	12	8	11	2,5	1,0	8	4,2	23112.0044
	16	8	11	2,5	1,0	8	5,3	23112.0045
4,5	8	8	11	2,5	1,0	8	2,9	23112.0046
	12	8	11	2,5	1,0	8	3,9	23112.0047
	16	8	11	2,5	1,0	8	5,0	23112.0048
5,0	8	8	11	2,5	1,0	8	2,6	23112.0050
	12	8	11	2,5	1,0	8	3,6	23112.0051
	16	8	11	2,5	1,0	8	4,5	23112.0052

→

3

Dimensions						Location hole		Art. No.
d_1 F7	l_1	d_2 n6	d_3	l_2	r	D H7		
[mm]						[mm]	[g]	
5,1	10	10	13	3,0	1,5	10	5,5	23112.0053
	16	10	13	3,0	1,5	10	8,2	23112.0054
	20	10	13	3,0	1,5	10	10,0	23112.0055
5,5	10	10	13	3,0	1,5	10	5,3	23112.0056
	16	10	13	3,0	1,5	10	7,9	23112.0057
	20	10	13	3,0	1,5	10	9,6	23112.0058
6,0	10	10	13	3,0	1,5	10	4,9	23112.0060
	16	10	13	3,0	1,5	10	7,3	23112.0061
	20	10	13	3,0	1,5	10	8,8	23112.0062
6,1	10	12	15	3,0	1,5	12	7,7	23112.0063
	16	12	15	3,0	1,5	12	12,0	23112.0064
	20	12	15	3,0	1,5	12	14,0	23112.0065
6,5	10	12	15	3,0	1,5	12	7,4	23112.0066
	16	12	15	3,0	1,5	12	11,0	23112.0067
	20	12	15	3,0	1,5	12	14,0	23112.0068
7,0	10	12	15	3,0	1,5	12	7,0	23112.0070
	16	12	15	3,0	1,5	12	10,0	23112.0071
	20	12	15	3,0	1,5	12	13,0	23112.0072
7,1	10	12	15	3,0	1,5	12	6,9	23112.0073
	16	12	15	3,0	1,5	12	10,0	23112.0074
	20	12	15	3,0	1,5	12	13,0	23112.0075
7,5	10	12	15	3,0	1,5	12	6,5	23112.0076
	16	12	15	3,0	1,5	12	9,7	23112.0077
	20	12	15	3,0	1,5	12	12,0	23112.0078
8,0	10	12	15	3,0	1,5	12	6,0	23112.0080
	16	12	15	3,0	1,5	12	9,0	23112.0081
	20	12	15	3,0	1,5	12	11,0	23112.0082
8,1	12	15	18	3,0	2,0	15	13,0	23112.0083
	20	15	18	3,0	2,0	15	25,0	23112.0084
	25	15	18	3,0	2,0	15	26,0	23112.0085
8,5	12	15	18	3,0	2,0	15	13,0	23112.0086
	20	15	18	3,0	2,0	15	20,0	23112.0087
	25	15	18	3,0	2,0	15	25,0	23112.0088
9,0	12	15	18	3,0	2,0	15	12,0	23112.0090
	20	15	18	3,0	2,0	15	19,0	23112.0091
	25	15	18	3,0	2,0	15	23,0	23112.0092
9,1	12	15	18	3,0	2,0	15	12,0	23112.0093
	20	15	18	3,0	2,0	15	19,0	23112.0094
	25	15	18	3,0	2,0	15	23,0	23112.0095
9,5	12	15	18	3,0	2,0	15	11,0	23112.0096
	20	15	18	3,0	2,0	15	18,0	23112.0097
	25	15	18	3,0	2,0	15	22,0	23112.0098
10,0	12	15	18	3,0	2,0	15	11,0	23112.0100
	20	15	18	3,0	2,0	15	17,0	23112.0101
	25	15	18	3,0	2,0	15	20,0	23112.0102
10,1	12	18	22	4,0	2,0	18	20,0	23112.0103
	20	18	22	4,0	2,0	18	30,0	23112.0104
	25	18	22	4,0	2,0	18	37,0	23112.0105
10,5	12	18	22	4,0	2,0	18	19,0	23112.0106
	20	18	22	4,0	2,0	18	29,0	23112.0107
	25	18	22	4,0	2,0	18	36,0	23112.0108
11,0	12	18	22	4,0	2,0	18	18,0	23112.0110
	20	18	22	4,0	2,0	18	28,0	23112.0111
	25	18	22	4,0	2,0	18	34,0	23112.0112
11,1	12	18	22	4,0	2,0	18	18,0	23112.0113
	20	18	22	4,0	2,0	18	28,0	23112.0114
	25	18	22	4,0	2,0	18	34,0	23112.0115
11,5	12	18	22	4,0	2,0	18	17,0	23112.0116
	20	18	22	4,0	2,0	18	26,0	23112.0117
	25	18	22	4,0	2,0	18	33,0	23112.0118
12,0	12	18	22	4,0	2,0	18	16,0	23112.0120
	20	18	22	4,0	2,0	18	25,0	23112.0121
	25	18	22	4,0	2,0	18	31,0	23112.0122

→

Dimensions						Location hole		Art. No.
d_1 F7	l_1	d_2 n6	d_3	l_2	r	D H7		
[mm]						[mm]	[g]	
12,1	16	22	26	4,0	2,0	22	37,0	23112.0123
	28	22	26	4,0	2,0	22	62,0	23112.0124
	36	22	26	4,0	2,0	22	78,0	23112.0125
12,5	16	22	26	4,0	2,0	22	36,0	23112.0126
	28	22	26	4,0	2,0	22	60,0	23112.0127
	36	22	26	4,0	2,0	22	76,0	23112.0128
13,0	16	22	26	4,0	2,0	22	34,0	23112.0130
	28	22	26	4,0	2,0	22	58,0	23112.0131
	36	22	26	4,0	2,0	22	73,0	23112.0132
14,0	16	22	26	4,0	2,0	22	32,0	23112.0140
	28	22	26	4,0	2,0	22	53,0	23112.0141
	36	22	26	4,0	2,0	22	67,0	23112.0142
15,0	16	22	26	4,0	2,0	22	29,0	23112.0150
	28	22	26	4,0	2,0	22	48,0	23112.0151
	36	22	26	4,0	2,0	22	61,0	23112.0152
16,0	16	26	30	4,0	2,0	26	45,0	23112.0160
	28	26	30	4,0	2,0	26	76,0	23112.0161
	36	26	30	4,0	2,0	26	97,0	23112.0162
16,1	16	26	30	4,0	2,0	26	45,0	23112.0163
	28	26	30	4,0	2,0	26	76,0	23112.0164
	36	26	30	4,0	2,0	26	96,0	23112.0165
16,5	16	26	30	4,0	2,0	26	44,0	23112.0166
	28	26	30	4,0	2,0	26	73,0	23112.0167
	36	26	30	4,0	2,0	26	93,0	23112.0168
17,0	16	26	30	4,0	2,0	26	42,0	23112.0171
	28	26	30	4,0	2,0	26	70,0	23112.0172
	36	26	30	4,0	2,0	26	90,0	23112.0173
18,0	16	26	30	4,0	2,0	26	39,0	23112.0181
	28	26	30	4,0	2,0	26	64,0	23112.0182
	36	26	30	4,0	2,0	26	82,0	23112.0183
19,0	20	30	34	5,0	3,0	30	71,0	23112.0191
	36	30	34	5,0	3,0	30	125,0	23112.0192
	45	30	34	5,0	3,0	30	154,0	23112.0193
20,0	20	30	34	5,0	3,0	30	67,0	23112.0201
	36	30	34	5,0	3,0	30	117,0	23112.0202
	45	30	34	5,0	3,0	30	143,0	23112.0203
20,1	20	30	34	5,0	3,0	30	66,0	23112.0204
	36	30	34	5,0	3,0	30	115,0	23112.0205
	45	30	34	5,0	3,0	30	142,0	23112.0206
22,0	20	30	34	5,0	3,0	30	56,0	23112.0221
	36	30	34	5,0	3,0	30	97,0	23112.0222
	45	30	34	5,0	3,0	30	120,0	23112.0223
25,0	20	35	39	5,0	3,0	35	80,0	23112.0251
	36	35	39	5,0	3,0	35	138,0	23112.0252
	45	35	39	5,0	3,0	35	171,0	23112.0253
30,0	25	42	46	5,0	3,0	42	139,0	23112.0301
	45	42	46	5,0	3,0	42	245,0	23112.0302
	56	42	46	5,0	3,0	42	304,0	23112.0303

Positioning Bushings • without collar, DIN 179 A

EH 23112.



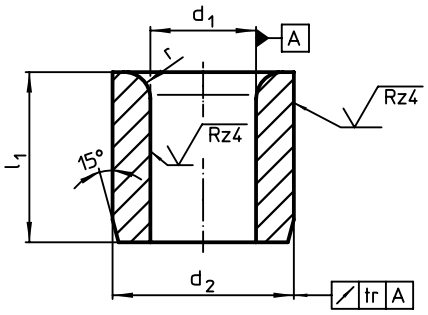
PRODUCT DESCRIPTION

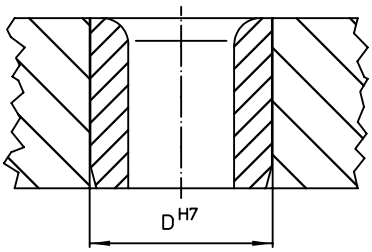
Positioning or drill bushes used to drill repetitive holes in the same location to ensure repeatabililty.
The hardened and ground positioning bushings can be used as wear-resistant guide for drills, shafts etc.

Material

- Case-hardened steel, case hardened

DRAWING





ORDER INFORMATION

Dimensions				Location hole		Art. No.
d_1 F7	l_1	d_2 n6	r	D H7		
[mm]				[mm]	[g]	
2,0	6	5	1,0	5	0,7	23112.0520
	9	5	1,0	5	1,1	23112.0521
2,1	6	5	1,0	5	0,7	23112.0522
	9	5	1,0	5	1,1	23112.0523
2,5	6	5	1,0	5	0,7	23112.0524
	9	5	1,0	5	1,0	23112.0525
3,0	8	6	1,0	6	1,3	23112.0530
	12	6	1,0	6	1,9	23112.0531
	16	6	1,0	6	2,6	23112.0532
3,1	8	6	1,0	6	1,2	23112.0533
	12	6	1,0	6	1,9	23112.0534
	16	6	1,0	6	2,5	23112.0535
3,5	8	7	1,0	7	1,7	23112.0536
	12	7	1,0	7	2,6	23112.0537
	16	7	1,0	7	3,6	23112.0538
4,0	8	7	1,0	7	1,5	23112.0540
	12	7	1,0	7	2,4	23112.0541
	16	7	1,0	7	3,2	23112.0542
4,1	8	8	1,0	8	2,2	23112.0543
	12	8	1,0	8	3,4	23112.0544
	16	8	1,0	8	4,6	23112.0545
4,5	8	8	1,0	8	2,1	23112.0546
	12	8	1,0	8	3,1	23112.0547
	16	8	1,0	8	4,2	23112.0548
5,0	8	8	1,0	8	1,8	23112.0550
	12	8	1,0	8	2,8	23112.0551
	16	8	1,0	8	3,7	23112.0552
5,1	10	10	1,5	10	4,4	23112.0553
	16	10	1,5	10	7,1	23112.0554
	20	10	1,5	10	8,9	23112.0555
5,5	10	10	1,5	10	4,1	23112.0556
	16	10	1,5	10	6,7	23112.0557
	20	10	1,5	10	8,4	23112.0558

→

Dimensions				Location hole		Art. No.
d_1 F7	l_1	d_2 n6	r	D H7		
[mm]				[mm]	[g]	
6,0	10	10	1,5	10	3,8	23112.0560
	16	10	1,5	10	6,1	23112.0561
	20	10	1,5	10	7,7	23112.0562
6,1	10	12	1,5	12	6,3	23112.0563
	16	12	1,5	12	10,0	23112.0564
	20	12	1,5	12	13,0	23112.0565
6,5	10	12	1,5	12	6,0	23112.0566
	16	12	1,5	12	9,7	23112.0567
	20	12	1,5	12	12,0	23112.0568
7,0	10	12	1,5	12	5,6	23112.0570
	16	12	1,5	12	9,1	23112.0571
	20	12	1,5	12	11,0	23112.0572
7,1	10	12	1,5	12	5,5	23112.0573
	16	12	1,5	12	9,0	23112.0574
	20	12	1,5	12	11,0	23112.0575
7,5	10	12	1,5	12	5,1	23112.0576
	16	12	1,5	12	8,4	23112.0577
	20	12	1,5	12	11,0	23112.0578
8,0	10	12	1,5	12	4,7	23112.0580
	16	12	1,5	12	7,6	23112.0581
	20	12	1,5	12	9,6	23112.0582
8,1	12	15	2,0	15	11,0	23112.0583
	20	15	2,0	15	19,0	23112.0584
	25	15	2,0	15	24,0	23112.0585
8,5	12	15	2,0	15	11,0	23112.0586
	20	15	2,0	15	18,0	23112.0587
	25	15	2,0	15	23,0	23112.0588
9,0	12	15	2,0	15	10,0	23112.0590
	20	15	2,0	15	17,0	23112.0591
	25	15	2,0	15	22,0	23112.0592
9,1	12	15	2,0	15	10,0	23112.0593
	20	15	2,0	15	17,0	23112.0594
	25	15	2,0	15	21,0	23112.0595
9,5	12	15	2,0	15	9,5	23112.0596
	20	15	2,0	15	16,0	23112.0597
	25	15	2,0	15	20,0	23112.0598
10,0	12	15	2,0	15	8,8	23112.0600
	20	15	2,0	15	15,0	23112.0601
	25	15	2,0	15	19,0	23112.0602
10,1	12	18	2,0	18	16,0	23112.0603
	20	18	2,0	18	27,0	23112.0604
	25	18	2,0	18	33,0	23112.0605
10,5	12	18	2,0	18	15,0	23112.0606
	20	18	2,0	18	26,0	23112.0607
	25	18	2,0	18	32,0	23112.0608
11,0	12	18	2,0	18	14,0	23112.0610
	20	18	2,0	18	24,0	23112.0611
	25	18	2,0	18	31,0	23112.0612
11,1	12	18	2,0	18	14,0	23112.0613
	20	18	2,0	18	24,0	23112.0614
	25	18	2,0	18	30,0	23112.0615
11,5	12	18	2,0	18	14,0	23112.0616
	20	18	2,0	18	23,0	23112.0617
	25	18	2,0	18	29,0	23112.0618
12,0	12	18	2,0	18	13,0	23112.0620
	20	18	2,0	18	22,0	23112.0621
	25	18	2,0	18	27,0	23112.0622
12,1	16	22	2,0	22	32,0	23112.0623
	28	22	2,0	22	57,0	23112.0624
	36	22	2,0	22	74,0	23112.0625
12,5	16	22	2,0	22	31,0	23112.0626
	28	22	2,0	22	66,0	23112.0627
	36	22	2,0	22	69,0	23112.0628

→

Dimensions				Location hole		Art. No.
d_1 F7	l_1	d_2 n6	r	D H7		
[mm]				[mm]	[g]	
13,0	**16**	22	2,0	22	30,0	**23112.0630**
	28	22	2,0	22	53,0	**23112.0631**
	36	22	2,0	22	69,0	**23112.0632**
14,0	**16**	22	2,0	22	27,0	**23112.0640**
	28	22	2,0	22	49,0	**23112.0641**
	36	22	2,0	22	63,0	**23112.0642**
15,0	**16**	22	2,0	22	25,0	**23112.0650**
	28	22	2,0	22	44,0	**23112.0651**
	36	22	2,0	22	56,0	**23112.0652**
16,0	**16**	26	2,0	26	45,0	**23112.0660**
	28	26	2,0	26	71,0	**23112.0661**
	36	26	2,0	26	92,0	**23112.0662**
16,1	**16**	26	2,0	26	40,0	**23112.0663**
	28	26	2,0	26	71,0	**23112.0664**
	36	26	2,0	26	91,0	**23112.0665**
16,5	**16**	26	2,0	26	39,0	**23112.0666**
	28	26	2,0	26	68,0	**23112.0667**
	36	26	2,0	26	88,0	**23112.0668**
17,0	**16**	26	2,0	26	37,0	**23112.0671**
	28	26	2,0	26	65,0	**23112.0672**
	36	26	2,0	26	84,0	**23112.0673**
18,0	**16**	26	2,0	26	33,0	**23112.0681**
	28	26	2,0	26	59,0	**23112.0682**
	36	26	2,0	26	77,0	**23112.0683**
19,0	**20**	30	3,0	30	64,0	**23112.0691**
	36	30	3,0	30	117,0	**23112.0692**
	45	30	3,0	30	147,0	**23112.0693**
20,0	**20**	30	3,0	30	59,0	**23112.0701**
	36	30	3,0	30	108,0	**23112.0702**
	45	30	3,0	30	136,0	**23112.0703**
20,1	**20**	30	3,0	30	59,0	**23112.0704**
	36	30	3,0	30	108,0	**23112.0705**
	45	30	3,0	30	135,0	**23112.0706**
22,0	**20**	30	3,0	30	49,0	**23112.0721**
	36	30	3,0	30	90,0	**23112.0722**
	45	30	3,0	30	113,0	**23112.0723**
25,0	**20**	35	3,0	35	71,0	**23112.0751**
	36	35	3,0	35	130,0	**23112.0752**
	45	35	3,0	35	163,0	**23112.0753**
30,0	**25**	42	3,0	42	129,0	**23112.0801**
	45	42	3,0	42	235,0	**23112.0802**
	56	42	3,0	42	293,0	**23112.0803**

Clamps • DIN 6314 flat

EH 23140.

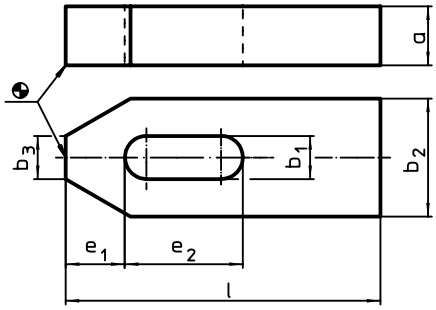


PRODUCT DESCRIPTION

Material

- Heat-treated steel, varnished

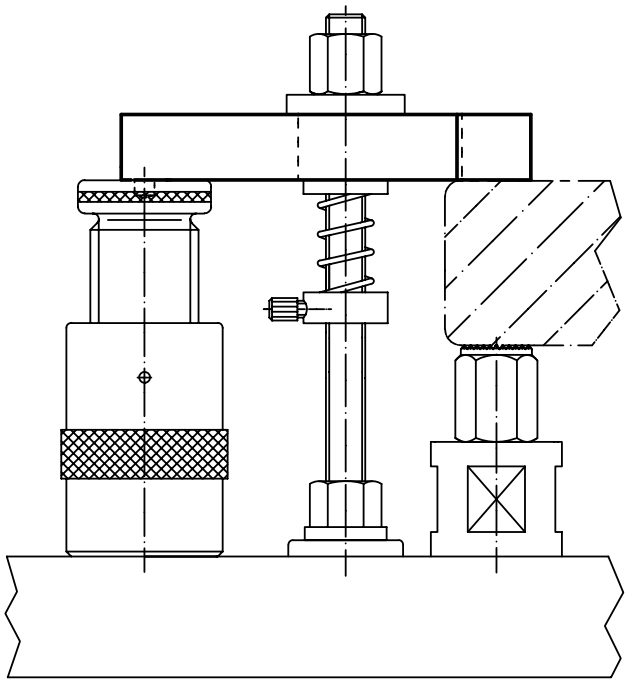
DRAWING



ORDER INFORMATION

Nominal dimension b_1	Dimensions						For screws			Art. No.
	l	a	b_2	b_3	e_1	e_2				
[mm]	[mm]						[mm]	[inch]	[g]	
6,6	**50**	10	20	8	10	20	M 6	1/4	61	**23140.0007**
9,0	**60**	12	25	10	13	22	M 8	5/16	112	**23140.0009**
11,0	**80**	15	30	12	15	30	M10	3/8	228	**23140.0011**
14,0	**100**	20	40	14	21	40	M12, M14	1/2	492	**23140.0014**
	125	20	40	14	21	50	M12, M14	1/2	623	**23140.0015**
18,0	**125**	25	50	18	26	45	M16, M18	5/8	980	**23140.0018**
	160	25	50	18	26	65	M16, M18	5/8	1246	**23140.0019**
22,0	**160**	30	60	22	30	60	M20, M22	3/4	1793	**23140.0022**
	200	30	60	22	30	80	M20, M22	3/4	2244	**23140.0023**
26,0	**200**	30	70	26	35	80	M24	1	2617	**23140.0026**
	250	30	70	26	35	105	M24	1	3823	**23140.0027**
33,0	**250**	40	80	34	45	100	M30	1 1/4	4980	**23140.0034**
	315	50	80	34	45	130	M30	1 1/4	7840	**23140.0035**

APPLICATION EXAMPLE



Clamps • DIN 6315 B forked

EH 23150.

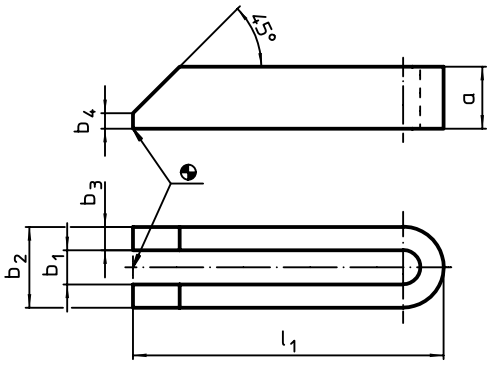


PRODUCT DESCRIPTION

Material

- Heat-treated steel, varnished

DRAWING



ORDER INFORMATION

Nominal dimension b_1	Dimensions					For screws			Art. No.
	l_1	a	b_2	b_3	b_4				
[mm]	[mm]					[mm]	[inch]	[g]	
6,6	**60**	12	19	6	3	M 6	1/4	65	**23150.0007**
9,0	**80**	15	25	8	4	M 8	5/16	141	**23150.0009**
11,0	**100**	20	31	10	5	M10	3/8	299	**23150.0011**
14,0	**125**	25	38	12	6	M12, M14	1/2	578	**23150.0014**
	160	25	38	12	6	M12, M14	1/2	715	**23150.0015**
	200	25	38	12	6	M12, M14	1/2	905	**23150.0016**
18,0	**160**	30	48	15	8	M16, M18	5/8	1077	**23150.0018**
	200	30	48	15	8	M16, M18	5/8	1346	**23150.0019**
	250	40	48	15	10	M16, M18	5/8	2300	**23150.0020**
22,0	**200**	40	52	15	10	M20, M22	3/4	1809	**23150.0022**
	250	40	62	20	10	M20, M22	3/4	3021	**23150.0023**
	315	40	62	20	10	M20, M22	3/4	3800	**23150.0024**
26,0	**200**	40	66	20	10	M24	1	2377	**23150.0026**
	250	40	66	20	10	M24	1	3031	**23150.0027**
	315	40	66	20	10	M24	1	3802	**23150.0028**
	500	40	66	20	10	M24	1	8937	**23150.0030**
33,0	**250**	50	74	20	12	M30	1 1/4	3720	**23150.0034**
	315	50	74	20	12	M30	1 1/4	4743	**23150.0035**
	400	50	74	20	12	M30	1 1/4	6080	**23150.0036**
40,0	**400**	60	100	30	12	M36	1 1/2	10920	**23150.0040**[1]
	600	60	100	30	12	M36	1 1/2	16500	**23150.0041**[1]

[1] DIN standards do not include these dimensions.

Clamps • DIN 6316 with goose-neck

EH 23160.

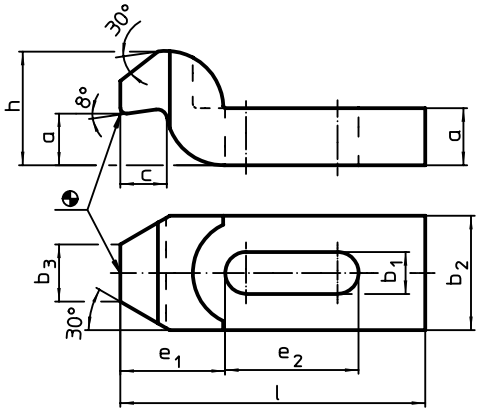


PRODUCT DESCRIPTION

Material

- Heat-treated steel, varnished

DRAWING

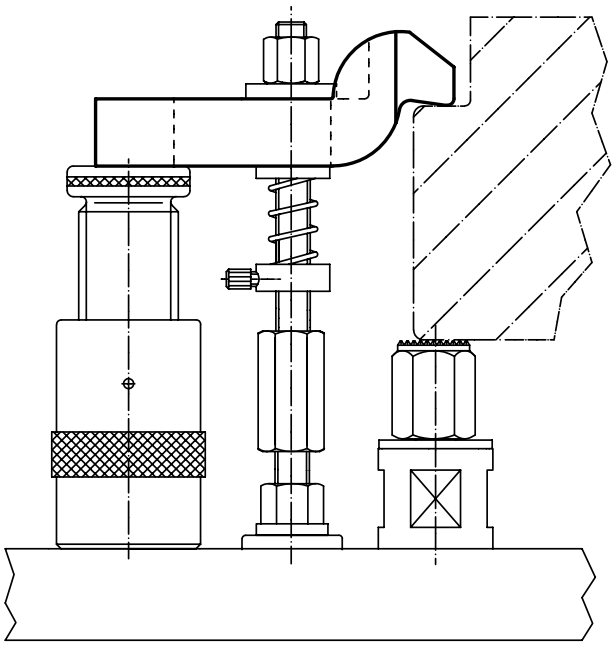


ORDER INFORMATION

Nominal dimension b_1	Dimensions								For screws			Art. No.
	l	a	b_2	b_3	c	e_1	e_2	h				
[mm]	[mm]								[mm]	[inch]	[g]	
6,6	60	10	20	10	8	20	20	20	M 6	1/4	81	23160.0007
9,0	80	12	25	12	9	25	25	24	M 8	5/16	165	23160.0009
11,0	100	15	30	15	12	32	32	30	M10	3/8	301	23160.0011
14,0	125	20	40	20	16	40	40	40	M12, M14	1/2	679	23160.0014
18,0	125	25	50	25	20	49	40	50	M16, M18	5/8	1059	23160.0018[1]
	160	25	50	25	20	49	50	50	M16, M18	5/8	1356	23160.0019
22,0	160	30	60	30	24	55	55	60	M20	3/4	1898	23160.0022[1]
	200	30	60	30	24	55	70	60	M20	3/4	2383	23160.0023
26,0	200	35	70	35	28	72	60	70	M24	1	3303	23160.0026[1]
	250	35	70	35	28	72	80	70	M24	1	4115	23160.0027
33,0	250	40	80	40	40	91	80	80	M30	1 1/4	4500	23160.0034[1]
	315	50	80	40	40	91	100	100	M30	1 1/4	8340	23160.0035

[1] DIN standards do not include these dimensions.

APPLICATION EXAMPLE



Clamps • stepped

EH 23160.

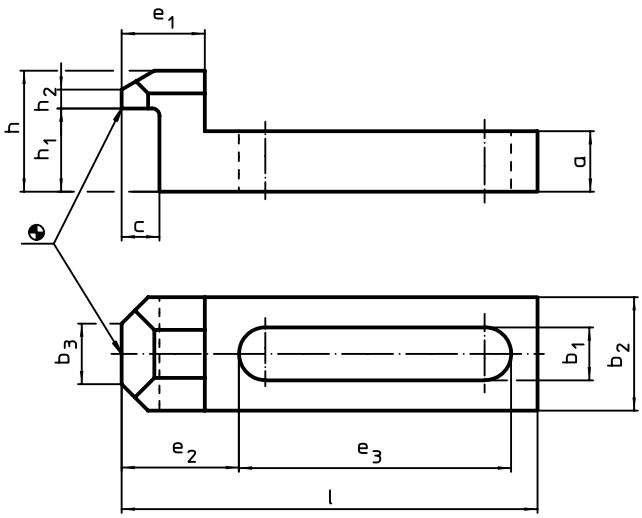


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, blackened

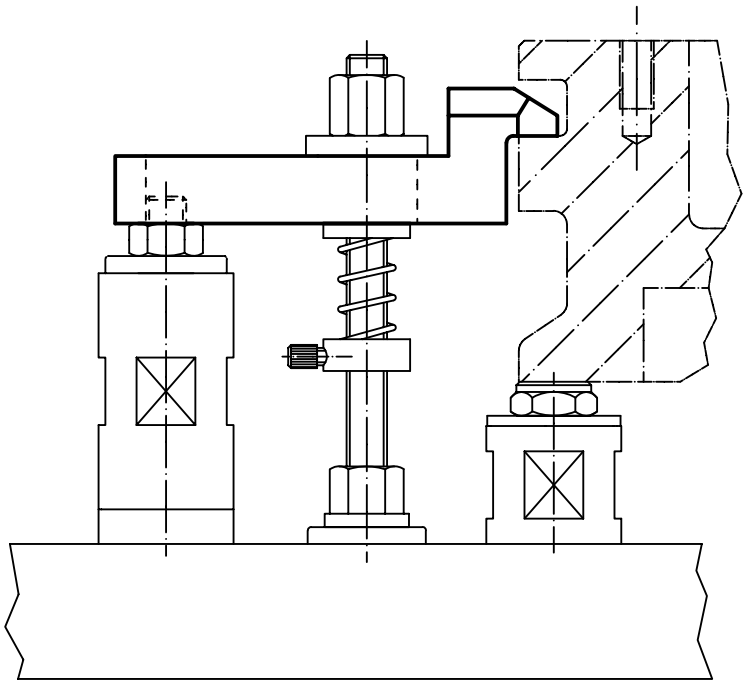
DRAWING



ORDER INFORMATION

Nominal dimension b_1	Dimensions											For screws			Art. No.
	l	a	b_2	b_3	c	e_1	e_2	e_3	h	h_1	h_2				
[mm]	[mm]											[mm]	[inch]	[g]	
6,6	**55**	8	15	8	5	11	15,5	36	16	11	2	M 6	1/4	39	23160.0107
9,0	**70**	10	20	10	8	15	19,5	46	20	14	3	M 8	5/16	80	23160.0109
11,0	**90**	13	25	12	10	19	26,5	58	25	18	4	M10	3/8	170	23160.0111
13,0	**115**	16	30	15	12	24	32,5	75	32	23	5	M12	1/2	328	23160.0113
17,0	**145**	20	40	20	14	29	38,5	99	40	28	6	M16	5/8	685	23160.0117

APPLICATION EXAMPLE



Clamps • with nose, closed

EH 23170.



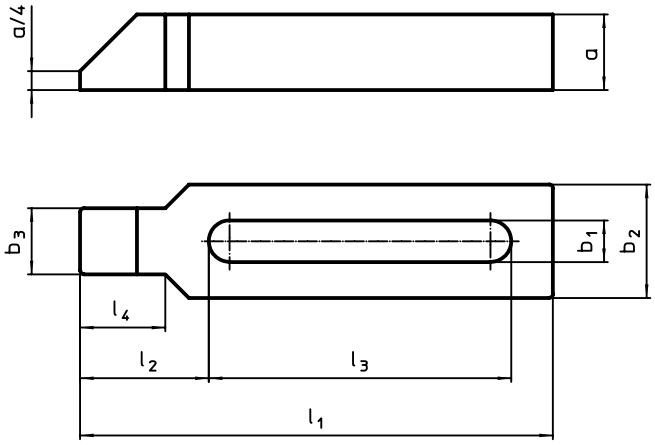
PRODUCT DESCRIPTION

Thanks to the closed slot, the clamp is suitable for an application with rotating workpieces.

Material

- Heat-treated steel, varnished

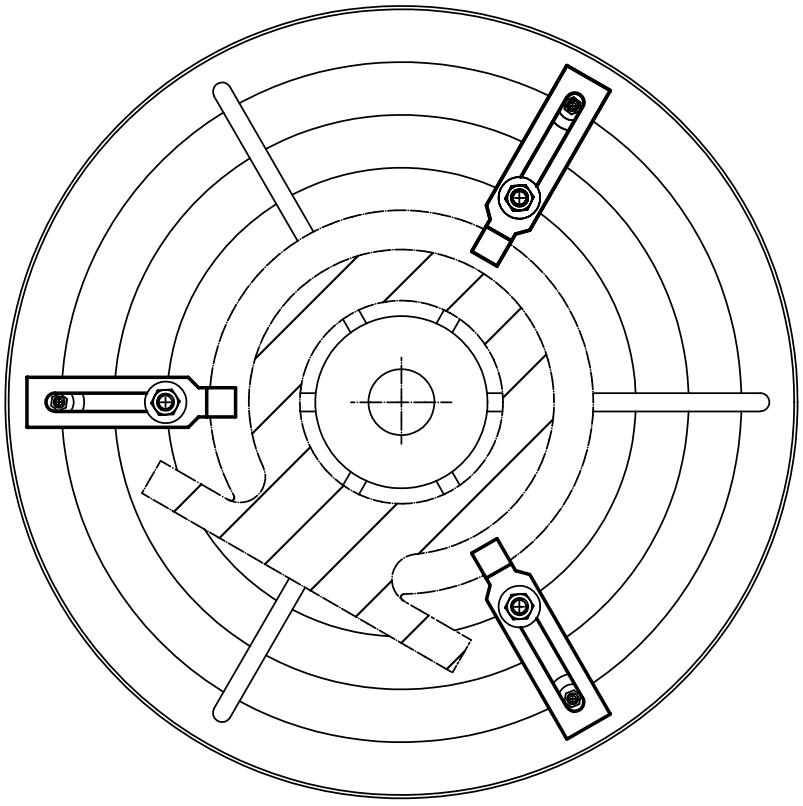
DRAWING



ORDER INFORMATION

Nominal dimension b_1	Dimensions							For screws			Art. No.
	l_1	a	b_2	b_3	l_2	l_3	l_4				
[mm]	[mm]							[mm]	[inch]	[g]	
22	250	40	60	35	68	160	45	M20, M22	3/4	2930	23170.0022
	315	40	60	35	68	220	45	M20, M22	3/4	3750	23170.0023
26	250	40	70	43	83	140	56	M24	1	3520	23170.0026
	315	40	70	43	83	200	56	M24	1	4510	23170.0027
	500	50	70	43	83	370	56	M24	1	7600	23170.0029
33	315	50	80	50	88	200	56	M30	1 1/4	6370	23170.0030
	400	50	80	50	88	283	56	M30	1 1/4	7780	23170.0031

APPLICATION EXAMPLE



Clamps • with flat-faced ball, similar to DIN 6314

EH 23180.



PRODUCT DESCRIPTION

Material

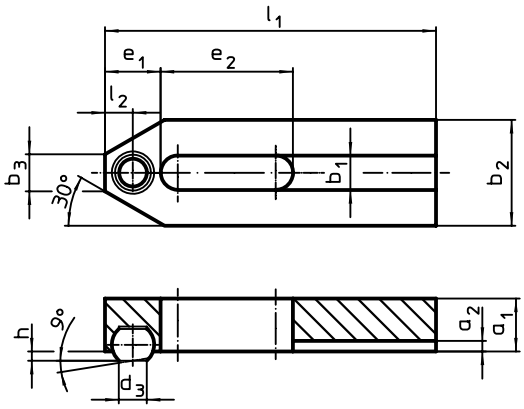
Ball
- Ball-bearing steel, hardened, bright

Clamp
- Heat-treated steel, blackened

MORE INFORMATION

Notes
Ball protected against rotating.

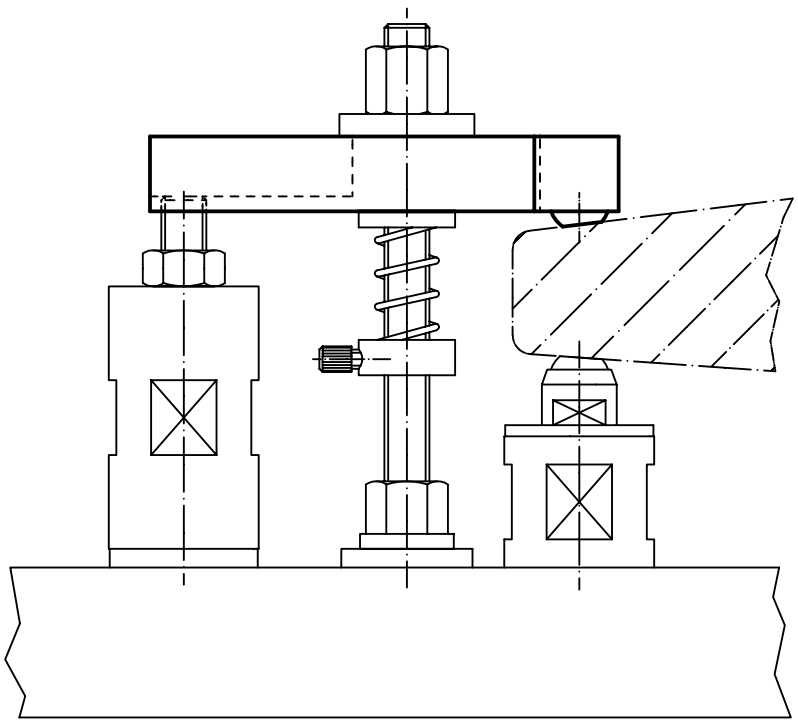
DRAWING



ORDER INFORMATION

Nominal dimension b_1	Dimensions												Art. No.
	l_1	d_3	a_1	a_2	b_2	b_3	e_1	e_2	h	l_2	Ball Ø		
[mm]	[mm]											[g]	
6,6	**50**	5,8	10	2,5	20	8	10	20	1,6	5,0	8,5	61	23180.0007
9,0	**60**	7,2	12	3,0	25	10	13	22	2,0	6,5	10,0	109	23180.0009
11,0	**80**	8,6	15	3,5	30	12	15	30	2,7	7,5	12,0	219	23180.0011
13,0	**125**	10,5	20	4,0	40	14	21	50	3,5	10,5	16,0	615	23180.0014

APPLICATION EXAMPLE



Clamps • with nose

EH 23180.

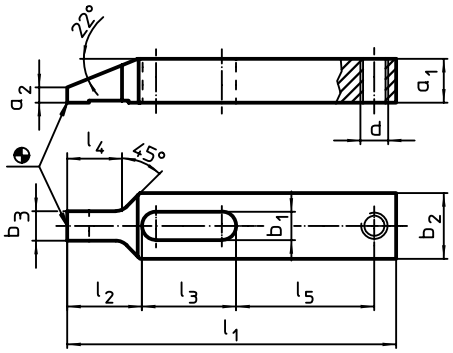


PRODUCT DESCRIPTION

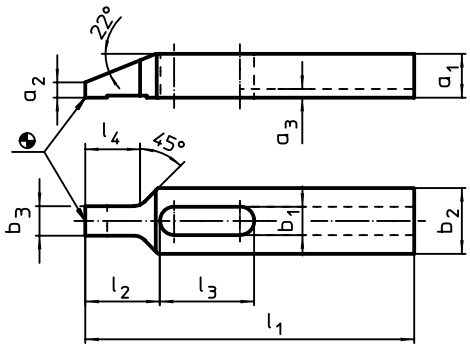
Material

- Heat-treated steel, tempered, blackened

DRAWING



picture 1

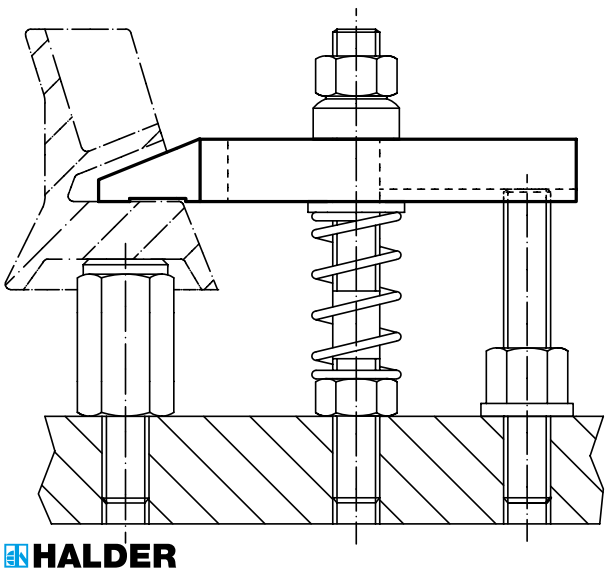


picture 2

ORDER INFORMATION

Nominal dimension b_1	Dimensions												Art. No.
	l_1	a_1	a_2	a_3	b_2	b_3	d	l_2	l_3	l_4	l_5		
[mm]	[mm]											[g]	
with thread for adjusting screw – picture 1													
6,6	**80**	8	2,5	–	15	7,5	M 6	17	23	13	34	54	23180.0107
9,0	**100**	12	4,0	–	20	9,5	M 8	22	29	17	42	133	23180.0109
11,0	**125**	15	5,0	–	25	11,5	M10	28	36	21	52	261	23180.0111
13,0	**150**	20	7,0	–	30	13,5	M12	34	43	25	63	504	23180.0113
17,0	**175**	25	9,0	–	35	15,5	M16	40	52	29	70	828	23180.0117
with keyway – picture 2													
6,6	**80**	8	2,5	2,5	15	7,5	–	17	23	13	–	50	23180.0207
9,0	**100**	12	4,0	3,0	20	9,5	–	22	29	17	–	127	23180.0209
11,0	**125**	15	5,0	3,5	25	11,5	–	28	36	21	–	251	23180.0211
13,0	**150**	20	7,0	4,0	30	13,5	–	34	43	25	–	488	23180.0213
17,0	**175**	25	9,0	4,5	35	15,5	–	40	52	29	–	812	23180.0217
22,0	**225**	35	15,5	5,5	50	19,5	–	52	62	33	–	2200	23180.0222
26,0	**250**	40	17,5	5,5	60	21,5	–	60	71	36	–	3340	23180.0226

APPLICATION EXAMPLE



3

Clamps • with soft face, similar to DIN 6314

EH 23190.



PRODUCT DESCRIPTION

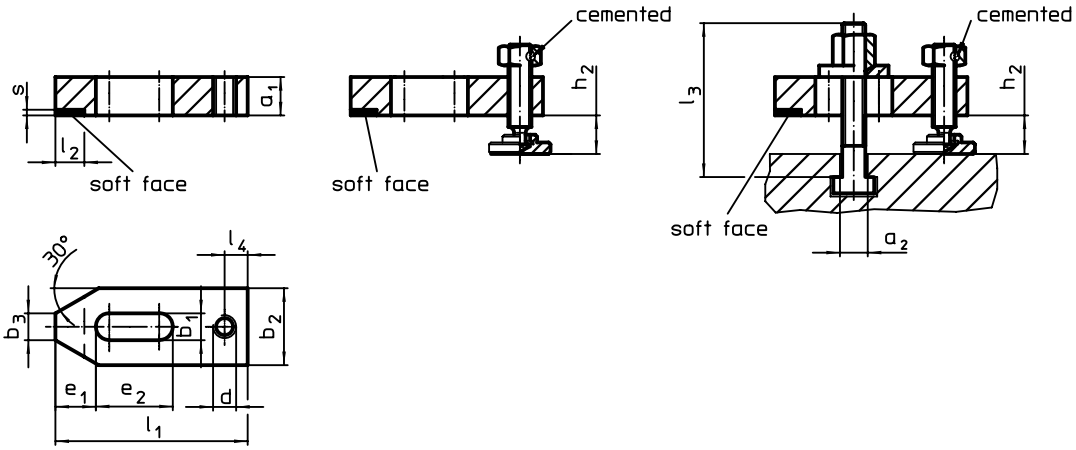
The brass plate protects the workpiece from damage. The combination of nut DIN 6330 B (EH 23070.)/ conical seat DIN 6319 G (EH 23050.) on the clamping bolt and thrust pad DIN 6311 (EH 22560. removable) on the adjusting screw compensates for the lack of parallelity. The clamp can be used either way (soft or hard clamping surface).

Material

Soft face
- Brass, brazed

Clamp
- Heat-treated steel, blackened

DRAWING



picture 1 picture 2 picture 3

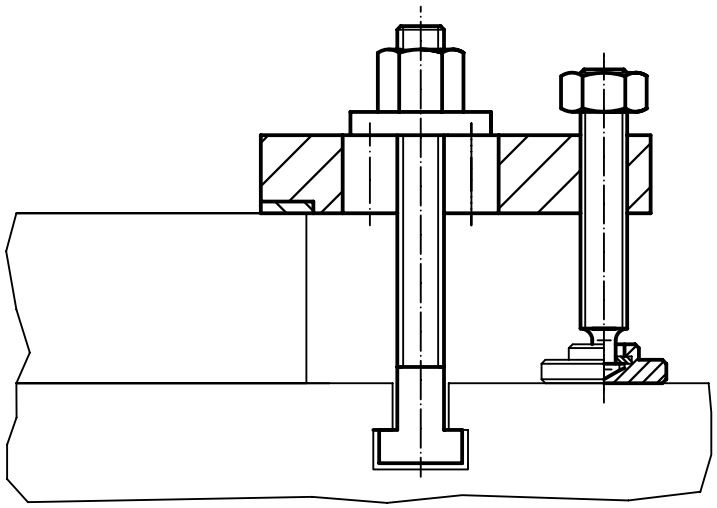
ORDER INFORMATION

Nominal dimension b_1 [mm]	Dimensions [mm]												T-slot size [mm]	Clamping height [mm]		Weight [g]	Art. No.
	a_1	l_3	a_2	b_2	b_3	d	e_1	e_2	l_1	l_2	l_4	s		h_2 min.	h_2 max.		
without accessories – picture 1																	
9	**12**	–	–	25	10	M 8	13	22	60	10	8	2	–	–	–	104	23190.0010
11	**15**	–	–	30	12	M10	15	30	80	12	10	2	–	–	–	211	23190.0020
14	**20**	–	–	40	14	M12	21	40	100	15	12	3	–	–	–	461	23190.0030
18	**25**	–	–	50	18	M16	26	45	125	20	16	3	–	–	–	917	23190.0040
only with adjusting screw – picture 2																	
9	**12**	–	–	25	10	M 8	13	22	60	10	8	2	–	8	23	150	23190.0011
															43	160	23190.0012
11	**15**	–	–	30	12	M10	15	30	80	12	10	2	–	10	38	295	23190.0021
															58	310	23190.0022
14	**20**	–	–	40	14	M12	21	40	100	15	12	3	–	10	31	590	23190.0031
															71	620	23190.0032
18	**25**	–	–	50	18	M16	26	45	125	20	16	3	–	12	42	1150	23190.0041
															87	1220	23190.0042

→

Nominal dimension b_1	Dimensions												T-slot size	Clamping height			Art. No.
	a_1	l_3	a_2	b_2	b_3	d	e_1	e_2	l_1	l_2	l_4	s		h_2 min.	h_2 max.		
[mm]	[mm]												[mm]	[mm]		[g]	
with adjusting screw and clamping bolt – picture 3																	
9	**12**	**50**	7,6	25	10	M 8	13	22	60	10	8	2	8	8	16	200	**23190.0015**
		80	7,6	25	10	M 8	13	22	60	10	8	2	8	8	43	220	**23190.0016**
11	**15**	**65**	9,6	30	12	M10	15	30	80	12	10	2	10	10	22	385	**23190.0025**
		100	9,6	30	12	M10	15	30	80	12	10	2	10	10	58	420	**23190.0026**
14	**20**	**80**	11,6	40	14	M12	21	40	100	15	12	3	12	10	28	740	**23190.0035**
		125	11,6	40	14	M12	21	40	100	15	12	3	12	10	71	805	**23190.0036**
		80	13,6	40	14	M12	21	40	100	15	12	3	14	10	26	755	**23190.0037**
		125	13,6	40	14	M12	21	40	100	15	12	3	14	10	71	820	**23190.0038**
18	**25**	**100**	15,6	50	18	M16	26	45	125	20	16	3	16	12	31	1470	**23190.0045**
		160	15,6	50	18	M16	26	45	125	20	16	3	16	12	87	1630	**23190.0046**
		100	17,6	50	18	M16	26	45	125	20	16	3	18	12	32	1490	**23190.0047**
		160	17,6	50	18	M16	26	45	125	20	16	3	18	12	87	1650	**23190.0048**

APPLICATION EXAMPLE



Clamps • with exchangeable soft jaw

EH 23190.



PRODUCT DESCRIPTION

For clamping sensitive components.
The soft jaw made from brass or plastic protects the workpiece from damage.

Material

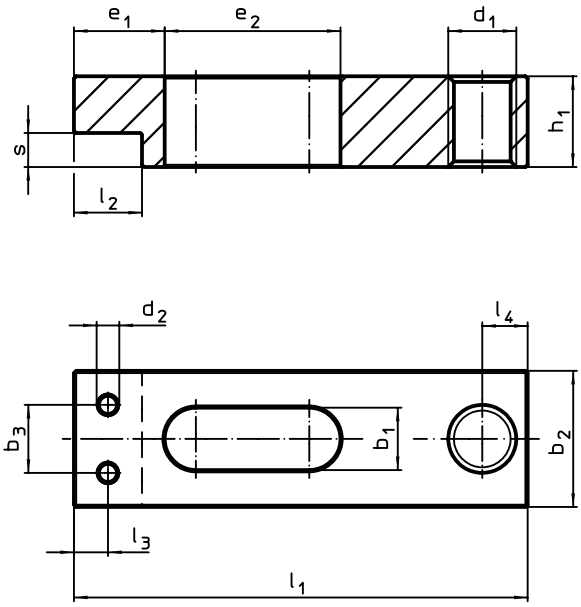
Soft jaw
- Brass
- Plastic

Clamp
- Heat-treated steel, blackened

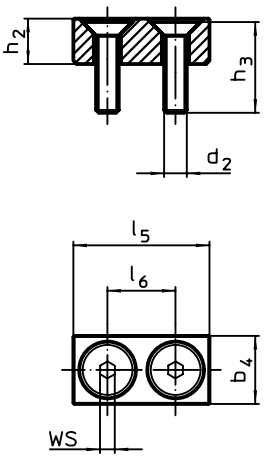
Assembly

The soft jaws are mounted or disassembled with two screws. These are included in the scope of delivery.

DRAWING



picture 1



picture 2

ORDER INFORMATION

Nominal dimension b_1 +0,5	Dimensions																	WS	min.	max.		Art. No.
[mm]	l_1	b_2	b_3	b_4	d_1	d_2	e_1	e_2	h_1	h_2	h_3	l_2	l_3	l_4	l_5	l_6	s	[mm]	[°C]		[g]	
plain clamp without soft jaw – picture 1																						
5,5	**40**	12	6	–	M 6	M2	8	15,5	8	–	–	6	3,0	4	–	–	3	–	–	–	25,0	23190.0050
7,0	**50**	16	9	–	M 6	M2,5	10	22,0	10	–	–	8	4,0	5	–	–	4	–	–	–	45,0	23190.0051
9,0	**63**	20	11	–	M 8	M3	12	29,0	12	–	–	10	5,0	6	–	–	4	–	–	–	85,0	23190.0052
11,0	**80**	25	14	–	M10	M4	15	36,0	16	–	–	13	6,5	8	–	–	6	–	–	–	180,0	23190.0053
14,0	**100**	32	16	–	M12	M5	18	44,0	20	–	–	16	8,0	10	–	–	8	–	–	–	363,0	23190.0054
18,0	**160**	50	30	–	M16	M8	30	63,0	30	–	–	28	14,0	16	–	–	12	–	–	–	1445,0	23190.0055
soft jaw from brass – picture 2																						
5,5	–	–	–	6	–	M2	–	–	–	4	8	–	–	–	12	6	–	1,3	–	250	2,5	23190.0060
7,0	–	–	–	8	–	M2,5	–	–	–	6	10	–	–	–	16	9	–	1,5	–	250	7,0	23190.0061
9,0	–	–	–	10	–	M3	–	–	–	6	12	–	–	–	20	11	–	2,0	–	250	11,0	23190.0062
11,0	–	–	–	13	–	M4	–	–	–	9	16	–	–	–	25	14	–	2,5	–	250	25,0	23190.0063
14,0	–	–	–	16	–	M5	–	–	–	12	20	–	–	–	32	16	–	3,0	–	250	53,0	23190.0064
18,0	–	–	–	28	–	M8	–	–	–	16	30	–	–	–	50	30	–	5,0	–	250	193,0	23190.0065
soft jaw from plastic – picture 2																						
5,5	–	–	–	6	–	M2	–	–	–	4	8	–	–	–	12	6	–	1,3	0	50	0,7	23190.0070
7,0	–	–	–	8	–	M2,5	–	–	–	6	10	–	–	–	16	9	–	1,5	0	50	1,6	23190.0071
9,0	–	–	–	10	–	M3	–	–	–	6	12	–	–	–	20	11	–	2,0	0	50	2,7	23190.0072
11,0	–	–	–	13	–	M4	–	–	–	9	16	–	–	–	25	14	–	2,5	0	50	6,0	23190.0073
14,0	–	–	–	16	–	M5	–	–	–	12	20	–	–	–	32	16	–	3,0	0	50	13,0	23190.0074
18,0	–	–	–	28	–	M8	–	–	–	16	30	–	–	–	50	30	–	5,0	0	50	48,0	23190.0075

Supporting Elements • for clamps

EH 23200.



PRODUCT DESCRIPTION

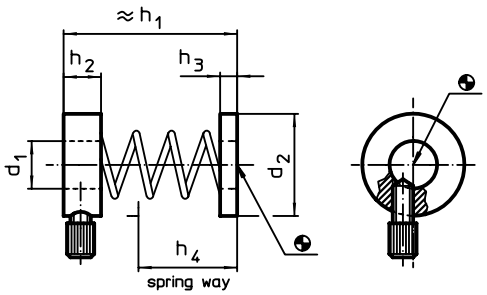
Material

Knurled screw
- Brass

Rings
- Aluminium, highly refractory

Spring
- Stainless steel

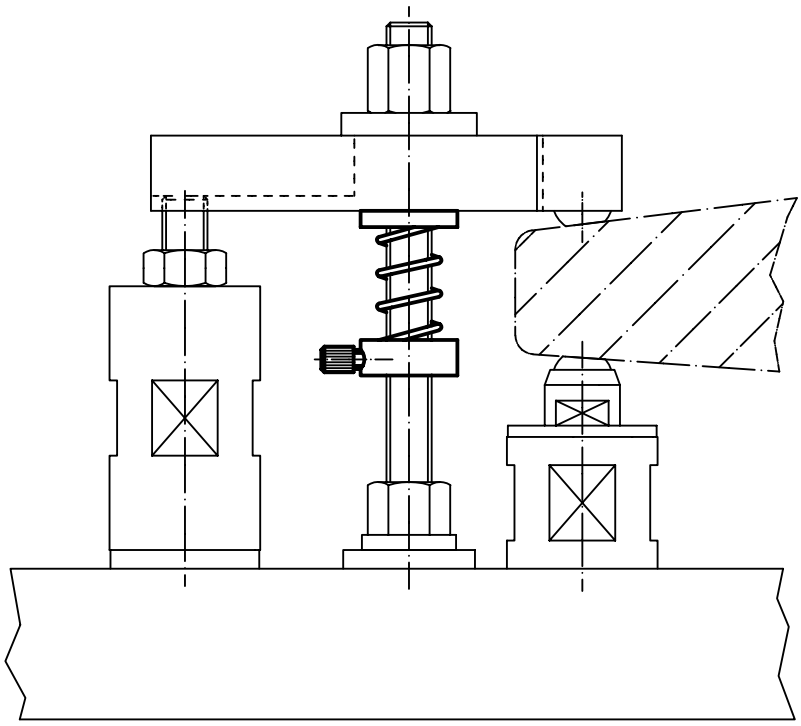
DRAWING



ORDER INFORMATION

Dimensions [mm]						For screw [mm]	[g]	Art. No.
d_1	d_2	h_1	h_2	h_3	h_4			
8,5	24	35	11	5	14	M 6, M8	24	23200.0010
14,0	28	51	11	5	29	M10, M12	28	23200.0020
16,5	35	60	12	5	35	M16	44	23200.0030

APPLICATION EXAMPLE

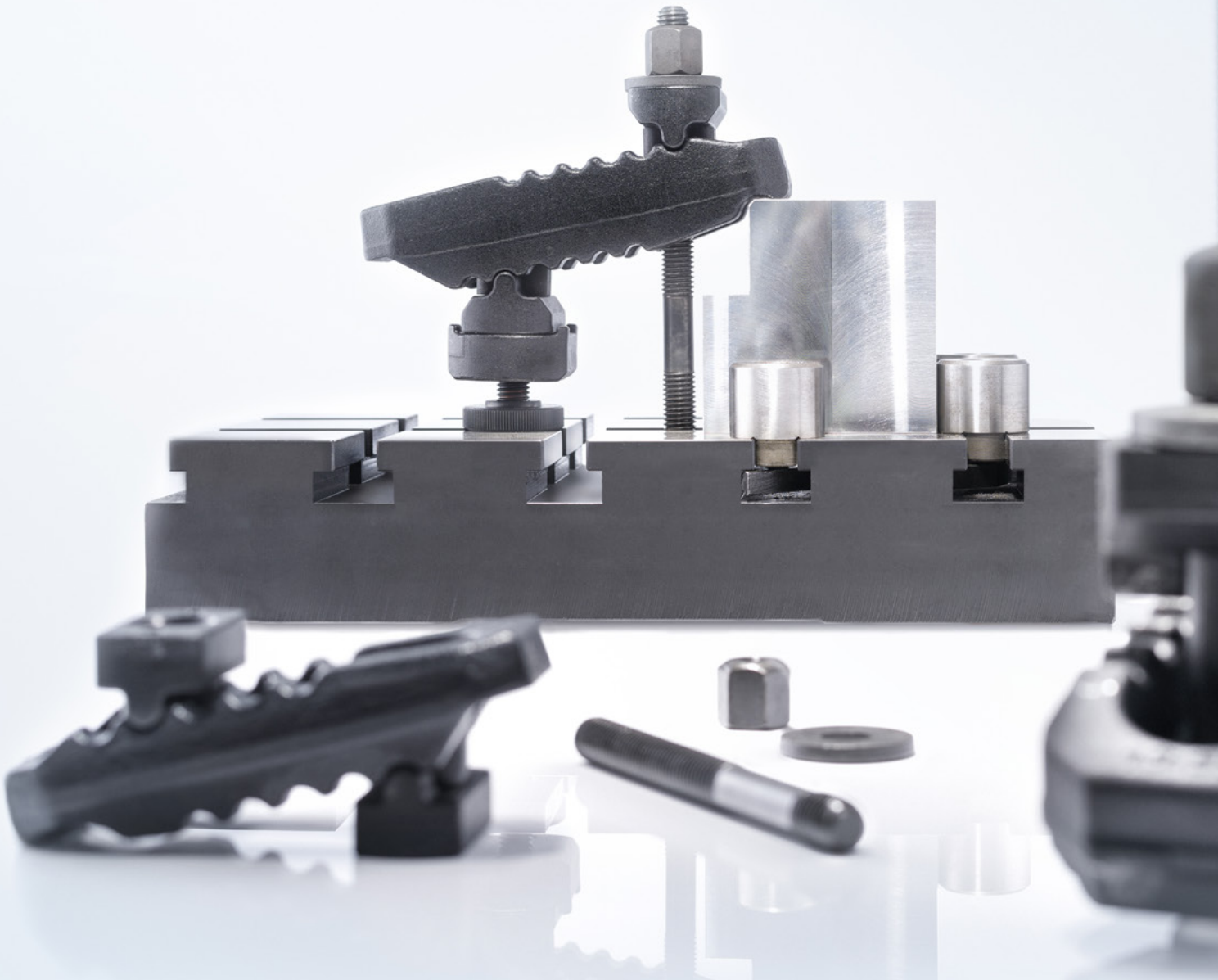


3

CLAMPING ELEMENTS

NO FEAR OF GRADIENTS

Our slotted clamps with adjustable counter piece effortlessly overcome any elevations in the clamped material. They are also quick and easy to use. What is more, thrust pad and counter piece are linked to the straight clamp by a non-losable connection, allowing for significantly improved handling.



Clamps • slotted, with adjustable counter piece

EH 23185.



PRODUCT DESCRIPTION

The thrust pad and the counter element are connected with the clamp and therefore secured against loss. Consequently, the clamp is quickly ready for use. The clamp is equipped with two flat noses and can be turned around depending on the case of application.

Material

- Steel, tempered, zinc-plated by galvanization, black

T-bolts DIN 787 (EH 23030.) or alternatively studs DIN 6379 (EH 23040.) can be used for the clamping.

MORE INFORMATION

References

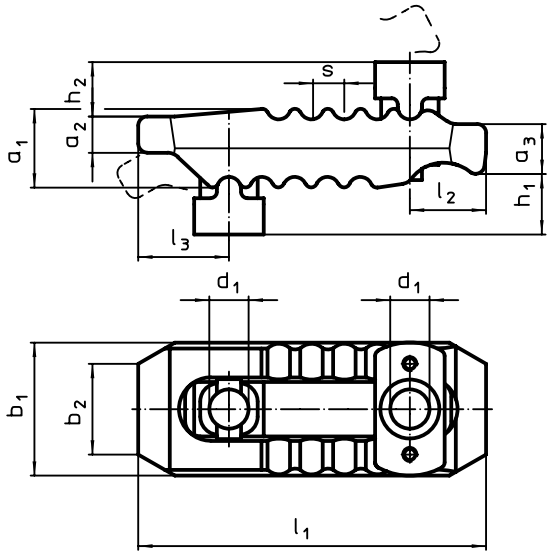
Larger clamping heights can be reached by the use of a support extension (EH 23185.).

Further products

Support Extensions, for straight clamps, slotted, with adjustable counter piece → p. 423

3

DRAWING



ORDER INFORMATION

Nominal dimension d_1	Dimensions											T-slot size	Clamping force[1] max.		Art. No.
	h_1	h_2	a_1	a_2	a_3	b_1	b_2	l_1	l_2	l_3	s				
[mm]	[mm]											[mm]	[kN]	[g]	
13	**0 – 55**	18	27	12	17	44	30	115	25	30	11	10, 12, 14	30	640	23185.0013
17	**0 – 70**	20	36	17	21	55	41	150	35	36	12	12, 14, 16, 18	40	1490	23185.0017
21	**0 – 80**	30	42	20	27	62	30	187	44	44	14	16, 18, 20, 22	60	2250	23185.0021
25	**0 – 100**	31	51	24	34	70	30	235	60	47	17	20, 22, 24, 28	75	3620	23185.0025
		35	56	24	35	73	30	285	62	51	17	20, 22, 24, 28	75	4350	23185.0026

[1] Stated clamping forces in optimal clamping position (smallest distance of the socket head screw to the clamping position). Clamping forces can vary depending on clamping, strength class of the socket head screw and condition of the thread (lubrication).

3

Clamps • slotted, with adjustable counter piece, with T-bolt

EH 23185.



PRODUCT DESCRIPTION

The thrust pad and the counter element are connected with the clamp and therefore secured against loss. Consequently, the clamp is quickly ready for use. The clamp is equipped with two flat noses and can be turned around depending on the case of application.

Material

Screw
- Heat-treated steel

Nut
- Heat-treated steel

Disc
- Heat-treated steel

Clamp
- Steel, tempered, zinc-plated by galvanization, black

MORE INFORMATION

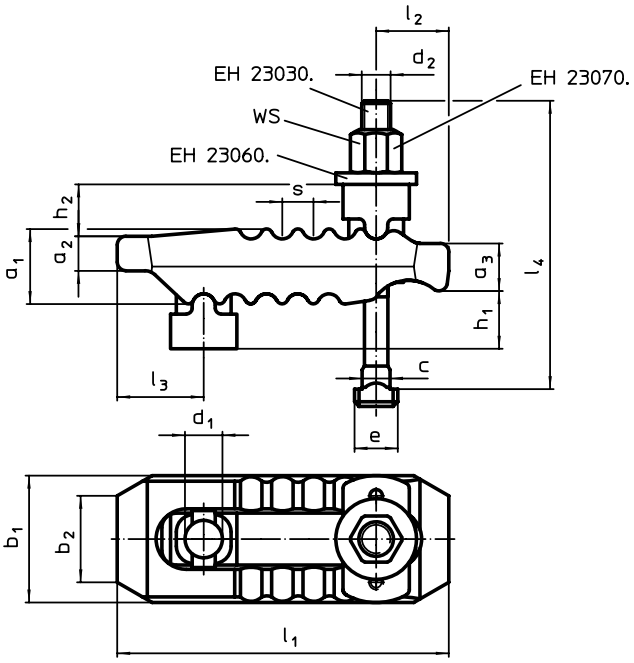
References

Larger clamping heights can be reached by the use of a support extension (EH 23185.).

Further products

Support Extensions, for straight clamps, slotted, with adjustable counter piece . . . . . → p. 423

DRAWING



ORDER INFORMATION

Nominal dimension d_1	T-slot size	Dimensions															WS	Clamping force[1] max.		Art. No.
		d_2	l_4	h_1	h_2	a_1	a_2	a_3	b_1	b_2	l_1	l_2	l_3	e	c	s				
[mm]	[mm]	[mm]															[mm]	[kN]	[g]	
13	10	M10	100	0 – 40	18	27	12	17	44	30	115	25	30	15	9,6	11	16	25	730	23185.0110
	12	M12	125	0 – 55	18	27	12	17	44	30	115	25	30	18	11,6	11	18	30	805	23185.0112
	14	M12	125	0 – 55	18	27	12	17	44	30	115	25	30	18	11,6	11	18	30	820	23185.0113
17	12	M12	160	0 – 70	20	36	17	21	55	41	150	35	36	18	11,6	12	18	35	1680	23185.0114
	14	M12	160	0 – 70	20	36	17	21	55	41	150	35	36	22	13,6	12	18	35	1695	23185.0115
	16	M16	160	0 – 70	20	36	17	21	55	41	150	35	36	25	15,6	12	24	40	1865	23185.0116
	18	M16	160	0 – 70	20	36	17	21	55	41	150	35	36	25	17,6	12	24	40	1890	23185.0117
21	16	M16	200	0 – 80	30	42	20	27	62	30	187	44	44	25	15,6	14	24	55	2675	23185.0118
	18	M16	200	0 – 80	30	42	20	27	62	30	187	44	44	25	17,6	14	24	55	2700	23185.0119
	20	M20	200	0 – 80	30	42	20	27	62	30	187	44	44	32	19,6	14	30	60	2950	23185.0120
	22	M20	200	0 – 80	30	42	20	27	62	30	187	44	44	32	21,6	14	30	60	3000	23185.0121
25	20	M20	250	0 – 100	31	51	24	34	70	30	235	60	47	32	19,6	17	30	70	4420	23185.0122
	22	M20	250	0 – 100	31	51	24	34	70	30	235	60	47	32	21,6	17	30	70	4475	23185.0123
	24	M24	250	0 – 100	31	51	24	34	70	30	235	60	47	44	23,6	17	36	75	4975	23185.0124
	28	M24	250	0 – 100	31	51	24	34	70	30	235	60	47	44	27,7	17	36	75	5015	23185.0125

[1] Stated clamping forces in optimal clamping position (smallest distance of the socket head screw to the clamping position). Clamping forces can vary depending on clamping, strength class of the socket head screw and condition of the thread (lubrication).

Clamps • slotted, with adjustable counter piece, with stud

EH 23185.



PRODUCT DESCRIPTION

The thrust pad and the counter element are connected with the clamp and therefore secured against loss. Consequently, the clamp is quickly ready for use. The clamp is equipped with two flat noses and can be turned around depending on the case of application.

Material

Screw
- Heat-treated steel

Nut
- Heat-treated steel

Disc
- Heat-treated steel

Clamp
- Steel, tempered, zinc-plated by galvani zation, black

MORE INFORMATION

References

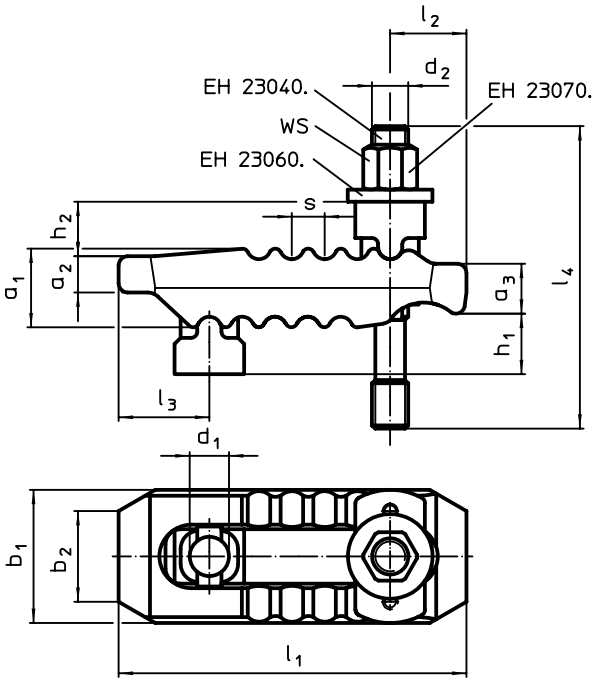
Larger clamping heights can be reached by the use of a support extension (EH 23185.).

Further products

Support Extensions, for straight clamps, slotted, with adjustable counter piece → p. 423

3

DRAWING



ORDER INFORMATION

Nominal dimension d_1	d_2	l_4	h_1	h_2	a_1	a_2	a_3	b_1	b_2	l_1	l_2	l_3	s	WS	Clamping force[1] max.		Art. No.
[mm]			[mm]											[mm]	[kN]	[g]	
13	M12	100	0 – 30	18	27	12	17	44	30	115	25	30	11	18	30	765	23185.0212
		125	0 – 55	18	27	12	17	44	30	115	25	30	11	18	30	780	23185.0213
17	M12	125	0 – 50	20	36	17	21	55	41	150	35	36	12	18	40	1630	23185.0214
		160	0 – 70	20	36	17	21	55	41	150	35	36	12	18	40	1655	23185.0215
	M16	125	0 – 40	20	36	17	21	55	41	150	35	36	12	24	40	1765	23185.0216
		160	0 – 70	20	36	17	21	55	41	150	35	36	12	24	40	1810	23185.0217
21	M16	160	0 – 40	30	42	20	27	62	30	187	44	44	14	24	60	2575	23185.0218
		200	0 – 80	30	42	20	27	62	30	187	44	44	14	24	60	2620	23185.0219
	M20	160	0 – 40	30	42	20	27	62	30	187	44	44	14	30	60	2750	23185.0220
		200	0 – 80	30	42	20	27	62	30	187	44	44	14	30	60	2835	23185.0221
25	M20	200	0 – 70	31	51	24	34	70	30	235	60	47	17	30	75	4200	23185.0222
		250	0 – 100	31	51	24	34	70	30	235	60	47	17	30	75	4305	23185.0223
	M24	200	0 – 50	31	51	24	34	70	30	235	60	47	17	36	75	4520	23185.0224
		250	0 – 100	31	51	24	34	70	30	235	60	47	17	36	75	4665	23185.0225

[1] Stated clamping forces in optimal clamping position (smallest distance of the socket head screw to the clamping position). Clamping forces can vary depending on clamping, strength class of the socket head screw and condition of the thread (lubrication).

3

Clamps • slotted, with adjustable counter piece, with stud with internal hexagon

EH 23185.



PRODUCT DESCRIPTION

The thrust pad and the counter element are connected with the clamp and therefore secured against loss. Consequently, the clamp is quickly ready for use. The clamp is equipped with two flat noses and can be turned around depending on the case of application.

Material

Screw
- Heat-treated steel

Nut
- Heat-treated steel

Disc
- Heat-treated steel

Clamp
- Steel, tempered, zinc-plated by galvani zation, black

Assembly

The internal hexagon in the stud enables quick assembly and disassembly.

MORE INFORMATION

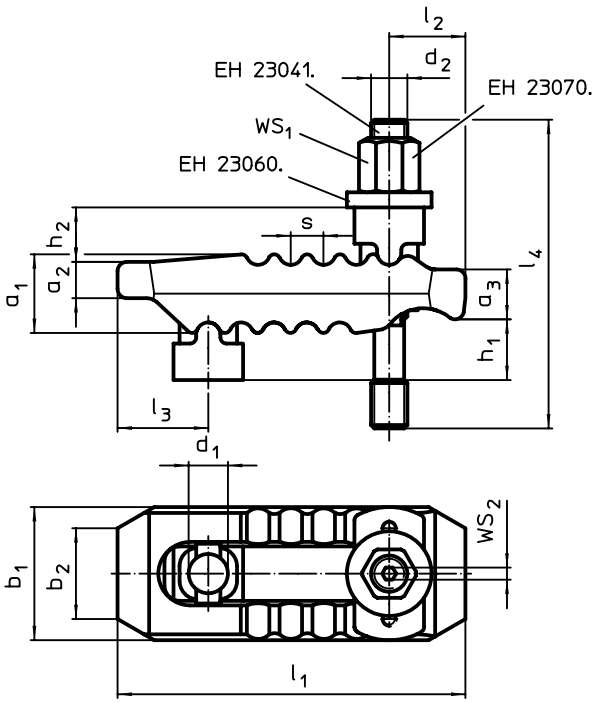
References

Larger clamping heights can be reached by the use of a support extension (EH 23185.).

Further products

Support Extensions, for straight clamps, slotted, with adjustable counter piece . . . . . → p. 423

DRAWING



ORDER INFORMATION

Nominal dimension d_1	Dimensions													WS_1	WS_2	Clamping force[1] max.		Art. No.
	d_2	l_4	h_1	h_2	a_1	a_2	a_3	b_1	b_2	l_1	l_2	l_3	s					
[mm]	[mm]													[mm]	[mm]	[kN]	[g]	
13	M12	100	0 – 30	18	27	12	17	44	30	115	25	30	11	18	4	30	765	23185.0312
		125	0 – 55	18	27	12	17	44	30	115	25	30	11	18	4	30	800	23185.0313
17	M12	125	0 – 50	20	36	17	21	55	41	150	35	36	12	18	4	40	1630	23185.0314
		160	0 – 70	20	36	17	21	55	41	150	35	36	12	18	4	40	1660	23185.0315
	M16	125	0 – 40	20	36	17	21	55	41	150	35	36	12	24	4	40	1765	23185.0316
		160	0 – 70	20	36	17	21	55	41	150	35	36	12	24	4	40	1810	23185.0317
21	M16	160	0 – 40	30	42	20	27	62	30	187	44	44	14	24	4	60	2575	23185.0318
		200	0 – 80	30	42	20	27	62	30	187	44	44	14	24	4	60	2620	23185.0319
	M20	160	0 – 40	30	42	20	27	62	30	187	44	44	14	30	5	60	2750	23185.0320
		200	0 – 80	30	42	20	27	62	30	187	44	44	14	30	5	60	2835	23185.0321
25	M20	200	0 – 70	31	51	24	34	70	30	235	60	47	17	30	5	75	4210	23185.0322
		250	0 – 100	31	51	24	34	70	30	235	60	47	17	30	5	75	4361	23185.0323
	M24	200	0 – 50	31	51	24	34	70	30	235	60	47	17	36	5	75	4525	23185.0324
		250	0 – 100	31	51	24	34	70	30	235	60	47	17	36	5	75	4680	23185.0325

[1] Stated clamping forces in optimal clamping position (smallest distance of the socket head screw to the clamping position). Clamping forces can vary depending on clamping, strength class of the socket head screw and condition of the thread (lubrication).

Support Extensions • for straight clamps, slotted, with adjustable counter piece

EH 23185.



PRODUCT DESCRIPTION

The support extension is screwed on the counter piece of the clamp EH 23185. for an extension of the clamping height (dimension h_2). The clamping height can be adjusted stepless by means of the support extension.

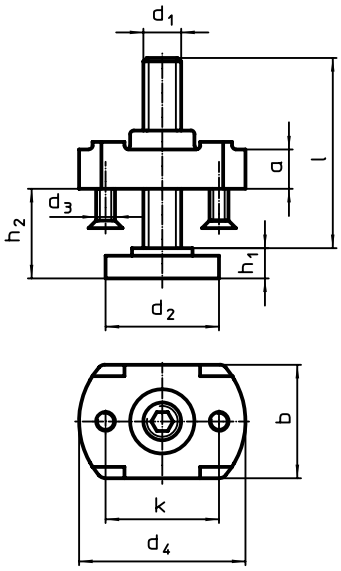
Material

Body
- Steel, tempered, zinc-plated by galvanization, black

Supporting bolt
- Heat-treated steel, quality 8.8, black

3

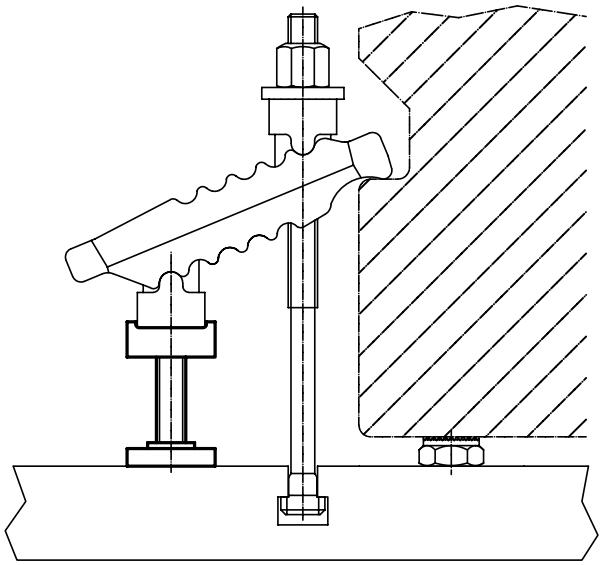
DRAWING



ORDER INFORMATION

Dimensions										For clamps d_1		Art. No.
d_1	l	d_2	d_3	d_4	h_1	h_2	a	b	k	[mm]	[g]	
M10	39	30	M5	44	8	8 – 30	10	30	30	13	140	23185.0410
M12	49	36	M5	54	10	10 – 37	16	42	35	17	350	23185.0412
	94	36	M5	54	10	10 – 80	16	42	35	17	380	23185.0413
M16	55	42	M5	60	13	13 – 41	20	50	40	21	570	23185.0416
	90	42	M5	60	13	13 – 73	20	50	40	21	610	23185.0417
M20	69	50	M6	70	16	16 – 52	25	50	50	25	925	23185.0420
	109	50	M6	70	16	16 – 91	25	50	50	25	1000	23185.0421

APPLICATION EXAMPLE



Clamping Element Systems

EH 23700.

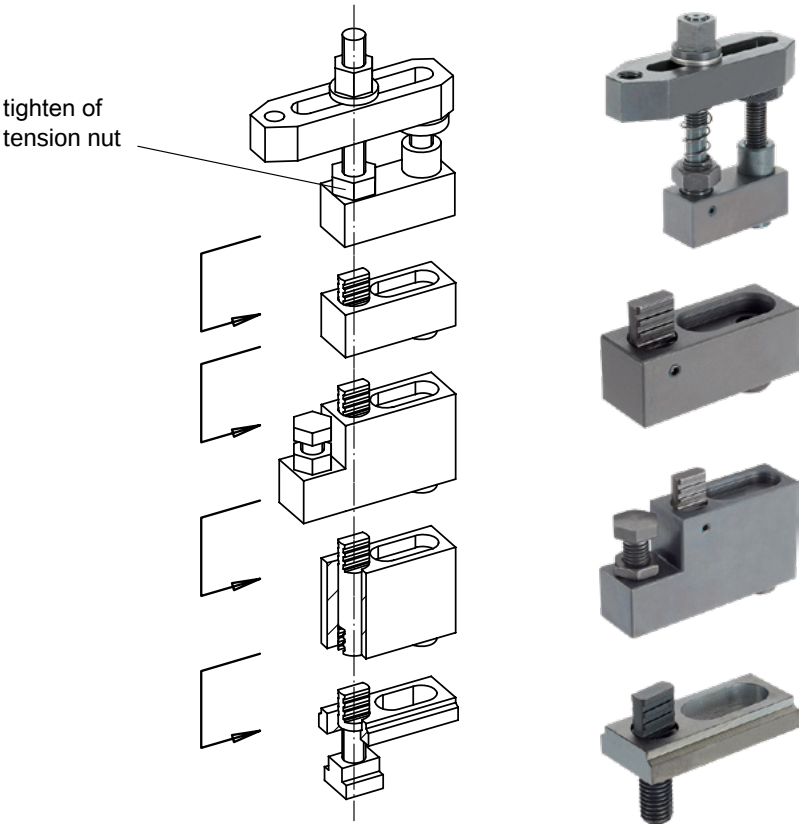
ASSEMBLY INSTRUCTIONS

Finish
Steel blackened, pull rod: special steel; wearing parts heat treated.

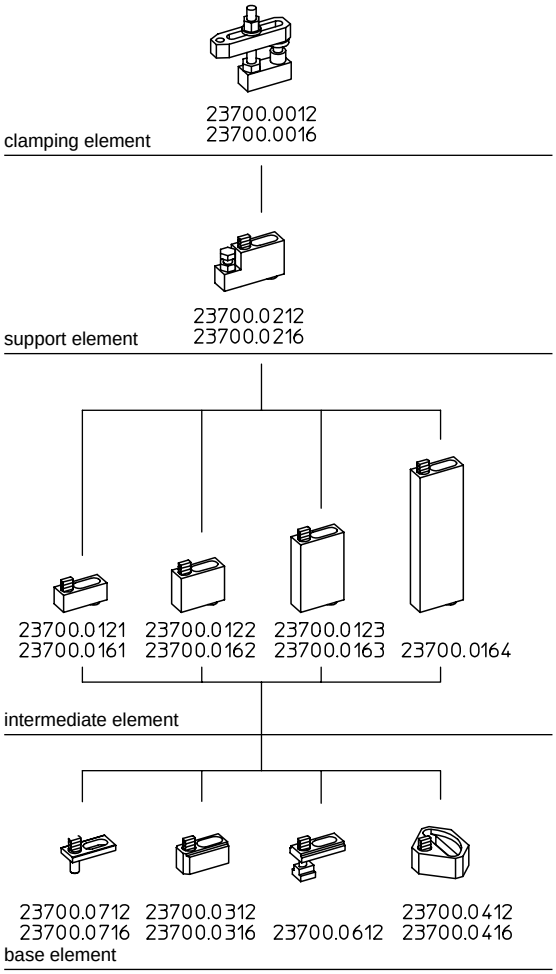
Note
All clamping elements are tightly and safely clamped on the machine table or onto the fixture via the pull rod by simply tightening the nut.

Advantages:

- Rapid, safe, simple, compact
- Stepless height adjusting by intermediate elements
- Fastening of the foot elements by using grub screws, slot tenons or socket-head cap srews.



ASSEMBLY



Clamping Element Systems

EH 23700.



PRODUCT DESCRIPTION

Material

Body
- Steel, blackened

Wearing parts
- Heat-treated steel

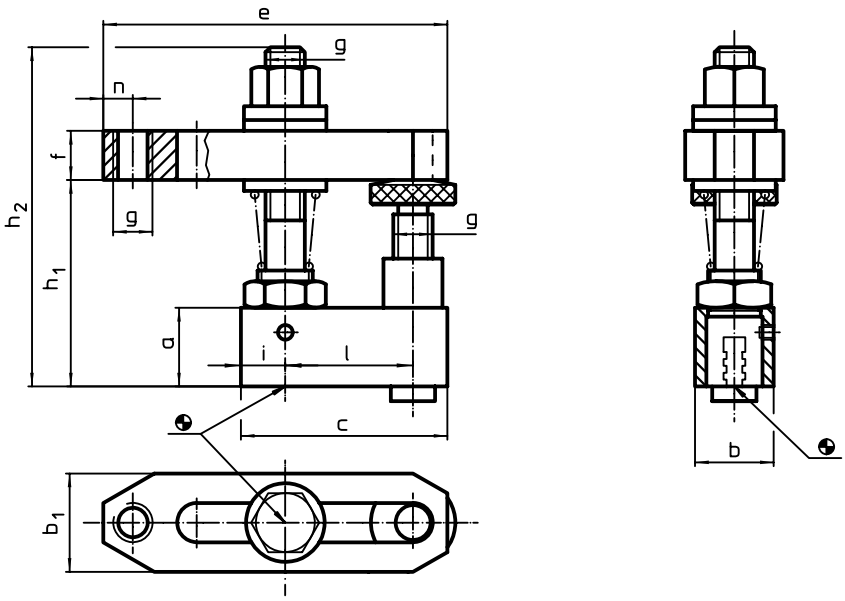
Pull-rod
- Special steel

MORE INFORMATION

Further products

Straight Clamps, long . . . . . → p. 427
Intermediate Elements. . . . . → p. 428
Intermediate Elements, with support . . → p. 429
Base Elements . . . . . → p. 430
Base Elements, swivelling. . . . . → p. 431
Base Elements, low. . . . . → p. 432
Base Elements, for location hole. . . . . → p. 433

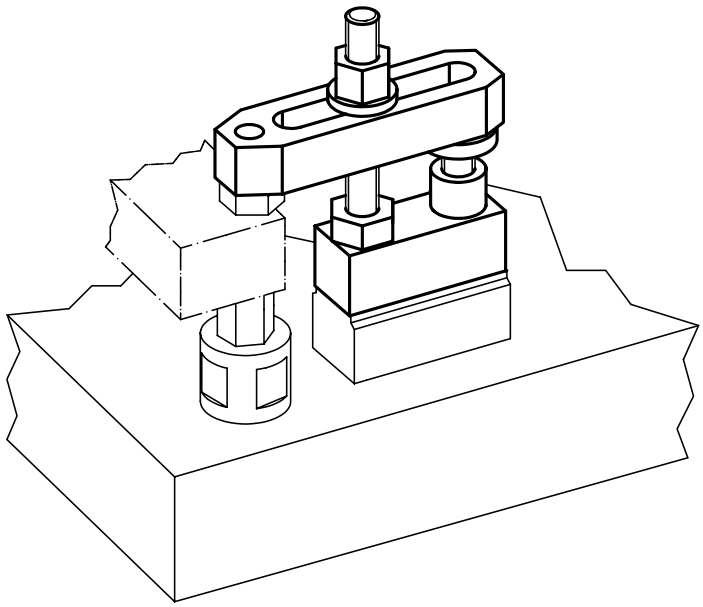
DRAWING



ORDER INFORMATION

Dimensions [mm]												[g]	Art. No.
a	b	c	b_1	e	f	g	h_1	h_2	i	l	n		
25	**25**	**65**	35	110	20	M12	48 – 78	112	12,5	40	10	860	23700.0012
30	**30**	**78**	40	142	30	M16	60 – 96	145	14,0	50	13	1698	23700.0016

APPLICATION EXAMPLE



Straight Clamps • short

EH 23700.

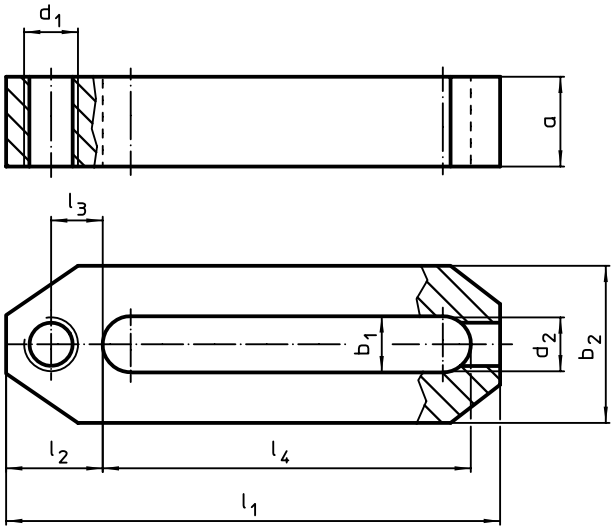


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, blackened

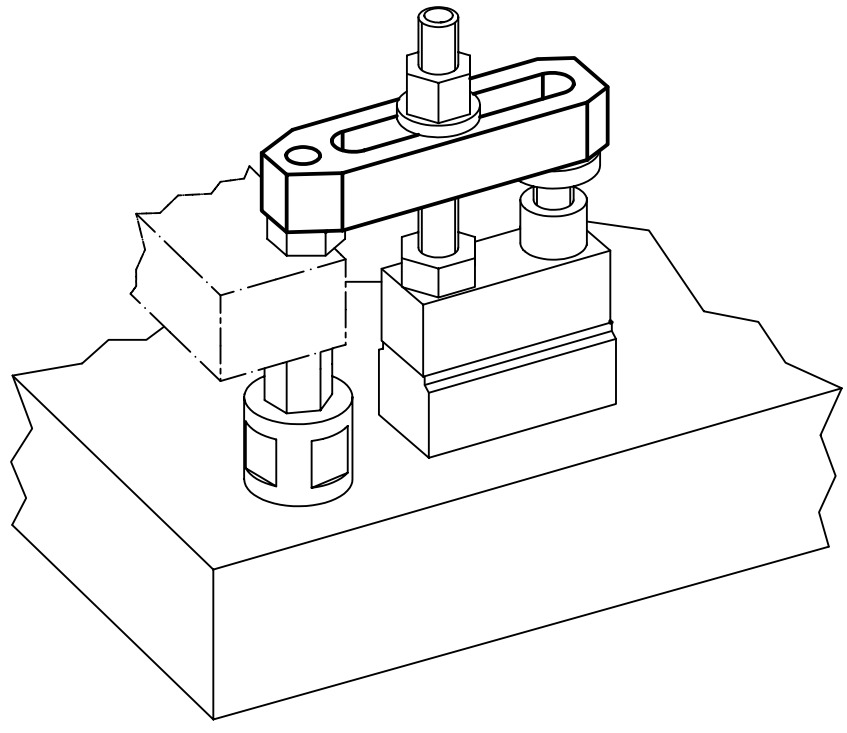
DRAWING



ORDER INFORMATION

Dimensions										Art. No.
b_1	l_1	a	b_2	d_1	d_2	l_2	l_3	l_4	[g]	
				[mm]						
12,5	**110**	20	35	M12	M10	21,5	11,5	82	370	23700.0022
17,0	**142**	30	40	M16	M12	28,0	15,0	107	788	23700.0026

APPLICATION EXAMPLE



Straight Clamps • long

EH 23700.

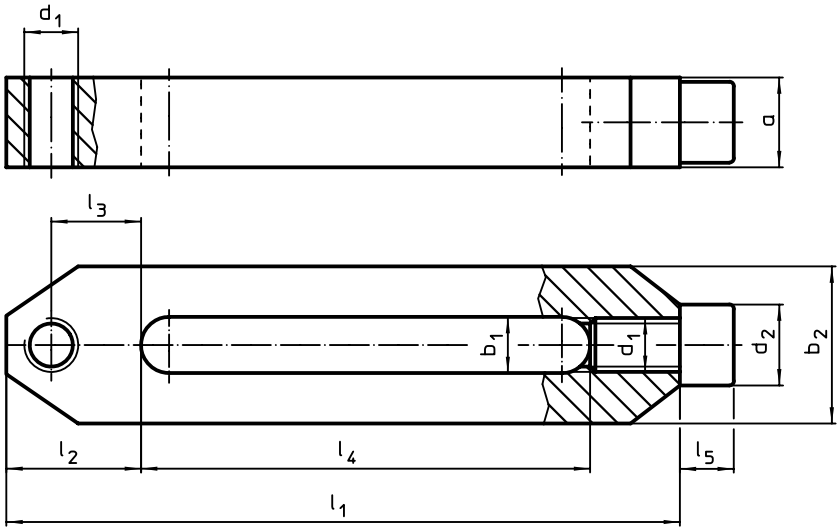


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, blackened

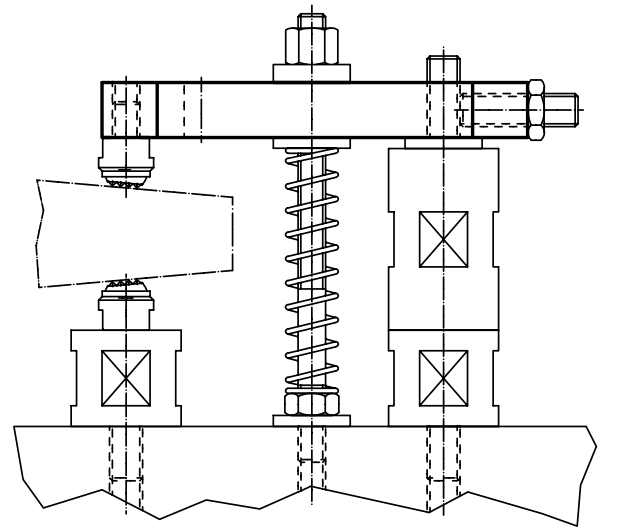
DRAWING

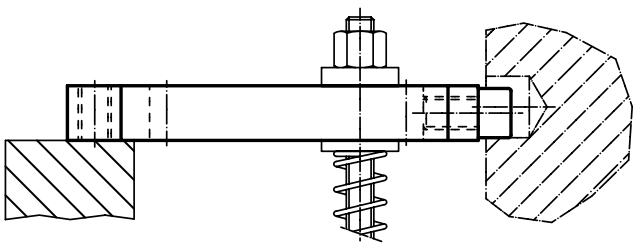


ORDER INFORMATION

Dimensions [mm]											Art. No.
b_1	l_1	a	b_2	d_1	l_2	l_3	l_4	l_5	d_2	[g]	
12,5	**156**	20	35,0	M12	30	20	106	12	18	595	23700.0042
17,0	**196**	30	45,5	M16	35	22	136	16	24	1422	23700.0046

APPLICATION EXAMPLE





Intermediate Elements

EH 23700.



PRODUCT DESCRIPTION

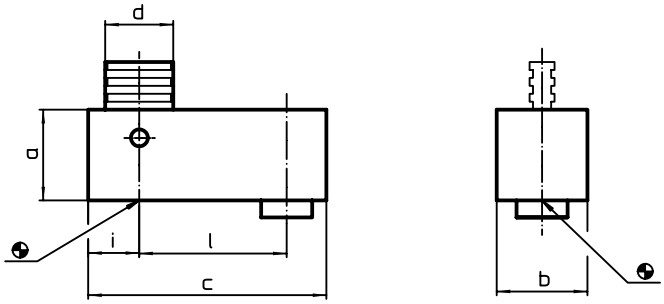
Material

Body
- Steel, blackened

Wearing part
- Heat-treated steel

Pull-rod
- Special steel

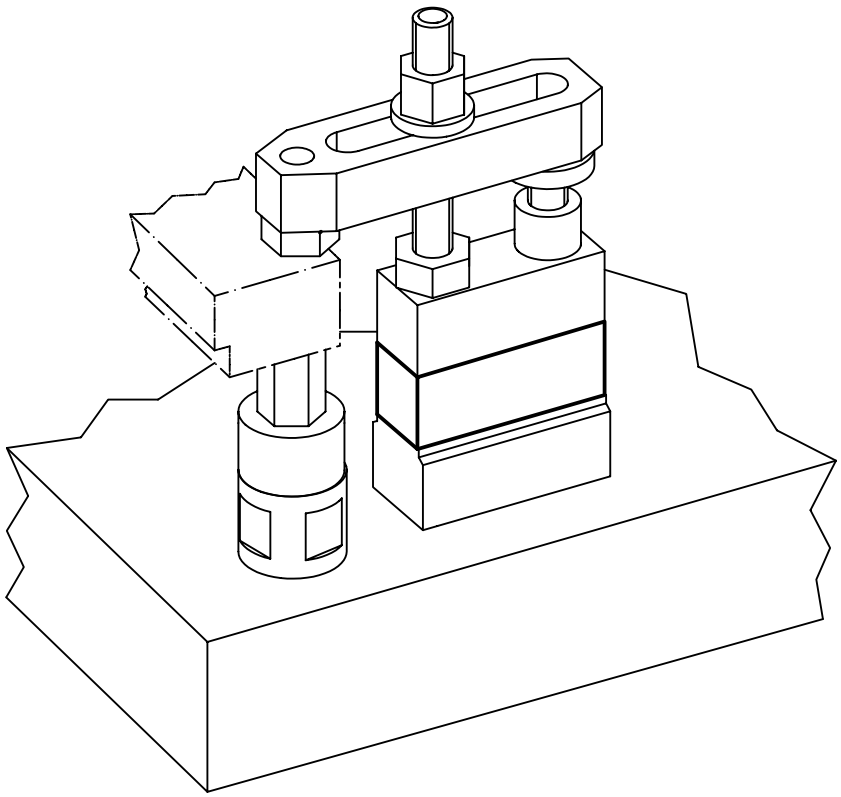
DRAWING



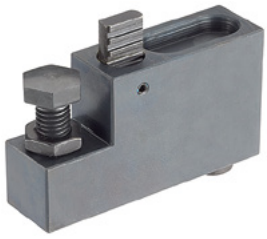
ORDER INFORMATION

Dimensions [mm]						[g]	Art. No.
a	b	c	d	i	l		
25	**25**	**65**	16	12,5	40	261	**23700.0121**
50	**25**	**65**	16	12,5	40	574	**23700.0122**
100	**25**	**65**	16	12,5	40	1201	**23700.0123**
30	**30**	**78**	22	14,0	50	468	**23700.0161**
60	**30**	**78**	22	14,0	50	1032	**23700.0162**
120	**30**	**78**	22	14,0	50	2100	**23700.0163**
240	**30**	**78**	22	14,0	50	4340	**23700.0164**

APPLICATION EXAMPLE



Intermediate Elements • with support
EH 23700.



PRODUCT DESCRIPTION

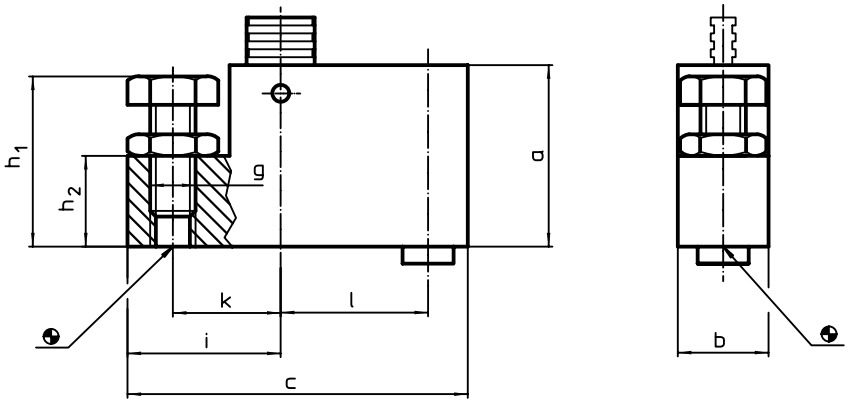
Material

Body
- Steel, blackened

Wearing part
- Heat-treated steel

Pull-rod
- Special steel

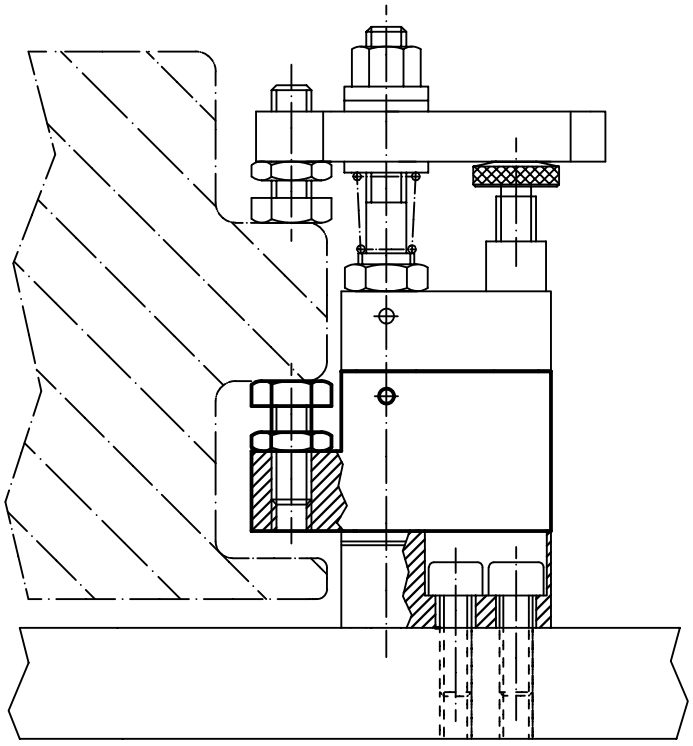
DRAWING



ORDER INFORMATION

Dimensions [mm]									[g]	Art. No.
a	b	c	g	h_1	h_2	i	k	l		
50	**25**	**92**	M12	38 – 53	25	39,5	28	40	550	23700.0212
60	**30**	**112**	M16	48 – 68	30	48,0	34	50	1140	23700.0216

APPLICATION EXAMPLE



3

Base Elements

EH 23700.



PRODUCT DESCRIPTION

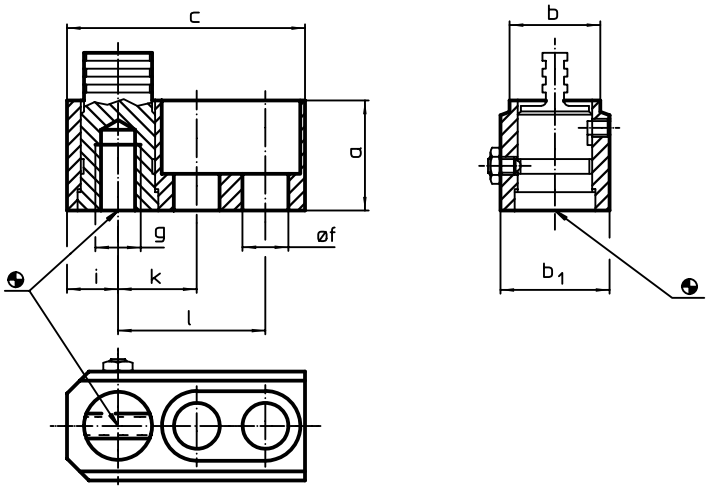
Material

Body
- Steel, blackened

Wearing part
- Heat-treated steel

Pull-rod
- Special steel

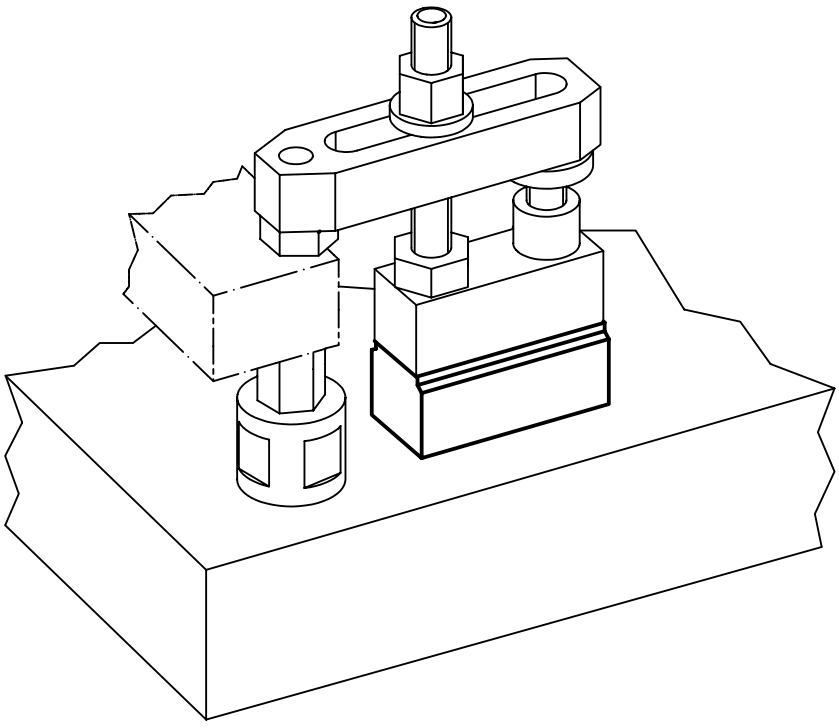
DRAWING



ORDER INFORMATION

Dimensions										Art. No.
a	b	c	b_1	f	g	i	k	l	[g]	
				[mm]						
30	**25**	**65**	30	12,5	M12	12,5	20	40	297	23700.0312
40	**30**	**80**	40	17,0	M16	16,0	25	50	641	23700.0316

APPLICATION EXAMPLE



Base Elements • swivelling
EH 23700.



PRODUCT DESCRIPTION

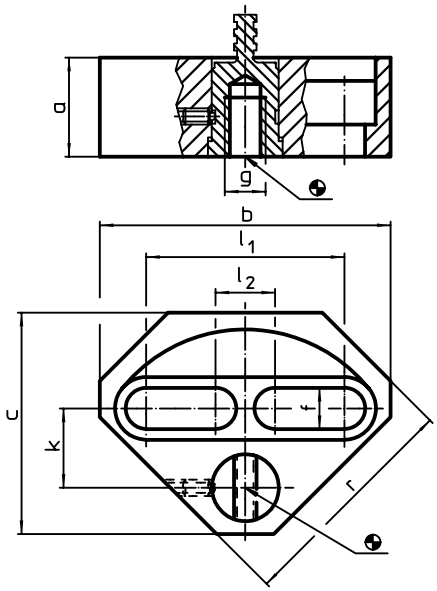
Material

Body
- Steel, blackened

Wearing part
- Heat-treated steel

Pull-rod
- Special steel

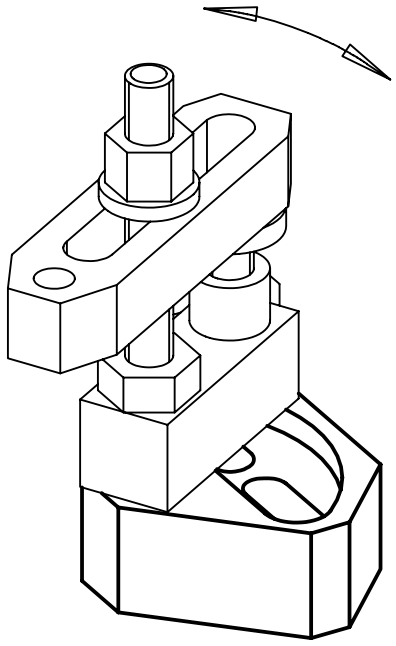
DRAWING



ORDER INFORMATION

Dimensions										Art. No.
a	b	c	f	g	k	l_1	l_2	r		
[mm]									[g]	
29,7	**90**	**70**	12,5	M12	24	57	25	73	758	23700.0412
39,7	**110**	**86**	17,0	M16	30	71	31	90	1300	23700.0416

APPLICATION EXAMPLE



Base Elements • low

EH 23700.



PRODUCT DESCRIPTION

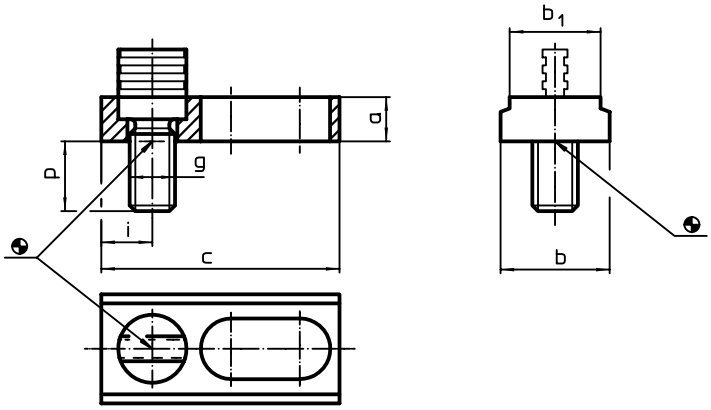
Material

Body
- Steel, blackened

Wearing part
- Heat-treated steel

Pull-rod
- Special steel

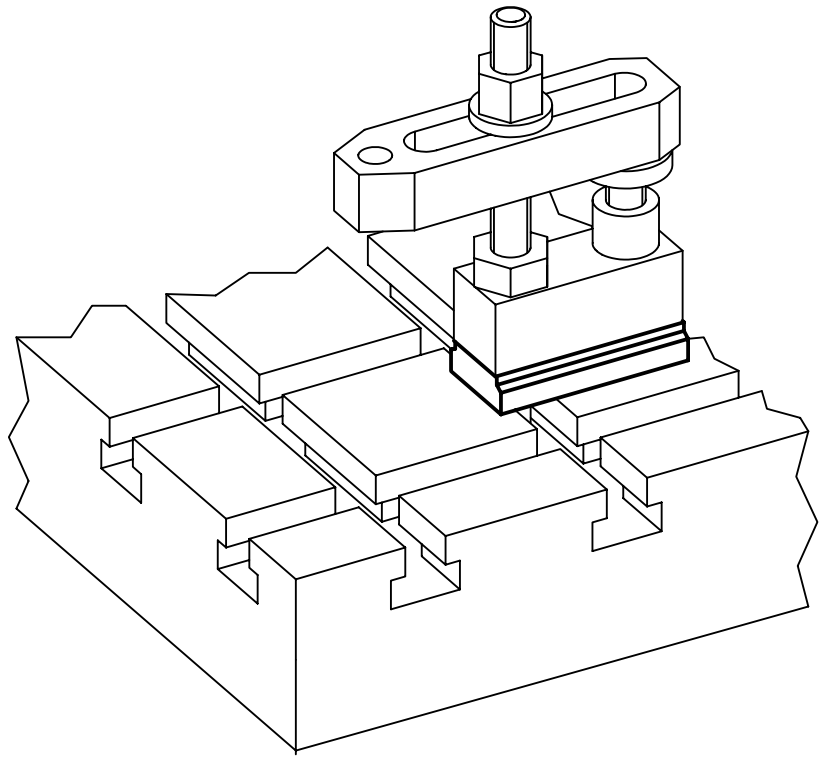
DRAWING



ORDER INFORMATION

Dimensions								Art. No.
a	b	c	b_1	g	i	p		
			[mm]				[g]	
12	**30**	**65**	25	M12	12,5	23	146	**23700.0612**

APPLICATION EXAMPLE



Base Elements • for location hole

EH 23700.



PRODUCT DESCRIPTION

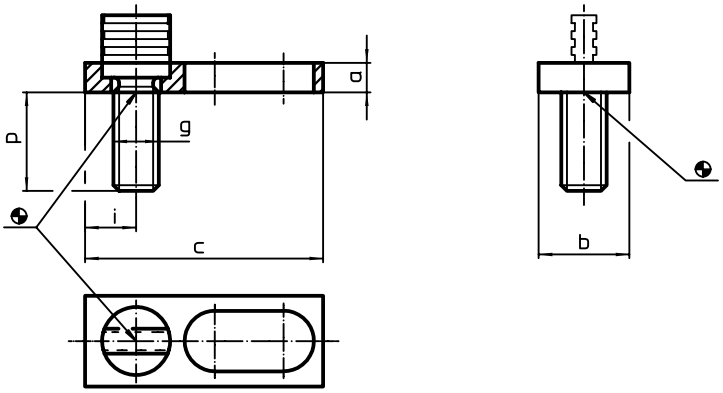
Material

Body
- Steel, blackened

Wearing part
- Heat-treated steel

Pull-rod
- Special steel

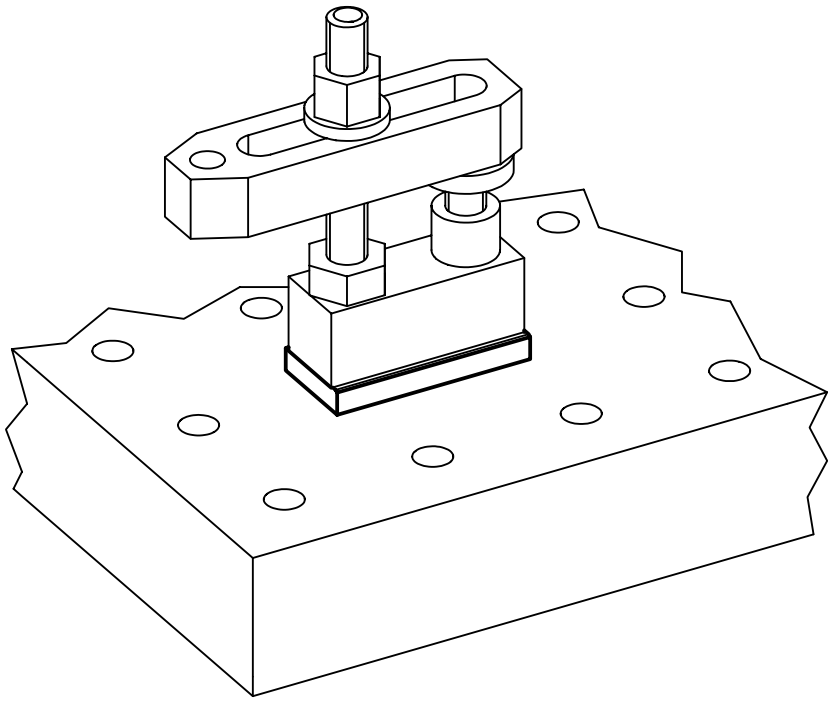
DRAWING



ORDER INFORMATION

Dimensions							Art. No.
a	b	c	g	i	p		
[mm]						[g]	
8	**25**	**65**	M12	12,5	27	95	**23700.0712**
12	**30**	**78**	M16	14,0	33	190	**23700.0716**

APPLICATION EXAMPLE



Down-Hold Clamps • with cranked clamping lever

EH 23210.



PRODUCT DESCRIPTION

The quick-acting clamping element simultaneously presses the workpieces towards both, the stops and fixture plate. The low profile construction enables the entire surface to be machined. In conjunction with cylindrical stops EH 23280., a special fixture can be replaced.

Material

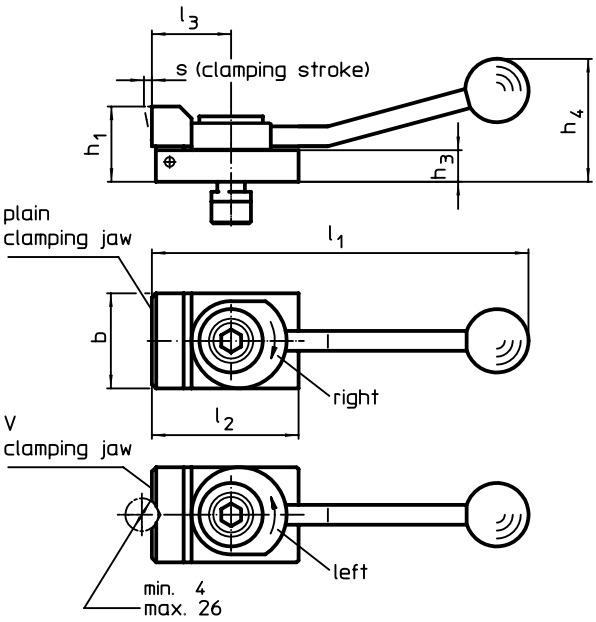
- Steel, case-hardened, blackened

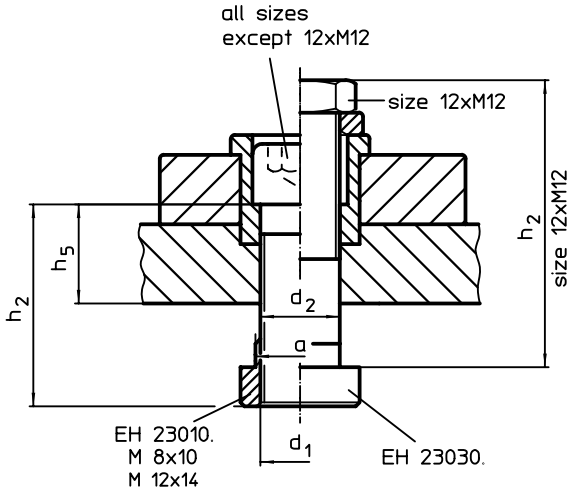
MORE INFORMATION

Further products

Stops, cylindrical . . . . . → p. 453

DRAWING



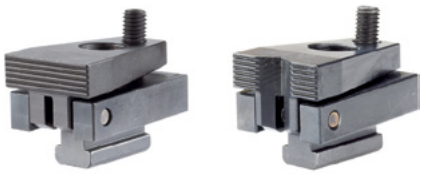


ORDER INFORMATION

T-slot size	Dimensions													Clamping force horizontal max.		Art. No.
	d_1	a	b	d_2	h_1	h_2	h_3	h_4	h_5	l_1	l_2	l_3	s			
[mm]	[mm]													[kN]	[g]	
with flat clamping jaw, clamping to the right																
10	**M 8**	9,6	32	8,4	20	30	8	40	12,6	132	50	32	3	3,5	262	23210.0101
12	**M12**	11,6	48	12,5	38	63	16	62	–	190	72	40	4	7,0	870	23210.0321
14	**M12**	13,6	48	12,5	38	40	16	62	19,1	190	72	40	4	7,0	845	23210.0341
with flat clamping jaw, clamping to the left																
10	**M 8**	9,6	32	8,4	20	30	8	40	12,6	132	50	32	3	3,5	262	23210.0105
12	**M12**	11,6	48	12,5	38	63	16	62	–	190	72	40	4	7,0	868	23210.0325
14	**M12**	13,6	48	12,5	38	40	16	62	19,1	190	72	40	4	7,0	847	23210.0345
with V-clamping jaw, clamping to the right																
10	**M 8**	9,6	32	8,4	20	30	8	40	12,6	132	50	32	3	3,5	263	23210.0102
12	**M12**	11,6	48	12,5	38	63	16	62	–	190	72	40	4	7,0	893	23210.0322
14	**M12**	13,6	48	12,5	38	40	16	62	19,1	190	72	40	4	7,0	838	23210.0342
with V-clamping jaw, clamping to the left																
10	**M 8**	9,6	32	8,4	20	30	8	40	12,6	132	50	32	3	3,5	264	23210.0106
12	**M12**	11,6	48	12,5	38	63	16	62	–	190	72	40	4	7,0	900	23210.0326
14	**M12**	13,6	48	12,5	38	40	16	62	19,1	190	72	40	4	7,0	841	23210.0346

Down-Hold Clamps • without clamping lever

EH 23210.



PRODUCT DESCRIPTION

By tightening the ball-ended thrust screw the workpiece is simultaneously pressed towards the stops and fixture plate. The favourable leverage enables high horizontal clamping forces. When using T-Nuts EH 23010. / EH 23020. (DIN 508) they can also be applied to other slot sizes.

Material

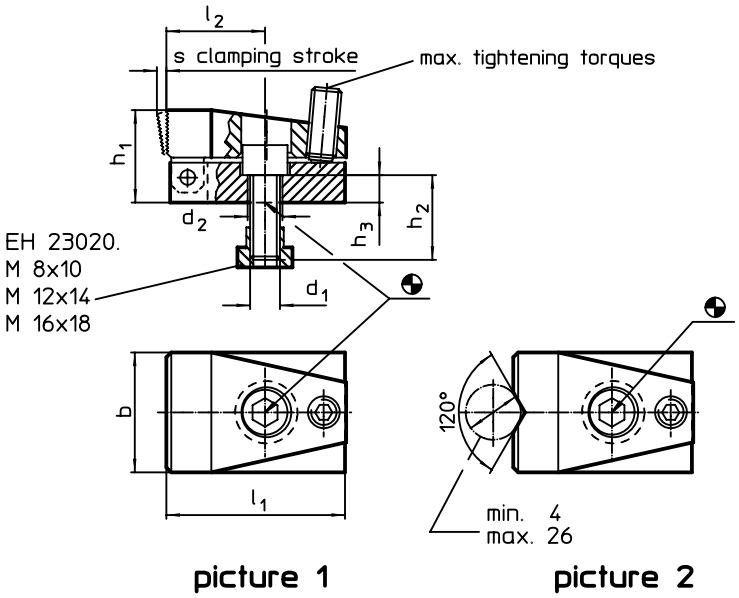
- Steel, case-hardened, blackened, ground

MORE INFORMATION

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362
Nuts for T-Slots, extended. . . . . → p. 366

DRAWING

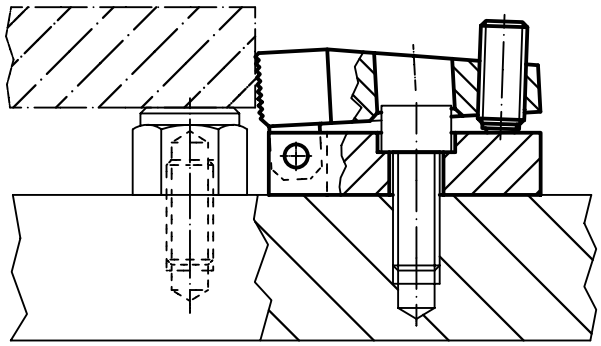


picture 1 picture 2

ORDER INFORMATION

T-slot size	Dimensions									Clamping force horizontal max.	Tightening torque max.		Art. No.
	d_1	d_2	b	h_1	h_2	h_3	l_1	l_2	s				
[mm]	[mm]									[kN]	[Nm]	[g]	
with flat clamping jaw – picture 1													
10	**M 8**	8,4	32	24	20	8	52	28	3	7,0	3	276	23210.0501
14	**M12**	12,5	48	37	30	11	72	40	4	15,0	9	831	23210.0521
18	**M16**	16,5	68	47	35	13	86	41	7	21,5	20	1749	23210.0541
with V-clamping jaw – picture 2													
10	**M 8**	8,4	32	24	20	8	52	28	3	7,0	3	266	23210.0502
14	**M12**	12,5	48	37	30	11	72	40	4	15,0	9	833	23210.0522
18	**M16**	16,5	68	47	35	13	86	41	7	21,5	20	1730	23210.0542

APPLICATION EXAMPLE



Down-Hold Clamps • without clamping lever, with support

EH 23210.



PRODUCT DESCRIPTION

By tightening the ball-ended thrust screw the workpiece is simultaneously pressed towards the stops and fixture plate. The favourable leverage enables high horizontal clamping forces. When using T-nuts EH 23010. / EH 23020. (DIN 508) they can also be applied to other slot sizes.

Material

- Steel, case-hardened, blackened, ground

MORE INFORMATION

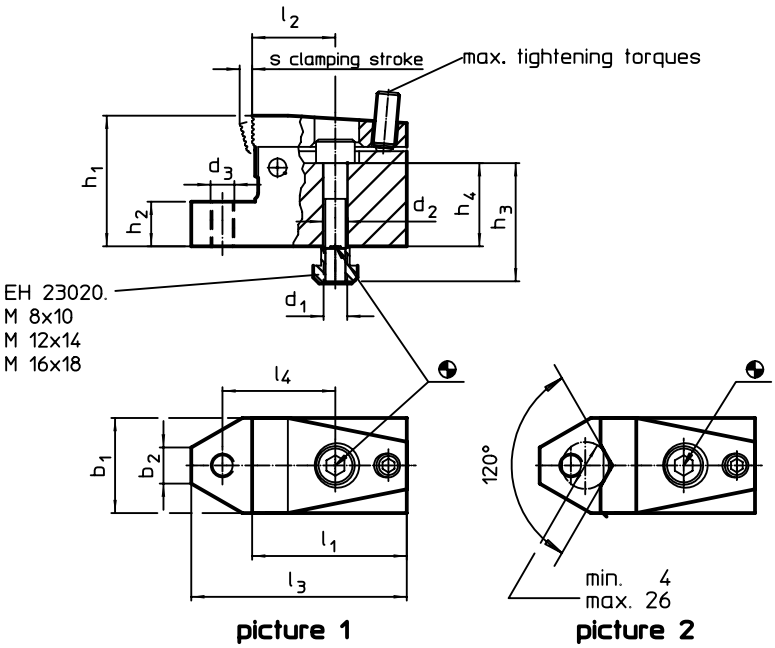
References

The integrated support is equipped with a location thread to fit for example screwed rest buttons EH 22690., self-aligning pads EH 22730. / EH 22740.

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362
Nuts for T-Slots, extended. . . . . → p. 366

DRAWING

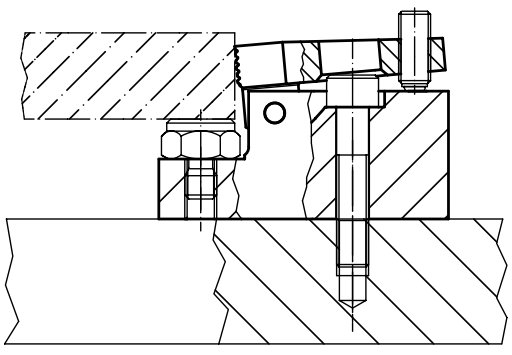


picture 1 picture 2

ORDER INFORMATION

T-slot size	Dimensions														Clamping force horizontal max.	Tightening torque max.		Art. No.
	d_1	d_2	d_3	b_1	b_2	h_1	h_2 ±0,01	h_3 ~	h_4 ~	l_1	l_2	l_3	l_4	s				
[mm]	[mm]														[kN]	[Nm]	[g]	
with flat clamping jaw – picture 1																		
10	**M 8**	8,4	M 8	32	12,1	44	15	40	28	52	28	72,5	38	3	7,0	3	556	23210.0551
14	**M12**	13,0	M12	48	16,0	53	15	45	27	72	40	100,0	55	4	15,0	9	1342	23210.0561
18	**M16**	17,0	M16	68	18,8	72	20	60	38	86	41	126,0	63	7	21,5	20	3149	23210.0571
with V-clamping jaw – picture 2																		
10	**M 8**	8,4	M 8	32	12,1	44	15	40	28	52	28	72,5	38	3	7,0	3	553	23210.0552
14	**M12**	13,0	M12	48	16,0	53	15	45	27	72	40	100,0	55	4	15,0	9	1324	23210.0562
18	**M16**	17,0	M16	68	18,8	72	20	60	38	86	41	126,0	63	7	21,5	20	3100	23210.0572

APPLICATION EXAMPLE



Holding Plates • for down-hold clamps

EH 23210.



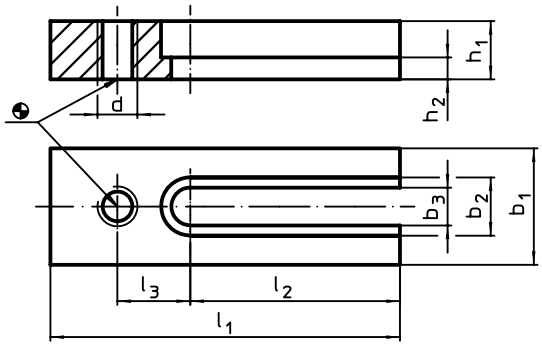
PRODUCT DESCRIPTION

By using the holding plates, the down-hold clamps can also be placed in any desired position across the T-slots.

Material

- Heat-treated steel, tempered, blackened

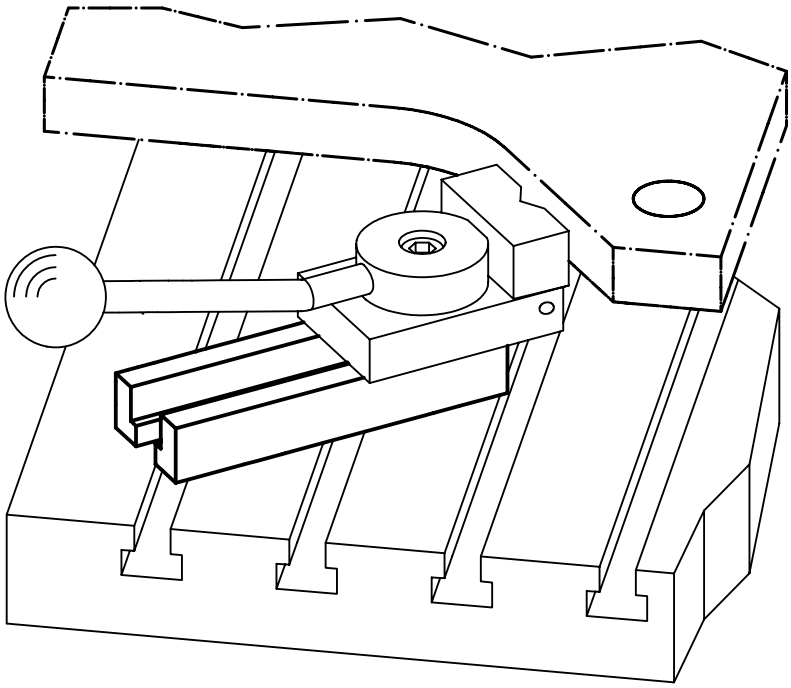
DRAWING



ORDER INFORMATION

Dimensions									For down-hold clamps		Art. No.
b_1	b_2	b_3	d	h_1 -0,4	h_2	l_1	l_2	l_3			
[mm]									[mm]	[g]	
30	15	9	M 8	15	6,5	100	63	20	M 8	246	23210.0730
40	20	13	M12	20	7,5	120	72	25	M12	515	23210.0740
60	26	17	M16	30	13,0	140	80	30	M16	1456	23210.0760
80	32	21	M20	40	18,0	200	110	50	–	3900	23210.0770
90	38	25	M24	50	24,0	220	130	55	–	5850	23210.0780

APPLICATION EXAMPLE



3

Sub-Part Clamps

EH 23211.



PRODUCT DESCRIPTION

The sub-part clamp and the sub-part stop enable workpieces to be clamped on the front face. This allows the full area of the machine table to be used to clamp the workpiece.

- Hold-down effect due to inclined arrangement of the clamping jaw
- Clamping of large workpieces on the whole of the machine table
- Large clamping forces up to 20 kN
- Clamping path 10.6 mm by means of clamping screw M 16 (WS 14)
- Solid version made of vibration-eliminating ductile iron
- Optimum adaptation to the workpiece and material, through the use of clamping inserts and interchangeable jaws
- Form and forced-fit assembly in a T-slot is possible
- Minimum interference contours, even for large workpieces
- Location holes at the sides for fastening of longitudinal stops

Material

- Ductile cast iron (GGG 60)

Assembly

The workpiece is positioned and then clamped on the ground precision support. The machine and fixture system parts in the Halder product range can be installed in the location thread to reach a customised clamping.
The location holes on the sides allow optional longitudinal stops to be installed.

MORE INFORMATION

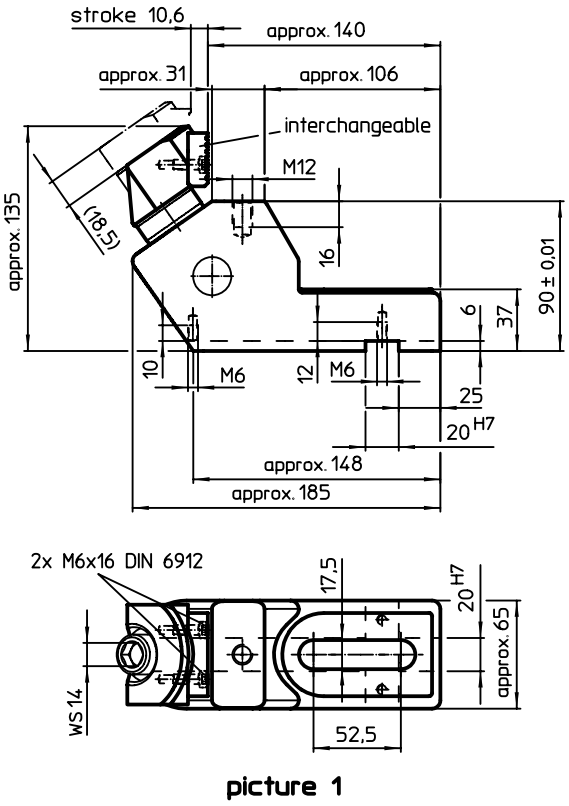
Notes

The delivery includes the interchangeable jaw 1138.400 (ribbed/smooth) - this can be changed to the interchangeable jaw 1138.100 (soft).

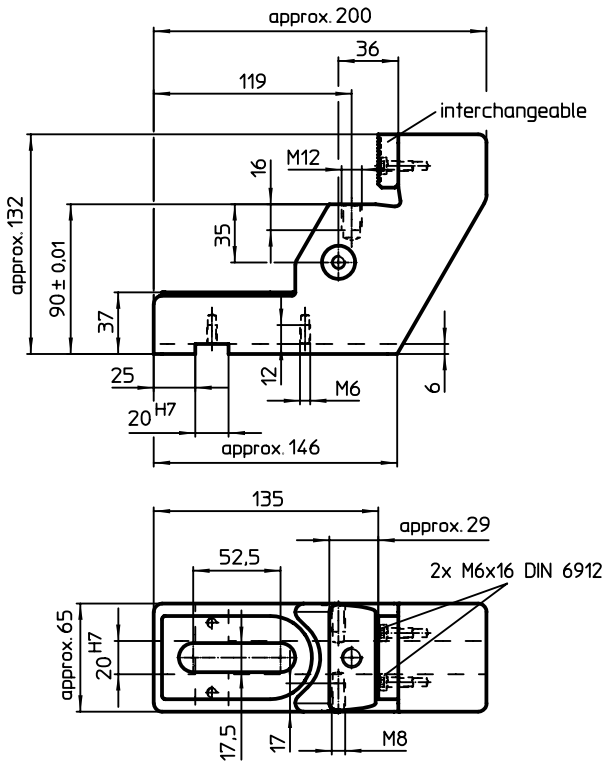
Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362
Nuts for T-Slots, extended. . . . . → p. 366
Fixed Slot Tenons . . . . . → p. 388
Fixed Slot Tenons, with cylindrical fastening . . . . . → p. 389
Clamping Vices, replacement jaw, soft → p. 747

DRAWING



picture 1

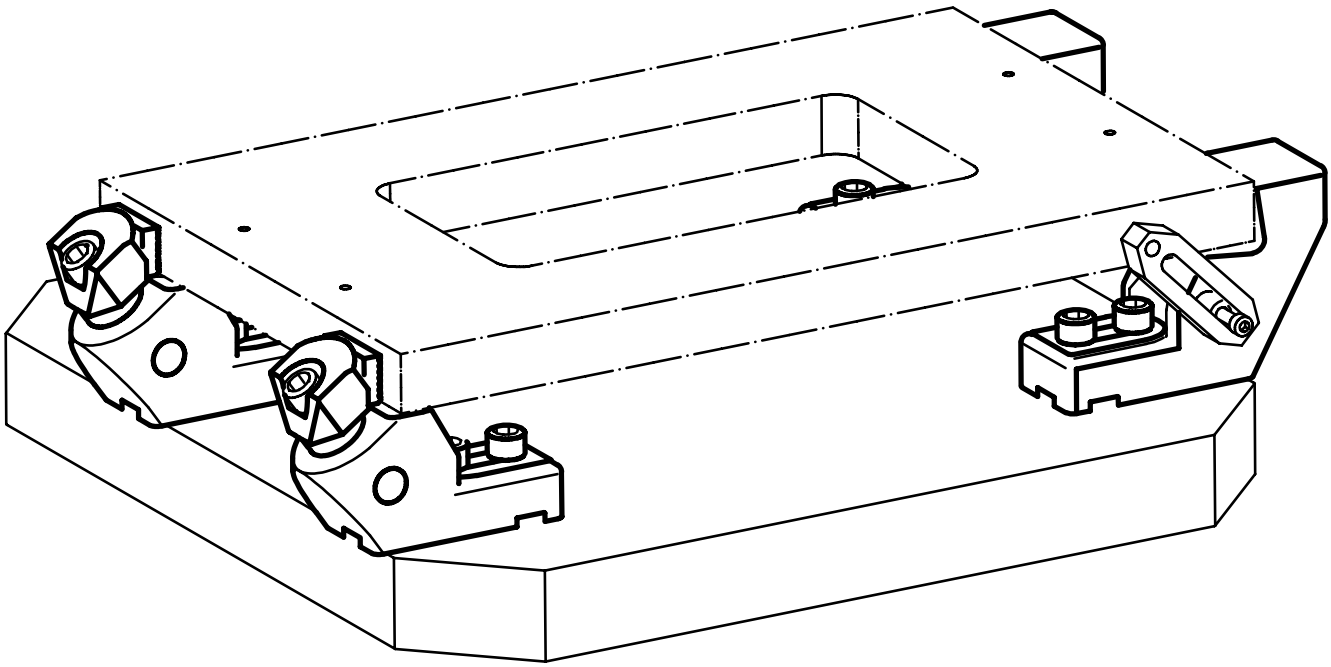


picture 2

ORDER INFORMATION

Clamping force horizontal max. [kN]	Tightening torque max. [Nm]	[g]	Art. No.
sub-part clamp – picture 1			
20	50	5000	23211.0010
sub-part stop – picture 2			
–	–	5380	23211.0020

APPLICATION EXAMPLE



Push-Pull Clamps

EH 23229.



PRODUCT DESCRIPTION

The clamp is suitable for easy and safe positioning of workpieces or components prior to clamping or assembly.
As the push/pull clamp is threaded on both sides it is possible to fix elements that are adapted to the workpiece, e.g. prisms, clamping bolts, self-aligning pads.

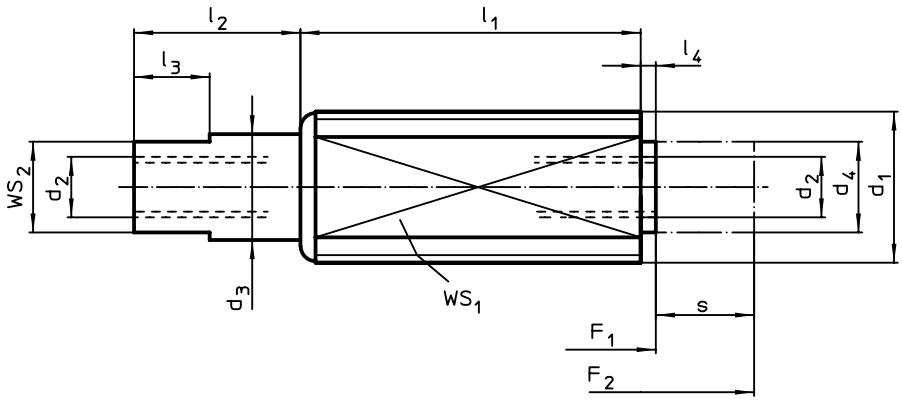
Material

Pin
- Steel, blackened

Body
- Steel, zinc-plated

Spring
- Stainless steel 1.4310

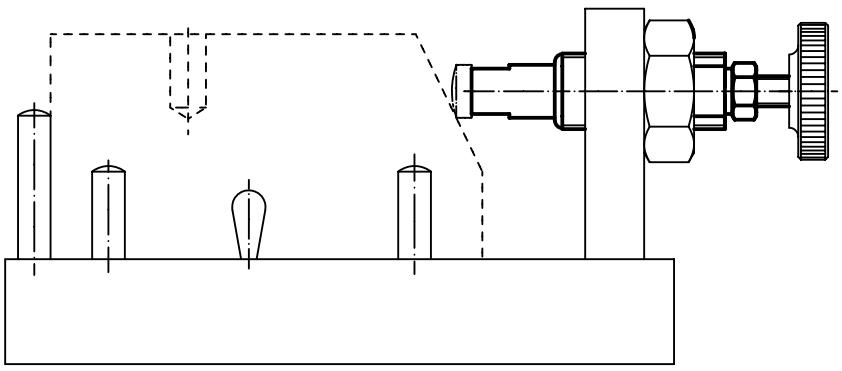
DRAWING



ORDER INFORMATION

Dimensions								Stroke	WS		Spring load			Art. No.
d_1	d_2	d_3	d_4	l_1 -1	l_2 ±0,5	l_3	l_4 -0,5	s ~	WS_1	WS_2	F_1 ~	F_2 ~		
[mm]								[mm]	[mm]		[N]		[g]	
light spring load														
M12	M4 x 8	7	6	11,0	4,5	5	1,5	3,5	10	6	5	20	5,1	23229.0005
				18,5	7,0	5	1,5	6,0	10	6	5	20	8,7	23229.0010
				26,0	11,0	5	1,5	10,0	10	6	5	20	13,0	23229.0015
standard spring load														
M12	M4 x 8	7	6	11,0	4,5	5	1,5	3,0	10	6	10	45	5,2	23229.0020
				18,5	7,0	5	1,5	5,0	10	6	10	45	8,7	23229.0025
				26,0	11,0	5	1,5	8,0	10	6	10	45	14,0	23229.0030
M18 x 1,5	M6 x 12	11	10	18,0	6,0	6	2,0	4,0	16	9	30	120	22,0	23229.0050
				31,5	11,5	6	2,0	7,0	16	9	30	120	42,0	23229.0055
				45,0	16,0	6	2,0	12,5	16	9	30	150	63,0	23229.0060
heavy spring load														
M12	M4 x 8	7	6	11,0	4,5	5	1,5	3,0	10	6	20	90	5,2	23229.0035
				18,5	7,0	5	1,5	5,0	10	6	20	90	9,0	23229.0040
				26,0	11,0	5	1,5	8,0	10	6	20	90	13,0	23229.0045

APPLICATION EXAMPLE



Push Plungers • with pin, protected against rotating

EH 23230.



PRODUCT DESCRIPTION

The push plunger is suitable for easy and safe positioning of workpieces or components prior to clamping or assembly.
Locating pins of your own profile or design can be attached to our threaded pin types.

Material

Pin
- Steel, case-hardened, blackened

Body
- Steel, zinc-plated by galvanization

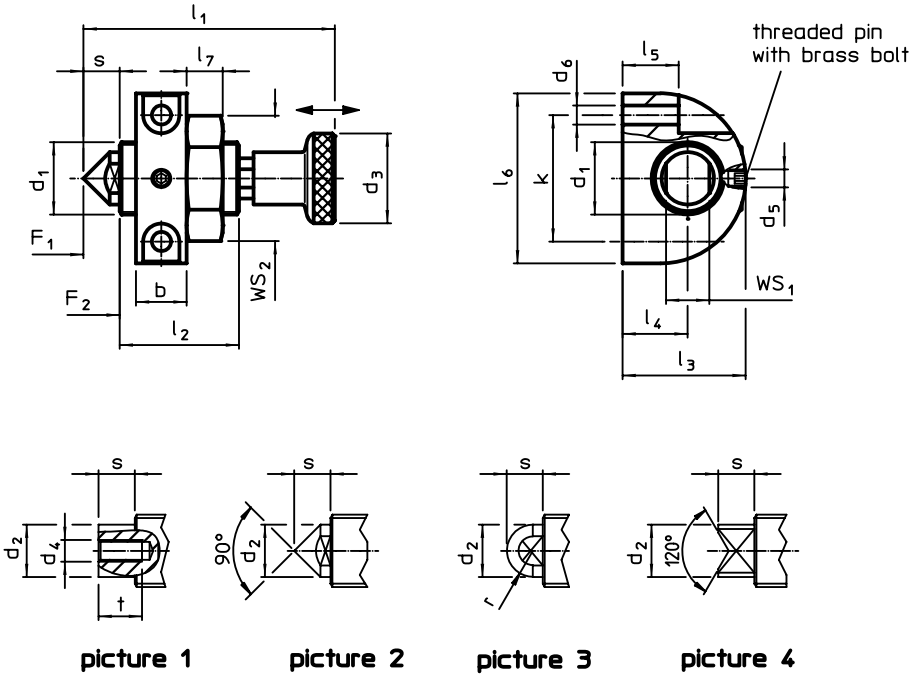
Threaded pin
- Steel, blackened, with brass pad

Mounting block
- Zinc die-cast, plastic coated, black

Knob
- Steel, blackened

Lock nut
- Steel, blackened

DRAWING



picture 1 picture 2 picture 3 picture 4

ORDER INFORMATION

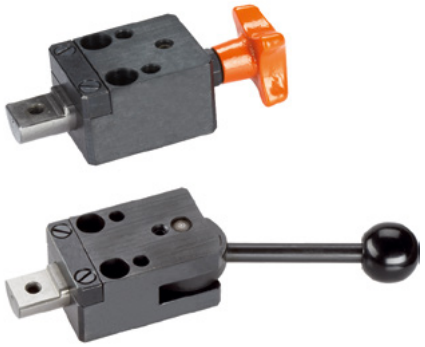
Dimensions																	Stroke s	WS		Spring load[1]		max.		Art. No.
d_1	d_2	d_3	d_4	d_5	d_6	l_1	l_2	l_3	l_4	l_5 -0,2	l_6	l_7	t min.	r	b	k		WS_1	WS_2	F_1	F_2			
[mm]																	[mm]	[mm]		[N]		[°C]	[g]	
with female thread – picture 1																								
M12 x 1,5	9,0	21	M4	M4	4,3	46,0	19	26	14	11,5	35	6	8	–	12	25	6	8	19	16	35	100	85	23230.0510
M16 x 1,5	12,0	21	M5	M5	5,3	56,0	27	34	18	15,5	47	8	10	–	14	35	8	10	24	25	71	100	154	23230.0512
M20 x 1,5	14,5	25	M6	M5	5,3	69,5	33	34	18	15,5	47	10	12	–	14	35	10	12	30	40	130	100	211	23230.0514
with tipped point – picture 2																								
M12 x 1,5	9,0	21	–	M4	4,3	46,0	19	26	14	11,5	35	6	–	–	12	25	6	8	19	16	35	100	85	23230.0530
M16 x 1,5	12,0	21	–	M5	5,3	56,0	27	34	18	15,5	47	8	–	–	14	35	8	10	24	25	71	100	154	23230.0532
M20 x 1,5	14,5	25	–	M5	5,3	69,5	33	34	18	15,5	47	10	–	–	14	35	10	12	30	40	130	100	209	23230.0534
with rounded pin – picture 3																								
M12 x 1,5	9,0	21	–	M4	4,3	46,0	19	26	14	11,5	35	6	–	4,5	12	25	6	8	19	16	35	100	85	23230.0550
M16 x 1,5	12,0	21	–	M5	5,3	56,0	27	34	18	15,5	47	8	–	6,0	14	35	8	10	24	25	71	100	155	23230.0552
M20 x 1,5	14,5	25	–	M5	5,3	69,5	33	34	18	15,5	47	10	–	7,2	14	35	10	12	30	40	130	100	210	23230.0554
with prism – picture 4																								
M12 x 1,5	9,0	21	–	M4	4,3	46,0	19	26	14	11,5	35	6	–	–	12	25	6	4	19	16	35	100	85	23230.0570
M16 x 1,5	12,0	21	–	M5	5,3	56,0	27	34	18	15,5	47	8	–	–	14	35	8	6	24	25	71	100	153	23230.0572
M20 x 1,5	14,5	25	–	M5	5,3	69,5	33	34	18	15,5	47	10	–	–	14	35	10	8	30	40	130	100	209	23230.0574

[1] statistical average value

3

Locating Clamps

EH 23230.



PRODUCT DESCRIPTION

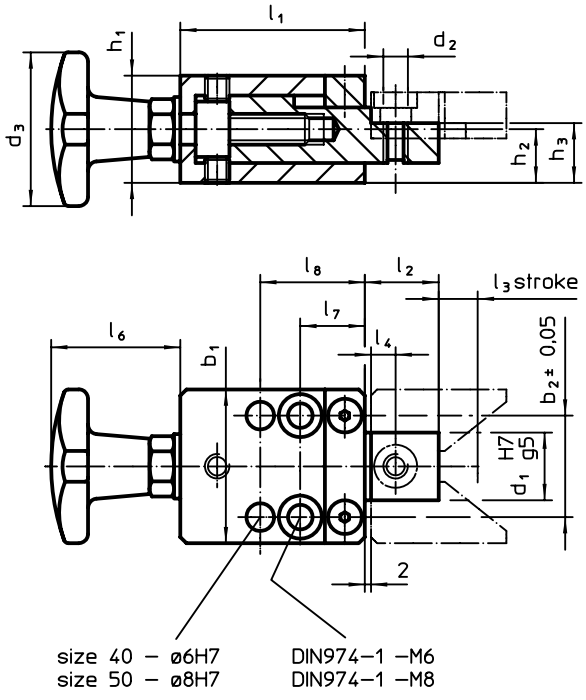
Suitable for a simultaneous "positioning" and "clamping" of workpieces. The locating element is a precision element which can be assembled from either side. The clamping and locating part adapted to the workpiece is screwed to the cylindrical support. Clamping and locating parts are manufactured by the user according to the individual requirements.

Material

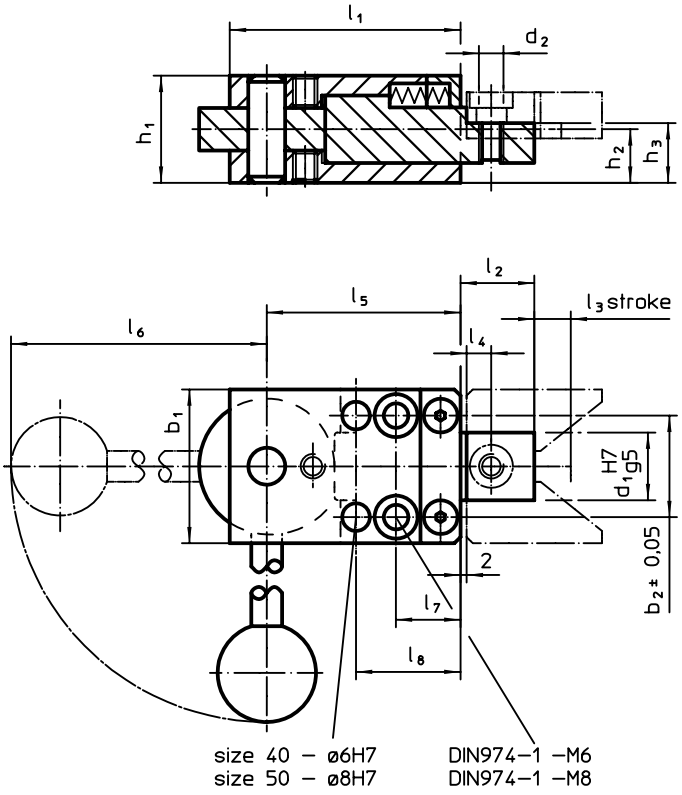
Handle
- Grey cast iron DIN 6335, orange plastic-coated
- Thermosetting plastic PF 31, black, DIN 319

Clamp
- Steel, case-hardened, blackened, ground

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions																	Art. No.
b_1	b_2 ±0,05	d_1 H7 g5	d_2	d_3	h_1	h_2	h_3	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	[g]	
								[mm]									
with palm grip – picture 1																	
40	27	18	M6	40	29,8	14,9	16,9	50	19	9	8	–	33	17	28	505	23230.0040
50	33	22	M8	50	34,8	17,4	19,4	60	24	10	10	–	42	21	34	862	23230.0050
with spiral eccentric clamping lever – picture 2																	
40	27	18	M6	–	29,8	14,9	16,9	60	19	3	8	50	96	17	28	566	23230.0440
50	33	22	M8	–	34,8	17,4	19,4	75	24	4	10	63	145	21	34	1071	23230.0450

Clamping Vices

EH 23231.





PRODUCT DESCRIPTION

The clamping vice is a solid, compact clamping module with a horizontally acting clamping force and a robust mechanical spindle.

- Clamping force up to max. 80 kN
- Clamping stroke 25 mm via screw drive WS 36
- Fixture via 4 cap screws M 24, quality 8.8 (tightening torque 600 Nm) with a hole spacing 100 x 100 mm
- Suitable clamping jaws 23231.0020 - .0033 are available

Material

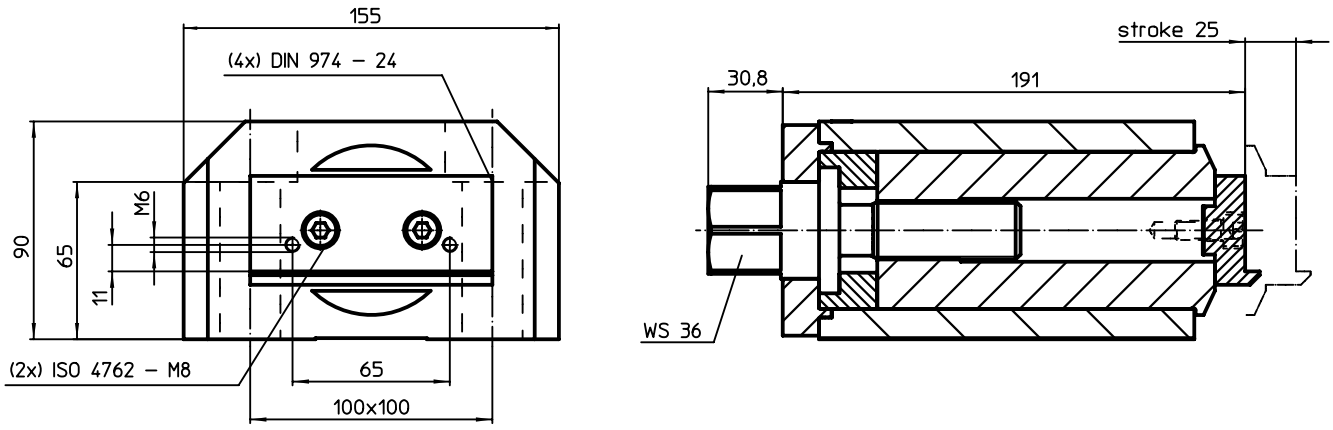
- Steel, case-hardened, ground

MORE INFORMATION

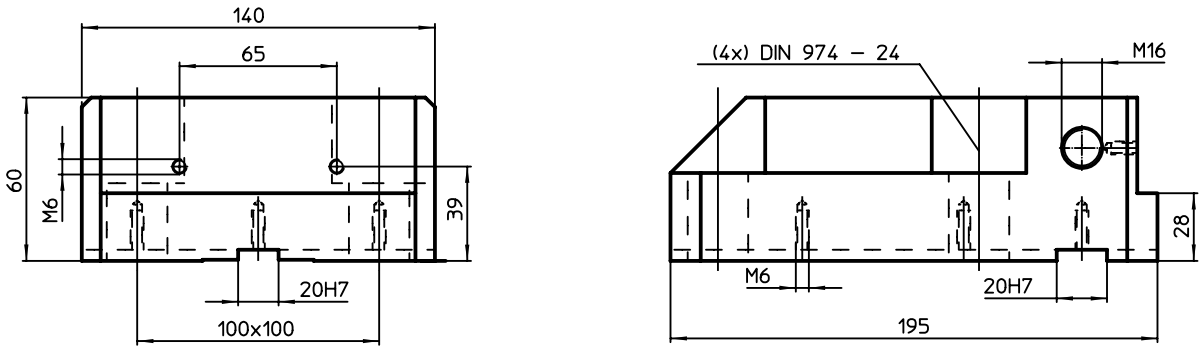
Further products

Standard Jaws, for vices . . . . . → p. 445
Interchangeable Jaws, for vices, with pull-down effect . . . . . → p. 446
Clamping Vices, moveable jaw . . . . . → p. 746
Clamping Vices, fixed jaw . . . . . → p. 746
Clamping Vices, replacement jaw, soft → p. 747
Clamping Vices, replacement jaw, ribbed/flat . . . . . → p. 747

DRAWING



picture 1

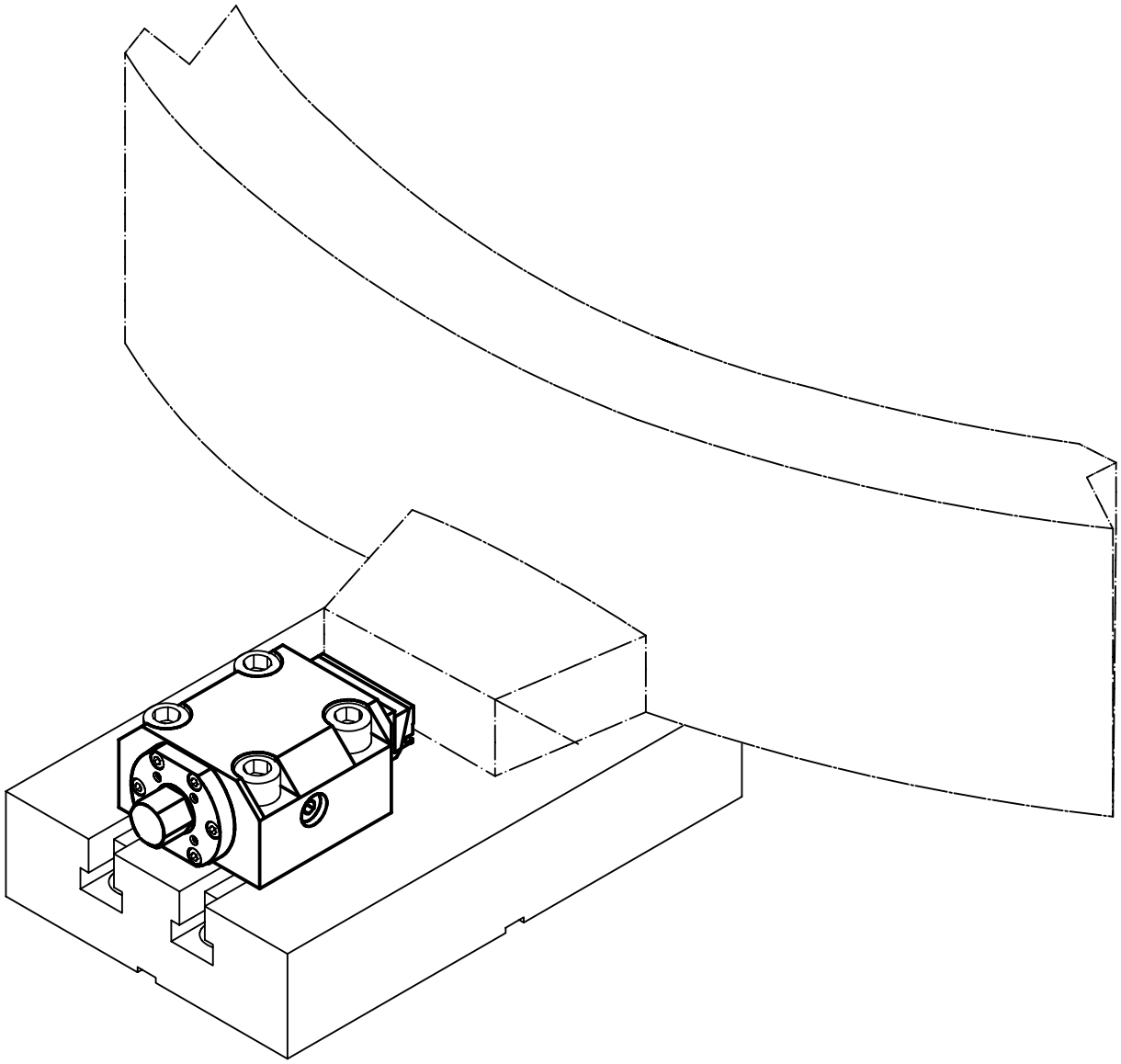


picture 2

ORDER INFORMATION

Clamping force horizontal max. [kN]	Tightening torque max. [Nm]	[kg]	Art. No.
moveable jaw – picture 1			
80	200	15,3	23231.0010
fixed jaw – picture 2			
–	–	10,0	23231.0011

APPLICATION EXAMPLE



Standard Jaws • for vices

EH 23231.



PRODUCT DESCRIPTION

Material

Plunger
- Heat-treated steel, induction hardened

Jaw
- Case-hardened steel

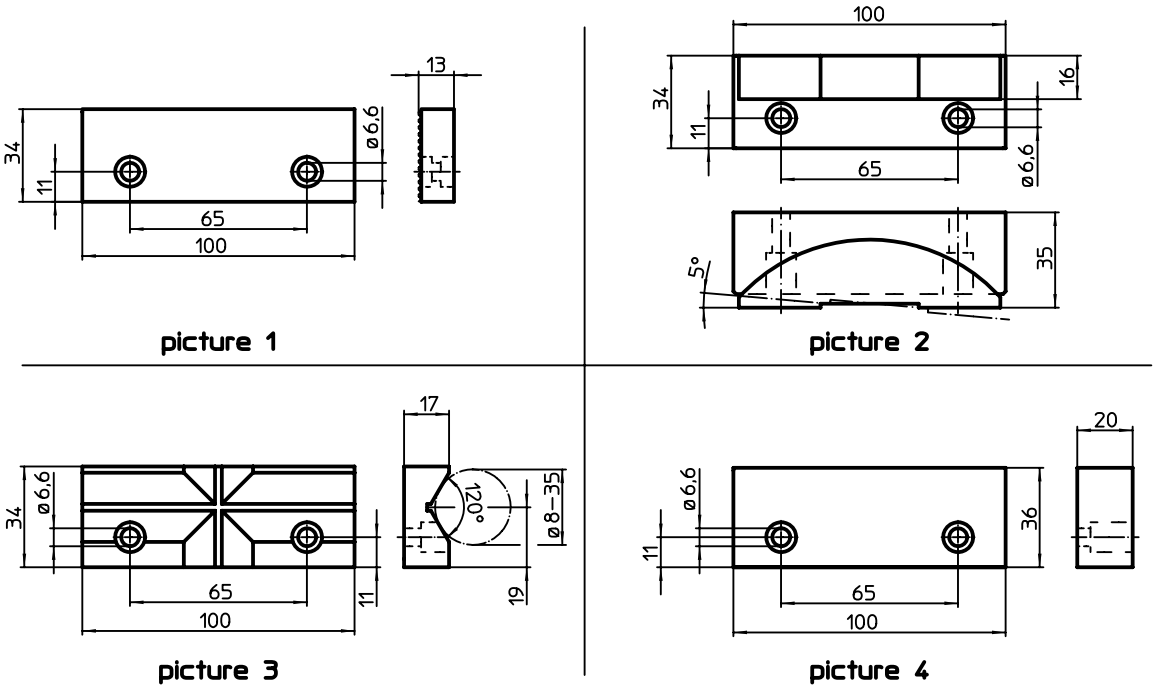
- Case-hardened steel, case hardened
- Heat-treated steel
- Tool steel

MORE INFORMATION

Notes
The delivery includes tightening screws.

3

DRAWING



ORDER INFORMATION

Nominal dimension [mm]	[g]	Art. No.
reversible jaw, smooth/ribbed made auf tool steel – picture 1		
100	320	**23231.0020**
floating jaw (body: of heat-treated steel / plunger: of heat-treated steel, induction-hardened) – picture 2		
100	790	**23231.0021**
V-clamping jaw of case-hardened steel, case-hardened – picture 3		
100	340	**23231.0022**
clamping jaw, soft of case-hardened steel – picture 4		
100	530	**23231.0023**

3

Interchangeable Jaws • for vices, with pull-down effect

EH 23231.



PRODUCT DESCRIPTION

Material

Base support
- Case-hardened steel, case hardened

Roller
- Cold worked steel, hardened

Jaw
- Case-hardened steel, case hardened
- Heat-treated steel, hardened

Assembly

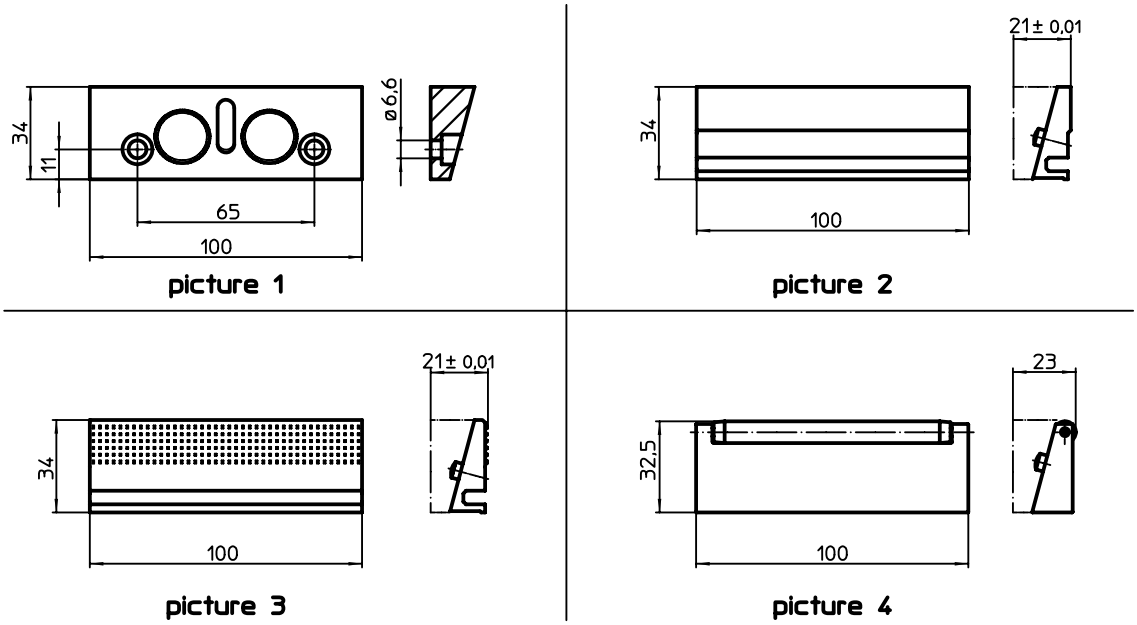
The base support (picture 1) is fixtured at the adapter of the clamping vice with the standardly delivered screws. The interchangeable jaws - held by 2 permanent magnets - can be inserted and exchanged with a manual handle.
Assembly-/Disassembly instruction:
1. Pull the jaw upwards with the manual handle until the alignment pin strikes against the slot.
2. Twist the jaw sideways and remove.
3. New jaw can be inserted.

MORE INFORMATION

Notes

The delivery includes tightening screws.

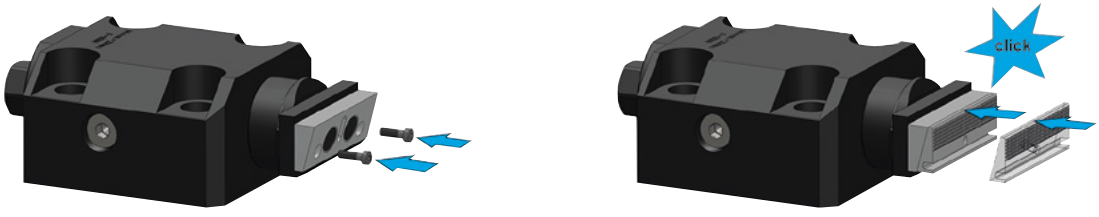
DRAWING



ORDER INFORMATION

Nominal dimension [mm]	[g]	Art. No.
base support of case-hardened steel – picture 1		
100	290	**23231.0030**
interchangeable jaw, smooth of case-hardened steel – picture 2		
100	200	**23231.0031**
interchangeable jaw, ribbed of case-hardened steel – picture 3		
100	195	**23231.0032**
interchangeable jaw with roller (body: head-treated steel, hardened / roller: cold worked steel, hardened) – picture 4		
100	270	**23231.0033**

APPLICATION EXAMPLE



Stabilizing Clamping Jaws

EH 23240.



PRODUCT DESCRIPTION

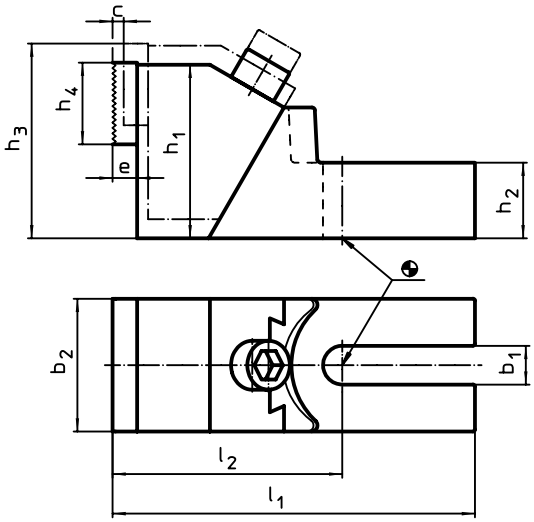
Due to the big clamping jaw, this clamping element is suitable for lateral clamping of high workpieces.
The clamping force acts forwards and downwards. Clamping plate is turnable, i.e. to the ground or ribbed side.

Material

Body
- Cast iron

Clamping jaws
- Steel, case-hardened

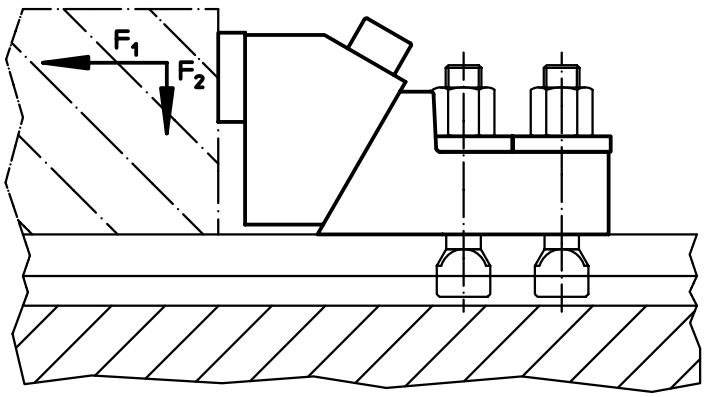
DRAWING



ORDER INFORMATION

Dimensions										T-slot size a	Spring load			Art. No.
b_1	c	h_1	h_2	h_3	h_4	b_2	l_1	l_2	e		F_1	F_2		
[mm]										[mm]	[kN]		[g]	
19	8	85	37	99	40	65	177,5	112,5	12	12 14 16 18	8 15 20 28	1,2 2,2 3,0 4,2	4013	23240.0012
26	11	100	45	118	40	75	226,5	136,5	12	20 22 24 28 30	30 30 32 32 36	4,5 4,5 4,8 4,8 5,4	6760	23240.0020

APPLICATION EXAMPLE



Taper Clamping Units

EH 23250.



PRODUCT DESCRIPTION

Taper clamping units are particularly suitable for horizontal and vertical multiple clampings. The taper clamps are compact in build and therefore enable clamping without geometric interference.

Material

Body
- Tool steel, hardened, bright

Screw
- Heat-treated steel, tempered, quality 12.9

Spring
- Spring steel wire
- NBR (O-Ring)

Clamping jaws
- Tool steel, hardened, blackened and ground

Assembly

Can be mounted in a threaded hole or with T-nuts for horizontal or vertical multiple clamping.

Operation

Inserting the socket head screw moves the two clamping chucks outwards and presses the workpieces against a stop. Using the double taper, an additional vertical clamping force will be achieved. Stroke of taper clamping units with M 5 = ±0,5, M 8 = ±0,5, M 12 = ±1 and M 16 = ±1,5. Can be mounted in a threaded hole or with T-nuts for horizontal or vertical multiple clamping.

MORE INFORMATION

References

For further taper clamping units, refer to section "Multiple Clamping Systems"

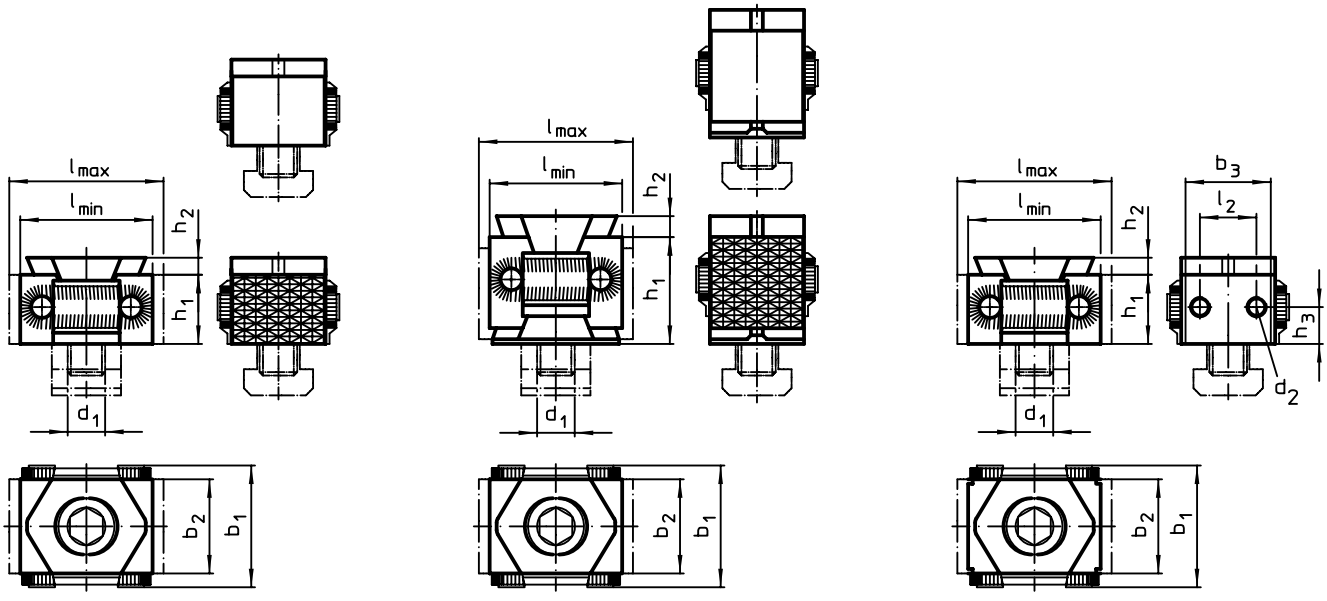
Accessories

T-nuts EH 23010. have to be purchased separately.

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362
Coverings, for taper clamping units. . . → p. 450
Taper Clamping Units, plain / ribbed, M8 . . . . . → p. 859
Taper Clamping Units, plain / ribbed, M12 . . . . . → p. 860
Taper Clamping Units, with screw fastened thread, M12. . . . . → p. 861

DRAWING



picture 1 | picture 2 | picture 3

ORDER INFORMATION

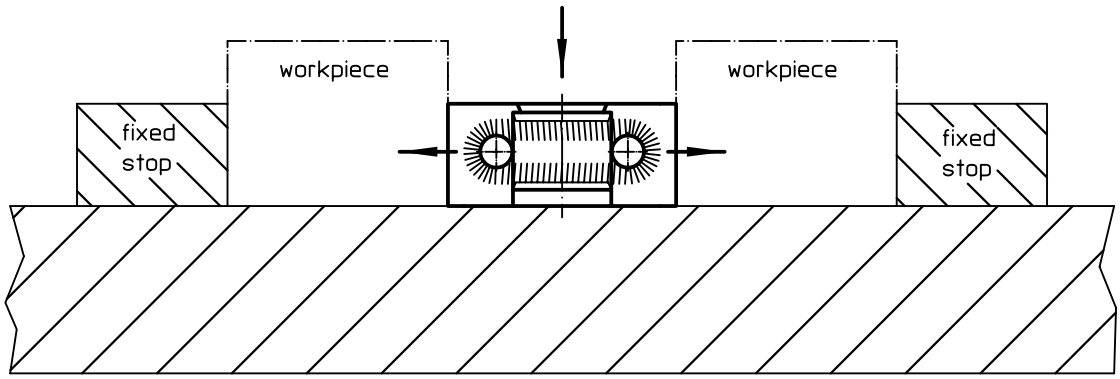
Dimensions [mm]										Clamping force max. [kN]	Tightening torque max. [Nm]	[g]	Art. No.
d_1	l	l_2	b_1	b_2	b_3	d_2	h_1	h_2	h_3				
single taper, ribbed clamping jaw, two-sided – picture 1													
M 8	27 – 31	–	29	21	–	–	15	2,5	–	20	43	73	23250.0008
M12	42 – 49	–	41	30	–	–	22	4,0	–	30	85	231	23250.0012
M16	57 – 65	–	56	42	–	–	29	5,0	–	50	210	587	23250.0016

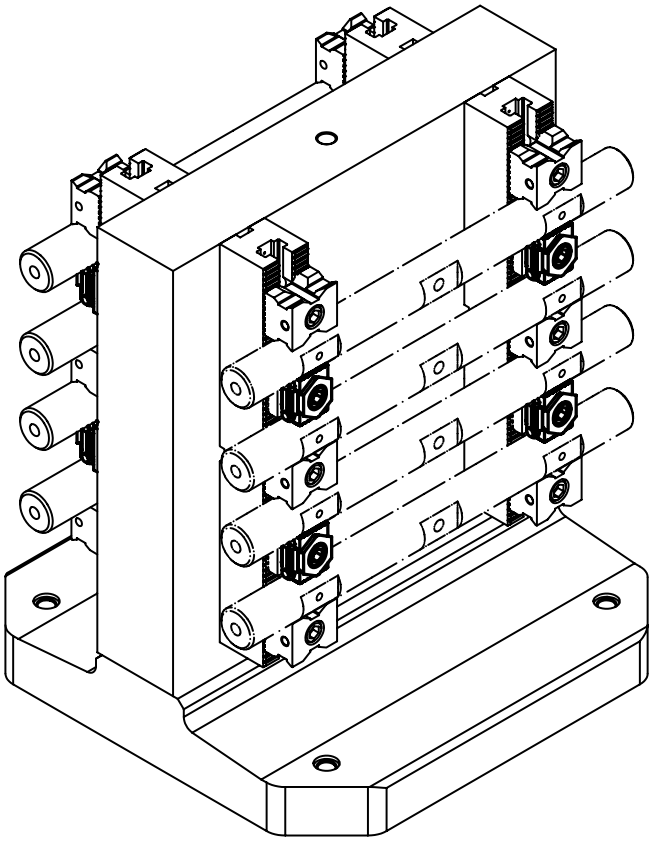
[1] Taper surfaces not ground, spring: O-ring (NBR)

Dimensions										Clamping force max.	Tightening torque max.		Art. No.
d_1	l	l_2	b_1	b_2	b_3	d_2	h_1	h_2	h_3				
[mm]										[kN]	[Nm]	[g]	
single taper, flat clamping jaw, two-sided – picture 1													
M 5	20 – 25	–	22	15	–	–	11	4,2	–	7	10	30	23250.0065[1]
M 8	27 – 31	–	29	21	–	–	15	2,5	–	20	43	73	23250.0048
M12	42 – 49	–	41	30	–	–	22	4,0	–	30	85	233	23250.0052
M16	57 – 64	–	56	42	–	–	29	5,0	–	50	210	587	23250.0056
double taper, ribbed clamping jaw, two-sided – picture 2													
M12	42 – 49	–	41	30	–	–	36	5,0	–	50	85	343	23250.0112
M16	58 – 66	–	56	42	–	–	50	5,0	–	80	210	896	23250.0116
double taper, flat clamping jaw, two-sided – picture 2													
M12	41 – 48	–	41	30	–	–	36	5,0	–	50	85	339	23250.0142
M16	58 – 66	–	56	42	–	–	50	5,0	–	80	210	895	23250.0146
single taper, clamping jaw with screw-fastened thread, two-sided – picture 3													
M 8	33 – 37	12	29	21	–	M5	15	2,5	7,5	20	43	75	23250.0158
M12	46 – 53	18	41	30	28	M5	22	4,0	11,0	30	85	247	23250.0162
M16	61 – 70	26	56	42	40	M5	29	5,0	14,5	60	210	618	23250.0166

[1] Taper surfaces not ground, spring: O-ring (NBR)

APPLICATION EXAMPLE





Coverings • for taper clamping units

EH 23250.



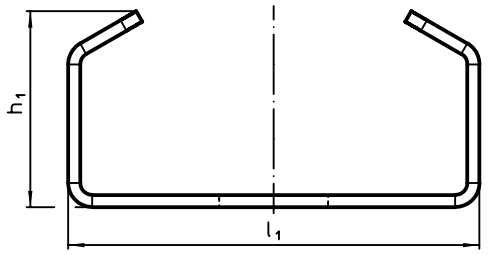
PRODUCT DESCRIPTION

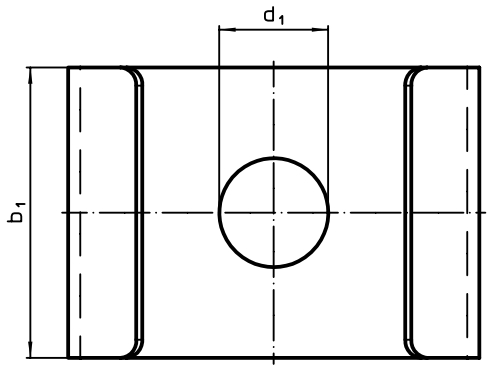
Protects against damage from scales of wood and dirt.

Material
- Steel

Assembly
The cover is mounted under the taper clamping unit.

DRAWING

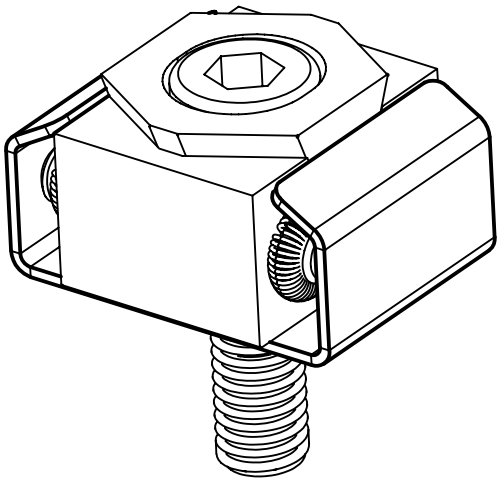




ORDER INFORMATION

Dimensions					For taper clamping units		Art. No.
d_1	For screw	b_1	h_1	l_1			
[mm]						[g]	
9	**M 8**	24	16,2	34	23250.0008/.0048/.0158	12	**23250.0408**
13	**M12**	38	22,1	44	23250.0012/.0052/.0142/.0162	26	**23250.0412**

APPLICATION EXAMPLE



Double Edge Clamps

EH 23251.



PRODUCT DESCRIPTION

Inserting the socket head screw moves the two clamping chucks outwards and presses the workpiece against a stop.

Material

Body
- Aluminium Al

Taper
- Case-hardened steel, blackened

Screw
- Steel

Assembly

Can be mounted in a threaded hole or with T-nuts for horizontal or vertical multiple clamping.

MORE INFORMATION

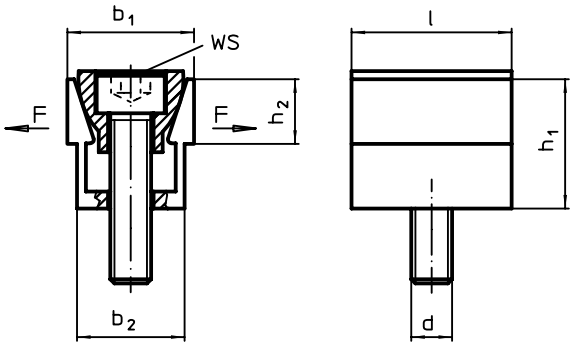
Accessories

T-nuts EH 23010. have to be purchased separately.

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362

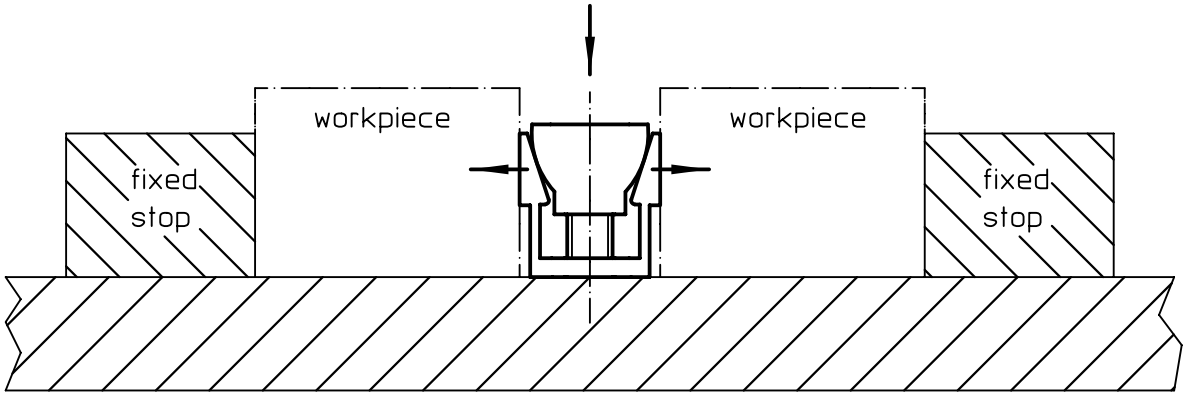
DRAWING



ORDER INFORMATION

Dimensions							WS	Clamping force max.	Tightening torque max.		Art. No.
b_1	b_1 max. spread	b_2	h_1	h_2	l	d					
[mm]							[mm]	[kN]	[Nm]	[g]	
18,6	20,3	16,1	19,0	9,5	23,8	M 6	5	6,7	14,3	36	23251.0006
24,8	26,9	20,8	25,9	12,7	31,7	M 8	6	8,9	14,5	85	23251.0008
37,3	39,9	30,8	38,6	19,0	47,6	M12	10	15,6	38,4	280	23251.0012
49,7	53,0	41,2	51,5	25,4	63,5	M16	14	26,7	74,6	700	23251.0016

APPLICATION EXAMPLE



Double Edge Clamps • machinable chucks

EH 23251.



PRODUCT DESCRIPTION

Inserting the socket head screw moves the two clamping chucks outwards and presses the workpiece against a stop.
The chucks can be machined to the needed workpiece contour. The locking plate is needed only for this machining, not for the workpiece clamping.

Material

Body
- Aluminium Al

Taper
- Case-hardened steel, blackened

Screw
- Steel

Locking plate
- Aluminium Al

Assembly

Can be mounted in a threaded hole or with T-nuts for horizontal or vertical multiple clamping.

MORE INFORMATION

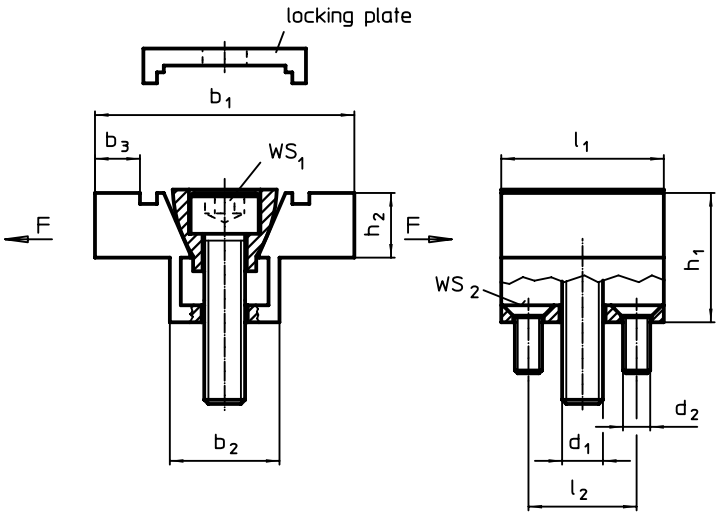
Accessories

T-nuts EH 23010. have to be purchased separately.

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362

DRAWING

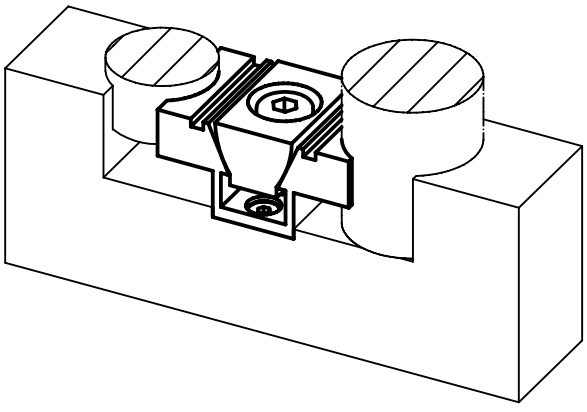


ORDER INFORMATION

Dimensions									WS1	WS2	Clamping force max.	Tightening torque max.		Art. No.
b1	b2	b3 1)	h1	h2	l1	l2	d1	d2						
[mm]									[mm]	[mm]	[kN]	[Nm]	[g]	
38,1	16,1	6,6	19,1	9,4	23,9	15,9	M 6	M4	5	2,5	6,7	14,3	67	23251.0106
50,8	20,8	9,9	25,4	12,7	31,8	20,6	M 8	M4	6	2,5	8,9	14,5	136	23251.0108
76,2	30,9	14,8	38,1	19,1	47,5	30,5	M12	M5	10	3,0	15,6	38,4	443	23251.0112
101,6	41,3	20,3	50,8	25,4	63,5	41,3	M16	M6	14	4,0	26,7	74,6	1068	23251.0116

1) machinable material allowance

APPLICATION EXAMPLE



Stops • cylindrical

EH 23280.



PRODUCT DESCRIPTION

The T-slot guide enables a quick and precise location of the workpiece. The cylindrical form of the stop facilitates to determine the 0-point coordinate. The short form, which is ground to a height tolerance of ± 0,01 mm, can also be used for locating.

Material

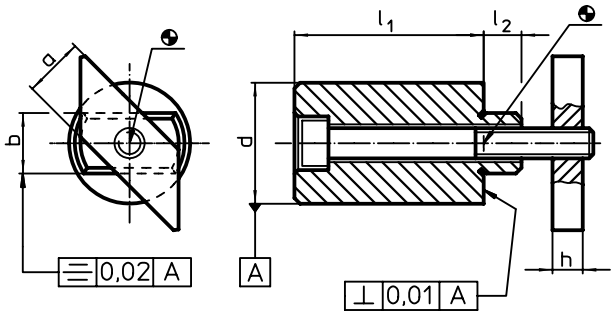
Stop
- Steel, case-hardened, ground

Holding plate
- Steel, blackened

Screw
- Steel, quality 8.8 (ISO 4762)

3

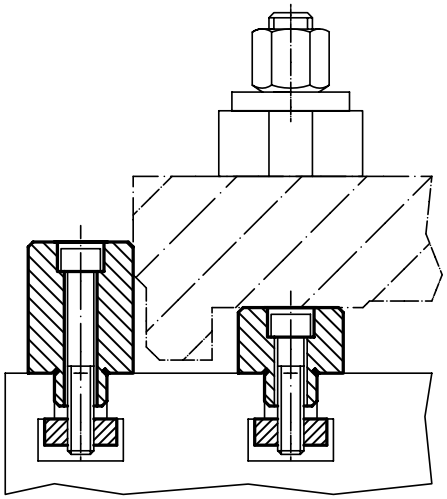
DRAWING



ORDER INFORMATION

T-slot size h6	Dimensions					Screw ISO 4762		Art. No.
	l_1	a -0,6	d ±0,01	h	l_2			
[mm]	[mm]					[mm]	[g]	
10	**15 ±0,01**	10	20	6	8	M 6 x 25	53	23280.0110
	25 ±0,20	10	20	6	8	M 6 x 35	76	23280.0210
12	**15 ±0,01**	12	20	6	8	M 6 x 25	58	23280.0112
	25 ±0,20	12	20	6	8	M 6 x 35	83	23280.0212
14	**25 ±0,01**	14	32	8	9	M 8 x 35	202	23280.0114
	50 ±0,20	14	32	8	9	M 8 x 60	357	23280.0214
16	**25 ±0,01**	16	32	8	10	M 8 x 45	221	23280.0116
	50 ±0,20	16	32	8	10	M 8 x 70	371	23280.0216
18	**25 ±0,01**	18	40	10	15	M10 x 50	371	23280.0118
	50 ±0,20	18	40	10	15	M10 x 75	613	23280.0218
22	**25 ±0,01**	20	40	14	15	M10 x 55	435	23280.0122
	50 ±0,20	20	40	14	15	M10 x 80	679	23280.0222
28	**25 ±0,01**	22	46	16	20	M12 x 60	661	23280.0128
	50 ±0,20	22	46	16	20	M12 x 90	985	23280.0228

APPLICATION EXAMPLE



Pitbull® Clamps

EH 23290.



PRODUCT DESCRIPTION

Pitbull® clamps for low mounting height with a high clamping force and down hold effect. The O-ring serves to lift the clamp off when releasing.

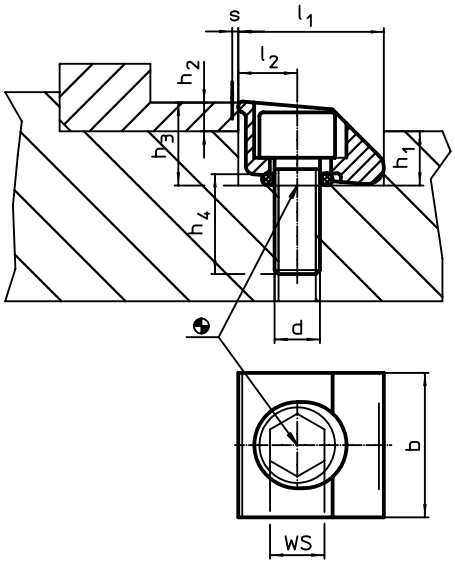
Material

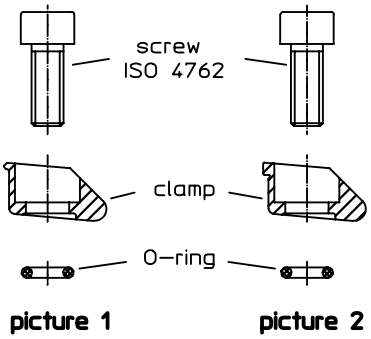
Body
- Steel, hardened

Screw
- Heat-treated steel, heat treated

O-ring
- NBR

DRAWING

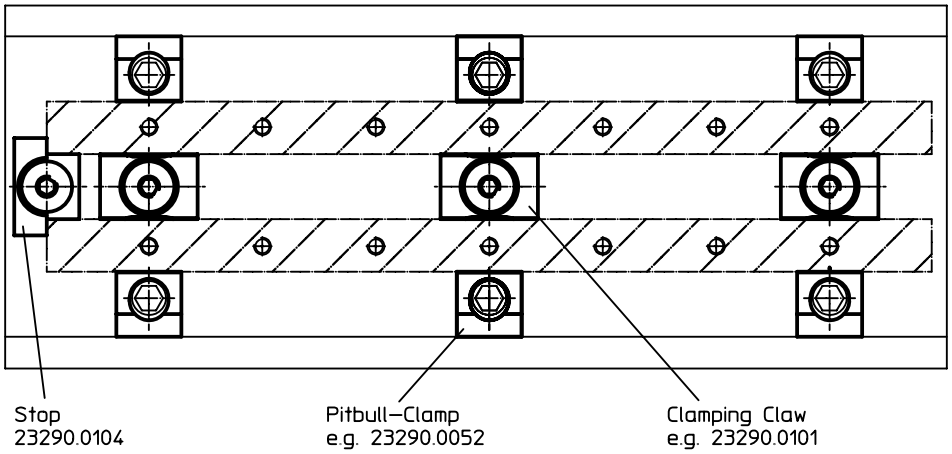




ORDER INFORMATION

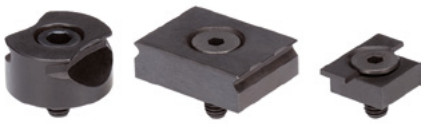
Dimensions								Clamping way s	WS	Clamping force max.	Tightening torque max.				Art. No.
d	b	l_1 H9	l_2	h_1	h_2 min.	h_3 ~	h_4 ~					min.	max.		
[mm]								[mm]	[mm]	[kN]	[Nm]	[°C]		[g]	
with knife edge – picture 1															
M 4	12,7	12,70	5,1	4,8	2,6	7,4	8	0,4	3	2,6	6	-30	80	6	23290.0052
M 6	19,1	19,05	7,6	7,1	3,8	10,9	11	0,6	5	3,8	17	-30	80	20	23290.0054
M10	25,4	25,40	10,2	11,4	6,4	17,8	17	1,2	8	15,0	80	-30	80	63	23290.0056
M12	38,1	38,10	15,2	16,3	9,5	25,8	21	1,9	10	20,8	140	-30	80	206	23290.0058
blunt edged – picture 2															
M 4	12,7	12,70	5,1	4,8	2,6	7,4	8	0,4	3	2,6	6	-30	80	6	23290.0062
M 6	19,1	19,05	7,6	7,1	3,8	10,9	11	0,6	5	5,7	17	-30	80	20	23290.0064
M10	25,4	25,40	10,2	11,4	6,4	17,8	17	1,2	8	15,1	80	-30	80	65	23290.0066
M12	38,1	38,10	15,2	16,3	9,5	25,8	21	1,9	10	22,0	140	-30	80	201	23290.0068

APPLICATION EXAMPLE



Clamping Claws

EH 23290.



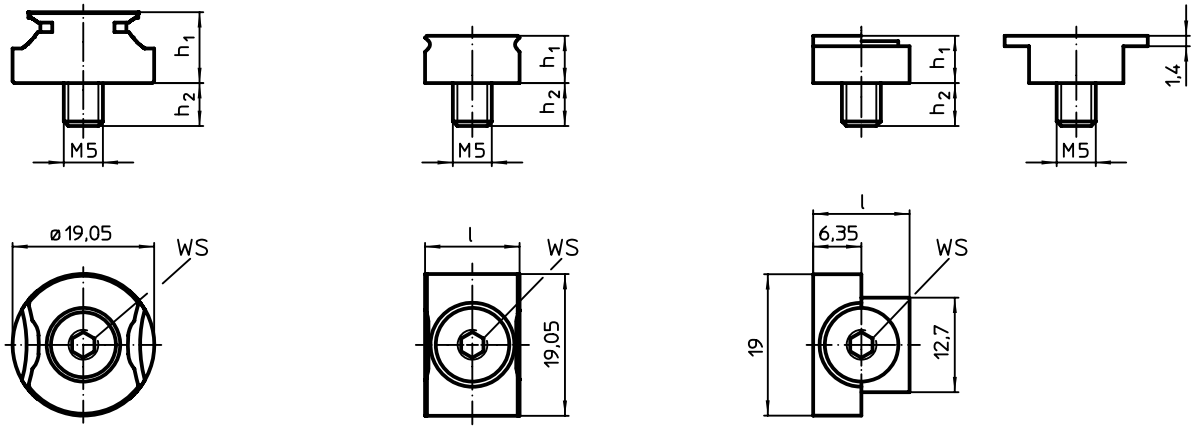
PRODUCT DESCRIPTION

The clamping claws are designated for the installation in clamping chucks and fixtures. Only a counterbore or rather a nut with threaded hole is needed for the installation. The sharp edges of the clamping claw are impressed in the workpiece and therefore they avoid a lateral and horizontal movement.
The stop can be used for the positioning of workpieces.

Material

- Steel, hardened, blackened

DRAWING

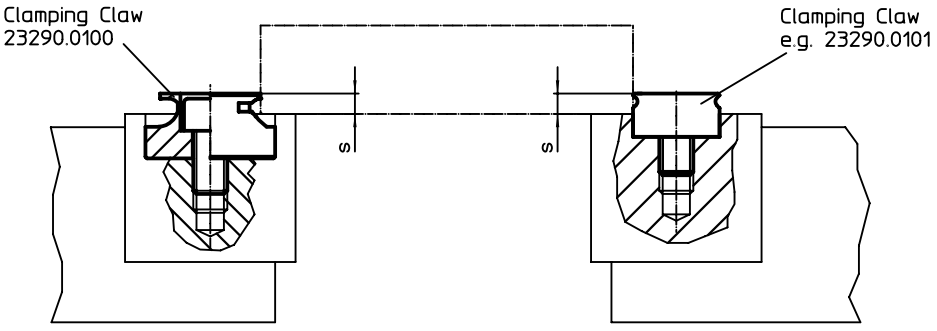


picture 1 picture 2 picture 3

ORDER INFORMATION

Dimensions				WS		Art. No.
l	h_1	h_2 ~	s			
[mm]				[mm]	[g]	
clamping claw, round – picture 1						
–	9,53	5,9	1,5 – 3,0	4	18	23290.0100
clamping claw – picture 2						
12,70	6,35	6,0	1,5 – 1,9	3	12	23290.0101
19,05	7,92	8,1	1,5 – 3,0	3	22	23290.0102
25,40	7,92	8,1	1,5 – 3,0	3	30	23290.0103
stop – picture 3						
12,70	6,35	6,0	–	3	6	23290.0104

APPLICATION EXAMPLE



Supporting Plates

EH 23210.



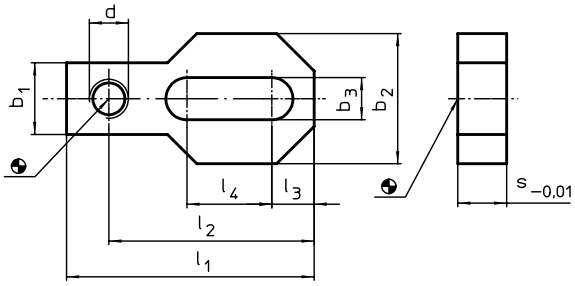
PRODUCT DESCRIPTION

Various seating elements (e.g. pins EH 22690. or self-aligning pads EH 22730., EH 22731. and EH 22740.) can be mounted on the supporting plates.
The supporting plate can be moved flexibly between two threads or T-slots.
Suitable for clamping devices M 20 - M 24.

Material

- Steel, case-hardened

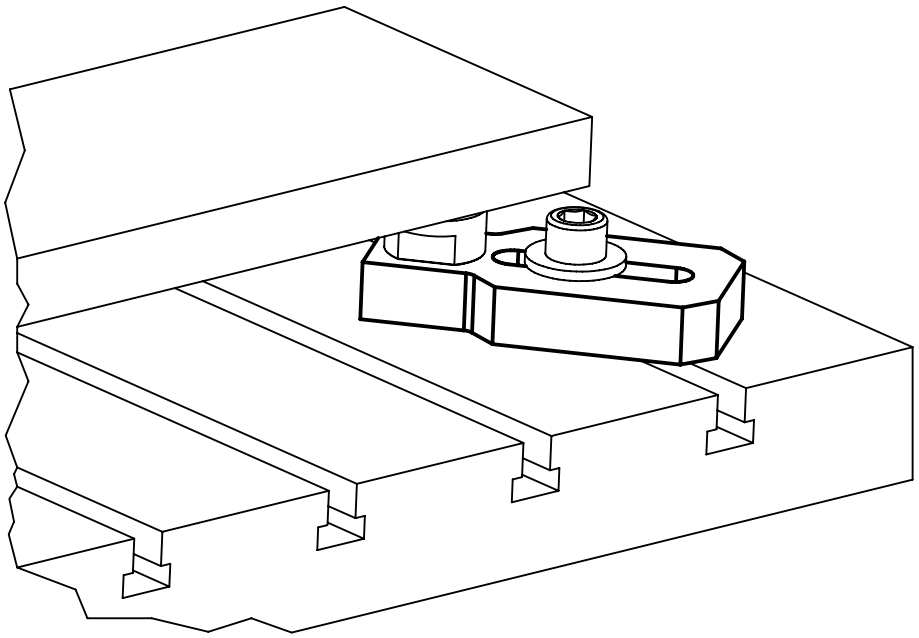
DRAWING



ORDER INFORMATION

d	Dimensions [mm]								[g]	Art. No.
	l_1	l_2	l_3	l_4	b_1	b_2	b_3	s -0,01		
M20	180	150	30	80	60	90	21	**30**	2770	23210.0870
M24	220	188	35	100	70	100	25	**30**	3770	23210.0880

APPLICATION EXAMPLE



Stops

EH 23281.



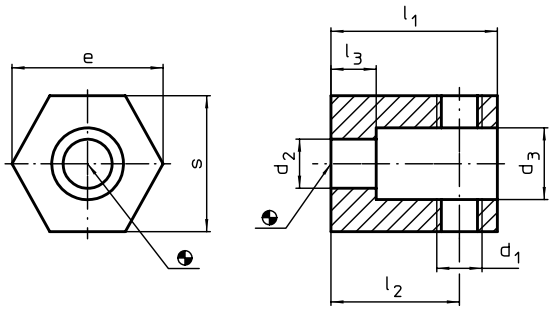
PRODUCT DESCRIPTION

With the stop a flexible stop for a workpiece can be realised.
Together with a grub screw (e.g. EH 22540.), a workpiece can be mounted and aligned.
The grub screw should be secured in position with a hexagon nut.
Suitable for clamping devices M 20 - M 24.

Material

- Steel, blackened

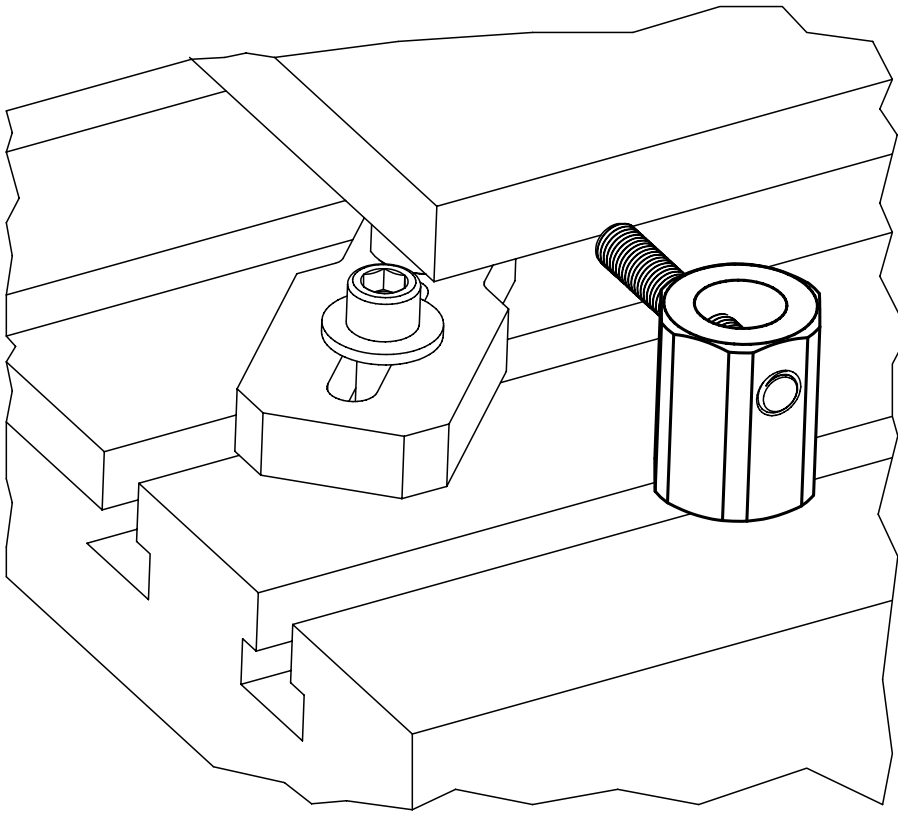
DRAWING



ORDER INFORMATION

Dimensions [mm]								[g]	Art. No.
d_1	d_2	d_3	l_1	l_2	l_3	s	e		
M20	26	38	85	60	20	65	70	1660	23281.0024

APPLICATION EXAMPLE



3

Bedding Supports

EH 23220.



PRODUCT DESCRIPTION

The bedding support is used to **support** overdetermined clamping points on components.
The benefits of the bedding support are:

- Support for unstable components, without distortion
- Eliminates tool vibration during machining
- Compact, low construction
- Supports ribs, beads and shackles, for reinforcement of clamped components
- Distortion-free support of raw parts
- Easy handling
- Flat and long design allows clamping with adjustable clamping lever even outside the workpiece.

Material

Handle
- Zinc die-cast

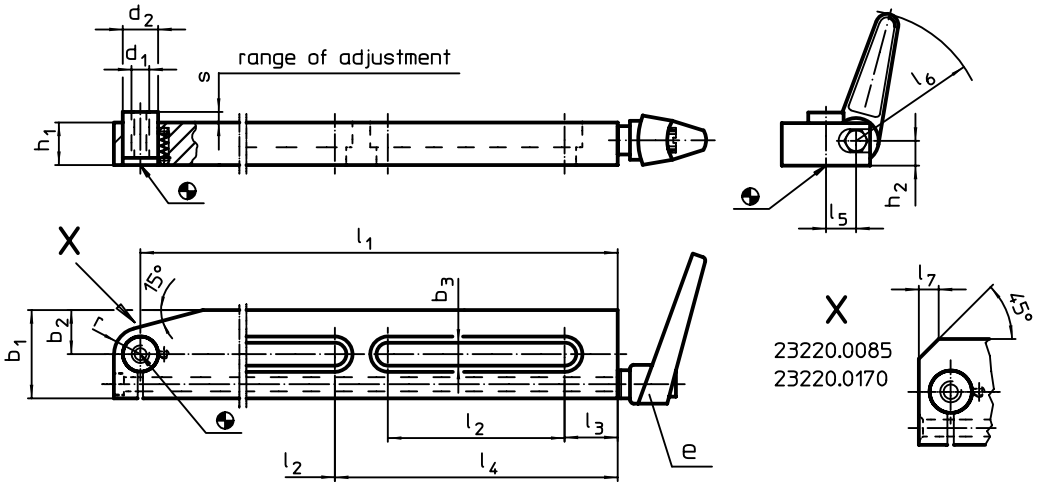
Clamp
- Steel, case-hardened, blackened, ground

Operation

1. By releasing the clamping lever, the support bolt contacts the workpiece with a light spring load.
2. By clamping the clamping lever, the support pin is blocked without displacement.
3. The clamping lever is released after removal of the workpiece. Then push the support pin into the starting position and clamp using the lever.

By screwing grub screws or supports into the support pin's female thread, the support height can be adjusted.

DRAWING

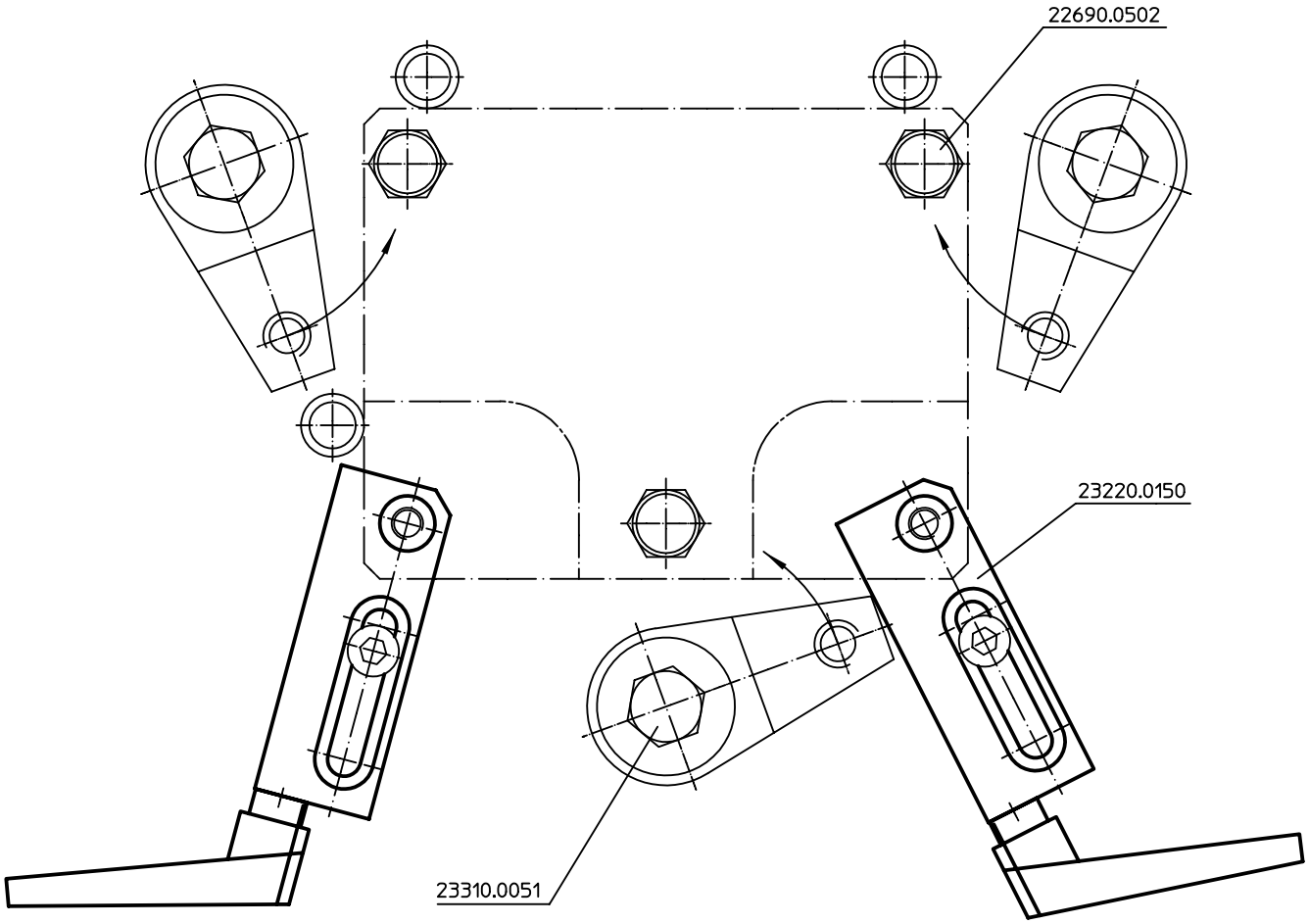


Sizes 8,5 x 75, 13 x 150 and 17 x 170 have only one slot.

ORDER INFORMATION

Dimensions [mm]															Stroke s [mm]	Load capacity max. [kN]	e	[g]	Art. No.
b_3	l_1	l_2	l_3	l_4	l_5	l_6	l_7	b_1	b_2	d_1	d_2	h_1	h_2	r					
8,5	**75**	35	13	–	13	62	5	30	10	M 8	13	19,5	11,5	–	3	0,5	24400.0311	342	23220.0085
13,0	**150**	90	20	–	17	74	–	50	25	M10	20	24,0	14,0	15	6	2,5	24400.0411	1159	23220.0150
17,0	**170**	100	25	–	27	108	11	60	20	M16	26	34,0	21,5	–	11	5,0	24400.0611	2534	23220.0170
13,0	**300**	100	30	160	17	74	–	50	25	M10	20	24,0	14,0	15	6	2,5	24400.0411	2100	23220.0300
25,0	**387**	110	30	200	30	89	–	85	40	M20	32	40,0	25,0	24	11	10,0	24420.0210	7300	23220.0450

APPLICATION EXAMPLE



3

Supporting Elements

EH 23220.



PRODUCT DESCRIPTION

The support element is used to **support** overdetermined clamping points on components.
The benefits of the support element are:

- Support for unstable components
- Eliminates tool vibration during machining
- Supports ribs, beads and shackles, for reinforcement of clamped components
- Distortion-free support of raw parts
- Easy handling

Material

Housing

- Aluminium, red anodised

Body

- Case hardened steel, nitrided, manganese phosphate treated and ground

Assembly

Fix the support element (2 x M 6 thread) onto the device. Pay attention to the operator's side!
Alternative: Dismantle the M 12 x 10 threaded pin and replace it by a M 12 x 30 threaded pin and assemble the support element with a wrench (WS 21), e.g. for T-slot mounting (no defined operator's side ensured). Threaded pin M 12 x 30 and T-nut DIN 508 M 12 x 14, quality 10, are part of the standard supply volume.
Lowering of the support element by 16 mm is possible.

Operation

By turning the clamping cam (WS 6 internal hexagon) on the outer surface of the red protective sleeve, the support pin contacts the workpiece with a slight spring load.

1. By turning on (15 Nm) as far as possible (lock), total of 180°, the clamping mechanism locks the support pin without moving. The support element has been placed onto the workpiece and locked.
2. If turned in the opposite direction (unlock), the clamping is released. If turned back as far as possible, i.e. total of 180° the support pin moves to the end position.

MORE INFORMATION

Notes

For safe functioning, the thread bore M 12 must always be closed.

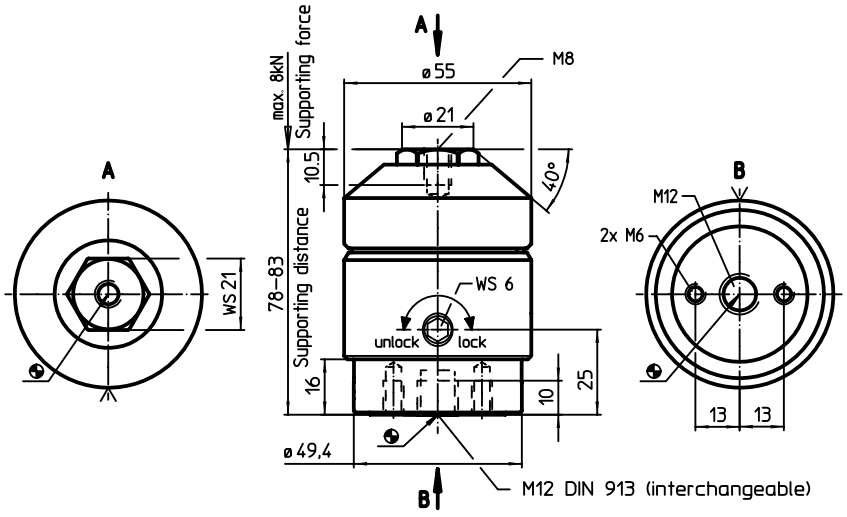
References

Additional flexible possibility of fitting with holding plate 23210.0740.
In the M 8 threaded pin on the support bolt various locating and seating pins (EH 22...) can be mounted. Custom-made extensions can also be fitted.
The clamping height can be increased using height adjusting cylinders EH 23310. and with spacers EH 1107. and EH 1108.

Further products

Holding Plates, for down-hold clamps . → p. 437
Height Adjusting Cylinders . . . . . → p. 505
Spacers . . . . . → p. 725

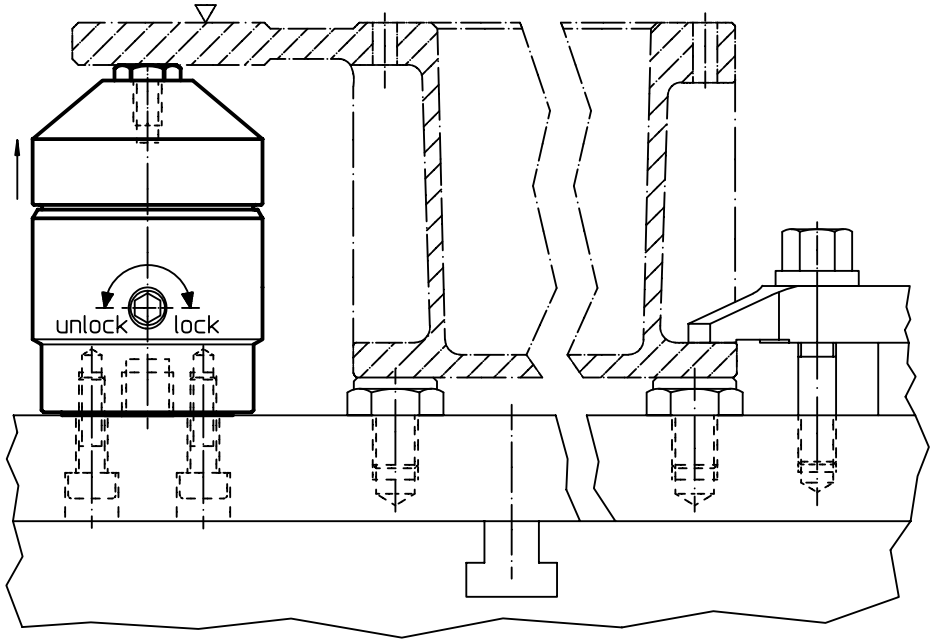
DRAWING

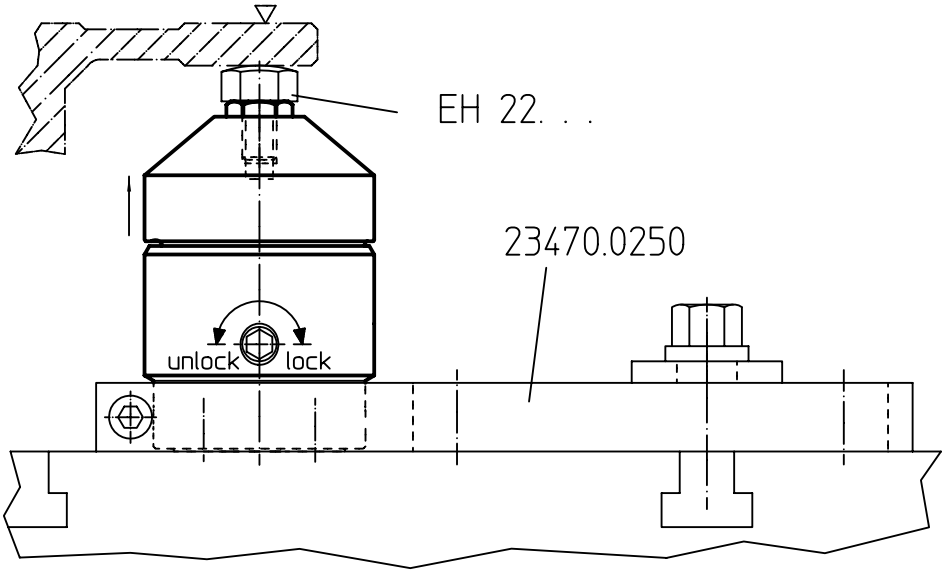


ORDER INFORMATION

[g]	Art. No.
950	23220.0400

APPLICATION EXAMPLE





3

FLOATING CLAMPS

COMPLICATED… AND SENSITIVE? NO PROBLEM.

THE RIGHT CLAMPING ELEMENT FOR EVERY WORK-PIECE.

The floating clamp is used to clamp and support additional clamping points on components. A big plus is the disortion-free clamping of raw materials. Vibrations are avoided during processing. This allows for the distortion-free clamping of such components as ribs and beads.

THEY ARE AVAILABLE IN THREE MODELS:

- M12: combined clamping and locking
- M12: separate clamping and locking
- M16: combined clamping and locking

NEW VERSION ALSO AVAILABLE WITH A COMPACT DESIGN!

Suitable for low clamping heights!

www.halder.com/
FloatingClamps-Video



Floating Clamps • compact construction, combined clamping and locking M 12

EH 23320.



PRODUCT DESCRIPTION

The floating clamp is used to **clamp and support** additional clamping points on components.
The benefits of the floating clamp are:
- Avoids vibration during the processing
- Clamps ribs, beads and shackles to reinforce clamped components
- Distortion-free clamping of raw parts
- Compact version with reduced height.

Material

Adjustable body
- Aluminium, red anodised

Body
- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaw
- Case hardened steel, nitrided, manganese phosphate treated

Assembly

1. Mount the floating clamp onto the device (mounting holes for M 6, see drawing).
2. Adjust the height limit stop and the rotating area with the sleeve, and clamp with set screw (4x WS 2.5). When setting the height limit upwards provide generous clearance (workpiece tolerance).

Operation

1. Push the floating clamp downwards.
2. Pivot the clamping jaws in as far as possible. The floating clamp contacts the bottom of the workpiece with a slight spring load.
3. Tighten the floating clamp with a hexagonal nut (WS 18) having a min. torque of 15 Nm and a maximum torque of 30 Nm. **In the clamping process, the workpiece is clamped and simultaneously supported.**
4. Releasing is done in reverse order.

MORE INFORMATION

Notes

For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalogue drawing: screw ISO 4762 - M8 - 12.9, M max. = 43 Nm).

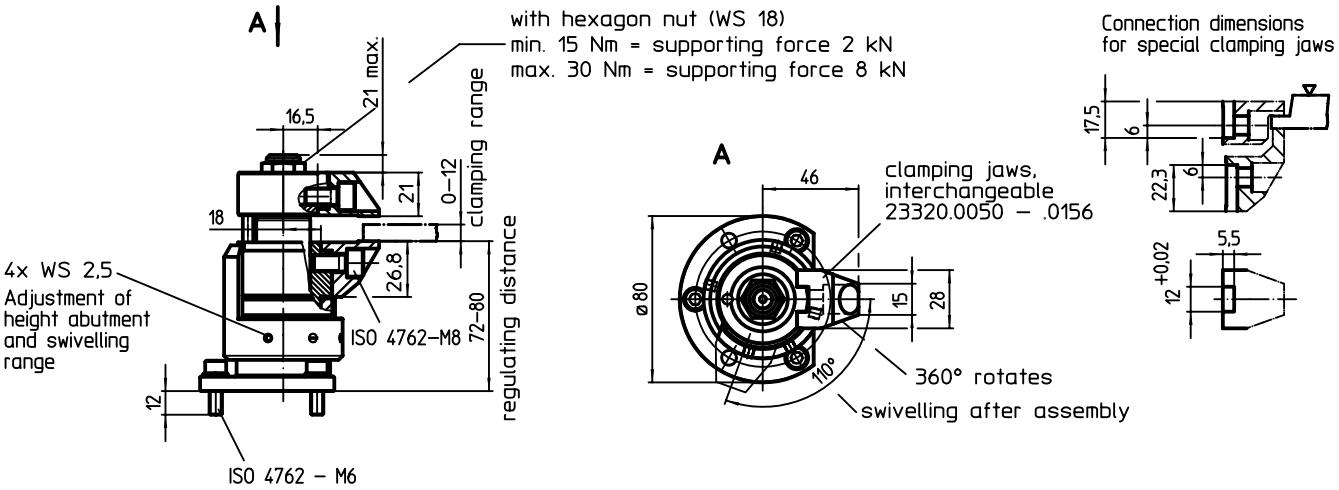
Accessories

As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050 -.0058, as well as pivot jaws, refer to 23320.0148 -.0156.

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362
Nuts for T-Slots, extended. . . . . → p. 366
Standard Clamping Jaws, for floating clamp M 12 . . . . . → p. 471
Clamping Jaws, for floating clamp M 12. . . . . → p. 472

DRAWING

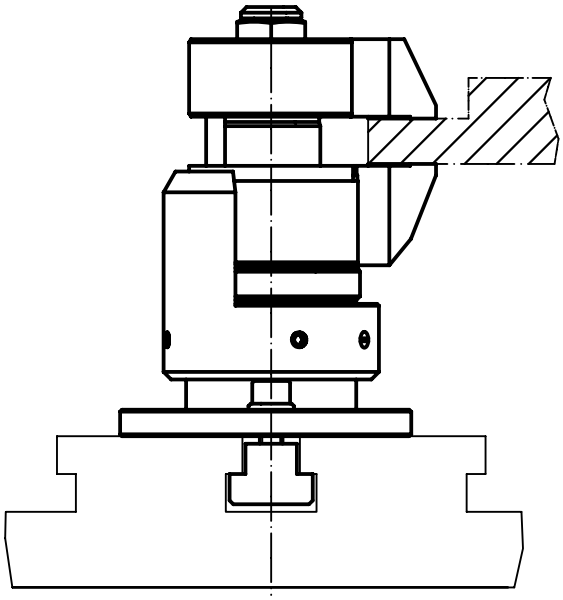


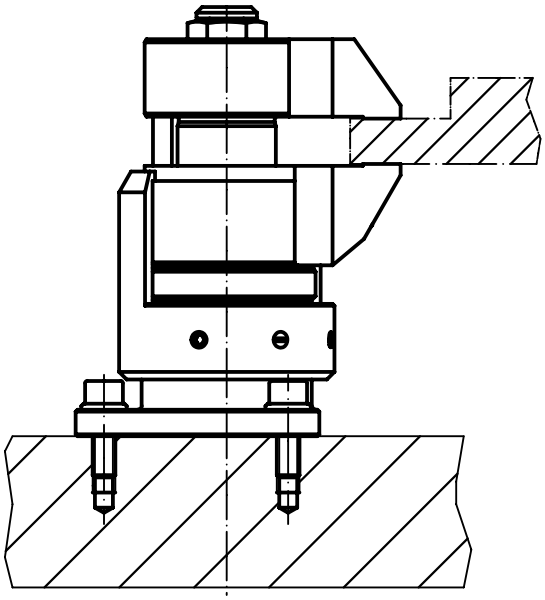
ORDER INFORMATION

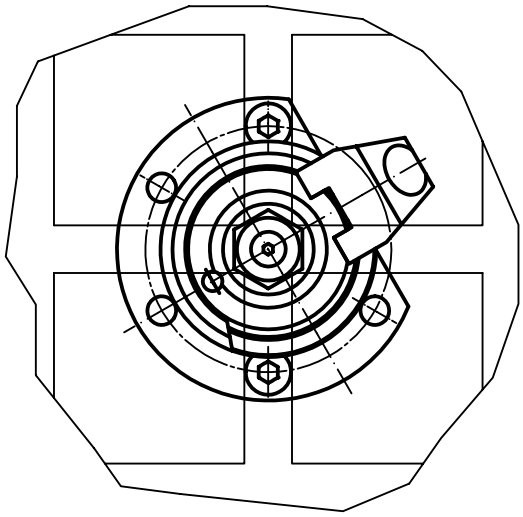
[g]	Art. No.
1450	23320.0008

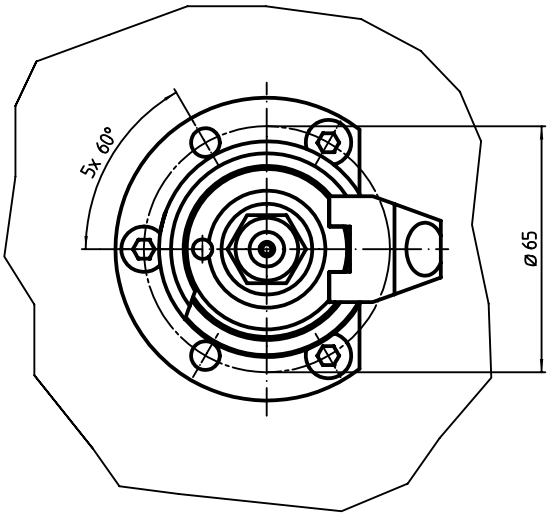
3

APPLICATION EXAMPLE









Floating Clamps • compact construction, separate clamping and locking M 12

EH 23320.



PRODUCT DESCRIPTION

Floating clamp with separate clamping and locking is used to clamp and support additional clamping points **on extremly pliable** workpieces. Both, clamping and supporting force can individually be designed.
The benefits of the floating clamp are:

- Avoids vibration during the processing
- Clamps ribs, beads and shackles to reinforce clamped components
- Distortion-free clamping of raw parts
- Compact version with reduced height.

Material

Adjustable body
- Aluminium, blue anodised

Body
- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaw
- Case hardened steel, nitrided, manganese phosphate treated

Assembly

1. Mount the floating clamp onto the device (mounting holes for M 6, see drawing).
2. Adjust the height limit stop and the rotating area with the sleeve, and clamp with set screw (4x WS 2.5). When setting the height limit upwards provide generous clearance (workpiece tolerance).

Operation

1. Push the floating clamp downwards.
2. Pivot the clamping jaws inwards.
3. Release floating clamp. The bottom jaw contacts the workpiece with the force of the contact spring.
4. Tighten the fixture nut (WS 18) (max. torque 15 Nm). **The jaws clamp the workpiece - the clamp is still floating.**
5. Then tighten the hexagon collar nut (WS 10) (max. torque 10 Nm).
6. The workpiece clamping process is complete.
7. Releasing is performed in the reverse order: release hexagon collar nut (WS 10) - release hexagon nut (WS 18) - pivot out the clamping jaws
8. Floating clamp is in end position.

MORE INFORMATION

Notes

For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalogue drawing: screw ISO 4762 - M8 - 12.9, M max. = 43 Nm).

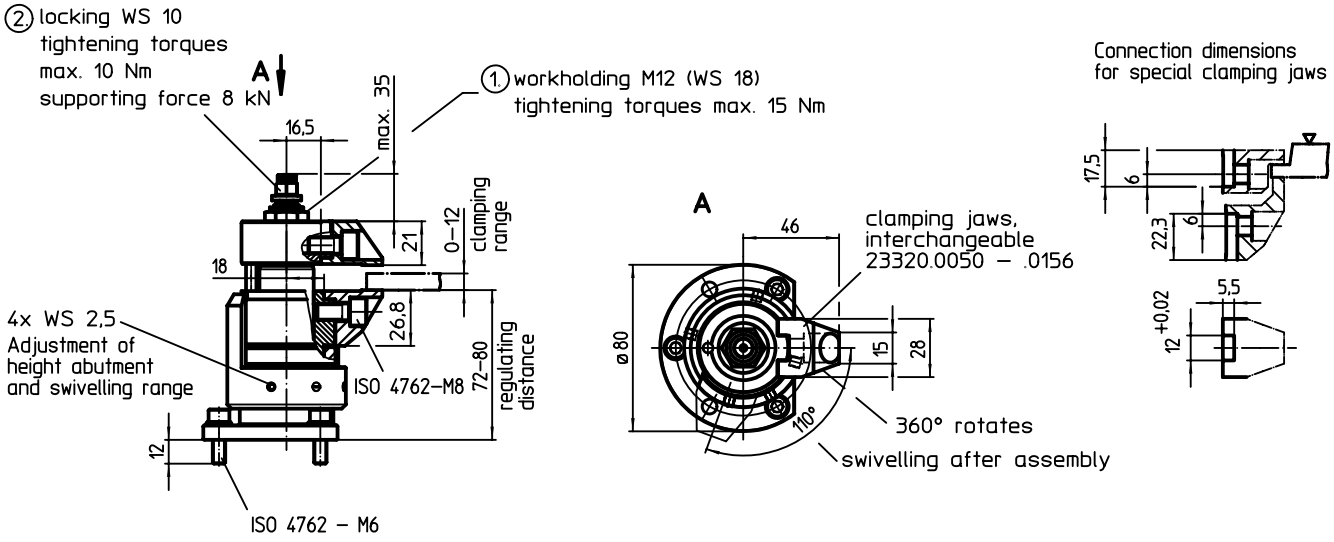
Accessories

As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050 -.0058, as well as pivot jaws, refer to 23320.0148 -.0156.

Further products

Nuts for T-Slots, DIN 508 . . . . . → p. 362
Nuts for T-Slots, extended. . . . . → p. 366
Standard Clamping Jaws, for floating clamp M 12 . . . . . → p. 471
Clamping Jaws, for floating clamp M 12. . . . . → p. 472

DRAWING

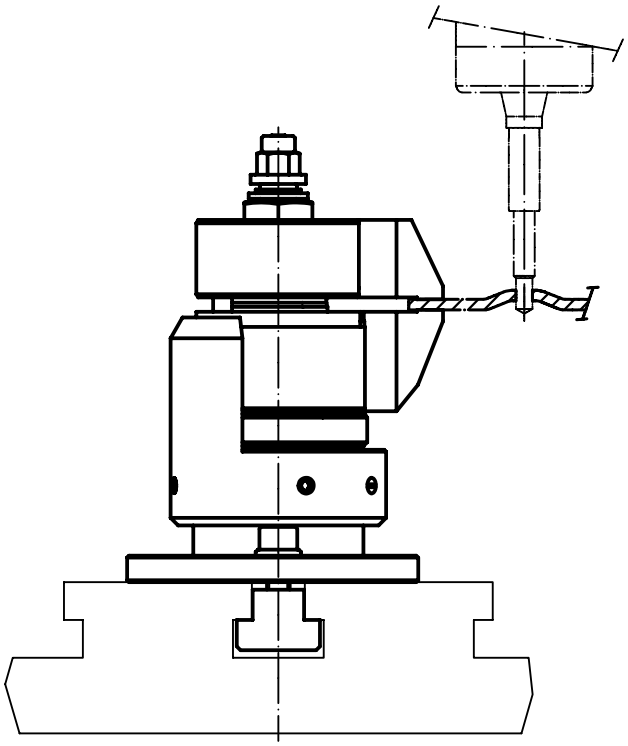


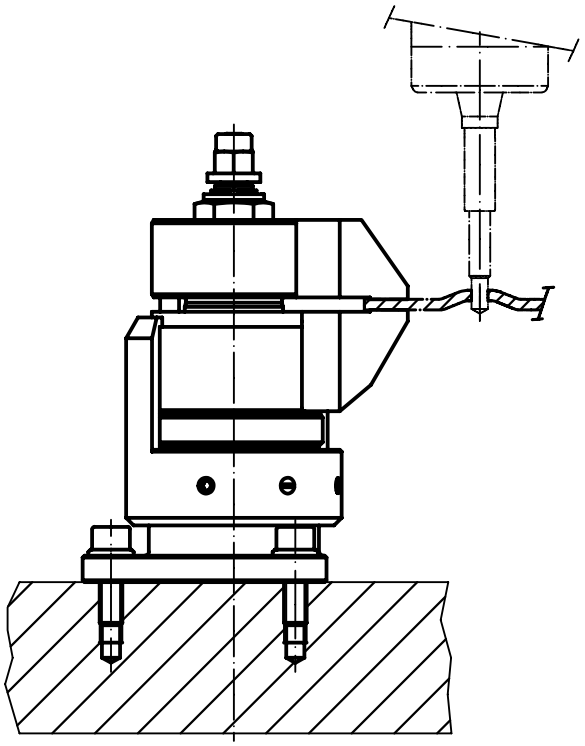
ORDER INFORMATION

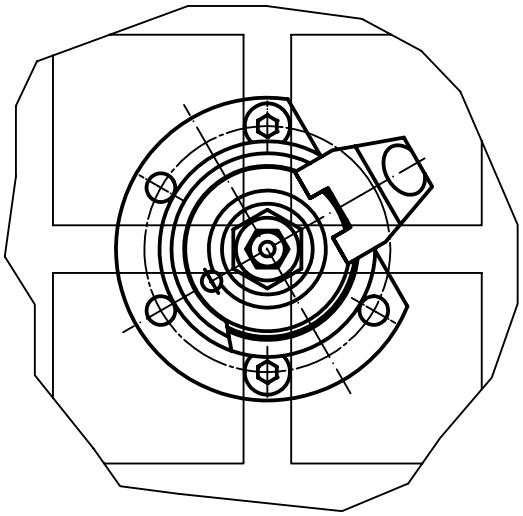
[g]	Art. No.
1650	23320.0010

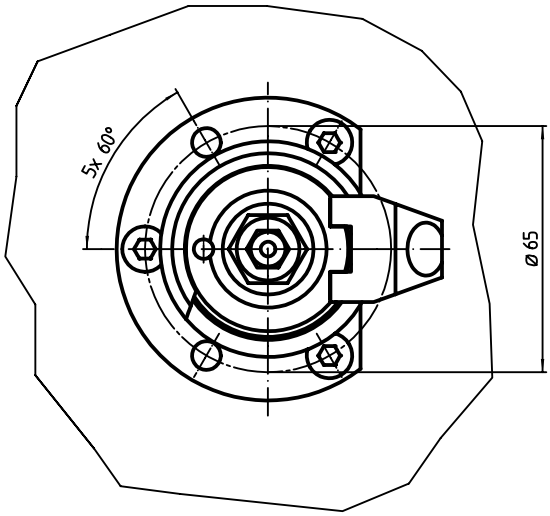
3

APPLICATION EXAMPLE









Floating Clamps • combined clamping and locking M 12

EH 23320.



PRODUCT DESCRIPTION

The floating clamp is used to **clamp and support** additional clamping points on components.
The benefits of the floating clamp are:
- Avoids vibration during the processing
- Clamps ribs, beads and shackles to reinforce clamped components
- Distortion-free clamping of raw parts.

Material

Adjustable body
- Aluminium, red anodised

Body
- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaw
- Case hardened steel, nitrided, manganese phosphate treated

Assembly

1. Mount the floating clamp (M 12 connection thread) onto the device with a wrench (WS 46).
2. Adjust the height limit stop and the rotating area with the red sleeve and clamp with a set screw (3 x WS 2.5). When setting the height limit, consider tolerance of workpiece.

Operation

1. Push the floating clamp downwards.
2. Pivot the clamping jaws in as far as possible. The floating clamp contacts the bottom of the workpiece with a slight spring load.
3. Tighten the floating clamp with a hexagonal nut (WS 18) having a min. torque of 15 Nm and a maximum torque of 30 Nm. **In the clamping process, the workpiece is clamped and simultaneously supported.**
4. Releasing is done in reverse order.

MORE INFORMATION

Notes

The thread bore must always be closed for safe functioning, e.g. set screw M 12 x 10. For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalogue drawing: screw ISO 4762 - M8 - 12.9, M max. = 43 Nm).

References

Additional flexible possibility of fitting with holder 23470.0250 or holding plate for down-hold clamps 23210.0740.

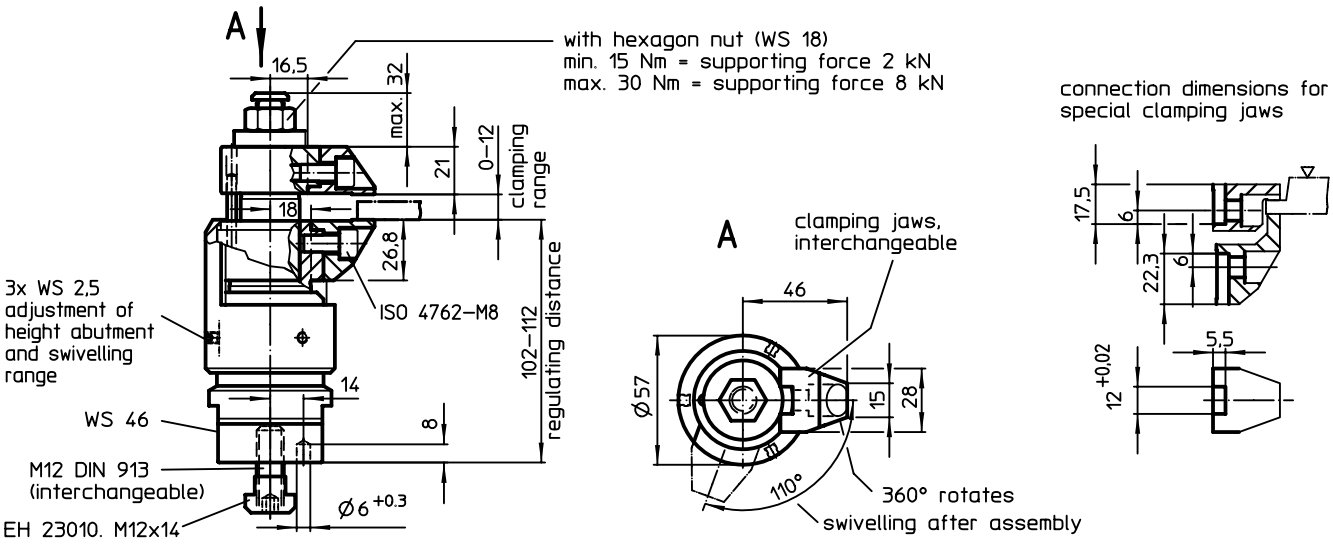
Accessories

As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050 -.0058, as well as pivot jaws, refer to 23320.0148 -.0156.

Further products

Holding Plates, for down-hold clamps . → p. 437
Floating Clamps, separate clamping and locking M 12 . . . . . → p. 469
Standard Clamping Jaws, for floating clamp M 12 . . . . . → p. 471
Clamping Jaws, for floating clamp M 12. . . . . → p. 472

DRAWING

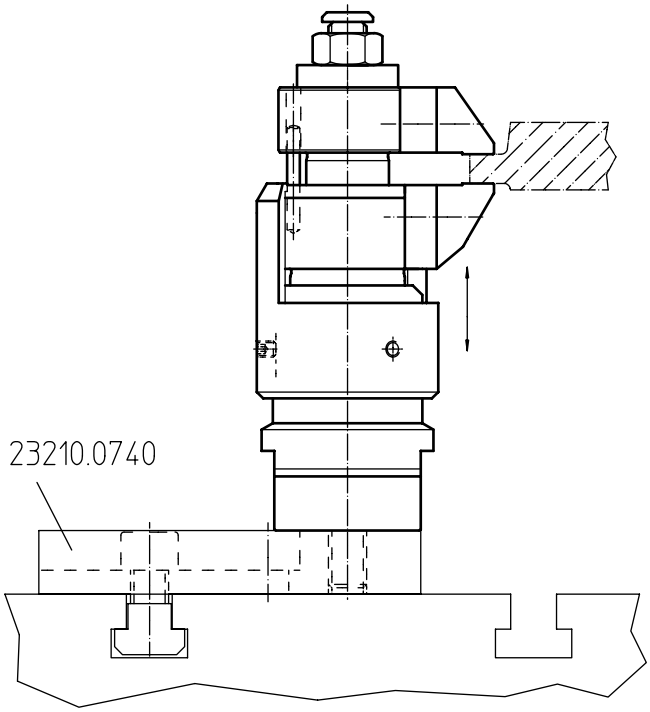


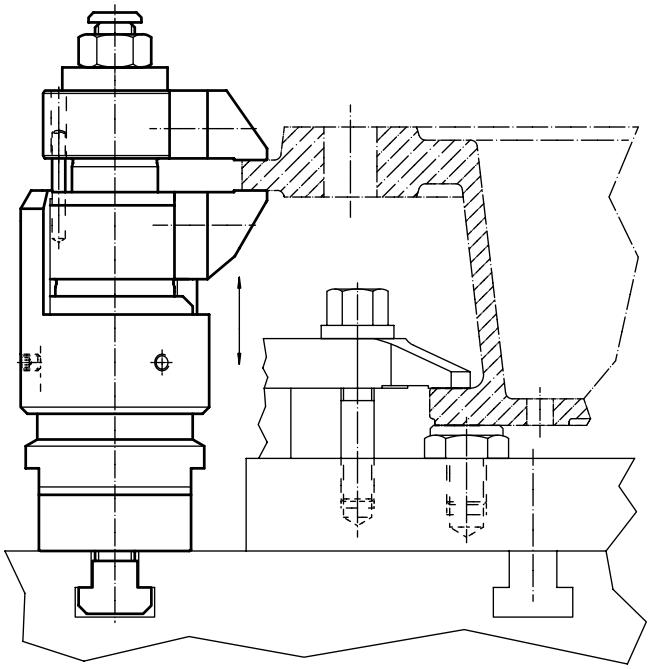
ORDER INFORMATION

[g]	Art. No.
2076	23320.0012

3

APPLICATION EXAMPLE





Floating Clamps • separate clamping and locking M 12

EH 23320.



PRODUCT DESCRIPTION

Floating clamp with separate clamping and locking is used to clamp and support additional clamping points **on extremly pliable** workpieces. Both, clamping and supporting force can individually be designed.
The benefits of the floating clamp are:

- Avoids vibration during the processing
- Clamps ribs, beads and shackles to reinforce clamped components
- Distortion-free clamping of raw parts.

Material

Adjustable body
- Aluminium, blue anodised

Body
- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaw
- Case hardened steel, nitrided, manganese phosphate treated

Assembly

1. Mount the floating clamp (M 12 connection thread) onto the device with a wrench (WS 46).
2. Adjust the height limit stop and the rotating area with the blue sleeve and clamp with a set screw (3 x WS 2.5). When setting the height limit, consider tolerance of workpiece.

Operation

1. Push the floating clamp downwards.
2. Pivot the clamping jaws inwards.
3. Release floating clamp. The bottom jaw contacts the workpiece with the force of the contact spring.
4. Tighten the fixture nut (WS 18) (max. torque 15 Nm). **The jaws clamp the workpiece - the clamp is still floating.**
5. Then tighten the hexagon collar nut (WS 10) (max. torque 10 Nm).
6. The workpiece clamping process is complete.
7. Releasing is performed in the reverse order: release hexagon collar nut (WS 10) - release hexagon nut (WS 18) - pivot out the clamping jaws
8. Floating clamp is in end position.

MORE INFORMATION

Notes

The thread bore must always be closed for safe functioning, e.g. set screw M 12 x 10. For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalogue drawing: screw ISO 4762 - M8 - 12.9, M max. = 43 Nm).

References

Additional flexible possibility of fitting with holder 23470.0250 or holding plate for down-hold clamps 23210.0740.

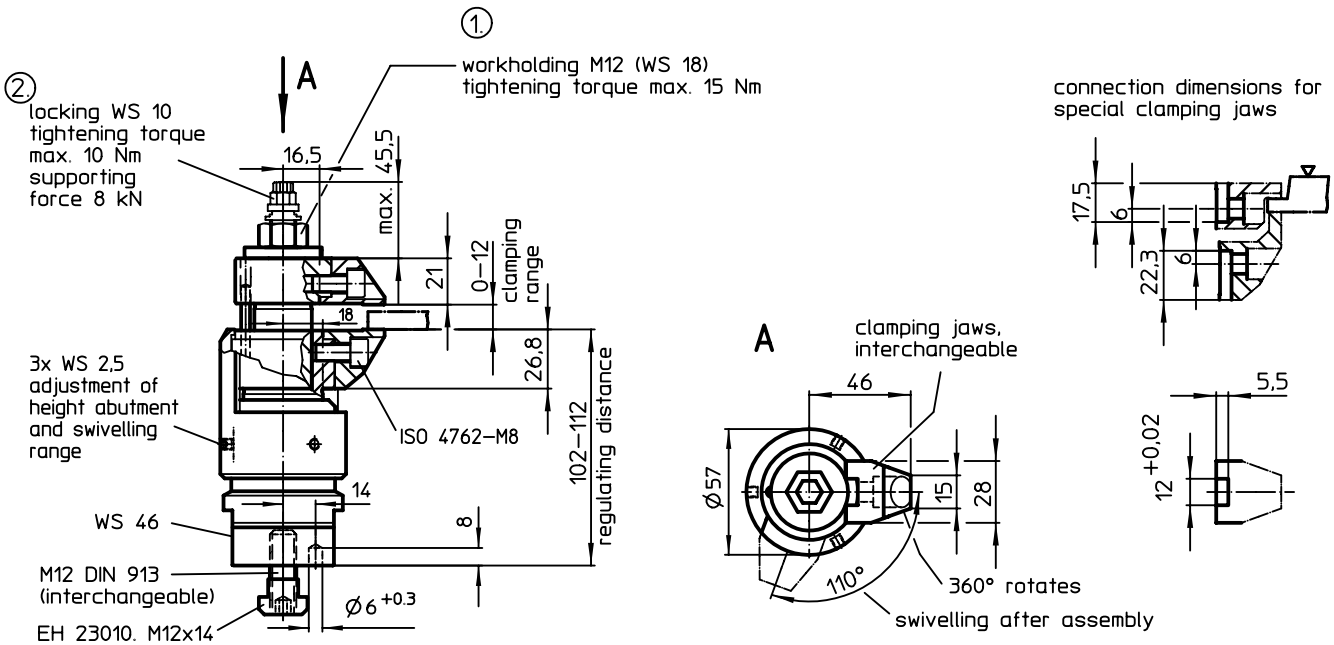
Accessories

As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050 -.0058, as well as pivot jaws, refer to 23320.0148 -.0156.

Further products

Holding Plates, for down-hold clamps . → p. 437
Floating Clamps, combined clamping and locking M 12 . . . . . → p. 467
Standard Clamping Jaws, for floating clamp M 12 . . . . . → p. 471
Clamping Jaws, for floating clamp M 12. . . . . → p. 472

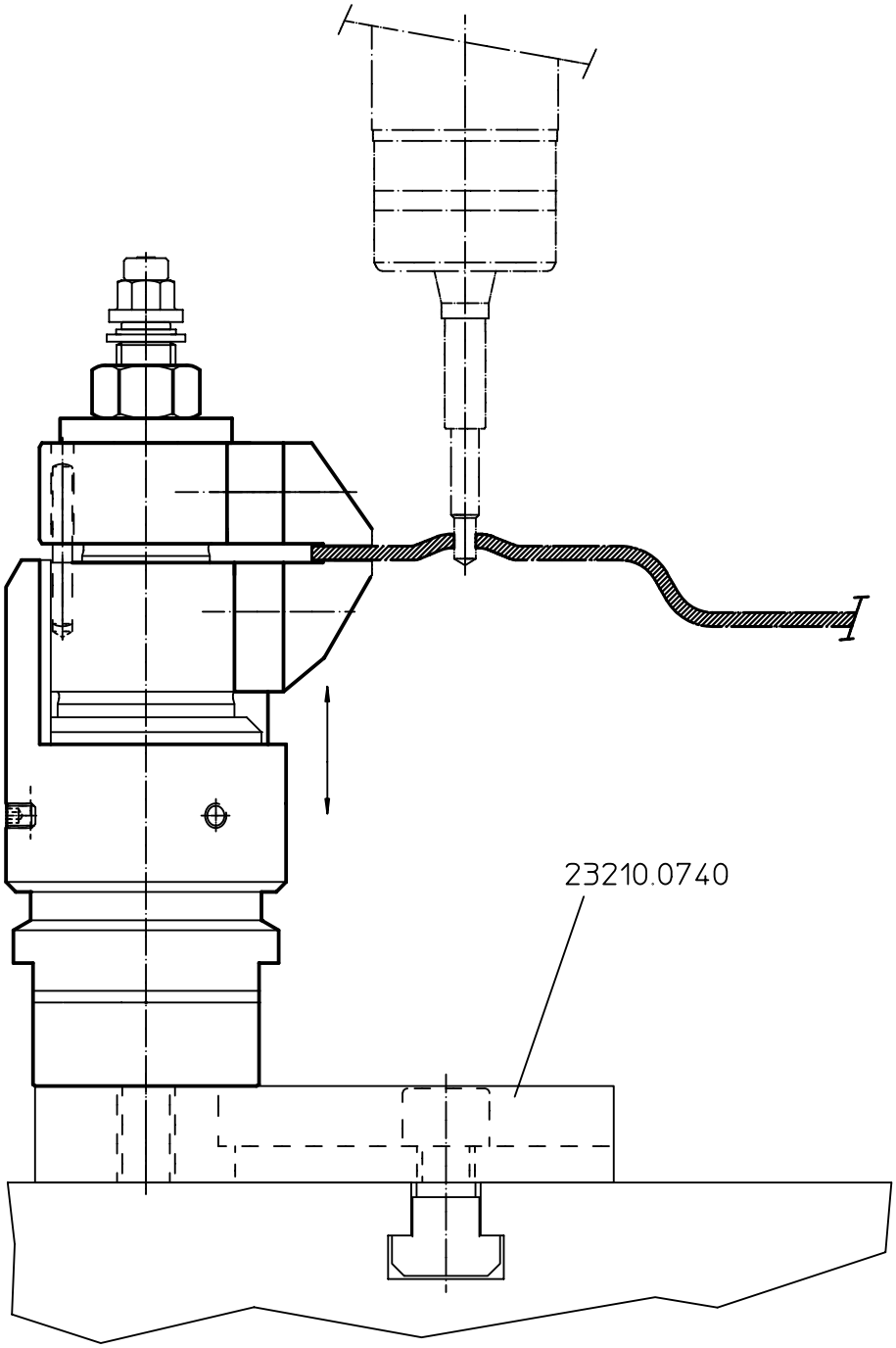
DRAWING



ORDER INFORMATION

[g]	Art. No.
1890	23320.0014

APPLICATION EXAMPLE



Standard Clamping Jaws • for floating clamp M 12

EH 23320.



PRODUCT DESCRIPTION

The clamping jaws can be used for floating clamps 23320.0008, 23320.0010, 23320.0012, and 23320.0014.

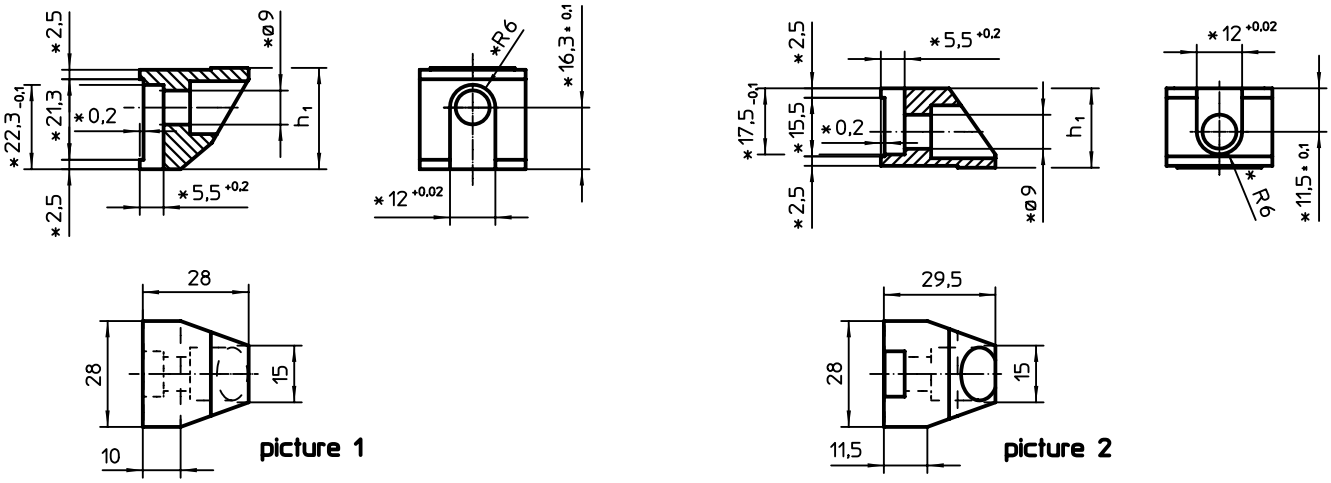
Material

- Case hardened steel, nitrided, manganese phosphate treated

Assembly

When using custom-made jaws, it is important to insert the tightening screw (M 8-12.9, 43 Nm) 10 mm deep into the clamp housing on the upper clamping jaw and 9 mm deep into the clamp housing on the lower clamping jaw.

DRAWING



* Specifications and material of especially designed jaws have to be taken into consideration.

ORDER INFORMATION

Clamping range [mm]	Dimensions h_1 -0,1 [mm]	[g]	Art. No.
lower standard clamping jaw – picture 1			
–	26,8	83	23320.0050
upper standard clamping jaw – picture 2			
0 – 12	21,0	69	23320.0052

3

Clamping Jaws • for floating clamp M 12

EH 23320.



PRODUCT DESCRIPTION

The clamping jaws can be used for floating clamps 23320.0008, 2332.0010, 23320.0012, and 23320.0014.
The upper clamping jaw (23320.0054, 23320.0056, and 23320.0058 - pictures 1 to 3) can be used to extend the clamping range.
Various standard parts can be screwed into in the upper clamping jaw as required, using female thread M 8 (23320.0154 / .0156 - pictures 4 and 5) - see "Further products".
The lower clamping jaw with pivot function (23320.0148 - picture 6) adapts to the profiles of the workpiece.

Material

Ball
- Ball-bearing steel

Clamping jaw
- Case hardened steel, nitrided, manganese phosphate treated

MORE INFORMATION

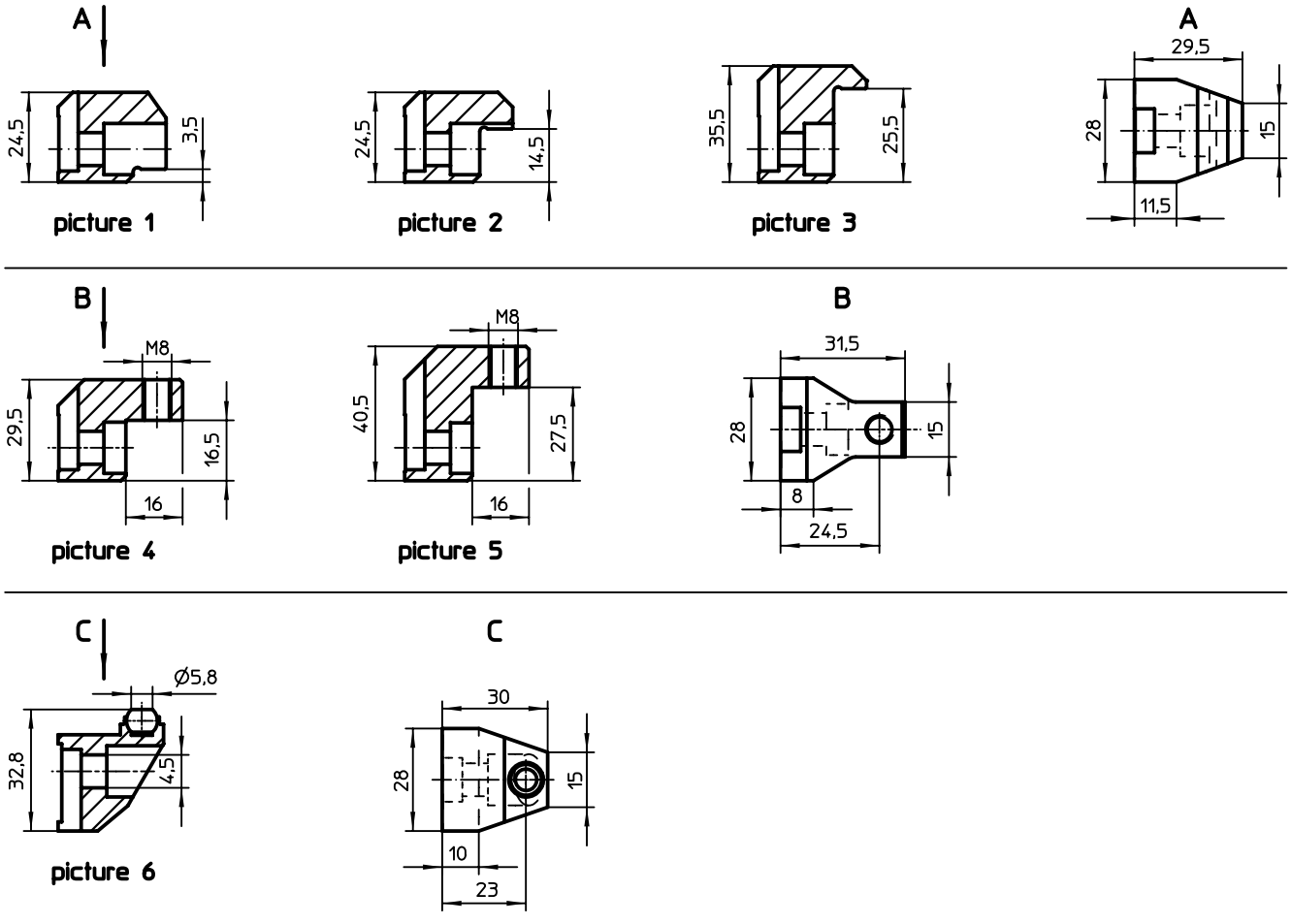
Notes

The tightening torque of the floating clamp must be adapted/reduced situationally.
Observe the surface pressure due the the reduced contact surface of the clamping jaws.

Further products

Seating Pins, ribbed or pointed . . . . . → p. 286
Ball-Ended Thrust Screws, headless, ball protected against rotating . . . . . → p. 297
Ball-Ended Thrust Screws, headless, flat-faced ball . . . . . → p. 304
Thrust Screws, with brass pad . . . . . → p. 311
Thrust Screws, with plastic pad . . . . . → p. 312
Self-Aligning Pads, adjustable . . . . . → p. 320
Self-Aligning Pads, adjustable with self-resetting . . . . . → p. 321

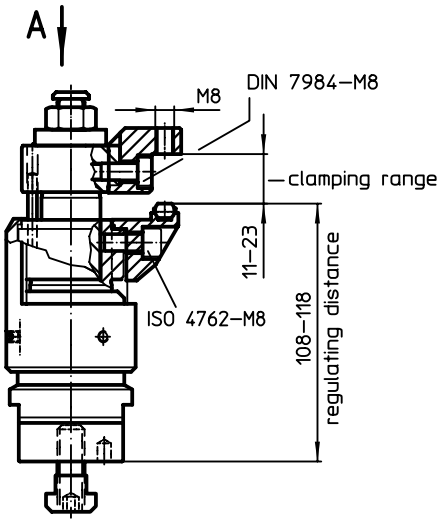
DRAWING

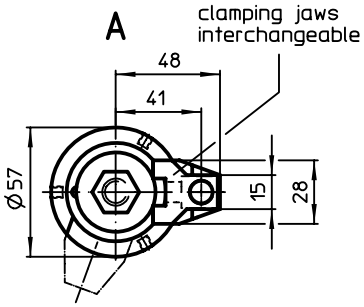


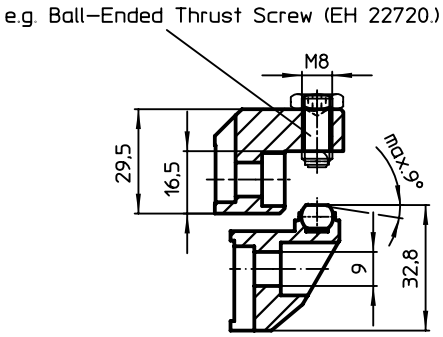
ORDER INFORMATION

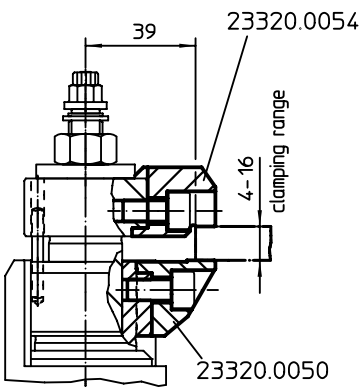
Clamping range max. in combination with 23320.0050 [mm]	Clamping range max. in combination with 23320.0148 [mm]	[g]	Art. No.
upper exchange clamping jaw – picture 1			
4 – 16	**–**	91	**23320.0054**
upper exchange clamping jaw – picture 2			
15 – 27	**–**	88	**23320.0056**
upper exchange clamping jaw – picture 3			
26 – 38	**–**	130	**23320.0058**
upper clamping jaw with location hole – picture 4			
29	**23**	83	**23320.0154**
upper clamping jaw with location hole – picture 5			
40	**34**	112	**23320.0156**
lower clamping jaw with flat-faced ball and pivot function, plain surface, protected against rotating – picture 6			
–	**–**	98	**23320.0148**

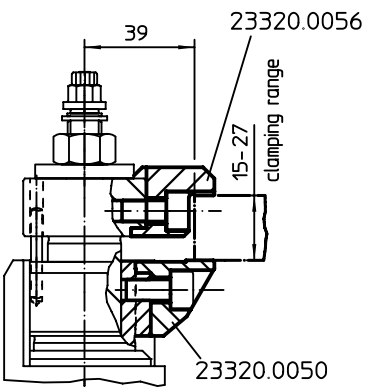
APPLICATION EXAMPLE

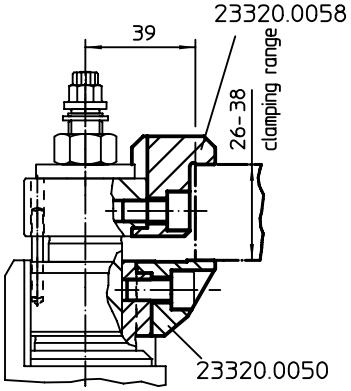


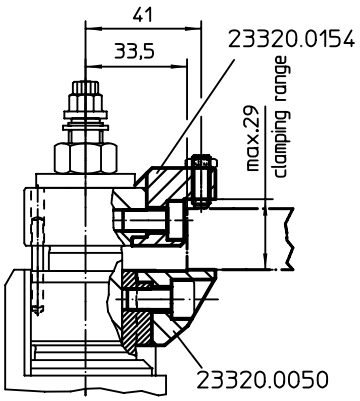


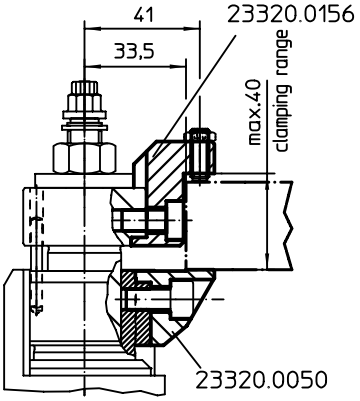


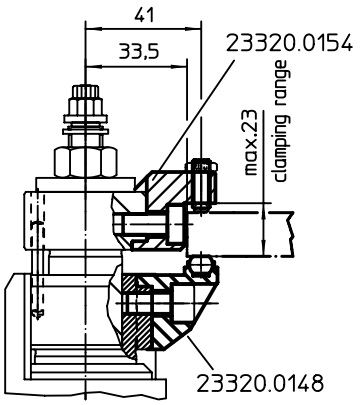

39
23320.0054
4–16
clamping range
23320.0050

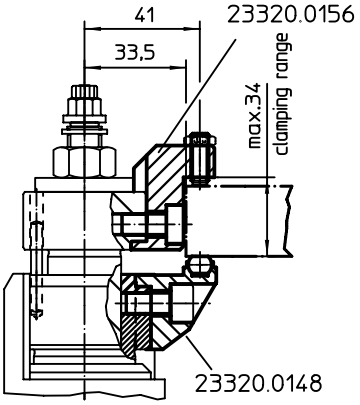

39
23320.0056
15–27
clamping range
23320.0050


39
23320.0058
26–38
clamping range
23320.0050


41
33,5
23320.0154
max.29
clamping range
23320.0050


41
33,5
23320.0156
max.40
clamping range
23320.0050


41
33,5
23320.0154
max.23
clamping range
23320.0148


41
33,5
23320.0156
max.34
clamping range
23320.0148

Floating Clamps • combined clamping and locking M 16

EH 23320.



PRODUCT DESCRIPTION

The floating clamp is used to **clamp and support** additional clamping points on components.
The benefits of the floating clamp are:

- Especially suitable for large workpieces with heavy machining
- Avoids vibration during the processing
- Clamps ribs, beads and shackles to reinforce clamped components
- Distortion-free clamping of raw parts

Material

Adjustable body
- Aluminium, red anodised

Body
- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaw
- Case hardened steel, nitrided, manganese phosphate treated

Assembly

1. Mount the floating clamp (M 16 connection thread) onto the device with a wrench (WS 55).
2. Adjust the height limit stop and the rotating area with the red sleeve and clamp with a set screw (3 x WS 3). When setting the height limit, consider tolerance of workpiece.

Operation

1. Push the floating clamp downwards.
2. Pivot the clamping jaws in as far as possible. The floating clamp contacts the bottom of the workpiece with a low spring load.
3. Tighten the floating clamp with a hexagonal nut (WS 24) having a min. torque of 50 Nm and a maximum torque of 115 Nm. **In the clamping process, the workpiece is clamped and simultaneously supported.**
4. Releasing is done in reverse order.

MORE INFORMATION

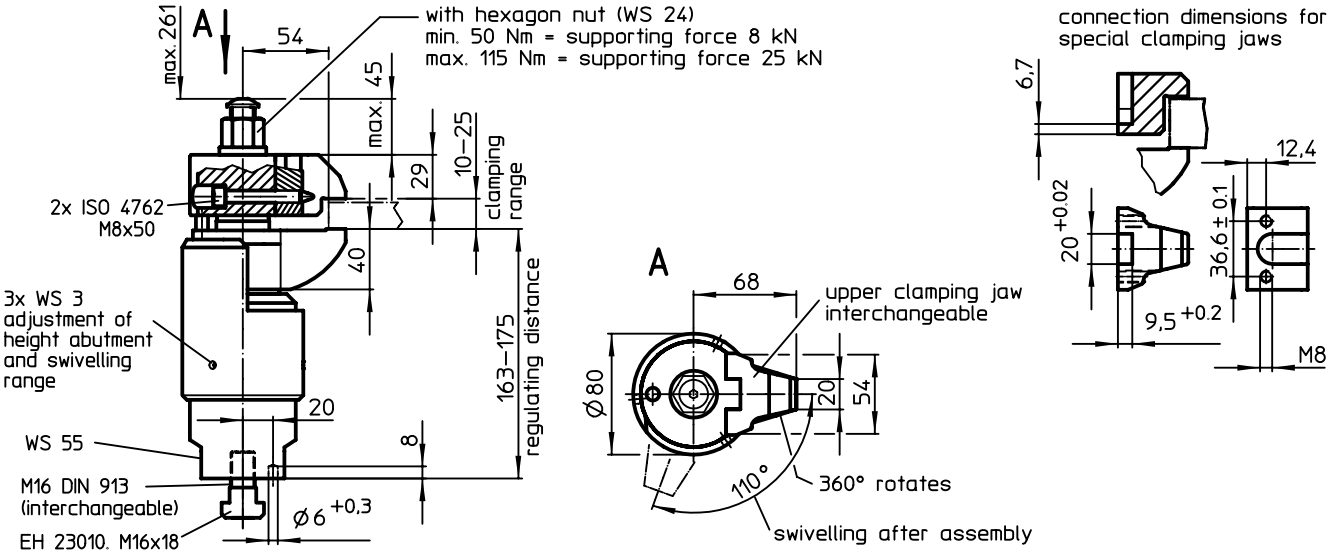
Accessories

For custom clamping situation, the standard upper clamping jaw supplied can be replaced by the exchange clamping jaws (23320.0062 / .0064 / .0066).

Further products

Clamping Jaws, for floating clamp M 16. . . . . → p. 477
Wrenches . . . . . → p. 748

DRAWING

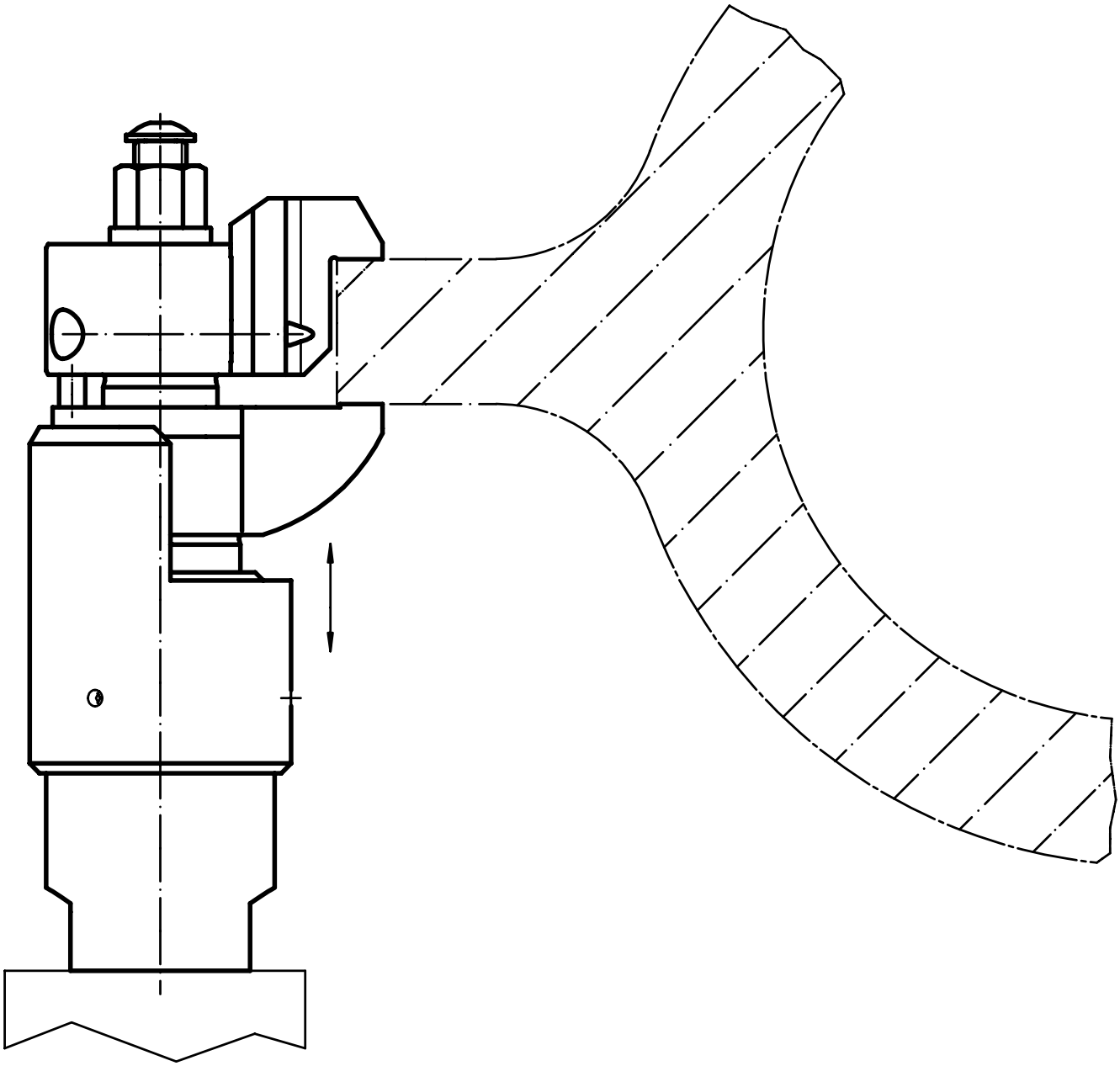


ORDER INFORMATION

[g]	Art. No.
6250	23320.0016

3

APPLICATION EXAMPLE



Clamping Jaws • for floating clamp M 16

EH 23320.



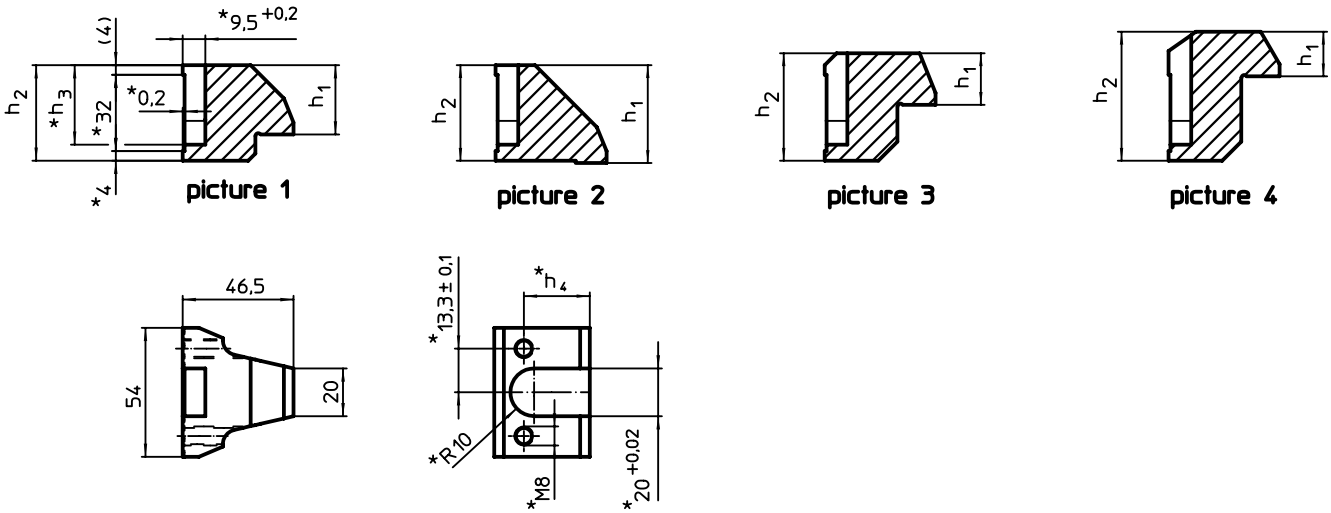
PRODUCT DESCRIPTION

The clamping jaws can be used for the floating clamp 23320.0016 to increase or decrease the clamping range.

Material

- Case hardened steel, nitrided, manganese phosphate treated

DRAWING

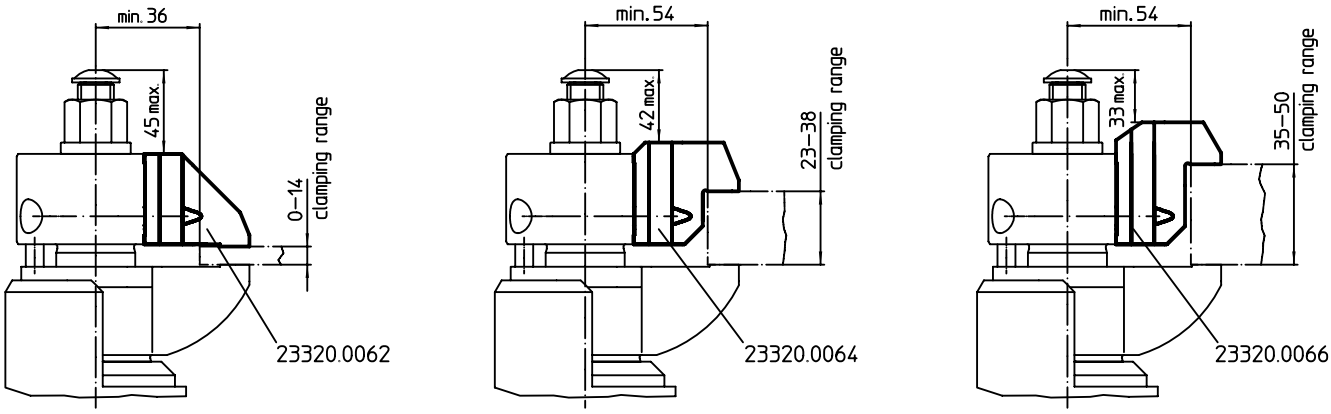


* Specifications and material of especially designed jaws have to be taken into consideration.

ORDER INFORMATION

Clamping range	Dimensions					Art. No.
	h_1	h_2	h_3	h_4		
[mm]	[mm]				[g]	
upper standard clamping jaw – picture 1						
10 – 25	29,0	40	33,3	27,6	402	23320.0060
upper exchange clamping jaw – picture 2						
0 – 14	41,0	40	33,3	27,6	380	23320.0062
upper exchange clamping jaw – picture 3						
23 – 38	21,6	45	38,3	32,6	435	23320.0064
upper exchange clamping jaw – picture 4						
35 – 50	18,6	54	47,3	41,6	490	23320.0066

APPLICATION EXAMPLE



3

Clamping Devices "actima"

EH 23260.



PRODUCT DESCRIPTION

The compact clamping element can be converted between pull and push clamping strain, depending on the model. The travel path is 10 mm. Within the short clamp travel of 2 mm, self-locking occurs in any position. The maximum permitted clamping force is 4.9 kN.

Material

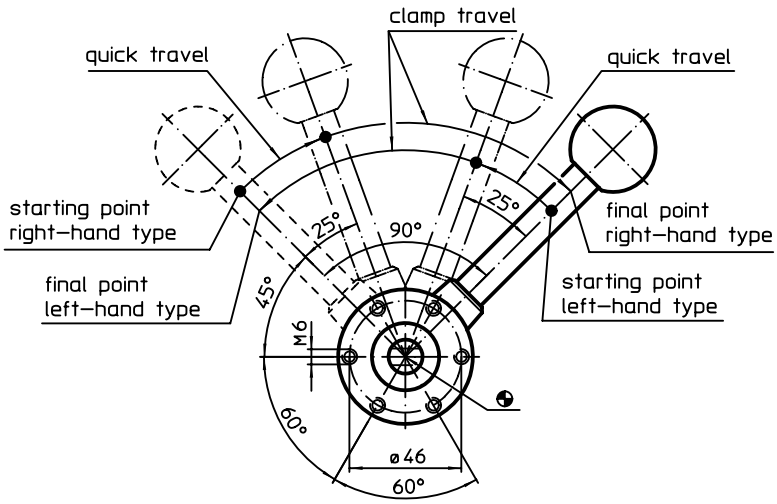
Housing
- Thermoplastic, black

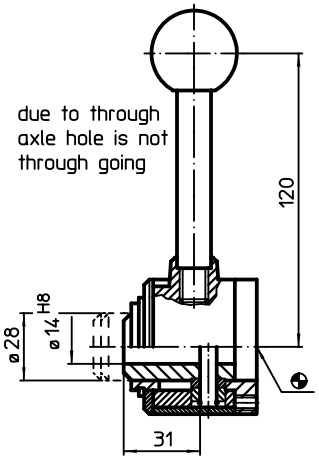
Body
- Steel, blackened

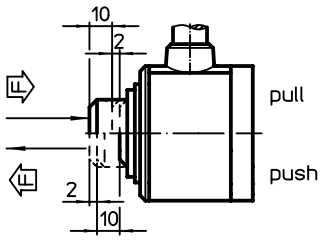
Ball knob
- DIN 7708 - thermosetting plastic (PF 31), red similar to RAL 3003

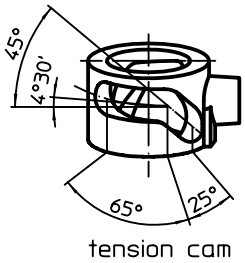
Accessories
- Steel, blackened

DRAWING

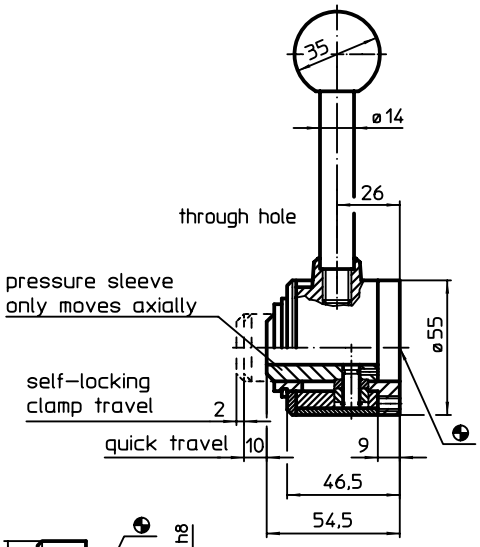




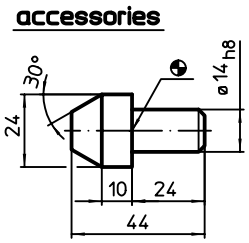




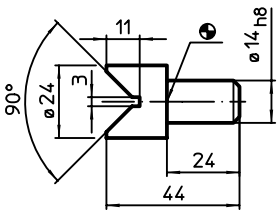
tension cam



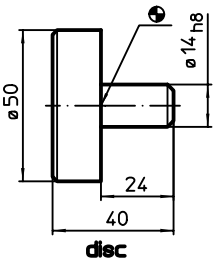
accessories



taper



V–block



disc

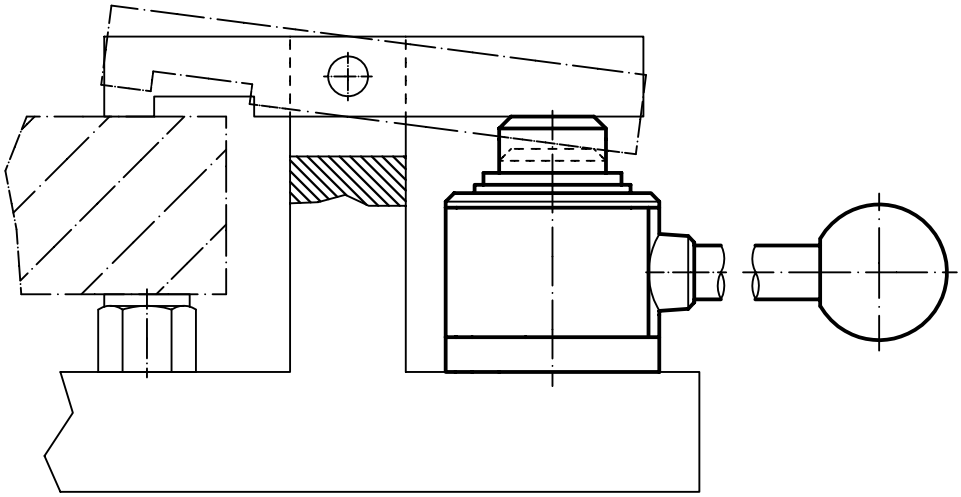
ORDER INFORMATION

Travel path [mm]	s Clamping way [mm]	Clamping force max. [kN]	[g]	Art. No. with transverse axis in the bore	Art. No. with throughgoing bore
pull to right					
10	2	4,9	751	23260.0003	–
			745	–	23260.0013
pull to left					
10	2	4,9	749	23260.0005	–
			750	–	23260.0015
push to right					
10	2	4,9	751	23260.0002	–
			745	–	23260.0012
push to left					
10	2	4,9	749	23260.0004	–
			750	–	23260.0014

ACCESSORIES

	[g]	Art. No.
disc		
	270	23260.0042
taper		
	85	23260.0044
V-block		
	82	23260.0046

APPLICATION EXAMPLE



Eccentric Clamping Clamps

EH 23270.



PRODUCT DESCRIPTION

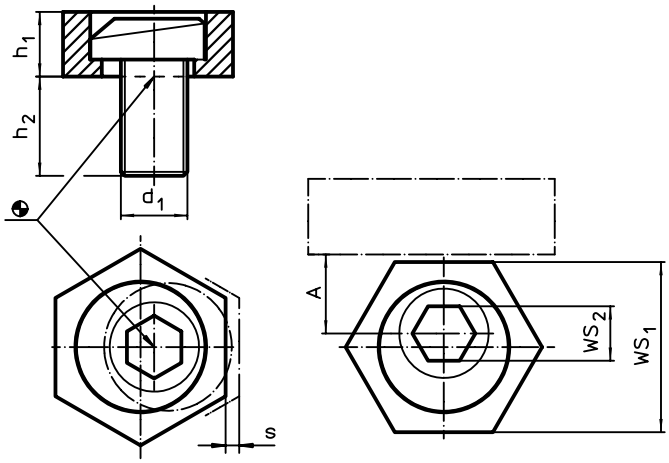
These clamps have a high clamping force for low clamping heights. The body from brass provides a gentle but safe clamping.

Material

Eccentric screw
- Steel

Body
- Brass

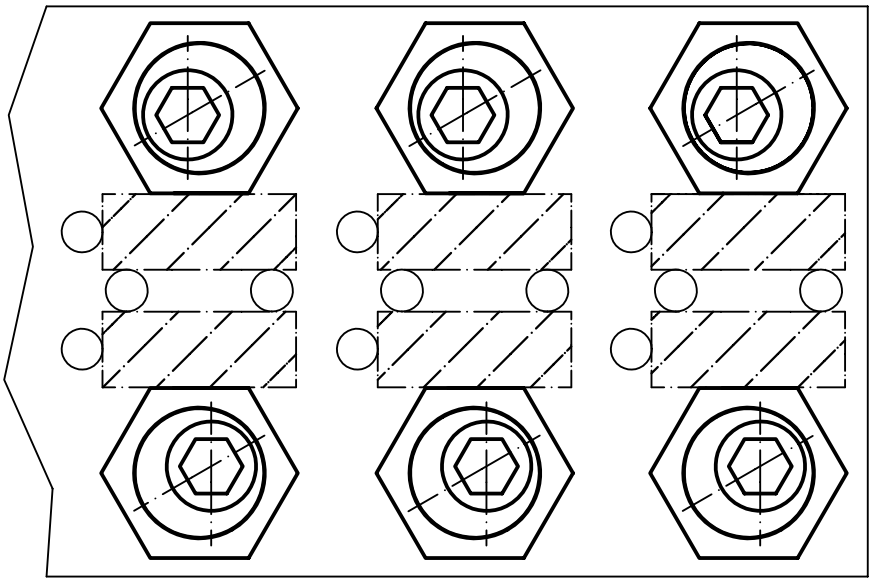
DRAWING



ORDER INFORMATION

Dimensions				A	WS1	WS2	Clamping force max.	Tightening torque max.		Art. No.
d1	h1	h2	s							
[mm]				[mm]	[mm]	[mm]	[kN]	[Nm]	[g]	
M 4	2,8	9,6	0,75	3,8	7,93	3	0,9	2,5	2	23270.0104
M 6	4,8	11,2	1,00	7,8	15,86	4	3,4	10,0	10	23270.0106
M 8	4,8	15,0	1,00	10,2	20,60	5	3,6	18,0	18	23270.0108
M10	6,3	19,0	1,30	10,2	20,60	7	7,0	26,0	27	23270.0110
M12	9,5	22,8	2,00	12,7	25,40	8	9,0	75,0	53	23270.0112
M16	12,7	28,5	2,50	15,0	30,13	12	12,0	120,0	108	23270.0116

APPLICATION EXAMPLE



Eccentric Clamping Washers

EH 23270.



PRODUCT DESCRIPTION

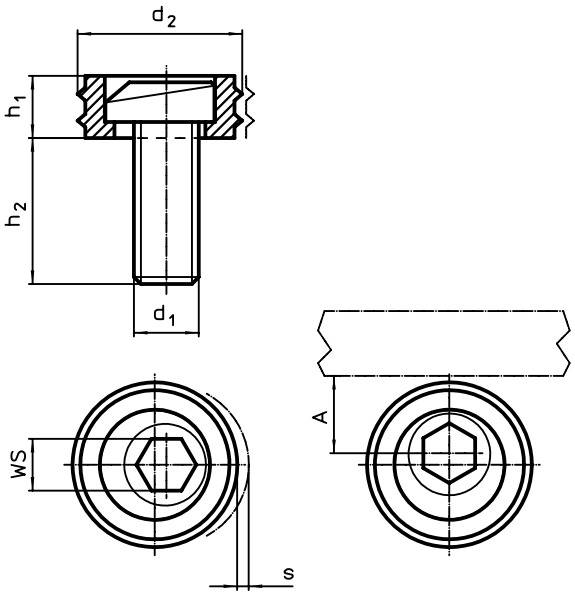
The eccentric clamping washers are especially suitable for the clamping of raw parts, e.g. cut-off portions, cast iron parts and forgings.

Material

Eccentric screw
- Steel

Body
- Steel, case-hardened

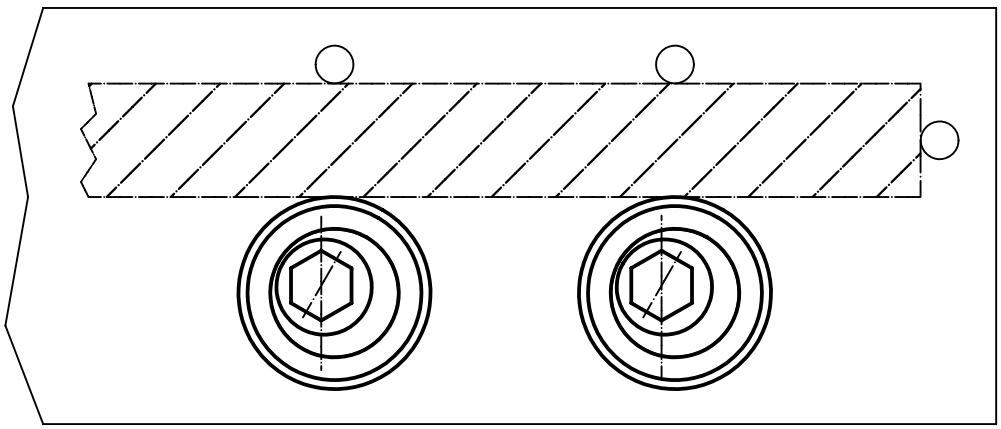
DRAWING



ORDER INFORMATION

Dimensions					A	WS	Clamping force max.	Tightening torque max.		Art. No.
d_1	d_2	h_1	h_2	s						
[mm]					[mm]	[mm]	[kN]	[Nm]	[g]	
M10	20,6	6,4	16,0	1,6	10,3	7	9,0	26	21	23270.0210
M12	25,4	9,6	22,5	2,0	12,7	8	17,8	88	40	23270.0212
M16	30,1	12,7	26,8	2,5	15,0	12	26,7	135	90	23270.0216

APPLICATION EXAMPLE



Eccentric Clamps

EH 23271.



PRODUCT DESCRIPTION

The eccentric clamp allows clamping with pull-down effect on different workpiece forms at low height.

Material

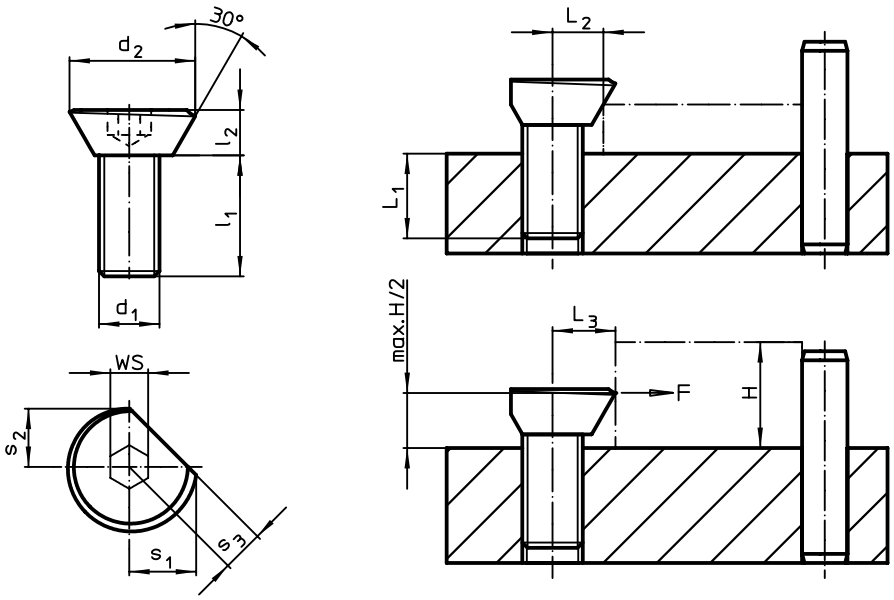
- Case-hardened steel, case-hardened and blue zinc-plated

Assembly

1. Manufacture a thread with the corresponding distance L_2 / L_3 to the workpiece.
2. Screw in the eccentric clamp at the necessary height and set it relative to the workpiece with its flat side.
3. Insert the workpiece and tighten the clamping pin using the internal hexagon. The proper tension is achieved after approx. 1/3 turn.

The threaded hole must be lubricated on a regular basis.
The rotational movement during tightening must always be completed towards the stops in order to prevent the workpiece from turning away from the stops.

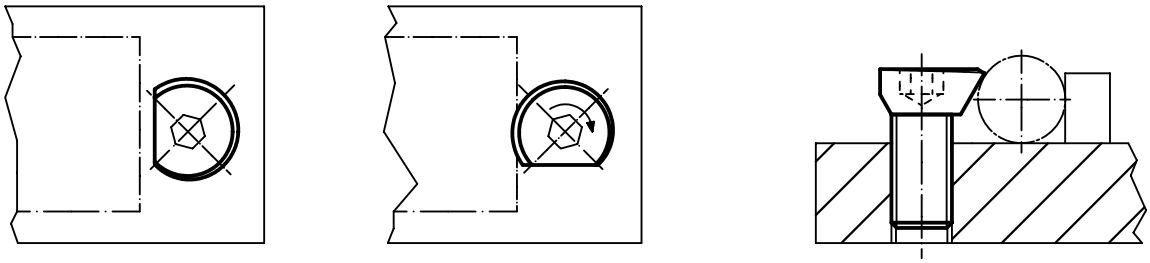
DRAWING



ORDER INFORMATION

Dimensions							L_1	L_2	L_3 ±0,2	WS	Clamping force max.	Tightening torque max.		Art. No.
d_1	d_2	l_1	l_2	s_1	s_2	s_3								
[mm]							[mm]	[mm]	[mm]	[mm]	[kN]	[Nm]	[g]	
M 3	6,7	6	2	3,5	2,9	2,2	3	3,0	3,2	2,0	0,05	1,0	0,57	23271.0003
M 4	8,7	8	3	4,6	4,0	3,0	4	3,5	4,2	2,5	0,09	1,5	1,43	23271.0004
M 5	10,9	10	4	5,7	5,0	3,5	5	4,2	5,2	3,0	0,10	2,0	2,84	23271.0005
M 6	13,5	12	5	7,1	6,1	4,5	6	5,4	6,4	4,0	0,30	4,5	4,95	23271.0006
M 8	16,9	16	6	8,9	7,7	5,5	8	6,6	8,0	5,0	2,70	20,0	9,10	23271.0008
M10	20,9	20	7	11,1	9,4	6,5	10	8,3	9,8	6,0	4,00	30,0	17,00	23271.0010
M12	26,1	24	9	13,5	11,6	8,0	12	10,1	12,0	8,0	5,40	44,0	31,00	23271.0012

APPLICATION EXAMPLE



Double Eccentric Levers • with fulcrum pin

EH 23380.



PRODUCT DESCRIPTION

Clamping on both sides.

Material

Fulcrum pin
- Steel, case-hardened

Lever
- Alloyed case-hardened steel, case hardened, blackened

Safety ring
- Spring steel

MORE INFORMATION

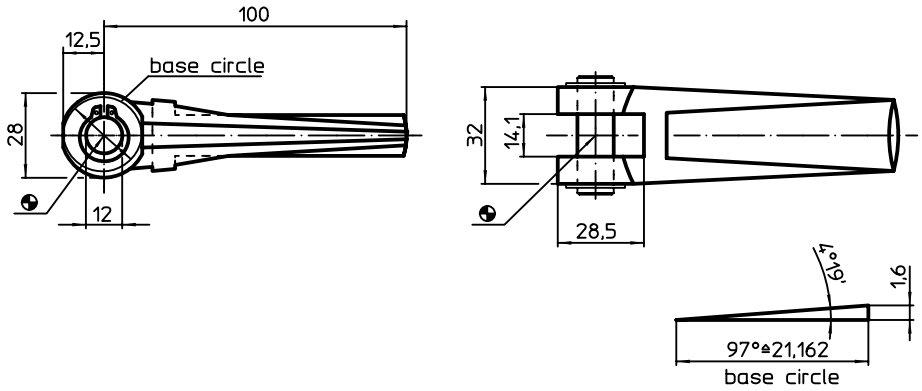
References

Can be used in combination with swing bolts DIN 444, M12 (EH 22980.).

Further products

Swing Bolts, DIN 444, form B . . . . . → p. 353
Swing Bolts, DIN 444, form B, quality 8.8 high precision design. . . . . → p. 354

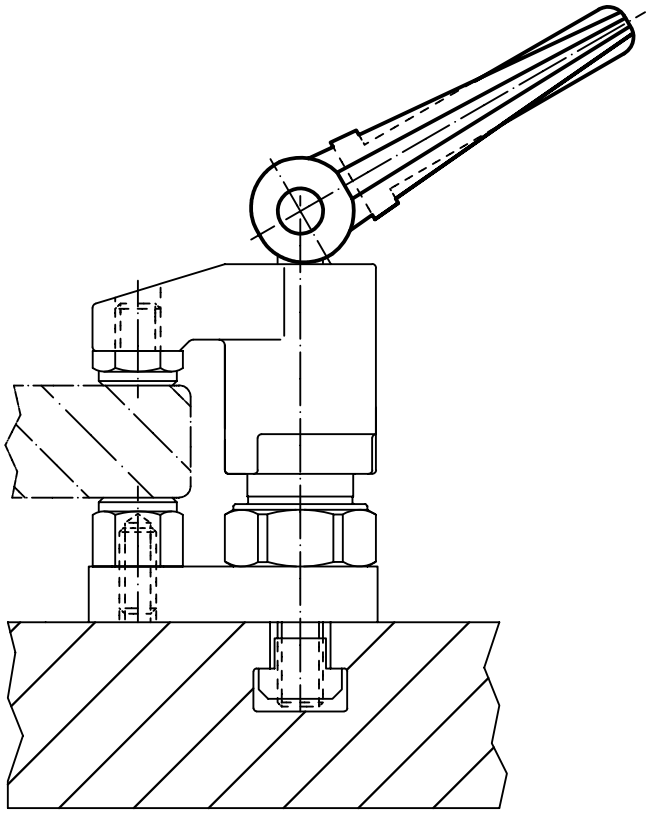
DRAWING



ORDER INFORMATION

Dimensions bore hole [mm]	[g]	Art. No.
12	334	23380.0012

APPLICATION EXAMPLE



3

Eccentric Levers • with fulcrum pin

EH 23390.



PRODUCT DESCRIPTION

Material

Fulcrum pin
- Stainless steel 1.4021, heat-treated

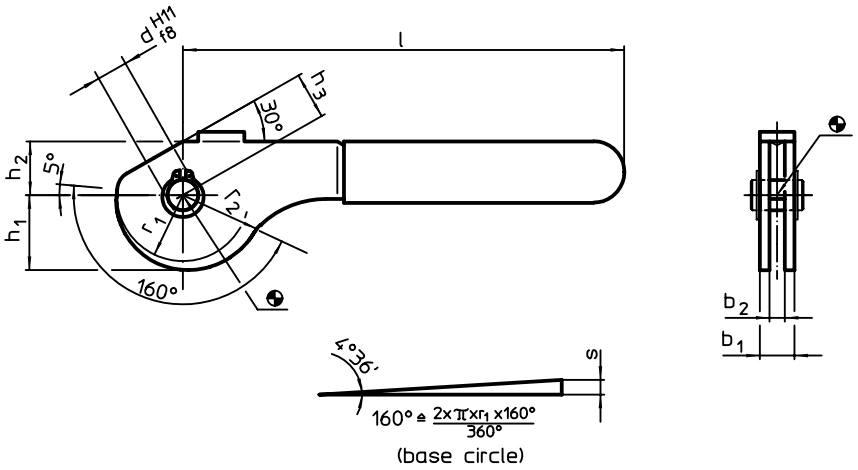
Eccentric part
- Steel St. 52-3, zinc phosphated

- Stainless steel 1.4301

Safety ring
- Stainless steel 1.4310

Plastic cap
- PVC, red

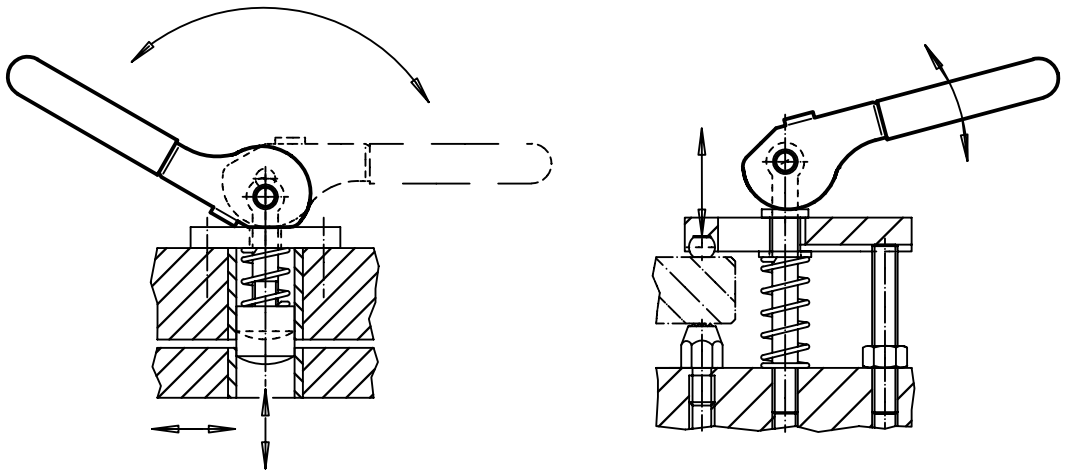
DRAWING



ORDER INFORMATION

Dimensions									Eccentric stroke s	Total stroke r_2-h_3	max.		Art. No.
b_1	d H11 f8	l ~	r_1	r_2	b_2	h_1	h_2	h_3 ~					
				[mm]					[mm]	[mm]	[°C]	[g]	
steel													
13	**8**	114	17,2	21,07	9	19,54	14	12	3,87	9,07	60	93	23390.0408
17	**10**	138	21,6	26,45	12	24,54	17	15	4,85	11,45	60	178	23390.0410
20	**12**	157	28,0	34,29	14	31,81	21	18	6,29	16,29	60	290	23390.0412
stainless steel													
13	**8**	114	17,2	21,07	9	19,54	14	12	3,87	9,07	60	94	23390.0508
17	**10**	138	21,6	26,45	12	24,54	17	15	4,85	11,45	60	175	23390.0510
20	**12**	157	28,0	34,29	14	31,81	21	18	6,29	16,29	60	288	23390.0512

APPLICATION EXAMPLE



Eccentric Quick Clamps • with female thread

EH 23390.



PRODUCT DESCRIPTION

For quick and easy clamping and releasing of workpieces.
When using the "adjustable" design (picture 2) the lever position can be moved.

Material

Support washer
- Thermoplastic PA, glass-fiber reinforced
- Thermoplastic POM, glass-fiber reinforced

Lever
- Zinc die-cast, plastic coated, black

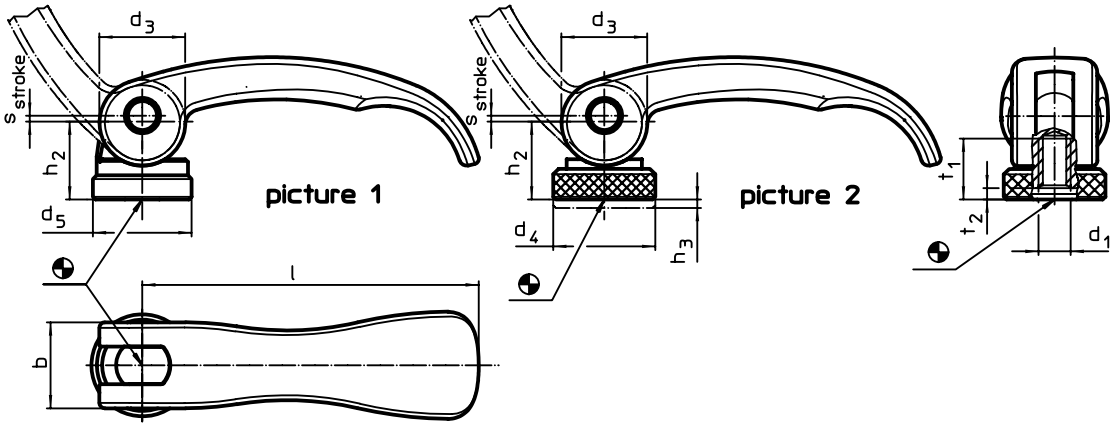
Threaded part
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

Inner part
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

Adjusting nut
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

3

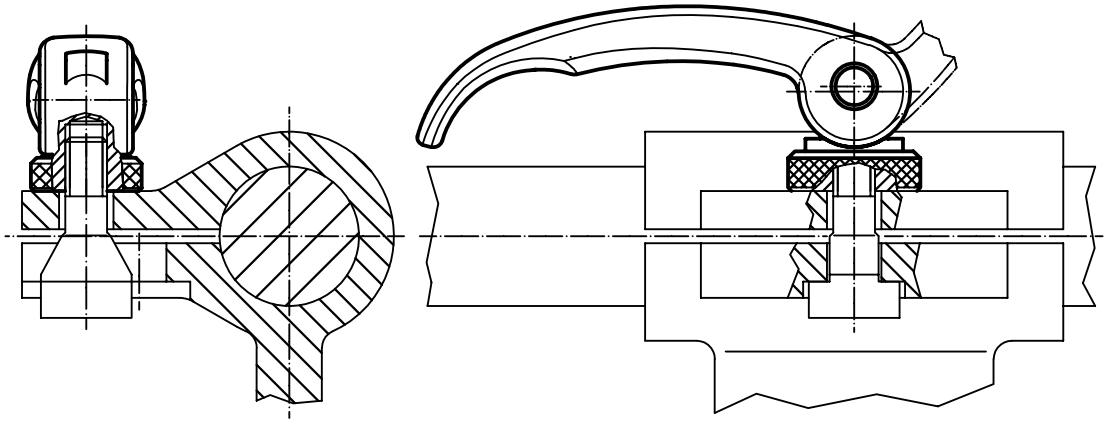
DRAWING



ORDER INFORMATION

Dimensions										Stroke s at 90° lever position	max.		Art. No.	
l	d_1	d_3	d_4	d_5	h_2 max.	Regulating-range h_3 min.	b	t_1	t_2 min. in clamp-ing position				steel	stainless steel
					[mm]					[mm]	[°C]	[g]		
with female thread – picture 1														
63	M5	16	–	18,5	16,4	–	16	13	3,0	0,75	80	60	23390.0003	23390.0203
	M6	16	–	18,5	16,4	–	16	13	3,0	0,75	80	58	23390.0001	23390.0201
82	M8	20	–	22,5	19,5	–	20	15	3,7	1,00	80	116	23390.0002	23390.0202
with female thread, adjustable – picture 2														
63	M5	16	19	–	16,4	1,5	16	13	3,0	0,75	80	65	23390.0103	23390.0303
	M6	16	19	–	16,4	1,5	16	13	3,0	0,75	80	65	23390.0101	23390.0301
82	M8	20	25	–	19,5	2,5	20	15	3,7	1,00	80	130	23390.0102	23390.0302

APPLICATION EXAMPLE



3

Eccentric Quick Clamps • with screw

EH 23390.



PRODUCT DESCRIPTION

For quick and easy clamping and releasing of workpieces.
When using the "adjustable" design (picture 2) the lever position can be moved.

Material

Support washer
- Thermoplastic PA, glass-fiber reinforced
- Thermoplastic POM, glass-fiber reinforced

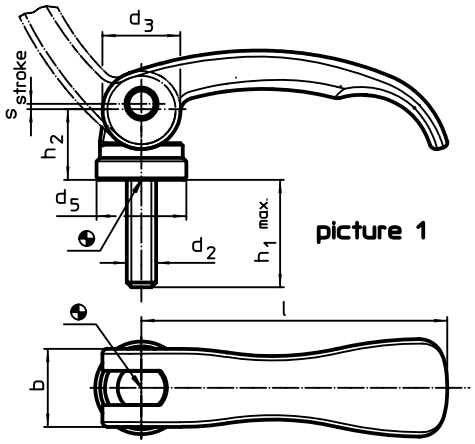
Lever
- Zinc die-cast, plastic coated, black

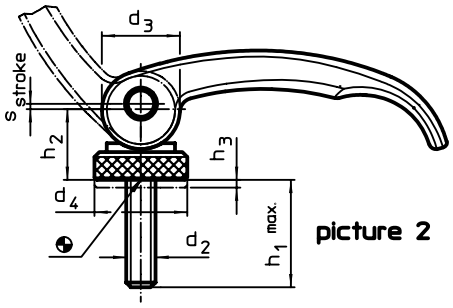
Inner part
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

Screw
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

Adjusting nut
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

DRAWING





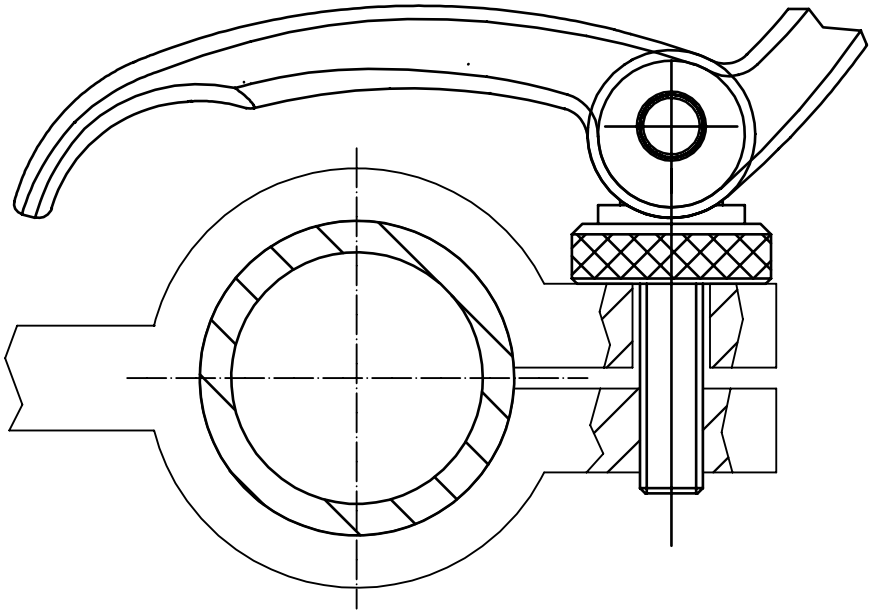
ORDER INFORMATION

Dimensions									Stroke s at 90° lever position	max.		Art. No.	
l	d_2	h_1 max. in clamping position	d_3	d_4	d_5	h_2 max.	Regulating-range h_3 min.	b				steel	stainless steel
		[mm]							[mm]	[°C]	[g]		
with screw – picture 1													
63	M5	16	16	–	18,5	16,4	–	16	0,75	80	62	23390.0030	23390.0230
		20	16	–	18,5	16,4	–	16	0,75	80	63	23390.0031	23390.0231
		25	16	–	18,5	16,4	–	16	0,75	80	64	23390.0032	23390.0232
		30	16	–	18,5	16,4	–	16	0,75	80	65	23390.0033	23390.0233
		35	16	–	18,5	16,4	–	16	0,75	80	65	23390.0034	23390.0234
		40	16	–	18,5	16,4	–	16	0,75	80	66	23390.0035	23390.0235
		50	16	–	18,5	16,4	–	16	0,75	80	67	23390.0036	23390.0236
	M6	16	16	–	18,5	16,4	–	16	0,75	80	63	23390.0009	23390.0209
		20	16	–	18,5	16,4	–	16	0,75	80	64	23390.0010	23390.0210
		25	16	–	18,5	16,4	–	16	0,75	80	65	23390.0011	23390.0211
		30	16	–	18,5	16,4	–	16	0,75	80	66	23390.0012	23390.0212
		35	16	–	18,5	16,4	–	16	0,75	80	67	23390.0013	23390.0213
		40	16	–	18,5	16,4	–	16	0,75	80	68	23390.0014	23390.0214
		50	16	–	18,5	16,4	–	16	0,75	80	69	23390.0016	23390.0216
82	M8	20	20	–	22,5	19,5	–	20	1,00	80	129	23390.0019	23390.0219
		25	20	–	22,5	19,5	–	20	1,00	80	130	23390.0020	23390.0220
		30	20	–	22,5	19,5	–	20	1,00	80	132	23390.0021	23390.0221
		35	20	–	22,5	19,5	–	20	1,00	80	133	23390.0022	23390.0222
		40	20	–	22,5	19,5	–	20	1,00	80	135	23390.0023	23390.0223
		50	20	–	22,5	19,5	–	20	1,00	80	138	23390.0025	23390.0225
		60	20	–	22,5	19,5	–	20	1,00	80	141	23390.0027	23390.0227

→

Dimensions									Stroke s at 90° lever position	max.		Art. No.	
l	d_2	h_1 max. in clamping position	d_3	d_4	d_5	h_2 max.	Regulating-range h_3 min.	b				steel	stainless steel
[mm]									[mm]	[°C]	[g]		
with screw, adjustable – picture 2													
63	M5	16	16	19	–	16,4	1,5	16	0,75	80	68	23390.0130	23390.0330
		20	16	19	–	16,4	1,5	16	0,75	80	69	23390.0131	23390.0331
		25	16	19	–	16,4	1,5	16	0,75	80	70	23390.0132	23390.0332
		30	16	19	–	16,4	1,5	16	0,75	80	71	23390.0133	23390.0333
		35	16	19	–	16,4	1,5	16	0,75	80	71	23390.0134	23390.0334
		40	16	19	–	16,4	1,5	16	0,75	80	72	23390.0135	23390.0335
		50	16	19	–	16,4	1,5	16	0,75	80	73	23390.0136	23390.0336
	M6	16	16	19	–	16,4	1,5	16	0,75	80	69	23390.0109	23390.0309
		20	16	19	–	16,4	1,5	16	0,75	80	69	23390.0110	23390.0310
		25	16	19	–	16,4	1,5	16	0,75	80	71	23390.0111	23390.0311
		30	16	19	–	16,4	1,5	16	0,75	80	72	23390.0112	23390.0312
		35	16	19	–	16,4	1,5	16	0,75	80	73	23390.0113	23390.0313
		40	16	19	–	16,4	1,5	16	0,75	80	74	23390.0114	23390.0314
		50	16	19	–	16,4	1,5	16	0,75	80	76	23390.0116	23390.0316
82	M8	20	20	25	–	19,5	2,5	20	1,00	80	142	23390.0119	23390.0319
		25	20	25	–	19,5	2,5	20	1,00	80	144	23390.0120	23390.0320
		30	20	25	–	19,5	2,5	20	1,00	80	146	23390.0121	23390.0321
		35	20	25	–	19,5	2,5	20	1,00	80	147	23390.0122	23390.0322
		40	20	25	–	19,5	2,5	20	1,00	80	149	23390.0123	23390.0323
		50	20	25	–	19,5	2,5	20	1,00	80	152	23390.0125	23390.0325
		60	20	25	–	19,5	2,5	20	1,00	80	155	23390.0127	23390.0327

APPLICATION EXAMPLE



Fulcrum Pins

EH 23400.



PRODUCT DESCRIPTION

Material

Fulcrum pin
- Stainless steel 1.4021, heat-treated

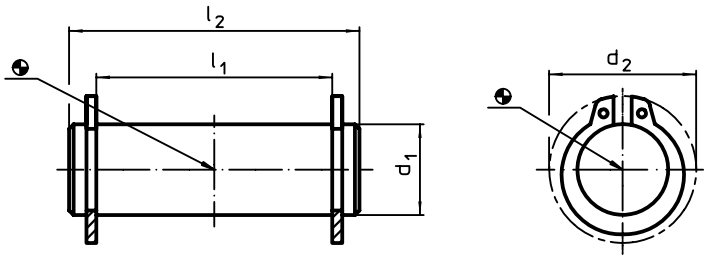
Safety ring
- Stainless steel 1.4310

MORE INFORMATION

References

Suitable for eccentric levers EH 23390. and similar applications.

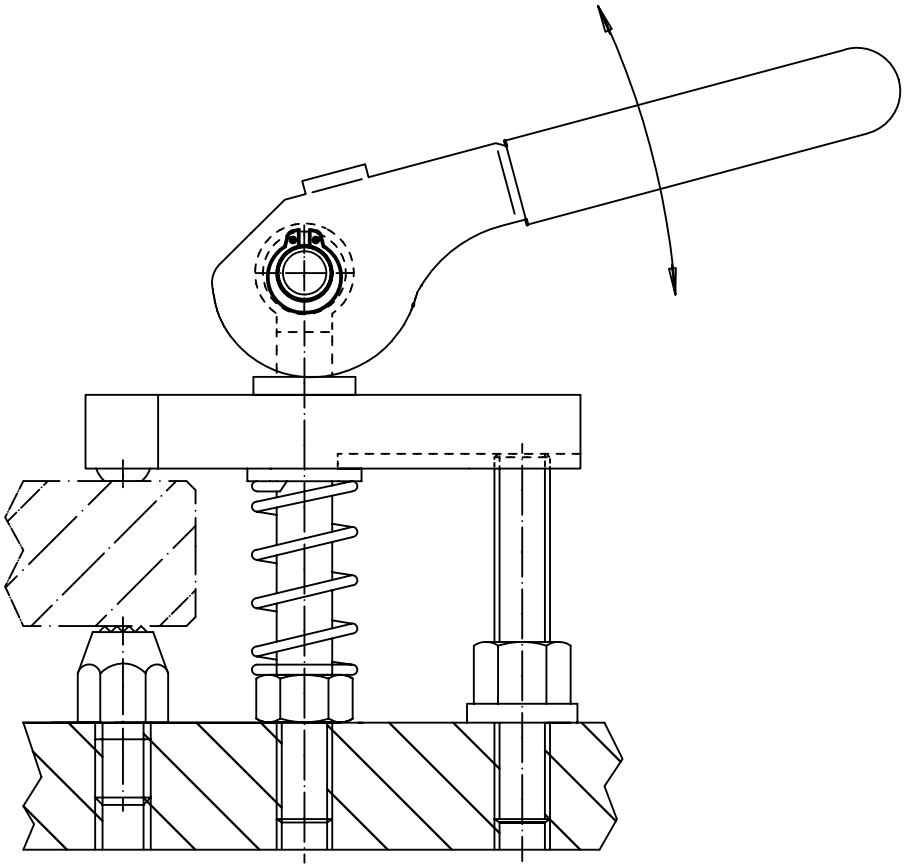
DRAWING



ORDER INFORMATION

Dimensions					Art. No.
d_1 f8	l_1 -0,5	d_2	l_2		
[mm]				[g]	
8	**14**	14,7	18	7,7	23400.0082
	21	14,7	27	10,0	23400.0085
10	**18**	17,0	24	14,0	23400.0102
	29	17,0	35	21,0	23400.0105
12	**21**	19,0	27	23,0	23400.0122
	31	19,0	37	34,0	23400.0125

APPLICATION EXAMPLE



Eccentric Clamps

EH 23410.



PRODUCT DESCRIPTION

Eccentric clamps enable fast and safe clamping and releasing with a relatively large adjustment range and high tensioning force. The eccentric plain washer enables a stepless radial clamping effect in any clamping position. Furthermore, the eccentric clamp is self-locking. The clamp can be used as a stepless stop by removing the thrust washer.

Material

Gear lever handle
- Steel, ground, blackened
- Stainless steel 1.4305, dull blasted

Body
- Steel, case-hardened, blackened
- Stainless steel 1.4305, nickel-plated

Screw
- Steel, hardened, blackened
- Stainless steel 1.4021, heat-treated, nickel-plated

Ball knob
- Thermosetting plastic PF 31, black, DIN 319

Assembly

Fix with screw bolt M 10 (WS 6). Ensure a tightening torque of max. 40 Nm.

Operation

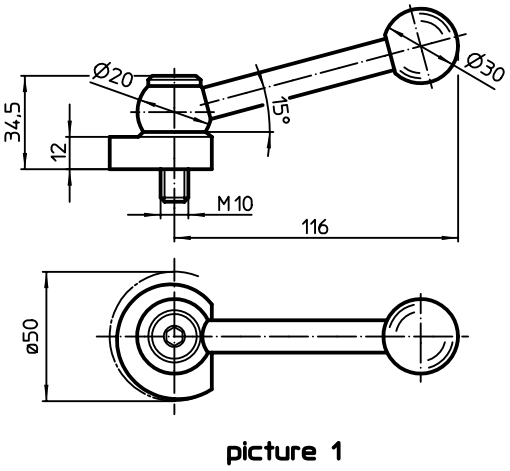
The screw bolt and the washer are adjustable. Once screwed in, the clamping catch can easily be turned to the desired position. For Art. No. 23410.0050 / .0051, the serration helps to put the clamping lever to the preferred position.

MORE INFORMATION

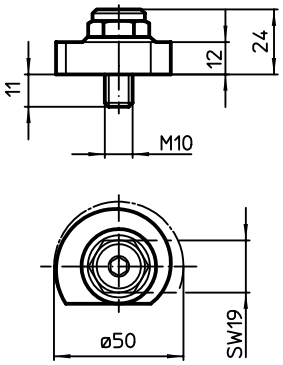
Notes

Left turn type can be supplied on request.

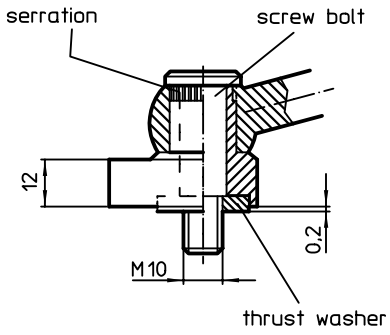
DRAWING

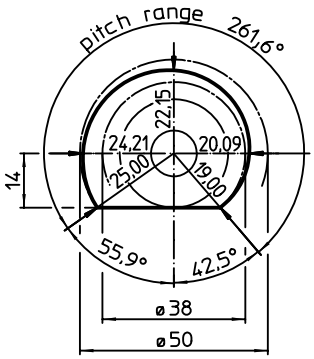


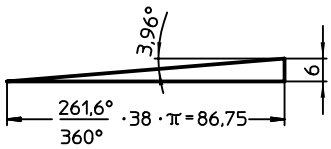
picture 1



picture 2





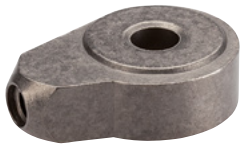


ORDER INFORMATION

[g]	Art. No. steel	Art. No. stainless steel
with clamping lever – picture 1		
317	23410.0050	23410.0051
with clamping screw – picture 2		
159	23410.0150	23410.0151

Eccentric Clamping Modules • with shaft location

EH 23410.



PRODUCT DESCRIPTION

The clamping effect remains unchanged and is self-locking in any angle position.

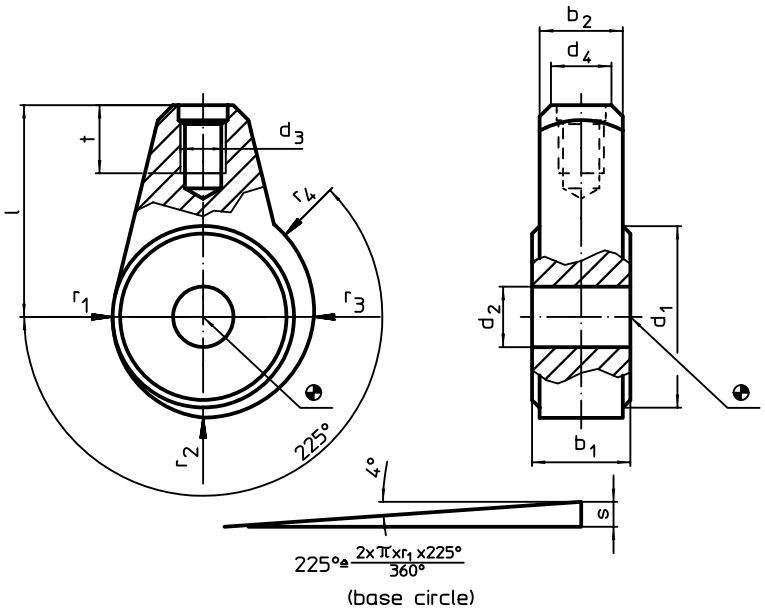
Material
- Sintered steel, case-hardened

Further products
Gear Lever Handles . . . . . → p. 574

MORE INFORMATION

References
Possible applications in combination with
e.g. gear lever handles EH 24350.

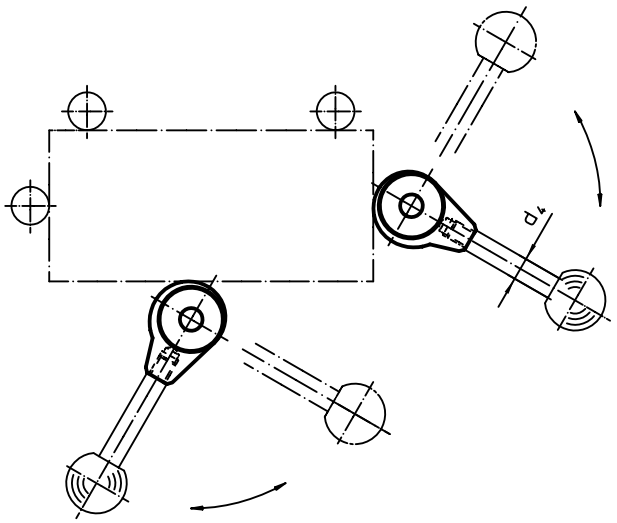
DRAWING



ORDER INFORMATION

Dimensions												d_4 Gear lever handle Ø EH 24350.		Art. No.
d_1	d_2 H9	b_1 -0,05 -0,15	b_2	d_3	l	r_1	r_2	r_3	r_4	s	t			
[mm]												[mm]	[g]	
24	**8**	13	11	M 6	28	12,0	13,32	14,64	15,30	3,3	9	8	50	23410.0210
30	**10**	15	13	M 8	32	15,0	16,65	18,30	19,12	4,1	12	10	100	23410.0220
35	**12**	17	15	M10	36	17,5	19,42	21,34	22,31	4,8	15	12	150	23410.0230

APPLICATION EXAMPLE



DOWN-THRUST CLAMPS

CLAMPED TO EXACTLY THE RIGHT SPOT

The down-thrust clamp is a universal mechanical clamping element for the fast and convenient changing and clamping of workpieces using clamping elements that can be swivelled by hand. Fast tool changes are important to cost-efficient production. The various down-thrust clamps from Erwin Halder KG offer simple and compact handling and, thanks to their height adjusting cylinders, are able to reach high clamping heights.

A special version has been created for point-accurate repeat clamping: a special positioning ring allows workpieces to always be securely clamped to the same point.



3

Down-Thrust Clamps • swivelling, size 25

EH 23310.



PRODUCT DESCRIPTION

Universal mechanical clamping element for fast and comfortable changing and clamping of workpieces by means of manually swivelling clamping claw.
The down-thrust clamps provide the following advantages:

- Rapid manual clamping by means of clamping screw, adjustable clamping lever or adjustable eccentric quick clamp.
- Easy and quick changing of the workpiece by swinging the clamping claw to the left or right.
- Reduced space requirements due to the compact design.
- Easy adaption even to larger clamping heights by means of height adjusting cylinders.

Material

- Case-hardened steel, case-hardened, blackened and ground

Assembly

Down-thrust clamps can be attached in two ways:

1. In a T-slot, using a nut for T-slots DIN 508 (EH 23010.)
2. With the set screw directly in the mounting plate of, for example, a fixture

The cylinder must make contact over the whole surface.

MORE INFORMATION

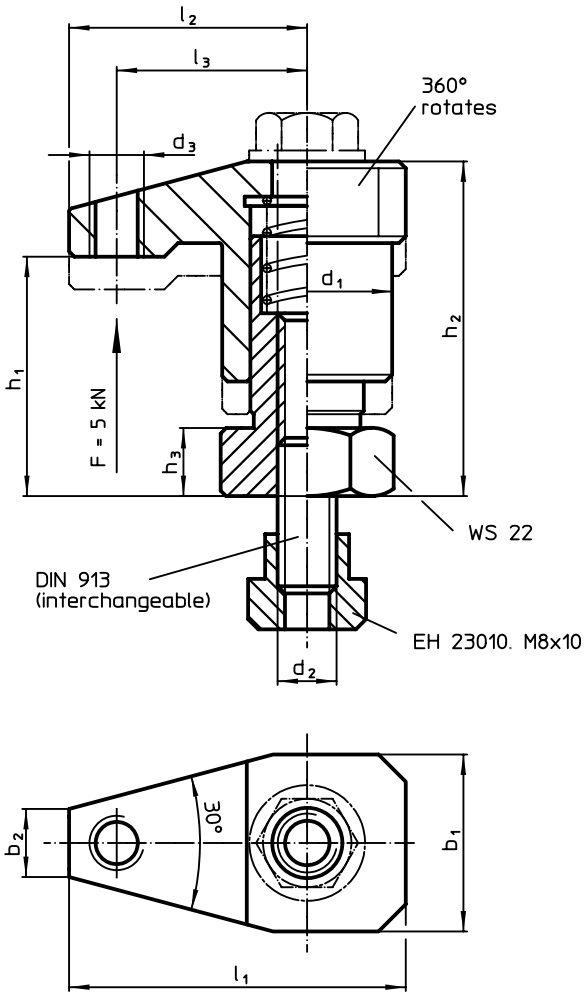
References

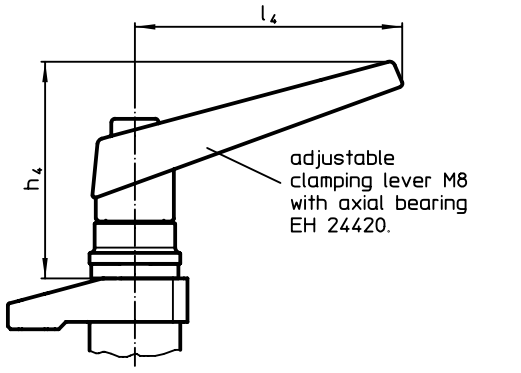
The clamping height can be increased with EH 23310. height adjusting cylinders and EH 1007. washers, and equally lowered by using clamping elements e.g. EH 22730.

Further products

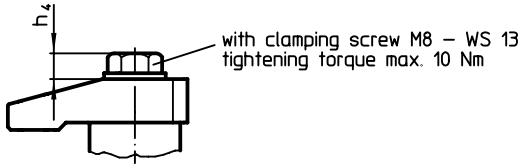
Height Adjusting Cylinders . . . . . → p. 505
Spacers . . . . . → p. 725

DRAWING

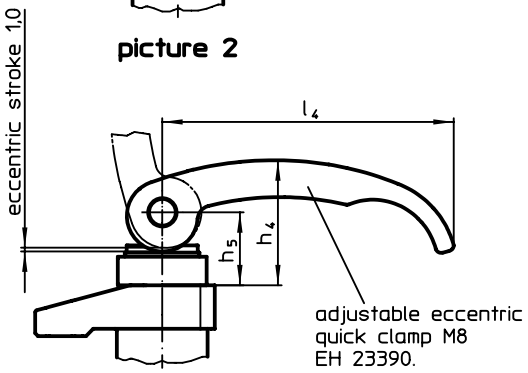




picture 1



picture 2

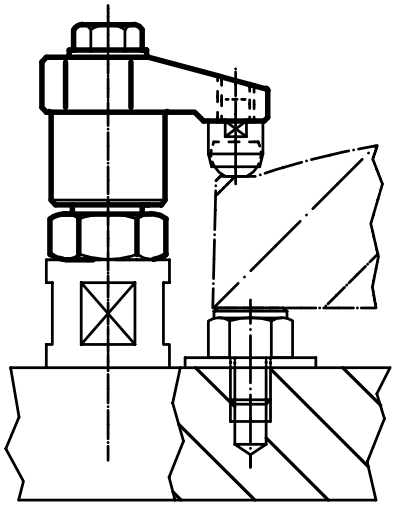


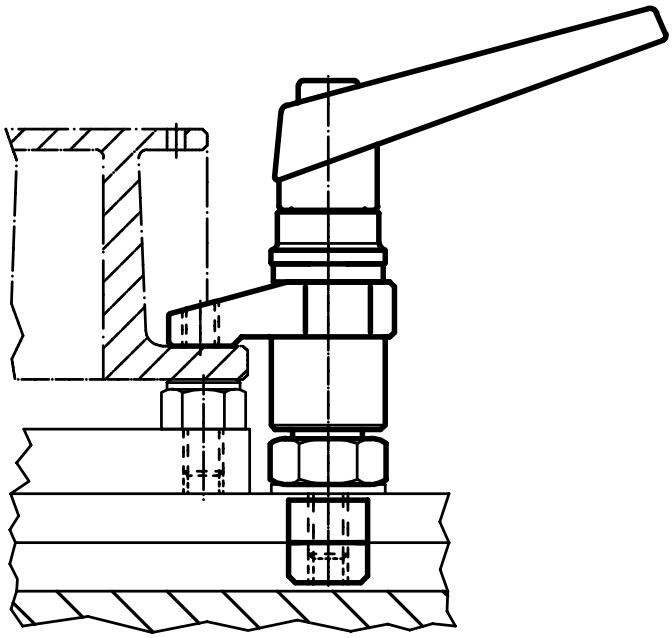
picture 3

ORDER INFORMATION

Dimensions																Stroke		Art. No.
d_1	b_1	b_2	d_2	d_3	h_1 min.	h_1 max.	h_2 min.	h_2 max.	h_3	h_4	h_5	l_1	l_2	l_3	l_4			
[mm]																[mm]	[g]	
with adjustable clamping lever with axial bearing – picture 1																		
25	26	10	M8	M8	30	35	44	49	10	60,0	–	49,5	35	28	74	5	363	23310.0024
with clamping screw – picture 2																		
25	26	10	M8	M8	30	35	44	49	10	6,9	–	49,5	35	28	–	5	227	23310.0025
with adjustable excentric quick clamp – picture 3																		
25	26	10	M8	M8	30	35	44	49	10	35,0	20,5	49,5	35	28	82	5	340	23310.0026

APPLICATION EXAMPLE





3

Down-Thrust Clamps • swivelling, size 40

EH 23310.



PRODUCT DESCRIPTION

Universal mechanical clamping element for fast and comfortable changing and clamping of workpieces by means of manually swivelling clamping claw.
The clamps provide the following advantages:

- Rapid manual clamping by means of the clamping screw, the adjustable clamping lever, or the double eccentric clamping lever.
- Easier and quicker workpiece change by swinging the clamping claw to the left or right. Continuously variable setting by means of positioning ring 23310.0350
- The use of positioning ring 23310.0350 allows a repeatable precise clamping. Here h_1 min. increases by at least 7 mm (stroke minus 7 mm).
- Compact design, therefore less space requirement when clamping.
- Easily adjustable even to large clamping heights, using the height adjusting cylinders.

Material

- Case-hardened steel, case-hardened, blackened and ground

Assembly

Down-thrust clamps can be attached in two ways:

1. In a T-slot, using a nut for T-slots DIN 508 (EH 23010.)
2. With the set screw directly in the mounting plate of, for example, a fixture

The cylinder must make contact over the whole surface.
Exceeding of the clamping height is inhibited by the height limitation.

MORE INFORMATION

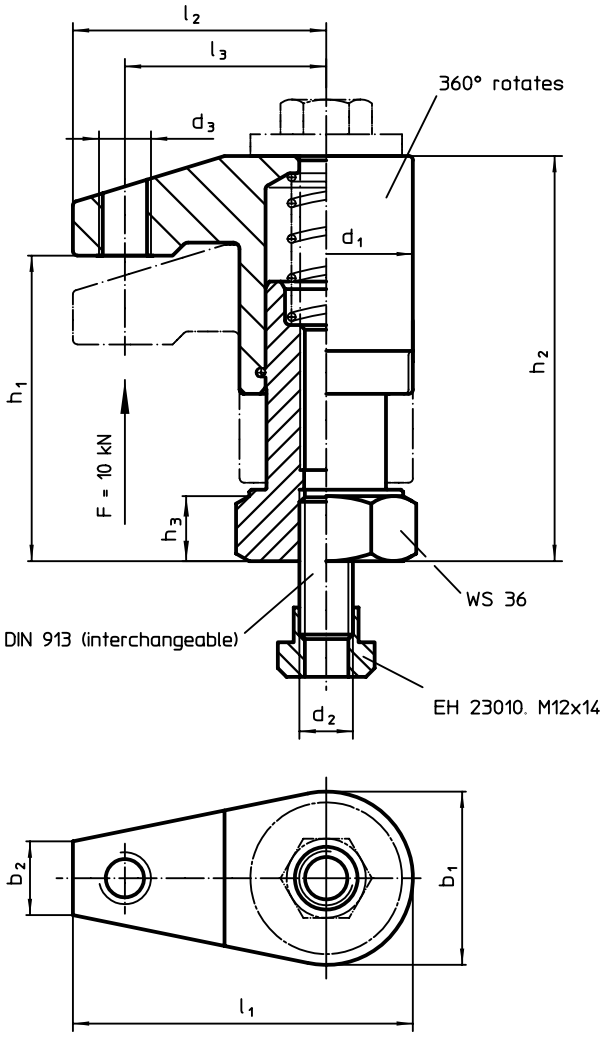
References

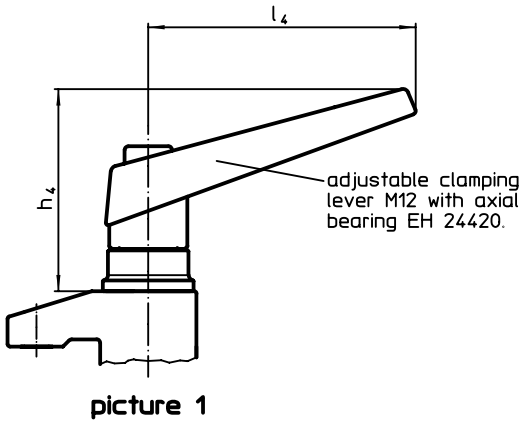
The clamping height can be increased by using height adjusting cylinders EH 23310. and disks EH 1107. and EH 1108. It can be reduced by employing clamping inserts, e.g. EH 22730.

Further products

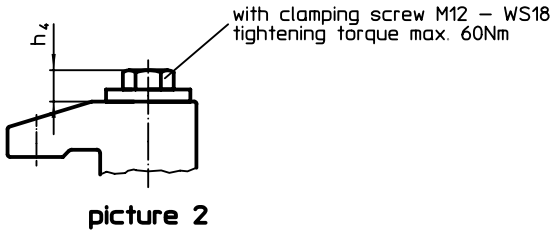
Positioning Rings, for down-thrust clamp . . . . . → p. 504
Height Adjusting Cylinders . . . . . → p. 505
Spacers . . . . . → p. 725
Wrenches . . . . . → p. 748

DRAWING

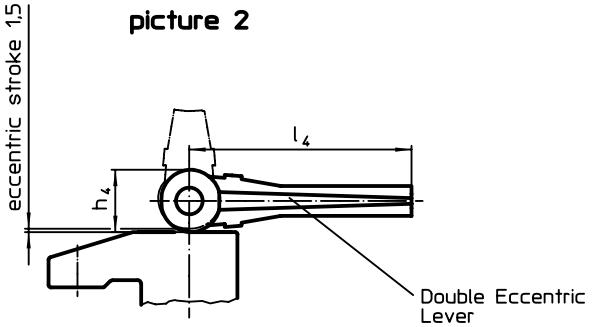




picture 1



picture 2

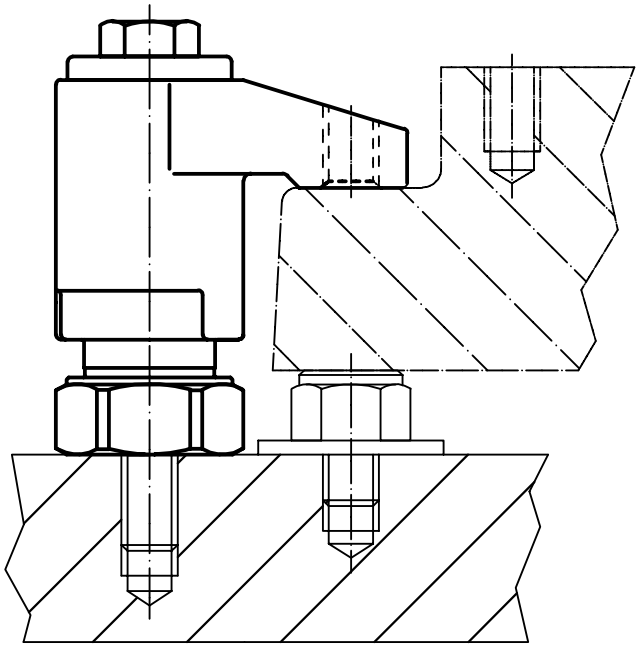


picture 3

ORDER INFORMATION

Dimensions														Stroke		Art. No.
d_1	b_1	b_2	d_2	d_3	h_1 min.	h_1 max.	h_2 min.	h_2 max.	h_3	h_4	l_1	l_2	l_3	l_4	[mm]	[g]	
with adjustable clamping lever with axial bearing – picture 1																	
40	40	17	M12	M12	50	70	73	93	15	82	75	55	43	108	20	1194	23310.0050
					68	98	91	121	15	82	75	55	43	108	30	1359	23310.0053
					95	135	118	158	22	82	75	55	43	108	40	1639	23310.0056
with clamping screw – picture 2																	
40	40	17	M12	M12	50	70	73	93	15	13	75	55	43	–	20	876	23310.0051
					68	98	91	121	15	13	75	55	43	–	30	964	23310.0054
					95	135	118	158	22	13	75	55	43	–	40	1300	23310.0057
with eccentric clamping lever – picture 3																	
40	40	17	M12	M12	50	70	73	93	15	28	75	55	43	100	20	1213	23310.0052
					68	98	91	121	15	28	75	55	43	100	30	1370	23310.0055
					95	135	118	158	22	28	75	55	43	100	40	1585	23310.0058

APPLICATION EXAMPLE



Down-Thrust Clamps • swivelling, low construction, size 44

EH 23310.



PRODUCT DESCRIPTION

Universal mechanical clamping element for fast and comfortable changing and clamping of workpieces by means of manually swivelling clamping claw.
Clamps provide the following advantages:

- Rapid manual clamping by means of a threaded spindle or eccentric lever
- Easy and rapid changing of workpieces by swinging away the clamping claw to the left or right
- Low construction, thus little space taken-up for clamping
- Simple adaption even to extreme clamping heights, using height adjusting cylinders

Material

- Case-hardened steel, case-hardened, blackened and ground

Assembly

Down-thrust clamps can be attached in two ways:

1. In a T-slot, using a nut for T-slots DIN 508 (EH 23010.)
2. With the set screw directly in the mounting plate of, for example, a fixture

The cylinder must make contact over the whole surface.

MORE INFORMATION

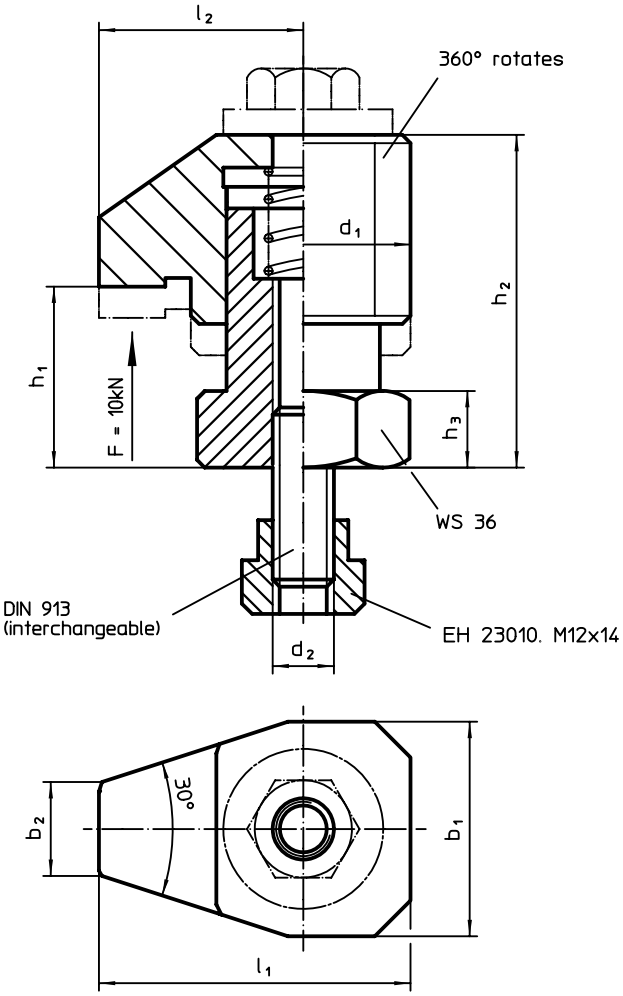
References

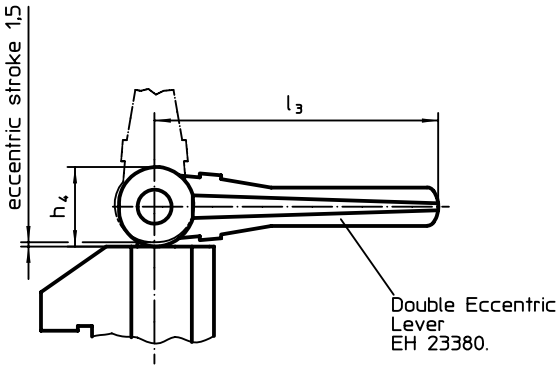
The clamping height can be increased using height adjusting cylinders EH 23310. and with spacers EH 1107. and EH 1108.

Further products

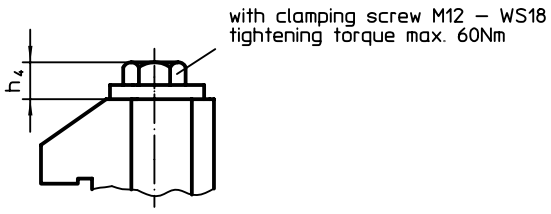
Height Adjusting Cylinders . . . . . → p. 505
Spacers . . . . . → p. 725
Wrenches . . . . . → p. 748

DRAWING





picture 1

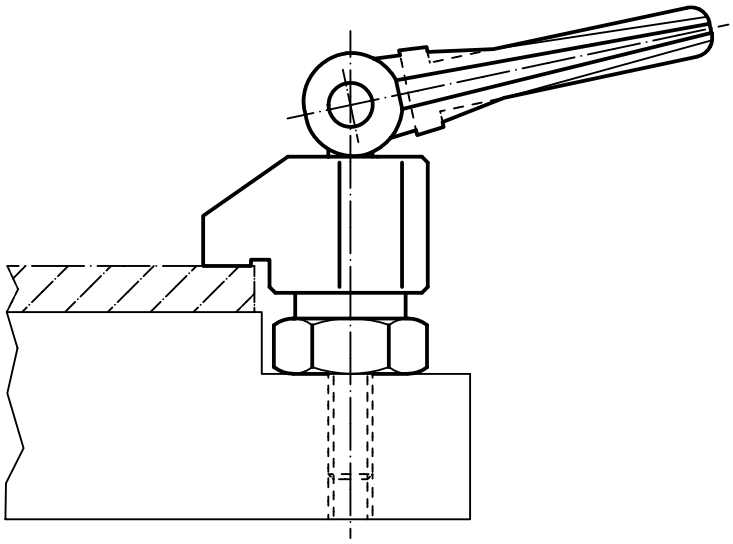


picture 2

ORDER INFORMATION

Dimensions													Stroke		Art. No.
d_1	b_1	b_2	d_2	h_1 min.	h_1 max.	h_2 min.	h_2 max.	h_3	h_4	l_1	l_2	l_3			
[mm]													[mm]	[g]	
with eccentric clamping lever – picture 1															
44	42	18	M12	25	30	54	59	15	28	61	40	100	5	1022	23310.0034
with clamping screw – picture 2															
44	42	18	M12	25	30	54	59	15	13	61	40	–	5	708	23310.0035

APPLICATION EXAMPLE



Down-Thrust Clamps • swivelling, size 60

EH 23310.



PRODUCT DESCRIPTION

Universal mechanical clamping element for fast and comfortable changing and clamping of workpieces by means of manually swivelling clamping claw.
Clamps provide the following advantages:

- Rapid manual clamping by means of a threaded spindle or eccentric lever
- Easy and rapid changing of workpieces by swinging away the clamping claw
- Compact construction, thus little space taken-up for clamping
- Simple adaption even to extreme clamping heights, using height adjusting cylinders

Material

- Case-hardened steel, case-hardened, blackened and ground

Assembly

Down-thrust clamps can be attached in two ways:

1. In a T-slot, using a nut for T-slots DIN 508 (EH 23010.)
2. With the set screw directly in the mounting plate of, for example, a fixture

The cylinder must make contact over the whole surface.
The clamping height h_1 must not be exceeded.

MORE INFORMATION

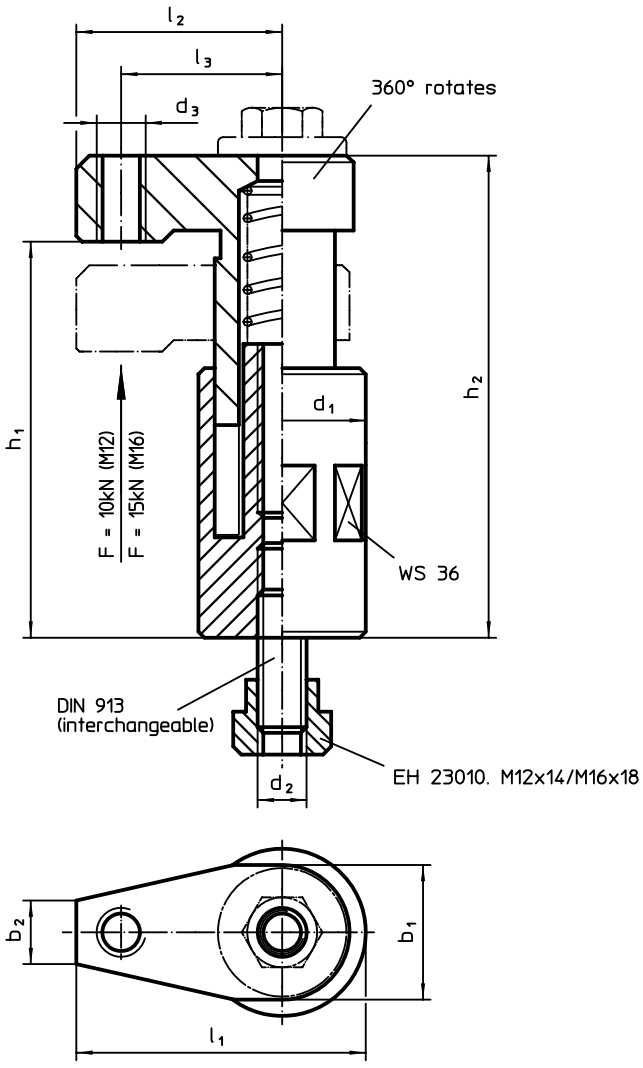
References

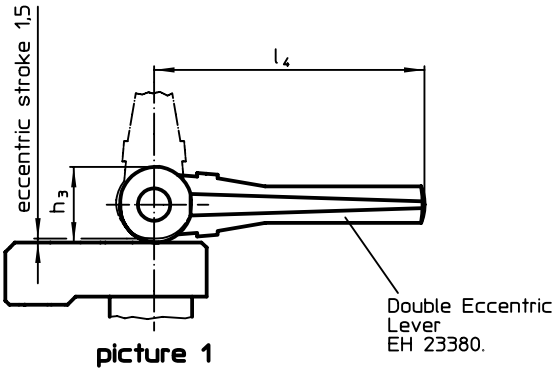
The clamping height can be increased by using height adjusting cylinders EH 23310. and disks EH 1107., EH 1108. and EH 1617. It can be reduced by using clamping inserts.

Further products

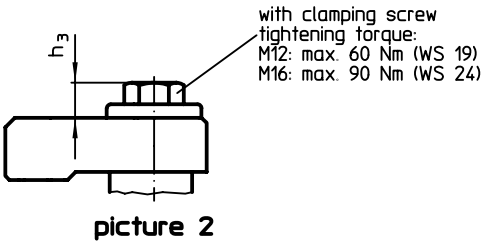
Height Adjusting Cylinders . . . . . → p. 505
Spacers . . . . . → p. 725
Wrenches . . . . . → p. 748
Spacers . . . . . → p. 781

DRAWING





picture 1

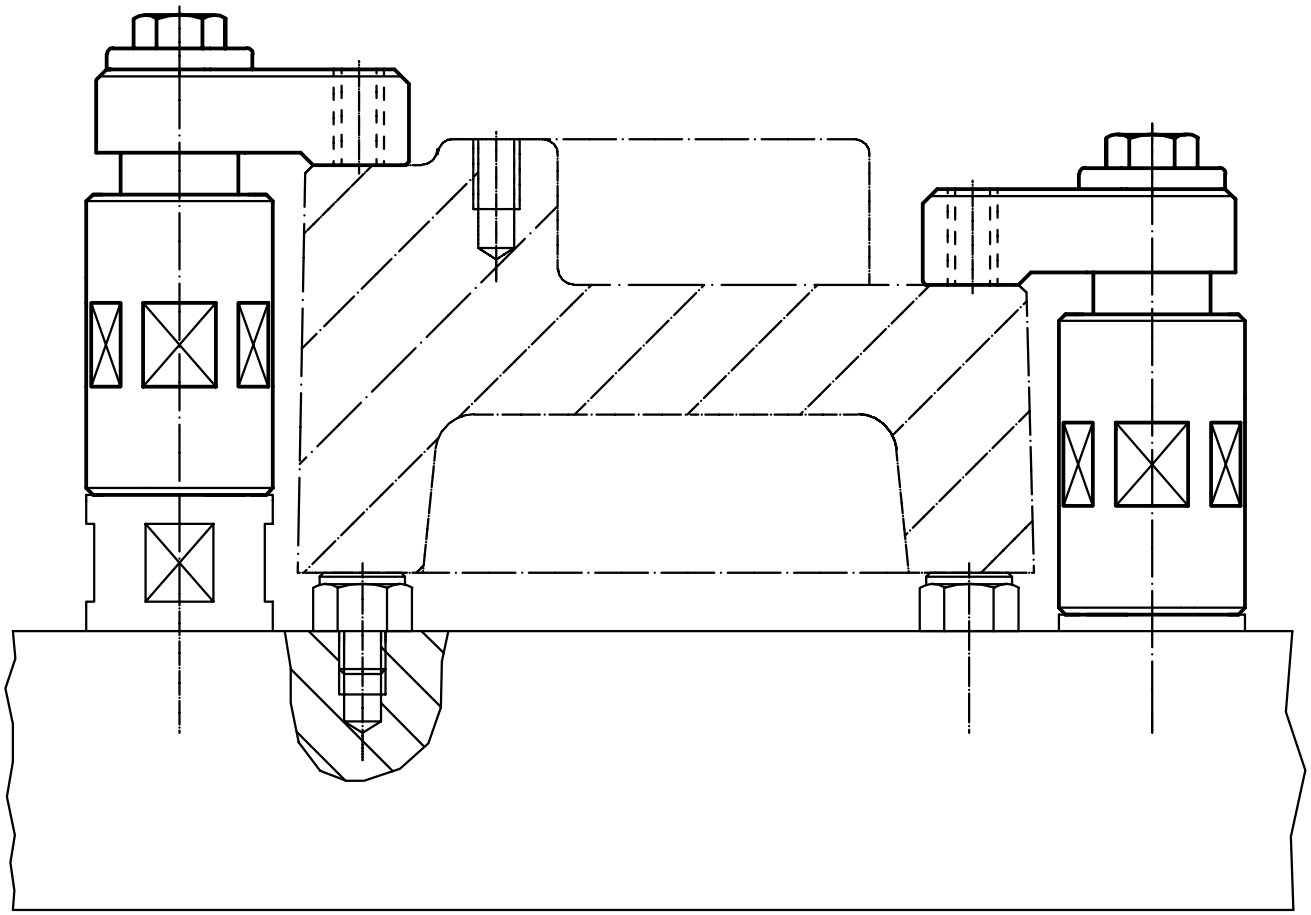


picture 2

ORDER INFORMATION

Dimensions [mm]														Stroke [mm]	[g]	Art. No.
d_1	d_2	b_1	b_2	d_3	h_1 min.	h_1 max.	h_2 min.	h_2 max.	h_3	l_1	l_2	l_3	l_4			
with eccentric clamping lever – picture 1																
60	**M12**	44	17	M12	100	135	123	158	28	95	65	53	100	35	3015	23310.0060
with clamping screw – picture 2																
60	**M12**	44	17	M12	100	135	123	158	13	95	65	53	–	35	2695	23310.0061
	M16	53	24	M16	100	135	123	158	16	99	69	53	–	35	2939	23310.0063

APPLICATION EXAMPLE



Down-Thrust Clamps • swivelling, size 82.5

EH 23310.



PRODUCT DESCRIPTION

The down-thrust clamp is a universal mechanical clamp that allows fast and easy exchange and clamping of workpieces - as the clamping claw can be easily manually swivelled to clear the workpiece.

The down-thrust clamps provide the following advantages:

- Compact design
- Clamping force of up to max. 30 kN via a clamping screw WS 36
- Clamping head swivels 360°
- Clamping stroke 30 mm
- Clamping height max. 250 mm
- Integrated clamping height stop for safe use
- Fixture via 4 cap screws M 24, quality 8.8 (tightening torque 600 Nm) with a hole spacing of 100 x 100 mm

Material

- Case-hardened steel, case-hardened, blackened and ground

Assembly

Fixture via 4 cap screws M 24, quality 8.8 (tightening torque 600 Nm) with a hole spacing 100 x 100 mm

MORE INFORMATION

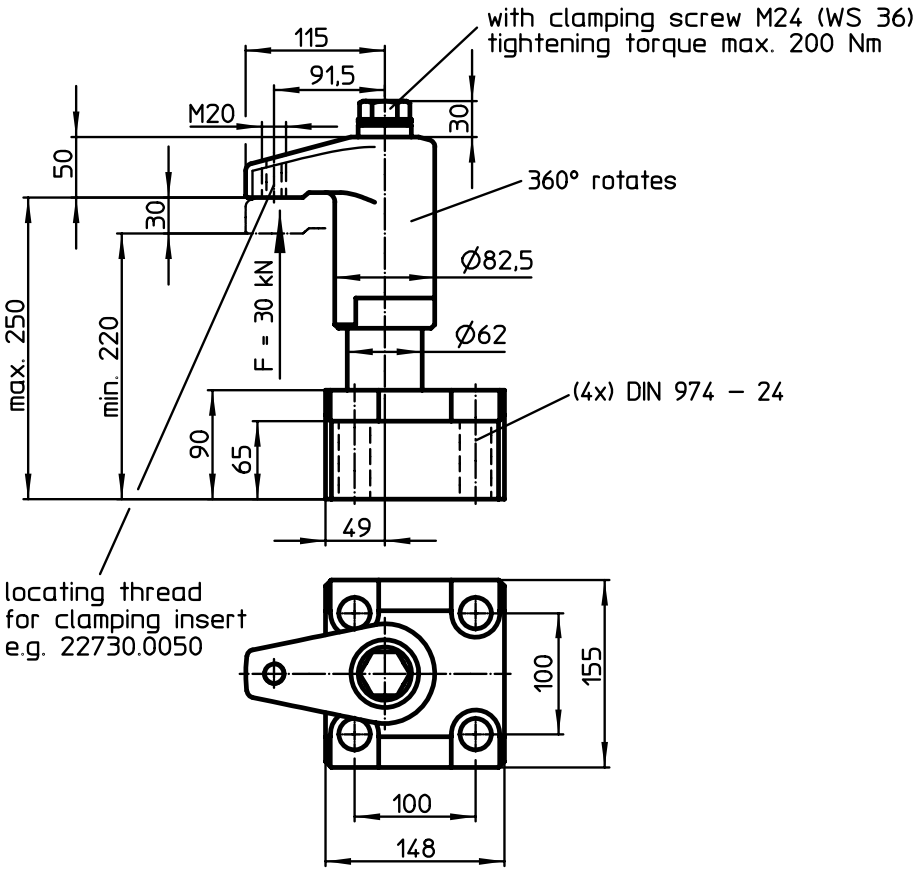
References

The positioning ring 23310.0351 ensures a repeatable precise clamping.

Further products

Positioning Rings, for down-thrust clamp . . . . . → p. 504
Wrenches . . . . . → p. 748

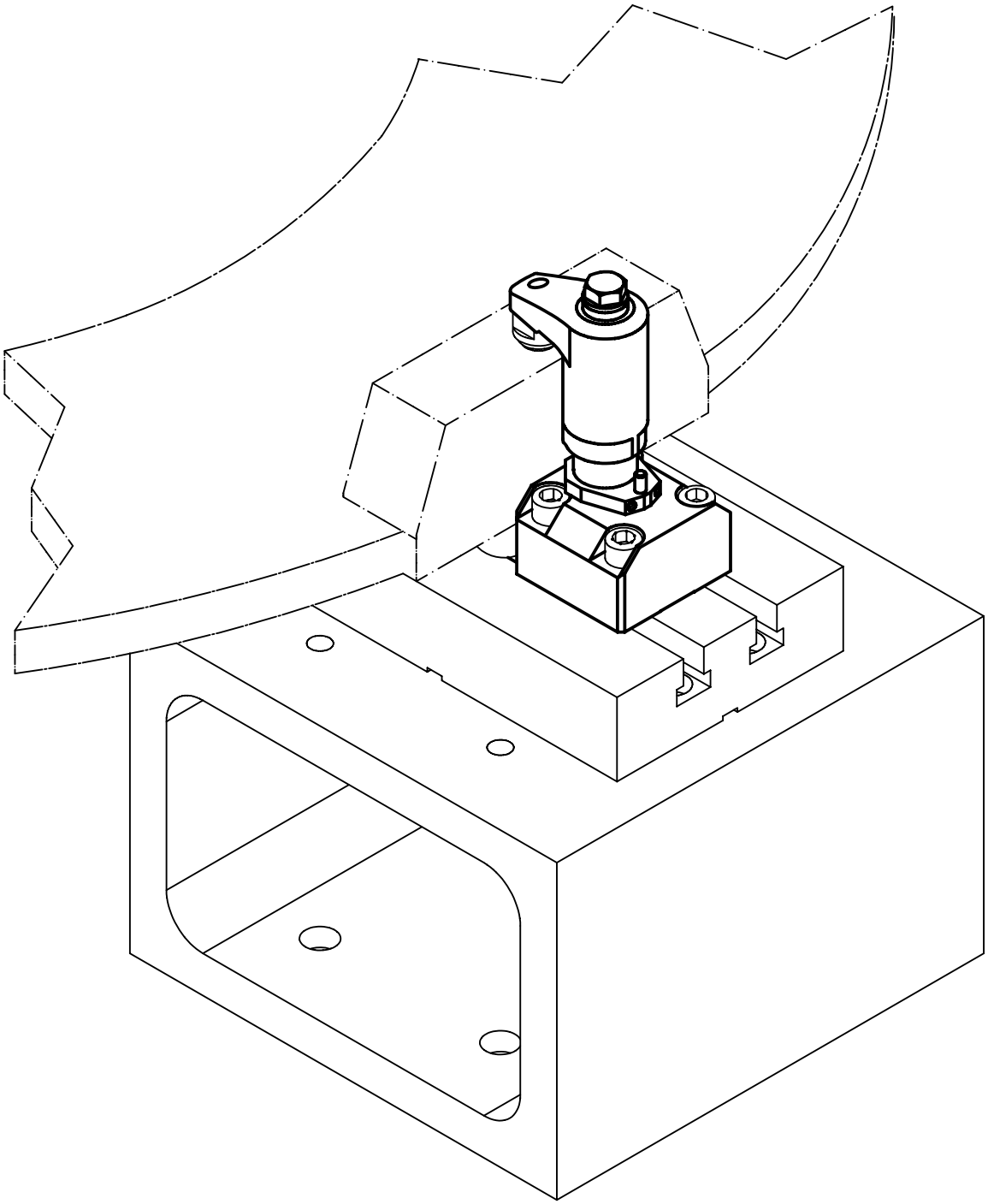
DRAWING



ORDER INFORMATION

Dimensions										Stroke s	Clamping force max.	Tightening torque max.		Art. No.
h_1 max.	h_1 min.	b_1	d_1	d_2	d_3	h_2	l_1	l_2	l_3					
[mm]										[mm]	[kN]	[Nm]	[kg]	
250	220	155	82,5	M20	62	30	115	148	49	30	30	200	20	23310.0070

APPLICATION EXAMPLE



Down-Thrust Clamps • moveable, size 40

EH 23310.



PRODUCT DESCRIPTION

The moveable downthrust clamps are used, amongst other things, when swivel movements are not possible because of the workpiece.
The clamps provide the following advantages:

- Easier and quicker workpiece change by moving the clamping claws forwards or backwards.
- The clamping range in horizontal direction is between l_1 min. and l_1 max..
- To change the workpiece, the clamping claw can be pushed back from l_1 max. by dimension l_2.
- Rapid manual clamping by means of the clamping screw, the adjustable clamping lever, or the double eccentric clamping lever.
- The use of positioning ring 23310.0350 allows the clamping position to be fixed. Here h_1 min. increases by at least 7 mm (stroke minus 7 mm).
- Compact design, therefore less space requirement when clamping.
- Easily adjustable even to large clamping heights, using the height adjusting cylinders.

Material

- Case-hardened steel, case-hardened, blackened and ground

Assembly

Down-thrust clamps can be attached in two ways:

1. In a T-slot, using a nut for T-slots DIN 508 (EH 23010.)
2. With the set screw directly in the mounting plate of, for example, a fixture

The cylinder must make contact over the whole surface.

Operation

1. Push clamping claw backwards.
2. Insert workpiece.
3. Push clamping claw forwards.
4. Adjust clamping position of clamping claw using the knurled screw.
5. Secure / lock the clamping position using the knurled nut.

MORE INFORMATION

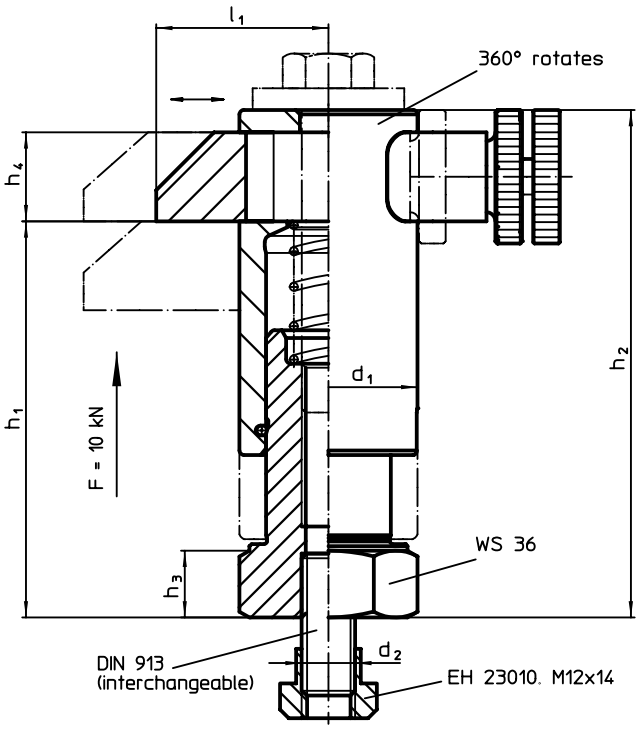
References

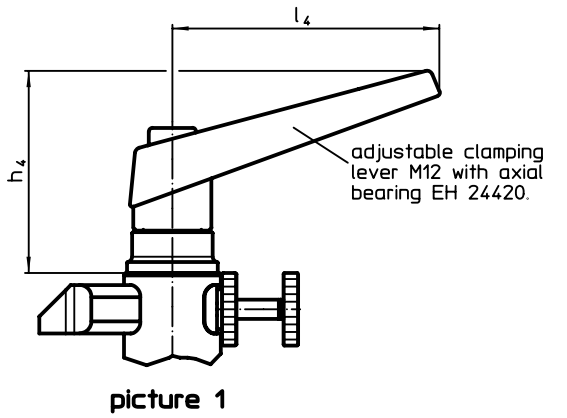
The clamping height can be increased by using height adjusting cylinders EH 23310. and disks EH 1107. and EH 1108. It can be reduced by employing clamping inserts, e.g. EH 22730.

Further products

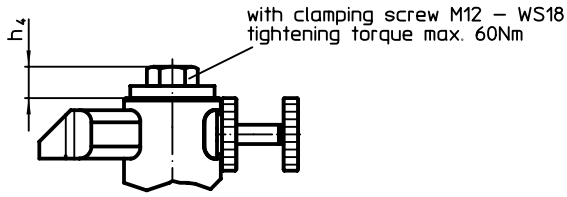
Positioning Rings, for down-thrust clamp . . . . . → p. 504

DRAWING

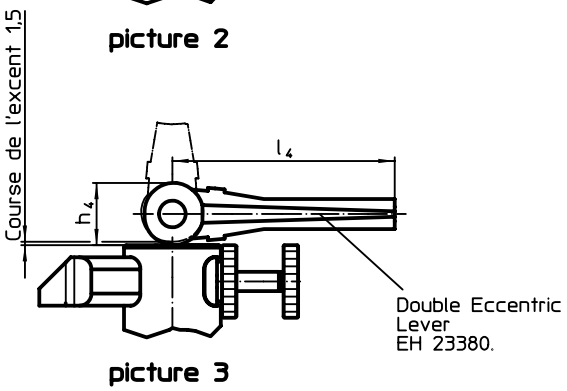




picture 1



picture 2

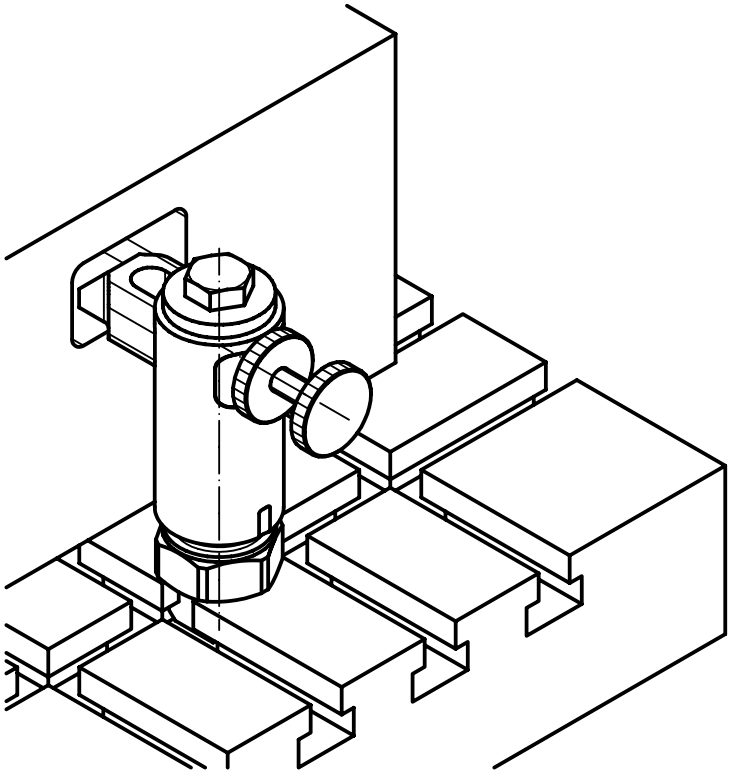


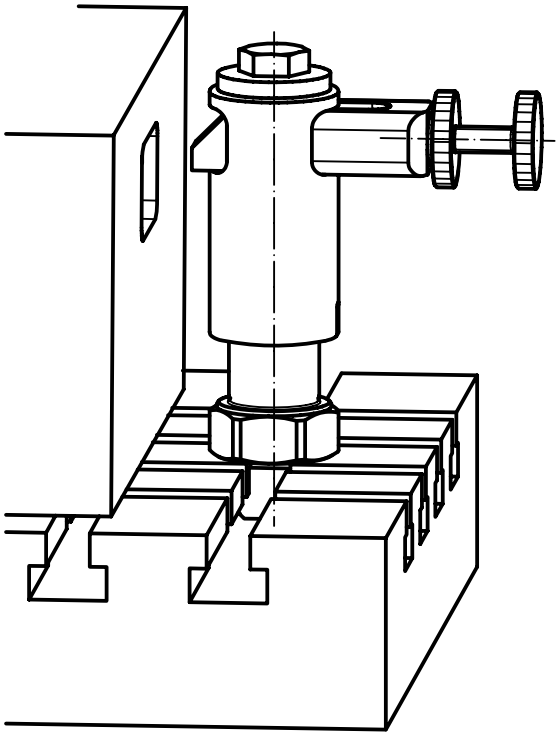
picture 3

ORDER INFORMATION

Dimensions															Stroke		Art. No.
d_1	b_1	b_2	d_2	h_1 min.	h_1 max.	h_2 min.	h_2 max.	h_3	h_4	l_1 min.	l_1 max.	l_2	l_3 min.	l_3 max.			
[mm]															[mm]	[g]	
with adjustable clamping lever with axial bearing – picture 1																	
40	30	13	M12	70	90	95	115	15	82	38	55	30	90	107	20	1300	23310.0083
				88	118	113	143	15	82	38	55	30	90	107	30	1205	23310.0086
with clamping screw – picture 2																	
40	30	13	M12	70	90	95	115	15	13	38	55	30	90	107	30	1480	23310.0084
				88	118	113	143	15	13	38	55	30	90	107	20	1370	23310.0087
with eccentric clamping lever – picture 3																	
40	30	13	M12	70	90	95	115	15	28	38	55	30	90	107	20	1040	23310.0085
				88	118	113	143	15	28	38	55	30	90	107	30	1540	23310.0088

APPLICATION EXAMPLE





Positioning Rings • for down-thrust clamp

EH 23310.



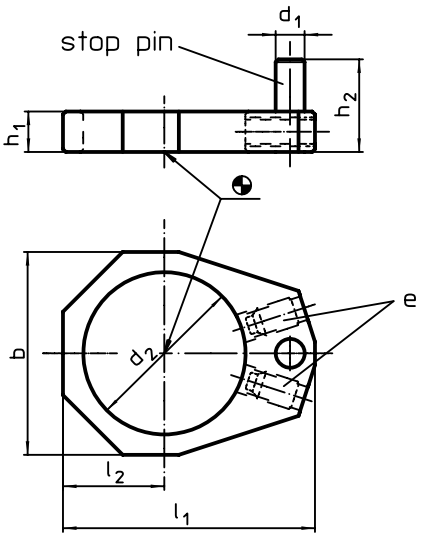
PRODUCT DESCRIPTION

The positioning ring is an accessory to down-thrust clamps 23310.0050 - .0058, 23310.0083 -.0088 and 23310.0070.
After aligning, the clamp positioning ring is fitted on the spindle with the effect, that repeated clamping is always exactly on the same point. The positioning ring is rotating by 360° on down-thrust clamp. After mounting, the clamping claw can swing 110° to the left or right (only for the swiveling versions).

Material
- Steel, blackened

Assembly
Before mounting the positioning ring, pull-off the clamping claw of down-thrust clamp.

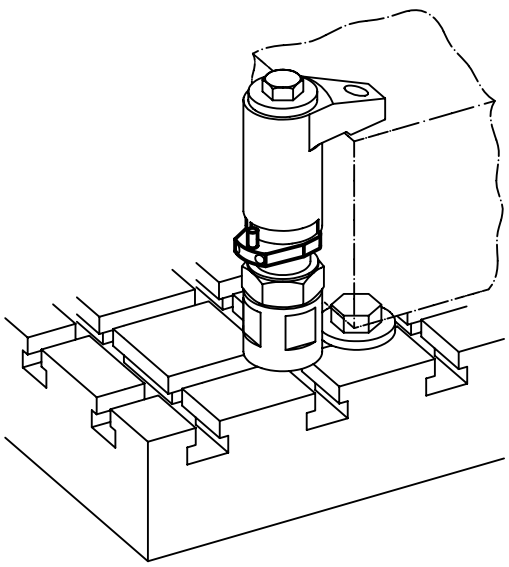
DRAWING



ORDER INFORMATION

Dimensions [mm]								For down-thrust clamp	[g]	Art. No.
h_1	h_2	d_1	d_2	l_1	l_2	b	e			
7	16	5	28	43,5	17,5	35	22760.0052	23310.0050-.0058/23310.0083-.0088	32	23310.0350
15	40	10	62	93,0	39,0	78	22760.0104	23310.0070	340	23310.0351

APPLICATION EXAMPLE



Height Adjusting Cylinders

EH 23310.



PRODUCT DESCRIPTION

The height adjusting cylinders can be used for increasing the clamping height of down-thrust clamps EH 23310. They are also used in combination with seating pins (EH 22680.), pins (EH 22690.) and self-aligning pads (EH 22730. - EH 22741.).

Material

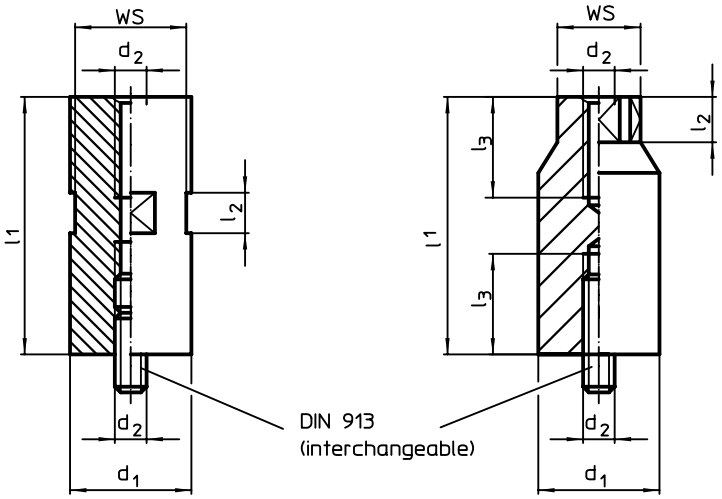
- Steel, case-hardened, blackened, ground

MORE INFORMATION

Further products

Seating Pins, ribbed or pointed . . . . . → p. 286
Seating Pins, pin shape. . . . . → p. 287
Pins . . . . . → p. 288
Seating Pins, adjustable . . . . . → p. 291
Self-Aligning Pads . . . . . → p. 315
Self-Aligning Pads, with hard metal ball, ribbed. . . . . → p. 316
Self-Aligning Pads, self-resetting. . . . . → p. 317
Self-Aligning Pads, with hard metal ball, ribbed and self-resetting . . . . . → p. 319
Self-Aligning Pads, adjustable. . . . . → p. 320
Self-Aligning Pads, adjustable with self-resetting . . . . . → p. 321

DRAWING



picture 1 picture 2

ORDER INFORMATION

Dimensions					WS		Art. No.
d_1 h9	l_1	d_2	l_2	l_3	[mm]	[g]	
picture 1							
25	**20 ±0,01**	**M 8**	10	–	22	71	23310.0125
	40 ±0,01	**M 8**	20	–	22	139	23310.0126
	80 ±0,01	**M 8**	20	–	22	292	23310.0127
40	**35 ±0,01**	**M12**	20	–	36	319	23310.0140
	70 ±0,01	**M12**	20	–	36	644	23310.0141
	140 ±0,01	**M12**	20	–	36	1325	23310.0142
	35 ±0,01	**M16**	20	–	36	318	23310.0145
	70 ±0,01	**M16**	20	–	36	634	23310.0146
	140 ±0,01	**M16**	20	–	36	1307	23310.0147
60	**35 ±0,01**	**M12**	20	–	55	755	23310.0160
	70 ±0,01	**M12**	20	–	55	1460	23310.0161
	140 ±0,01	**M12**	20	–	55	3034	23310.0162
	35 ±0,01	**M16**	20	–	55	760	23310.0165
	70 ±0,01	**M16**	20	–	55	1493	23310.0166
	140 ±0,01	**M16**	20	–	55	3016	23310.0167
	50 ±0,01	**M20**	20	–	55	1087	23310.0170
	100 ±0,01	**M20**	20	–	55	2126	23310.0171
	200 ±0,01	**M20**	20	–	55	3623	23310.0172
70	**50 ±0,01**	**M24**	25	–	65	1310	23310.0241
	100 ±0,01	**M24**	25	–	65	2682	23310.0242
picture 2							
90	**200 ±0,02**	**M24**	35	50	65	8655	23310.0243
	300 ±0,02	**M24**	35	50	65	13617	23310.0244

3

Clamping Claws

EH 23370.



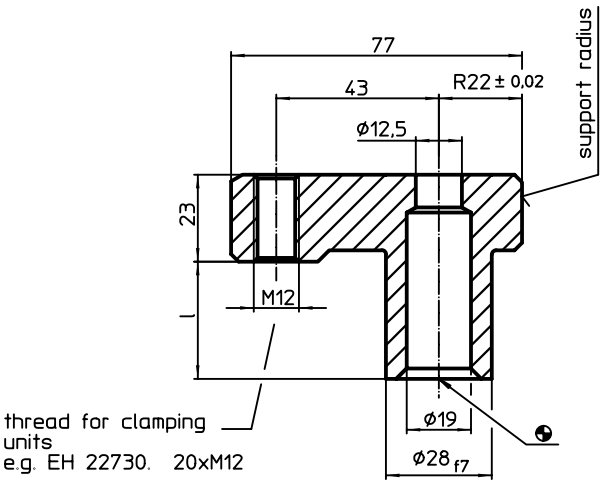
PRODUCT DESCRIPTION

Used as clamps in conventional fixtures. A reamed hole is provided in the body of the fixture. The hole depth has to be adapted to the desired clamping height. To provide a counter force, a support can be placed against the rounded end of the clamp (radius 22). This support can be flat, half-rounded or V-shaped. Clamping is achieved by means of a DIN 933 hexagon screw.

Material

- Steel, case-hardened, blackened, ground

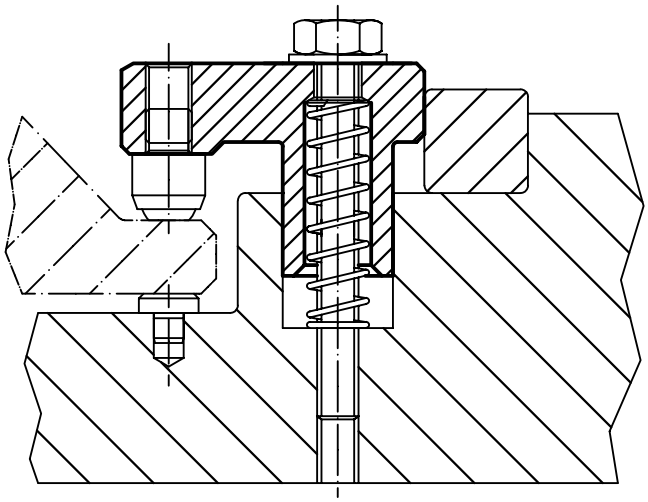
DRAWING



ORDER INFORMATION

Dimensions l [mm]	Clamp length [mm]	Location hole H7 [mm]	 [g]	Art. No.
31	77	28	433	23370.0031
53	77	28	462	23370.0053
83	77	28	577	23370.0083

APPLICATION EXAMPLE



TOGGLE CLAMPS

FULL CLAMPING FORCE, EXTRA EASY

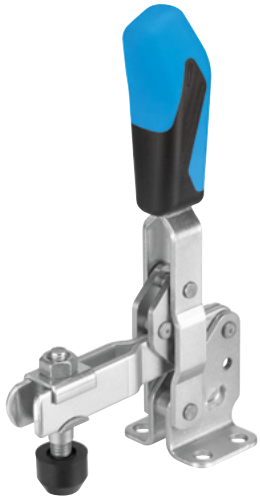
CLAMP PARTS SECURELY AND WITH NO EFFORT.

Short set-up times are paramount for an economical production process. Even a minor cog in the production machinery - like a clamping system - can increase cost significantly. Aside from precise and secure clamping of the workpieces, the toggle clamps engineered by Erwin Halder KG afford the user superior ease of use and let them exchange the parts they need to process with unsurpassed speed and ease. The Halder toggle clamp sets itself apart further by its ergonomic handle combined with the sturdy and long-lasting design and a safety clamping piece.



Vertical Toggle Clamps • with horizontal base

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated
- Stainless steel

Rivet
- Stainless steel
- Steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization
- stainless steel

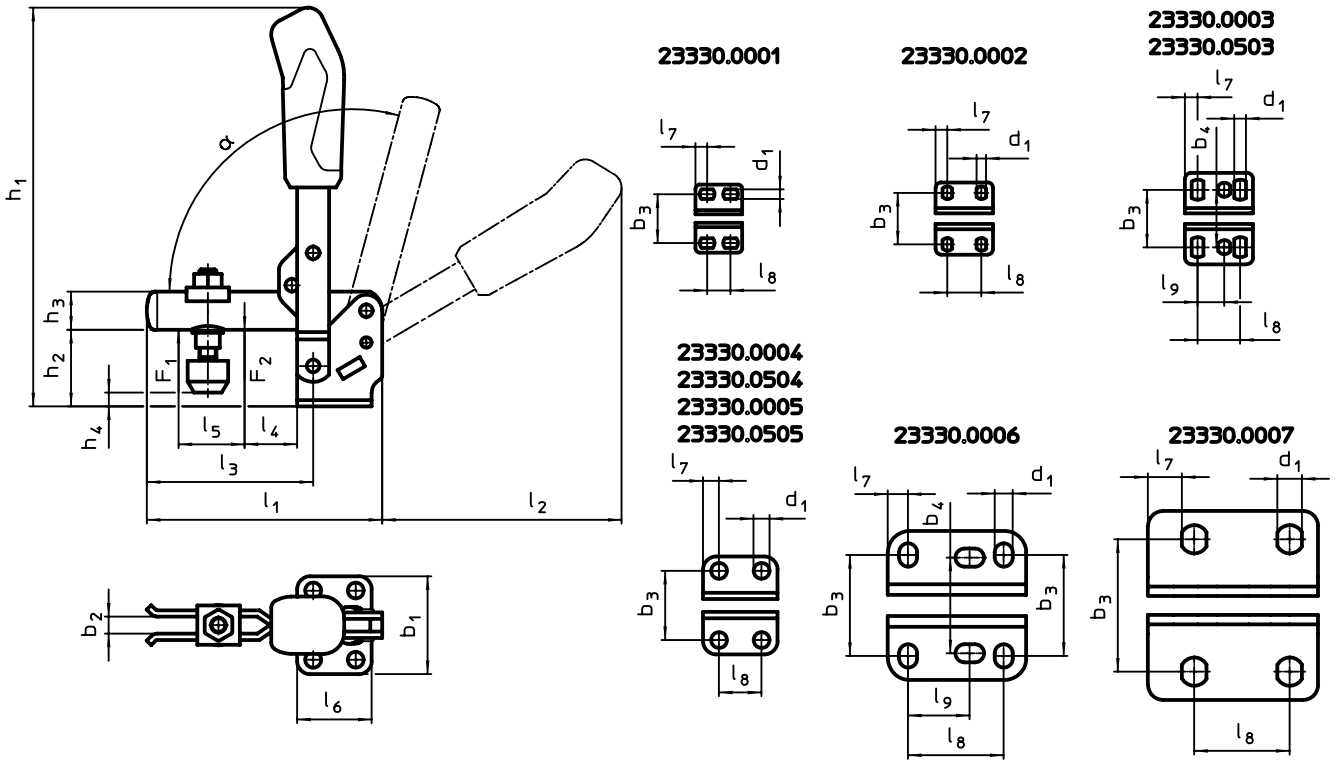
Clamping cap
- Rubber, black

MORE INFORMATION

References

Replacement clamping screws are available as accessories in the online shop.

DRAWING

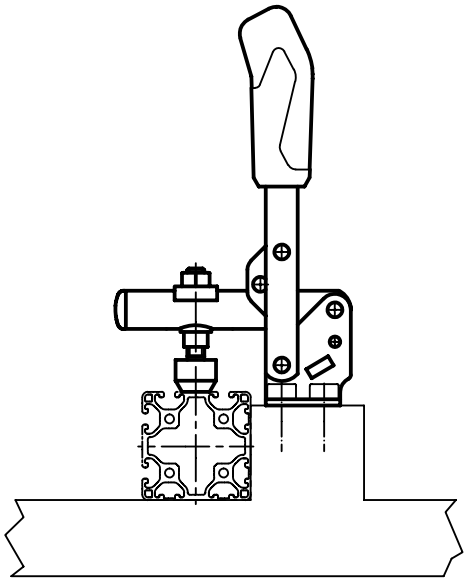


ORDER INFORMATION

Nominal size	Dimensions																			Holding force		α				Art. No.
	Clamping screw	d_1	b_1	b_2	b_3	b_4	h_1	h_2	h_3	h_4 min.	h_4 max.	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	F_1	F_2		min.	max.		
	[mm]																				[kN]			[°C]		[g]	
steel																											
1	M 4 x 25	4,5	32	4	23,0	–	81,0	18,0	8	-1,5	3,5	49	50	31,0	5,5	14	22	5,5	8,5 – 13,5	–	0,5	0,7	95°	-10	80	65	23330.0001
2	M 5 x 30	4,5	34	5	22,5 – 26,0	–	98,5	19,0	10	-4,0	2,0	61	59	39,0	6,0	18	27	5,5	16,0	–	0,6	1,1	95°	-10	80	114	23330.0002
3	M 6 x 35	5,5	43	6	23,0 – 31,0	27	129,5	23,0	12	-3,0	4,5	78	80	52,0	11,0	25	32	6,0	20,0	12,5	0,8	1,2	105°[1)]	-10	80	192	23330.0003
4	M 8 x 45	7,5	46	8	32,5	–	186,0	33,0	18	2,0	11,0	112	112	79,0	19,0	37	35	7,5	20,0	–	1,2	2,5	105°[1)]	-10	80	410	23330.0004
5	M 8 x 65	8,6	64	10	43,5 – 46,5	–	221,0	42,5	20	-6,0	22,5	141	130	101,0	16,0	54	53	13,0	32,0	–	1,7	3,0	105°[1)]	-10	80	687	23330.0005
6	M12 x 80	8,5	70	14	45,0 – 50,0	45	281,0	55,8	25	-3,0	27,5	195	185	140,0	34,0	73	65	9,5	45,0	26,5 – 31,5	3,0	5,0	115°[1)]	-10	80	1492	23330.0006
7	M12 x 110	13,0	100	14	37,5 – 72,5	–	333,0	81,0	30	-2,5	55,0	231	206	165,5	28,0	89	90	24,5	50,5	–	3,4	5,5	140°[1)]	-10	80	2421	23330.0007
stainless steel																											
3	M 6 x 35	5,5	43	6	23,0 – 31,0	27	139,5	23,0	12	-3,0	4,5	78	89	52,0	11,0	25	32	6,0	20,0	12,5	0,8	1,2	105°[1)]	-10	80	195	23330.0503
4	M 8 x 45	7,5	46	8	32,5	–	186,0	33,0	18	2,0	11,0	112	112	79,0	19,0	37	35	7,5	20,0	–	1,2	2,5	105°[1)]	-10	80	430	23330.0504
5	M 8 x 65	8,6	64	10	43,5 – 46,5	–	221,0	42,5	20	-6,0	22,5	141	130	101,0	16,0	54	53	13,0	32,0	–	1,7	3,0	105°[1)]	-10	80	697	23330.0505

[1)] The opening angle of the handle can be changed to 60° by pressing in a stop pin.

APPLICATION EXAMPLE



Vertical Toggle Clamps • with vertical base

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
A oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

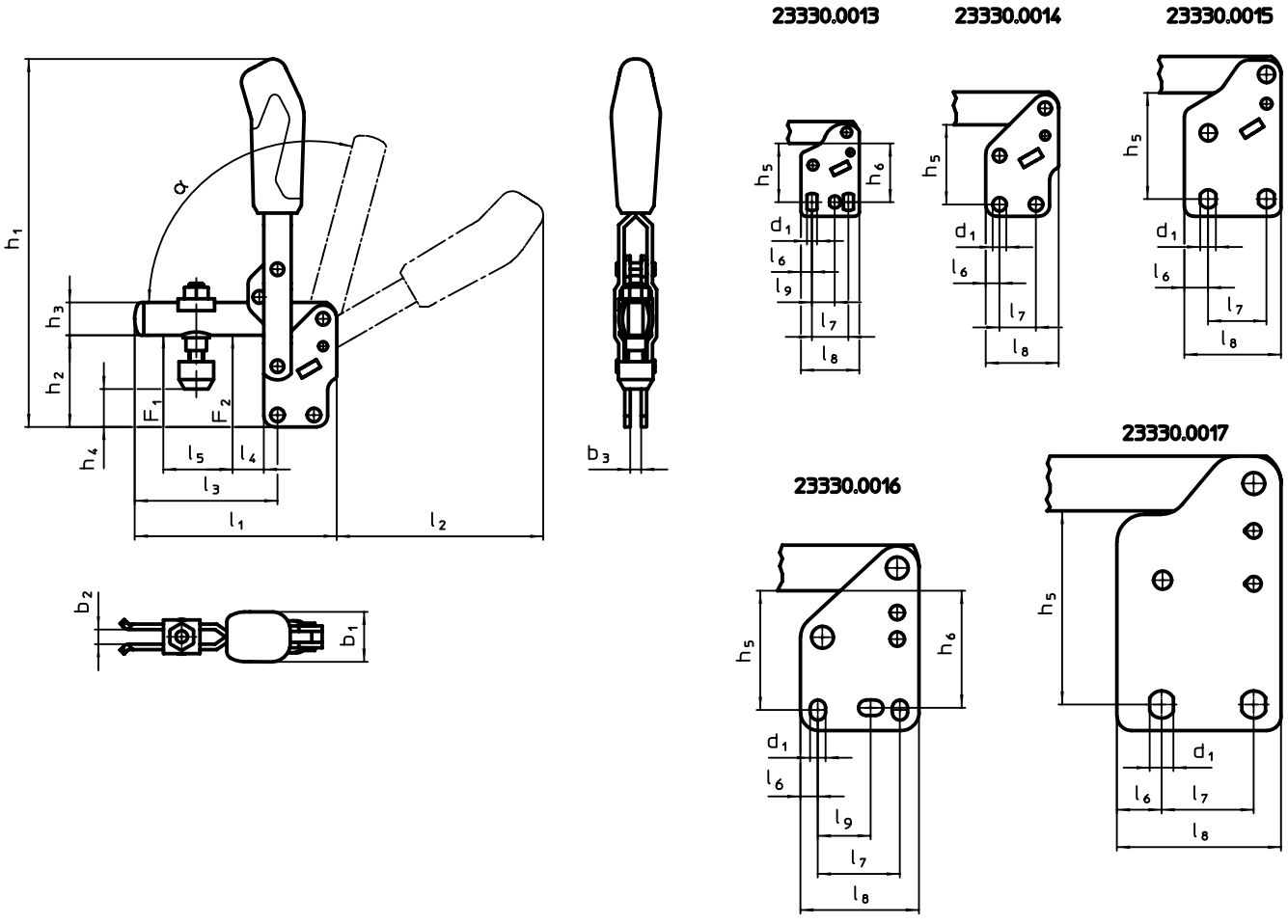
Clamping cap
- Rubber, black

MORE INFORMATION

References

Replacement clamping screws are available as accessories in the online shop.

DRAWING



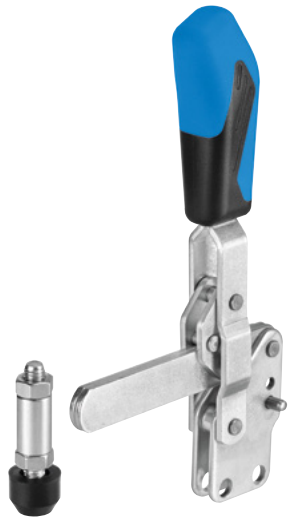
ORDER INFORMATION

Nominal size	Dimensions																				Holding force		α				Art. No.
	d_1	Clamping screw	b_1	b_2	b_3	h_1	h_2	h_3	h_4 min.	h_4 max.	h_5	h_6	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	F_1	F_2		min.	max.		
	[mm]																				[kN]			[°C]		[g]	
3	5,5	M 6 x 35	21	6	5	144,5	38	12	11,5	19,5	28,5 – 32	30	78	80	52	11	25	6,0	20,0	32	0,8	1,2	60°	-10	80	197	23330.0013
4	7,5	M 8 x 45	27	8	6	200,0	48	18	16,5	25,0	41,0	–	112	114	79	19	36	7,5	20,0	40	1,2	2,5	60°	-10	80	417	23330.0014
5	8,6	M 8 x 65	35	10	8	244,0	65	20	16,5	45,5	55,5	–	141	130	101	16	54	13,0	32,0	53	1,7	3,0	60°	-10	80	689	23330.0015
6	8,5	M12 x 80	45	14	10	301,0	77	25	18,0	49,0	66,0	64	195	183	140	35	72	9,5	45,0	65	3,0	5,0	60°	-10	80	1511	23330.0016
7	13,0	M12 x 110	45	14	10	369,0	117	30	33,0	90,5	102,0	–	231	206	165	28	89	24,5	50,5	90	3,4	5,5	60°	-10	80	2420	23330.0017

3

Vertical Toggle Clamps • with vertical base and solid support arm

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for maintenance-free continuous use.
An oil resistant ergonomic 2-component handle, with slip-proof, soft surface and large grip area for high ease of use.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

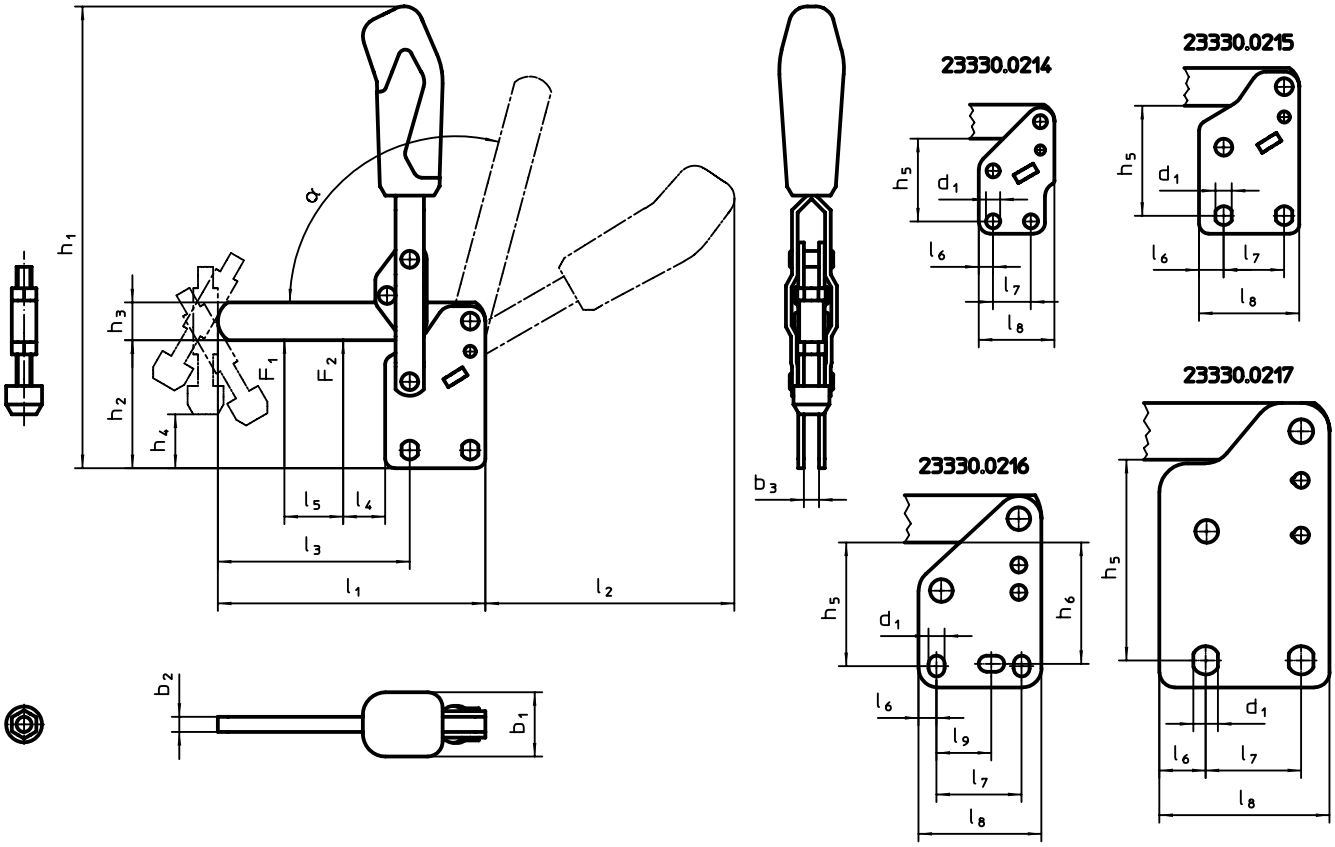
Clamping screw
- Steel, tempered, zinc-plated by galvanization

Clamping cap
- Rubber, black

Assembly

The clamping screw must be welded to the support arm in the desired position.

DRAWING



ORDER INFORMATION

Nominal size	Dimensions																					Holding force		α				Art. No.
	d_1	d_2	b_1	b_2	b_3	h_1	h_2	h_3	h_4 min.	h_4 max.	h_5	h_6	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	F_1	F_2		min.	max.		
	[mm]																					[kN]			[°C]		[g]	
4	7,5	M 8 x 45	27	6	6	200	48	18	14,5	26,0	41,0	–	108,5	116,0	81,0	19,5	43	7,5	20,0	35	–	1,4	2,5	105°	-10	80	426	23330.0214
5	8,6	M 8 x 65	34	8	8	244	65	20	13,0	44,0	55,5	–	141,5	129,5	101,0	17,0	61	13,0	32,0	53	–	2,0	3,0	105°	-10	80	679	23330.0215
6	8,5	M12 x 80	36	10	10	302	77	25	15,0	47,0	66,0	64	196,5	184,0	141,0	30,5	88	9,5	45,0	65	16,5 – 31,5	3,0	5,0	115°	-10	80	1506	23330.0216
7	13,0	M12 x 110	39	10	10	369	117	30	28,5	86,5	102,0	–	232,0	206,0	165,5	20,5	90	24,5	50,5	90	–	3,5	5,5	140°	-10	80	2408	23330.0217

Vertical Toggle Clamps • with vertical base and safety lock

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

Clamping cap
- Rubber, black

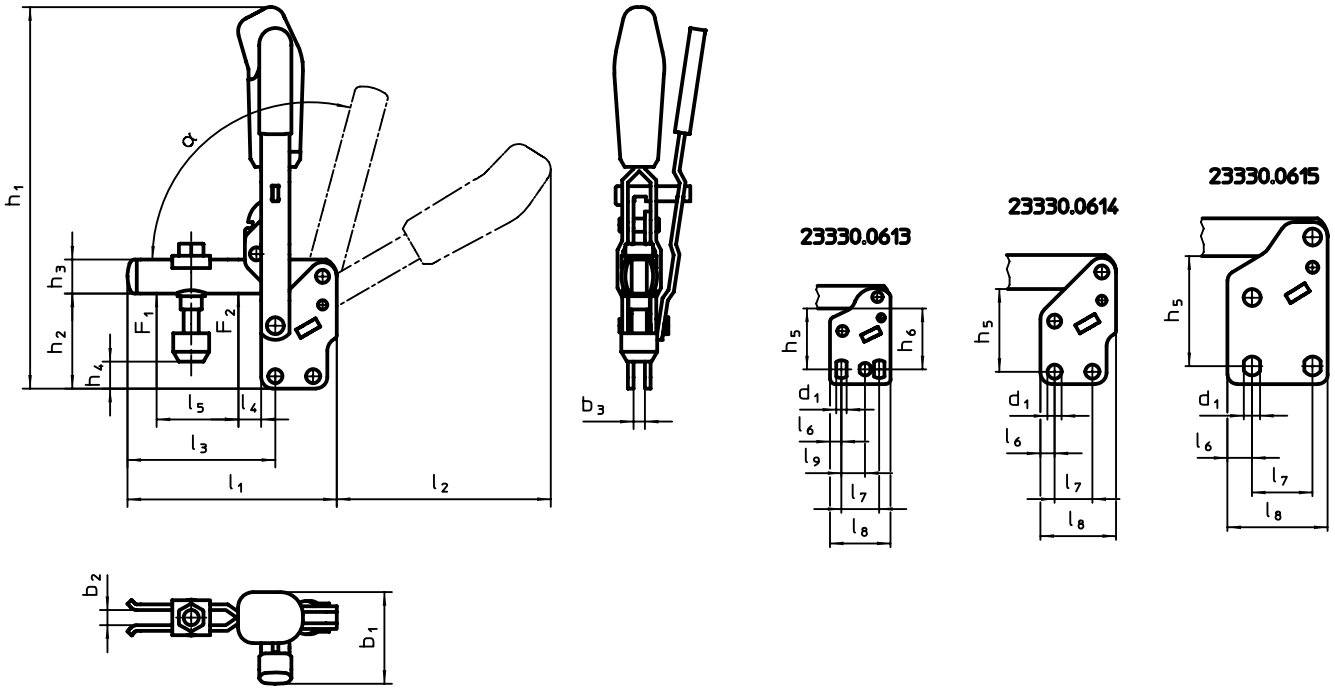
Plastic cap
- PVC, black

MORE INFORMATION

References

Replacement clamping screws are available as accessories in the online shop.

DRAWING

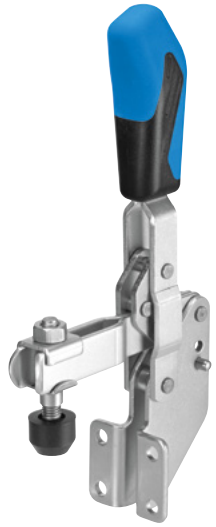


ORDER INFORMATION

Nominal size	Dimensions																					Holding force		α	Temperature		Weight	Art. No.
	d_1	d_2	b_1	b_2	b_3	h_1	h_2	h_3	h_4 min.	h_4 max.	h_5	h_6	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	F_1	F_2		min.	max.		
	[mm]																					[kN]			[°C]		[g]	
3	5,5	M6 x 35	38	6	5	154	38	12	11,5	19,5	28,5 – 32	30	78	89	52	11	25	6,0	20	32	12,5	1,0	1,2	95°	-10	80	237	23330.0613
4	7,5	M8 x 45	48	8	6	200	48	18	10,0	18,5	41,0	–	111	114	79	19	37	7,5	20	40	–	1,4	2,5	105°	-10	80	484	23330.0614
5	8,6	M8 x 65	53	10	8	244	65	20	16,5	45,5	55,5	–	141	130	101	16	54	13,0	32	53	–	2,0	3,0	105°	-10	80	776	23330.0615

Vertical Toggle Clamps • with angle base

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

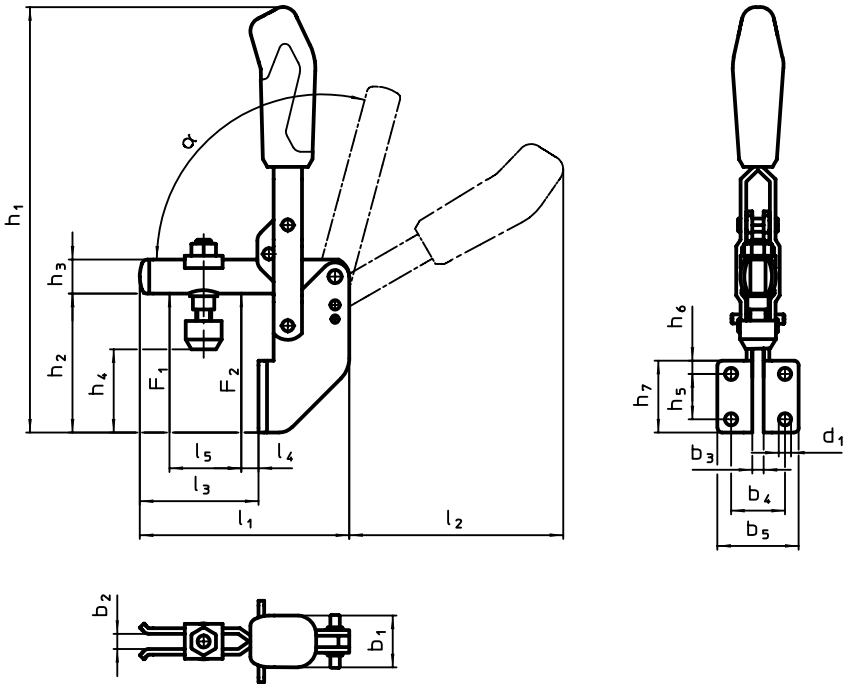
Clamping cap
- Rubber, black

MORE INFORMATION

References

Replacement clamping screws are available as accessories in the online shop.

DRAWING



ORDER INFORMATION

Nominal size	Dimensions [mm]																					Holding force [kN]		α	Temperature [°C]		Weight [g]	Art. No.
	d_1	Clamping screw	b_1	b_2	b_3	b_4	b_5	h_1	h_2	h_3	h_4 min.	h_4 max.	h_5	h_6	h_7	l_1	l_2	l_3	l_4	l_5	F_1	F_2		min.	max.		
3	6,1	M6 x 35	21	6	5	25,5	37,0	167	60	12	7,5	15,5	20	6	32	77	81	41	6	25	1,0	1,2	60°	-10	80	231	23330.0023
4	6,5	M8 x 45	27	8	6	28,5	42,5	223	71	18	9,0	17,5	24	7	38	111	112	63	11	37	1,4	2,5	60°	-10	80	483	23330.0024
5	8,5	M8 x 65	35	10	8	32,0	52,0	280	102	20	11,0	40,0	32	54	96	141	129	84	11	54	2,0	3,0	60°	-10	80	802	23330.0025

Vertical Toggle Clamps • with angle base and safety lock

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

Clamping cap
- Rubber, black

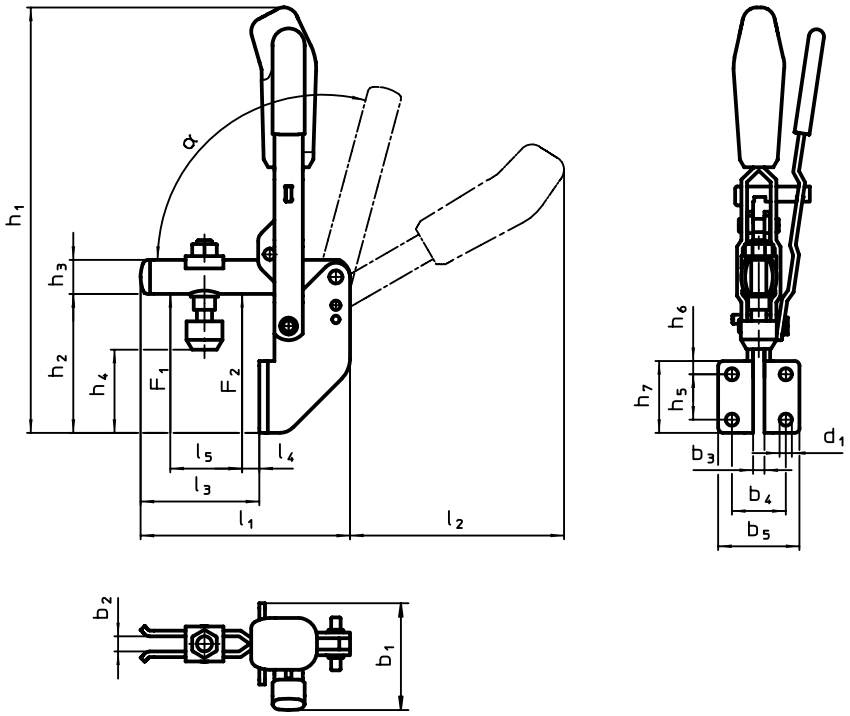
Plastic cap
- PVC, black

MORE INFORMATION

References

Replacement clamping screws are available as accessories in the online shop.

DRAWING



ORDER INFORMATION

Nominal size	Dimensions [mm]																				Holding force [kN]		α	Temperature [°C]		Weight [g]	Art. No.
	d_1	d_2	b_1	b_2	b_3	b_4	b_5	h_1	h_2	h_3	h_4 min.	h_4 max.	h_5	h_6	h_7	l_1	l_2	l_3	l_4	l_5	F_1	F_2		min.	max.		
3	5,5	M6 x 35	22	6	5	25,5	38	180	61	12	2	11	20	6	32	7	63	40	9	25	1,0	1,2	105°	-10	80	272	23330.0623
4	6,5	M8 x 45	29	8	6	28,5	43	243	71	18	6	18	24	7	38	112	111	65	11	43	1,4	2,5	105°	-10	80	551	23330.0624
5	8,5	M8 x 65	31	10	8	32,0	52	280	102	20	11	40	32	54	96	140	129	84	17	50	2,0	3,0	105°	-10	80	885	23330.0625

Vertical Toggle Clamps • with horizontal base and solid support arm

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for maintenance-free continuous use.
An oil resistant ergonomic 2-component handle, with slip-proof, soft surface and large grip area for high ease of use.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

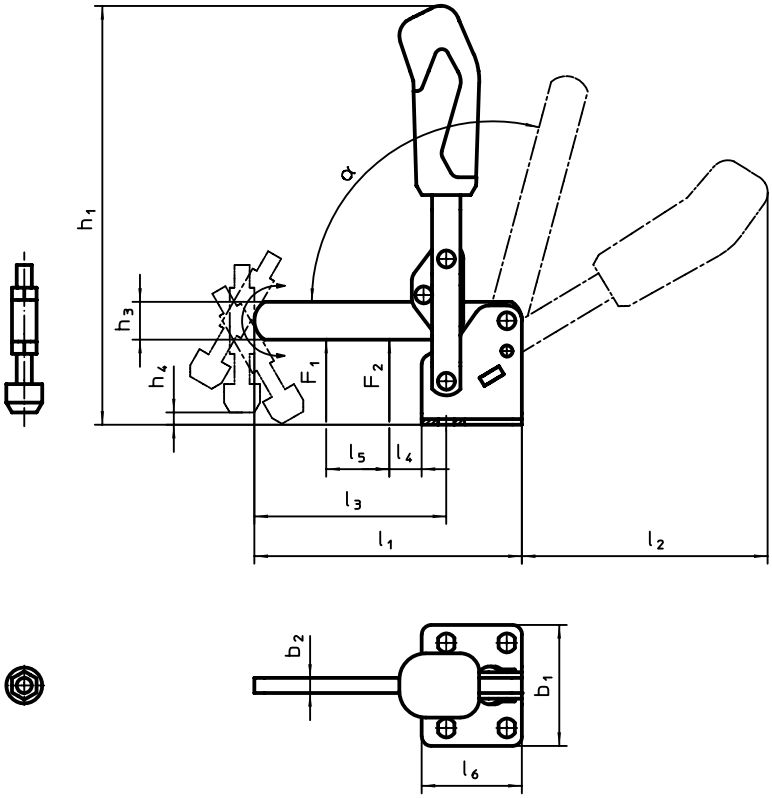
Clamping screw
- Steel, tempered, zinc-plated by galvanization

Clamping cap
- Rubber, black

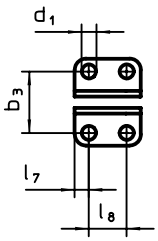
Assembly

The clamping screw must be welded to the support arm in the desired position.

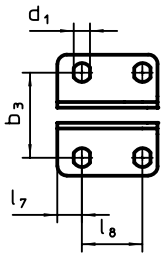
DRAWING



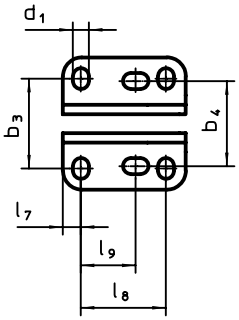
23330.0204



23330.0205
23330.0207



23330.0206



ORDER INFORMATION

Nominal size	Dimensions																			Holding force		α	Temperature		Weight	Art. No.
	d_1	Clamping screw	b_1	b_2	b_4	h_1	h_2	h_3	h_4 min.	h_4 max.	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	F_1	F_2		min.	max.		
	[mm]																			[kN]			[°C]		[g]	
4	7,5	M 8 x 45	46	6	–	186	33,5	18	0	12,0	108,5	116,5	81,0	19,5	43	35	7,5	20,0	–	1,4	2,5	105°	-10	80	426	23330.0204
5	8,6	M 8 x 65	64	8	–	221	42,5	20	-8	21,0	141,5	129,5	101,0	17,0	61	53	13,0	32,0	–	2,0	3,0	105°	-10	80	686	23330.0205
6	8,5	M12 x 80	70	10	45	281	55,5	25	-6	25,5	196,5	184,0	141,0	30,5	88	65	9,5	45,0	45	3,0	5,0	105°	-10	80	1503	23330.0206
7	13,0	M12 x 110	100	10	–	331	81,0	30	-5	51,0	232,0	206,0	166,5	20,5	90	90	24,5	50,5	–	3,5	5,5	105°	-10	80	2420	23330.0207

Vertical Toggle Clamps • with horizontal base and safety lock

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

Clamping cap
- Rubber, black

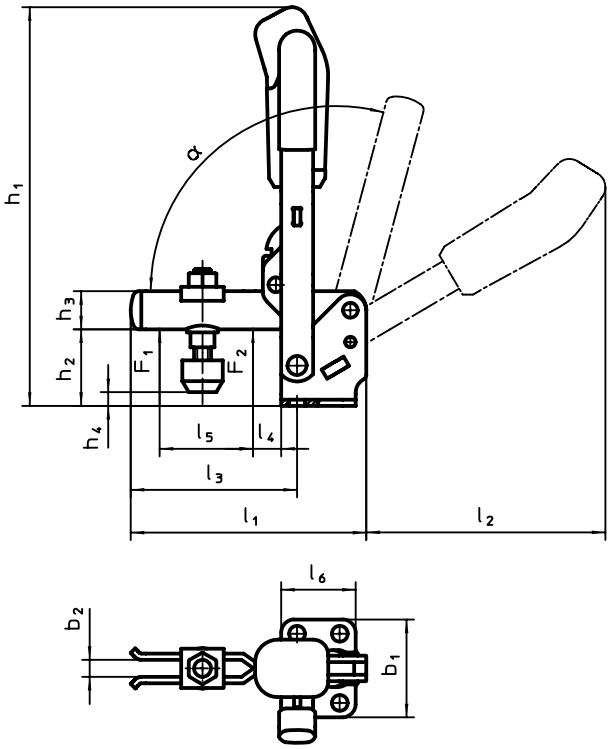
Plastic cap
- PVC, black

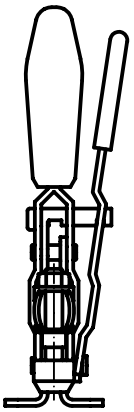
MORE INFORMATION

References

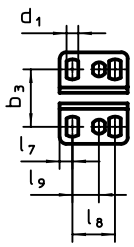
Replacement clamping screws are available as accessories in the online shop.

DRAWING

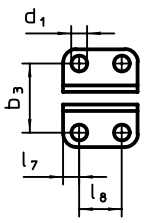




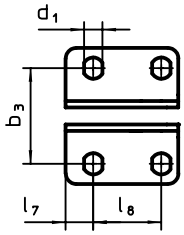
23330.0603



23330.0604



23330.0605

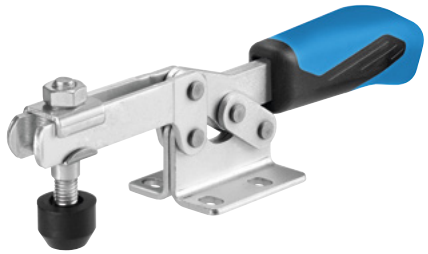


ORDER INFORMATION

Nominal size	Dimensions																			Holding force		α				Art. No.
	d_1	d_2	b_1	b_2	b_3	h_1	h_2	h_3	h_4 min.	h_4 max.	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	F_1	F_2		min.	max.		
	[mm]																			[kN]			[°C]		[g]	
3	5,5	M6 x 35	43	6	23,0 – 31	139,5	23,0	12	-3	4,5	78	89	52	11	25	32	6,0	20	12,5	1,0	1,2	105°	-10	80	238	23330.0603
4	7,5	M8 x 45	46	8	32,5	186,0	33,0	18	2	11,0	112	112	79	19	36	35	7,5	20	–	1,4	2,5	105°	-10	80	484	23330.0604
5	8,6	M8 x 65	64	10	45,0	221,0	42,5	20	-6	22,5	141	130	101	16	54	53	13,0	32	–	2,0	3,0	105°	-10	80	775	23330.0605

Horizontal Toggle Clamps • with horizontal base

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated
- Stainless steel

Rivet
- Stainless steel
- Steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization
- stainless steel

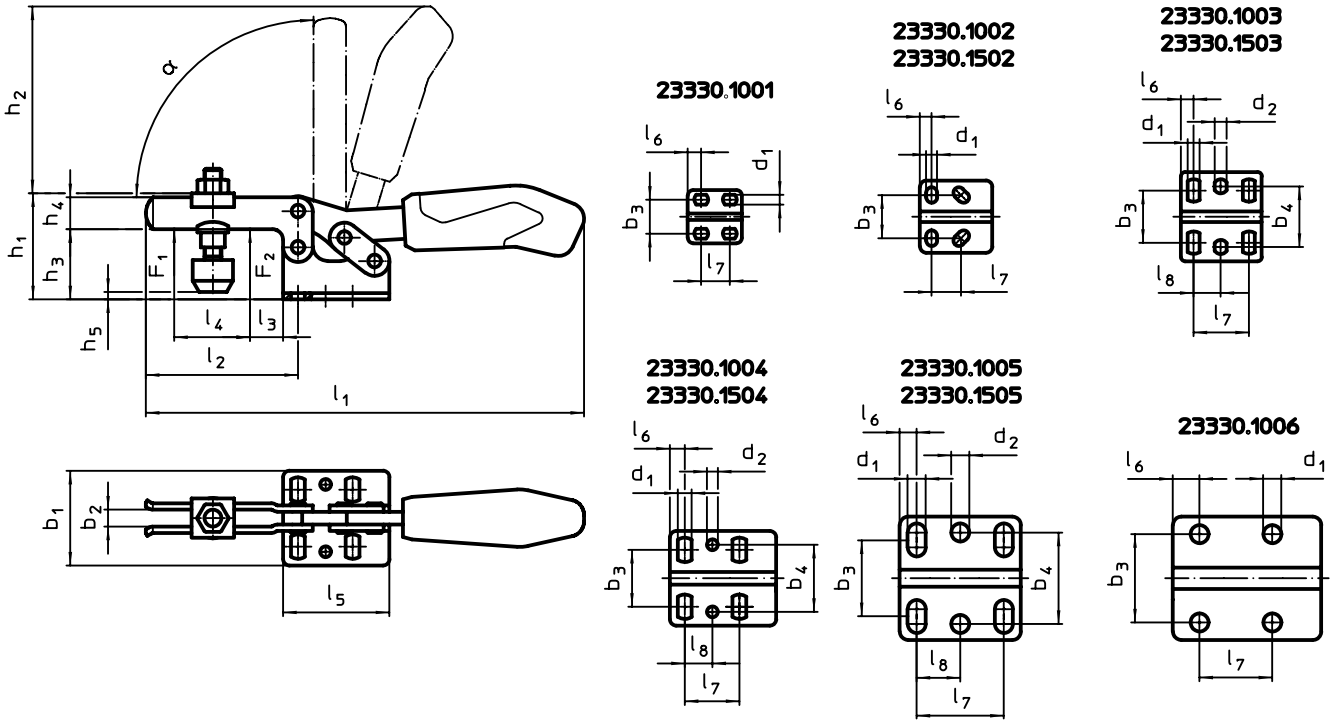
Clamping cap
- Rubber, black

MORE INFORMATION

References

Replacement clamping screws are available as accessories in the online shop.

DRAWING



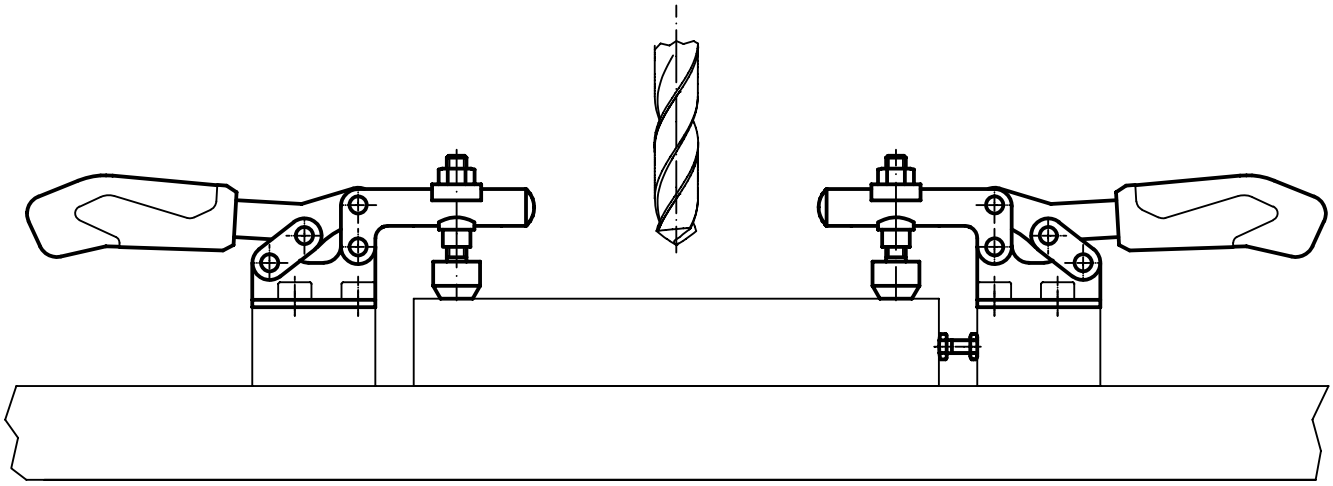
ORDER INFORMATION

Nominal size	Clamping screw	d_1	d_2	b_1	b_2	b_3	b_4	h_1	h_2	h_3	h_4	h_5 min.	h_5 max.	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	Holding force F_1	Holding force F_2	α	min.	max.		Art. No.
		[mm]																				[kN]			[°C]		[g]	
steel																												
1	M 4 x 25	4,6	–	25,0	4	16,0	–	23,0	34	14,5	7,5	-5,5	0,0	79	28	5,5	9,0	25,5	6,3	11,5 – 15,5	–	0,25	0,4	90°	-10	80	38	23330.1001
2	M 5 x 30	5,2	–	34,0	5	18,0 – 21,5	–	30,0	49	19,0	10,0	-3,0	2,5	120	42	8,0	18,7	34,0	5,5	13,0 – 14,5	–	0,80	1,1	90°	-10	80	110	23330.1002
3	M 6 x 35	5,6	5,6	42,0	6	19,5 – 29,5	28,5	45,0	68	24,0	13,2	-1,5	5,0	162	64	16,0	32,0	38,0	6,0	26,0	12,7	1,00	1,2	90°	-10	80	190	23330.1003
4	M 8 x 45	6,5	5,1	45,5	8	22,0 – 31,8	31,6	48,5	86	32,0	15,0	-2,0	9,0	206	73	14,0	38,0	50,0	7,0	25,7	13,0	1,80	2,5	90°	-10	80	337	23330.1004
5	M 8 x 65	8,5	8,5	58,0	10	29,0 – 43,0	43,0	75,0	126	45,0	20,0	-4,0	24,0	287	113	27,0	63,0	57,0	8,0	41,0	20,5	2,00	3,0	90°	-10	80	726	23330.1005
6	M12 x 80	8,5	–	58,0	10	41,5	–	73,0	128	46,0	25,0	1,7	25,0	321	123	16,0	78,0	77,0	12,5	41,5	–	3,00	5,0	90°	-10	80	1112	23330.1006

→

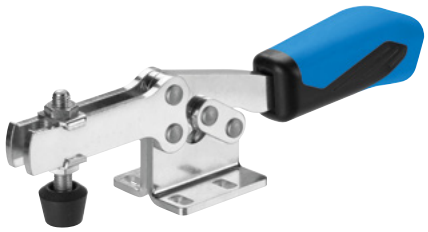
Nominal size	Clamping screw	d_1	d_2	b_1	b_2	b_3	b_4	h_1	h_2	h_3	h_4	h_5 min.	h_5 max.	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	Holding force F_1	Holding force F_2	α	min.	max.		Art. No.
		[mm]																				[kN]			[°C]		[g]	
stainless steel																												
2	M 5 x 30	5,2	–	34,0	5	18,0 – 21,5	–	30,0	49	19,0	10,0	-3,0	2,5	120	42	8,0	18,7	34,0	5,5	13,0 – 14,5	–	0,80	1,1	90°	-10	80	113	23330.1502
3	M 6 x 35	5,6	5,6	42,0	6	19,5 – 29,5	28,5	45,0	68	24,0	13,2	-1,5	5,0	162	64	16,0	32,0	38,0	6,0	26,0	12,7	1,00	1,2	90°	-10	80	189	23330.1503
4	M 8 x 45	6,5	5,1	45,5	8	22,0 – 31,8	31,6	48,5	86	32,0	15,0	-2,0	9,0	206	73	14,0	38,0	50,0	7,0	25,7	13,0	1,80	2,5	90°	-10	80	341	23330.1504
5	M 8 x 65	8,5	8,5	58,0	10	29,0 – 43,0	43,0	75,0	126	45,0	20,0	-4,0	24,0	287	113	27,0	63,0	57,0	8,0	41,0	20,5	2,00	3,0	90°	-10	80	744	23330.1505

APPLICATION EXAMPLE



Horizontal Toggle Clamps • with horizontal base / increased holding force

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

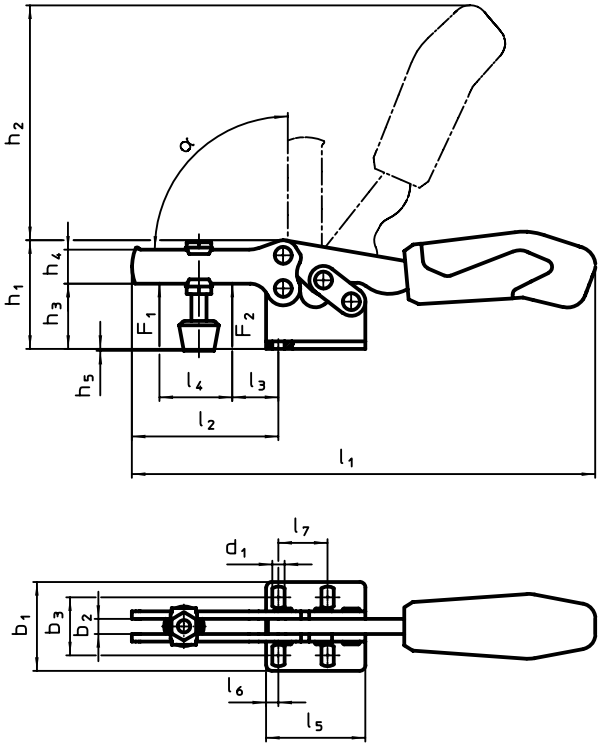
Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

Clamping cap
- Rubber, black

DRAWING

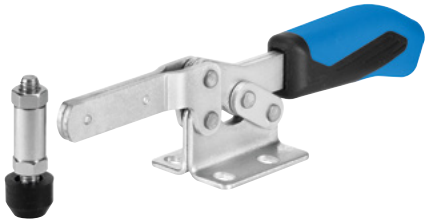


ORDER INFORMATION

Nominal size	Dimensions																		Holding force		α				Art. No.
	d_1	Clamping screw	b_1	b_2	h_1	h_2	h_3	h_4	h_5 min.	h_5 max.	l_1	l_2	l_3	l_4	l_5	l_6	l_7		F_1	F_2		min.	max.	[g]	
	[mm]																		[kN]			[°C]			
2	4,3	M5 x 35	27,5	5	35	46	19,0	12	0	10,0	126	46	16,5	20	34,0	6,0	13,5		1,1	1,7	90°	-10	80	136	23330.1302
4	6,5	M8 x 58	47,0	8	58	112	33,5	18	-1	13,0	242	78	22,0	43	52,5	6,5	26,0		2,5	4,0	90°	-10	80	557	23330.1304
5	8,6	–	60,0	10	77	135	41,0	24	-2	16,5	329	120	23,0	69	76,0	10,5	41,5		3,5	8,0	90°	-10	80	1261	23330.1305

Horizontal Toggle Clamps • with horizontal base and solid support arm

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for maintenance-free continuous use.
An oil resistant ergonomic 2-component handle, with slip-proof, soft surface and large grip area for high ease of use.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

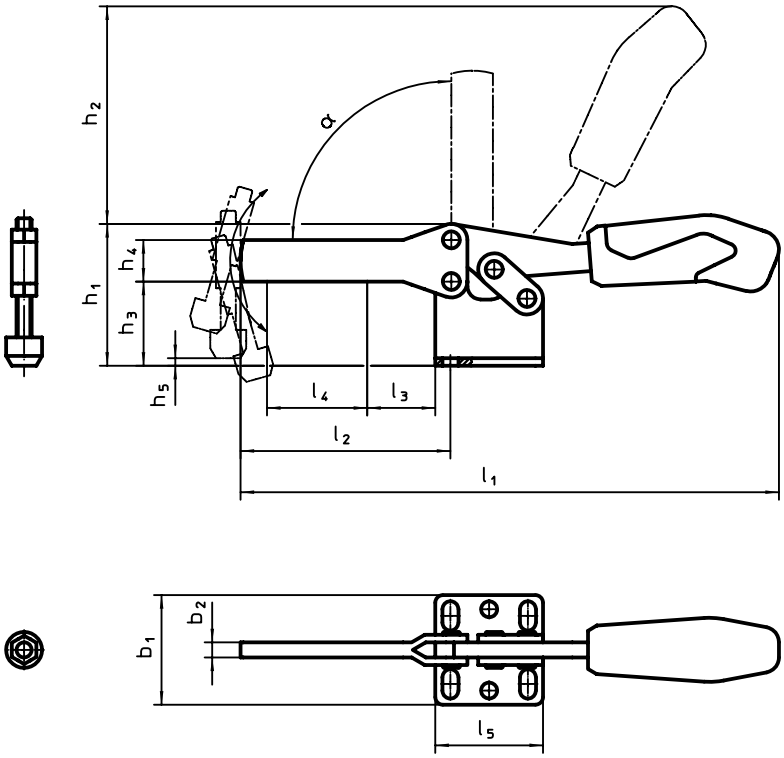
Clamping screw
- Steel, tempered, zinc-plated by galvanization

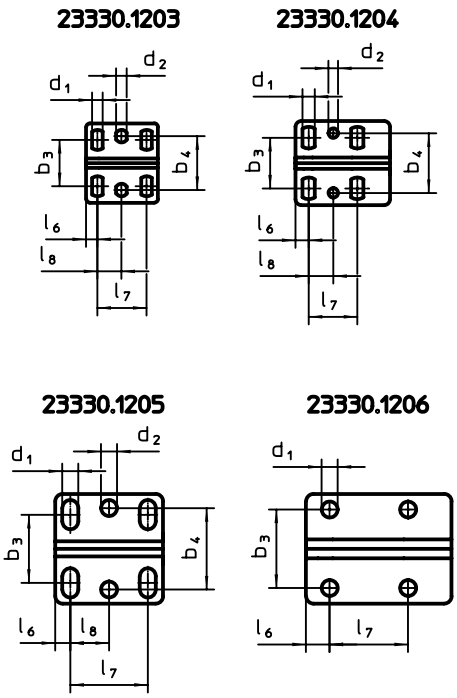
Clamping cap
- Rubber, black

Assembly

The clamping screw must be welded to the support arm in the desired position.

DRAWING



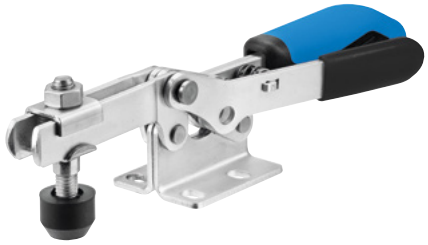


ORDER INFORMATION

Nominal size	Dimensions [mm]																						Holding force [kN]		α	[°C]		[g]	Art. No.
	d_1	d_2	d_3	b_1	b_2	b_3	b_4	h_1	h_2	h_3	h_4	h_5 min.	h_5 max.	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	F_1	F_2		min.	max.		
3	5,6	5,6	M 6 x 35	42,0	5	19,5 – 29,5	28,5	45,0	66	24	13	-2,0	7,5	161	63	24	35	38	6,0	26,0	13	1,0	1,2	90°	-10	80	196	23330.1203
4	6,5	5,1	M 8 x 45	45,5	6	22,0 – 31,8	32,0	48,5	86	32	15	-3,5	11,0	205	72	32	44	50	7,0	26,0	13	1,8	2,5	90°	-10	80	400	23330.1204
5	8,5	8,5	M 8 x 65	58,0	8	29,0 – 43,0	43,0	75,0	114	45	20	-6,0	22,0	280	111	45	66	57	8,0	41,0	21	2,0	3,0	90°	-10	80	716	23330.1205
6	8,5	–	M12 x 80	58,0	10	41,5	–	73,0	128	46	25	-13,0	12,5	320	121	46	78	77	12,5	41,5	–	3,0	5,0	90°	-10	80	1222	23330.1206

Horizontal Toggle Clamps • with horizontal base and safety lock

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

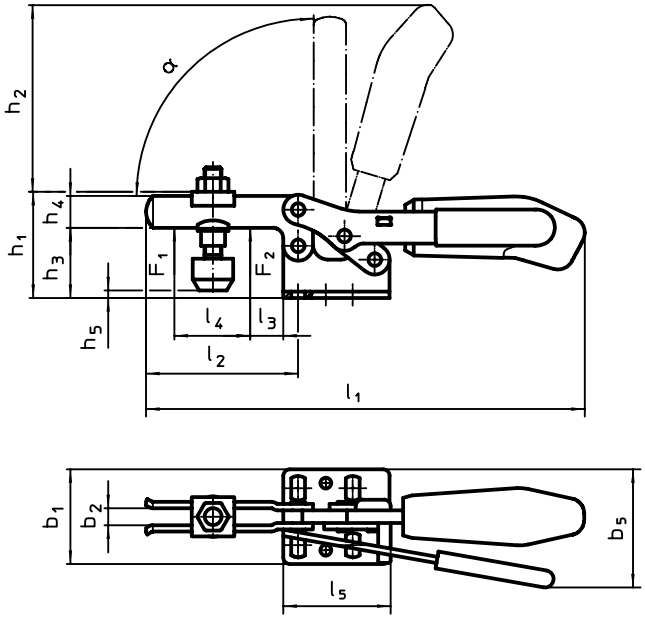
Clamping cap
- Rubber, black

Plastic cap
- PVC, black

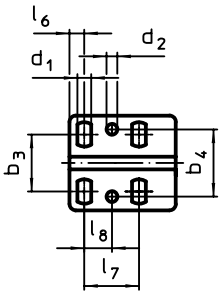
MORE INFORMATION

References
Replacement clamping screws are available as accessories in the online shop.

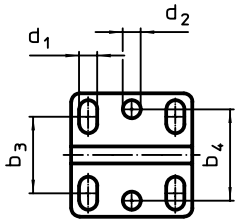
DRAWING



23330.1604



23330.1605

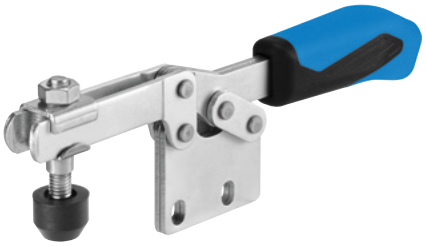


ORDER INFORMATION

Nominal size	Dimensions																			Holding force		α				Art. No.
	d_1	d_2	d_3	b_1	b_2	b_3	b_4	h_1	h_2	h_3	h_4	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	F_1	F_2		min.	max.		
	[mm]																			[kN]			[°C]		[g]	
4	6,5	5,1	M8 x 45	45,5	8	22 – 31,8	31,6	48,5	86,0	32	15	206	73	14	38	50	7	25,7	13	1,8	2,5	90°	-10	80	400	23330.1604
5	8,5	8,5	M8 x 65	58,0	10	29 – 43,0	43,0	75,0	126,5	45	20	287	113	27	63	57	8	41,0	21	2,0	3,0	90°	-10	80	833	23330.1605

Horizontal Toggle Clamps • with vertical base

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

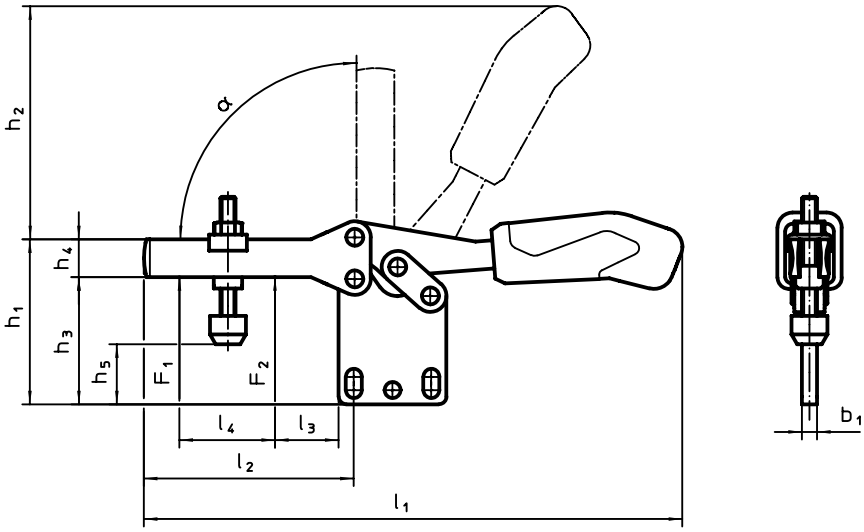
Clamping cap
- Rubber, black

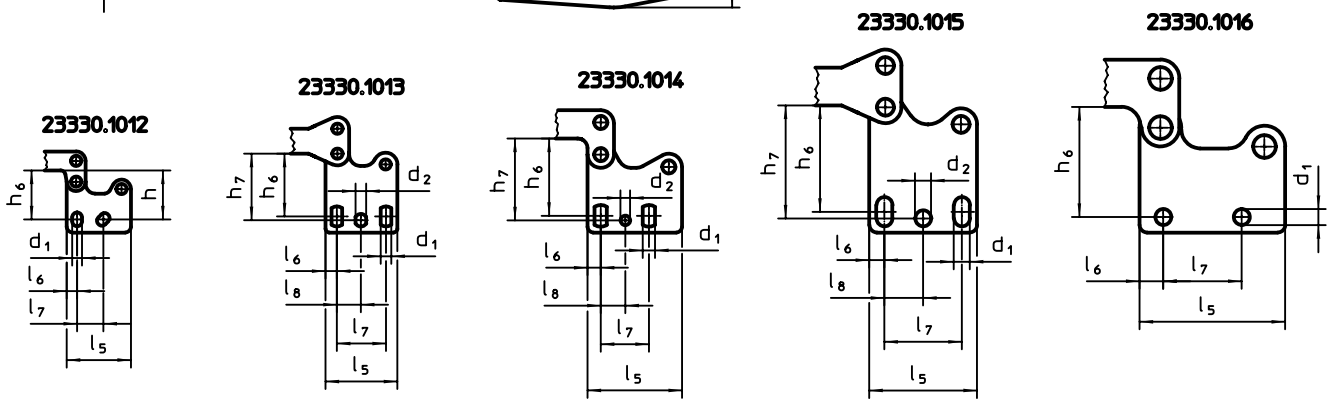
MORE INFORMATION

References

Replacement clamping screws are available as accessories in the online shop.

DRAWING





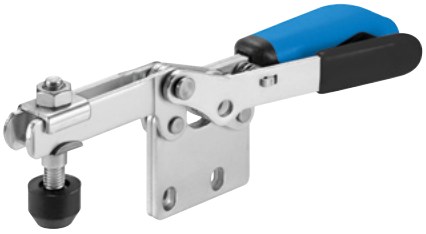
ORDER INFORMATION

Nominal size	Dimensions																				Holding force		α				Art. No.
	d_1	d_2	Clamping screw	b_1	b_2	b_3	h_1	h_2	h_3	h_4	h_5 min.	h_5 max.	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	F_1	F_2		min.	max.		
	[mm]																				[kN]			[°C]		[g]	
2	5,2	–	M5 x 30	5	5	18	43,0	49	31,5	10,0	8,0	15	120	42	8	18,5	34	5,5	13,0 – 14,5	–	0,8	1,1	90°	-10	80	112	23330.1012
3	5,6	5,6	M6 x 35	5	6	21	61,0	68	40,0	13,2	15,0	22	164	64	16	32,0	38	6,0	26,0	12,7	1,0	1,2	90°	-10	80	194	23330.1013
4	6,5	5,1	M8 x 45	6	8	27	65,0	86	49,0	5,0	14,5	26	206	73	14	38,5	50	7,0	25,7	13,0	1,8	2,5	90°	-10	80	341	23330.1014
5	8,5	8,5	M8 x 65	8	10	34	97,0	115	66,5	20,0	17,5	46	287	113	27	63,0	57	8,0	41,0	20,5	2,0	3,0	90°	-10	80	726	23330.1015
6	8,5	–	M8 x 65	10	10	35	92,5	128	65,0	25,0	21,5	45	321	123	16	78,0	77	12,5	41,5	–	3,0	5,0	90°	-10	80	1132	23330.1016

3

Horizontal Toggle Clamps • with vertical base and safety lock

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

Clamping cap
- Rubber, black

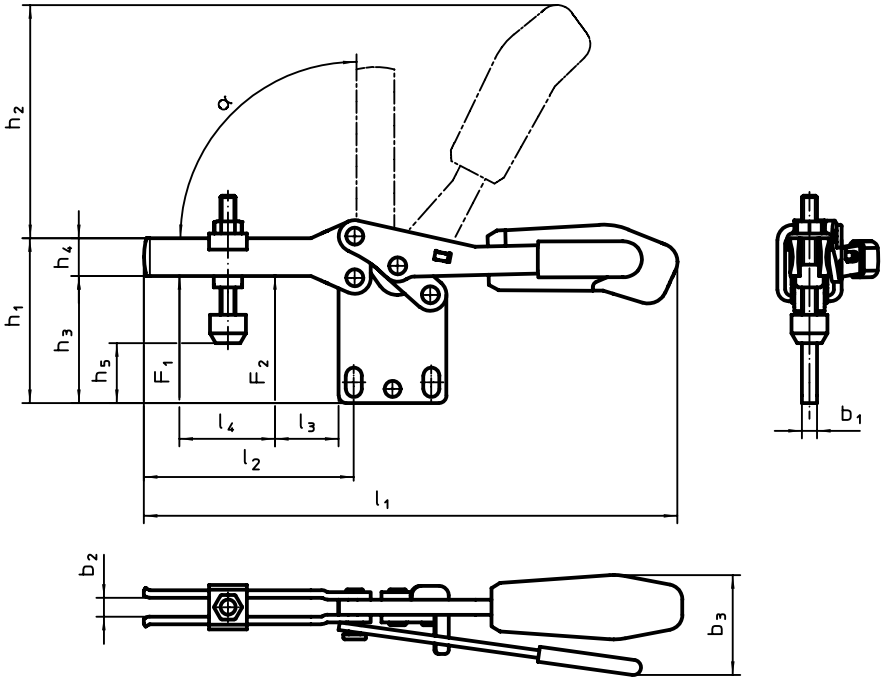
Plastic cap
- PVC, black

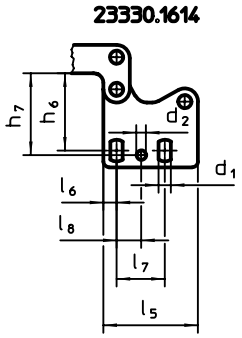
MORE INFORMATION

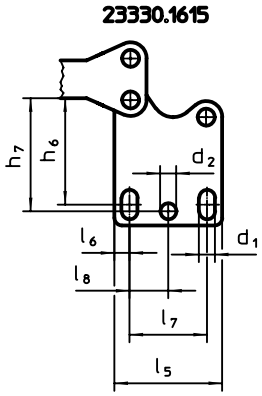
References

Replacement clamping screws are available as accessories in the online shop.

DRAWING





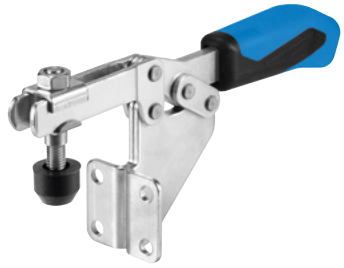


ORDER INFORMATION

Nominal size	Dimensions																						Holding force		α				Art. No.
	d_1	d_2	d_3	b_1	b_2	b_3	h_1	h_2	h_3	h_4	h_5 min.	h_5 max.	h_6	h_7	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	F_1	F_2		min.	max.		
	[mm]																						[kN]			[°C]		[g]	
4	6,5	5,1	M8 x 45	6	8	48	65	86	49,0	15	14,5	26	37,5 – 42,5	42	206	73	14	38	50	7	25,7	13,0	1,8	2,5	90°	-10	80	401	23330.1614
5	8,5	8,5	M8 x 65	8	10	51	97	115	66,5	20	17,5	46	52,0 – 59,0	59	287	113	27	63	57	8	41,0	20,5	2,0	3,0	90°	-10	80	834	23330.1615

Horizontal Toggle Clamps • with angle base

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for continuous use.
An oil resistant ergonomic 2-component handle, with increased grip area with soft surface for high ease of use.
The quickly adjustable clamping screws are provided by a retainer.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

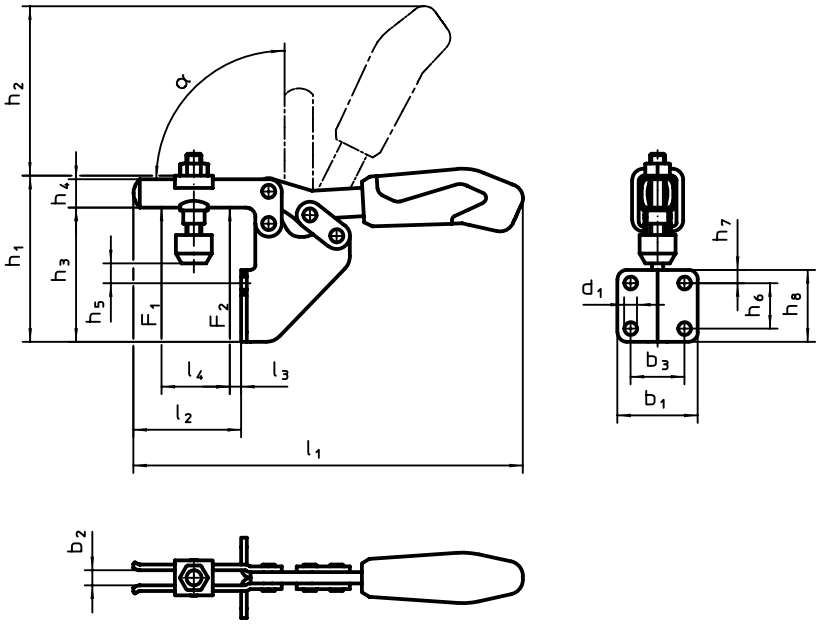
Clamping screw
- Steel, tempered, zinc-plated by galvanization

Clamping cap
- Rubber, black

MORE INFORMATION

References
Replacement clamping screws are available as accessories in the online shop.

DRAWING



ORDER INFORMATION

Nominal size	Dimensions																			Holding force		α	Temperature		Weight	Art. No.
	d_1	Clamping screw	b_1	b_2	b_3	h_1	h_2	h_3	h_4	h_5 min.	h_5 max.	h_6	h_7	h_8	l_1	l_2	l_3	l_4	F_1	F_2		min.	max.		
	[mm]																		[kN]			[°C]		[g]	
2	5,2	M5 x 30	31,0	5,0	19,0	68,0	49	57	10,0	14	20,0	13,5	8	28	120	32	4,0	18,5	0,8	1,1	90°	-10	80	154	23330.1022
3	5,6	M6 x 35	37,0	6,2	25,5	94,0	68	73	13,2	22	29,5	20,0	6	32	162	52	10,5	32,0	1,0	1,2	90°	-10	80	247	23330.1023
4	6,8	M8 x 45	42,5	8,0	28,5	86,5	86	70	15,0	5	16,0	24,0	7	38	206	59	6,5	37,0	1,8	2,5	90°	-10	80	400	23330.1024
5	8,5	M8 x 65	52,0	10,0	32,0	133,0	120	102	20,0	11	40,0	32,0	40	82	282	93	15,0	63,0	2,0	3,0	90°	-10	80	901	23330.1025

3

Toggle Clamps Push-Pull Type • with angle base

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for maintenance-free continuous use.
An oil resistant ergonomic 2-component handle, with slip-proof, soft surface and large grip area for high ease of use.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel
- Steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

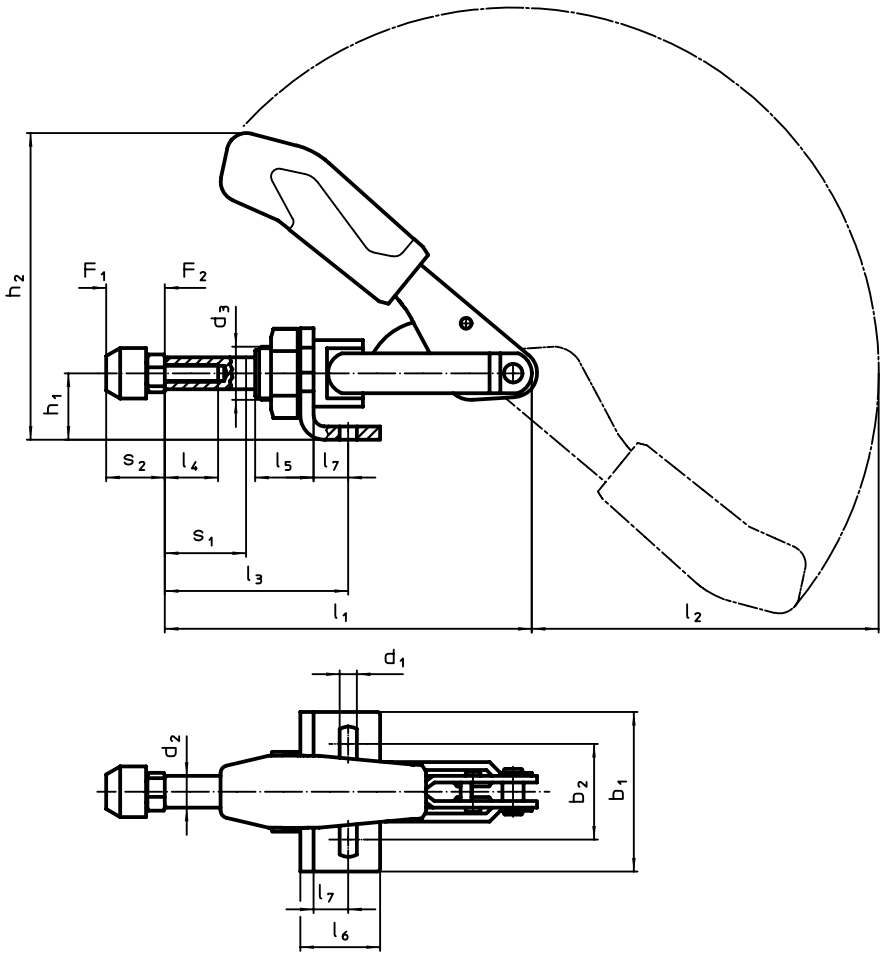
Clamping cap
- Rubber, black

MORE INFORMATION

References

Replacement clamping screws are available as accessories in the online shop.

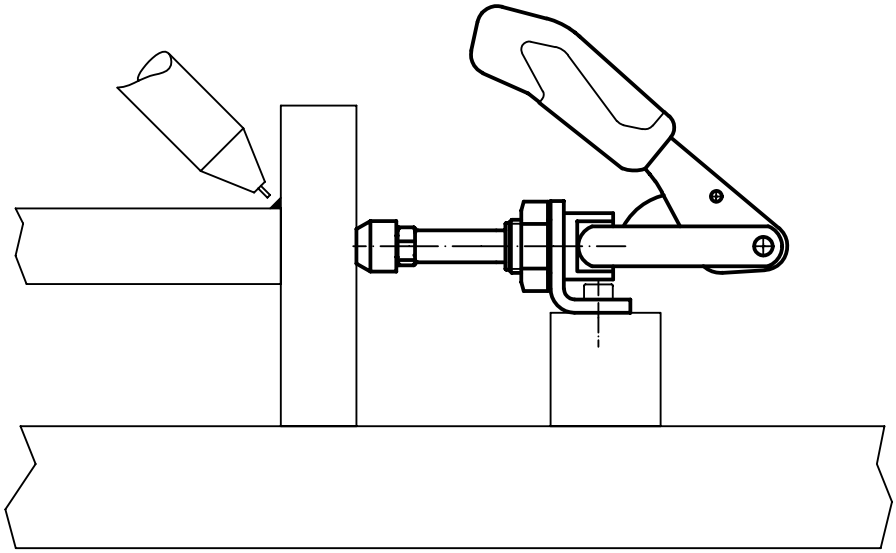
DRAWING



ORDER INFORMATION

Nominal size	Dimensions																		Stroke s_1	Holding force					Art. No.
	Clamping screw	d_1	d_2	d_3	b_1	b_2	h_1	h_2	l_1	l_2	l_3 min.	l_3 max.	l_4	l_5	l_6	l_7	s_2 min.	s_2 max.		F_1	F_2	min.	max.		
	[mm]																		[mm]	[kN]		[°C]		[g]	
1	M 4 x 20	4,5	6,5	M10 x 1	25	16,0	12	49,3	66,5	54,0	17,0	33,0	13	10	16	6,5	12	20	16	0,8	0,8	-10	80	73	23330.2001
2	M 4 x 20	4,5	8,0	M12 x 1,5	30	16,0 – 19,5	15	60,5	91,0	74,0	24,5	44,5	20	16	20	7,0	12	20	20	1,0	1,0	-10	80	124	23330.2002
3	M 6 x 25	5,6	10,0	M16 x 1,5	50	31,8 – 36,0	20	85,5	114,0	105,0	32,5	58,5	20	19	34	12,5	17	25	26	2,0	2,0	-10	80	323	23330.2003
4	M 8 x 35	6,5	12,0	M20 x 1,5	60	29,5 – 42,5	25	108,0	140,0	127,5	37,0	69,0	30	22	30	13,0	22	35	32	2,5	2,5	-10	80	505	23330.2004
6	M12 x 50	8,5	16,0	M24 x 1,5	65	29,0 – 46,0	30	129,5	171,5	158,0	41,5	81,5	50	25	35	15,5	30	50	40	4,5	4,5	-10	80	929	23330.2006

APPLICATION EXAMPLE



Toggle Clamps Push-Pull Type • with fastening thread

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action the toggle clamps are versatile applicable for a wide rang of uses.
These toggle clamps can be used in the metal working industry when drilling, welding, bending, grinding, testing and fitting as well as in the wood and plastic industry in glueing, drilling, cutting and milling jigs.
The "toggle" principle of the toggle clamp allows a large and quick opening of the clamp. If unclamped, the workpieces are completely cleared for unimpeded removal. The large power transmission results maximum clamping force by low hand force. The clamps are self-arresting they remain locked, resisting the force produced when machining components.
The toggle clamps are manufactured from high quality components and are designed for maintenance-free continuous use.
An oil resistant ergonomic 2-component handle, with slip-proof, soft surface and large grip area for high ease of use.

Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

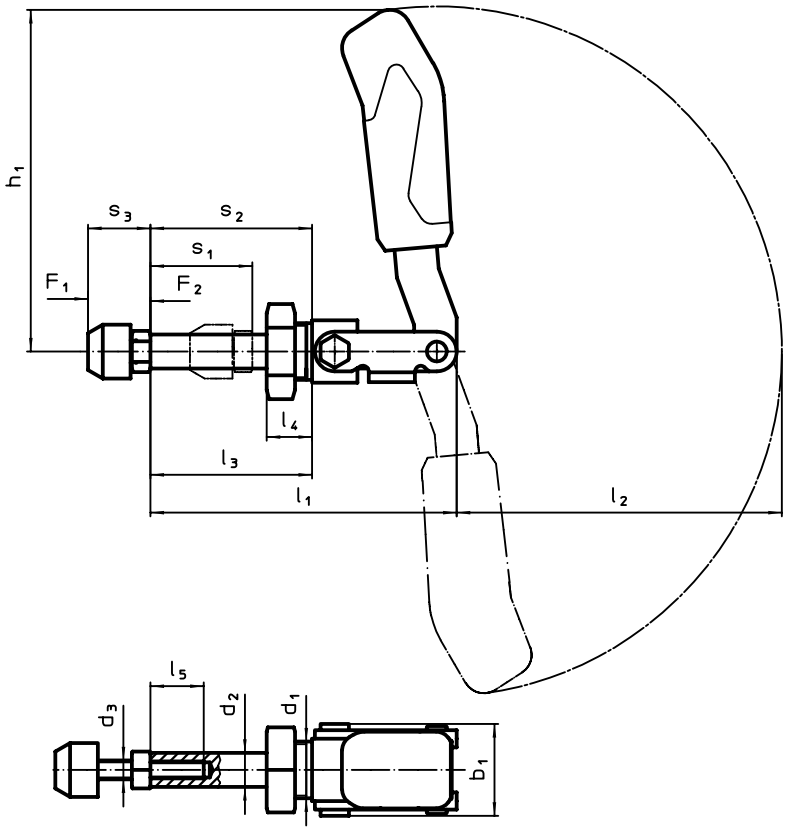
Clamping screw
- Steel, tempered, zinc-plated by galvanization

Clamping cap
- Rubber, black

MORE INFORMATION

References
Replacement clamping screws are available as accessories in the online shop.

DRAWING

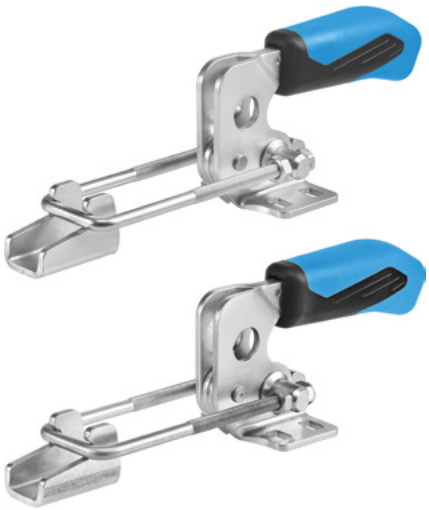


ORDER INFORMATION

Nominal size	Dimensions														Stroke s_1	Holding force					Art. No.
	Clamping screw	d_1	d_2	d_3	b_1	h_1	l_1	l_2	l_3	l_4	l_5	s_2	s_3 min.	s_3 max.		F_1	F_2	min.	max.		
	[mm]														[mm]	[kN]		[°C]		[g]	
3	M 6 x 25	M16 x 1,5	10	M 6	30,5	73	68,5	68	36	13	15	36	17	25	21,5	1,0	1,0	-10	80	152	23330.2103
4	M 8 x 35	M20 x 1,5	12	M 8	33,0	123	108,0	115	57	16	25	57	22	35	40,0	2,5	2,5	-10	80	327	23330.2104
6	M12 x 50	M24 x 1,5	16	M12	49,0	149	175,0	139	92	24	45	92	30	50	67,0	4,0	4,0	-10	80	920	23330.2106

Toggle Clamps Hook Type • with horizontal base

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action, the toggle clamps are versatile applicable for a wide rang of uses.
The toggle clamps are manufactured from high quality components and are designed for maintenance-free continuous use.
An oil resistant ergonomic 2-component handle, with slip-proof, soft surface and large grip area for high ease of use.

Material

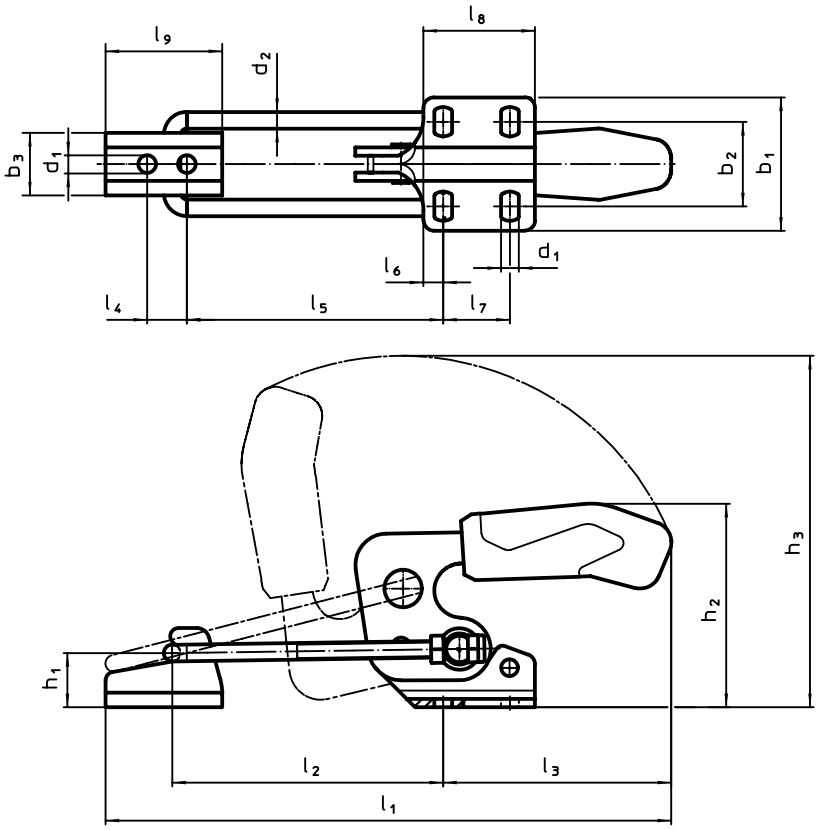
Clamp
- Steel, zinc-plated by galvanization, passivated
- Stainless steel

Rivet
- Stainless steel

Handle
- Plastic

Counter catch
- Steel, zinc-plated by galvanization, passivated
- Stainless steel

DRAWING



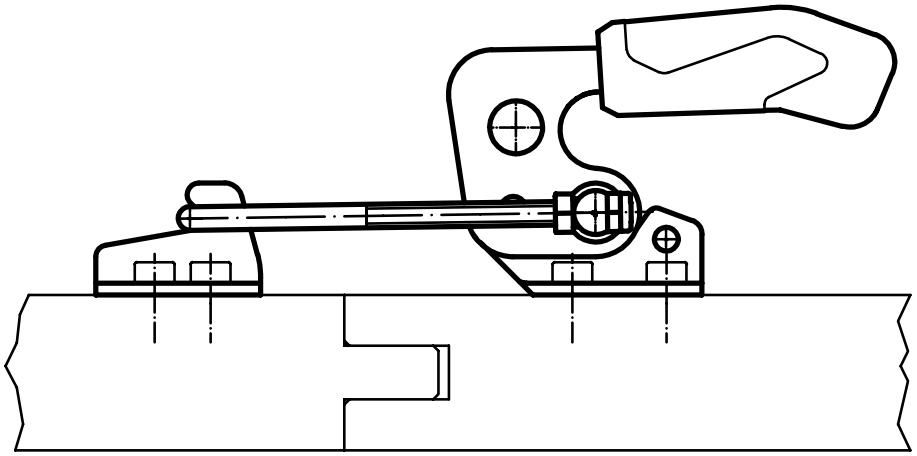
ORDER INFORMATION

Nominal size	Dimensions																				Holding force				Art. No.
	d_1	d_2	b_1	b_2	b_3	h_1	h_2	h_3	l_1 min.	l_1 max.	l_2 min.	l_2 max.	l_3	l_4	l_5 min.	l_5 max.	l_6	l_7	l_8	l_9	F_1	min.	max.		
	[mm]																				[kN]	[°C]		[g]	
steel																									
3	5,2	4	38,0	19,5 – 23,5	18	12	47,0	99,0	125	159	42,0	76	69	11	38,0	72	6,4	13	26,0	26	1,6	-10	80	143	23330.3003
4	6,5	6	48,0	24,5 – 32,0	23	19	70,0	135,5	169	216	53,5	101	93	14	48,6	96	8,0	19	35,0	39	3,2	-10	80	365	23330.3004
5	8,5	8	64,3	35,0 – 46,0	30	26	94,5	171,5	209	273	66,0	130	111	19	59,0	123	9,5	32	53,5	56	7,0	-10	80	821	23330.3005
stainless steel																									
3	5,2	4	38,0	19,5 – 23,5	18	12	47,0	99,0	125	159	42,0	76	69	11	38,0	72	6,4	13	26,0	26	1,6	-10	80	144	23330.3103
4	6,5	6	48,0	24,5 – 32,0	23	19	70,0	135,5	169	216	53,5	101	93	14	48,6	96	8,0	19	35,0	39	3,2	-10	80	365	23330.3104
5	8,5	8	64,3	35,0 – 46,0	30	26	94,5	171,5	209	273	66,0	130	111	19	59,0	123	9,5	32	53,5	56	7,0	-10	80	821	23330.3105

ACCESSORIES

Nominal size	[g]	Art. No. steel	Art. No. stainless steel
counter catch			
3	15	23330.9023	23330.9523
4	42	23330.9024	23330.9524
5	108	23330.9025	23330.9525

APPLICATION EXAMPLE



Toggle Clamps Hook Type • vertical, with horizontal base

EH 23330.



PRODUCT DESCRIPTION

Due to their favourable power to movement ratio and their easy action, the toggle clamps are versatile applicable for a wide rang of uses.
The toggle clamps are manufactured from high quality components and are designed for maintenance-free continuous use.
An oil resistant ergonomic 2-component handle, with slip-proof, soft surface and large grip area for high ease of use.

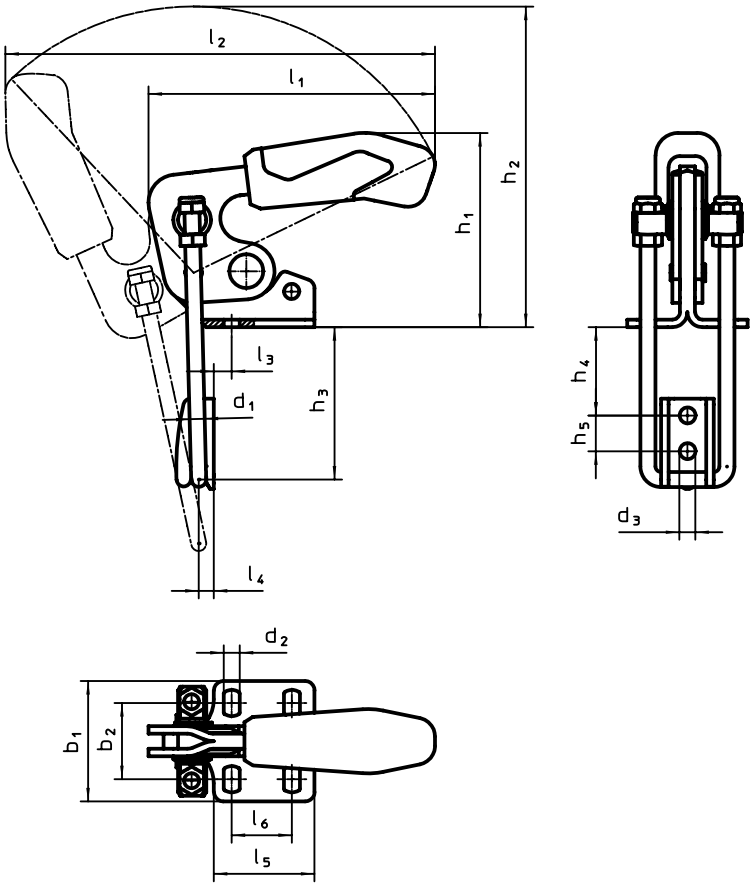
Material

Clamp
- Steel, zinc-plated by galvanization, passivated

Rivet
- Stainless steel

Handle
- Plastic

DRAWING



ORDER INFORMATION

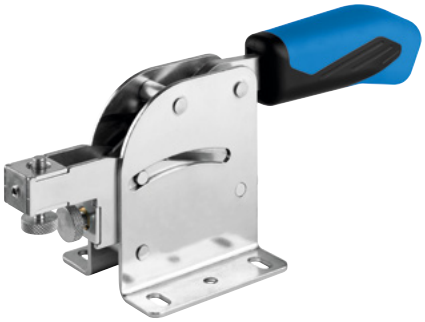
Nominal size	Dimensions																		Holding force				Art. No.
	d_1	d_2	d_3	b_1	b_2	h_1	h_2	h_3 min.	h_3 max.	h_4 min.	h_4 max.	h_5	l_1	l_2	l_3	l_4	l_5	l_6	F_1	min.	max.		
	[mm]																		[kN]	[°C]		[g]	
3	4	5,2	5,2	38	19,5 – 23,5	47,0	99	24,0	49	5	30	11	91	158	6,4	5	26	13	1,6	-10	80	149	23330.5003
4	6	6,5	6,5	48	24,5 – 32,0	70,0	136	34,5	64	7	36	14	125	190	8,0	6	35	19	3,2	-10	80	358	23330.5004
5	8	8,5	8,5	65	35,0 – 46,0	94,5	168	43,0	81	9	47	19	151	239	9,5	8	54	32	7,0	-10	80	791	23330.5005

ACCESSORIES

Nominal size	[g]	Art. No. steel
counter catch		
3	15	23330.9023
4	42	23330.9024
5	108	23330.9025

Combination Clamps • with horizontal base

EH 23330.



PRODUCT DESCRIPTION

The combination clamp combines a toggle clamp push-pull type and a vertical toggle clamp in one clamp. Thus the use of different toggle clamps is not necessary. The horizontal and vertical clamping movement is achieved by simple operation using an ergonomic handle. Simultaneous exact positioning and secure clamping of the component is guaranteed.
The toggle clamps are manufactured from high quality components and are designed for maintenance-free continuous use.
An oil resistant ergonomic 2-component handle, with slip-proof, soft surface and large grip area for high ease of use.

Material

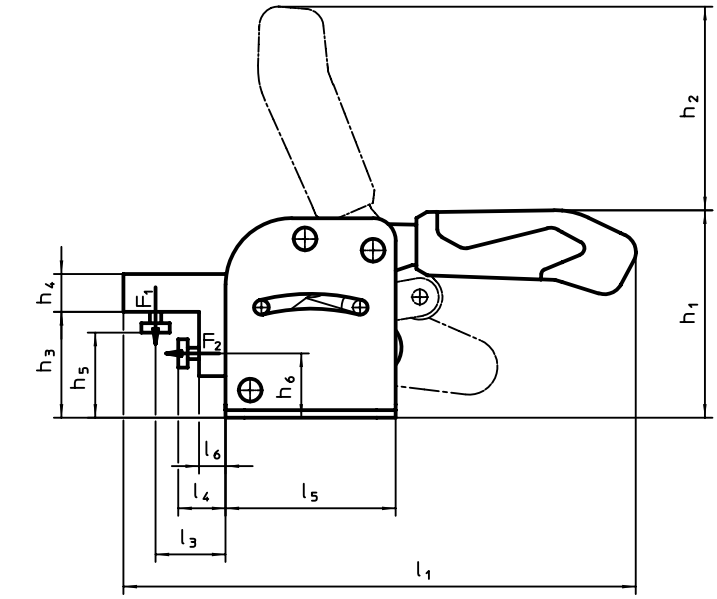
Clamp
- Steel, zinc-plated by galvanization, passivated

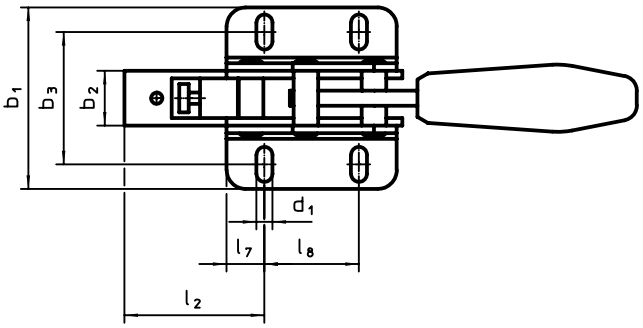
Rivet
- Stainless steel

Handle
- Plastic

Clamping screw
- Steel, tempered, zinc-plated by galvanization

DRAWING





ORDER INFORMATION

Nominal size	Dimensions																				Holding force				Art. No.
	d_1	b_1	b_2	b_3	h_1	h_2	h_3	h_4	h_5 min.	h_5 max.	h_6	l_1	l_2	l_3	l_4 min.	l_4 max.	l_5	l_6	l_7	l_8	F_1	F_2	min.	max.		
	[mm]																				[kN]		[°C]		[g]	
2	5,5	53	17,0	0,0 – 39,5	74	62	36,0	12	25	32	22	150	33	15	5	10	55	0,5	7,5	40	1	1	-10	80	330	23330.4002
3	6,5	75	19,5	48,5 – 61,5	94	87	46,0	16	30	40	28	219	56	32	14	24	75	9,0	12,5	50	2	2	-10	80	714	23330.4003
4	8,5	96	29,0	60,0 – 80,0	110	106	55,5	20	40	50	34	270	74	37	20	30	90	14,0	20,0	50	3	3	-10	80	1618	23330.4004

COMPACT CLAMPS

PRECISE IN ANY POSITION

Our compact clamps are suitable for use as all-purpose clamping elements on machined and non-machined parts. Their self-locking clamping lever makes it possible to use the clamps in both vertical and horizontal position.







FEATURES

- Exact clamping with pin-point accuracy.
- Simple and universal handling.
- High clamping force at low tightening torque levels and abrasion-resistant thanks to clamping lever with bearings.
- Large and continuous clamping area.
- Clamping lever entirely retractable for hindrance-free exchange of workpieces.
- Threaded clamping lever can be used with many clamping elements, e.g. ball-ended thrust screws (EH 22700. - EH 22720.), self-aligning pads (EH 22730./EH 22740.) etc.
- Large adjusting range at constant clamping force.
- Continuous height adjustment by height adapters 23690.0112/.0116.
- Simple and versatile attachment options.
- Corrosion-resistant.
- Resistant to dirt and chips.



Compact Clamps

EH 23690.



PRODUCT DESCRIPTION

The compact clamps are all purpose clamping elements. Due to the self-locking clamping lever application can either take place in horizontal or vertical position in both, machined and raw workpieces.

Features:

- Exact and position precise clamping
- Easy, universal handling
- High clamping force at low tightening torques, abrasion-resistant due to clamping lever with bearings
- Continuous, large clamping area
- Clamping lever entirely retractable for hindrance-free exchange of workpieces
- Clamping lever with mounting thread for various clamping elements, e.g. ball-ended thrust screws (EH 22700. - EH 22720.), self-aligning pads (EH 22730. / EH 22740.) etc.
- Large adjusting range at constant clamping force
- Continuous increase of the clamping range by height adapters 23690.0112/.0116
- Easy and flexible mounting options
- Corrosion-resistant
- Resistant to dirt and chips

Material

Body

- Heat-treated steel, black coated

Clamping lever

- Heat-treated steel, tempered, silver coated

Assembly

Assembly and set-Up:

1. Take out stop pin ISO 4762-M 6 x 10.
2. Move back and take out clamping lever.
3. Tightening by 2 screws with internal hexagon (included in supply volume).
4. Place clamping lever in sliding rail and then insert.
5. Tighten stop pin ISO 4762 - M 6 x 10.

Operation

Clamping Process:

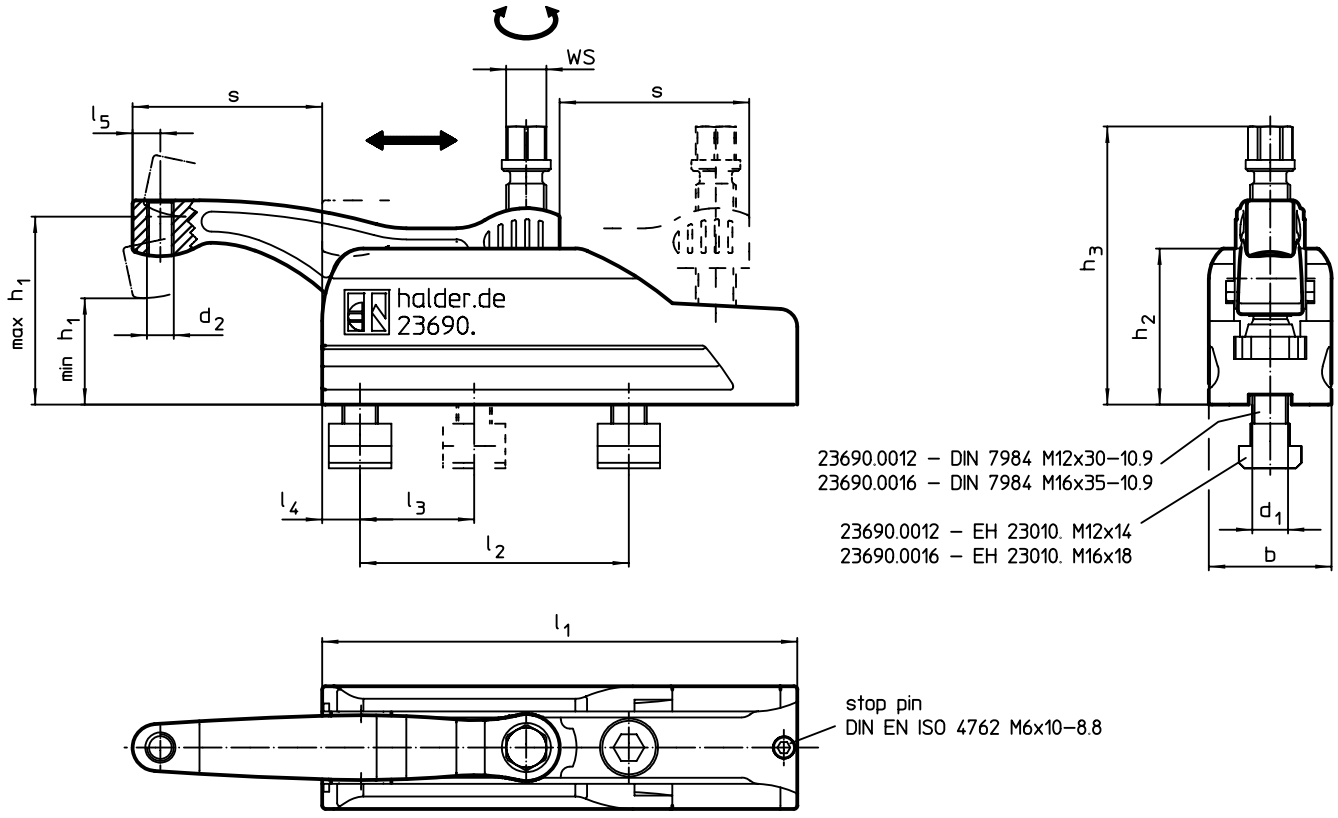
1. Slide clamping lever to clamping position.
2. Clamping is made via a hexagon collar screw.
3. Releasing is done in reverse order.

MORE INFORMATION

Further products

Height Adapters, for compact clamp . . → p. 538

DRAWING

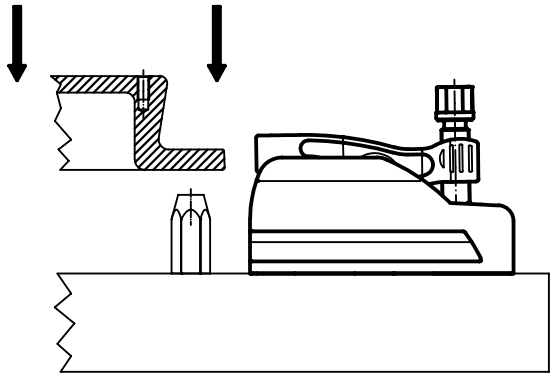


ORDER INFORMATION

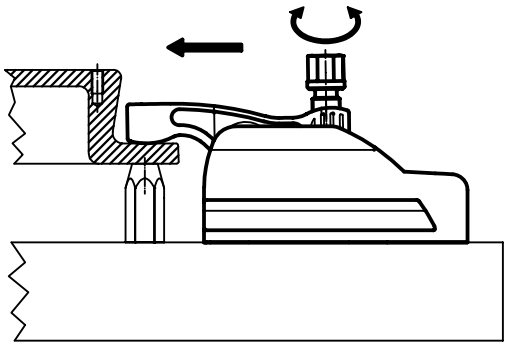
Dimensions													WS	Clamping force max.	Tightening torque max.		Art. No.
d_1	d_2	h_1 min.	h_1 max.	h_2	h_3	s max.	l_1	l_2 +1	l_3	l_4	l_5	b					
[mm]													[mm]	[kN]	[Nm]	[g]	
M12	M 8	40	60	59	95	43	134	70	50	13	10,0	45	16	15	45	1813	23690.0012
M16	M12	47	85	70	126	85	213	120	50	17	12,5	55	18	25	75	4274	23690.0016

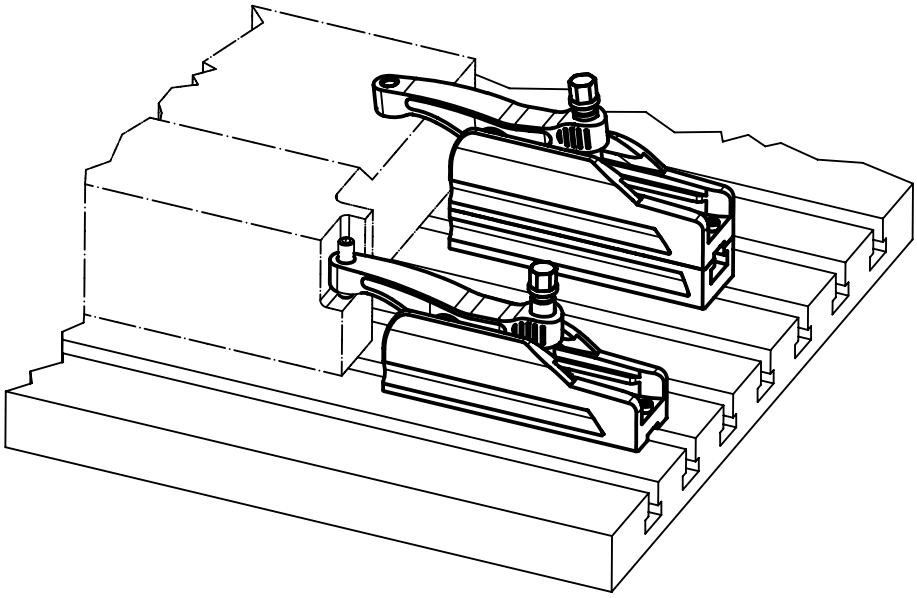
APPLICATION EXAMPLE

Ⅰ



Ⅱ





Height Adapters • for compact clamp

EH 23690.



PRODUCT DESCRIPTION

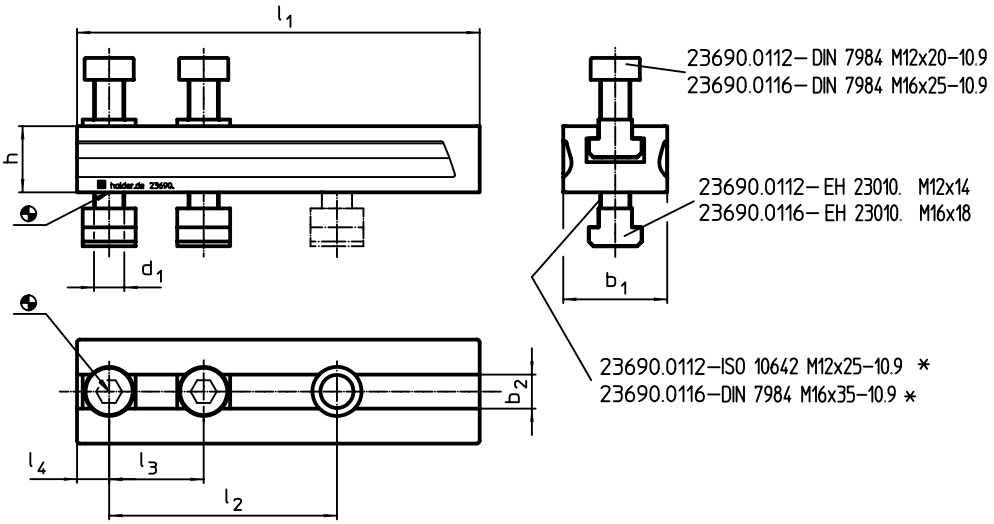
The height adapter for compact clamps allows a clamping height increase and has the following characteristics:

- Continuous covering of clamping height
- T-slot in the height adapter allows exact positioning by moving the compact clamp at specified grid spacings
- Height can be expanded user-defined

Material

- Heat-treated steel, black coated

DRAWING

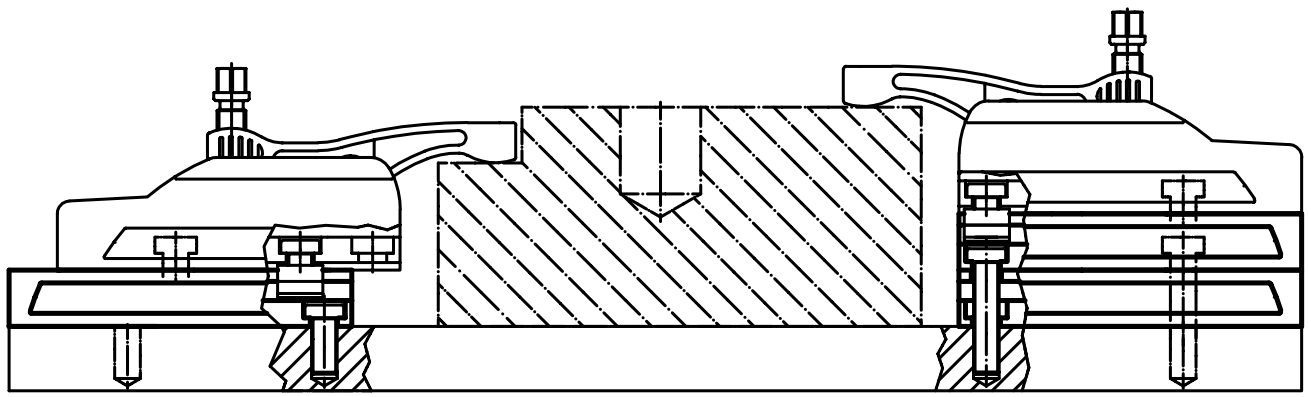


* When using more height adapters, the screws ISO 10642 or DIN 7984 have to be replaced by screws extended by the dimension h.

ORDER INFORMATION

Dimensions									Art. No.
d_1	l_1	l_2 +1	l_3	l_4	h	b_1	b_2 H12	[g]	
			[mm]						
M12	134	70	50	13	20	45	14	874	23690.0112
M16	213	120	50	17	35	55	18	2534	23690.0116

APPLICATION EXAMPLE



CENTERING CLAMPING ELEMENTS

THE FORCE LIES AT THE CENTRE

Centering clamping elements are used to centre and clamp parts that come with a location hole. Precise self-centring with an accuracy of ± 0.025 mm. The ground clamping segments make it possible to achieve force closure when centring parts with a rough or machined surface and pull the parts down to fixture plates. The centering clamping element is distinguished by its long adjustment travel and low construction height. Can be screwed on at the top and the bottom.

www.halder.com/
CenteringClampingElements-Video



Centering Clamping Elements • with clamping segments

EH 23340.



PRODUCT DESCRIPTION

For clamping and centering of workpieces with internal bore. Exact self centering with a precision of ±0,025 mm. Due to the clamping segments being ground, workpieces with raw and/or machined surfaces can be frictionally connected, centered and held down at the seats. Large adjustment stroke and a low building height are a feature of the centering clamping element.

Mounting from either top or bottom.

Material

Body
- Tool steel, hardened, blackened

Spring
- Stainless steel

Clamping segments
- Stainless steel 1.4112, hardened and ground

Assembly

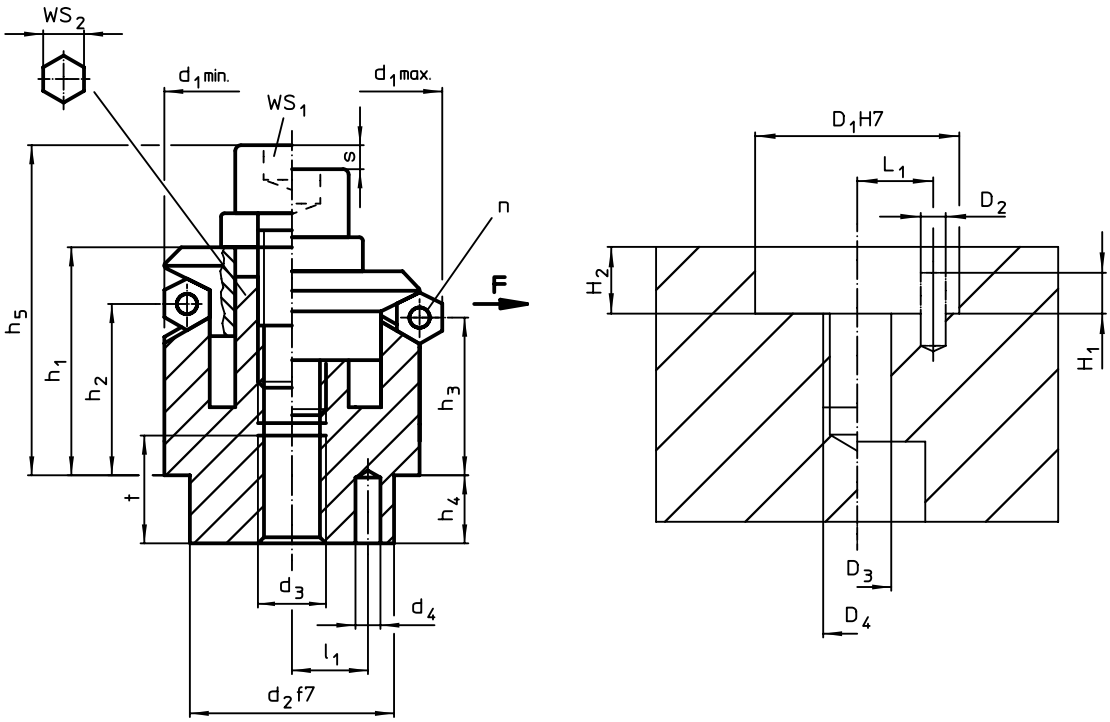
Assembly instructions for mounting from above: remove clamping plate and screw. Screw in threaded pin from below, and tighten from above using female WS_2.

MORE INFORMATION

Further products

Centering Clamping Elements, with clamping balls . . . . . → p. 542

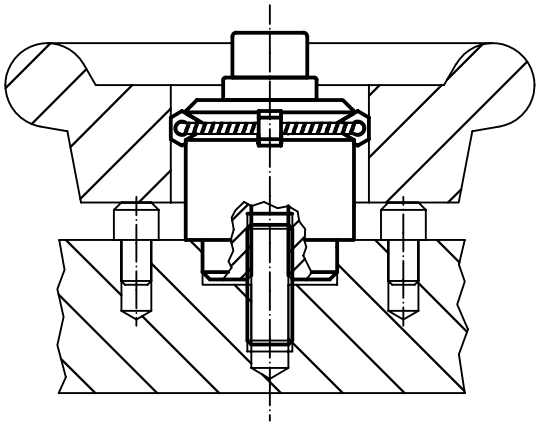
DRAWING

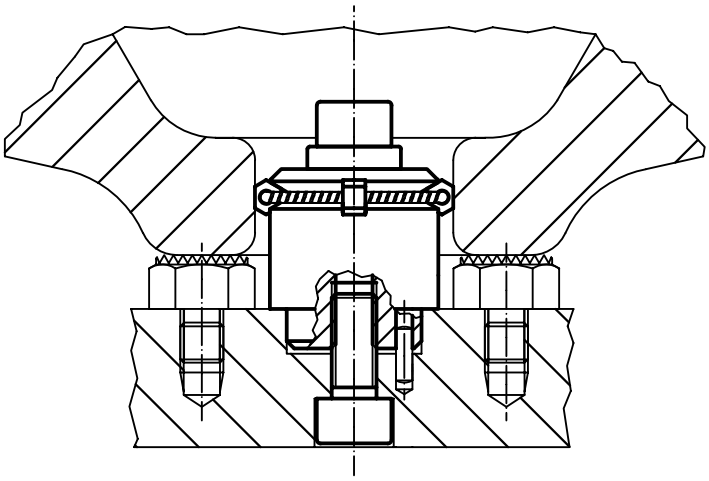


ORDER INFORMATION

Dimensions												Number of segments n	Stroke s	WS		Clamping force F max.	Tightening torque max.	Location hole								Art. No.
d_1 min.	d_1 max.	d_2 f7	d_3	d_4 +0,3	h_1 -1	h_2	h_3	h_4	h_5 -2	l_1 ±0,1	t			WS_1	WS_2			D_1 H7	D_2	D_3	D_4	H_1	H_2 +0,5	L_1 ±0,1		
[mm]													[mm]	[mm]		[kN]	[Nm]	[mm]							[g]	
14,5	18,5	12	M 4	2,0	14,3	9,8	8,6	5,5	19,3	4,5	6	3	2,3	3	5	3,5	5	12	2,0	4	M 4	2,0	5,5	4,5	19	23340.0014
18,5	22,5	15	M 5	2,5	16,6	11,5	10,4	7,5	22,8	5,5	7	3	2,3	4	5	4,5	10	15	2,5	5	M 5	2,5	7,5	5,5	38	23340.0018
22,5	26,5	20	M 6	3,0	19,7	14,1	13,0	6,0	28,7	7,0	8	3	2,3	5	6	5,0	17	20	3,0	6	M 6	3,0	6,0	7,0	62	23340.0022
26,5	30,5	20	M 6	3,0	19,9	14,2	13,0	6,0	28,9	7,0	8	3	2,3	5	6	5,0	17	20	3,0	6	M 6	3,0	6,0	7,0	87	23340.0026
30,5	38,5	25	M 6	4,0	23,2	14,0	11,7	7,0	32,2	9,0	8	3	4,6	5	6	5,0	17	25	4,0	6	M 6	4,0	7,0	9,0	133	23340.0030
38,5	46,5	30	M 8	4,0	27,2	18,0	15,5	7,5	39,2	11,0	10	6	4,6	6	8	6,5	43	30	4,0	8	M 8	4,0	7,5	11,0	238	23340.0038
46,5	54,5	30	M 8	4,0	27,2	18,0	15,7	7,5	39,2	11,0	10	6	4,6	6	8	6,5	43	30	4,0	8	M 8	4,0	7,5	11,0	327	23340.0046
54,5	70,5	45	M10	5,0	40,7	23,7	19,1	9,0	54,7	15,0	12	6	9,2	8	10	8,0	79	45	5,0	10	M10	5,0	9,0	15,0	658	23340.0054
70,5	86,5	60	M12	5,0	46,0	28,3	23,6	10,0	63,0	17,0	15	6	9,2	10	12	10,0	141	60	5,0	12	M12	5,0	10,0	17,0	1286	23340.0070
86,5	102,5	60	M16	5,0	51,1	30,3	25,6	10,0	72,1	25,0	15	6	9,2	14	17	10,0	354	60	5,0	16	M16	5,0	10,0	25,0	1778	23340.0086

APPLICATION EXAMPLE





Centering Clamping Elements • with clamping balls

EH 23340.



PRODUCT DESCRIPTION

To be used for accurate centering and clamping of workpieces with locating hole on which light spherical marks are acceptable. Exact self-centering with a precision of ±0,025 mm. The clamping balls frictionally center and hold workpieces with raw or pre-machined surfaces down to the bearing points. Large adjustment stroke and a small building height are a feature of this center clamping element.
Mounting from either top or bottom.

Material

Body
- Tool steel, hardened, blackened

Spring
- Stainless steel

Clamping balls
- Stainless steel 1.4112, hardened and ground

Assembly

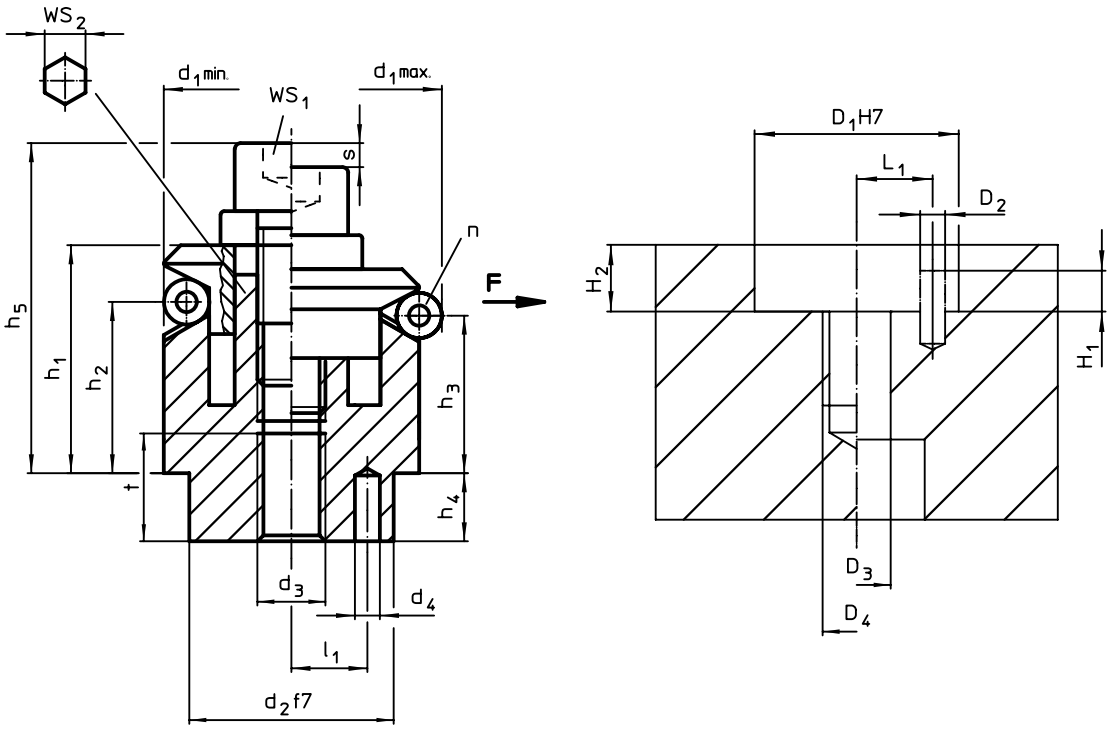
Assembly instructions for mounting from above: remove clamping plate and screw. Screw in threaded pin from below, and tighten from above using female WS_2.

MORE INFORMATION

Further products

Centering Clamping Elements, with clamping segments . . . . . → p. 540

DRAWING

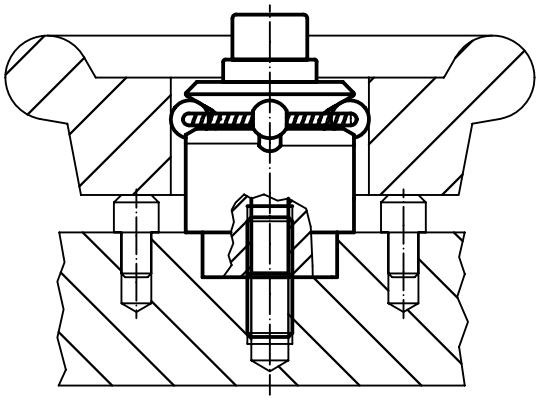


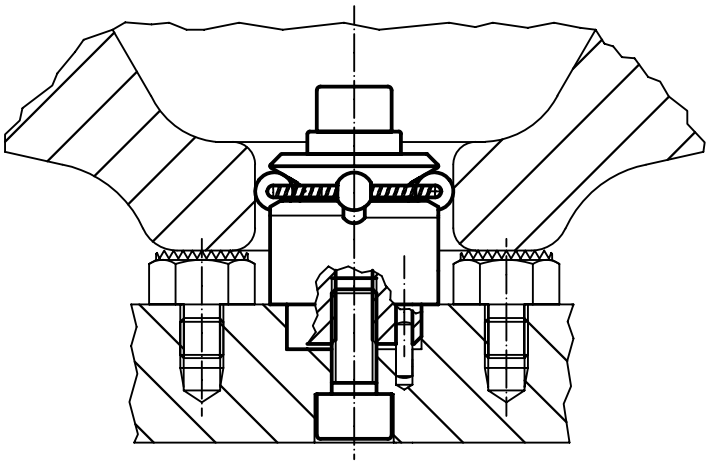
ORDER INFORMATION

Dimensions													Number of balls n	Stroke s	WS		Clamping force F max.	Tightening torque max.	Location hole									Art. No.
d_1 min.	d_1 max.	d_2 f7	d_3	d_4 +0,3	h_1 -1	h_2	h_3	h_4	h_5 -2	l_1 ±0,1	Ball Ø	t			WS_1	WS_2			D_1 H7	D_2	D_3	D_4	H_1	H_2 +0,5	L_1 ±0,1			
[mm]														[mm]	[mm]		[kN]	[Nm]	[mm]							[g]	
11,7	14,2	10	M 4	1,5	8,6	3,9	3,2	3,5	14,7	3,5	2,5	4	3	1,3	3	–	0,5	5	10	1,5	4	M 4	2,0	3,5	3,5	9	23340.0212[1]
14,5	18,5	12	M 4	2,0	14,2	9,8	8,6	5,5	19,2	4,5	4,0	6	3	2,3	3	5	3,5	5	12	2,0	4	M 4	2,5	5,5	4,5	20	23340.0214
18,5	22,5	15	M 5	2,5	16,5	11,6	10,4	7,5	22,7	5,5	4,0	7	3	2,3	4	5	4,5	10	15	2,5	5	M 5	3,5	7,5	5,5	39	23340.0218
22,5	26,5	20	M 6	3,0	19,6	14,1	12,9	6,0	28,6	7,0	4,0	8	3	2,3	5	6	5,0	17	20	3,0	6	M 6	3,5	6,0	7,0	60	23340.0222
26,5	30,5	20	M 6	3,0	19,8	14,1	13,0	6,0	28,8	7,0	4,0	8	3	2,3	5	6	5,0	17	20	3,0	6	M 6	3,5	6,0	7,0	86	23340.0226
30,5	38,5	25	M 6	4,0	23,2	14,1	11,8	7,0	32,2	9,0	8,0	8	3	4,6	5	6	5,0	17	25	4,0	6	M 6	3,5	7,0	9,0	125	23340.0230
38,5	46,5	30	M 8	4,0	27,2	18,0	15,7	7,5	39,2	11,0	8,0	10	6	4,6	6	8	6,5	43	30	4,0	8	M 8	4,5	7,5	11,0	233	23340.0238
46,5	54,5	30	M 8	4,0	27,1	18,0	15,7	7,5	39,2	11,0	8,0	10	6	4,6	6	8	6,5	43	30	4,0	8	M 8	6,5	7,5	11,0	323	23340.0246
54,5	70,5	45	M10	5,0	40,6	23,7	19,1	9,0	54,6	15,0	16,0	12	6	9,2	8	10	8,0	79	45	5,0	10	M10	6,5	9,0	15,0	653	23340.0254
70,5	86,5	60	M12	5,0	46,1	28,3	23,7	10,0	63,1	17,0	16,0	15	6	9,2	10	12	10,0	141	60	5,0	12	M12	6,5	10,0	17,0	1271	23340.0270
86,5	102,5	60	M16	5,0	51,2	30,3	25,6	10,0	72,2	25,0	16,0	15	6	9,2	14	17	10,0	354	60	5,0	16	M16	6,5	10,0	25,0	1783	23340.0286

[1] no WS_2 clamping screw and threaded pin to be mounted from top

APPLICATION EXAMPLE





Centering Clamping Elements • with clamping segments, operation from the bottom

EH 23340.



PRODUCT DESCRIPTION

For centering and clamping in blind holes of workpieces with locating hole. Exact self-centering with a precision of ±0,025 mm. Components with raw or machined surface can be centered positively and are pulled down on the contact points due to the ground clamping elements. The centering clamping element is characterised by large setting ranges and a compact construction height.

Mounting from either top or bottom.

Material

Body
- Tool steel, hardened, blackened

Spring
- Stainless steel

Clamping segments
- Stainless steel 1.4112, hardened and ground

Assembly

Assembly instructions for mounting from above: remove clamping plate and screw. Screw in threaded pin from below, and tighten from above using female WS_2.

Operation

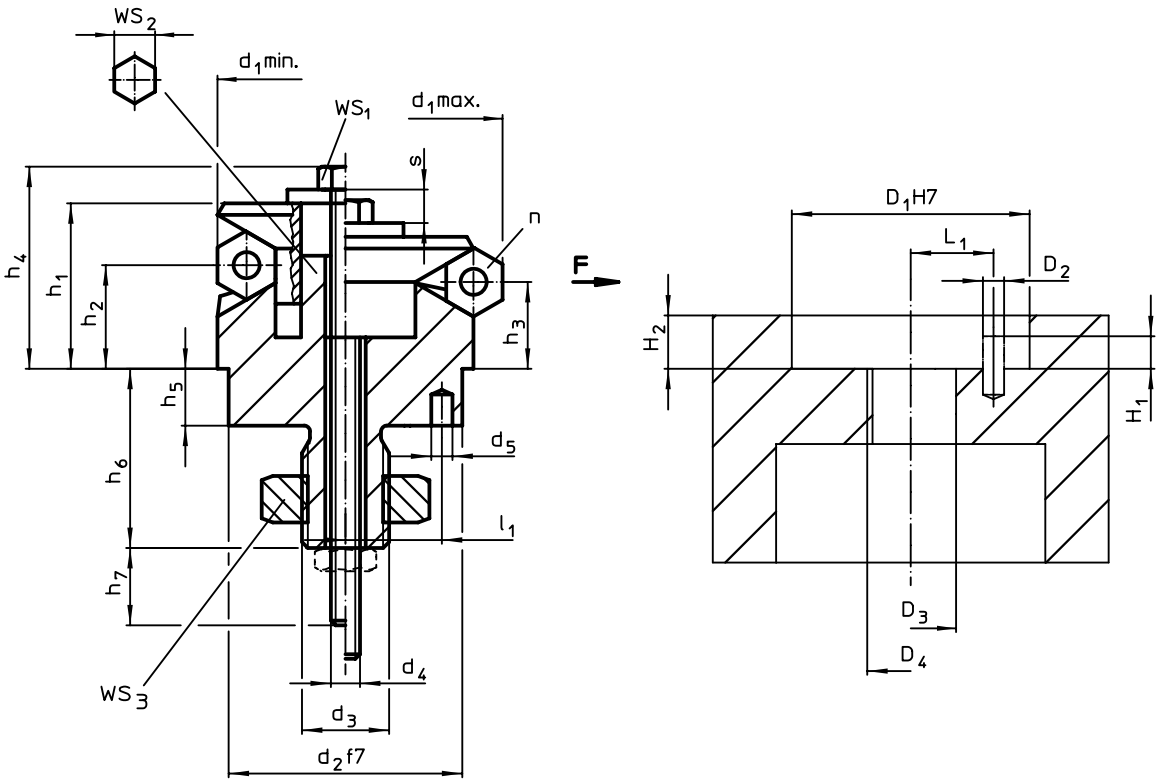
Operation from bottom manually or automatically with either pneumatic or hydraulic actuation.

MORE INFORMATION

Further products

Centering Clamping Elements, with clamping balls, operation from the bottom . . . . . → p. 546

DRAWING



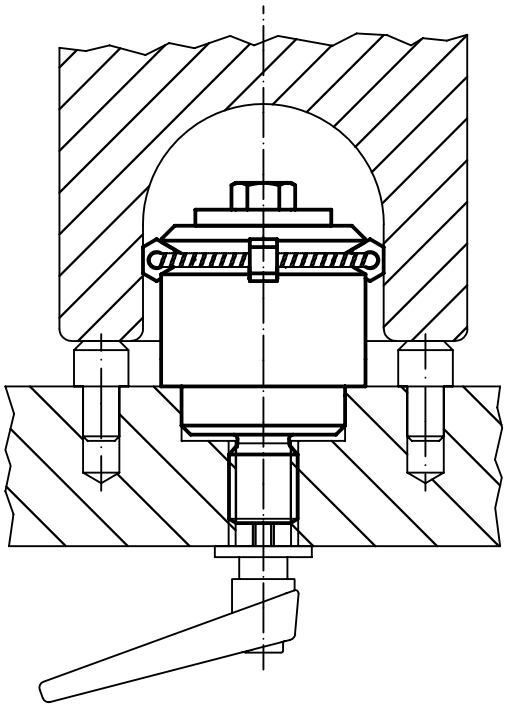
ORDER INFORMATION

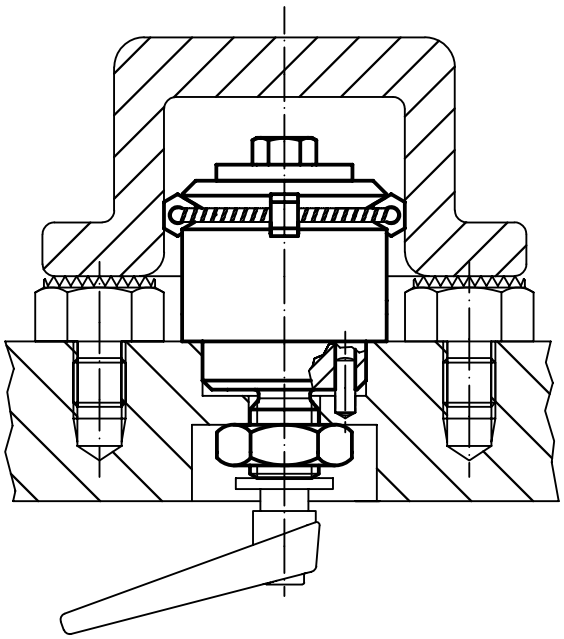
Dimensions														Number of segments	Stroke	WS			Clamping force	Tightening torque	Location hole								Art. No.
d_1 min.	d_1 max.	d_2 f7	d_3	d_4	d_5 +0,3	h_1	h_2	h_3	h_4 -2	h_5	h_6 +1	h_7 ~	l_1 ±0,1	n	s	WS_1	WS_2	WS_3	F max.	max.	D_1 H7	D_2	D_3	D_4	H_1	H_2 +0,5	L_1 ±0,1		
[mm]															[mm]	[mm]			[kN]	[Nm]	[mm]							[g]	
14,5	**18,5**	12	M 6	M 3	2,0	14,2	9,8	8,6	17,0	5,5	14,1	12	4,5	3	2,3	5,5	3	10	3,5	2	12	2,0	6	M 6	2,5	5,5	4,5	21	23340.0114
18,5	**22,5**	15	M 8	M 4	2,5	16,6	11,5	10,4	20,5	7,5	18,2	14	5,5	3	2,3	7,0	5	13	4,0	5	15	2,5	8	M 8	3,5	7,5	5,5	46	23340.0120
22,5	**26,5**	20	M10	M 5	3,0	19,7	14,1	13,0	24,4	6,0	17,4	15	7,0	3	2,3	8,0	6	16	4,5	10	20	3,0	10	M10	3,5	6,0	7,0	78	23340.0122
26,5	**30,5**	20	M10	M 5	3,0	19,9	14,2	13,0	24,6	6,0	17,4	15	7,0	3	2,3	8,0	6	16	4,5	10	20	3,0	10	M10	3,5	6,0	7,0	96	23340.0126
30,5	**38,5**	25	M12	M 6	4,0	23,2	14,0	11,7	28,8	7,0	21,9	20	9,0	3	4,6	10,0	6	18	4,5	17	25	4,0	12	M12	3,5	7,0	9,0	143	23340.0130

→

Dimensions														Number of segments n	Stroke s	WS			Clamping force F max.	Tightening torque max.	Location hole								Art. No.
d_1 min.	d_1 max.	d_2 f7	d_3	d_4	d_5 +0,3	h_1	h_2	h_3	h_4 -2	h_5	h_6 +1	h_7 ~	l_1 ±0,1			WS_1	WS_2	WS_3			D_1 H7	D_2	D_3	D_4	H_1	H_2 +0,5	L_1 ±0,1		
[mm]															[mm]	[mm]			[kN]	[Nm]	[mm]							[g]	
38,5	**46,5**	30	M12	M 6	4,0	27,2	18,0	15,5	33,1	7,5	22,5	20	11,0	6	4,6	10,0	8	18	6,5	17	30	4,0	12	M12	4,5	7,5	11,0	250	23340.0138
46,5	**54,5**	30	M12	M 6	4,0	27,2	18,0	15,7	33,1	7,5	22,5	20	11,0	6	4,6	10,0	8	18	6,5	17	30	4,0	12	M12	6,5	7,5	11,0	340	23340.0146
54,5	**70,5**	45	M14 x 1,5	M 8	5,0	40,7	23,7	19,1	50,0	9,0	24,5	32	15,0	6	9,2	13,0	10	21	8,0	43	45	5,0	14	M14 x 1,5	6,5	9,0	15,0	680	23340.0154
70,5	**86,5**	60	M16 x 1,5	M 8	5,0	46,0	28,1	23,5	55,3	10,0	29,4	20	17,0	6	9,2	13,0	12	24	10,0	43	60	5,0	16	M16 x 1,5	6,5	10,0	17,0	1300	23340.0170
86,5	**102,5**	60	M16 x 1,5	M10	5,0	51,1	30,1	25,5	61,5	10,0	29,4	25	25,0	6	9,2	16,0	12	24	12,5	79	60	5,0	16	M16 x 1,5	6,5	10,0	25,0	2060	23340.0186

APPLICATION EXAMPLE





Centering Clamping Elements • with clamping balls, operation from the bottom

EH 23340.



PRODUCT DESCRIPTION

To be used for accurate centering and clamping in blind holes of workpieces with locating hole. Exact self-centering with a precision of ±0,025 mm. The clamping balls frictionally center and hold workpieces with raw or pre-machined surfaces down to the bearing points. Large adjustment stroke and a small building height are a feature of this center clamping element.

Mounting from either top or bottom.

Material

Body
- Tool steel, hardened, blackened

Spring
- Stainless steel

Clamping balls
- Stainless steel 1.4112, hardened and ground

Assembly

Assembly instructions for mounting from above: remove clamping plate and screw. Screw in threaded pin from below, and tighten from above using female WS_2.

Operation

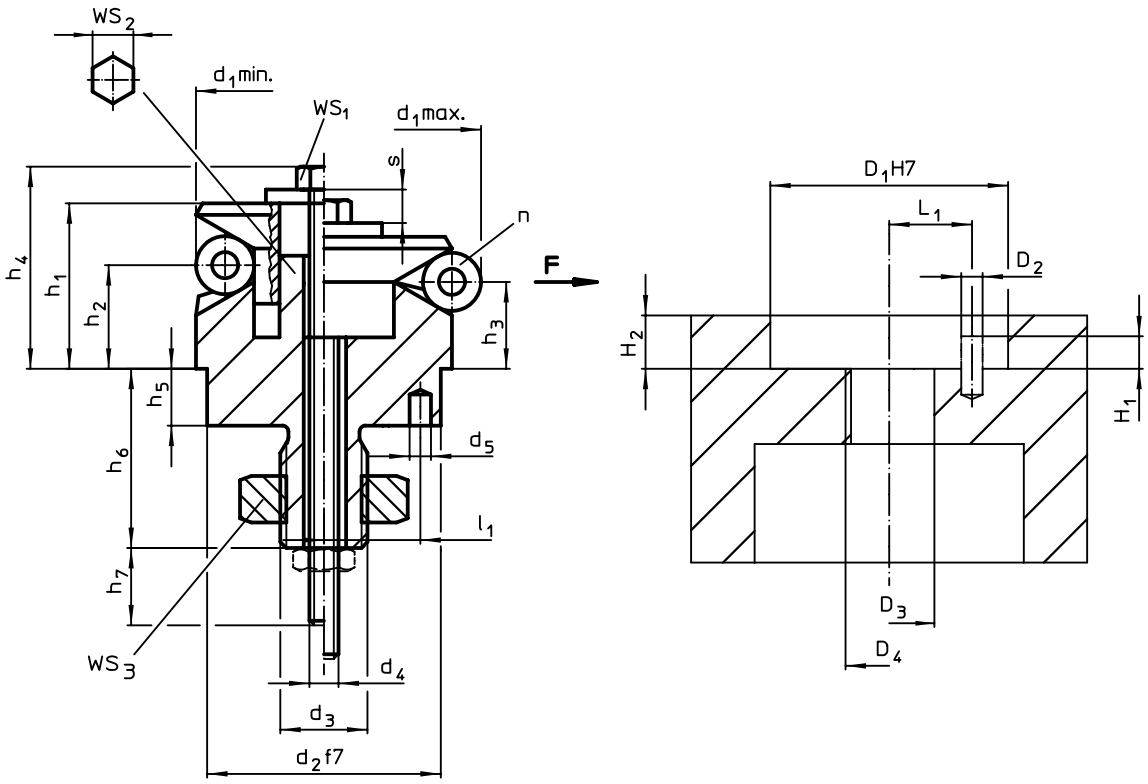
Operation from bottom manually or automatically with either pneumatic or hydraulic actuation.

MORE INFORMATION

Further products

Centering Clamping Elements, with clamping segments, operation from the bottom → p. 544

DRAWING



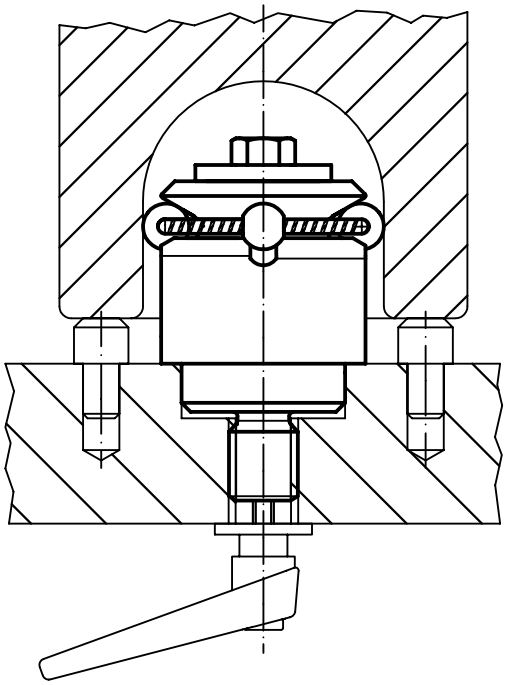
ORDER INFORMATION

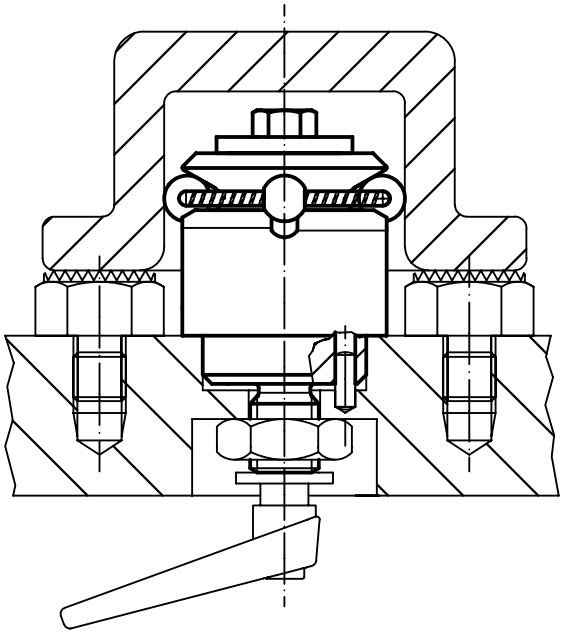
Dimensions															Number of balls n	Stroke s	WS			Clamping force F max.	Tightening torque max.	Location hole								Art. No.
d_1 min.	d_1 max.	d_2 f7	d_3	d_4	d_5 +0,3	h_1	h_2	h_3	h_4 -2	h_5	h_6 +1	h_7 ~	l_1 ±0,1	Ball Ø			WS_1	WS_2	WS_3			D_1 H7	D_2	D_3	D_4	H_1	H_2 +0,5	L_1 ±0,1		
[mm]																[mm]	[mm]			[kN]	[Nm]	[mm]							[g]	
11,7	**14,2**	10	M 5	M 3	1,5	9,9	3,9	3,2	12,7	3,5	11,0	10	3,5	2,5	3	1,3	5,5	4	8	0,5	2	10	1,5	5	M 5	2,0	3,5	3,5	12	23340.0312
14,5	**18,5**	12	M 6	M 3	2,0	14,2	9,8	8,6	17,0	5,5	14,1	12	4,5	4,0	3	2,3	5,5	3	10	3,5	2	12	2,0	6	M 6	2,5	5,5	4,5	21	23340.0314
18,5	**22,5**	15	M 8	M 4	2,5	16,5	11,6	10,4	20,4	7,5	18,2	14	5,5	4,0	3	2,3	7,0	5	13	4,0	5	15	2,5	8	M 8	3,5	7,5	5,5	45	23340.0318
22,5	**26,5**	20	M10	M 5	3,0	19,6	14,1	12,9	24,3	6,0	17,4	15	7,0	4,0	3	2,3	8,0	6	16	4,5	10	20	3,0	10	M10	3,5	6,0	7,0	77	23340.0322
26,5	**30,5**	20	M10	M 5	3,0	19,8	14,1	13,0	24,5	6,0	17,4	15	7,0	4,0	3	2,3	8,0	6	16	4,5	10	20	3,0	10	M10	3,5	6,0	7,0	96	23340.0326
30,5	**38,5**	25	M12	M 6	4,0	23,2	14,1	11,8	28,8	7,0	21,9	20	9,0	8,0	3	4,6	10,0	6	18	4,5	17	25	4,0	12	M12	3,5	7,0	9,0	140	23340.0330

→

Dimensions																Number of balls n	Stroke s	WS			Clamping force F max.	Tightening torque max.	Location hole								Art. No.
d_1 min.	d_1 max.	d_2 f7	d_3	d_4	d_5 +0,3	h_1	h_2	h_3	h_4 -2	h_5	h_6 +1	h_7 ~	l_1 ±0,1	Ball Ø			WS_1	WS_2	WS_3			D_1 H7	D_2	D_3	D_4	H_1	H_2 +0,5	L_1 ±0,1		
[mm]																	[mm]			[kN]	[Nm]	[mm]							[g]	
38,5	**46,5**	30	M12	M 6	4,0	27,1	18,0	15,5	33,0	7,5	22,5	20	11,0	8,0	6	4,6	10,0	8	18	6,5	17	30	4,0	12	M12	4,5	7,5	11,0	246	23340.0338
46,5	**54,5**	30	M12	M 6	4,0	27,2	18,0	15,7	33,1	7,5	22,5	20	11,0	8,0	6	4,6	10,0	8	18	6,5	17	30	4,0	12	M12	6,5	7,5	11,0	327	23340.0346
54,5	**70,5**	45	M14 x 1,5	M 8	5,0	40,6	23,7	19,1	49,9	9,0	24,5	32	15,0	16,0	6	9,2	13,0	10	21	8,0	43	45	5,0	14	M14 x 1,5	6,5	9,0	15,0	650	23340.0354
70,5	**86,5**	60	M16 x 1,5	M 8	5,0	46,1	28,3	23,7	55,4	10,0	29,4	20	17,0	16,0	6	9,2	13,0	12	24	10,0	43	60	5,0	16	M16 x 1,5	6,5	10,0	17,0	1272	23340.0370
86,5	**102,5**	60	M16 x 1,5	M10	5,0	51,2	30,3	25,7	61,6	10,0	29,4	25	25,0	16,0	6	9,2	16,0	12	24	12,5	79	60	5,0	16	M16 x 1,5	6,5	10,0	25,0	2042	23340.0386

APPLICATION EXAMPLE





3

Centering Clamping Mandrels

EH 23340.



PRODUCT DESCRIPTION

For clamping and centering of workpieces with internal bore.

Material

Body
- Steel, blackened

Clamping screw
- Case-hardened steel, case hardened

Assembly

The centering clamping mandrel can be machined to the required seating diameter (e.g. by turning/milling). It must be noticed that before machining the centering clamping mandrel, it will be expanded approx. 0.1 mm over the clamping diameter. To machine the mandrel, a nut will be provided.

MORE INFORMATION

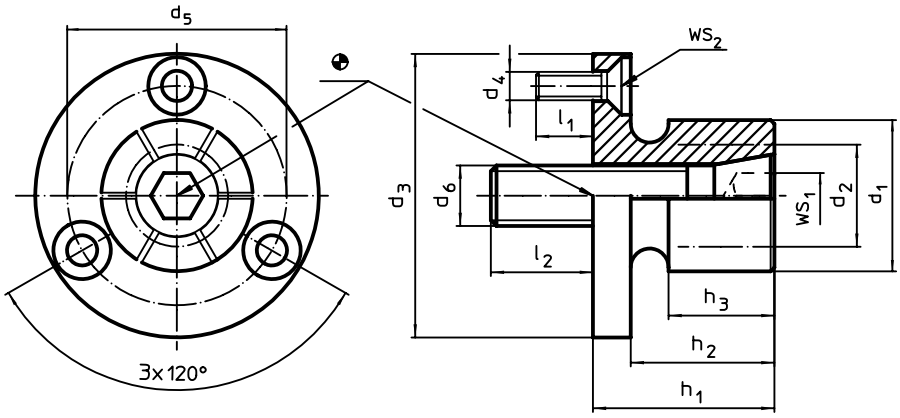
Notes

Special types on request.

Further products

Centering Clamping Mandrels, with lateral handling . . . . . → p. 549

DRAWING

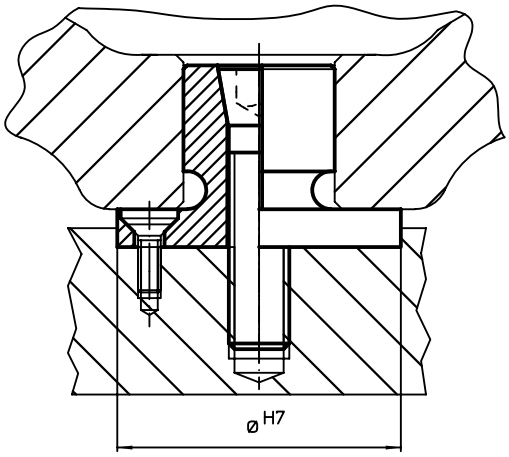


ORDER INFORMATION

Dimensions											Number of segments	WS		Clamping force max.	Tightening torque max.	Location hole H7		Art. No.
d_1	d_2 min.	d_3 -0,05	d_4	d_5	d_6	h_1	h_2	h_3	l_1 ~	l_2		WS_1	WS_2					
[mm]												[mm]		[kN]	[Nm]	[mm]	[g]	
12,4	**8,0**	29,72	M3	21,0	M 4	21,8	16,0	15,0	6	8	4	3	2,0	3	3,5	29,72	55	23340.0104
14,2	**12,2**	31,50	M3	23,1	M 6	24,9	19,0	15,0	6	12	4	5	2,0	6	12,0	31,50	68	23340.0106
20,0	**13,5**	37,50	M3	29,0	M 8	24,9	19,0	15,0	6	14	6	6	2,0	8	24,0	37,50	104	23340.0108
27,0	**18,0**	50,00	M4	39,4	M10	28,6	22,2	17,5	7	17	6	8	2,5	13	42,0	50,00	197	23340.0111
35,3	**25,4**	56,00	M4	45,5	M12	31,8	25,4	20,6	7	21	6	10	2,5	15	105,0	56,00	322	23340.0112
51,0	**30,0**	75,50	M5	63,9	M16	39,6	31,8	27,0	11	22	6	14	3,0	26	200,0	75,50	809	23340.0116
77,0	**30,0**	107,50	M6	92,5	M16	45,5	37,6	32,3	12	20	8	14	4,0	26	200,0	107,50	1832	23340.0118[1)]

[1)] including clamping nut and clamping ring to enable machining as described in note

APPLICATION EXAMPLE



Centering Clamping Mandrels • with lateral handling

EH 23340.



PRODUCT DESCRIPTION

For clamping and centering of workpieces with internal bore.

Material

Body
- Steel, blackened

Clamping screw
- Heat-treated steel

Assembly

The centering clamping mandrel can be machined to the required seating diameter (e.g. by turning/milling). It must be noticed that before machining the centering clamping mandrel, it will be expanded approx. 0,1 mm over the clamping diameter. To machine the mandrel, a locking ring will be provided.

Operation

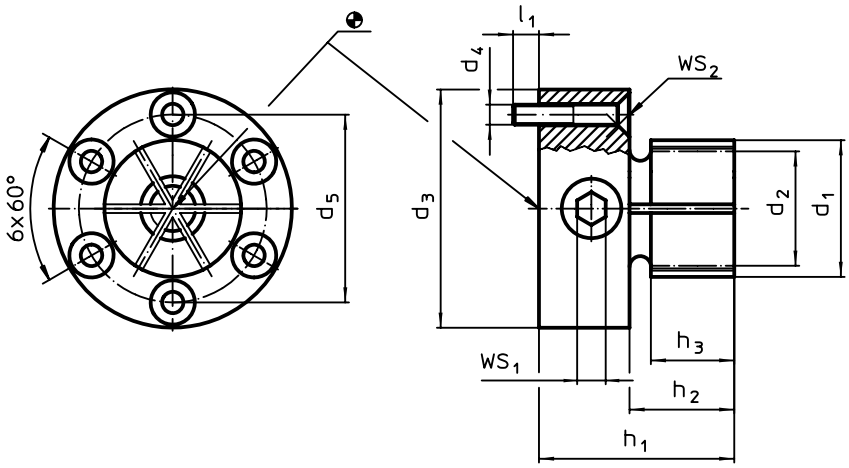
Thanks to the lateral handling it can also be used for blind hole drilling.

MORE INFORMATION

Further products

Centering Clamping Mandrels . . . . . → p. 548

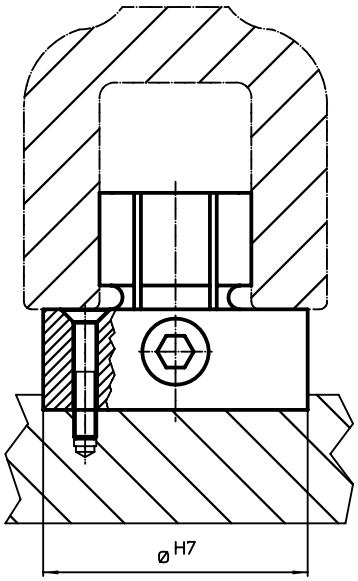
DRAWING



ORDER INFORMATION

Dimensions									WS		Clamping force max.	Tightening torque max.	Location hole H7		Art. No.
d_1	d_2 min.	d_3 -0,05	d_4	d_5	h_1	h_2	h_3	l_1 ~	WS_1	WS_2					
[mm]									[mm]		[kN]	[Nm]	[mm]	[g]	
28,7	17,8	50	M4	39,4	41	22	17,5	7	6	2,5	20	66	50	380	23340.0125

APPLICATION EXAMPLE



Shaft Clamps

EH 23341.



PRODUCT DESCRIPTION

Shaft clamps are used to clamp round workpieces, e.g. shafts, axels, tubes or rods voth axially and radially.

Material

Body
- Steel, blackened

Clamping screw
- Steel, zinc-plated (DIN 912)

Assembly

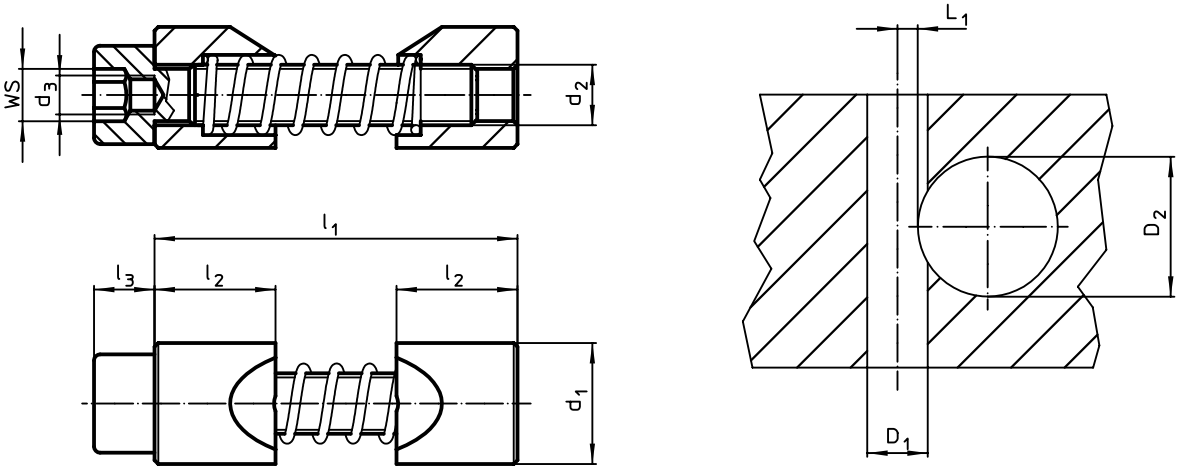
1. Expand the clamping jaws to the diameter of the shaft to be clamped.
2. Insert shaft clamp into hole using the assembly tool.
3. Insert and position the shaft.
4. Clamp using cylinder screw WS (observe tightening torque).

MORE INFORMATION

Notes

The thread d_3 serves to hold the assembly tool (optional).

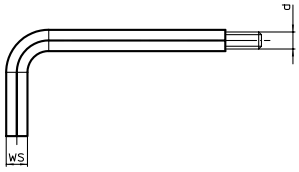
DRAWING



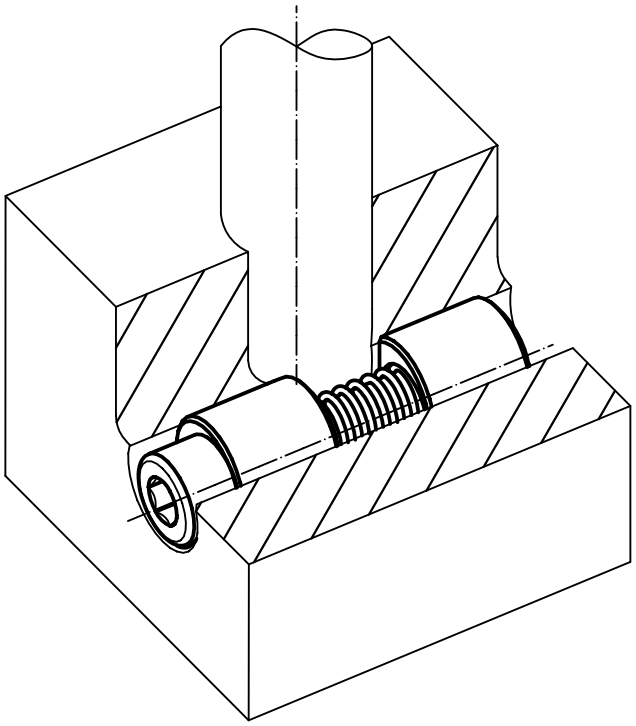
ORDER INFORMATION

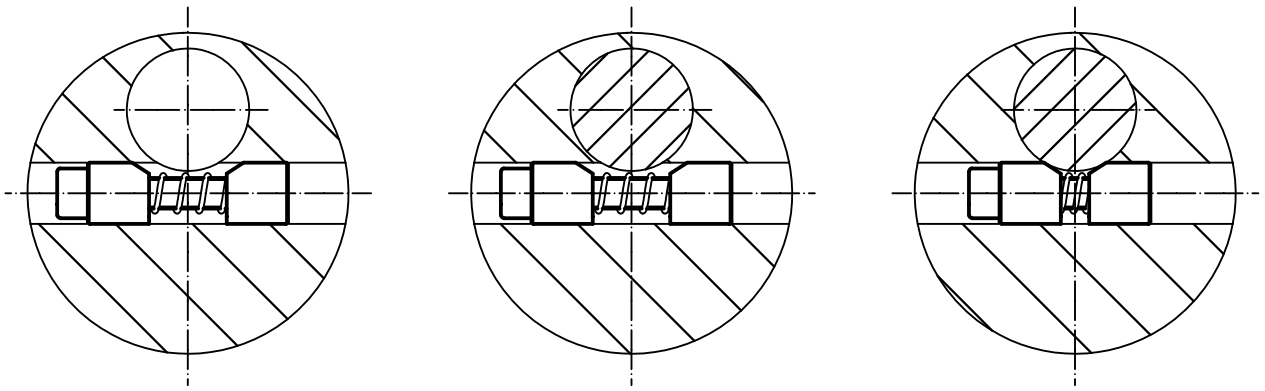
Dimensions						WS	Tightening torque max.	Location hole				Art. No.
d_1 h11	d_2	d_3	l_1 max.	l_2	l_3			Hub bore D_1 H7	shaft diameter D_2	L_1 +0,2		
[mm]						[mm]	[Nm]	[mm]			[g]	
8	M 4	M 2,5	27	8	4	3	2,9	8	6 – 10	2,8	7	23341.0008
10	M 5	M 3	33	10	5	4	6,0	10	10 – 15	3,3	13	23341.0010
12	M 6	M 4	39	12	6	5	10,0	12	15 – 20	3,5	22	23341.0012
16	M 8	M 5	46	16	8	6	25,0	16	20 – 30	4,0	52	23341.0016
20	M10	M 6	53	20	10	8	46,0	20	30 – 40	4,8	104	23341.0020
25	M12	M 8	70	25	12	10	82,0	25	40 – 60	5,6	189	23341.0025
30	M16	M10	81	30	16	14	206,0	30	60 – 125	7,9	346	23341.0030

ACCESSORIES

	WS [mm]	d [mm]	[g]	Art. No.
special hexagon key				
	**3**	**M 2,5**	5	23341.1008
	4	**M 3**	10	23341.1010
	5	**M 4**	18	23341.1012
	6	**M 5**	28	23341.1016
	8	**M 6**	57	23341.1020
	10	**M 8**	95	23341.1025
	14	**M10**	248	23341.1030

APPLICATION EXAMPLE





Screw Jacks

EH 23470.



PRODUCT DESCRIPTION

Trapezoidal self-locking thread, spindle with final safety device. The holders, which can be secured by means of the T-slots, make it possible to tighten the jacks so that they will not slip out of position when a workpiece is changed. They also allow to fit screw jacks to vertical clamping surfaces. Screw jacks are frequently used for supporting workpieces. Use of the self-aligning cap ensures a correctly aligned bearing surface. Using the centering plate as an intermediate element, it is possible to fit a number of screw jacks sizes 52, 70 and 100 together one above the other.

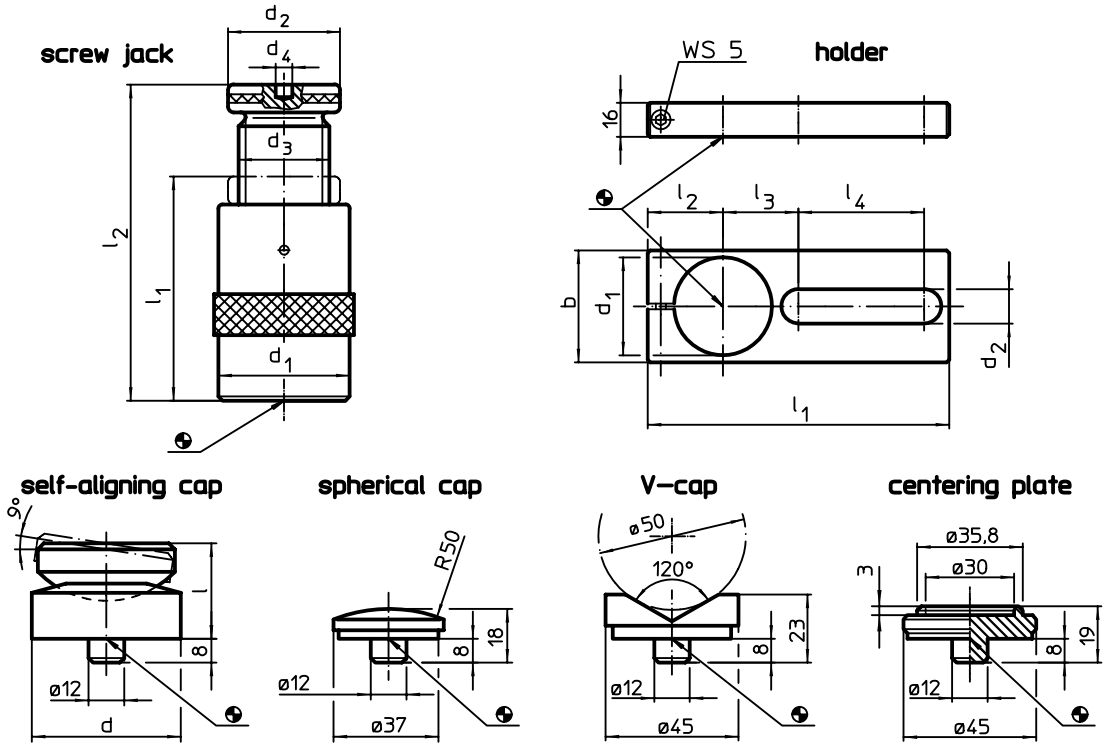
Material

Caps
- Stel, case-hardened, blackened

Holder
- Steel, blackened

Screw jack
- Steel 1.0503 varnished

DRAWING



ORDER INFORMATION

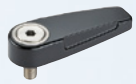
l_2 Clamping height max.	Dimensions					Carrying force		Art. No.
	l_1 min.	d_1	d_2	d_3	d_4			
[mm]	[mm]				[mm]	[kN]	[g]	
screw jack								
50	38	31	31	Tr 20 x 4	–	15	191	23470.0005
52	42	50	50	Tr 30 x 4	12	60	539	23470.0006
70	50	50	50	Tr 30 x 4	12	60	645	23470.0007
100	70	50	50	Tr 30 x 4	12	60	900	23470.0010
140	100	69	69	Tr 40 x 7	12	100	2614	23470.0014
210	140	80	70	Tr 50 x 8	12	170	4336	23470.0021
300	190	100	80	Tr 65 x 10	12	350	9680	23470.0030

ACCESSORIES

	Dimensions [mm]									For screw jacks [mm]	[g]	Art. No.
	d	d_1	b	d_2	l	l_1	l_2	l_3	l_4			
holder												
	–	31	40	18,5	–	175	30	35	90	50	518	23470.0232
		50	60	20,5	–	190	38	46	90	52/ 70/100	891	23470.0250
		69	80	24,5	–	210	48	54	90	140	1300	23470.0270
self-aligning cap												
	50	–	–	–	32	–	–	–	–	52/ 70/100	399	23470.0350
	65	–	–	–	35	–	–	–	–	140/210	715	23470.0365
spherical cap												
	–	–	–	–	–	–	–	–	–	52/ 70/100/140/210/300	74	23470.0171
V-cap												
	–	–	–	–	–	–	–	–	–	52/ 70/100/140/210/300	138	23470.0172
centering plate												
	–	–	–	–	–	–	–	–	–	52/ 70/100	107	23470.0170

4 OPERATING ELEMENTS



	Product group	Page
	Retaining Catches	556
	U-Handles	559
	Tubular Handles	566
	Crank Handles	568
	Gear Lever Handles	574
	Adjustable Clamping Levers	575
	Clamping Levers	588
	Clamping Levers / Clamping Nuts	597
	Rotating Handles	600
	Knurled Nuts / Knurled Thumb Screws	604
	Tommy Nuts / Tommy Screws	612
	Handles	616
	Thumb Knobs	618
	Star Grips / Star Grip Screws	622
	Palm Grips / Palm Grip Screws	633
	Torque Handles	641
	Handwheels	643
	Clamping Screws	656

Retaining Catches • one-sided

EH 24100.



PRODUCT DESCRIPTION

To be used for door locking, drawers and as handling aid etc.
The retaining catch is indexing 4 x 90°.

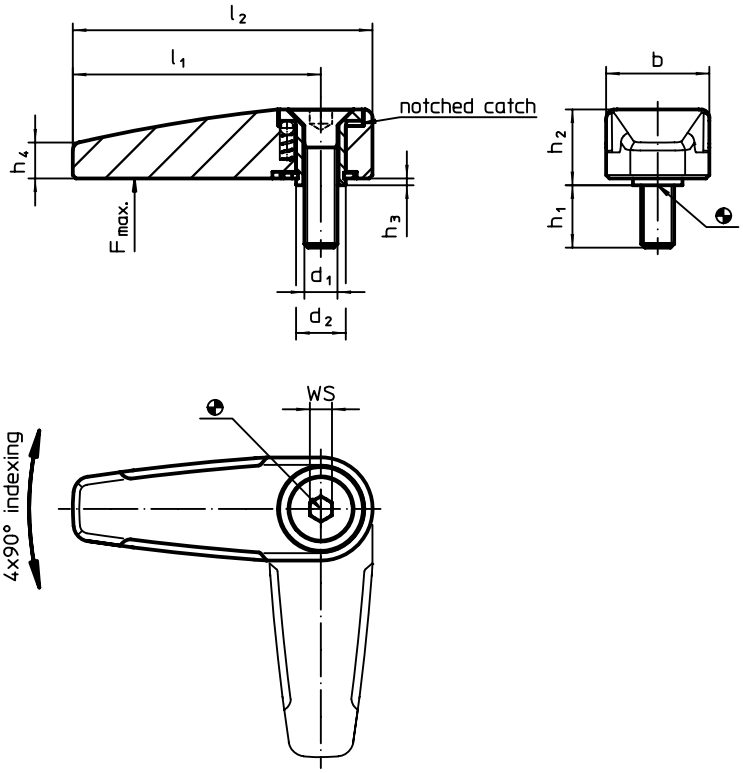
Material

Lever
- Zinc die-cast, silver, similar to RAL 9006
- Zinc die-cast, black, similar to RAL 9005

Inner parts
- Dry powdered metal

Screw
- Stainless steel A2 (ISO 10642)

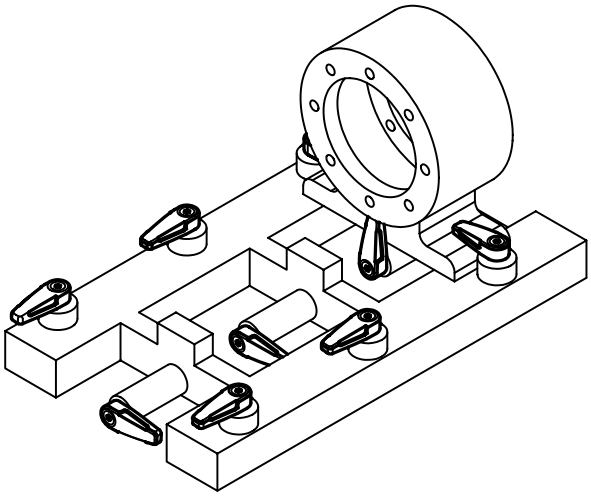
DRAWING



ORDER INFORMATION

Dimensions									WS	Load capacity max.		Art. No.	
d_1	d_2	l_1	l_2	b	h_1	h_2	h_3	h_4				silver	black
[mm]									[mm]	[N]	[g]		
M6	9	45	55	19,0	12	13,3	0,8	6,5	4	500	59	24100.0101	24100.0102
M8	14	65	78	25,2	14	15,8	0,8	9,0	5	1000	136	24100.0151	24100.0152

APPLICATION EXAMPLE



Retaining Catches • double-sided

EH 24100.



PRODUCT DESCRIPTION

To be used for door locking, drawers and as handling aid etc.
The retaining catch is indexing 4 x 90°.

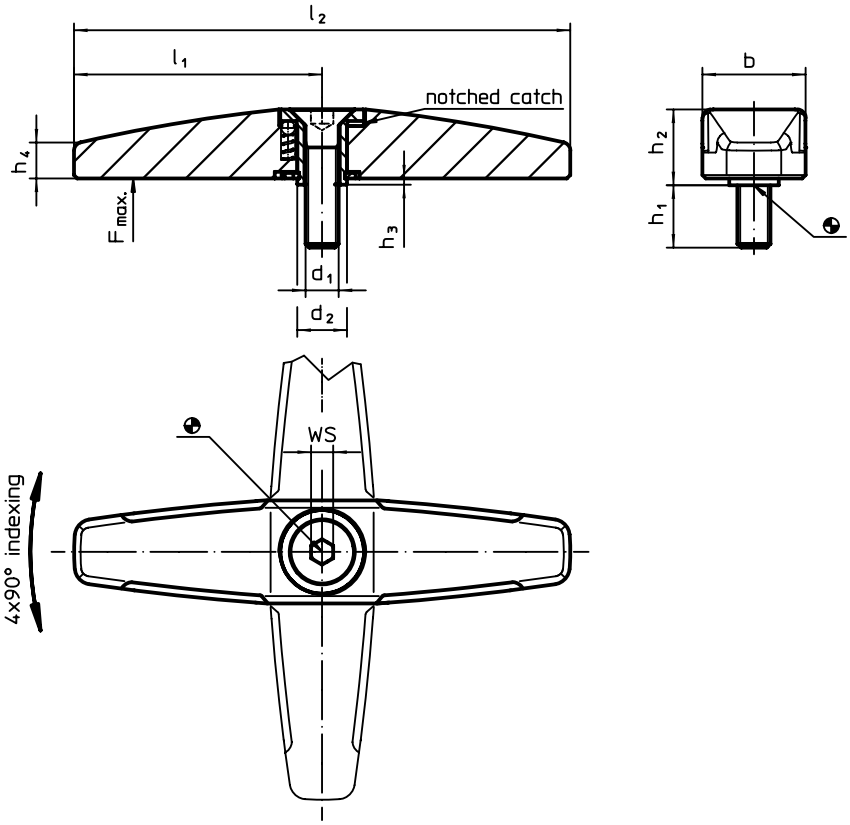
Material

Lever
- Zinc die-cast, silver, similar to RAL 9006
- Zinc die-cast, black, similar to RAL 9005

Inner part
- Dry powdered metal

Screw
- Stainless steel A2 (ISO 10642)

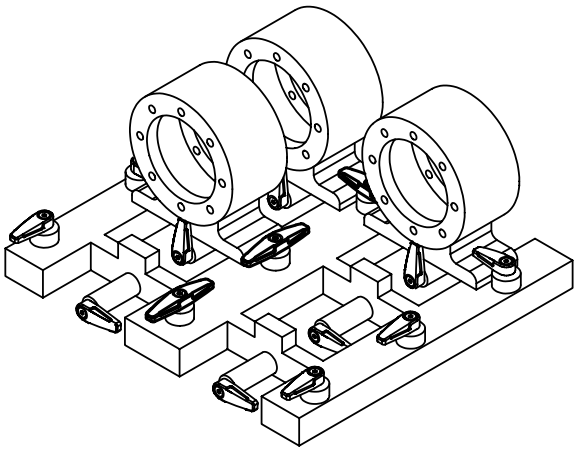
DRAWING



ORDER INFORMATION

Dimensions									WS	Load capacity max.		Art. No.	
d_1	d_2	l_1	l_2	b	h_1	h_2	h_3	h_4				silver	black
[mm]									[mm]	[N]	[g]		
M6	9	45	90	19,0	12	13,3	0,8	6,5	4	500	93	24100.0601	24100.0602
M8	14	65	130	25,2	14	15,8	0,8	9,0	5	1000	220	24100.0651	24100.0652

APPLICATION EXAMPLE



Retaining Catches • wing grip, one-sided

EH 24101.



PRODUCT DESCRIPTION

To be used for door locking, drawers and as handling aid etc.
The retaining catch is indexing 4 x 90°.

Material

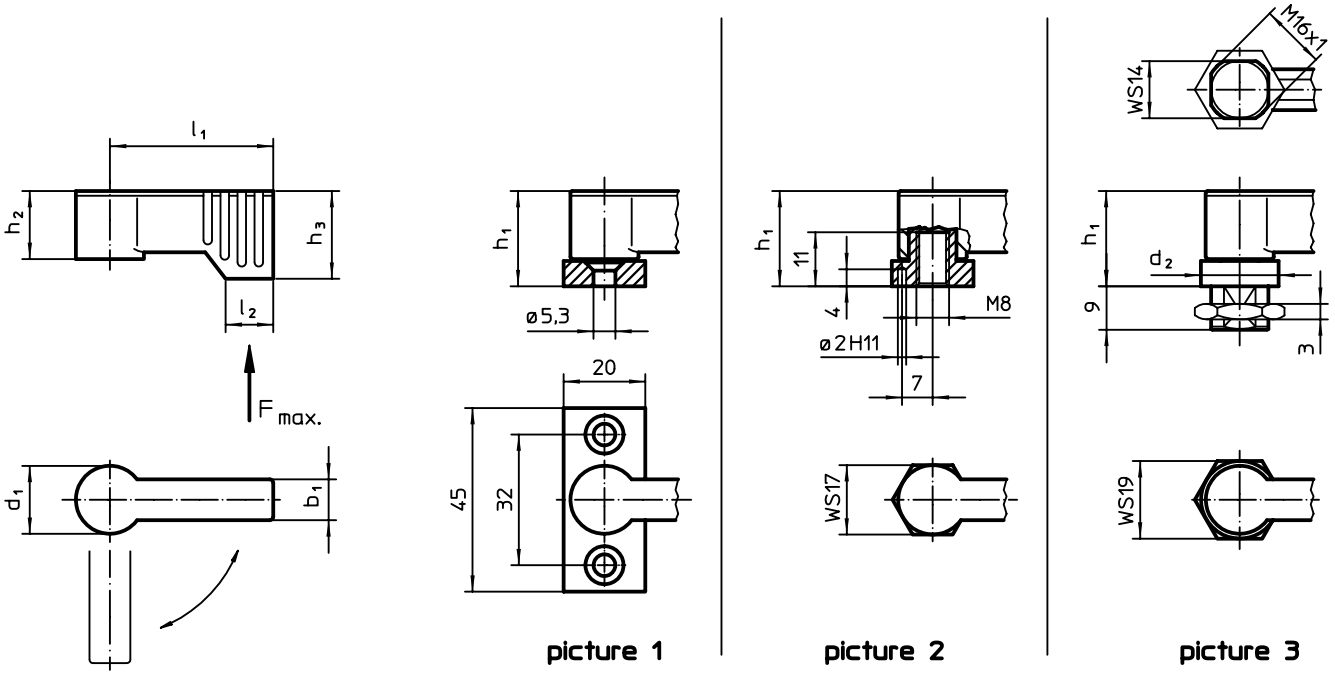
Flange
- Zinc die-cast, plastic coated, black

Lever
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Inner part
- Zinc die-cast
- Steel
- Plastic

4

DRAWING



ORDER INFORMATION

Dimensions								Load capacity F max.		Art. No.	
d_1	l_1	b_1	d_2	h_1 ~	h_2 ~	h_3 min.	l_2			silver	black
[mm]								[N]	[g]		
with mounting flange – picture 1											
17	40	10	–	22	16,5	21,5	11	450	20	24101.0201	24101.0202
	55	10	–	22	16,5	21,5	11	450	80	24101.0204	24101.0203
with female thread – picture 2											
17	40	10	–	22	16,5	21,5	11	450	57	24101.0231	24101.0232
	55	10	–	22	16,5	21,5	11	450	64	24101.0234	24101.0233
with male thread – picture 3											
17	40	10	19	22	16,5	21,5	11	450	50	24101.0261	24101.0262
	55	10	19	22	16,5	21,5	11	450	76	24101.0264	24101.0263

U-Handles

EH 24300.



PRODUCT DESCRIPTION

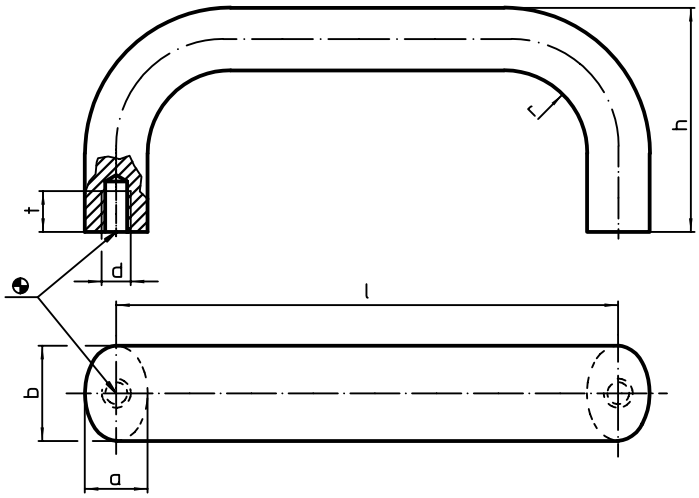
Ergonomic design offering high stability and smooth surfaces.

Material

Handle

- Aluminium, drawn, bright, vibratory grinded
- Aluminium, plastic coated, similar to RAL 9005, black
- Stainless steel 1.4301, dull blasted

DRAWING



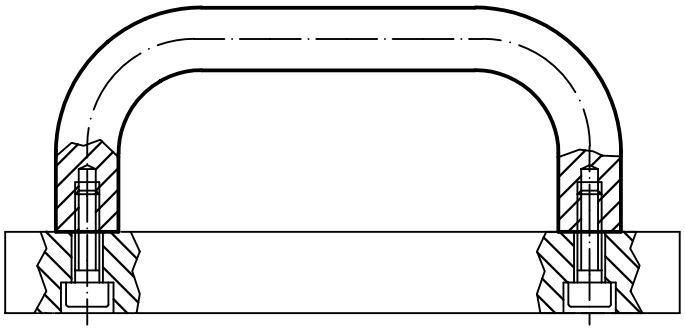
ORDER INFORMATION

Dimensions								Art. No.
b	l ±0,25	a	d	h	r	t		
			[mm]				[g]	
aluminium, bright								
20	**100**	13	M6	49	13	10	90	24300.0100
	112	13	M6	49	13	10	97	24300.0110
	117	13	M6	49	13	10	100	24300.0112
	120	13	M6	49	13	10	97	24300.0114
	128	13	M6	51	13	10	107	24300.0120
	160	13	M6	51	13	10	122	24300.0130
26	**112**	17	M8	55	17	12	163	24300.0140
	117	17	M8	55	17	12	166	24300.0142
	120	17	M8	55	17	12	200	24300.0144
	125	17	M8	55	17	12	180	24300.0146
	128	17	M8	55	17	12	179	24300.0150
	160	17	M8	57	17	12	211	24300.0160
	179	17	M8	57	17	12	234	24300.0162
	192	17	M8	57	17	12	236	24300.0170
	300	17	M8	57	17	12	344	24300.0180
	400	17	M8	57	17	12	436	24300.0190
	500	17	M8	57	17	12	538	24300.0200

→

Dimensions								Art. No.
b	l ±0,25	a	d	h	r	t		
			[mm]				[g]	
aluminium, black								
20	**100**	13	M6	49	13	10	92	24300.0300
	112	13	M6	49	13	10	97	24300.0310
	117	13	M6	49	13	10	100	24300.0312
	120	13	M6	49	13	10	104	24300.0314
	128	13	M6	51	13	10	110	24300.0320
	160	13	M6	51	13	10	126	24300.0330
26	**112**	17	M8	55	17	12	165	24300.0340
	117	17	M8	55	17	12	166	24300.0342
	120	17	M8	55	17	12	160	24300.0344
	125	17	M8	55	17	12	178	24300.0346
	128	17	M8	55	17	12	181	24300.0350
	160	17	M8	57	17	12	219	24300.0360
	179	17	M8	57	17	12	234	24300.0362
	192	17	M8	57	17	12	250	24300.0370
	300	17	M8	57	17	12	347	24300.0380
	400	17	M8	57	17	12	445	24300.0390
	500	17	M8	57	17	12	538	24300.0400
stainless steel								
20	**112**	13	M6	49	13	10	271	24300.0510
	128	13	M6	51	13	10	305	24300.0520
	160	13	M6	51	13	10	366	24300.0530
	200	13	M6	51	13	10	440	24300.0540
	250	13	M6	51	13	10	517	24300.0550
	300	13	M6	51	13	10	597	24300.0560
	350	13	M6	51	13	10	660	24300.0570
	400	13	M6	51	13	10	737	24300.0580

APPLICATION EXAMPLE



U-Handles • front mounting

EH 24300.



PRODUCT DESCRIPTION

Ergonomic design offering high stability and smooth surfaces.

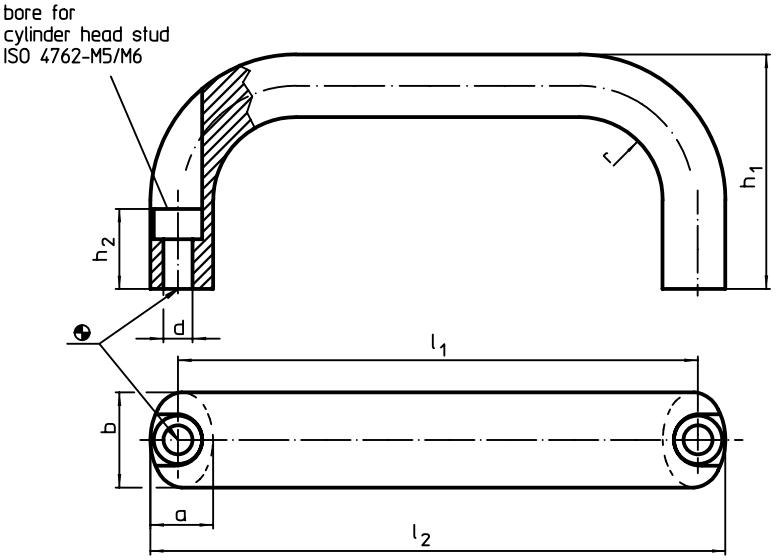
Material

Handle
- Aluminium, drawn, bright, vibratory grinded
- Aluminium, plastic coated, similar to RAL 9005, black
- Stainless steel

Assembly

Front mount handle.

DRAWING



ORDER INFORMATION

b	l1 ±0,25	l2	a	d	h1	h2	r	For cylinder screw		Art. No.
			Dimensions [mm]					[mm]	[g]	
aluminium, bright										
20	**100**	112	13	5,4	49	19	13	M5	80	24300.0101
	112	124	13	5,4	49	19	13	M5	82	24300.0111
	128	140	13	5,4	51	19	13	M5	100	24300.0121
	160	172	13	5,4	51	19	13	M5	100	24300.0131
26	**116**	130	17	6,4	55	17	17	M6	146	24300.0141
	132	146	17	6,4	55	17	17	M6	161	24300.0151
	164	178	17	6,4	57	17	17	M6	196	24300.0161
	179	193	17	6,4	57	17	17	M6	215	24300.0166
	196	210	17	6,4	57	17	17	M6	229	24300.0171
aluminium, black										
20	**100**	112	13	5,4	49	19	13	M5	80	24300.0301
	112	124	13	5,4	49	19	13	M5	80	24300.0311
	128	140	13	5,4	51	19	13	M5	100	24300.0321
	160	172	13	5,4	51	19	13	M5	120	24300.0331
26	**116**	130	17	6,4	55	17	17	M6	132	24300.0341
	132	146	17	6,4	55	17	17	M6	164	24300.0351
	164	178	17	6,4	57	17	17	M6	206	24300.0361
	179	193	17	6,4	57	17	17	M6	213	24300.0366
	196	210	17	6,4	57	17	17	M6	232	24300.0371
stainless steel										
20	**112**	124	13	5,4	49	19	13	M5	258	24300.0511
	128	140	13	5,4	51	19	13	M5	293	24300.0521
	160	172	13	5,4	51	19	13	M5	345	24300.0531

U-Handles • with support washer

EH 24310.



PRODUCT DESCRIPTION

Material

Handle
- Steel, chromium-plated
- Steel, plastic coated, black
- Stainless steel 1.4305, dull blasted

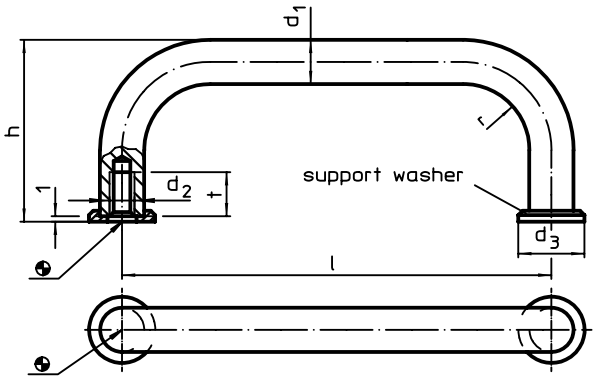
Support washer
- Zinc die-cast, nickel-plated
- Stainless steel

Assembly

The supporting washer provides a good surface. Suitable washers are joined in loose form.

4

DRAWING



ORDER INFORMATION

Dimensions								Art. No.		
d_1	l ±0,5	d_2	d_3	h	r	t min.		steel, chromium-plated	steel, plastic coated, black	stainless steel 1.4305
[mm]							[g]			
8	**55**	M4	12	35	10	8	40	24310.0010	24310.0310	–
	64	M4	12	35	10	8	44	24310.0020	24310.0320	24310.0520
	88	M4	12	35	10	8	53	24310.0030	24310.0330	24310.0530
	96	M4	12	35	10	8	57	24310.0040	24310.0340	24310.0540
	100	M4	12	35	10	8	60	24310.0050	24310.0350	24310.0550
	120	M4	12	35	10	8	66	24310.0060	24310.0360	24310.0560
	128	M4	12	35	10	8	69	24310.0110	24310.0410	24310.0610
10	**88**	M5	15	43	12	12	91	24310.0120	24310.0420	24310.0620
	100	M5	15	43	12	12	98	24310.0130	24310.0430	24310.0630
	120	M5	15	43	12	12	109	24310.0140	24310.0440	24310.0640
	180	M5	15	43	12	12	146	24310.0150	24310.0450	24310.0650
	200	M5	15	43	12	12	161	24310.0160	24310.0460	24310.0660
	235	M5	15	43	12	12	183	24310.0170	24310.0470	24310.0670

U-Handles

EH 24310.



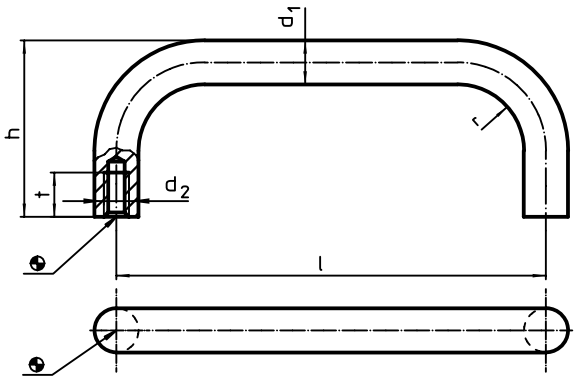
PRODUCT DESCRIPTION

Same design as version with bearing washer.
Thanks to the larger supporting surface, no bearing washers are needed.

Material

Handle
- Stainless steel 1.4301, dull blasted

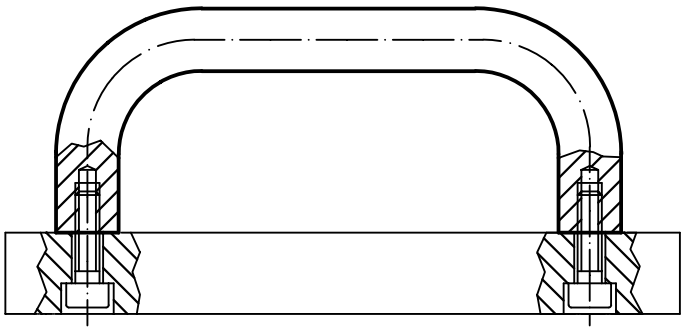
DRAWING



ORDER INFORMATION

Dimensions							Art. No.
d_1	l ±0,5	d_2	h	r	t min.		
[mm]						[g]	
12	**125**	M6	51	14	12	162	24310.0710
	160	M6	51	14	12	201	24310.0720
	200	M6	51	14	12	237	24310.0730
	250	M6	51	14	12	282	24310.0740
16	**160**	M6	59	18	12	373	24310.0750
	200	M6	59	18	12	437	24310.0760
	250	M6	59	18	12	523	24310.0770
	300	M6	59	18	12	603	24310.0780

APPLICATION EXAMPLE



U-Handles • plastic, front mounting

EH 24320.



PRODUCT DESCRIPTION

Material

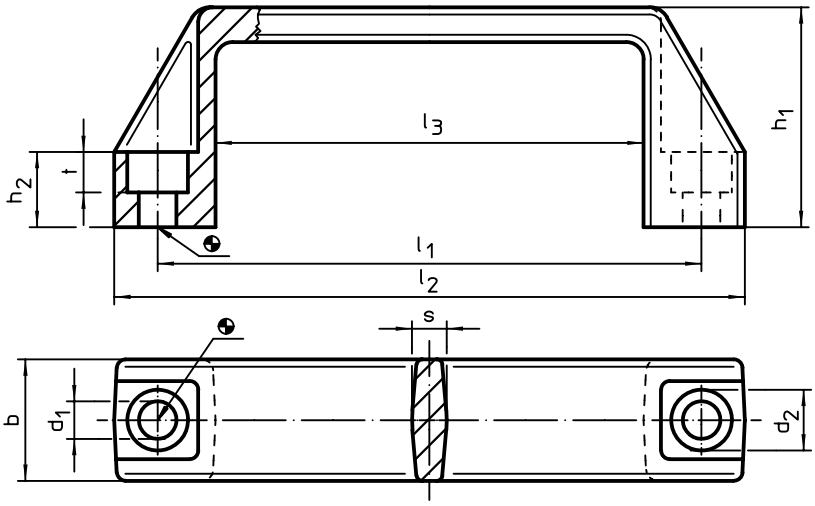
Handle

- Thermoplastic PA, glass-fibre reinforced, black

Assembly

Front mount handle.

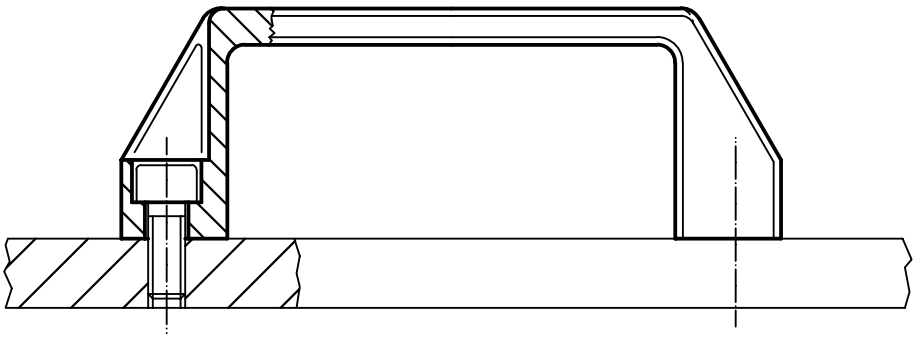
DRAWING



ORDER INFORMATION

Dimensions												Art. No.
l_1 ±0,5	d_1	b	l_2	d_2	h_1	h_2	l_3	s	t	max.		
[mm]										[°C]	[g]	
93,5	**6,5**	**21**	109	10,5	38	13	74	6,0	7,0	100	26	**24320.0010**
117,0	**8,5**	**26**	137	13,5	41	15	93	7,0	8,5	100	44	**24320.0020**
132,0	**8,5**	**27**	150	13,5	45	16	108	7,0	8,5	100	47	**24320.0030**
179,0	**8,5**	**28**	196	13,5	50	17	151	7,5	8,5	100	70	**24320.0040**
235,0	**10,5**	**30**	260	16,5	54	20	201	8,5	10,5	100	118	**24320.0050**

APPLICATION EXAMPLE



U-Handles • plastic

EH 24320.



PRODUCT DESCRIPTION

Material

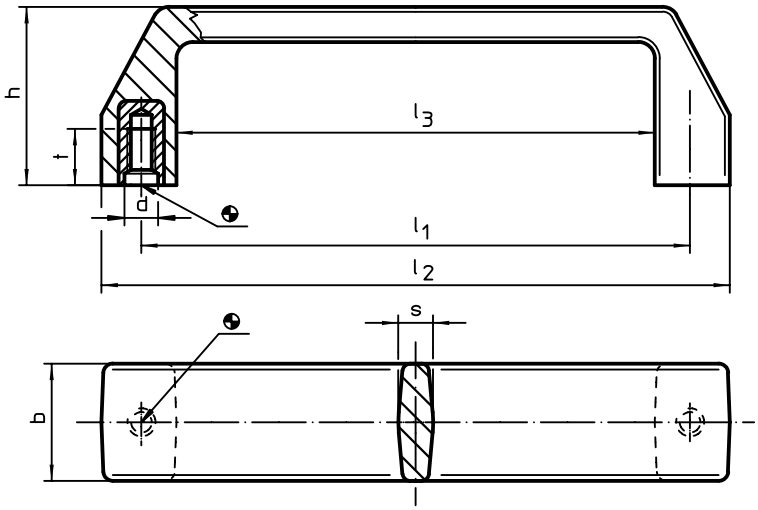
Bushing
- Brass

Handle
- Thermoplastic PA, glass-fibre reinforced, black

Assembly

Back mount handle.

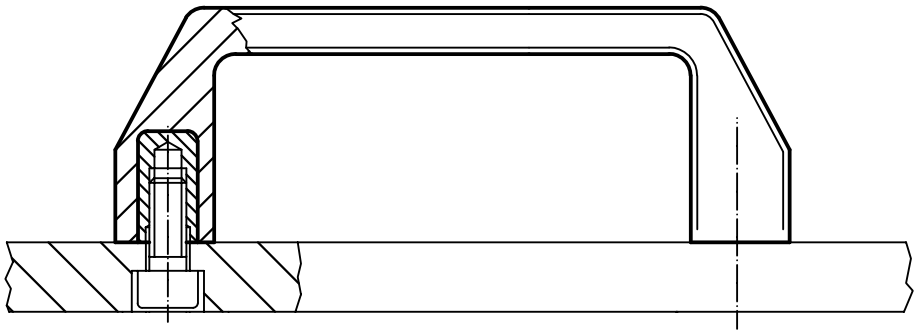
DRAWING



ORDER INFORMATION

Dimensions										Art. No.
l_1 ±0,5	d	b	h	l_2	l_3	s	t	max. [°C]	[g]	
			[mm]							
93,5	**M6**	**21**	36	107	79	6,0	10	100	31	24320.0210
117,0	**M6**	**25**	38	134	102	7,5	12	100	57	24320.0220
	M8	**25**	38	134	102	7,5	12	100	50	24320.0230
132,0	**M8**	**26**	45	150	116	8,0	13	100	59	24320.0240

APPLICATION EXAMPLE



Tubular Handles

EH 24321.



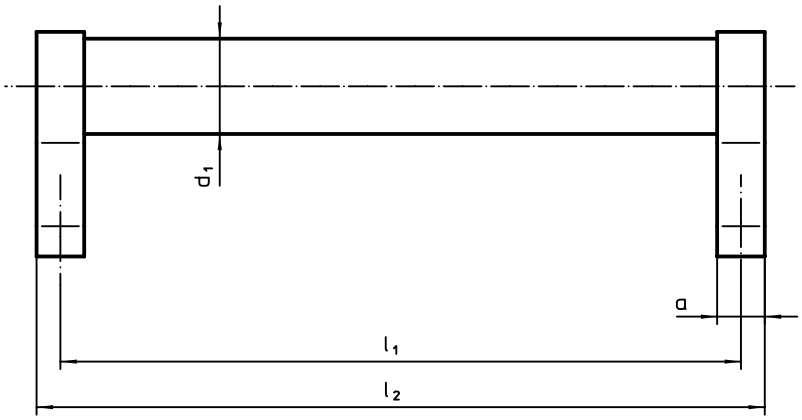
PRODUCT DESCRIPTION

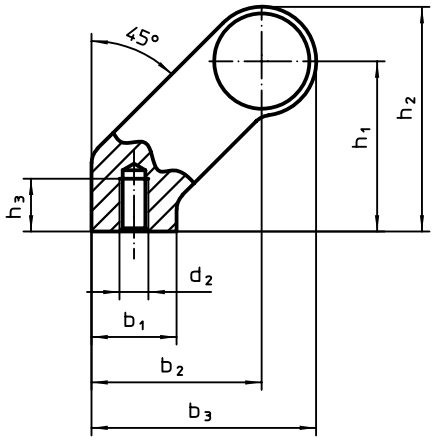
Material

Cap
- Plastic, light grey

Handle
- Aluminium, anodised
- Aluminium, plastic coated, similar to RAL 9005 black, matt structure

DRAWING





ORDER INFORMATION

Dimensions												Art. No.	
d_1	l_1 ±0,25	a	b_1	b_2	b_3	d_2	h_1	h_2	h_3 min.	l_2		silver	black
[mm]											[g]		
20	180	12	24	42	54	M6	42	54	12	192	242	24321.0005	24321.0505
	200	12	24	42	54	M6	42	54	12	212	246	24321.0010	24321.0510
	250	12	24	42	54	M6	42	54	12	262	259	24321.0015	24321.0515
	300	12	24	42	54	M6	42	54	12	312	276	24321.0020	24321.0520
	350	12	24	42	54	M6	42	54	12	362	292	24321.0025	24321.0525
	400	12	24	42	54	M6	42	54	12	412	311	24321.0030	24321.0530
28	200	14	25	50	66	M8	50	66	15	214	430	24321.0035	24321.0535
	250	14	25	50	66	M8	50	66	15	264	440	24321.0040	24321.0540
	300	14	25	50	66	M8	50	66	15	314	470	24321.0045	24321.0545
	350	14	25	50	66	M8	50	66	15	364	495	24321.0050	24321.0550
	400	14	25	50	66	M8	50	66	15	414	500	24321.0055	24321.0555
	500	14	25	50	66	M8	50	66	15	514	535	24321.0060	24321.0560
	600	14	25	50	66	M8	50	66	15	614	570	24321.0065	24321.0565
30	200	17	27	51	68	M8	51	68	15	217	426	24321.0070	24321.0570
	300	17	27	51	68	M8	51	68	15	317	480	24321.0075	24321.0575
	350	17	27	51	68	M8	51	68	15	367	511	24321.0080	24321.0580
	400	17	27	51	68	M8	51	68	15	417	538	24321.0085	24321.0585
	500	17	27	51	68	M8	51	68	15	517	606	24321.0090	24321.0590
	600	17	27	51	68	M8	51	68	15	617	660	24321.0095	24321.0595

Tubular Handles • front mounting

EH 24321.



PRODUCT DESCRIPTION

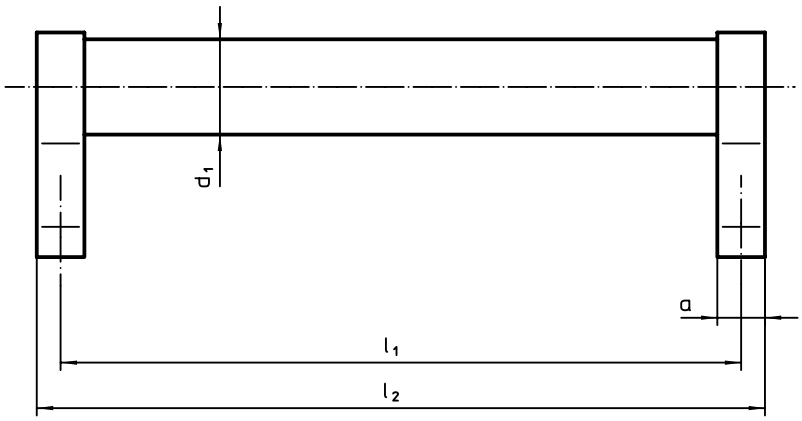
Material

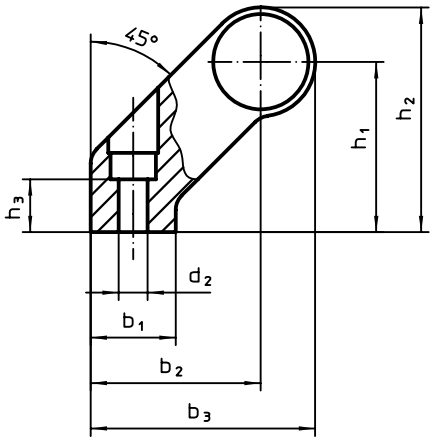
Cap
- Plastic, light grey

Handle
- Aluminium, anodised
- Aluminium, plastic coated, similar to RAL 9005 black, matt structure

Covering
- Plastic, light grey
- Plastic, black

DRAWING





ORDER INFORMATION

Dimensions												Art. No.	
d_1	l_1 ±0,25	a	b_1	b_2	b_3	d_2	h_1	h_2	h_3 min.	l_2		silver	black
[mm]											[g]		
28	**200**	14	25	50	66	6,5	50	66	17	214	401	24321.0100	24321.0600
	250	14	25	50	66	6,5	50	66	17	264	420	24321.0105	24321.0605
	300	14	25	50	66	6,5	50	66	17	314	460	24321.0110	24321.0610
	350	14	25	50	66	6,5	50	66	17	364	483	24321.0115	24321.0615
	400	14	25	50	66	6,5	50	66	17	414	500	24321.0120	24321.0620
	500	14	25	50	66	6,5	50	66	17	514	556	24321.0125	24321.0625
	600	14	25	50	66	6,5	50	66	17	614	600	24321.0130	24321.0630

Crank Handles • DIN 469 straight, with square end DIN 79

EH 24330.



PRODUCT DESCRIPTION

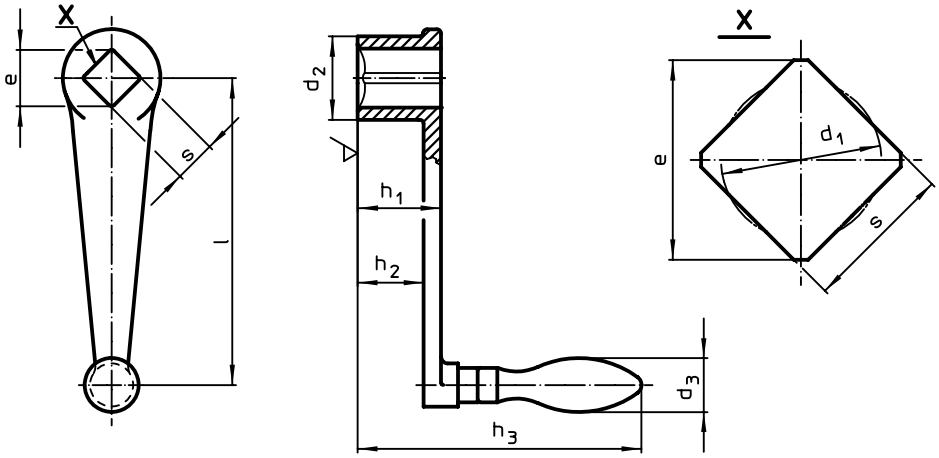
With these crank handles, the seam is ground and blasted. The hub is machined.

Material

Machine handle
- Steel, turned, zinc-plated by galvanization, passivated

Handle body
- Cast iron (GTW), plastic coated, black
- Nodular cast iron, plastic coated, black

DRAWING



ORDER INFORMATION

Dimensions								d_3 Machine handle ∅		Art. No.
l	s H11	e min.	d_1	d_2	h_1	h_2 ~	h_3	[mm]	[g]	
with rotating machine handle (EH 24460., DIN 98), form D										
63	**10**	13,1	10,5	20	20	15	79	16	118	24330.0010[1]
80	**10**	13,1	10,5	24	24	18	97	18	194	24330.0020
	12	16,1	12,6	24	24	18	97	18	197	24330.0021
100	**12**	16,1	12,6	28	28	21	100	20	272	24330.0030
	14	18,1	14,7	28	28	21	100	20	280	24330.0031
125	**14**	18,1	14,7	34	34	26	122	22	468	24330.0040
	17	22,2	17,9	34	34	26	122	22	433	24330.0041
160	**17**	22,2	17,9	38	38	29	126	25	667	24330.0050
	19	25,2	20,0	38	38	29	126	25	665	24330.0051
200	**19**	25,2	20,0	44	44	34	160	28	1054	24330.0060
	22	28,2	23,1	44	44	34	160	28	992	24330.0061
250	**22**	28,2	23,1	48	48	36	162	32	1441	24330.0070
	24	32,2	25,3	48	48	36	162	32	1409	24330.0071
with mounted machine handle (EH 24450., DIN 39), form F										
63	**10**	13,1	10,5	20	20	15	74	16	109	24330.0110[1]
80	**10**	13,1	10,5	24	24	18	94	18	183	24330.0120
	12	16,1	12,6	24	24	18	94	18	186	24330.0121
100	**12**	16,1	12,6	28	28	21	98	20	278	24330.0130
	14	18,1	14,7	28	28	21	98	20	259	24330.0131
125	**14**	18,1	14,7	34	34	26	120	22	444	24330.0140
	17	22,2	17,9	34	34	26	120	22	433	24330.0141
160	**17**	22,2	17,9	38	38	29	122	25	649	24330.0150
	19	25,2	20,0	38	38	29	122	25	633	24330.0151
200	**19**	25,2	20,0	44	44	34	154	28	962	24330.0160
	22	28,2	23,1	44	44	34	154	28	983	24330.0161
250	**22**	28,2	23,1	48	48	36	157	32	1360	24330.0170
	24	32,2	25,3	48	48	36	157	32	1351	24330.0171

[1] Handle body made from cast iron (GTW)

Crank Handles • DIN 468 goose-neck form with square end DIN 79

EH 24330.



PRODUCT DESCRIPTION

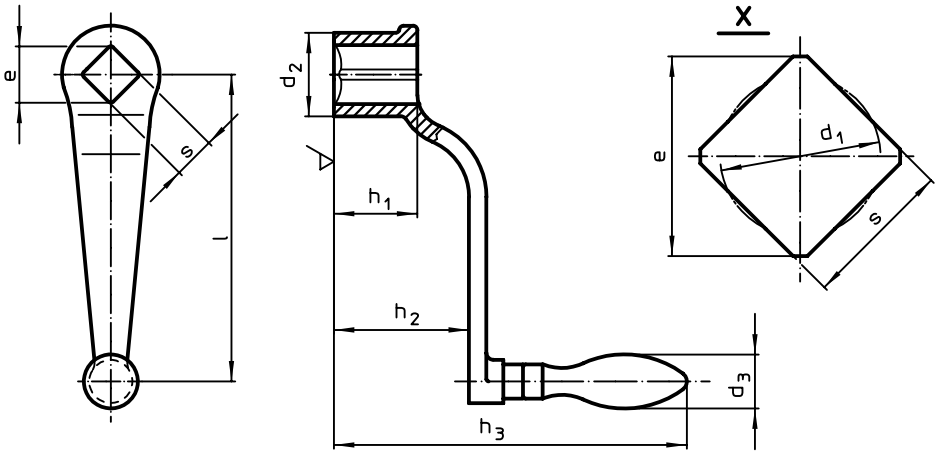
With these crank handles, the seam is ground and blasted. The hub is machined.

Material

Machine handle
- Steel, turned, zinc-plated by galvanization, passivated

Handle body
- Cast iron (GTW), plastic coated, black
- Nodular cast iron, plastic coated, black

DRAWING



ORDER INFORMATION

Dimensions										Art. No.
l	s H11	e min.	d_1	d_2	h_1	h_2 ~	h_3	d_3 Machine handle ∅		
[mm]								[mm]	[g]	
with rotating machine handle (EH 24460., DIN 98), form D										
63	**10**	13,1	10,5	20	20	32	96	16	128	24330.0210[1]
80	**10**	13,1	10,5	24	24	38	116	18	201	24330.0220
	12	16,1	12,6	24	24	38	116	18	200	24330.0221
100	**12**	16,1	12,6	28	28	48	126	20	310	24330.0230
	14	18,1	14,7	28	28	48	126	20	291	24330.0231
125	**14**	18,1	14,7	34	34	55	150	22	464	24330.0240
	17	22,2	17,9	34	34	55	150	22	455	24330.0241
160	**17**	22,2	17,9	38	38	65	160	25	674	24330.0250
	19	25,2	20,0	38	38	65	160	25	664	24330.0251
200	**19**	25,2	20,0	44	44	78	202	28	1083	24330.0260
	22	28,2	23,1	44	44	78	202	28	1034	24330.0261
250	**22**	28,2	23,1	48	48	90	214	32	1497	24330.0270
	24	32,2	25,3	48	48	90	214	32	1478	24330.0271
315	**24**	32,2	25,3	54	54	105	248	36	2220	24330.0280
	27	36,2	28,4	54	54	105	248	36	2200	24330.0281
with mounted machine handle (EH 24450., DIN 39), form F										
63	**10**	13,1	10,5	20	20	32	92	16	112	24330.0310[1]
80	**10**	13,1	10,5	24	24	38	114	18	187	24330.0320
	12	16,1	12,6	24	24	38	114	18	183	24330.0321
100	**12**	16,1	12,6	28	28	48	124	20	288	24330.0330
	14	18,1	14,7	28	28	48	124	20	292	24330.0331
125	**14**	18,1	14,7	34	34	55	148	22	460	24330.0340
	17	22,2	17,9	34	34	55	148	22	439	24330.0341
160	**17**	22,2	17,9	38	38	65	158	25	661	24330.0350
	19	25,2	20,0	38	38	65	158	25	627	24330.0351
200	**19**	25,2	20,0	44	44	78	197	28	1020	24330.0360
	22	28,2	23,1	44	44	78	197	28	1004	24330.0361
250	**22**	28,2	23,1	48	48	90	209	32	1438	24330.0370
	24	32,2	25,3	48	48	90	209	32	1415	24330.0371
315	**24**	32,2	25,3	54	54	105	243	36	2200	24330.0380
	27	36,2	28,4	54	54	105	243	36	2100	24330.0381

[1] Handle body made from cast iron (GTW)

Crank Handles

EH 24330.



PRODUCT DESCRIPTION

Material

Handle body
- Zinc die-cast, plastic coated, black, matt structure
- Aluminium, plastic coated, black, matt structure

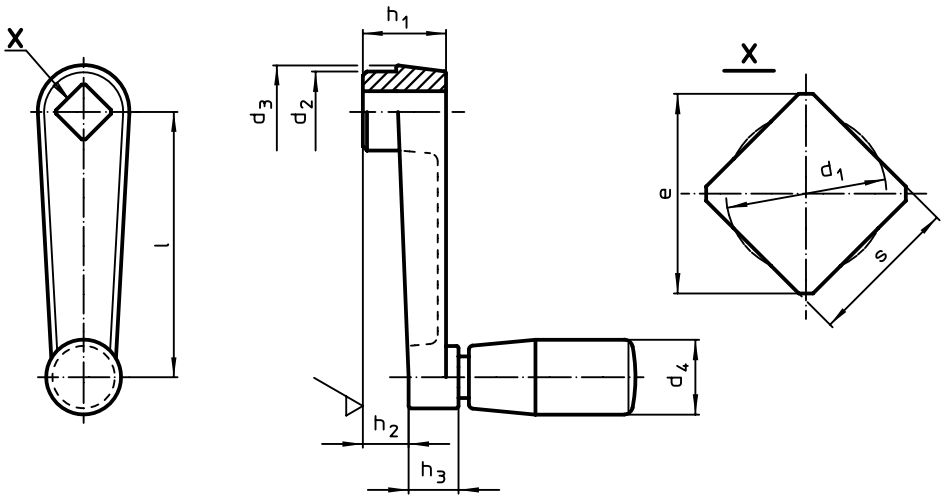
Cylindrical handle
- Thermosetting plastic PF 31, black

MORE INFORMATION

References

Alternative to crank handles DIN 469.

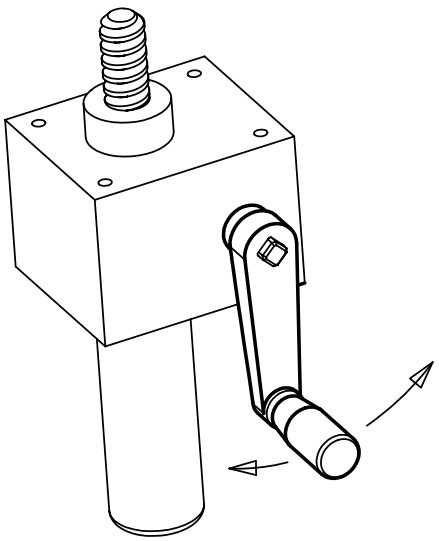
DRAWING



ORDER INFORMATION

Dimensions									d4 Cylindrical handle ∅			Art. No.
l	s H11	e min.	d1 max.	d2	d3	h1	h2 ~	h3	EH 24530.	max.		
[mm]									[mm]	[°C]	[g]	
zinc die-cast												
50	**8**	10,1	8,4	16	18	18	10	10	14	80	58	24330.0420
64	**10**	13,1	10,5	19	22	20	11	12	18	80	97	24330.0422
80	**10**	13,1	10,5	23	26	24	14	14	21	80	166	24330.0424
100	**12**	16,1	12,6	27	30	28	17	15	23	80	270	24330.0436
aluminium Al												
80	**10**	13,1	10,5	23	26	24	14	14	21	80	97	24330.0410
100	**12**	16,1	12,6	27	30	28	17	15	23	80	161	24330.0412
125	**14**	18,1	14,7	32	35	34	22	18	26	80	251	24330.0414
160	**17**	22,2	17,9	35	39	38	26	18	26	80	280	24330.0416

APPLICATION EXAMPLE



Crank Handles • stainless steel precision casting

EH 24330.



PRODUCT DESCRIPTION

Flat side of the hub is machined.

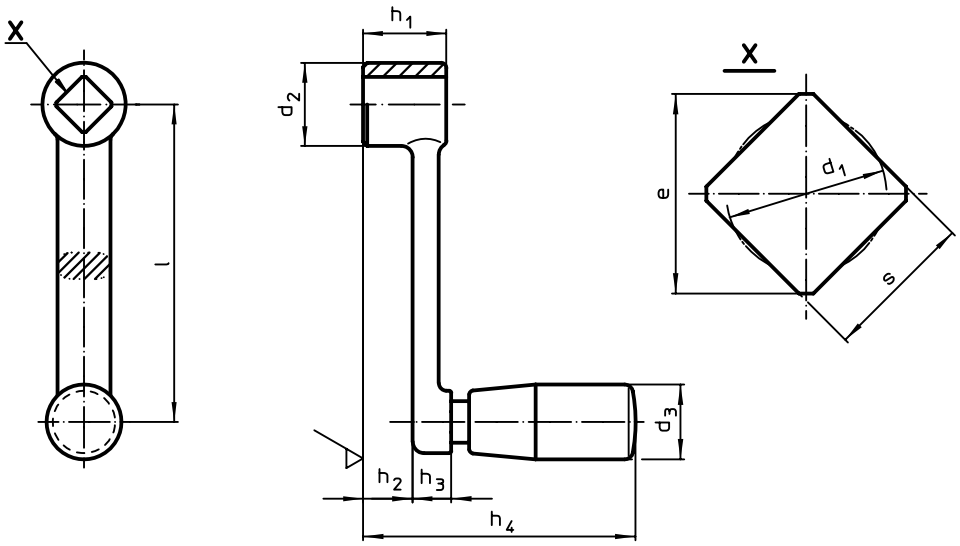
Material

Axle part
- Stainless steel 1.4301

Handle body
- Stainless steel 1.4308

Cylindrical handle
- Thermosetting plastic PF 31, black

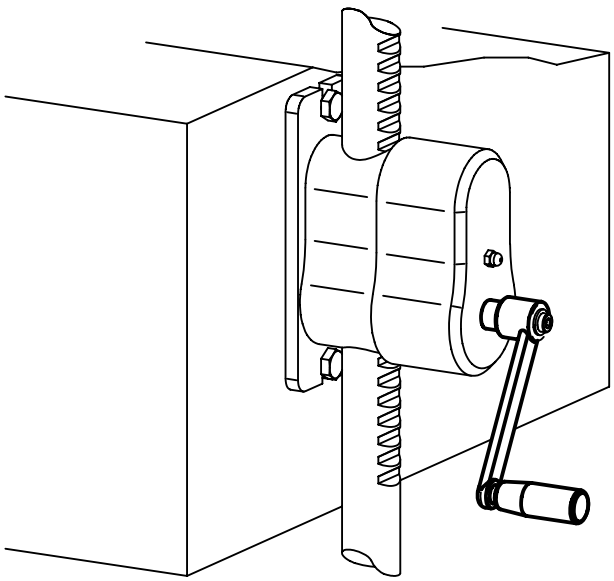
DRAWING



ORDER INFORMATION

Dimensions									d_3 Cylindrical handle ∅		Art. No.
l	s H11	e min.	d_1 max.	d_2	h_1	h_2 ~	h_3	h_4 ~	EH 24530.		
[mm]									[mm]	[g]	
80	**10**	13,1	10,5	22	22	15,4	6,6	64,5	18	124	24330.0520
100	**12**	16,1	12,6	26	26	17,7	8,3	78,5	21	187	24330.0530
125	**14**	18,1	14,7	28	28	18,8	9,2	95,5	23	320	24330.0540
160	**17**	22,2	17,9	32	32	22,6	9,4	99,5	23	370	24330.0550

APPLICATION EXAMPLE



Crank Handles • with folding handle

EH 24331.



PRODUCT DESCRIPTION

Material

Axle part
- Steel, blackened

Handle
- Thermoplastic, black, dull

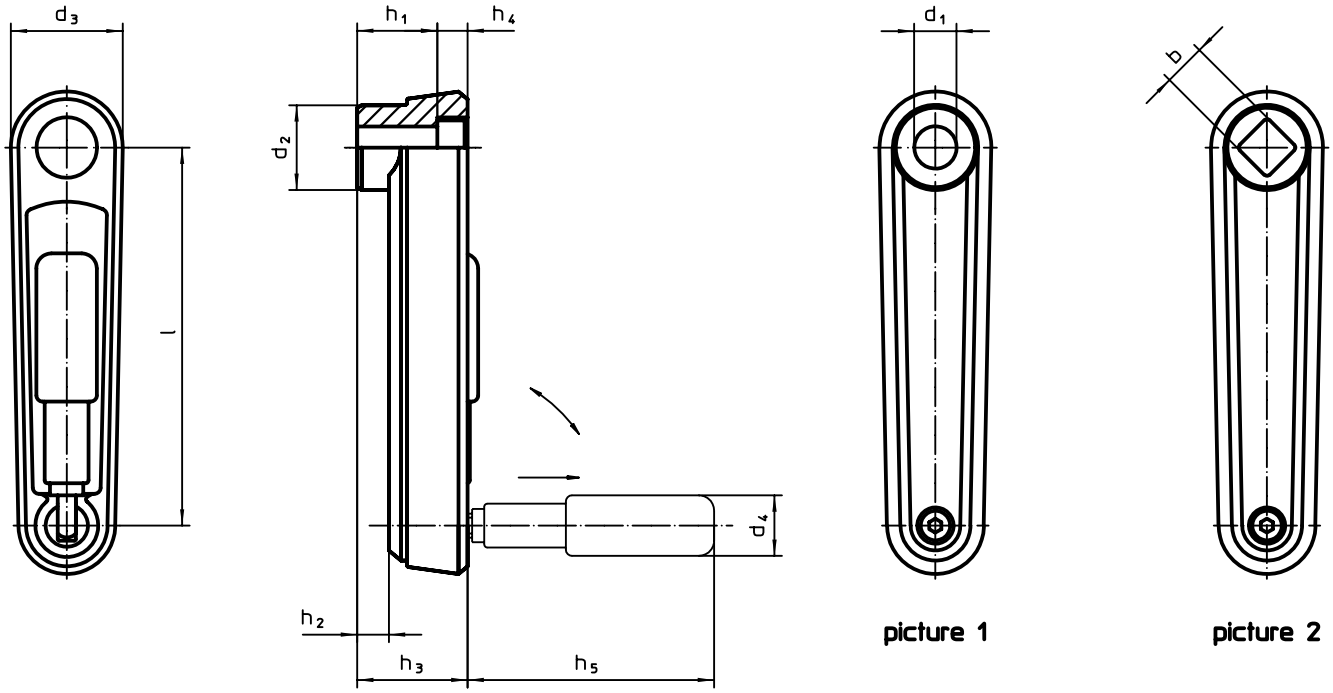
Handle body
- Aluminium, plastic coated, similar to RAL 9006 silver, structural matt
- Aluminium, plastic coated, similar to RAL 9005 black, matt structure

Covering
- Plastic, light grey

Operation

In the operating position the handle is locked. To move the handle to the rest position, it must be pulled out axially and flipped round.

DRAWING



picture 1 picture 2

ORDER INFORMATION

Dimensions												Art. No.	
l	d_1 H7	b H11	d_2	d_3	h_1	h_2 ~	h_3	h_4	h_5	d_4 Cylindrical handle ∅	[g]	silver	black
					[mm]								
with smooth bore – picture 1													
80	**10**	–	23,0	30	19,5	4,0	25,5	4,3	43,0	16	131	24331.0005	24331.0105
100	**12**	–	26,7	35	23,5	5,5	29,5	4,2	57,5	18	180	24331.0010	24331.0110
125	**14**	–	28,0	37	30,5	10,5	36,5	4,2	76,5	24	305	24331.0015	24331.0115
with square shaft – picture 2													
80	–	**10**	23,0	30	19,5	4,0	25,5	4,3	43,0	16	131	24331.0205	24331.0305
100	–	**12**	26,7	35	23,5	5,5	29,5	4,2	57,5	18	180	24331.0210	24331.0310
125	–	**14**	28,0	37	30,5	10,5	36,5	4,2	76,5	24	280	24331.0215	24331.0315

Crank Handles • with folding handle, stainless steel

EH 24331.



PRODUCT DESCRIPTION

Material

Axle part
- Stainless steel 1.4305

Handle
- Thermoplastic, black, dull

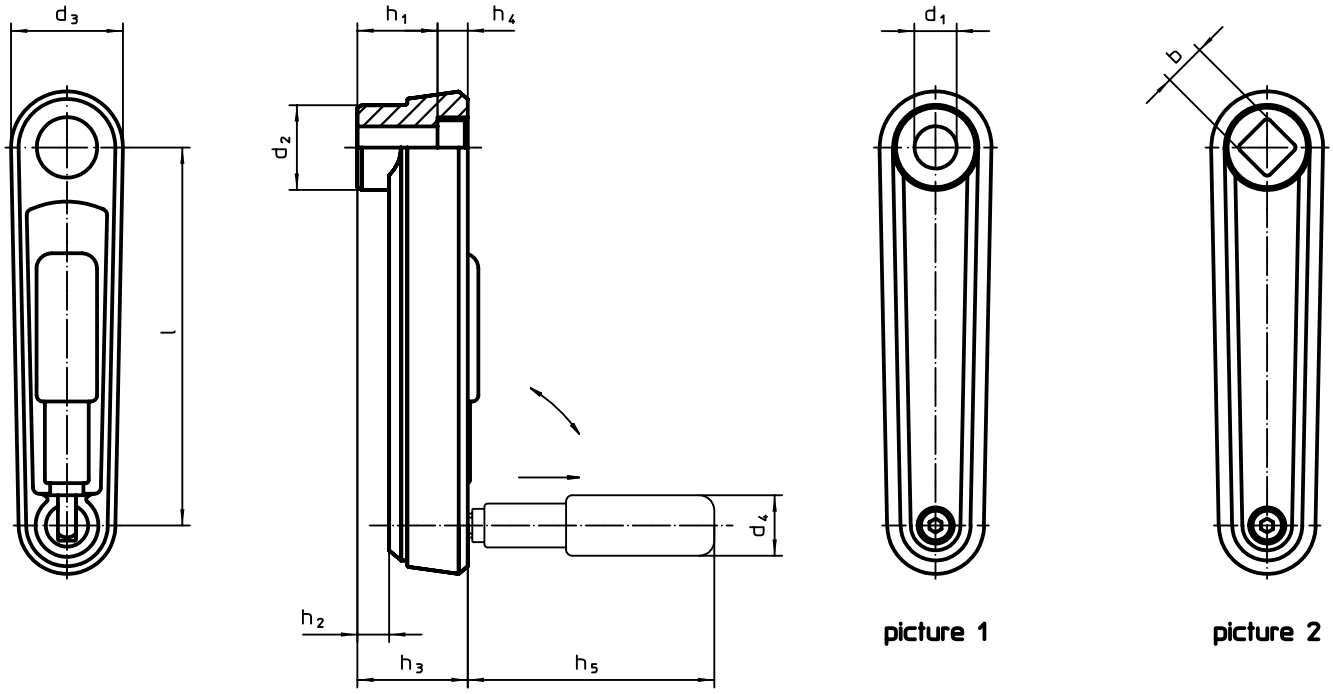
Handle body
- Aluminium, plastic coated, similar to RAL 9006 silver, structural matt
- Aluminium, plastic coated, similar to RAL 9005 black, matt structure

Covering
- Plastic, light grey

Operation

In the operating position the handle is locked. To move the handle to the rest position, it must be pulled out axially and flipped round.

DRAWING



picture 1 picture 2

ORDER INFORMATION

Dimensions												Art. No.	
l	d_1 H7	b H11	d_2	d_3	h_1	h_2 ~	h_3	h_4	h_5	d_4 Cylindrical handle ∅	[g]	silver	black
					[mm]								
with smooth bore – picture 1													
80	**10**	**–**	23,0	30	19,5	4,0	25,5	4,3	43,0	16	118	24331.0405	24331.0505
100	**12**	**–**	26,7	35	23,5	5,5	29,5	4,2	57,5	18	197	24331.0410	24331.0510
125	**14**	**–**	28,0	37	30,5	10,5	36,5	4,2	76,5	24	283	24331.0415	24331.0515
with square shaft – picture 2													
80	**–**	**10**	23,0	30	19,5	4,0	25,5	4,3	43,0	16	118	24331.0605	24331.0705
100	**–**	**12**	26,7	35	23,5	5,5	29,5	4,2	57,5	18	197	24331.0610	24331.0710
125	**–**	**14**	28,0	37	30,5	10,5	36,5	4,2	76,5	24	283	24331.0615	24331.0715

Gear Lever Handles

EH 24350.



PRODUCT DESCRIPTION

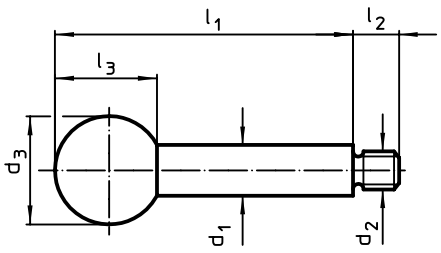
Material

Gear lever handle
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4305, dull blasted

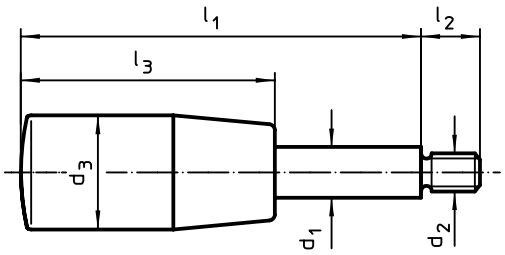
Ball knob
- Thermosetting plastic PF 31, black, DIN 319

Cylindrical handle
- Thermosetting plastic PF 31, black

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions						max.		Art. No.	
d_1	l_1	d_2	d_3	l_2	l_3			steel	stainless steel
[mm]						[°C]	[g]		
with spherical knob – picture 1									
8	**63**	M 6	20	9	18,0	110	30	24350.0020	24350.0520
	80	M 6	20	9	18,0	110	34	24350.0022	24350.0522
	100	M 6	20	9	18,0	110	39	24350.0024	24350.0524
10	**80**	M 8	25	11	22,5	110	50	24350.0030	24350.0530
	100	M 8	25	11	22,5	110	62	24350.0032	24350.0532
	125	M 8	25	11	22,5	110	76	24350.0034	24350.0534
12	**100**	M10	32	14	29,0	110	96	24350.0040	24350.0540
	125	M10	32	14	29,0	110	116	24350.0042	24350.0542
	160	M10	32	14	29,0	110	146	24350.0044	24350.0544
14	**125**	M12	35	16	32,5	110	157	24350.0050	24350.0550
	160	M12	35	16	32,5	110	201	24350.0052	24350.0552
	200	M12	35	16	32,5	110	251	24350.0054	24350.0554
16	**160**	M14	40	18	37,0	110	255	24350.0060	–
	200	M14	40	18	37,0	110	326	24350.0062	–
	250	M14	40	18	37,0	110	397	24350.0064	–
with cylindrical handle – picture 2									
8	**63**	M 6	18	9	40,0	110	26	24350.0120	24350.0620
	80	M 6	18	9	40,0	110	33	24350.0122	24350.0622
	100	M 6	18	9	40,0	110	42	24350.0124	24350.0624
10	**80**	M 8	21	11	50,0	110	50	24350.0130	24350.0630
	100	M 8	21	11	50,0	110	62	24350.0132	24350.0632
	125	M 8	21	11	50,0	110	78	24350.0134	24350.0634
12	**100**	M10	23	14	65,0	110	81	24350.0140	24350.0640
	125	M10	23	14	65,0	110	103	24350.0142	24350.0642
	160	M10	23	14	65,0	110	133	24350.0144	24350.0644
14	**125**	M12	26	16	80,0	110	125	24350.0150	24350.0650
	160	M12	26	16	80,0	110	168	24350.0152	24350.0652
	200	M12	26	16	80,0	110	216	24350.0154	24350.0654
16	**160**	M14	28	18	90,0	110	214	24350.0160	–
	200	M14	28	18	90,0	110	273	24350.0162	–
	250	M14	28	18	90,0	110	352	24350.0164	–

Adjustable Clamping Levers • inner parts from stainless steel, with female thread

EH 24390.



PRODUCT DESCRIPTION

Adjustable clamping levers with rust-proof inner parts. Suitable for multiple applications, e.g. medical environments, chemical industry, and so on.

Material

Lever
- Zinc die-cast, plastic coated, orange similar to RAL 2004, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Threaded part
- Stainless steel 1.4305

Inner parts
- Stainless steel 1.4305

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

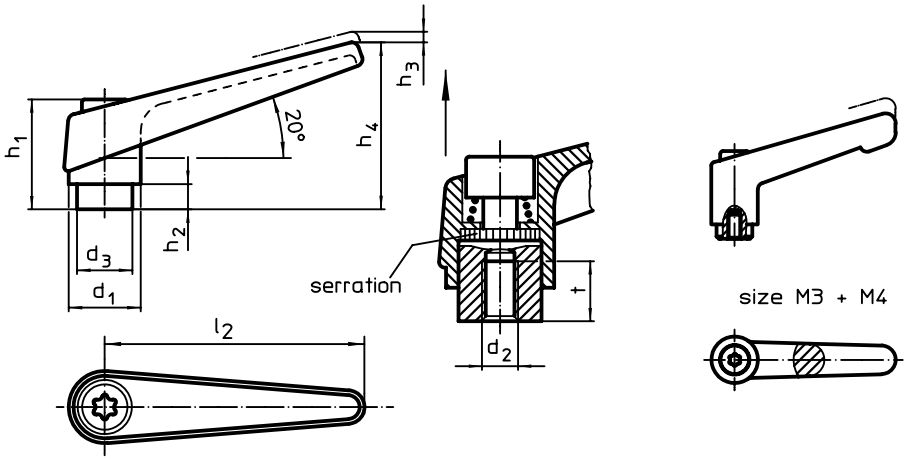
MORE INFORMATION

Notes

The threaded portion can be exchanged.

4

DRAWING



ORDER INFORMATION

Dimensions										Art. No.	
d_1	d_2	d_3	h_1	h_2	h_3	h_4	l_2	t ≥		orange	black
[mm]									[g]		
13	M 3	10,0	24,5	4,0	3,5	30,5	30	7	26	24390.0032	24390.0034
	M 4	10,0	24,5	4,0	3,5	30,5	30	9	25	24390.0036	24390.0038
14	M 5	10,0	24,5	4,0	3,0	35,0	45	8	33	24390.0111	24390.0114
	M 6	10,0	24,5	4,0	3,0	35,0	45	8	33	24390.0121	24390.0124
18	M 8	13,5	31,0	6,5	3,0	45,0	62	10	67	24390.0321	24390.0324
22	M 8	16,0	36,0	8,0	3,5	52,0	74	14	112	24390.0411	24390.0414
	M10	16,0	36,0	8,0	3,5	52,0	74	14	109	24390.0421	24390.0424
25	M10	19,0	43,0	11,0	4,0	63,0	89	17	175	24390.0511	24390.0514
	M12	19,0	43,0	11,0	4,0	63,0	89	17	171	24390.0521	24390.0524
30	M12	23,0	50,5	12,0	5,0	76,0	108	22	286	24390.0611	24390.0614
	M16	23,0	50,5	12,0	5,0	76,0	108	22	269	24390.0621	24390.0624

Adjustable Clamping Levers • inner parts from stainless steel, with screw

EH 24390.



PRODUCT DESCRIPTION

Adjustable clamping levers with rust-proof inner parts. Suitable for multiple applications, e.g. medical environments, chemical industry, and so on.

Material

Lever
- Zinc die-cast, plastic coated, orange similar to RAL 2004, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Inner parts
- Stainless steel 1.4305

Screw
- Stainless steel 1.4305

Operation

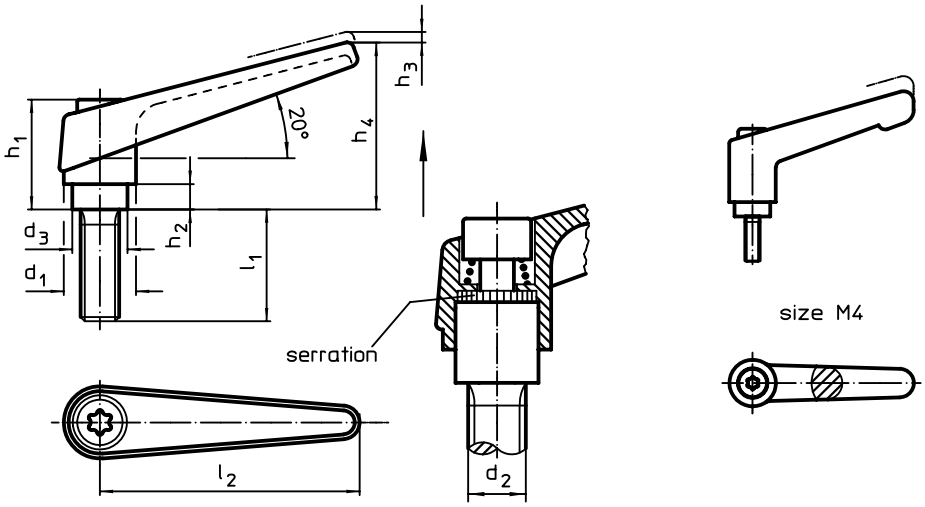
By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

MORE INFORMATION

Notes

The screw part can be exchanged.

DRAWING



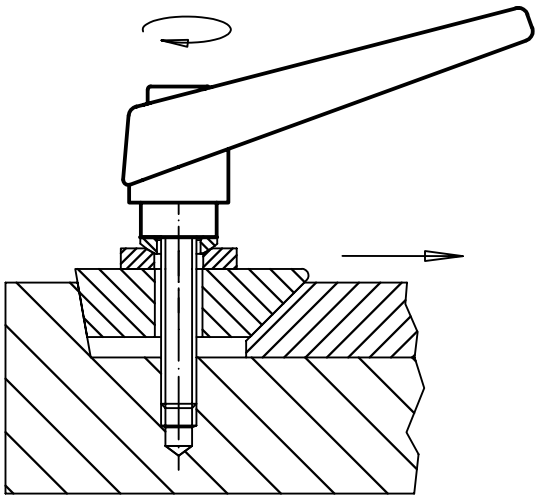
ORDER INFORMATION

Dimensions										Art. No.	
d_1	d_2	l_1	d_3	h_1	h_2	h_3	h_4	l_2	[g]	orange	black
				[mm]							
13	M 4	12	10,0	24,5	4,0	3,5	30,5	30	27	24390.0010	24390.0012
		16	10,0	24,5	4,0	3,5	30,5	30	27	24390.0014	24390.0016
		20	10,0	24,5	4,0	3,5	30,5	30	28	24390.0018	24390.0020
		25	10,0	24,5	4,0	3,5	30,5	30	28	24390.0022	24390.0024
		32	10,0	24,5	4,0	3,5	30,5	30	29	24390.0026	24390.0028
14	M 5	12	10,0	24,5	4,0	3,0	35,0	45	36	24390.0041	24390.0044
		16	10,0	24,5	4,0	3,0	35,0	45	36	24390.0051	24390.0054
		20	10,0	24,5	4,0	3,0	35,0	45	37	24390.0061	24390.0064
		25	10,0	24,5	4,0	3,0	35,0	45	38	24390.0071	24390.0074
		32	10,0	24,5	4,0	3,0	35,0	45	38	24390.0081	24390.0084
		40	10,0	24,5	4,0	3,0	35,0	45	39	24390.0086	24390.0089
	M 6	12	10,0	24,5	4,0	3,0	35,0	45	37	24390.0131	24390.0134
		16	10,0	24,5	4,0	3,0	35,0	45	37	24390.0141	24390.0144
		20	10,0	24,5	4,0	3,0	35,0	45	38	24390.0151	24390.0154
		25	10,0	24,5	4,0	3,0	35,0	45	39	24390.0161	24390.0164
		32	10,0	24,5	4,0	3,0	35,0	45	40	24390.0171	24390.0174
		40	10,0	24,5	4,0	3,0	35,0	45	41	24390.0181	24390.0184
		50	10,0	24,5	4,0	3,0	35,0	45	43	24390.0191	24390.0194

→

Dimensions [mm]									[g]	Art. No. orange	Art. No. black
d_1	d_2	l_1	d_3	h_1	h_2	h_3	h_4	l_2			
18	M 8	**16**	13,5	31,0	6,5	3,0	45,0	62	74	24390.0331	24390.0334
		20	13,5	31,0	6,5	3,0	45,0	62	76	24390.0341	24390.0344
		25	13,5	31,0	6,5	3,0	45,0	62	77	24390.0351	24390.0354
		32	13,5	31,0	6,5	3,0	45,0	62	79	24390.0361	24390.0364
		40	13,5	31,0	6,5	3,0	45,0	62	81	24390.0371	24390.0374
		50	13,5	31,0	6,5	3,0	45,0	62	84	24390.0381	24390.0384
		63	13,5	31,0	6,5	3,0	45,0	62	89	24390.0391	24390.0394
22	M10	**20**	16,0	36,0	8,0	3,5	52,0	74	128	24390.0441	24390.0444
		25	16,0	36,0	8,0	3,5	52,0	74	130	24390.0451	24390.0454
		32	16,0	36,0	8,0	3,5	52,0	74	134	24390.0461	24390.0464
		40	16,0	36,0	8,0	3,5	52,0	74	138	24390.0471	24390.0474
		50	16,0	36,0	8,0	3,5	52,0	74	143	24390.0481	24390.0484
		63	16,0	36,0	8,0	3,5	52,0	74	148	24390.0486	24390.0489
		80	16,0	36,0	8,0	3,5	52,0	74	157	24390.0491	24390.0494
25	M12	**25**	19,0	43,0	11,0	4,0	63,0	89	205	24390.0541	24390.0544
		32	19,0	43,0	11,0	4,0	63,0	89	209	24390.0551	24390.0554
		40	19,0	43,0	11,0	4,0	63,0	89	215	24390.0561	24390.0564
		50	19,0	43,0	11,0	4,0	63,0	89	222	24390.0571	24390.0574
		63	19,0	43,0	11,0	4,0	63,0	89	232	24390.0581	24390.0584
		80	19,0	43,0	11,0	4,0	63,0	89	240	24390.0591	24390.0594
30	M16	**32**	23,0	50,5	12,0	5,0	76,0	108	348	24390.0641	24390.0644
		40	23,0	50,5	12,0	5,0	76,0	108	357	24390.0651	24390.0654
		50	23,0	50,5	12,0	5,0	76,0	108	370	24390.0661	24390.0664
		63	23,0	50,5	12,0	5,0	76,0	108	386	24390.0671	24390.0674
		80	23,0	50,5	12,0	5,0	76,0	108	407	24390.0681	24390.0684

APPLICATION EXAMPLE



Adjustable Clamping Levers • with female thread

EH 24400.



PRODUCT DESCRIPTION

Material

Lever
- Zinc die-cast, plastic coated, orange similar to RAL 2004, matt structure
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Threaded part
- Steel, blackened, quality 5

Inner parts
- Steel, blackened, quality 5.8

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

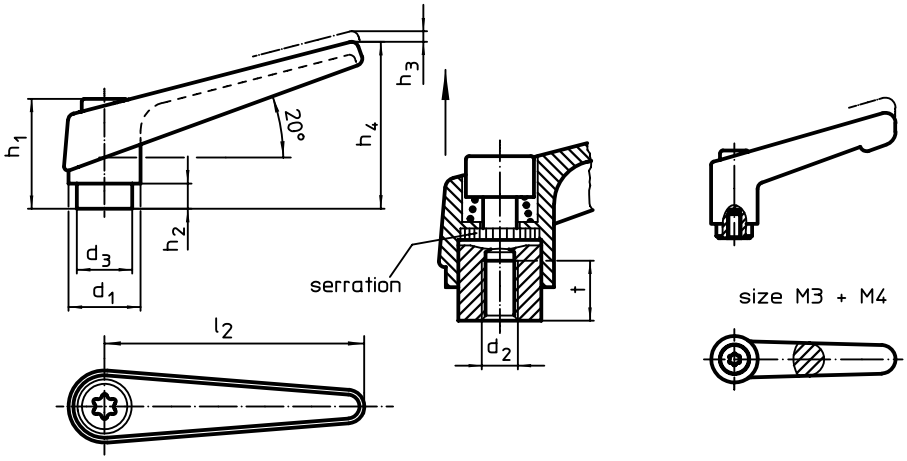
MORE INFORMATION

Notes

The threaded portion can be exchanged.

4

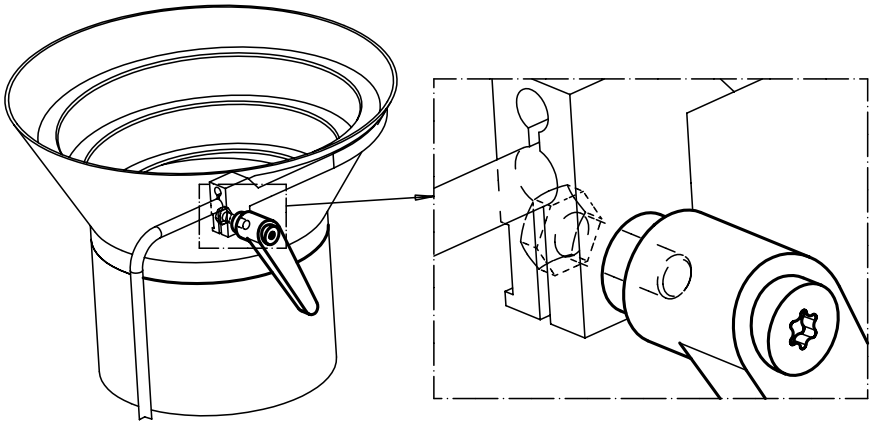
DRAWING



ORDER INFORMATION

Dimensions										Art. No.		
d_1	d_2	d_3	h_1	h_2	h_3	h_4	l_2	t ≥		orange	silver	black
[mm]									[g]			
13	M 3	10,0	24,5	4,0	3,5	30,5	30	7	26	24400.0032	–	24400.0034
	M 4	10,0	24,5	4,0	3,5	30,5	30	9	25	24400.0036	–	24400.0038
14	M 5	10,0	24,5	4,0	3,0	35,0	45	8	33	24400.0111	24400.0113	24400.0114
	M 6	10,0	24,5	4,0	3,0	35,0	45	8	33	24400.0121	24400.0123	24400.0124
18	M 6	13,5	31,0	6,5	3,0	45,0	62	10	67	24400.0311	24400.0313	24400.0314
	M 8	13,5	31,0	6,5	3,0	45,0	62	10	67	24400.0321	24400.0323	24400.0324
22	M 8	16,0	36,0	8,0	3,5	52,0	74	14	112	24400.0411	24400.0413	24400.0414
	M10	16,0	36,0	8,0	3,5	52,0	74	14	109	24400.0421	24400.0423	24400.0424
25	M10	19,0	43,0	11,0	4,0	63,0	89	17	176	24400.0511	24400.0513	24400.0514
	M12	19,0	43,0	11,0	4,0	63,0	89	17	171	24400.0521	24400.0523	24400.0524
30	M12	23,0	50,5	12,0	5,0	76,0	108	22	286	24400.0611	24400.0613	24400.0614
	M16	23,0	50,5	12,0	5,0	76,0	108	22	269	24400.0621	24400.0623	24400.0624

APPLICATION EXAMPLE



Adjustable Clamping Levers • with screw

EH 24400.



PRODUCT DESCRIPTION

Material

Lever
- Zinc die-cast, plastic coated, orange similar to RAL 2004, matt structure
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Inner parts
- Steel, blackened, quality 5.8

Screw
- Steel, blackened, quality 5.8

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

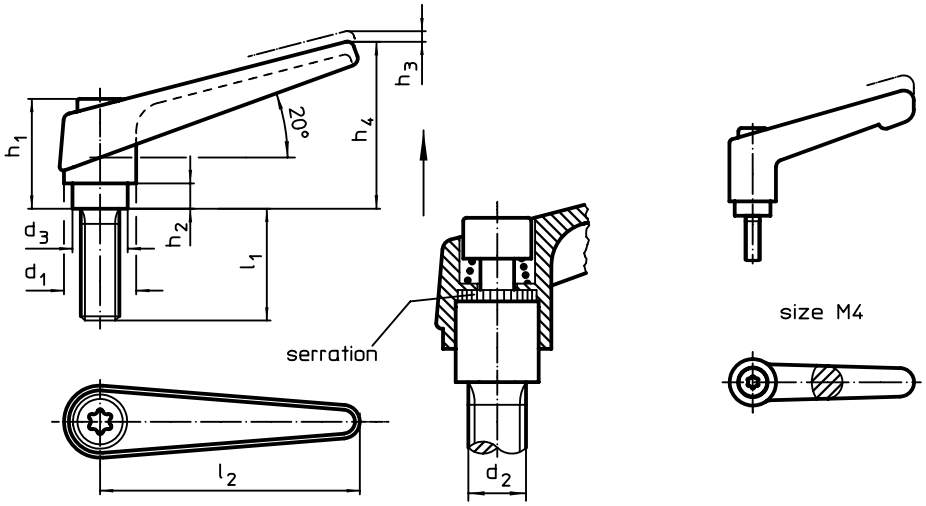
MORE INFORMATION

Notes

The screw part can be exchanged.

4

DRAWING



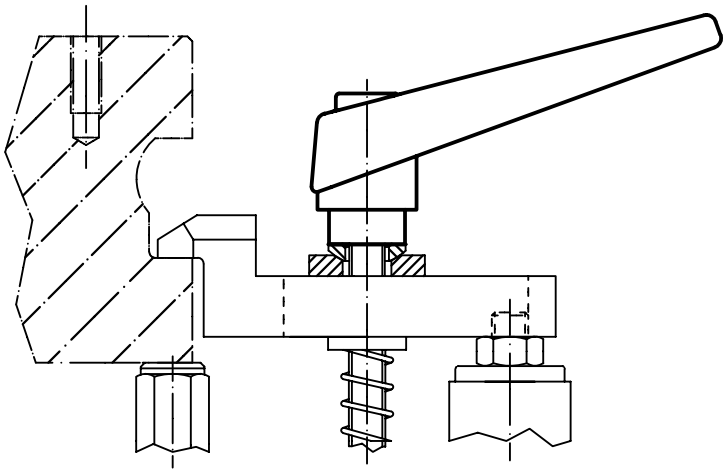
ORDER INFORMATION

Dimensions										Art. No.		
d_1	d_2	l_1	d_3	h_1	h_2	h_3	h_4	l_2	[g]	orange	silver	black
				[mm]								
13	M 4	12	10,0	24,5	4,0	3,5	30,5	30	27	24400.0010	–	24400.0012
		16	10,0	24,5	4,0	3,5	30,5	30	27	24400.0014	–	24400.0016
		20	10,0	24,5	4,0	3,5	30,5	30	28	24400.0018	–	24400.0020
		25	10,0	24,5	4,0	3,5	30,5	30	28	24400.0022	–	24400.0024
		32	10,0	24,5	4,0	3,5	30,5	30	28	24400.0026	–	24400.0028
14	M 5	12	10,0	24,5	4,0	3,0	35,0	45	36	24400.0041	24400.0043	24400.0044
		16	10,0	24,5	4,0	3,0	35,0	45	36	24400.0051	24400.0053	24400.0054
		20	10,0	24,5	4,0	3,0	35,0	45	37	24400.0061	24400.0063	24400.0064
		25	10,0	24,5	4,0	3,0	35,0	45	38	24400.0071	24400.0073	24400.0074
		32	10,0	24,5	4,0	3,0	35,0	45	38	24400.0081	24400.0083	24400.0084
		40	10,0	24,5	4,0	3,0	35,0	45	39	24400.0086	24400.0088	24400.0089
	M 6	12	10,0	24,5	4,0	3,0	35,0	45	37	24400.0131	24400.0133	24400.0134
		16	10,0	24,5	4,0	3,0	35,0	45	37	24400.0141	24400.0143	24400.0144
		20	10,0	24,5	4,0	3,0	35,0	45	38	24400.0151	24400.0153	24400.0154
		25	10,0	24,5	4,0	3,0	35,0	45	39	24400.0161	24400.0163	24400.0164
		32	10,0	24,5	4,0	3,0	35,0	45	40	24400.0171	24400.0173	24400.0174
		40	10,0	24,5	4,0	3,0	35,0	45	41	24400.0181	24400.0183	24400.0184
		50	10,0	24,5	4,0	3,0	35,0	45	43	24400.0191	24400.0193	24400.0194

→

Dimensions										Art. No.		
d_1	d_2	l_1	d_3	h_1	h_2	h_3	h_4	l_2	[g]	orange	silver	black
				[mm]								
18	M 6	16	13,5	31,0	6,5	3,0	45,0	62	72	24400.0221	24400.0223	24400.0224
		20	13,5	31,0	6,5	3,0	45,0	62	72	24400.0231	24400.0233	24400.0234
		25	13,5	31,0	6,5	3,0	45,0	62	74	24400.0241	24400.0243	24400.0244
		32	13,5	31,0	6,5	3,0	45,0	62	74	24400.0251	24400.0253	24400.0254
		40	13,5	31,0	6,5	3,0	45,0	62	76	24400.0261	24400.0263	24400.0264
		50	13,5	31,0	6,5	3,0	45,0	62	76	24400.0271	24400.0273	24400.0274
		63	13,5	31,0	6,5	3,0	45,0	62	80	24400.0281	24400.0283	24400.0284
	M 8	16	13,5	31,0	6,5	3,0	45,0	62	74	24400.0331	24400.0333	24400.0334
		20	13,5	31,0	6,5	3,0	45,0	62	76	24400.0341	24400.0343	24400.0344
		25	13,5	31,0	6,5	3,0	45,0	62	78	24400.0351	24400.0353	24400.0354
		32	13,5	31,0	6,5	3,0	45,0	62	80	24400.0361	24400.0363	24400.0364
		40	13,5	31,0	6,5	3,0	45,0	62	81	24400.0371	24400.0373	24400.0374
		50	13,5	31,0	6,5	3,0	45,0	62	84	24400.0381	24400.0383	24400.0384
		63	13,5	31,0	6,5	3,0	45,0	62	89	24400.0391	24400.0393	24400.0394
22	M10	20	16,0	36,0	8,0	3,5	52,0	74	128	24400.0441	24400.0443	24400.0444
		25	16,0	36,0	8,0	3,5	52,0	74	130	24400.0451	24400.0453	24400.0454
		32	16,0	36,0	8,0	3,5	52,0	74	134	24400.0461	24400.0463	24400.0464
		40	16,0	36,0	8,0	3,5	52,0	74	138	24400.0471	24400.0473	24400.0474
		50	16,0	36,0	8,0	3,5	52,0	74	143	24400.0481	24400.0483	24400.0484
		63	16,0	36,0	8,0	3,5	52,0	74	148	24400.0486	24400.0488	24400.0489
		80	16,0	36,0	8,0	3,5	52,0	74	157	24400.0491	24400.0493	24400.0494
25	M12	25	19,0	43,0	11,0	4,0	63,0	89	205	24400.0541	24400.0543	24400.0544
		32	19,0	43,0	11,0	4,0	63,0	89	209	24400.0551	24400.0553	24400.0554
		40	19,0	43,0	11,0	4,0	63,0	89	215	24400.0561	24400.0563	24400.0564
		50	19,0	43,0	11,0	4,0	63,0	89	222	24400.0571	24400.0573	24400.0574
		63	19,0	43,0	11,0	4,0	63,0	89	232	24400.0581	24400.0583	24400.0584
		80	19,0	43,0	11,0	4,0	63,0	89	244	24400.0591	24400.0593	24400.0594
30	M16	32	23,0	50,5	12,0	5,0	76,0	108	348	24400.0641	24400.0643	24400.0644
		40	23,0	50,5	12,0	5,0	76,0	108	357	24400.0651	24400.0653	24400.0654
		50	23,0	50,5	12,0	5,0	76,0	108	370	24400.0661	24400.0663	24400.0664
		63	23,0	50,5	12,0	5,0	76,0	108	386	24400.0671	24400.0673	24400.0674
		80	23,0	50,5	12,0	5,0	76,0	108	407	24400.0681	24400.0683	24400.0684

APPLICATION EXAMPLE



Adjustable Clamping Levers • with clamping screw

EH 24410.



PRODUCT DESCRIPTION

Material

Lever
- Zinc die-cast, plastic coated, orange similar to RAL 2004, matt structure
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Inner parts
- Steel, blackened, quality 5.8

Screw
- Steel, blackened, quality 5.8

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

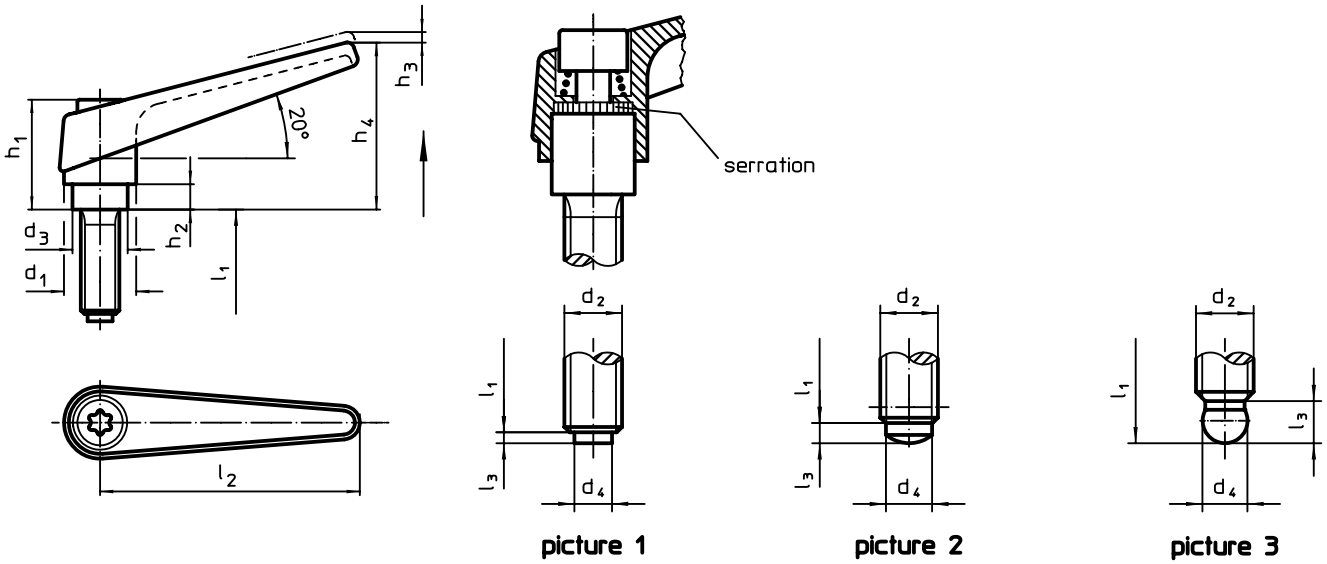
MORE INFORMATION

Notes

The screw part can be exchanged.

4

DRAWING



ORDER INFORMATION

Dimensions [mm]											[g]	Art. No.		
d_1	d_2	l_1	d_3	d_4	h_1	h_2	h_3	h_4	l_2	l_3		orange	silver	black
with plastic thrust pin – picture 1														
14	M 6	16	10,0	4,0	24,5	4,0	3,0	35	45	1,0	37	24410.0141	24410.0143	24410.0144
		20	10,0	4,0	24,5	4,0	3,0	35	45	1,0	38	24410.0151	24410.0153	24410.0154
		25	10,0	4,0	24,5	4,0	3,0	35	45	1,0	39	24410.0161	24410.0163	24410.0164
		32	10,0	4,0	24,5	4,0	3,0	35	45	1,0	40	24410.0171	24410.0173	24410.0174
		40	10,0	4,0	24,5	4,0	3,0	35	45	1,0	41	24410.0181	24410.0183	24410.0184
		50	10,0	4,0	24,5	4,0	3,0	35	45	1,0	43	24410.0191	24410.0193	24410.0194
18	M 8	20	13,5	4,0	31,0	6,5	3,0	45	62	1,0	76	24410.0341	24410.0343	24410.0344
		25	13,5	4,0	31,0	6,5	3,0	45	62	1,0	77	24410.0351	24410.0353	24410.0354
		32	13,5	4,0	31,0	6,5	3,0	45	62	1,0	79	24410.0361	24410.0363	24410.0364
		40	13,5	4,0	31,0	6,5	3,0	45	62	1,0	81	24410.0371	24410.0373	24410.0374
		50	13,5	4,0	31,0	6,5	3,0	45	62	1,0	84	24410.0381	24410.0383	24410.0384
		63	13,5	4,0	31,0	6,5	3,0	45	62	1,0	89	24410.0391	24410.0393	24410.0394
22	M10	20	16,0	8,0	36,0	8,0	3,5	52	74	2,0	128	24410.0441	24410.0443	24410.0444
		25	16,0	8,0	36,0	8,0	3,5	52	74	2,0	130	24410.0451	24410.0453	24410.0454
		32	16,0	8,0	36,0	8,0	3,5	52	74	2,0	134	24410.0461	24410.0463	24410.0464
		40	16,0	8,0	36,0	8,0	3,5	52	74	2,0	138	24410.0471	24410.0473	24410.0474
		50	16,0	8,0	36,0	8,0	3,5	52	74	2,0	143	24410.0481	24410.0483	24410.0484
		63	16,0	8,0	36,0	8,0	3,5	52	74	2,0	148	24410.0491	24410.0493	24410.0494

→

Dimensions												Art. No.		
d_1	d_2	l_1	d_3	d_4	h_1	h_2	h_3	h_4	l_2	l_3	[g]	orange	silver	black
					[mm]									
with brass thrust pin – picture 1														
14	M 6	**16**	10,0	3,5	24,5	4,0	3,0	35	45	1,3	36	24410.1141	24410.1143	24410.1144
		20	10,0	3,5	24,5	4,0	3,0	35	45	1,3	37	24410.1151	24410.1153	24410.1154
		25	10,0	3,5	24,5	4,0	3,0	35	45	1,3	38	24410.1161	24410.1163	24410.1164
		32	10,0	3,5	24,5	4,0	3,0	35	45	1,3	39	24410.1171	24410.1173	24410.1174
		40	10,0	3,5	24,5	4,0	3,0	35	45	1,3	40	24410.1181	24410.1183	24410.1184
		50	10,0	3,5	24,5	4,0	3,0	35	45	1,3	42	24410.1191	24410.1193	24410.1194
18	M 8	**20**	13,5	3,5	31,0	6,5	3,0	45	62	1,3	75	24410.1341	24410.1343	24410.1344
		25	13,5	3,5	31,0	6,5	3,0	45	62	1,3	76	24410.1351	24410.1353	24410.1354
		32	13,5	3,5	31,0	6,5	3,0	45	62	1,3	78	24410.1361	24410.1363	24410.1364
		40	13,5	3,5	31,0	6,5	3,0	45	62	1,3	80	24410.1371	24410.1373	24410.1374
		50	13,5	3,5	31,0	6,5	3,0	45	62	1,3	83	24410.1381	24410.1383	24410.1384
		63	13,5	3,5	31,0	6,5	3,0	45	62	1,3	88	24410.1391	24410.1393	24410.1394
22	M10	**20**	16,0	6,5	36,0	8,0	3,5	52	74	1,9	127	24410.1441	24410.1443	24410.1444
		25	16,0	6,5	36,0	8,0	3,5	52	74	1,9	129	24410.1451	24410.1453	24410.1454
		32	16,0	6,5	36,0	8,0	3,5	52	74	1,9	133	24410.1461	24410.1463	24410.1464
		40	16,0	6,5	36,0	8,0	3,5	52	74	1,9	137	24410.1471	24410.1473	24410.1474
		50	16,0	6,5	36,0	8,0	3,5	52	74	1,9	142	24410.1481	24410.1483	24410.1484
		63	16,0	6,5	36,0	8,0	3,5	52	74	1,9	147	24410.1491	24410.1493	24410.1494
with thrust pin – picture 2														
14	M 6	**16**	10,0	4,0	24,5	4,0	3,0	35	45	1,8	39	24410.2141	24410.2143	24410.2144
		20	10,0	4,0	24,5	4,0	3,0	35	45	1,8	40	24410.2151	24410.2153	24410.2154
		25	10,0	4,0	24,5	4,0	3,0	35	45	1,8	41	24410.2161	24410.2163	24410.2164
		32	10,0	4,0	24,5	4,0	3,0	35	45	1,8	42	24410.2171	24410.2173	24410.2174
		40	10,0	4,0	24,5	4,0	3,0	35	45	1,8	43	24410.2181	24410.2183	24410.2184
		50	10,0	4,0	24,5	4,0	3,0	35	45	1,8	45	24410.2191	24410.2193	24410.2194
18	M 8	**20**	13,5	4,0	31,0	6,5	3,0	45	62	1,8	78	24410.2341	24410.2343	24410.2344
		25	13,5	4,0	31,0	6,5	3,0	45	62	1,8	79	24410.2351	24410.2353	24410.2354
		32	13,5	4,0	31,0	6,5	3,0	45	62	1,8	81	24410.2361	24410.2363	24410.2364
		40	13,5	4,0	31,0	6,5	3,0	45	62	1,8	83	24410.2371	24410.2373	24410.2374
		50	13,5	4,0	31,0	6,5	3,0	45	62	1,8	86	24410.2381	24410.2383	24410.2384
		63	13,5	4,0	31,0	6,5	3,0	45	62	1,8	91	24410.2391	24410.2393	24410.2394
22	M10	**20**	16,0	8,0	36,0	8,0	3,5	52	74	3,5	130	24410.2441	24410.2443	24410.2444
		25	16,0	8,0	36,0	8,0	3,5	52	74	3,5	132	24410.2451	24410.2453	24410.2454
		32	16,0	8,0	36,0	8,0	3,5	52	74	3,5	136	24410.2461	24410.2463	24410.2464
		40	16,0	8,0	36,0	8,0	3,5	52	74	3,5	140	24410.2471	24410.2473	24410.2474
		50	16,0	8,0	36,0	8,0	3,5	52	74	3,5	145	24410.2481	24410.2483	24410.2484
		63	16,0	8,0	36,0	8,0	3,5	52	74	3,5	150	24410.2491	24410.2493	24410.2494
ball-headed – picture 3														
14	M 6	**16**	10,0	4,5	24,5	4,0	3,0	35	45	3,6	35	24410.3141	24410.3143	24410.3144
		20	10,0	4,5	24,5	4,0	3,0	35	45	3,6	36	24410.3151	24410.3153	24410.3154
		25	10,0	4,5	24,5	4,0	3,0	35	45	3,6	37	24410.3161	24410.3163	24410.3164
		32	10,0	4,5	24,5	4,0	3,0	35	45	3,6	38	24410.3171	24410.3173	24410.3174
		40	10,0	4,5	24,5	4,0	3,0	35	45	3,6	39	24410.3181	24410.3183	24410.3184
		50	10,0	4,5	24,5	4,0	3,0	35	45	3,6	41	24410.3191	24410.3193	24410.3194
18	M 8	**20**	13,5	4,5	31,0	6,5	3,0	45	62	3,6	74	24410.3341	24410.3343	24410.3344
		25	13,5	4,5	31,0	6,5	3,0	45	62	3,6	75	24410.3351	24410.3353	24410.3354
		32	13,5	4,5	31,0	6,5	3,0	45	62	3,6	77	24410.3361	24410.3363	24410.3364
		40	13,5	4,5	31,0	6,5	3,0	45	62	3,6	79	24410.3371	24410.3373	24410.3374
		50	13,5	4,5	31,0	6,5	3,0	45	62	3,6	82	24410.3381	24410.3383	24410.3384
		63	13,5	4,5	31,0	6,5	3,0	45	62	3,6	87	24410.3391	24410.3393	24410.3394
22	M10	**20**	16,0	7,8	36,0	8,0	3,5	52	74	4,3	126	24410.3441	24410.3443	24410.3444
		25	16,0	7,8	36,0	8,0	3,5	52	74	4,3	128	24410.3451	24410.3453	24410.3454
		32	16,0	7,8	36,0	8,0	3,5	52	74	4,3	132	24410.3461	24410.3463	24410.3464
		40	16,0	7,8	36,0	8,0	3,5	52	74	4,3	136	24410.3471	24410.3473	24410.3474
		50	16,0	7,8	36,0	8,0	3,5	52	74	4,3	141	24410.3481	24410.3483	24410.3484
		63	16,0	7,8	36,0	8,0	3,5	52	74	4,3	146	24410.3491	24410.3493	24410.3494

Adjustable Clamping Levers • with axial bearing
EH 24420.

TWICE THE CLAMPING FORCE AT THE SAME HAND FORCE





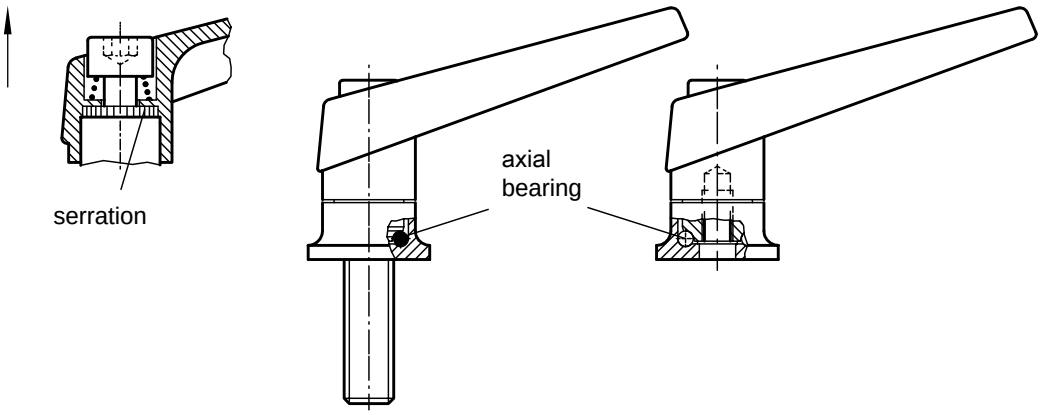




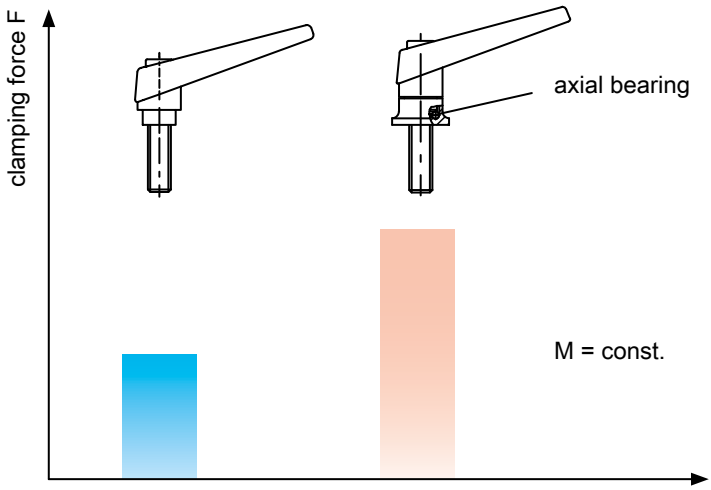
Tests have proven that vital advantages can be achieved when using clamping levers with integrated axial thrust bearing

ADVANTAGES

- The clamping force is greater in comparison to the clamping levers, by up to 100% (please refer to diagram) using the same amount of strength.
- Screwed connections can be replaced with clamping connections for technical applications.
- Smaller clamping levers can be used because of the improved clamping force, thus reducing the necessary construction space.
- Considerably less force loss due to settling; no releasing due to vibrations.
- Non-damaging to clamped parts due to the rotating bearing surface.



Increase of clamping force with axial bearing
(while manual force is unchanged)



Adjustable Clamping Levers • with axial bearing, with female thread

EH 24420.



PRODUCT DESCRIPTION

Advantages of axial bearing:
- Double clamping force with same lever size, by reducing the surface friction.
- Protection of workpiece by a fixed locating surface.
- Little setting due to higher pre-clamping force of bolt, e.g. thread.

Material

Lever
- Zinc die-cast, plastic coated, orange similar to RAL 2004, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

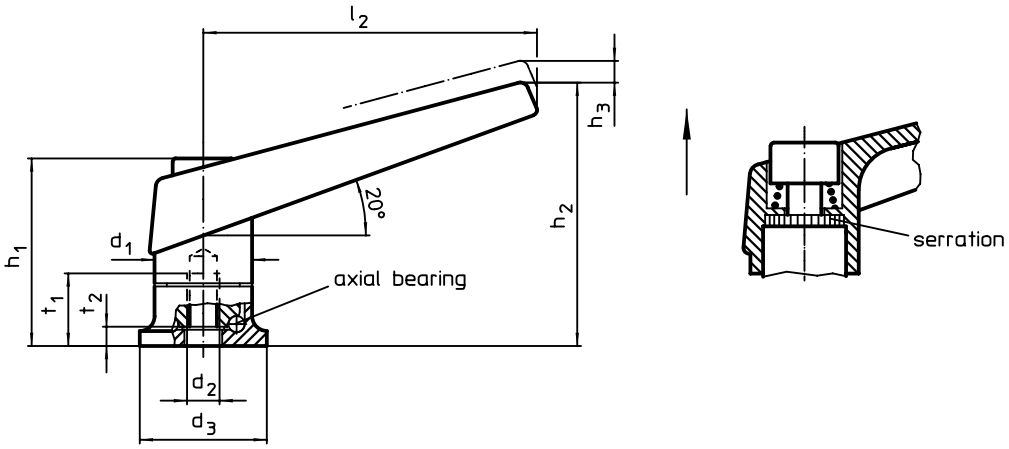
Threaded part
- Steel, nitrided, blackened

Inner parts
- Steel, nitrided, blackened

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

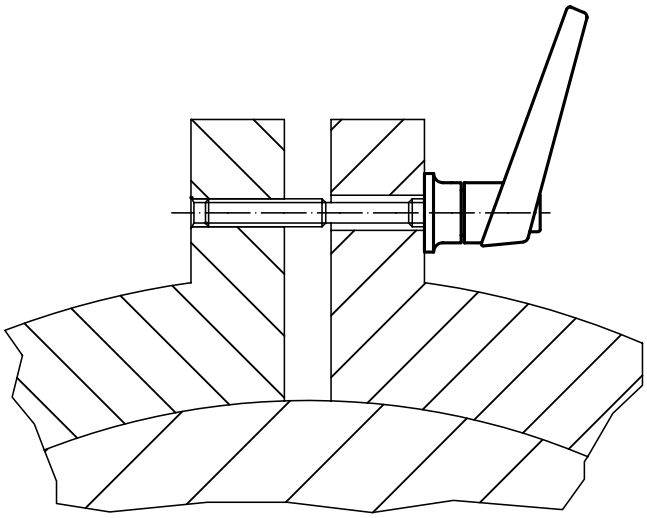
DRAWING



ORDER INFORMATION

Dimensions										Art. No.	
d_1	d_2	d_3	h_1	h_2	h_3	l_2	t_1 min.	t_2		orange	black
[mm]									[g]		
18	**M 6**	24	34,5	50	3,0	62	12,5	5,0	99	24420.0010	24420.0012
22	**M 8**	25	39,5	56	3,5	74	14,0	4,2	140	24420.0110	24420.0112
25	**M10**	30	46,5	66	4,0	89	18,0	5,4	207	24420.0210	24420.0212
30	**M12**	35	56,5	82	5,0	108	26,5	6,6	359	24420.0310	24420.0312

APPLICATION EXAMPLE



Adjustable Clamping Levers • with axial bearing, with screw

EH 24420.



PRODUCT DESCRIPTION

Advantages of axial bearing:
- Double clamping force with same lever size, by reducing the surface friction.
- Protection of workpiece by a fixed locating surface.
- Little setting due to higher pre-clamping force of bolt, e.g. thread.

Material

Lever
- Zinc die-cast, plastic coated, orange similar to RAL 2004, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Inner parts
- Steel, nitrided, blackened

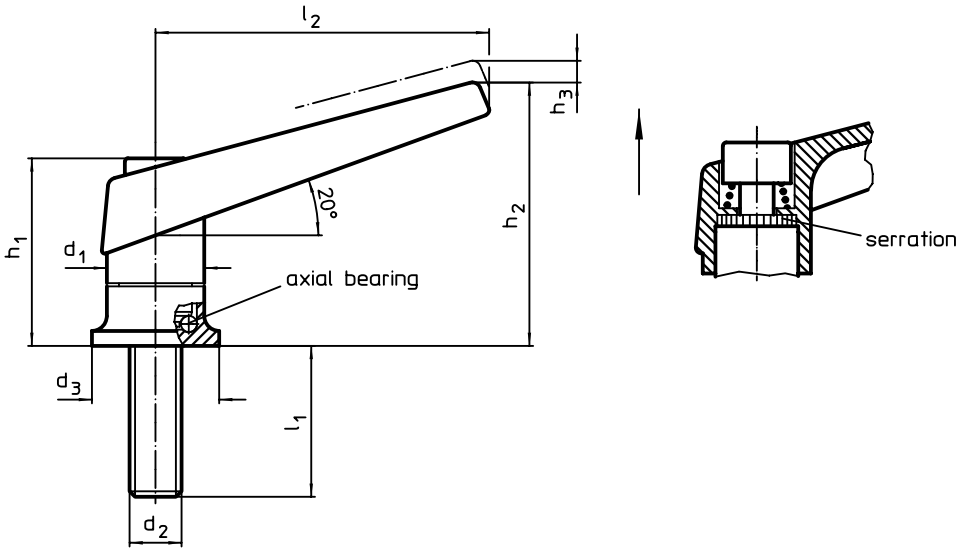
Screw
- Steel, nitrided, blackened

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

4

DRAWING



ORDER INFORMATION

Dimensions [mm]								[g]	Art. No.	
d_1	d_2	l_1	d_3	h_1	h_2	h_3	l_2		orange	black
18	M 6	20	24	34,5	50	3,0	62	97	24420.0030	24420.0032
		27	24	34,5	50	3,0	62	98	24420.0050	24420.0052
22	M 8	21	25	39,5	56	3,5	74	151	24420.0130	24420.0132
		36	25	39,5	56	3,5	74	157	24420.0150	24420.0152
25	M10	29	30	46,5	66	4,0	89	232	24420.0230	24420.0232
		47	30	46,5	66	4,0	89	242	24420.0250	24420.0252
30	M12	34	35	56,5	82	5,0	108	412	24420.0330	24420.0332
		50	35	56,5	82	5,0	108	420	24420.0346	24420.0348
		57	35	56,5	82	5,0	108	426	24420.0350	24420.0352
		65	35	56,5	82	5,0	108	431	24420.0364	24420.0366
		85	35	56,5	82	5,0	108	449	24420.0384	24420.0386

Adjustable Clamping Levers • with axial bearing from stainless steel, with female thread

EH 24420.



PRODUCT DESCRIPTION

Adjustable clamping levers with rust-proof inner parts. Suitable for multiple applications, e.g. medical environments, chemical industry, and so on.
Advantages of axial bearing:

- Double clamping force with same lever size, by reducing the surface friction.
- Protection of workpiece by a fixed locating surface.
- Little setting due to higher pre-clamping force of bolt, e.g. thread.

Material

Lever

- Zinc die-cast, plastic coated, orange similar to RAL 2004, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Threaded part

- Stainless steel

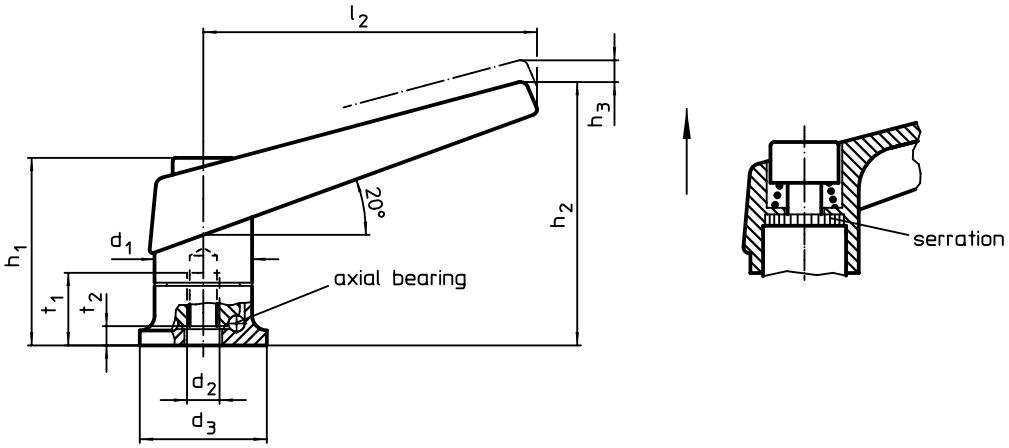
Inner parts

- Stainless steel

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

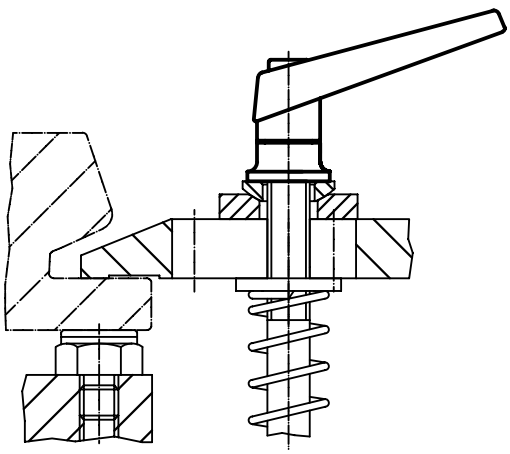
DRAWING



ORDER INFORMATION

Dimensions										Art. No.	
d_1	d_2	d_3	h_1	h_2	h_3	l_2	t_1 min.	t_2		orange	black
[mm]									[g]		
18	**M 6**	24	34,5	50	3,0	62	12,5	5,0	99	24420.1010	24420.1012
22	**M 8**	25	39,5	56	3,5	74	14,0	4,2	140	24420.1110	24420.1112
25	**M10**	30	46,5	66	4,0	89	18,0	5,4	207	24420.1210	24420.1212
30	**M12**	35	56,5	82	5,0	108	26,5	6,6	359	24420.1310	24420.1312

APPLICATION EXAMPLE



Adjustable Clamping Levers • with axial bearing from stainless steel, with screw

EH 24420.



PRODUCT DESCRIPTION

Adjustable clamping levers with rust-proof inner parts. Suitable for multiple applications, e.g. medical environments, chemical industry, and so on.
Advantages of axial bearing:

- Double clamping force with same lever size, by reducing the surface friction.
- Protection of workpiece by a fixed locating surface.
- Little setting due to higher pre-clamping force of bolt, e.g. thread.

Material

Lever

- Zinc die-cast, plastic coated, orange similar to RAL 2004, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Inner parts

- Stainless steel

Screw

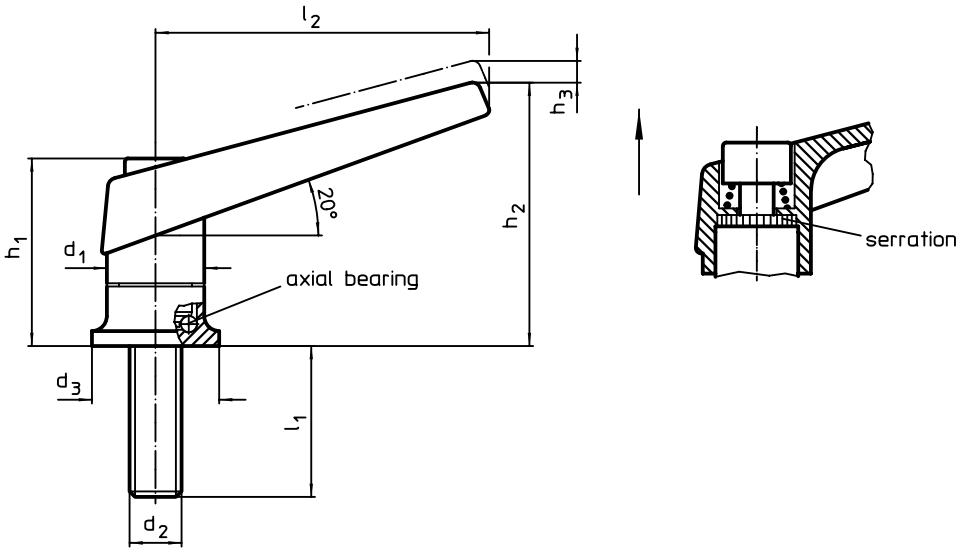
- Stainless steel

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

4

DRAWING



ORDER INFORMATION

Dimensions [mm]								[g]	Art. No.	
d_1	d_2	l_1	d_3	h_1	h_2	h_3	l_2		orange	black
18	M 6	20	24	34,5	50	3,0	62	97	24420.1030	24420.1032
		27	24	34,5	50	3,0	62	98	24420.1050	24420.1052
22	M 8	21	25	39,5	56	3,5	74	151	24420.1130	24420.1132
		36	25	39,5	56	3,5	74	157	24420.1150	24420.1152
25	M10	29	30	46,5	66	4,0	89	232	24420.1230	24420.1232
		47	30	46,5	66	4,0	89	242	24420.1250	24420.1252
30	M12	34	35	56,5	82	5,0	108	412	24420.1330	24420.1332
		50	35	56,5	82	5,0	108	420	24420.1346	24420.1348
		57	35	56,5	82	5,0	108	426	24420.1350	24420.1352
		65	35	56,5	82	5,0	108	431	24420.1364	24420.1366
		85	35	56,5	82	5,0	108	449	24420.1384	24420.1386

Clamping Levers

EH 24430.



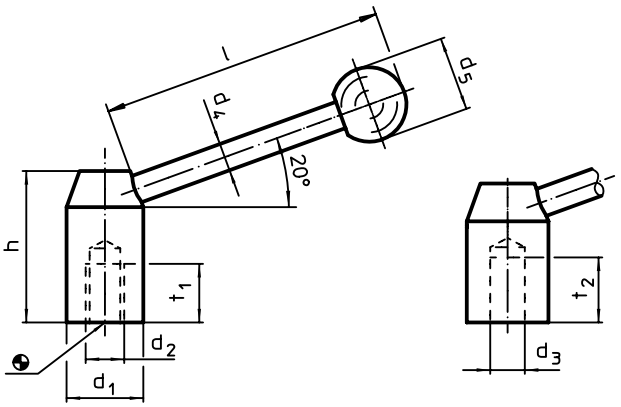
PRODUCT DESCRIPTION

Material

Lever
- Steel, blackened
- Stainless steel 1.4305, dull blasted

Ball knob
- Thermosetting plastic PF 31, black, DIN 319

DRAWING

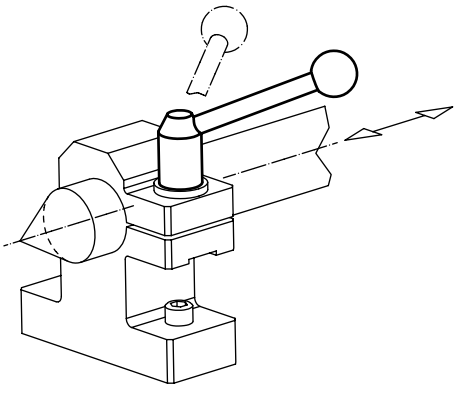


picture 1 picture 2

ORDER INFORMATION

Dimensions										Art. No.	
d_1	d_2	d_3 H7	d_4	d_5	h	l ~	t_1	t_2		steel	stainless steel
[mm]									[g]		
with female thread – picture 1											
20	**M 8**	–	8	20	33	67	15	–	97	24430.0022	–
22	**M 8**	–	8	20	37	70	15	–	121	–	24430.0230
	M10	–	8	20	37	82	15	–	113	24430.0032	–
25	**M10**	–	10	25	42	96	15	–	186	–	24430.0236
	M12	–	10	25	42	96	18	–	165	24430.0038	–
28	**M12**	–	12	30	47	110	18	–	262	24430.0042	24430.0242
32	**M16**	–	12	32	52	124	23	–	354	24430.0048	24430.0248
36	**M16**	–	14	35	58	138	24	–	519	24430.0052	–
40	**M20**	–	16	40	64	152	27	–	715	24430.0058	–
45	**M20**	–	16	40	71	170	30	–	967	24430.0062	–
with smooth bore – picture 2											
20	–	**10**	8	20	33	67	–	16	91	24430.0020	–
22	–	**10**	8	20	37	82	–	18	117	24430.0030	–
25	–	**12**	10	25	42	96	–	21	170	24430.0035	–
28	–	**12**	12	30	47	110	–	22	268	24430.0040	–
32	–	**16**	12	32	52	124	–	25	351	24430.0045	–
36	–	**16**	14	35	58	138	–	26	524	24430.0050	–
40	–	**20**	16	40	64	152	–	29	700	24430.0055	–

APPLICATION EXAMPLE



Adjustable Clamping Levers

EH 24440.



PRODUCT DESCRIPTION

Material

Lever
- Steel, blackened
- Stainless steel 1.4305, dull blasted

Inner parts
- Steel, blackened, quality 5.8
- Stainless steel 1.4305

Screw
- Steel, blackened, quality 5.8
- Stainless steel 1.4305

Ball knob
- Thermosetting plastic PF 31, black, DIN 319

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

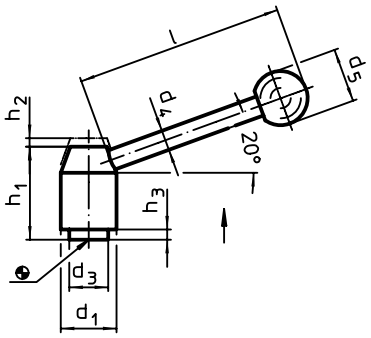
MORE INFORMATION

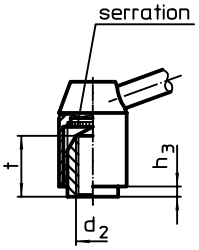
Notes

The threaded portion can be exchanged.

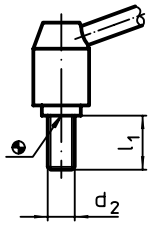
4

DRAWING





picture 1



picture 2

ORDER INFORMATION

Dimensions [mm]											[g]	Art. No. steel	Art. No. stainless steel
d_1	d_2	l_1	d_3	d_4	d_5	h_1	h_2	h_3	l ~	t min.			
with female thread – picture 1													
21	**M 6**	–	13,5	8	20	33,5	4,0	1,0	70	11	91	24440.0101	24440.0601
	M 8	–	13,5	8	20	33,5	4,0	1,0	70	11	89	24440.0102	24440.0602
24	**M 8**	–	16,0	10	25	40,0	4,5	2,5	96	14	159	24440.0201	24440.0611
	M10	–	16,0	10	25	40,0	4,5	2,5	96	14	153	24440.0202	24440.0612
28	**M10**	–	19,0	12	30	48,5	4,5	4,5	110	17	255	24440.0301	24440.0621
	M12	–	19,0	12	30	48,5	4,5	4,5	110	17	248	24440.0302	24440.0622
33	**M12**	–	23,0	12	32	55,0	5,5	6,0	124	23	365	24440.0401	–
	M16	–	23,0	12	32	55,0	5,5	6,0	124	23	347	24440.0402	–
40	**M16**	–	30,0	14	35	68,0	5,5	6,0	138	36	622	24440.0501	–
	M20	–	30,0	14	35	68,0	5,5	6,0	138	36	599	24440.0502	–

→

Dimensions												Art. No.	
d_1	d_2	l_1	d_3	d_4	d_5	h_1	h_2	h_3	l ~	t min.		steel	stainless steel
[mm]											[g]		
with screw – picture 2													
21	**M 8**	**12**	13,5	8	20	33,5	4,0	1,0	70	–	98	24440.0120	–
		16	13,5	8	20	33,5	4,0	1,0	70	–	99	24440.0122	24440.0702
		20	13,5	8	20	33,5	4,0	1,0	70	–	103	24440.0124	24440.0704
		25	13,5	8	20	33,5	4,0	1,0	70	–	102	24440.0126	24440.0706
		32	13,5	8	20	33,5	4,0	1,0	70	–	105	24440.0128	24440.0708
		40	13,5	8	20	33,5	4,0	1,0	70	–	112	24440.0130	24440.0710
		50	13,5	8	20	33,5	4,0	1,0	70	–	109	24440.0132	24440.0712
		63	13,5	8	20	33,5	4,0	1,0	70	–	114	24440.0134	24440.0714
24	**M10**	**16**	16,0	10	25	40,0	4,5	2,5	96	–	172	24440.0220	–
		20	16,0	10	25	40,0	4,5	2,5	96	–	173	24440.0222	24440.0722
		25	16,0	10	25	40,0	4,5	2,5	96	–	174	24440.0224	24440.0724
		32	16,0	10	25	40,0	4,5	2,5	96	–	177	24440.0226	24440.0726
		40	16,0	10	25	40,0	4,5	2,5	96	–	184	24440.0228	24440.0728
		50	16,0	10	25	40,0	4,5	2,5	96	–	185	24440.0230	24440.0730
		63	16,0	10	25	40,0	4,5	2,5	96	–	195	24440.0232	24440.0732
		80	16,0	10	25	40,0	4,5	2,5	96	–	205	24440.0234	24440.0734
28	**M12**	**16**	19,0	12	30	48,5	4,5	4,5	110	–	277	24440.0318	–
		20	19,0	12	30	48,5	4,5	4,5	110	–	282	24440.0320	–
		25	19,0	12	30	48,5	4,5	4,5	110	–	283	24440.0322	24440.0742
		32	19,0	12	30	48,5	4,5	4,5	110	–	287	24440.0324	24440.0744
		40	19,0	12	30	48,5	4,5	4,5	110	–	298	24440.0326	24440.0746
		50	19,0	12	30	48,5	4,5	4,5	110	–	302	24440.0328	24440.0748
		63	19,0	12	30	48,5	4,5	4,5	110	–	312	24440.0330	24440.0750
		80	19,0	12	30	48,5	4,5	4,5	110	–	320	24440.0332	24440.0752
33	**M16**	**32**	23,0	12	32	55,0	5,5	6,0	124	–	422	24440.0422	–
		40	23,0	12	32	55,0	5,5	6,0	124	–	439	24440.0424	–
		50	23,0	12	32	55,0	5,5	6,0	124	–	446	24440.0426	–
		63	23,0	12	32	55,0	5,5	6,0	124	–	461	24440.0428	–
		80	23,0	12	32	55,0	5,5	6,0	124	–	486	24440.0430	–
40	**M20**	**40**	30,0	14	35	68,0	5,5	6,0	138	–	772	24440.0520	–
		50	30,0	14	35	68,0	5,5	6,0	138	–	792	24440.0522	–
		63	30,0	14	35	68,0	5,5	6,0	138	–	826	24440.0524	–
		80	30,0	14	35	68,0	5,5	6,0	138	–	859	24440.0526	–

Adjustable Flat Clamping Levers

EH 24441.



PRODUCT DESCRIPTION

Adjustable flat clamping levers are used when the swivel range is limited or a specific lever position is required.
Adjustable flat clamping levers are characterised by their low construction height and are particularly suitable for use in restricted spaces or when the lever should not overhang..

Material

Lever
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure

Inner parts
- Steel, blackened

Covering
- Plastic, black
- Plastic, light grey

Operation

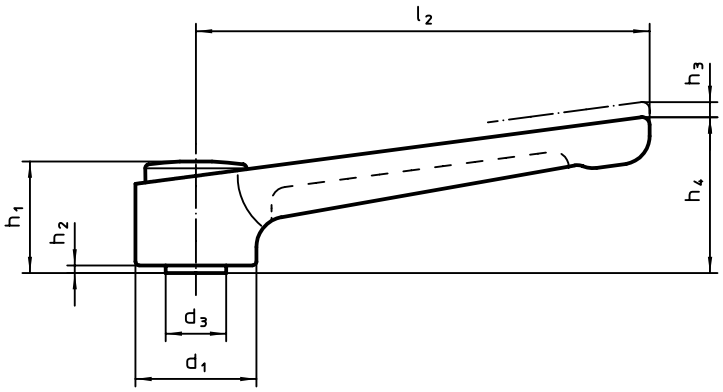
By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

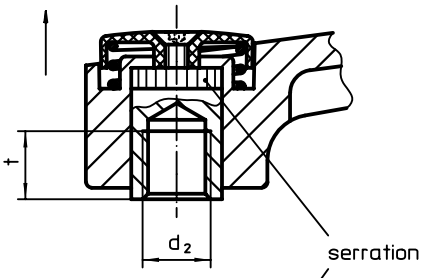
MORE INFORMATION

Notes
The threaded portion can be exchanged.

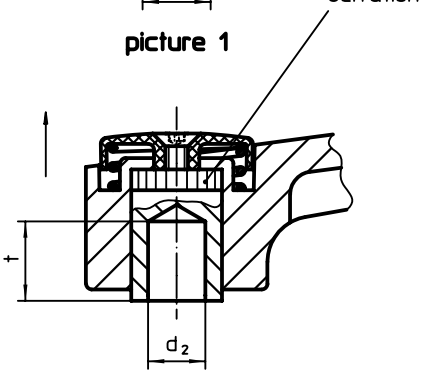
4

DRAWING





picture 1



picture 2

ORDER INFORMATION

Dimensions												Art. No.	
d_2	d_2 H7	l_2	d_1	d_3	h_1	h_2	h_3	h_4	t min.	min. [°C]	max. [°C]	[g]	black	silver
[mm]														
with female thread – picture 1														
M 8	**16**	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	186	24441.0005	24441.0105
M10	**16**	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	183	24441.0010	24441.0110
M12	**16**	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	179	24441.0015	24441.0115
	23	**145**	40	23	42,0	4	4,0	56,0	22	-30	80	313	24441.0020	24441.0120
M16	**23**	**145**	40	23	42,0	4	4,0	56,0	22	-30	80	373	24441.0025	24441.0125
with smooth bore – picture 2														
–	**8**	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	188	24441.0050	24441.0150
	10	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	185	24441.0055	24441.0155
	12	**145**	40	23	42,0	4	4,0	56,0	22	-30	80	387	24441.0060	24441.0160
	16	**145**	40	23	42,0	4	4,0	56,0	22	-30	80	389	24441.0065	24441.0165

Adjustable Flat Clamping Levers • stainless steel

EH 24441.



PRODUCT DESCRIPTION

Adjustable flat clamping levers are used when the swivel range is limited or a specific lever position is required.
Adjustable flat clamping levers are characterised by their low construction height and are particularly suitable for use in restricted spaces or when the lever should not overhang..

Material

Lever
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure

Inner parts
- Stainless steel 1.4305

Covering
- Plastic, black
- Plastic, light grey

Operation

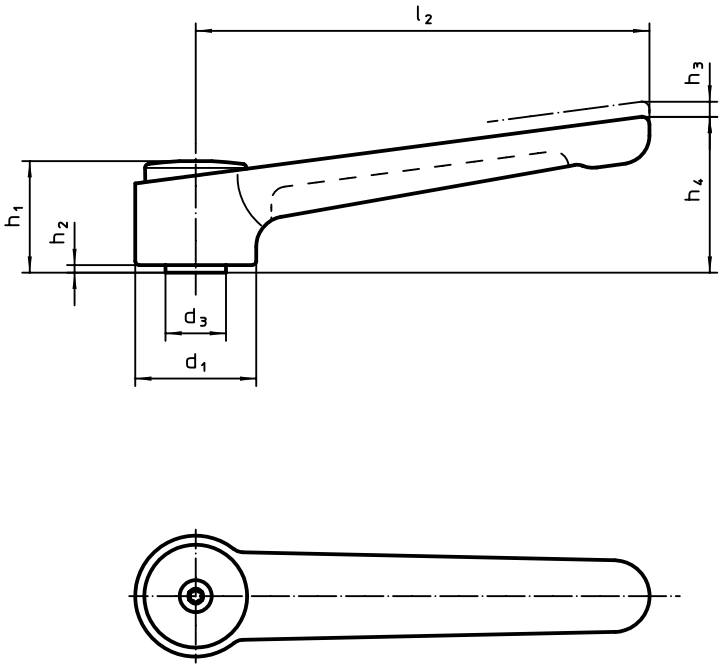
By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

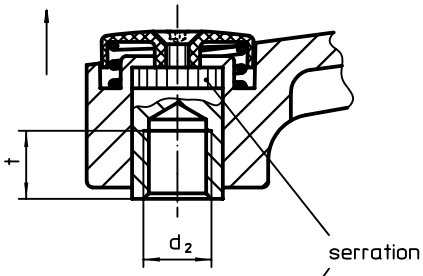
MORE INFORMATION

Notes

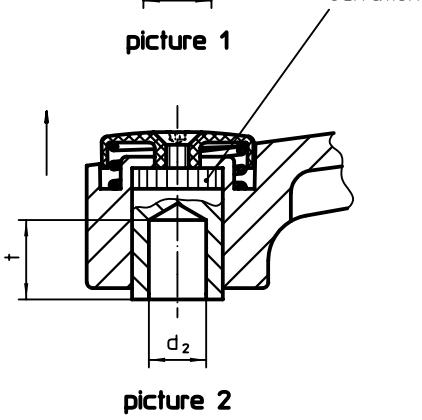
The threaded portion can be exchanged.

DRAWING





picture 1



picture 2

ORDER INFORMATION

Dimensions													Art. No.	
d_2	d_2 H7	l_2	d_1	d_3	h_1	h_2	h_3	h_4	t min.	min.	max.		black	silver
[mm]										[°C]		[g]		
with female thread – picture 1														
M 8	**16**	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	187	24441.0205	24441.0305
M10	**16**	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	187	24441.0210	24441.0310
M12	**16**	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	187	24441.0215	24441.0315
	23	**145**	40	23	42,0	4	4,0	56,0	22	-30	80	390	24441.0220	24441.0320
M16	**23**	**145**	40	23	42,0	4	4,0	56,0	22	-30	80	373	24441.0225	24441.0325
with smooth bore – picture 2														
–	**8**	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	185	24441.0250	24441.0350
	10	**120**	32	16	29,5	2	2,5	41,5	14	-30	80	187	24441.0255	24441.0355
	12	**145**	40	23	42,0	4	4,0	56,0	22	-30	80	390	24441.0260	24441.0360
	16	**145**	40	23	42,0	4	4,0	56,0	22	-30	80	367	24441.0265	24441.0365

Adjustable Flat Clamping Levers • with screw

EH 24441.



PRODUCT DESCRIPTION

Adjustable flat clamping levers are used when the swivel range is limited or a specific lever position is required.
Adjustable flat clamping levers are characterised by their low construction height and are particularly suitable for use in restricted spaces or when the lever should not overhang..

Material

Lever
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure

Inner parts
- Steel, blackened

Screw
- Steel, blackened

Covering
- Plastic, black
- Plastic, light grey

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

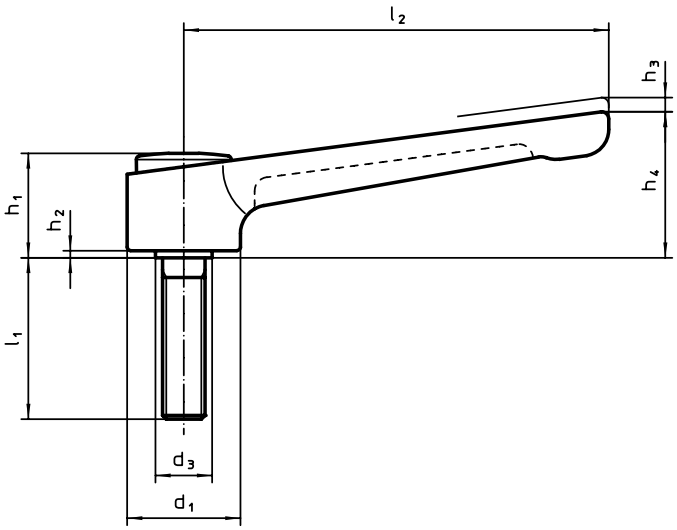
MORE INFORMATION

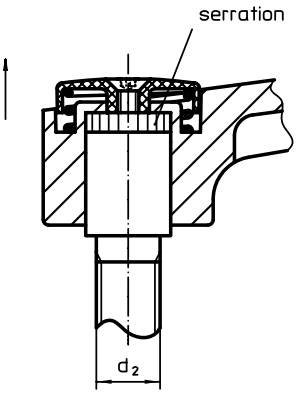
Notes

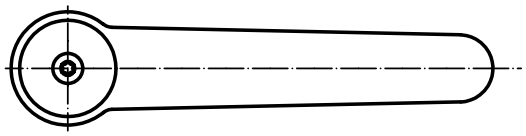
The screw part can be exchanged.

4

DRAWING







ORDER INFORMATION

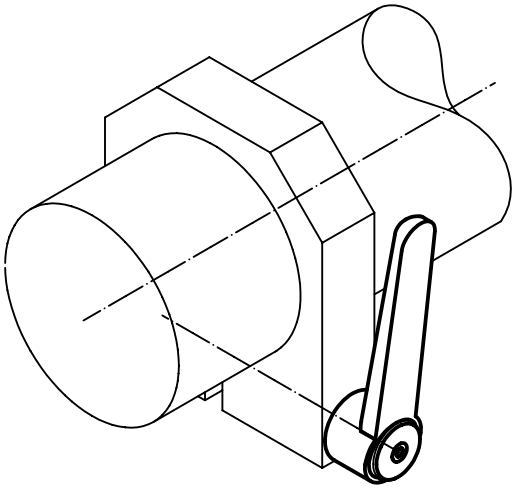
Dimensions									min.	max.		Art. No.	
d_1	d_2	l_1	d_3	h_1	h_2	h_3	h_4	l_2	[°C]		[g]	black	silver
				[mm]									
32	M10	20	16	29,5	2	2,5	41,5	120	-30	80	202	24441.0450	24441.0850
		25	16	29,5	2	2,5	41,5	120	-30	80	204	24441.0455	24441.0855
		32	16	29,5	2	2,5	41,5	120	-30	80	207	24441.0460	24441.0860
		40	16	29,5	2	2,5	41,5	120	-30	80	211	24441.0465	24441.0865
		50	16	29,5	2	2,5	41,5	120	-30	80	216	24441.0470	24441.0870
		63	16	29,5	2	2,5	41,5	120	-30	80	222	24441.0475	24441.0875
		80	16	29,5	2	2,5	41,5	120	-30	80	231	24441.0480	24441.0880
	M12	20	16	29,5	2	2,5	41,5	120	-30	80	206	24441.0485	24441.0885
		25	16	29,5	2	2,5	41,5	120	-30	80	210	24441.0490	24441.0890
		32	16	29,5	2	2,5	41,5	120	-30	80	215	24441.0495	24441.0895
		40	16	29,5	2	2,5	41,5	120	-30	80	221	24441.0500	24441.0900
		50	16	29,5	2	2,5	41,5	120	-30	80	228	24441.0505	24441.0905
		63	16	29,5	2	2,5	41,5	120	-30	80	236	24441.0510	24441.0910
		80	16	29,5	2	2,5	41,5	120	-30	80	248	24441.0515	24441.0915

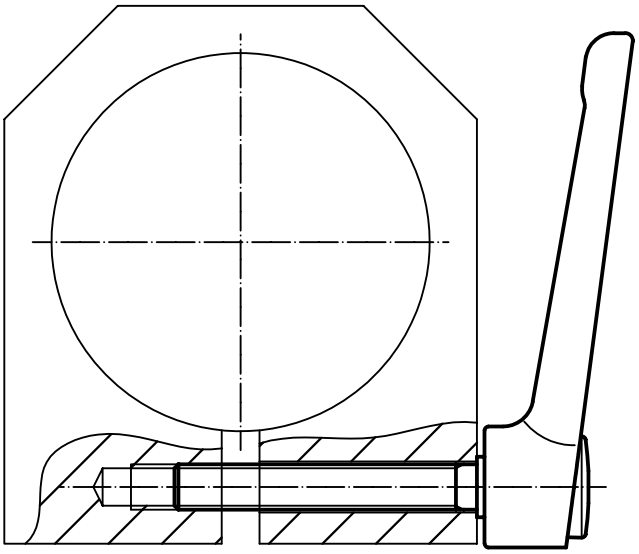
→

Dimensions											Art. No.	
d_1	d_2	l_1	d_3	h_1	h_2	h_3	h_4	l_2	min.	max.	black	silver
[mm]									[°C]		[g]	
40	M12	32	23	42,0	4	4,0	56,0	145	-30	80	434	24441.0525	24441.0925
		40	23	42,0	4	4,0	56,0	145	-30	80	440	24441.0530	24441.0930
		50	23	42,0	4	4,0	56,0	145	-30	80	447	24441.0535	24441.0935
		63	23	42,0	4	4,0	56,0	145	-30	80	455	24441.0540	24441.0940
		80	23	42,0	4	4,0	56,0	145	-30	80	467	24441.0545	24441.0945
	M16	32	23	42,0	4	4,0	56,0	145	-30	80	449	24441.0550	24441.0950
		40	23	42,0	4	4,0	56,0	145	-30	80	460	24441.0555	24441.0955
		50	23	42,0	4	4,0	56,0	145	-30	80	472	24441.0560	24441.0960
		63	23	42,0	4	4,0	56,0	145	-30	80	491	24441.0565	24441.0965
		80	23	42,0	4	4,0	56,0	145	-30	80	513	24441.0570	24441.0970

4

APPLICATION EXAMPLE





Adjustable Flat Clamping Levers • with screw, stainless steel

EH 24441.



PRODUCT DESCRIPTION

Adjustable flat clamping levers are used when the swivel range is limited or a specific lever position is required.
Adjustable flat clamping levers are characterised by their low construction height and are particularly suitable for use in restricted spaces or when the lever should not overhang..

Material

Lever
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure

Inner parts
- Stainless steel 1.4305

Screw
- Stainless steel 1.4305

Covering
- Plastic, black
- Plastic, light grey

Operation

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged.

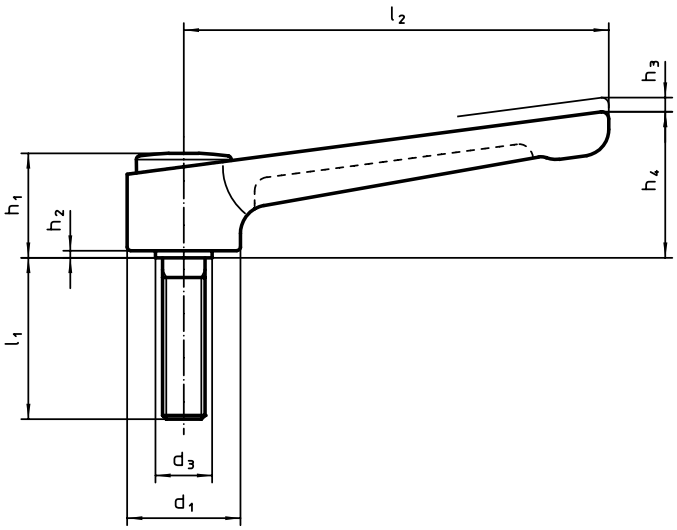
MORE INFORMATION

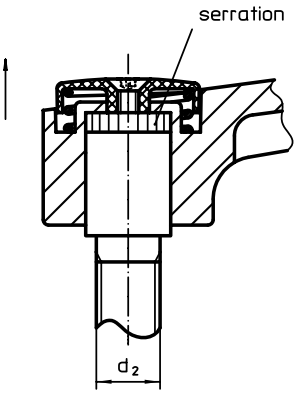
Notes

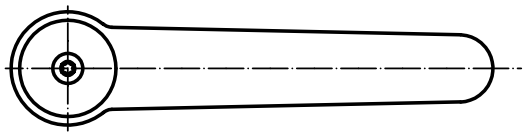
The screw part can be exchanged.

4

DRAWING







ORDER INFORMATION

Dimensions									min.	max.		Art. No.	
d_1	d_2	l_1	d_3	h_1	h_2	h_3	h_4	l_2	[°C]		[g]	black	silver
				[mm]									
32	M10	20	16	29,5	2	2,5	41,5	120	-30	80	202	24441.0650	24441.1650
		25	16	29,5	2	2,5	41,5	120	-30	80	204	24441.0655	24441.1655
		32	16	29,5	2	2,5	41,5	120	-30	80	207	24441.0660	24441.1660
		40	16	29,5	2	2,5	41,5	120	-30	80	212	24441.0665	24441.1665
		50	16	29,5	2	2,5	41,5	120	-30	80	217	24441.0670	24441.1670
		63	16	29,5	2	2,5	41,5	120	-30	80	224	24441.0675	24441.1675
		80	16	29,5	2	2,5	41,5	120	-30	80	231	24441.0680	24441.1680
	M12	20	16	29,5	2	2,5	41,5	120	-30	80	206	24441.0685	24441.1685
		25	16	29,5	2	2,5	41,5	120	-30	80	210	24441.0690	24441.1690
		32	16	29,5	2	2,5	41,5	120	-30	80	215	24441.0695	24441.1695
		40	16	29,5	2	2,5	41,5	120	-30	80	221	24441.0700	24441.1700
		50	16	29,5	2	2,5	41,5	120	-30	80	228	24441.0705	24441.1705
		63	16	29,5	2	2,5	41,5	120	-30	80	237	24441.0710	24441.1710
		80	16	29,5	2	2,5	41,5	120	-30	80	249	24441.0715	24441.1715

→

Dimensions											Art. No.	
d_1	d_2	l_1	d_3	h_1	h_2	h_3	h_4	l_2	min.	max.	black	silver
[mm]									[°C]		[g]	
40	M12	32	23	42,0	4	4,0	56,0	145	-30	80	432	24441.0725	24441.1725
		40	23	42,0	4	4,0	56,0	145	-30	80	440	24441.0730	24441.1730
		50	23	42,0	4	4,0	56,0	145	-30	80	447	24441.0735	24441.1735
		63	23	42,0	4	4,0	56,0	145	-30	80	455	24441.0740	24441.1740
		80	23	42,0	4	4,0	56,0	145	-30	80	445	24441.0745	24441.1745
	M16	32	23	42,0	4	4,0	56,0	145	-30	80	449	24441.0750	24441.1750
		40	23	42,0	4	4,0	56,0	145	-30	80	460	24441.0755	24441.1755
		50	23	42,0	4	4,0	56,0	145	-30	80	472	24441.0760	24441.1760
		63	23	42,0	4	4,0	56,0	145	-30	80	491	24441.0765	24441.1765
		80	23	42,0	4	4,0	56,0	145	-30	80	513	24441.0770	24441.1770

Clamping Levers • DIN 99

EH 24470.

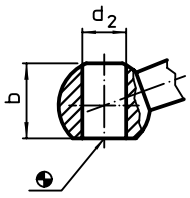


PRODUCT DESCRIPTION

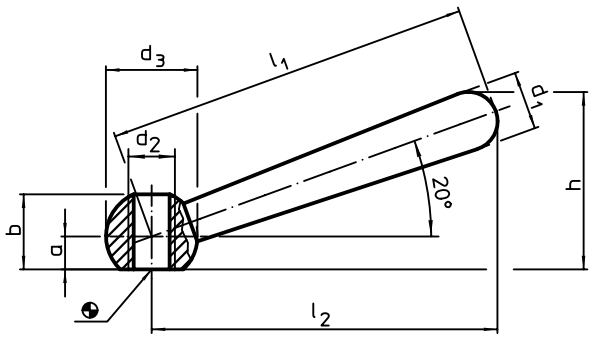
Material

- Steel, blackened
- Stainless steel 1.4305, dull blasted

DRAWING



picture 1

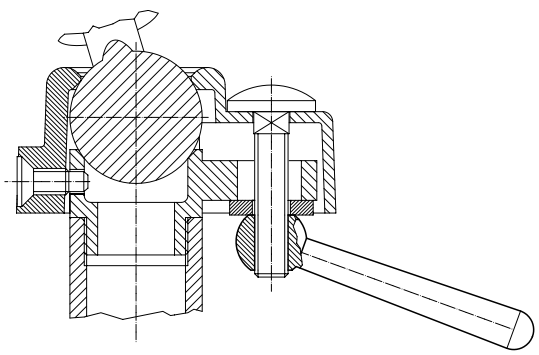


picture 2

ORDER INFORMATION

Dimensions									Art. No.	
l_1	l_2 ~	a	b ~	d_1	d_2	d_3	h ~		steel	stainless steel
[mm]								[g]		
slanted, with smooth bore, form L – picture 1										
50	48	4,0	9,5	8	6 H7	12	24,0	16	24470.0105	–
63	60	5,0	12,0	10	8 H7	16	30,5	37	24470.0106	24470.0206
80	76	6,0	14,5	13	10 H7	20	38,0	73	24470.0108	24470.0208
100	95	7,5	18,5	16	12 H7	25	47,0	140	24470.0110	24470.0210
125	119	10,0	24,0	20	16 H7	32	59,5	282	24470.0112	–
160	152	12,5	30,0	25	20 H7	40	75,7	553	24470.0116	–
200	190	18,0	40,0	32	24 H7	50	97,0	1096	24470.0120	–
slanted, with threaded bore, form N – picture 2										
50	48	4,0	9,5	8	M 6	12	24,0	17	24470.0305	24470.0405
63	60	5,0	12,5	10	M 8	16	30,5	38	24470.0306	24470.0406
80	76	6,0	15,0	13	M10	20	38,0	74	24470.0308	24470.0408
100	95	7,5	19,0	16	M12	25	47,0	142	24470.0310	24470.0410
125	119	10,0	25,0	20	M16	32	59,5	297	24470.0312	24470.0412
160	152	12,5	31,0	25	M20	40	75,7	566	24470.0316	–
200	190	18,0	41,0	32	M24	50	97,0	1140	24470.0320	–

APPLICATION EXAMPLE



Clamping Nuts • welded

EH 24470.





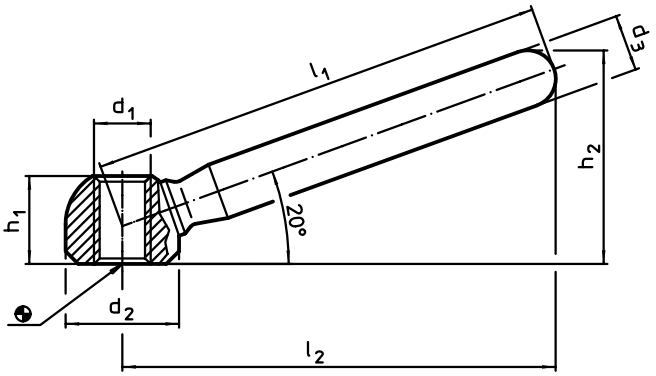
PRODUCT DESCRIPTION

Low-price version to DIN 99.

Material

- Steel, zinc-plated by galvanization
- Stainless steel 1.4301, dull blasted

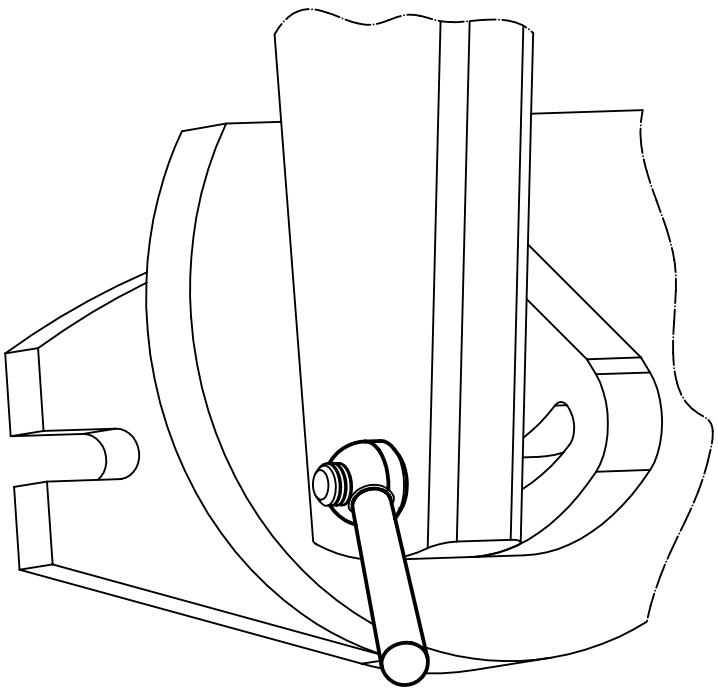
DRAWING



ORDER INFORMATION

Dimensions								Art. No.	
l_1	l_2 ~	d_1	d_2	d_3	h_1	h_2 ~		steel	stainless steel
[mm]							[g]		
63	60	M 8	16	10	12,5	30,5	39	24470.0506	24470.0606
80	76	M10	20	12	15,0	37,0	74	24470.0508	24470.0608
100	95	M12	25	14	19,0	46,0	153	24470.0510	24470.0610
125	119	M16	32	18	25,0	58,5	316	24470.0512	24470.0612
160	152	M20	40	20	31,0	73,0	533	24470.0516	24470.0616

APPLICATION EXAMPLE



Clamping Nuts • welded, double-sided

EH 24470.



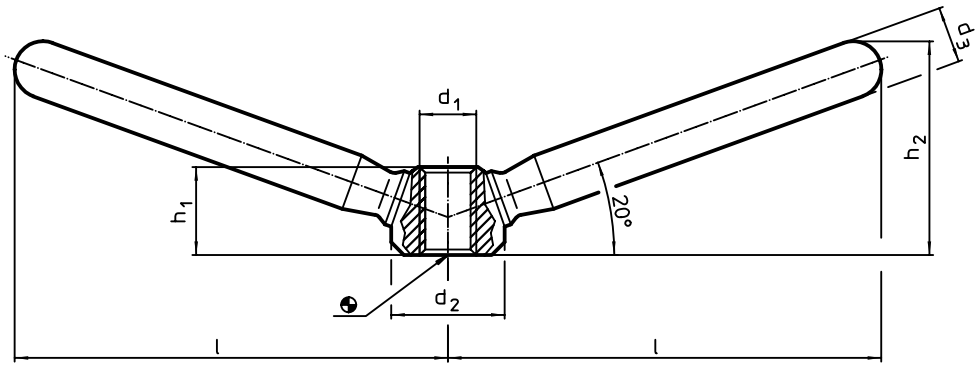
PRODUCT DESCRIPTION

Allows for two-handed operating.

Material

- Steel, zinc-plated by galvanization
- Stainless steel 1.4301, dull blasted

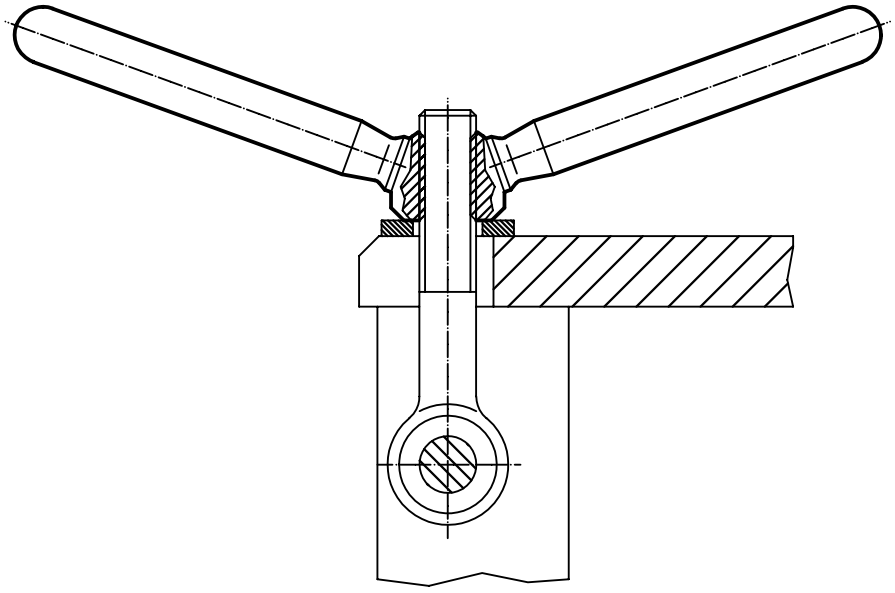
DRAWING



ORDER INFORMATION

Dimensions							Art. No.	
l ~	d_1	d_2	d_3	h_1	h_2		steel	stainless steel
[mm]						[g]		
47,5	M 8	16	10	12,5	26	55	24470.0706	24470.0806
59,5	M10	20	12	15,0	32	116	24470.0708	24470.0808
75,5	M12	25	14	19,0	40	210	24470.0710	24470.0810
94,5	M16	32	18	25,0	52	432	24470.0712	24470.0812
118,0	M20	40	20	31,0	62	716	24470.0716	24470.0816

APPLICATION EXAMPLE



Machine Handles • DIN 39

EH 24450.

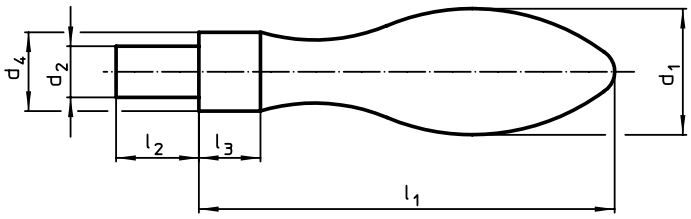


PRODUCT DESCRIPTION

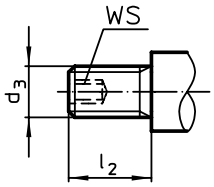
Material

- Steel, turned, zinc-plated by galvanization, passivated
- Stainless steel 1.4404

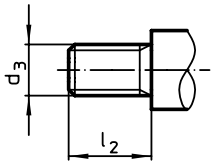
DRAWING



picture 1



picture 2

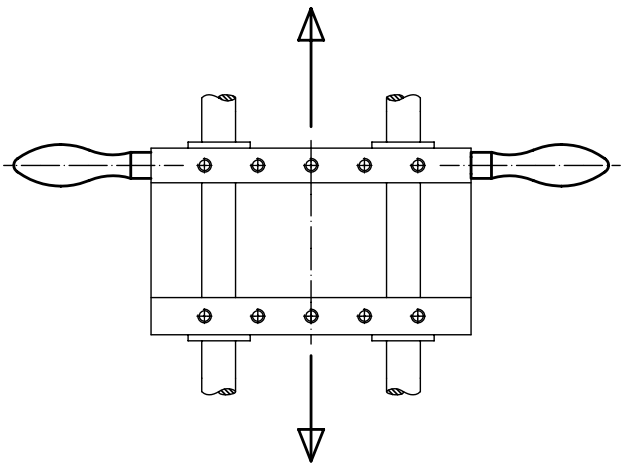


picture 3

ORDER INFORMATION

Dimensions							WS		Art. No.	
d_1	d_2 h8	d_3	d_4 h13	l_1 ~	l_2	l_3			steel	stainless steel
[mm]							[mm]	[g]		
with smooth lug, form D – picture 1										
16	7	–	10	50	11	7	–	45	24450.0016	–
20	8	–	13	64	13	8	–	92	24450.0020	–
25	10	–	16	80	14	10	–	177	24450.0025	–
32	13	–	20	100	21	13	–	359	24450.0032	–
36	16	–	22	112	26	14	–	519	24450.0036	–
with male thread lug, form E – picture 2										
16	–	M 6	10	50	11	7	3	43	24450.0116	–
20	–	M 8	13	64	13	8	4	88	24450.0120	–
25	–	M10	16	80	14	10	5	175	24450.0125	–
32	–	M12	20	100	21	13	6	346	24450.0132	–
36	–	M16	22	112	26	14	8	509	24450.0136	–
with male thread lug, form E – picture 3										
16	–	M 6	10	50	11	7	–	45	–	24450.0316
20	–	M 8	13	64	13	8	–	92	–	24450.0320
25	–	M10	16	80	14	10	–	186	–	24450.0325

APPLICATION EXAMPLE



Rotating Machine Handles • DIN 98

EH 24460.

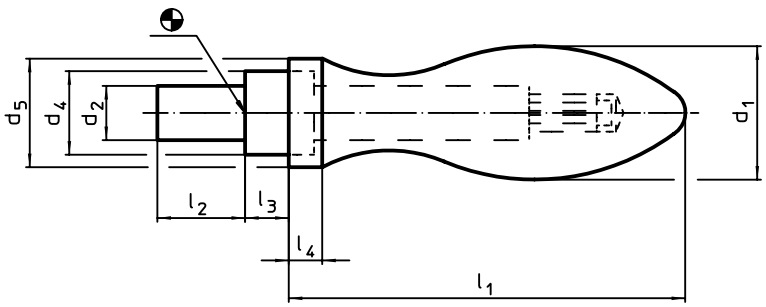


PRODUCT DESCRIPTION

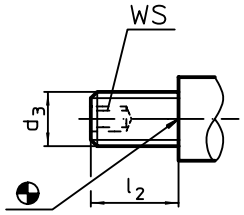
Material

- Steel, turned, zinc-plated by galvanization, passivated

DRAWING



picture 1

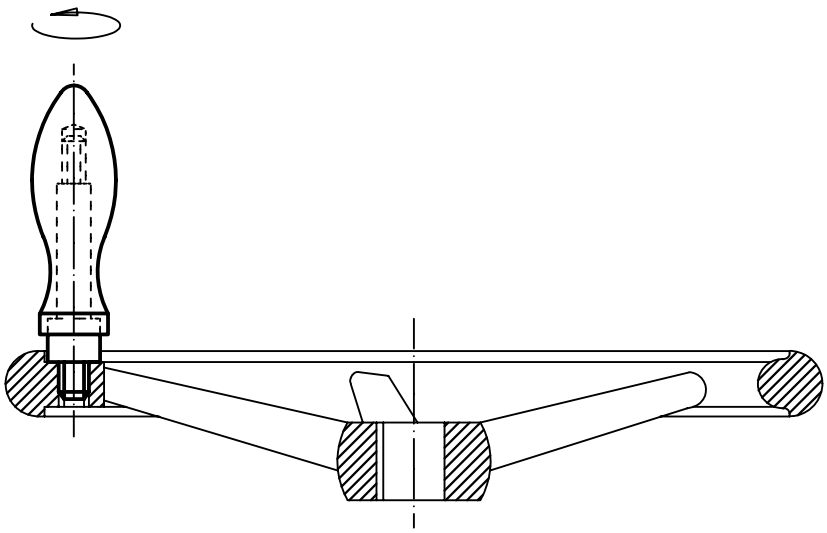


picture 2

ORDER INFORMATION

Dimensions									WS		Art. No.
d_1	d_2 h8	d_3	d_4 h13	d_5	l_1 ~	l_2	l_3	l_4			
[mm]									[mm]	[g]	
with smooth lug, form D – picture 1											
16	7	–	10	14	49	11	5,5	5,0	–	53	24460.0016
20	8	–	13	18	61	13	6,0	6,0	–	109	24460.0020
25	10	–	16	21	75	14	8,0	6,5	–	200	24460.0025
32	13	–	20	26	95	21	10,5	8,0	–	395	24460.0032
36	16	–	22	29	106	26	11,0	9,0	–	569	24460.0036
with male thread lug, form E – picture 2											
16	–	M 6	10	14	49	11	5,5	5,0	3	51	24460.0116
20	–	M 8	13	18	61	13	6,0	6,0	4	101	24460.0120
25	–	M10	16	21	75	14	8,0	6,5	5	191	24460.0125
32	–	M12	20	26	95	21	10,5	8,0	6	387	24460.0132
36	–	M16	22	29	106	26	11,0	9,0	8	566	24460.0136

APPLICATION EXAMPLE



Cylindrical Handles • rotating

EH 24530.



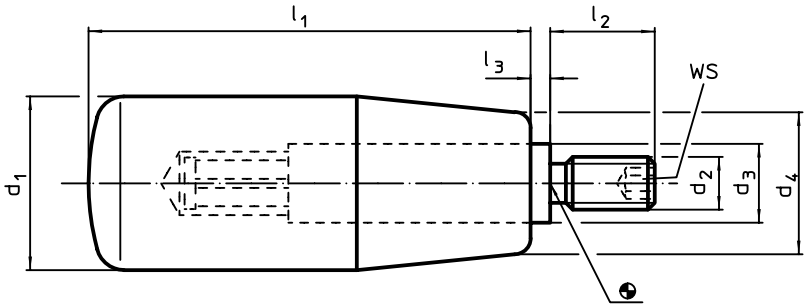
PRODUCT DESCRIPTION

Material

Axle part
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

Cylindrical handle
- Thermoplastic PA, black, dull
- Thermosetting plastic PF 31, black

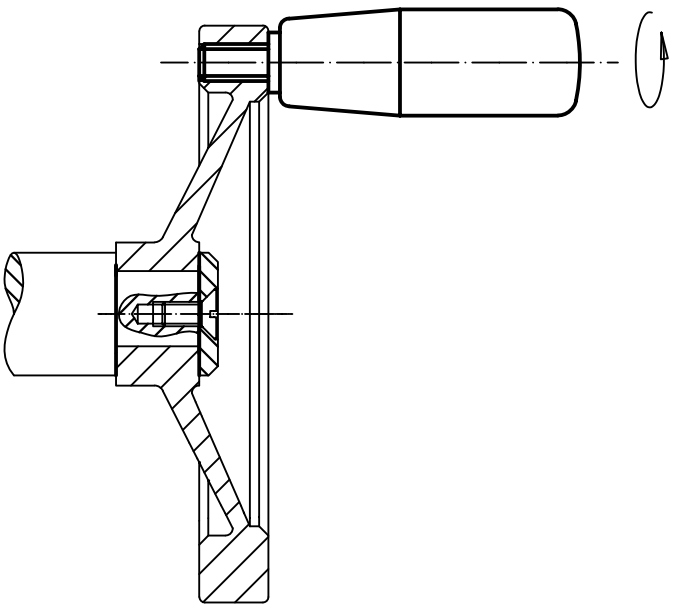
DRAWING



ORDER INFORMATION

Dimensions							WS	max.		Art. No.	
d_1	d_2	d_3	d_4	l_1	l_2	l_3				steel	stainless steel
[mm]							[mm]	[°C]	[g]		
cylindrical handle: thermoplastic											
14	**M 6**	8	11	28	10	0,5	3	80	13	24530.0008	–
cylindrical handle: thermoset											
18	**M 6**	10	15	40	12	2,5	3	110	29	24530.0010	24530.0210
21	**M 6**	10	17	50	13	2,5	3	110	42	24530.0020	24530.0220
	M 8	10	17	50	13	2,5	4	110	43	24530.0021	–
22	**M 6**	10	18	56	13	2,5	3	110	47	24530.0030	–
	M 8	10	18	56	13	2,5	4	110	48	24530.0031	–
23	**M 8**	13	19	65	14	2,5	4	110	79	24530.0040	24530.0240
	M10	13	19	65	14	2,5	5	110	80	24530.0041	–
26	**M 8**	13	21	80	16	2,5	4	110	106	24530.0050	–
	M10	13	21	80	16	2,5	5	110	108	24530.0051	24530.0251
28	**M10**	13	22	90	16	2,5	5	110	126	24530.0060	24530.0260
31	**M12**	14	25	102	20	2,5	6	110	178	24530.0071	24530.0271

APPLICATION EXAMPLE



Folding Handles • rotating

EH 24532.



PRODUCT DESCRIPTION

Material

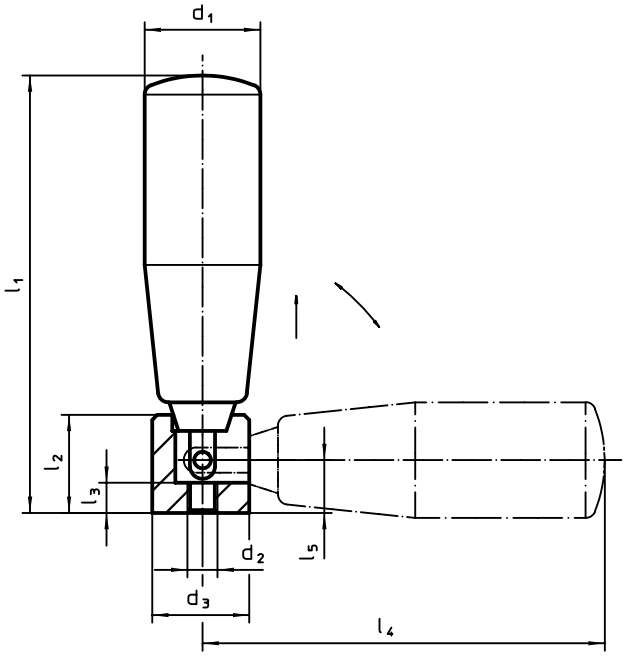
Axle part
- Steel, blackened
- Stainless steel 1.4305

Handle
- Thermoplastic, black, dull

Operation

In the operating position the handle is locked. To move the handle to the rest position, it must be pulled out axially and flipped round.

DRAWING



ORDER INFORMATION

Dimensions										Art. No.	
d_1	d_2	d_3	l_1 ~	l_2	l_3	l_4 ~	l_5	max.		steel	stainless steel
[mm]								[°C]	[g]		
18	**M5**	16	57	15,0	5	52	9,5	110	50	24532.0018	–
21	**M5**	16	67	15,0	5	62	9,5	110	58	24532.0021	–
22	**M5**	16	73	15,0	5	68	9,5	110	63	24532.0022	–
23	**M6**	20	87	19,5	6	80	10,5	110	106	24532.0023	24532.0123
26	**M6**	20	102	19,5	6	95	10,5	110	130	24532.0026	24532.0126
28	**M8**	26	118	26,0	10	106	16,0	110	220	24532.0028	24532.0128

Knurled Nuts • DIN 6303

EH 24480.



PRODUCT DESCRIPTION

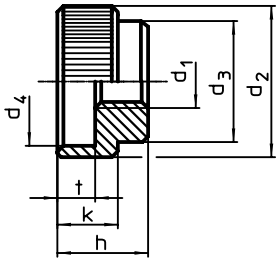
Material

- Free cutting steel, blackened
- Stainless steel 1.4305

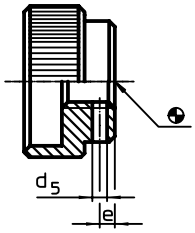
Assembly

Form B: after being bored through the pin hole is to be situated within the tolerance field H7.

DRAWING



picture 1

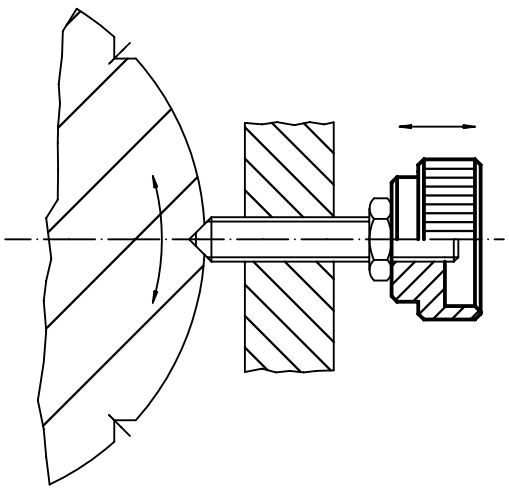


picture 2

ORDER INFORMATION

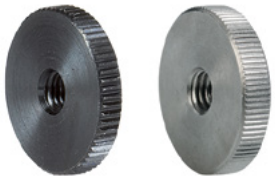
Dimensions									Suitable straight pin DIN 7		Art. No.	
d_1	d_2	d_3	d_4	d_5 Predrilled	e	h	k	t			free cutting steel	stainless steel
[mm]										[g]		
without pin hole, form A – picture 1												
M 5	20	14	15	–	–	12	8	5	–	16	24480.0005	24480.0205
M 6	24	16	18	–	–	14	10	6	–	27	24480.0006	24480.0206
M 8	30	20	24	–	–	17	12	7	–	46	24480.0008	24480.0208
M10	36	28	30	–	–	20	14	8	–	83	24480.0010	24480.0210
M12	40	32	34	–	–	24	16	10	–	123	24480.0012	24480.0212
with pin hole, form B – picture 2												
M 5	20	14	15	1,4	2,5	12	8	5	1,5 m6 x 14	15	24480.0105	24480.0305
M 6	24	16	18	1,4	2,5	14	10	6	1,5 m6 x 16	25	24480.0106	24480.0306
M 8	30	20	24	1,9	3,0	17	12	7	2,0 m6 x 20	45	24480.0108	24480.0308
M10	36	28	30	2,9	4,0	20	14	8	3,0 m6 x 28	86	24480.0110	24480.0310
M12	40	32	34	3,9	4,0	24	16	10	4,0 m6 x 32	121	24480.0112	24480.0312

APPLICATION EXAMPLE



Flat Knurled Nuts • DIN 467

EH 24760.

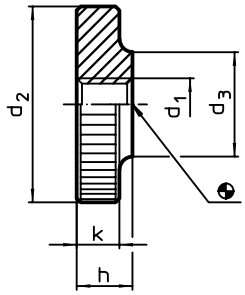


PRODUCT DESCRIPTION

Material

- Steel, blackened, quality 5
- Stainless steel 1.4305, dull blasted

DRAWING

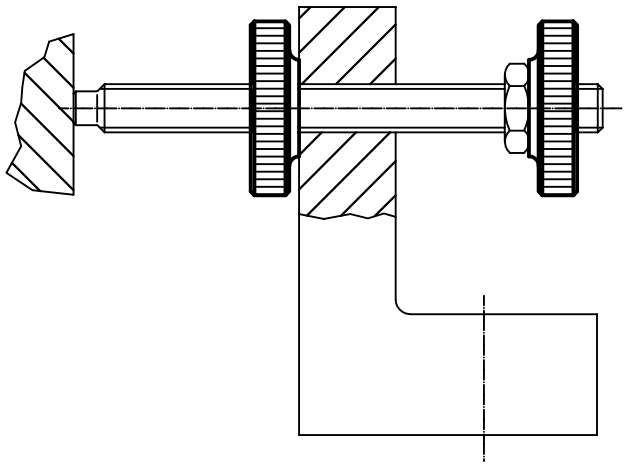


ORDER INFORMATION

Dimensions						Art. No.	
d_1	d_2	d_3	h	k		steel	stainless steel
		[mm]			[g]		
M 3	12	6	3	2,5	2,1	24760.0030	24760.0230
M 4	16	8	4	3,5	5,0	24760.0040	24760.0240
M 5	20	10	5	4,0	9,4	24760.0050	24760.0250
M 6	24	12	6	5,0	17,0	24760.0060	24760.0260
M 8	30	16	8	6,0	32,0	24760.0080	24760.0280
M10	36	20	10	8,0	61,0	24760.0100	24760.0300
M12	40	22	12	10,0	92,0	24760.0120[1)]	–

[1)] DIN standards do not include these dimensions.

APPLICATION EXAMPLE



Flat Knurled Thumb Screws • DIN 653

EH 24770.



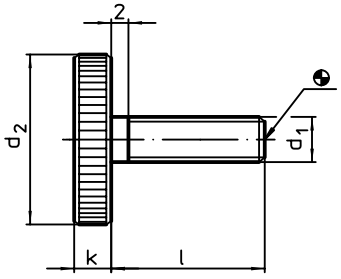
PRODUCT DESCRIPTION

All knurled screws are one-piece manufactured with thread up to the head (DIN-designation A).

Material

- Steel, blackened, quality 5.8
- Stainless steel 1.4305, dull blasted

DRAWING

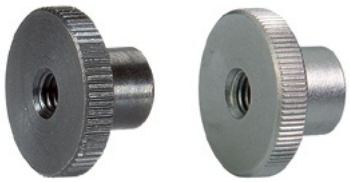


ORDER INFORMATION

Dimensions					Art. No.	
d_1	l	d_2	k		steel	stainless steel
	[mm]			[g]		
M 3	6	12	2,5	2,3	24770.0072	–
	8	12	2,5	2,4	24770.0073	–
	10	12	2,5	2,5	24770.0074	–
	16	12	2,5	2,7	24770.0077	–
	20	12	2,5	2,9	24770.0079	–
M 4	8	16	3,5	5,6	24770.0092	24770.0292
	10	16	3,5	5,7	24770.0093	24770.0293
	12	16	3,5	6,1	24770.0094	24770.0294
	16	16	3,5	6,2	24770.0096	24770.0296
	20	16	3,5	6,6	24770.0098	–
	25	16	3,5	7,0	24770.0100	–
M 5	10	20	4,0	10,0	24770.0112	24770.0312
	12	20	4,0	11,0	24770.0113	24770.0313
	16	20	4,0	12,0	24770.0115	24770.0315
	20	20	4,0	12,0	24770.0117	24770.0317
	25	20	4,0	12,0	24770.0119	–
	30	20	4,0	13,0	24770.0121	–
M 6	12	24	5,0	18,0	24770.0132	24770.0332
	16	24	5,0	20,0	24770.0134	24770.0334
	20	24	5,0	20,0	24770.0136	24770.0336
	25	24	5,0	20,0	24770.0138	24770.0338
	30	24	5,0	22,0	24770.0140	–
	40	24	5,0	23,0	24770.0142	–
M 8	16	30	6,0	36,0	24770.0152	24770.0352
	20	30	6,0	37,0	24770.0154	24770.0354
	25	30	6,0	39,0	24770.0156	24770.0356
	30	30	6,0	40,0	24770.0158	24770.0358
	35	30	6,0	42,0	24770.0160	–
	40	30	6,0	44,0	24770.0161	–
M10	20	36	8,0	71,0	24770.0172	24770.0372
	25	36	8,0	72,0	24770.0174	24770.0374
	30	36	8,0	76,0	24770.0176	24770.0376
	35	36	8,0	78,0	24770.0178	–
	40	36	8,0	80,0	24770.0180	24770.0380

High Knurled Nuts (with Collar) • DIN 466

EH 24780.

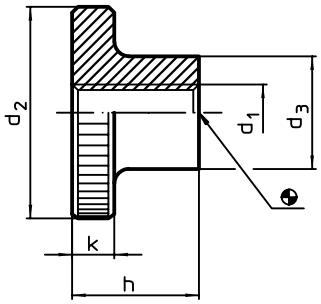


PRODUCT DESCRIPTION

Material

- Steel, blackened, quality 5
- Stainless steel 1.4301, dull blasted

DRAWING

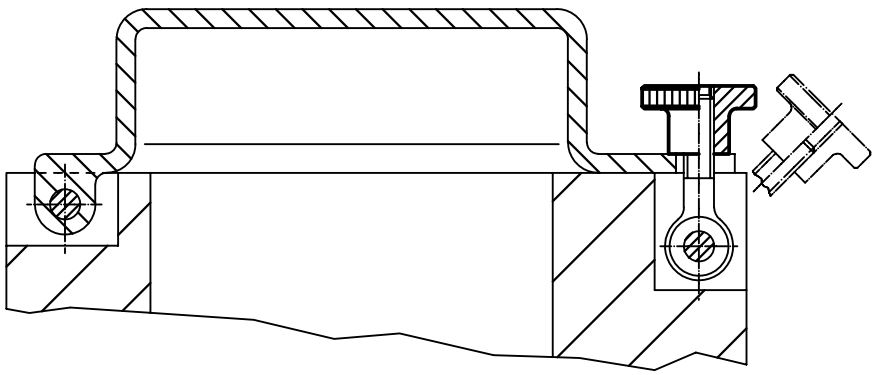


ORDER INFORMATION

Dimensions						Art. No.	
d_1	d_2	d_3	h	k		steel	stainless steel
		[mm]			[g]		
M 3	12	6	7,5	2,5	2,9	24780.0030	–
M 4	16	8	9,5	3,5	6,7	24780.0040	24780.0240
M 5	20	10	11,5	4,0	12,0	24780.0050	24780.0250
M 6	24	12	15,0	5,0	23,0	24780.0060	24780.0260
M 8	30	16	18,0	6,0	44,0	24780.0080	24780.0280
M10	36	20	23,0	8,0	85,0	24780.0100	24780.0300
M12	40	22	25,0	10,0	119,0	24780.0120[1)]	–

[1)] DIN standards do not include these dimensions.

APPLICATION EXAMPLE



High Knurled Thumb Screws • DIN 464

EH 24790.



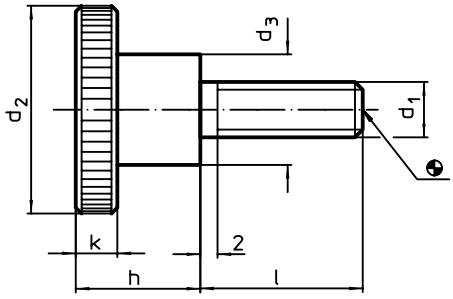
PRODUCT DESCRIPTION

All knurled screws are one-piece manufactured. Contrary to the official standard sheet, they all have a thread up to the head, but no recess at the thread end.

Material

- Steel, blackened, quality 5.8
- Stainless steel 1.4305, dull blasted

DRAWING



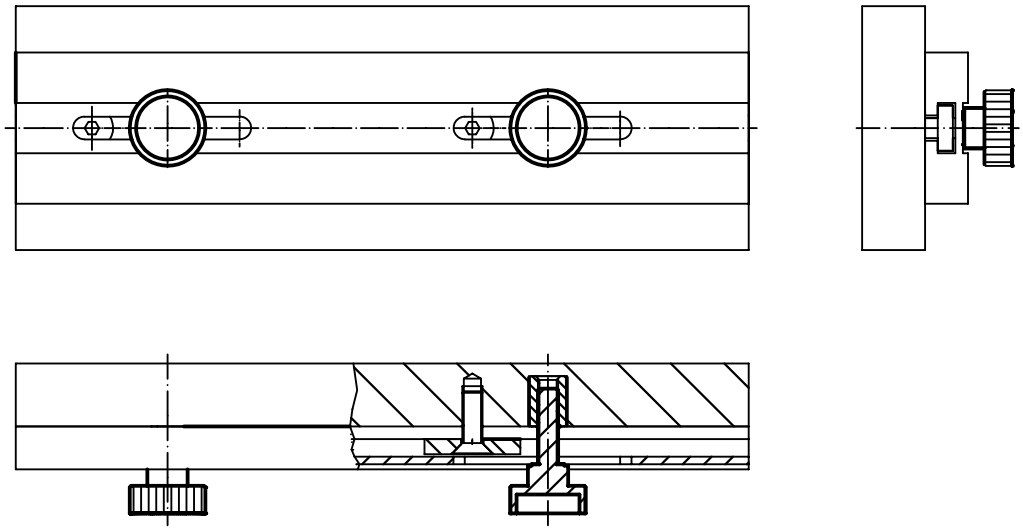
ORDER INFORMATION

Dimensions							Art. No.	
d_1	l	d_2	d_3	h	k		steel	stainless steel
[mm]						[g]		
M 3	6	12	6	7,5	2,5	3,7	24790.0074	24790.0274
	10	12	6	7,5	2,5	3,8	24790.0076	24790.0276
	12	12	6	7,5	2,5	4,0	24790.0077	24790.0277
	16	12	6	7,5	2,5	4,0	24790.0079	24790.0279
	20	12	6	7,5	2,5	4,5	24790.0081	–
M 4	5	16	8	9,5	3,5	7,7	24790.0092	–
	8	16	8	9,5	3,5	7,9	24790.0094	24790.0294
	10	16	8	9,5	3,5	8,1	24790.0095	24790.0295
	12	16	8	9,5	3,5	8,3	24790.0096	24790.0296
	16	16	8	9,5	3,5	8,4	24790.0098	24790.0298
	20	16	8	9,5	3,5	9,1	24790.0100	24790.0300
	25	16	8	9,5	3,5	9,0	24790.0102	24790.0302
M 5	6	20	10	11,5	4,0	14,0	24790.0112	–
	8	20	10	11,5	4,0	15,0	24790.0113	–
	10	20	10	11,5	4,0	15,0	24790.0114	24790.0314
	12	20	10	11,5	4,0	15,0	24790.0115	24790.0315
	16	20	10	11,5	4,0	16,0	24790.0117	24790.0317
	20	20	10	11,5	4,0	16,0	24790.0119	24790.0319
	25	20	10	11,5	4,0	17,0	24790.0121	24790.0321
	30	20	10	11,5	4,0	17,0	24790.0123	24790.0323
M 6	8	24	12	15,0	5,0	28,0	24790.0132	–
	10	24	12	15,0	5,0	27,0	24790.0133	–
	12	24	12	15,0	5,0	28,0	24790.0134	24790.0334
	16	24	12	15,0	5,0	28,0	24790.0136	24790.0336
	20	24	12	15,0	5,0	29,0	24790.0138	24790.0338
	25	24	12	15,0	5,0	30,0	24790.0140	24790.0340
	30	24	12	15,0	5,0	31,0	24790.0142	24790.0342
	35	24	12	15,0	5,0	31,0	24790.0144	24790.0344

→

Dimensions							Art. No.	
d_1	l	d_2	d_3	h	k		steel	stainless steel
[mm]						[g]		
M 8	**12**	30	16	18,0	6,0	53,0	24790.0152	–
	16	30	16	18,0	6,0	55,0	24790.0154	24790.0354
	20	30	16	18,0	6,0	56,0	24790.0156	24790.0356
	25	30	16	18,0	6,0	58,0	24790.0158	24790.0358
	30	30	16	18,0	6,0	60,0	24790.0160	24790.0360
	35	30	16	18,0	6,0	60,0	24790.0162	24790.0362
	40	30	16	18,0	6,0	61,0	24790.0164	–
M10	**15**	36	20	23,0	8,0	104,0	24790.0171	–
	20	36	20	23,0	8,0	106,0	24790.0173	–
	25	36	20	23,0	8,0	109,0	24790.0175	–
	30	36	20	23,0	8,0	112,0	24790.0177	–
	35	36	20	23,0	8,0	116,0	24790.0179	–
	40	36	20	23,0	8,0	116,0	24790.0181	–

APPLICATION EXAMPLE



Knurled Nuts • plastic

EH 24820.



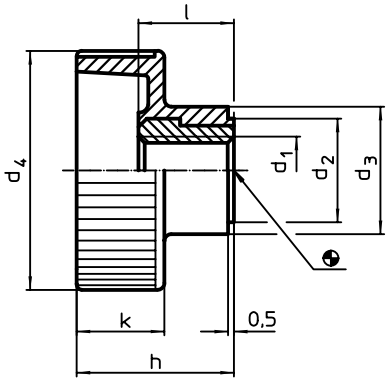
PRODUCT DESCRIPTION

Material

Bushing
- Steel, zinc-plated by galvanization
- Stainless steel 1.4305

Handle
- Thermoplastic PA, black

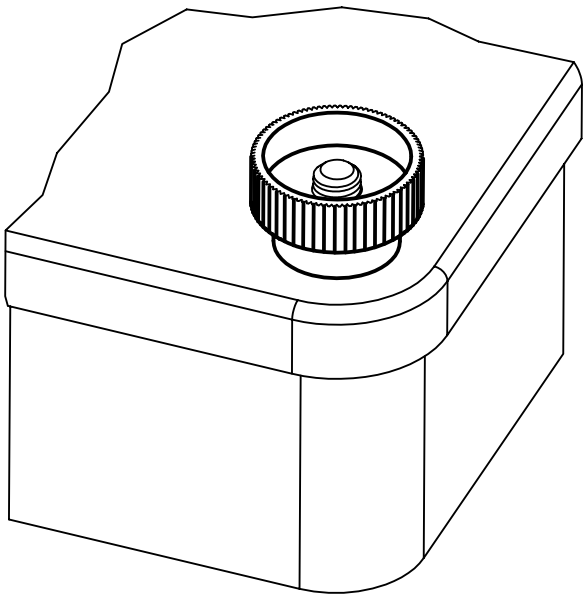
DRAWING



ORDER INFORMATION

Dimensions										Art. No.
d_1	d_2	d_3	d_4	h	k	l	min.	max.	[g]	
[mm]							[°C]			
bushing from steel										
M 4	9	12	19	14,0	8,0	9,0	-30	80	4,5	24820.0004
M 5	9	12	19	14,0	8,0	9,0	-30	80	4,0	24820.0005
M 6	12	14	24	16,5	9,5	10,5	-30	80	7,0	24820.0006
M 8	14	16	30	19,5	11,0	11,5	-30	80	10,0	24820.0008
M10	16	18	36	22,5	12,5	14,0	-30	80	15,0	24820.0010
bushing from stainless steel										
M 5	9	12	19	14,0	8,0	9,0	-30	80	4,0	24820.0205
M 6	12	14	24	16,5	9,5	10,5	-30	80	7,0	24820.0206
M 8	14	16	30	19,5	11,0	11,5	-30	80	10,0	24820.0208

APPLICATION EXAMPLE



Knurled Thumb Screws • plastic

EH 24830.



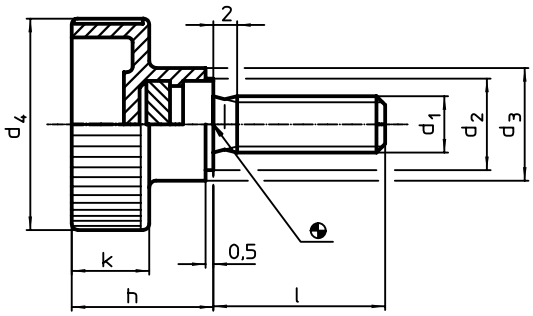
PRODUCT DESCRIPTION

Material

Handle
- Thermoplastic PA, black

Screw
- Steel, zinc-plated by galvanization
- Stainless steel 1.4567

DRAWING



ORDER INFORMATION

Dimensions										Art. No.	
d_1	l	d_2	d_3	d_4	h	k	min.	max.		steel	stainless steel
[mm]							[°C]		[g]		
M 4	10	9	12	19	14,0	8,0	-30	80	4,0	24830.0030	–
	15	9	12	19	14,0	8,0	-30	80	4,0	24830.0032	–
	20	9	12	19	14,0	8,0	-30	80	4,2	24830.0034	–
	30	9	12	19	14,0	8,0	-30	80	7,0	24830.0036	–
M 5	10	9	12	19	14,0	8,0	-30	80	4,3	24830.0042	24830.0242
	15	9	12	19	14,0	8,0	-30	80	5,0	24830.0043	24830.0243
	20	9	12	19	14,0	8,0	-30	80	5,5	24830.0045	24830.0245
	25	9	12	19	14,0	8,0	-30	80	6,0	24830.0046	24830.0246
M 6	10	12	14	24	16,5	9,5	-30	80	7,0	24830.0050	24830.0250
	16	12	14	24	16,5	9,5	-30	80	8,0	24830.0053	24830.0253
	20	12	14	24	16,5	9,5	-30	80	9,0	24830.0054	24830.0254
	25	12	14	24	16,5	9,5	-30	80	9,0	24830.0055	24830.0255
	30	12	14	24	16,5	9,5	-30	80	10,0	24830.0057	24830.0257
M 8	16	14	16	30	19,5	11,0	-30	80	14,0	24830.0060	–
	20	14	16	30	19,5	11,0	-30	80	16,0	24830.0062	24830.0262
	25	14	16	30	19,5	11,0	-30	80	17,0	24830.0064	24830.0264
	30	14	16	30	19,5	11,0	-30	80	19,0	24830.0065	24830.0265
	40	14	16	30	19,5	11,0	-30	80	20,0	24830.0067	24830.0267
M10	20	16	18	36	22,5	12,5	-30	80	30,0	24830.0070	24830.0270
	25	16	18	36	22,5	12,5	-30	80	31,0	24830.0072	24830.0272
	30	16	18	36	22,5	12,5	-30	80	33,0	24830.0074	24830.0274
	40	16	18	36	22,5	12,5	-30	80	38,0	24830.0076	–
	45	16	18	36	22,5	12,5	-30	80	43,0	–	24830.0278
	55	16	18	36	22,5	12,5	-30	80	48,0	–	24830.0280

Tommy Screws • DIN 6304 with fixed pin

EH 24490.



PRODUCT DESCRIPTION

With this version, the pin is pressed in.

Material

- Free cutting steel, blackened, pressure lug hardened.

MORE INFORMATION

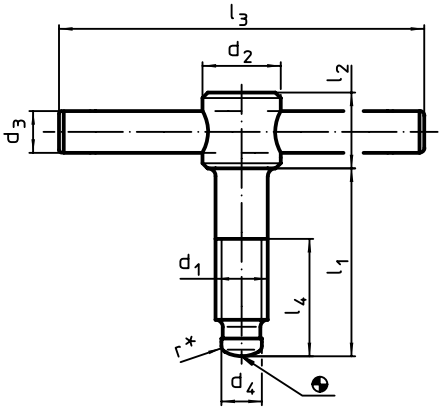
References

Thrust point for thrust pad DIN 6311 form S, EH 22560.

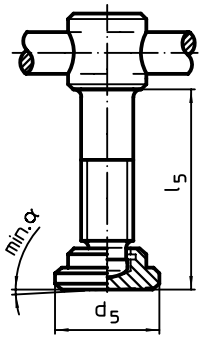
Further products

Thrust Pads, DIN 6311 and low model → p. 257

DRAWING



picture 1



picture 2

* to ease assembly the DIN 6304 specification has been completed by r

ORDER INFORMATION

Dimensions [mm]										α min.		Art. No.
d_1	l_1	d_2	d_3	d_4	d_5	l_2	l_3 ~	l_4	l_5 ~		[g]	
without thrust pad, form E – picture 1												
M 6	**40**	12	5	4,5	–	10	50	30	–	–	21	24490.0006
	50	12	5	4,5	–	10	50	40	–	–	23	24490.0007
M 8	**50**	14	6	6,0	–	12	60	35	–	–	39	24490.0008
	60	14	6	6,0	–	12	60	45	–	–	43	24490.0009
M10	**60**	18	8	8,0	–	14	80	40	–	–	82	24490.0010
	70	18	8	8,0	–	14	80	50	–	–	86	24490.0011
M12	**70**	20	10	8,0	–	18	100	50	–	–	140	24490.0012
	80	20	10	8,0	–	18	100	60	–	–	149	24490.0013
M16	**75**	24	12	12,0	–	20	120	55	–	–	248	24490.0016
	90	24	12	12,0	–	20	120	70	–	–	267	24490.0017
	110	24	12	12,0	–	20	120	90	–	–	294	24490.0018
M20	**75**	30	16	15,5	–	28	140	55	–	–	475	24490.0020
	90	30	16	15,5	–	28	140	70	–	–	506	24490.0021
	110	30	16	15,5	–	28	140	90	–	–	548	24490.0022
with thrust pad, form F – picture 2												
M 6	**40**	12	5	4,5	12	10	50	30	42,1	7°	24	24490.0106
	50	12	5	4,5	12	10	50	40	52,1	7°	28	24490.0107
M 8	**50**	14	6	6,0	16	12	60	35	53,0	4°	49	24490.0108
	60	14	6	6,0	16	12	60	45	63,0	4°	54	24490.0109
M10	**60**	18	8	8,0	20	14	80	40	63,6	3°	97	24490.0110
	70	18	8	8,0	20	14	80	50	73,6	3°	102	24490.0111
M12	**70**	20	10	8,0	25	18	100	50	74,6	3°	173	24490.0112
	80	20	10	8,0	25	18	100	60	84,6	3°	178	24490.0113
M16	**75**	24	12	12,0	32	20	120	55	80,4	5°	317	24490.0116
	90	24	12	12,0	32	20	120	70	95,4	5°	342	24490.0117
	110	24	12	12,0	32	20	120	90	115,4	5°	367	24490.0118
M20	**75**	30	16	15,5	40	28	140	55	80,5	4°	573	24490.0120
	90	30	16	15,5	40	28	140	70	95,5	4°	603	24490.0121
	110	30	16	15,5	40	28	140	90	115,5	4°	643	24490.0122

Tommy Screws • DIN 6306 with moveable pin

EH 24500.



PRODUCT DESCRIPTION

With this version, the pin is moveable and held by the spring.

Material

- Free cutting steel, blackened, pressure lug hardened.

MORE INFORMATION

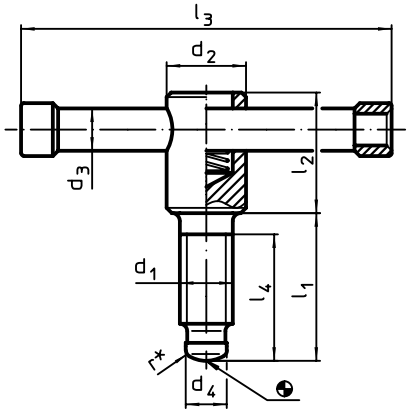
References

Thrust point for thrust pad DIN 6311 form S, EH 22560.

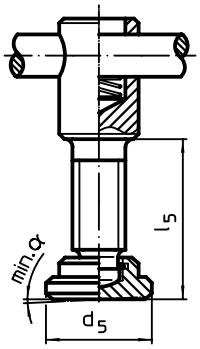
Further products

Thrust Pads, DIN 6311 and low model → p. 257

DRAWING



picture 1



picture 2

* to ease assembly the DIN 6306 specification has been completed by r

ORDER INFORMATION

Dimensions [mm]										α min.	[g]	Art. No.
d_1	l_1	d_2	d_3	d_4	d_5	l_2	l_3	l_4	l_5 ~			
without thrust pad, form D – picture 1												
M 8	**40**	14	6	6,0	–	25	60	32	–	–	41	24500.0008
	50	14	6	6,0	–	25	60	42	–	–	45	24500.0009
M10	**40**	18	8	8,0	–	32	80	30	–	–	91	24500.0010
	50	18	8	8,0	–	32	80	40	–	–	95	24500.0011
M12	**50**	20	10	8,0	–	35	100	40	–	–	154	24500.0012
	60	20	10	8,0	–	35	100	50	–	–	161	24500.0013
M16	**55**	24	13	12,0	–	40	120	45	–	–	330	24500.0016
	70	24	13	12,0	–	40	120	60	–	–	318	24500.0017
	90	24	13	12,0	–	40	120	60	–	–	345	24500.0018
M20	**55**	30	16	15,5	–	45	140	45	–	–	522	24500.0020
	70	30	16	15,5	–	45	140	60	–	–	551	24500.0021
	90	30	16	15,5	–	45	140	80	–	–	593	24500.0022
with thrust pad, form E – picture 2												
M 8	**40**	14	6	6,0	16	25	60	32	43,0	3°	50	24500.0108
	50	14	6	6,0	16	25	60	42	53,0	3°	54	24500.0109
M10	**40**	18	8	8,0	20	32	80	30	43,6	3°	110	24500.0110
	50	18	8	8,0	20	32	80	40	53,6	3°	114	24500.0111
M12	**50**	20	10	8,0	25	35	100	40	54,6	3°	193	24500.0112
	60	20	10	8,0	25	35	100	50	64,6	3°	198	24500.0113
M16	**55**	24	13	12,0	32	40	120	45	60,4	5°	357	24500.0116
	70	24	13	12,0	32	40	120	60	75,4	5°	377	24500.0117
	90	24	13	12,0	32	40	120	80	95,4	5°	402	24500.0118
M20	**55**	30	16	15,5	40	45	140	45	60,5	4°	623	24500.0120
	70	30	16	15,5	40	45	140	60	75,5	4°	653	24500.0121
	90	30	16	15,5	40	45	140	80	95,5	4°	693	24500.0122

Tommy Nuts • DIN 6305 with fixed pin

EH 24510.



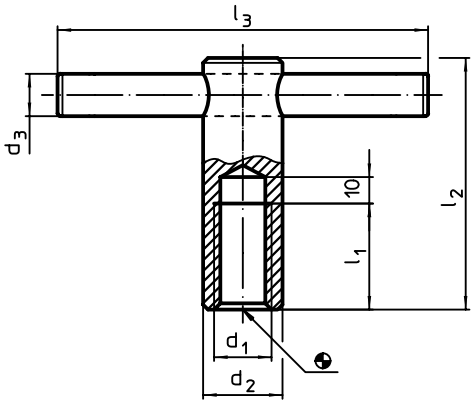
PRODUCT DESCRIPTION

With this version, the pin is pressed in.

Material

- Free cutting steel, blackened

DRAWING

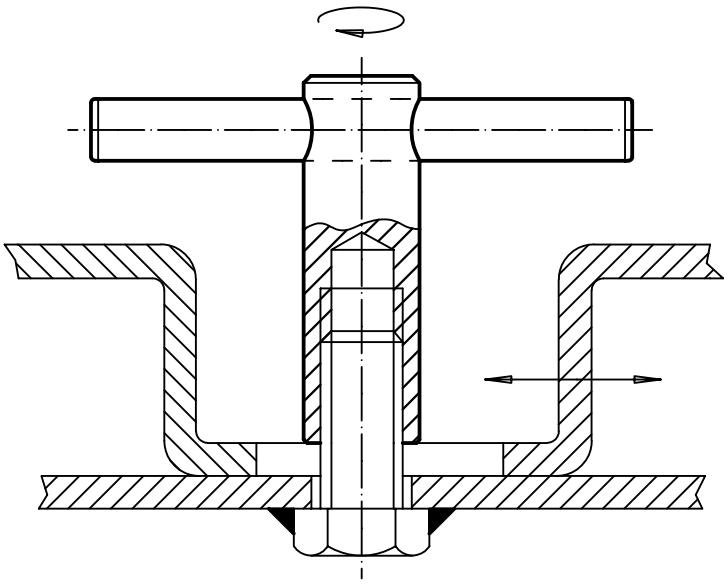


ORDER INFORMATION

Dimensions							Art. No.
d_1	d_2	d_3	l_1	l_2	l_3 ~	[g]	
		[mm]					
M 8	16	6	16	50	60	79	24510.0508[1]
M10	18	8	20	60	80	127	24510.0510
M12	20	10	25	70	100	192	24510.0512
M16	24	12	35	85	120	318	24510.0516
M20	30	16	40	95	140	590	24510.0520

[1] DIN standards do not include these dimensions.

APPLICATION EXAMPLE



Tommy Nuts • DIN 6307 with moveable pin

EH 24510.



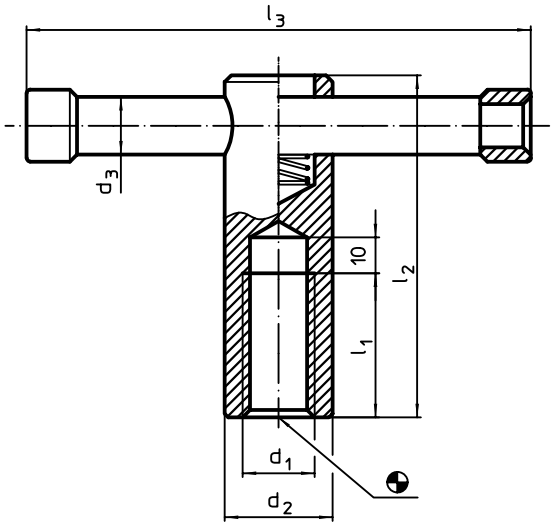
PRODUCT DESCRIPTION

With this version, the pin is moveable and held by the spring.

Material

- Free cutting steel, blackened

DRAWING

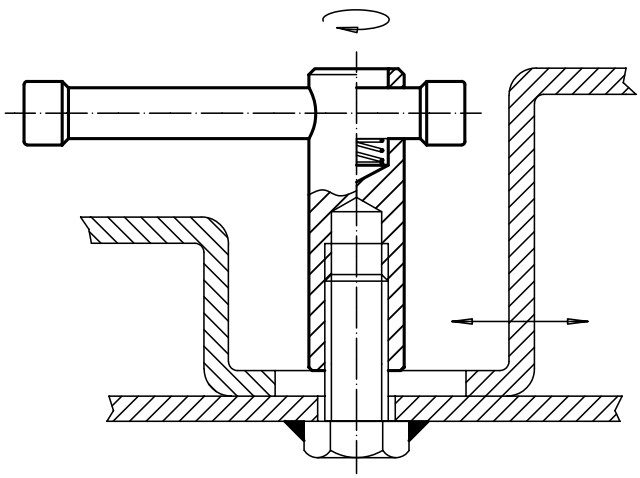


ORDER INFORMATION

Dimensions							Art. No.
d_1	d_2	d_3	l_1	l_2	l_3	[g]	
			[mm]				
M 8	16	6	16	50	60	69	24510.0708[1]
M10	18	8	20	60	80	112	24510.0710
M12	20	10	25	70	100	179	24510.0712
M16	24	13	35	85	120	327	24510.0716
M20	30	16	40	95	140	581	24510.0720

[1] DIN standards do not include these dimensions.

APPLICATION EXAMPLE



T-Handles

EH 24512.

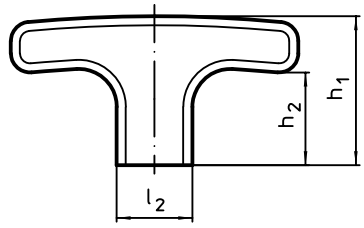


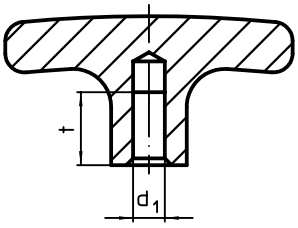
PRODUCT DESCRIPTION

Material

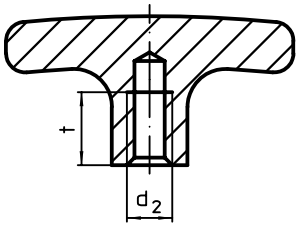
- Aluminium, plastic coated, similar to RAL 9005 black, matt structure

DRAWING

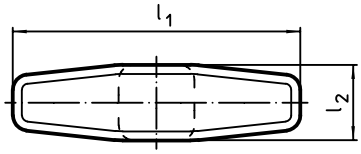




picture 1



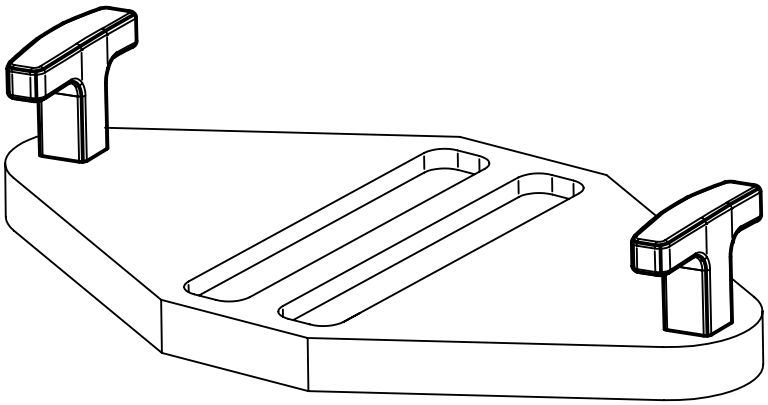
picture 2



ORDER INFORMATION

Dimensions								Art. No.
d_1 H7	d_2	l_1	l_2	h_1	h_2	t		
[mm]							[g]	
with smooth blind hole – picture 1								
6	**–**	**55**	14	33	22	12	31	24512.0020
8	**–**	**67**	16	37	25	16	46	24512.0030
		80	20	41	26	16	80	24512.0035
with threaded blind hole – picture 2								
–	**M 6**	**55**	14	33	22	12	33	24512.0120
	M 8	**55**	14	33	22	12	40	24512.0125
		67	16	37	25	16	48	24512.0130
		80	20	41	26	16	80	24512.0135
	M10	**80**	20	41	26	16	80	24512.0140

APPLICATION EXAMPLE



Mushroom-Type Knobs

EH 24540.





PRODUCT DESCRIPTION

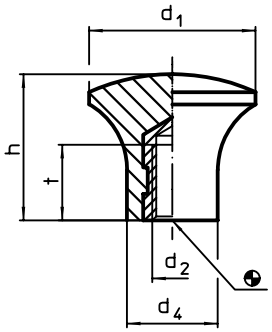
Material

Mushroom-type knob
- Thermosetting plastic PF 31, black

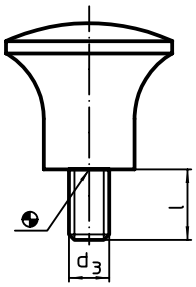
Bushing
- Brass

Screw
- Steel, zinc-plated by galvanization

DRAWING



picture 1

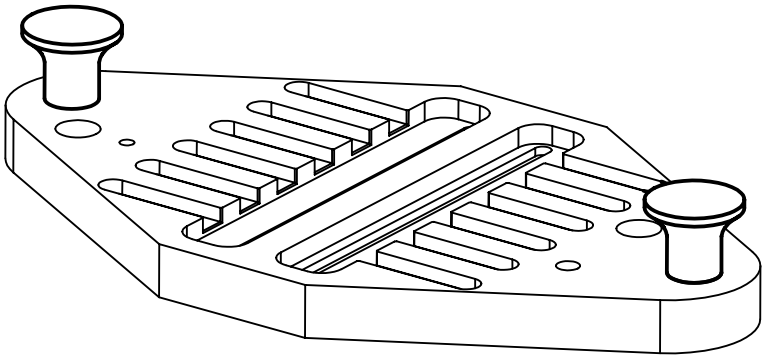


picture 2

ORDER INFORMATION

Dimensions									Art. No.
d_1	d_2	d_3	l	d_4	h	t	max. [°C]	[g]	
[mm]									
with female thread – picture 1									
17	**M5**	**–**	**–**	10	14	7	110	4,8	24540.0017
21	**M6**	**–**	**–**	12	17	11	110	8,2	24540.0021
25	**M6**	**–**	**–**	14	21	11	110	11,0	24540.0025
33	**M8**	**–**	**–**	18	29	12	110	19,0	24540.0033
with screw – picture 2									
17	**–**	**M5**	**9**	10	14	–	110	4,2	24540.0117
21	**–**	**M6**	**10**	12	17	–	110	7,1	24540.0121
25	**–**	**M6**	**10**	14	21	–	110	10,0	24540.0125
33	**–**	**M8**	**14**	18	29	–	110	23,0	24540.0133

APPLICATION EXAMPLE



Thumb Knobs

EH 24520.

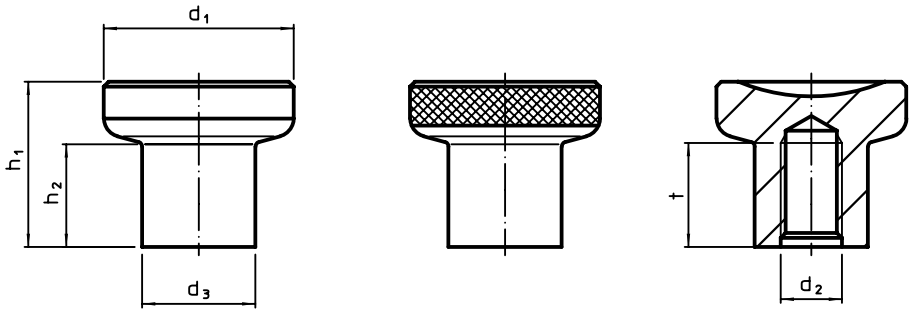


PRODUCT DESCRIPTION

Material

- Steel, blackened
- Stainless steel 1.4305, dull blasted

DRAWING

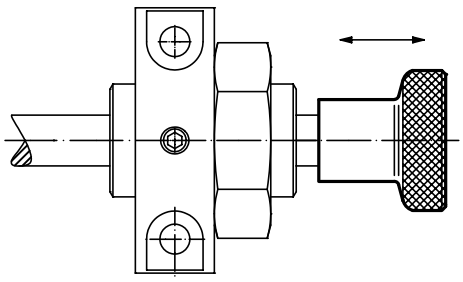


picture 1 picture 2

ORDER INFORMATION

Dimensions							Art. No.	
d_1	d_2	d_3	h_1	h_2	t min.		steel	stainless steel
[mm]						[g]		
without knurling – picture 1								
21	M 4	12,5	18,0	10,5	10	26	24520.0002	24520.0102
	M 5	12,5	18,0	10,5	10	25	24520.0003	24520.0103
25	M 6	14,5	22,5	14,0	12	42	24520.0005	24520.0105
	M 8	14,5	22,5	14,0	12	39	24520.0006	24520.0106
31	M 8	18,5	27,0	17,0	15	75	24520.0008	24520.0108
	M10	18,5	27,0	17,0	17	74	24520.0009	24520.0109
with knurling – picture 2								
21	M 4	12,5	18,0	10,5	10	26	24520.0022	24520.0122
	M 5	12,5	18,0	10,5	10	25	24520.0023	24520.0123
25	M 6	14,5	22,5	14,0	12	40	24520.0025	24520.0125
	M 8	14,5	22,5	14,0	12	40	24520.0026	24520.0126
31	M 8	18,5	27,0	17,0	15	75	24520.0028	24520.0128
	M10	18,5	27,0	17,0	17	74	24520.0029	24520.0129

APPLICATION EXAMPLE



Conical Knobs

EH 24550.

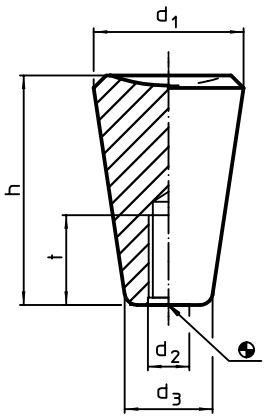


PRODUCT DESCRIPTION

Material

- Thermosetting plastic PF 31, black

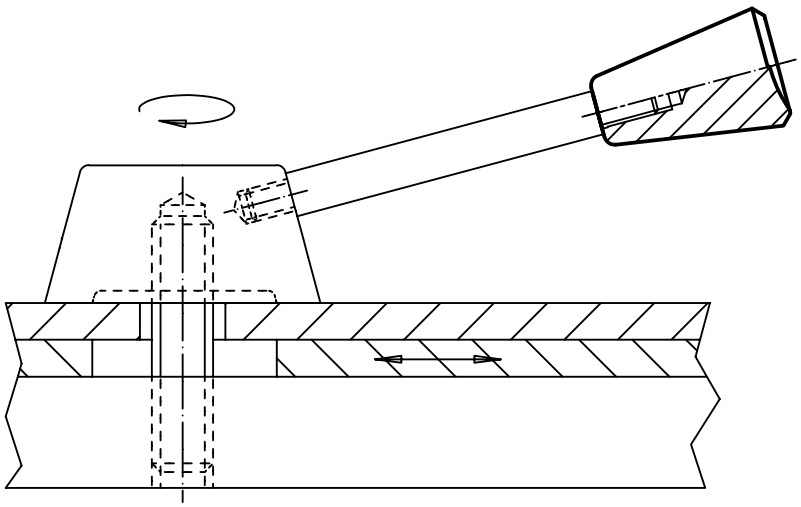
DRAWING



ORDER INFORMATION

Dimensions							Art. No.
d_1	d_2	d_3 ~	h	t min.	max.		
		[mm]			[°C]	[g]	
20	M 5	12	30	18	110	7,8	24550.0010
	M 6	12	30	18	110	7,4	24550.0011
25	M 6	15	38	18	110	14,0	24550.0020
	M 8	15	38	18	110	13,0	24550.0021
30	M 8	18	46	18	110	26,0	24550.0030
	M10	18	46	18	110	25,0	24550.0031
35	M10	21	53	21	110	46,0	24550.0040
	M12	21	53	21	110	43,0	24550.0041

APPLICATION EXAMPLE



Ball Knobs • DIN 319

EH 24560.



PRODUCT DESCRIPTION

The DIN 319 ball knobs are jointless and polished.

Material

Bushing
- Steel, zinc-plated by galvanization
- Brass

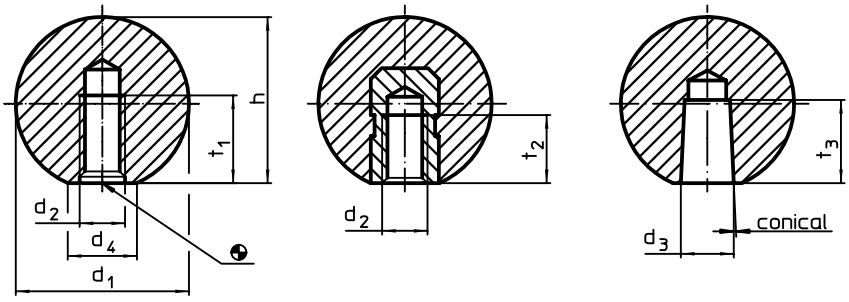
Ball
- DIN 7708 - thermosetting plastic (PF 31), black similar to RAL 9005
- DIN 7708 - thermosetting plastic (PF 31), red similar to RAL 3003

Assembly

Assembly instruction for form M: fitted by lightly tapping with a hammer, holds in position without being cemented. For the counter element a h9-fit is sufficient.

4

DRAWING



picture 1 picture 2 picture 3

ORDER INFORMATION

Dimensions								For pin h9	max.		Art. No.	
d_1	d_2	d_3	d_4 ~	h ~	t_1 min.	t_2 min.	t_3 min.				black	red
[mm]								[mm]	[°C]	[g]		
with moulded material thread, form C – picture 1												
16	M 4	–	8	15,0	7	–	–	–	110	3,2	24560.0016	24560.0516
20	M 5	–	12	18,0	9	–	–	–	110	5,2	24560.0020	24560.0520
25	M 6	–	15	22,5	11	–	–	–	110	10,0	24560.0025	24560.0525
32	M 8	–	18	29,0	14	–	–	–	110	22,0	24560.0032	24560.0532
40	M10	–	22	37,0	18	–	–	–	110	43,0	24560.0040	24560.0540
50	M12	–	28	46,0	21	–	–	–	110	86,0	24560.0050	24560.0550
with threaded bushing, form E – picture 2												
16	M 4	–	8	15,0	–	6,0	–	–	110	5,1	24560.0116[1)]	24560.0616[1)]
20	M 5	–	12	18,0	–	7,5	–	–	110	6,6	24560.0120	24560.0620
25	M 6	–	15	22,5	–	9,0	–	–	110	13,0	24560.0125	24560.0625
32	M 8	–	18	29,0	–	12,0	–	–	110	26,0	24560.0132	24560.0632
40	M10	–	22	37,0	–	15,0	–	–	110	56,0	24560.0140	24560.0640
50	M12	–	28	46,0	–	18,0	–	–	110	108,0	24560.0150	24560.0650
with taper bore form M – picture 3												
16	–	4	8	15,0	–	–	9	4	110	2,7	24560.0216	–
20	–	5	12	18,0	–	–	12	5	110	5,1	24560.0220	–
25	–	6	15	22,5	–	–	15	6	110	9,3	24560.0225	–
32	–	8	18	29,0	–	–	15	8	110	19,0	24560.0232	–
40	–	10	22	37,0	–	–	20	10	110	39,0	24560.0240	–
50	–	12	28	46,0	–	–	22	12	110	84,0	24560.0250	–

[1)] bushing from brass

Ball Knobs • metal types similar to DIN 319

EH 24561.



PRODUCT DESCRIPTION

Material

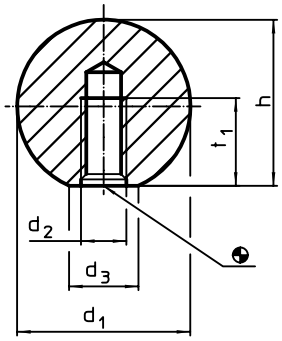
- Steel, polished, bright
- Stainless steel 1.4305, dull blasted
- Aluminium, polished

MORE INFORMATION

Notes

Supplement DIN 319 Form C about metallic versions.

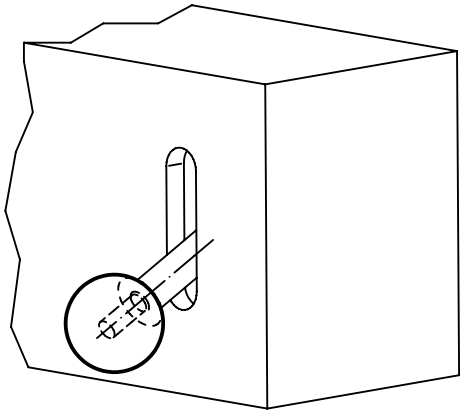
DRAWING



ORDER INFORMATION

Dimensions						Art. No.
d_1	d_2	d_3 ~	h ~	t_1 min.		
[mm]					[g]	
steel						
16	M 4	8	15,0	7,0	16	24561.0016
20	M 5	12	18,0	9,0	26	24561.0020
25	M 6	15	22,5	11,0	58	24561.0025
32	M 8	18	29,0	14,5	116	24561.0032
40	M10	22	37,0	18,0	241	24561.0040
50	M12	27	46,0	21,0	475	24561.0050
stainless steel						
16	M 4	8	15,0	7,0	16	24561.0216
20	M 5	12	18,0	9,0	31	24561.0220
25	M 6	15	22,5	11,0	59	24561.0225
32	M 8	18	29,0	14,5	122	24561.0232
40	M10	22	37,0	18,0	242	24561.0240
aluminium Al						
16	M 4	8	15,0	7,0	7	24561.0116
20	M 5	12	18,0	9,0	12	24561.0120
25	M 6	15	22,5	11,0	22	24561.0125
32	M 8	18	29,0	14,5	44	24561.0132
40	M10	22	37,0	18,0	87	24561.0140
50	M12	27	46,0	21,0	173	24561.0150

APPLICATION EXAMPLE



Star Grips • DIN 6336 cast iron

EH 24650.





PRODUCT DESCRIPTION

Sandblasted or tumbled.

Material

Handle

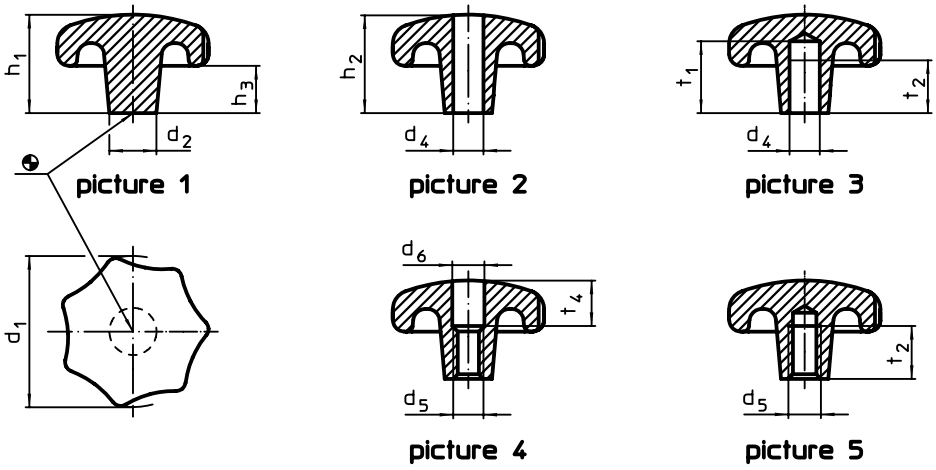
- Grey cast iron GG 20, bright

MORE INFORMATION

Notes

Grips with different bores or surface treatment can be obtained on request.

DRAWING



ORDER INFORMATION

Dimensions												Art. No.
d_1	d_2	d_4 H7	d_5	d_6	h_1	h_2	h_3	t_1	t_2	t_4	[g]	
					[mm]							
raw part, form A – picture 1												
32	12	–	–	–	21	–	10	–	–	–	55	24650.0032
40	14	–	–	–	26	–	13	–	–	–	82	24650.0040
50	18	–	–	–	34	–	17	–	–	–	150	24650.0050
63	20	–	–	–	42	–	21	–	–	–	260	24650.0063
80	25	–	–	–	52	–	25	–	–	–	510	24650.0080
with smooth throughgoing bore, form B – picture 2												
32	12	6	–	–	–	20	–	–	–	–	49	24650.0132
40	14	8	–	–	–	25	–	–	–	–	72	24650.0140
50	18	10	–	–	–	32	–	–	–	–	130	24650.0150
63	20	12	–	–	–	40	–	–	–	–	220	24650.0163
80	25	16	–	–	–	50	–	–	–	–	440	24650.0180
with smooth blind hole, form C – picture 3												
32	12	6	–	–	–	20	–	15	12	–	50	24650.0232
40	14	8	–	–	–	25	–	18	15	–	74	24650.0240
50	18	10	–	–	–	32	–	21	18	–	135	24650.0250
63	20	12	–	–	–	40	–	25	22	–	235	24650.0263
80	25	16	–	–	–	50	–	32	28	–	460	24650.0280
with thread, drilled out, form D – picture 4												
32	12	–	M 6	6,4	–	20	–	–	–	10	49	24650.0332
40	14	–	M 8	8,4	–	25	–	–	–	12	72	24650.0340
50	18	–	M10	10,5	–	32	–	–	–	16	127	24650.0350
63	20	–	M12	13,0	–	40	–	–	–	20	220	24650.0363
80	25	–	M16	17,0	–	50	–	–	–	30	545	24650.0380
with threaded blind hole, form E – picture 5												
32	12	–	M 6	–	–	20	–	–	12	–	50	24650.0432
40	14	–	M 8	–	–	25	–	–	15	–	74	24650.0440
50	18	–	M10	–	–	32	–	–	18	–	135	24650.0450
63	20	–	M12	–	–	40	–	–	22	–	235	24650.0463
80	25	–	M16	–	–	50	–	–	28	–	460	24650.0480

Star Grips • DIN 6336 light metal

EH 24660.



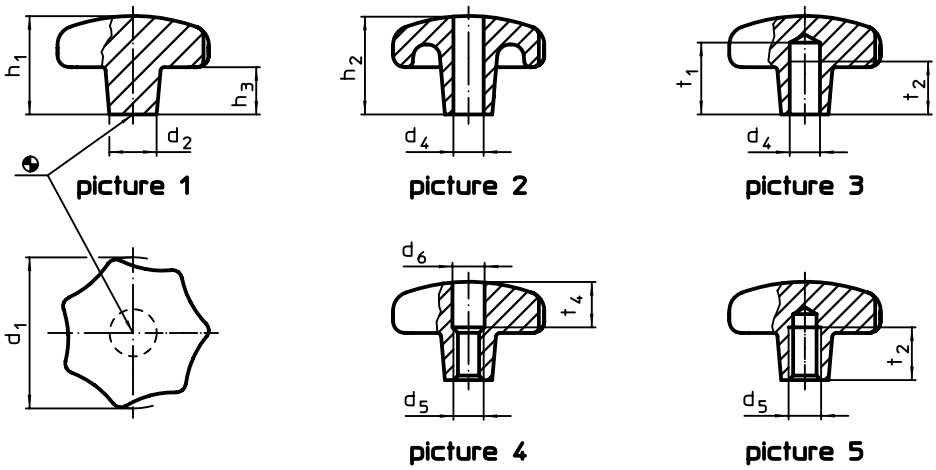
PRODUCT DESCRIPTION

Material

Handle

- Light metal Al, unpolished
- Light metal Al, polished

DRAWING



ORDER INFORMATION

Dimensions												Art. No.	
d_1	d_2	d_4 H7	d_5	d_6	h_1	h_2	h_3	t_1	t_2	t_4	[g]	unpolished	polished
[mm]													
raw part, form A – picture 1													
40	14	–	–	–	26	–	13	–	–	–	36	24660.0040	–
50	18	–	–	–	34	–	17	–	–	–	70	24660.0050	–
63	20	–	–	–	42	–	21	–	–	–	128	24660.0063	–
80	25	–	–	–	52	–	25	–	–	–	245	24660.0080	–
with smooth blind hole, form C – picture 3													
40	14	8	–	–	–	25	–	18	15	–	30	24660.0240	24660.0640
50	18	10	–	–	–	32	–	21	18	–	63	24660.0250	24660.0650
63	20	12	–	–	–	40	–	25	22	–	117	24660.0263	24660.0663
80	25	16	–	–	–	50	–	32	28	–	223	24660.0280	24660.0680
with thread, drilled out, form D – picture 4													
40	14	–	M 8	8,4	–	25	–	–	–	12	32	24660.0340	24660.0740
50	18	–	M10	10,5	–	32	–	–	–	16	62	24660.0350	24660.0750
63	20	–	M12	13,0	–	40	–	–	–	20	109	24660.0363	24660.0763
80	25	–	M16	17,0	–	50	–	–	–	30	218	24660.0380	24660.0780
with threaded blind hole, form E – picture 5													
40	14	–	M 8	–	–	25	–	–	15	–	33	24660.0440	24660.0840
50	18	–	M10	–	–	32	–	–	18	–	63	24660.0450	24660.0850
63	20	–	M12	–	–	40	–	–	22	–	118	24660.0463	24660.0863
80	25	–	M16	–	–	50	–	–	28	–	227	24660.0480	24660.0880

Star Grips • DIN 6336 stainless steel die-cast

EH 24661.





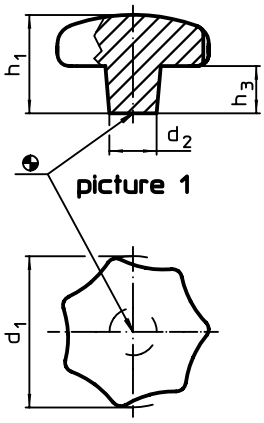
PRODUCT DESCRIPTION

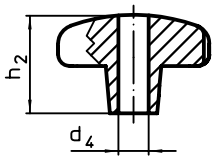
Material

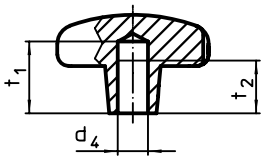
Handle

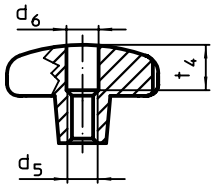
- Stainless steel A2, dull blasted

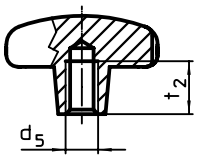
DRAWING











ORDER INFORMATION

Dimensions [mm]									[g]	Art. No.
d_1	d_2	d_5	d_6	h_1	h_2	h_3	t_2	t_4		
raw part, form A – picture 1										
32	12	–	–	21	–	10	–	–	56	24661.0032
40	14	–	–	26	–	13	–	–	85	24661.0040
50	18	–	–	34	–	17	–	–	181	24661.0050
63	20	–	–	42	–	21	–	–	319	24661.0063
with thread, drilled out, form D – picture 4										
32	12	M 6	6,4	–	20	–	–	10	52	24661.0332
40	14	M 8	8,4	–	25	–	–	12	75	24661.0340
50	18	M10	10,5	–	32	–	–	16	158	24661.0350
63	20	M12	13,0	–	40	–	–	20	279	24661.0363
with threaded blind hole, form E – picture 5										
32	12	M 6	–	–	20	–	12	–	53	24661.0432
40	14	M 8	–	–	25	–	15	–	77	24661.0440
50	18	M10	–	–	32	–	18	–	165	24661.0450
63	20	M12	–	–	40	–	22	–	296	24661.0463

Star Grips • DIN 6336 plastic

EH 24670.



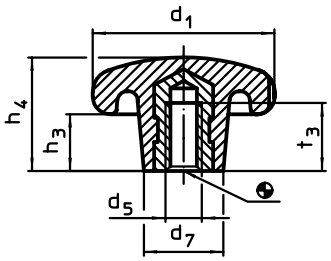
PRODUCT DESCRIPTION

Material

Bushing
- Brass
- Steel, zinc-plated by galvanization
- Stainless steel A2

Handle
- DIN 7708 - thermosetting plastic (PF 31), black similar to RAL 9005

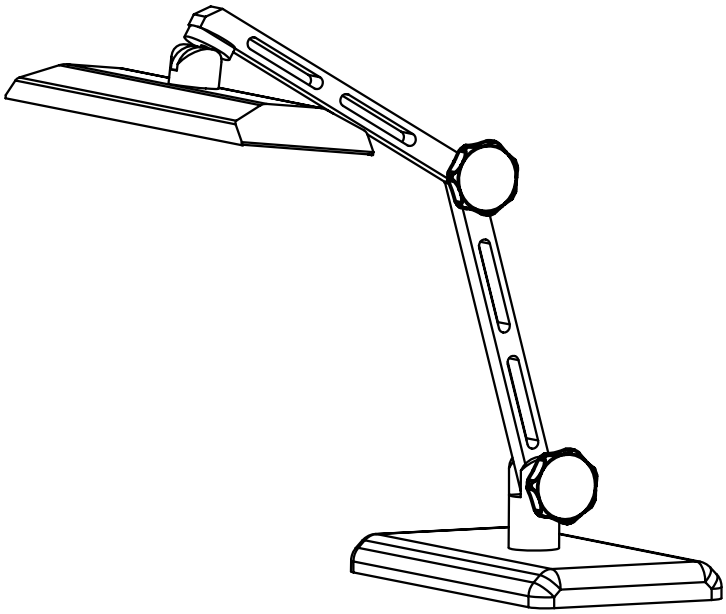
DRAWING



ORDER INFORMATION

Dimensions								Art. No.		
d_1	d_5	d_7	h_3	h_4	t_3	max.		brass	steel	stainless steel
[mm]						[°C]	[g]			
with threaded bushing, form K										
20	M 4	10	7	13	6,5	110	3,4	24670.0220	–	–
25	M 5	12	8	16	9,5	110	7,4	–	24670.0225	24670.1225
32	M 6	14	10	20	12,0	110	11,0	–	24670.0232	24670.1232
40	M 8	18	13	25	14,0	110	22,0	–	24670.0240	24670.1240
50	M10	22	17	32	18,0	110	40,0	–	24670.0250	24670.1250
63	M12	26	21	40	22,0	110	83,0	–	24670.0263	24670.1263
80	M16	35	25	50	30,0	110	161,0	–	24670.0280	24670.1280

APPLICATION EXAMPLE



Star Grips • stainless steel

EH 24690.



PRODUCT DESCRIPTION

Material

Handle

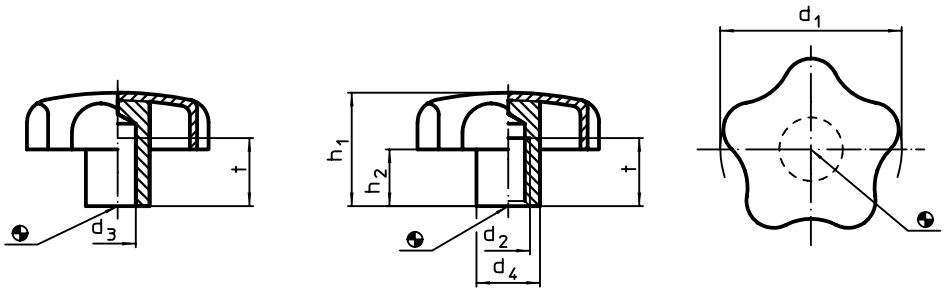
- Stainless steel 1.4301, dull blasted

MORE INFORMATION

Notes

Grip: Sheet-iron drawn. **Hub:** Butt-welded

DRAWING

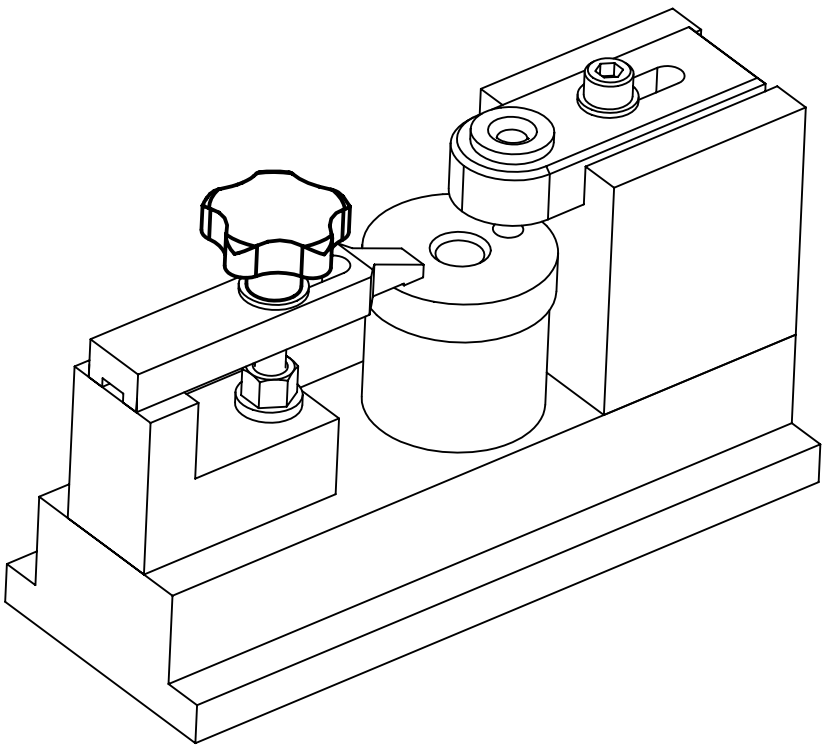


picture 1 picture 2

ORDER INFORMATION

Dimensions								Art. No.
d_1	d_2	d_3 H7	d_4	h_1 ~	h_2 ~	t min.		
			[mm]				[g]	
with smooth blind hole – picture 1								
40	**–**	**8**	14	25	12,5	15	29	24690.0240
50	**–**	**10**	18	32	17,5	18	67	24690.0250
60	**–**	**12**	20	40	21,0	22	110	24690.0260
with threaded blind hole – picture 2								
40	**M 8**	**–**	14	25	12,5	15	37	24690.0440
50	**M10**	**–**	18	32	17,5	18	69	24690.0450
60	**M12**	**–**	20	40	21,0	22	112	24690.0460

APPLICATION EXAMPLE



Grub Screws with Star Grip • stainless steel

EH 24690.



PRODUCT DESCRIPTION

Material

Handle
- Stainless steel 1.4301, dull blasted

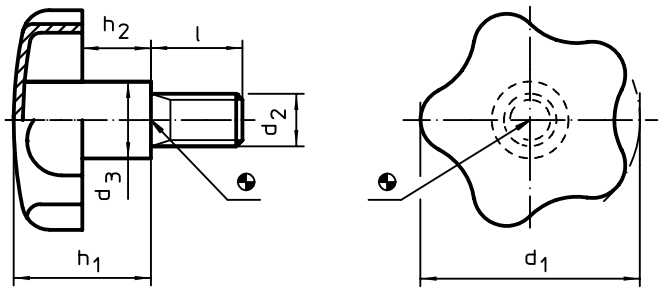
Screw
- Stainless steel 1.4301

MORE INFORMATION

Notes

Grip: Sheet-iron drawn. **Hub:** Butt-welded

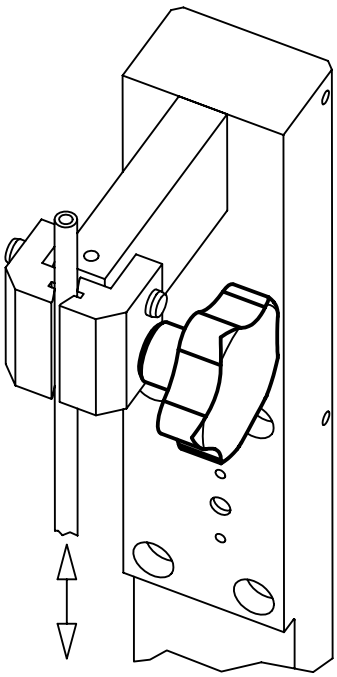
DRAWING



ORDER INFORMATION

Dimensions							Art. No.
d_1	d_2	l	d_3	h_1 ~	h_2 ~		
[mm]						[g]	
40	**M 8**	**20**	14	24,0	12,0	50	**24690.0140**
		30	14	24,0	12,0	55	**24690.0142**
		40	14	24,0	12,0	56	**24690.0144**
50	**M10**	**20**	18	30,0	16,5	95	**24690.0150**
		30	18	30,0	16,5	97	**24690.0152**
		40	18	30,0	16,5	100	**24690.0154**
60	**M12**	**30**	20	37,5	20,0	155	**24690.0160**
		40	20	37,5	20,0	162	**24690.0162**
		50	20	37,5	20,0	169	**24690.0164**

APPLICATION EXAMPLE



Star Grips • stainless steel, solid

EH 24690.





PRODUCT DESCRIPTION

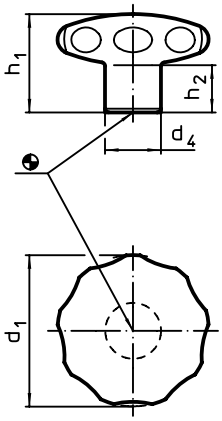
Version without dirt trap. Convenient for all applications having high hygienic requirements (e.g. food industry).

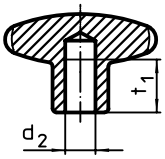
Material

Handle

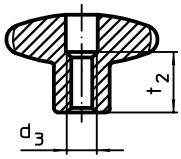
- Stainless steel 1.4305, dull blasted

DRAWING

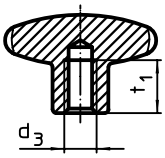




picture 1



picture 2



picture 3

ORDER INFORMATION

Dimensions									Art. No.
d_1	d_2 h7	d_3	d_4	h_1	h_2	t_1 min.	t_2	[g]	
			[mm]						
with smooth blind hole – picture 1									
40	**8**	**–**	18	30,5	15	12	–	131	24690.0643
50	**10**	**–**	21	34,0	17	15	–	223	24690.0653
60	**12**	**–**	25	39,0	18	18	–	386	24690.0663
with thread, drilled-out – picture 2									
40	**–**	**M 8**	18	30,5	15	–	13	129	24690.0644
50	**–**	**M10**	21	34,0	17	–	16	216	24690.0654
60	**–**	**M12**	25	39,0	18	–	20	362	24690.0664
with threaded blind hole – picture 3									
40	**–**	**M 6**	18	30,5	15	12	–	134	24690.0645
		M 8	18	30,5	15	12	–	132	24690.0646
50	**–**	**M 8**	21	34,0	17	15	–	226	24690.0655
		M10	21	34,0	17	15	–	222	24690.0656
60	**–**	**M10**	25	39,0	18	18	–	395	24690.0665
		M12	25	39,0	18	18	–	384	24690.0666

Grub Screws with Star Grip • DIN 6336 plastic

EH 24740.



PRODUCT DESCRIPTION

Material

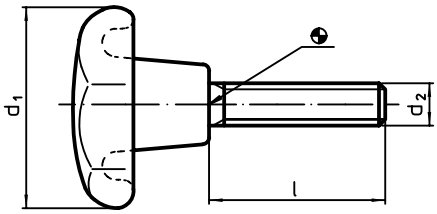
Handle
- DIN 7708 - thermosetting plastic (PF 31), black similar to RAL 9005

Screw
- Steel, zinc-plated by galvanization
- Stainless steel A2

MORE INFORMATION

Notes
Special types, e.g. differing lengths or threaded pins from brass / stainless steel on request.

DRAWING



ORDER INFORMATION

Dimensions			max.		Art. No.	
d_1	d_2	l			steel	stainless steel
[mm]			[°C]	[g]		
form L						
25	M 5	10	110	7,3	24740.0051	24740.1051
		15	110	7,2	24740.0053	24740.1053
		20	110	8,7	24740.0056	24740.1056
		25	110	8,7	24740.0058	24740.1058
		30	110	9,2	24740.0059	24740.1059
32	M 6	15	110	14,0	24740.0101	24740.1101
		20	110	14,0	24740.0104	24740.1104
		25	110	14,0	24740.0106	24740.1106
		30	110	16,0	24740.0107	24740.1107
		40	110	17,0	24740.0110	24740.1110
40	M 8	20	110	28,0	24740.0152	24740.1152
		25	110	31,0	24740.0154	24740.1154
		30	110	32,0	24740.0155	24740.1155
		40	110	35,0	24740.0158	24740.1158
		50	110	38,0	24740.0160	24740.1160
50	M10	25	110	51,0	24740.0202	24740.1202
		30	110	54,0	24740.0203	24740.1203
		40	110	60,0	24740.0206	24740.1206
		50	110	64,0	24740.0208	24740.1208
		60	110	77,0	24740.0209	24740.1209
63	M12	30	110	101,0	24740.0251	24740.1251
		40	110	108,0	24740.0254	24740.1254
		50	110	115,0	24740.0256	24740.1256
		60	110	121,0	24740.0257	24740.1257
		80	110	143,0	24740.0260	24740.1260
80	M16	40	110	223,0	24740.0302	24740.1302
		50	110	237,0	24740.0304	24740.1304
		60	110	232,0	24740.0305	24740.1305
		80	110	274,0	24740.0308	24740.1308

Star Grips • plastic

EH 24750.



PRODUCT DESCRIPTION

Material

Cap
- Thermoplastic PA, black similar to RAL 9005
- Thermoplastic PA, white similar to RAL 9019
- Thermoplastic PA, orange similar to RAL 2004
- Thermoplastic PA, yellow similar to RAL 1016
- Thermoplastic PA, blue similar to RAL 5015

Handle
- Thermoplastic PA 6, black similar to RAL 9005

Threaded bushing
- Stainless steel

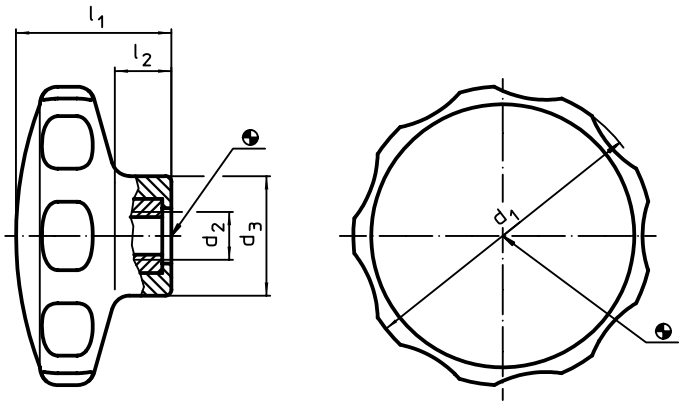
MORE INFORMATION

Notes

Special types, e.g. differing threads, on request.

4

DRAWING



ORDER INFORMATION

Dimensions								Art. No.				
d_1	d_2	d_3	l_1	l_2	min.	max.		black	white	orange	yellow	blue
[mm]					[°C]		[g]					
30	M 4	14,0	19	7	-30	80	5,3	24750.0030	24750.0031	24750.0032	24750.0033	24750.0034
	M 5	14,0	19	7	-30	80	5,7	24750.0035	24750.0036	24750.0037	24750.0038	24750.0039
40	M 5	16,5	22	9	-30	80	8,2	24750.0040	24750.0041	24750.0042	24750.0043	24750.0044
	M 6	16,5	22	9	-30	80	9,5	24750.0045	24750.0046	24750.0047	24750.0048	24750.0049
50	M 6	22,0	26	10	-30	80	16,0	24750.0050	24750.0051	24750.0052	24750.0053	24750.0054
	M 8	22,0	26	10	-30	80	19,0	24750.0055	24750.0056	24750.0057	24750.0058	24750.0059
62	M 8	22,0	35	13	-30	80	19,0	24750.0060	24750.0061	24750.0062	24750.0063	24750.0064
	M10	22,0	35	13	-30	80	39,0	24750.0065	24750.0066	24750.0067	24750.0068	24750.0069

Grub Screws with Star Grip • plastic

EH 24750.



PRODUCT DESCRIPTION

Material

Cap
- Thermoplastic PA, black similar to RAL 9005
- Thermoplastic PA, white similar to RAL 9019
- Thermoplastic PA, orange similar to RAL 2004
- Thermoplastic PA, yellow similar to RAL 1016
- Thermoplastic PA, blue similar to RAL 5015

Handle
- Thermoplastic PA 6, black similar to RAL 9005

Screw
- Stainless steel

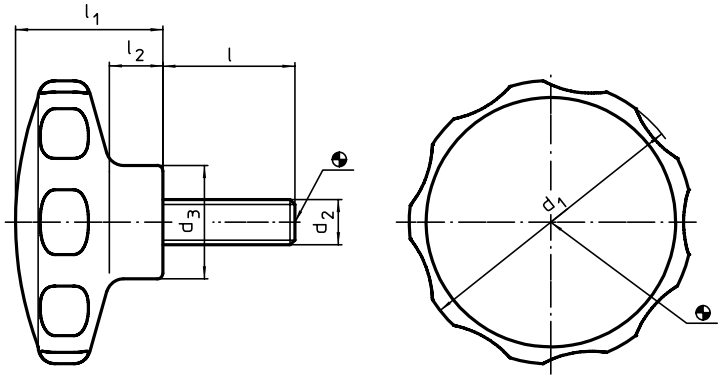
MORE INFORMATION

Notes

Special types, e.g. differing threads or thread lengths, on request.

4

DRAWING



ORDER INFORMATION

Dimensions									Art. No.				
d_1	d_2	l	d_3	l_1	l_2	min.	max.		black	white	orange	yellow	blue
[mm]						[°C]		[g]					
30	M 4	10	14,0	19	7	-30	80	6,1	24750.0100	24750.0101	24750.0102	24750.0103	24750.0104
		14	14,0	19	7	-30	80	6,6	24750.0110	24750.0111	24750.0112	24750.0113	24750.0114
		18	14,0	19	7	-30	80	6,9	24750.0120	24750.0121	24750.0122	24750.0123	24750.0124
		23	14,0	19	7	-30	80	7,3	24750.0130	24750.0131	24750.0132	24750.0133	24750.0134
		28	14,0	19	7	-30	80	7,7	24750.0140	24750.0141	24750.0142	24750.0143	24750.0144
	M 5	10	14,0	19	7	-30	80	7,1	24750.0150	24750.0151	24750.0152	24750.0153	24750.0154
		14	14,0	19	7	-30	80	7,9	24750.0160	24750.0161	24750.0162	24750.0163	24750.0164
		18	14,0	19	7	-30	80	8,4	24750.0170	24750.0171	24750.0172	24750.0173	24750.0174
		23	14,0	19	7	-30	80	9,0	24750.0180	24750.0181	24750.0182	24750.0183	24750.0184
		28	14,0	19	7	-30	80	9,0	24750.0190	24750.0191	24750.0192	24750.0193	24750.0194
40	M 5	10	16,5	22	9	-30	80	9,6	24750.0200	24750.0201	24750.0202	24750.0203	24750.0204
		14	16,5	22	9	-30	80	10,0	24750.0210	24750.0211	24750.0212	24750.0213	24750.0214
		18	16,5	22	9	-30	80	11,0	24750.0220	24750.0221	24750.0222	24750.0223	24750.0224
		23	16,5	22	9	-30	80	12,0	24750.0230	24750.0231	24750.0232	24750.0233	24750.0234
		28	16,5	22	9	-30	80	12,0	24750.0240	24750.0241	24750.0242	24750.0243	24750.0244
	M 6	14	16,5	22	9	-30	80	12,0	24750.0250	24750.0251	24750.0252	24750.0253	24750.0254
		18	16,5	22	9	-30	80	13,0	24750.0260	24750.0261	24750.0262	24750.0263	24750.0264
		23	16,5	22	9	-30	80	14,0	24750.0270	24750.0271	24750.0272	24750.0273	24750.0274
		28	16,5	22	9	-30	80	15,0	24750.0280	24750.0281	24750.0282	24750.0283	24750.0284
		38	16,5	22	9	-30	80	16,0	24750.0290	24750.0291	24750.0292	24750.0293	24750.0294

→

Dimensions									Art. No.				
d_1	d_2	l	d_3	l_1	l_2	min.	max.		black	white	orange	yellow	blue
[mm]						[°C]		[g]					
50	M 6	14	22,0	26	10	-30	80	19,0	24750.0300	24750.0301	24750.0302	24750.0303	24750.0304
		18	22,0	26	10	-30	80	19,0	24750.0310	24750.0311	24750.0312	24750.0313	24750.0314
		23	22,0	26	10	-30	80	20,0	24750.0320	24750.0321	24750.0322	24750.0323	24750.0324
		28	22,0	26	10	-30	80	21,0	24750.0330	24750.0331	24750.0332	24750.0333	24750.0334
		38	22,0	26	10	-30	80	23,0	24750.0340	24750.0341	24750.0342	24750.0343	24750.0344
	M 8	18	22,0	26	10	-30	80	26,0	24750.0350	24750.0351	24750.0352	24750.0353	24750.0354
		23	22,0	26	10	-30	80	27,0	24750.0360	24750.0361	24750.0362	24750.0363	24750.0364
		28	22,0	26	10	-30	80	29,0	24750.0370	24750.0371	24750.0372	24750.0373	24750.0374
		38	22,0	26	10	-30	80	32,0	24750.0380	24750.0381	24750.0382	24750.0383	24750.0384
		48	22,0	26	10	-30	80	35,0	24750.0390	24750.0391	24750.0392	24750.0393	24750.0394
62	M 8	18	22,0	35	13	-30	80	40,0	24750.0400	24750.0401	24750.0402	24750.0403	24750.0404
		23	22,0	35	13	-30	80	41,0	24750.0410	24750.0411	24750.0412	24750.0413	24750.0414
		28	22,0	35	13	-30	80	43,0	24750.0420	24750.0421	24750.0422	24750.0423	24750.0424
		38	22,0	35	13	-30	80	46,0	24750.0430	24750.0431	24750.0432	24750.0433	24750.0434
		48	22,0	35	13	-30	80	49,0	24750.0440	24750.0441	24750.0442	24750.0443	24750.0444
	M10	23	22,0	35	13	-30	80	51,0	24750.0450	24750.0451	24750.0452	24750.0453	24750.0454
		28	22,0	35	13	-30	80	54,0	24750.0460	24750.0461	24750.0462	24750.0463	24750.0464
		38	22,0	35	13	-30	80	59,0	24750.0470	24750.0471	24750.0472	24750.0473	24750.0474
		48	22,0	35	13	-30	80	64,0	24750.0480	24750.0481	24750.0482	24750.0483	24750.0484
		58	22,0	35	13	-30	80	69,0	24750.0490	24750.0491	24750.0492	24750.0493	24750.0494

Palm Grips • DIN 6335 cast iron

EH 24620.





PRODUCT DESCRIPTION

Sandblasted or tumbled.

Material

Handle

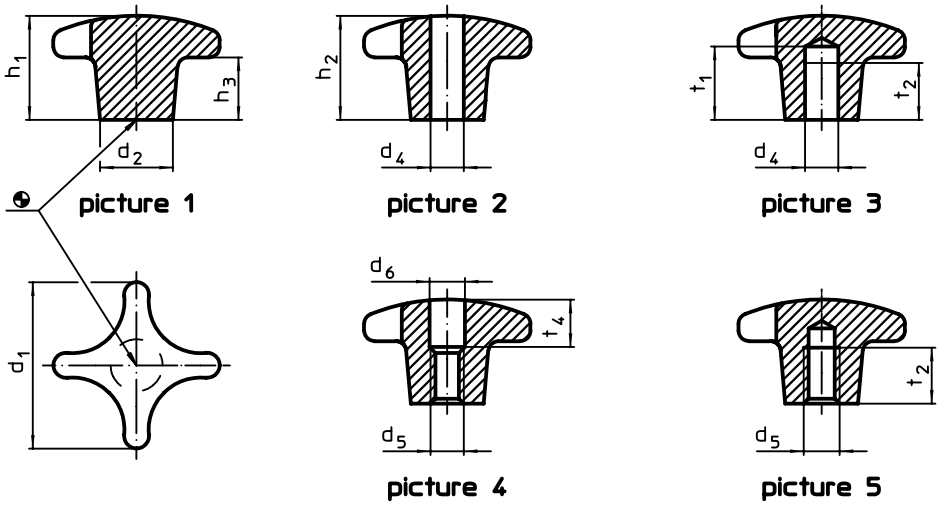
- Grey cast iron GG 20, bright

MORE INFORMATION

Notes

Grips with different bores or surface treatment can be obtained on request.

DRAWING



ORDER INFORMATION

Dimensions												Art. No.
d_1	d_2	d_4 H7	d_5	d_6	h_1	h_2	h_3	t_1	t_2	t_4	[g]	
					[mm]							
raw part, form A – picture 1												
32	12	–	–	–	21	–	10	–	–	–	38	24620.0032
40	14	–	–	–	26	–	14	–	–	–	69	24620.0040
50	18	–	–	–	34	–	20	–	–	–	115	24620.0050
63	20	–	–	–	42	–	25	–	–	–	228	24620.0063
80	25	–	–	–	52	–	30	–	–	–	415	24620.0080
100	32	–	–	–	65	–	38	–	–	–	855	24620.0090
with smooth throughgoing bore, form B – picture 2												
32	12	6	–	–	–	20	–	–	–	–	34	24620.0132
40	14	8	–	–	–	25	–	–	–	–	59	24620.0140
50	18	10	–	–	–	32	–	–	–	–	95	24620.0150
63	20	12	–	–	–	40	–	–	–	–	171	24620.0163
80	25	16	–	–	–	50	–	–	–	–	338	24620.0180
100	32	20	–	–	–	63	–	–	–	–	709	24620.0190
with smooth blind hole, form C – picture 3												
32	12	6	–	–	–	20	–	15	12	–	36	24620.0232
40	14	8	–	–	–	25	–	18	15	–	61	24620.0240
50	18	10	–	–	–	32	–	21	18	–	99	24620.0250
63	20	12	–	–	–	40	–	25	22	–	200	24620.0263
80	25	16	–	–	–	50	–	32	28	–	380	24620.0280
100	32	20	–	–	–	63	–	40	36	–	706	24620.0290

→

Dimensions												Art. No.
d_1	d_2	d_4 H7	d_5	d_6	h_1	h_2	h_3	t_1	t_2	t_4		
[mm]											[g]	
with thread, drilled out, form D – picture 4												
32	12	–	M 6	6,4	–	20	–	–	–	10	34	24620.0332
40	14	–	M 8	8,4	–	25	–	–	–	12	60	24620.0340
50	18	–	M10	10,5	–	32	–	–	–	16	95	24620.0350
63	20	–	M12	13,0	–	40	–	–	–	20	191	24620.0363
80	25	–	M16	17,0	–	50	–	–	–	30	339	24620.0380
100	32	–	M20	21,0	–	63	–	–	–	38	704	24620.0390
with threaded blind hole, form E – picture 5												
32	12	–	M 6	–	–	20	–	–	12	–	35	24620.0432
40	14	–	M 8	–	–	25	–	–	15	–	63	24620.0440
50	18	–	M10	–	–	32	–	–	18	–	103	24620.0450
63	20	–	M12	–	–	40	–	–	22	–	205	24620.0463
80	25	–	M16	–	–	50	–	–	28	–	359	24620.0480
100	32	–	M20	–	–	63	–	–	36	–	730	24620.0490

Palm Grips • DIN 6335 cast iron, plastic-coated

EH 24620.





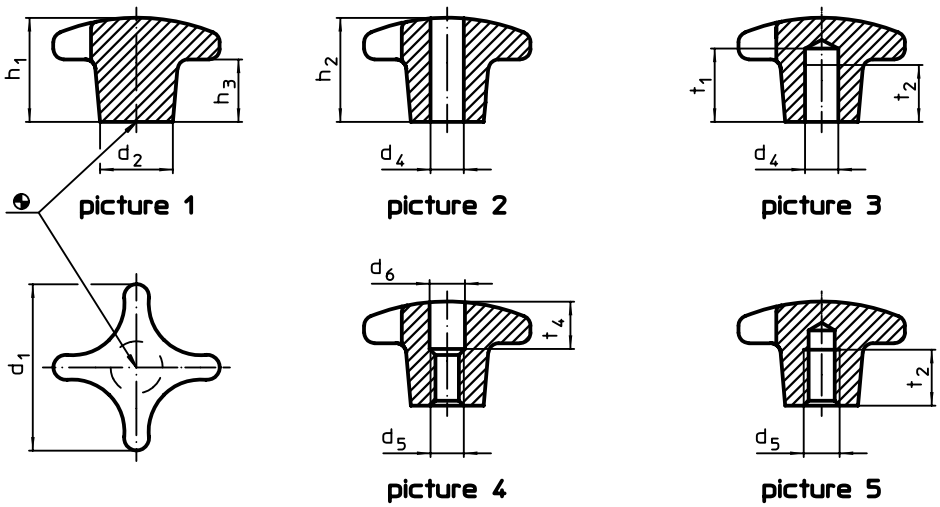
PRODUCT DESCRIPTION

Material

Handle

- Grey cast iron GG 20, plastic-coated, orange similar to RAL 2004
- Grey cast iron GG 20, plastic-coated, black similar to RAL 9005 dull finish

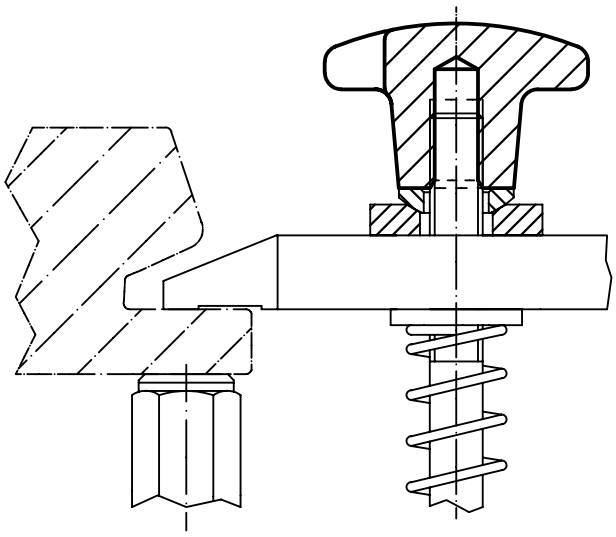
DRAWING



ORDER INFORMATION

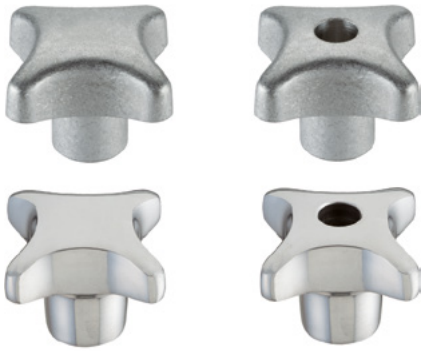
Dimensions								Art. No.	
d_1	d_2	d_4 H7	d_5	h_2	t_1	t_2		orange	black
[mm]							[g]		
with smooth blind hole, form C – picture 3									
40	14	8	–	25	18	15	62	24620.0540	24620.0640
50	18	10	–	32	21	18	106	24620.0550	24620.0650
63	20	12	–	40	25	22	201	24620.0563	24620.0663
80	25	16	–	50	32	28	353	24620.0580	24620.0680
with threaded blind hole, form E – picture 5									
40	14	–	M 8	25	–	15	56	24620.0541	24620.0641
50	18	–	M10	32	–	18	110	24620.0551	24620.0651
63	20	–	M12	40	–	22	198	24620.0564	24620.0664
80	25	–	M16	50	–	28	364	24620.0581	24620.0681

APPLICATION EXAMPLE



Palm Grips • DIN 6335 light metal

EH 24630.



PRODUCT DESCRIPTION

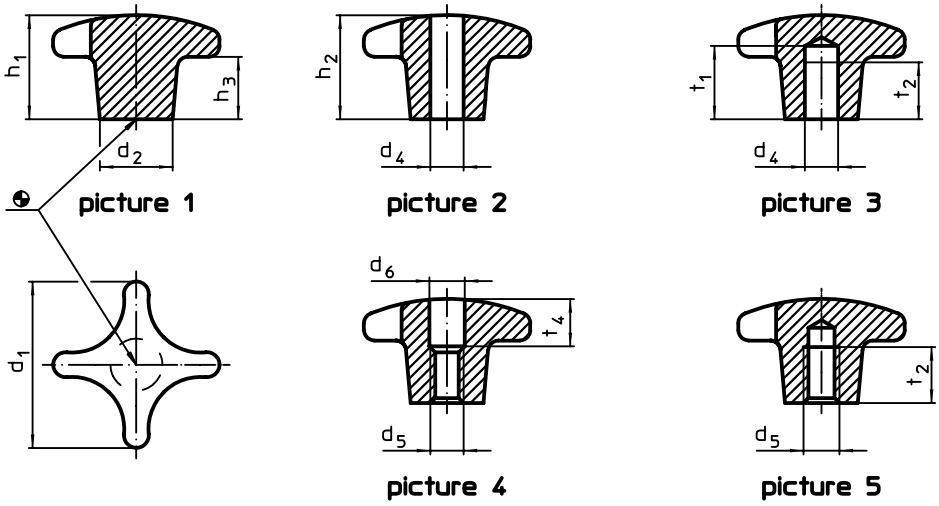
Material

Handle

- Light metal Al, unpolished
- Light metal Al, polished

4

DRAWING



ORDER INFORMATION

Dimensions												Art. No.	
d_1	d_2	d_4 H7	d_5	d_6	h_1	h_2	h_3	t_1	t_2	t_4		unpolished	polished
[mm]											[g]		
raw part, form A – picture 1													
40	14	–	–	–	26	–	14	–	–	–	27	24630.0040	–
50	18	–	–	–	34	–	20	–	–	–	51	24630.0050	–
63	20	–	–	–	42	–	25	–	–	–	95	24630.0063	–
80	25	–	–	–	52	–	30	–	–	–	161	24630.0080	–
with smooth blind hole, form C – picture 3													
40	14	8	–	–	–	25	–	18	15	–	23	24630.0240	24630.0640
50	18	10	–	–	–	32	–	21	18	–	42	24630.0250	24630.0650
63	20	12	–	–	–	40	–	25	22	–	73	24630.0263	24630.0663
80	25	16	–	–	–	50	–	32	28	–	138	24630.0280	24630.0680
with thread, drilled out, form D – picture 4													
40	14	–	M 8	8,4	–	25	–	–	–	12	23	24630.0340	24630.0740
50	18	–	M10	10,5	–	32	–	–	–	16	44	24630.0350	24630.0750
63	20	–	M12	13,0	–	40	–	–	–	20	70	24630.0363	24630.0763
80	25	–	M16	17,0	–	50	–	–	–	30	129	24630.0380	24630.0780
with threaded blind hole, form E – picture 5													
40	14	–	M 8	–	–	25	–	–	15	–	24	24630.0440	24630.0840
50	18	–	M10	–	–	32	–	–	18	–	46	24630.0450	24630.0850
63	20	–	M12	–	–	40	–	–	22	–	74	24630.0463	24630.0863
80	25	–	M16	–	–	50	–	–	28	–	142	24630.0480	24630.0880

Palm Grips • DIN 6335 stainless steel, die-cast

EH 24631.





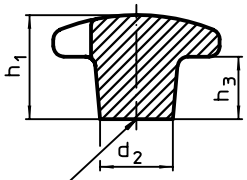
PRODUCT DESCRIPTION

Material

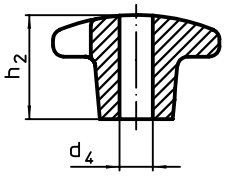
Handle

- Stainless steel A2, dull blasted

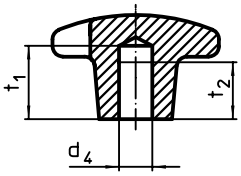
DRAWING



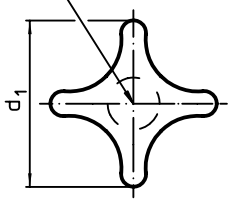
picture 1

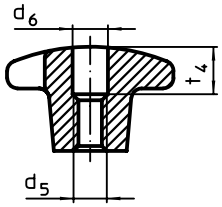


picture 2

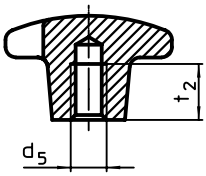


picture 3





picture 4

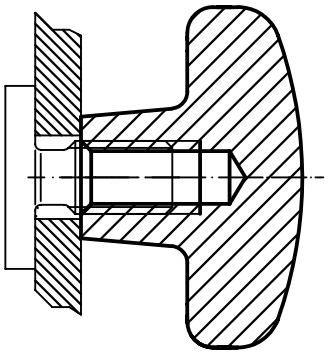


picture 5

ORDER INFORMATION

Dimensions [mm]									[g]	Art. No.
d_1	d_2	d_5	d_6	h_1	h_2	h_3	t_2	t_4		
raw part, form A – picture 1										
32	12	–	–	21	–	10	–	–	41	24631.0032
40	14	–	–	26	–	14	–	–	70	24631.0040
50	18	–	–	34	–	20	–	–	128	24631.0050
63	20	–	–	42	–	25	–	–	227	24631.0063
with thread, drilled out, form D – picture 4										
32	12	M 6	6,4	–	20	–	–	10	36	24631.0332
40	14	M 8	8,4	–	25	–	–	12	60	24631.0340
50	18	M10	10,5	–	32	–	–	16	107	24631.0350
63	20	M12	13,0	–	40	–	–	20	192	24631.0363
with threaded blind hole, form E – picture 5										
32	12	M 6	–	–	20	–	12	–	38	24631.0432
40	14	M 8	–	–	25	–	15	–	62	24631.0440
50	18	M10	–	–	32	–	18	–	114	24631.0450
63	20	M12	–	–	40	–	22	–	205	24631.0463

APPLICATION EXAMPLE



Palm Grips • DIN 6335 plastic

EH 24640.



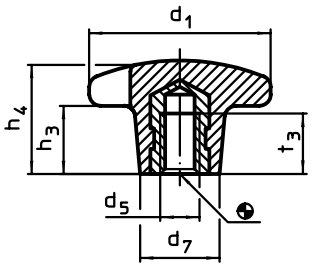
PRODUCT DESCRIPTION

Material

Bushing
- Brass
- Steel, zinc-plated by galvanization
- Stainless steel A2

Handle
- DIN 7708 - thermosetting plastic (PF 31), black similar to RAL 9005

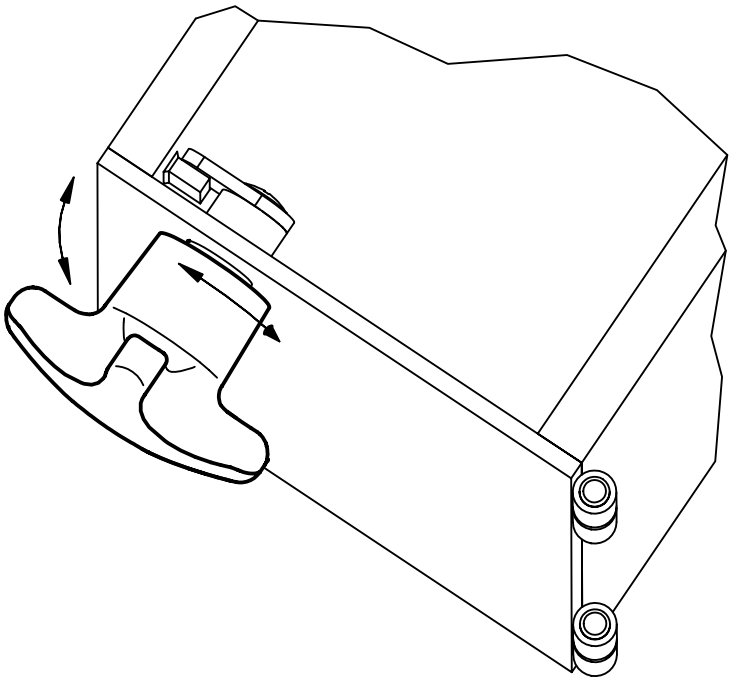
DRAWING



ORDER INFORMATION

Dimensions								Art. No.		
d_1	d_5	d_7	h_3	h_4	t_3	max.		brass	steel	stainless steel
[mm]						[°C]	[g]			
with threaded bushing, form K										
20	M 4	10	6	13	6,5	110	3,3	24640.0220	–	–
25	M 5	12	8	16	9,5	110	7,0	–	24640.0225	24640.1225
32	M 6	14	10	20	12,0	110	12,0	–	24640.0232	24640.1232
40	M 8	18	13	25	14,0	110	16,0	–	24640.0240	24640.1240
50	M10	22	20	32	18,0	110	32,0	–	24640.0250	24640.1250
63	M12	26	25	40	22,0	110	62,0	–	24640.0263	24640.1263
80	M16	35	30	50	30,0	110	137,0	–	24640.0280	24640.1280

APPLICATION EXAMPLE



Palm Grips • with axial bearing

EH 24700.



PRODUCT DESCRIPTION

Advantages of axial bearing:
- Double clamping force with same grip size, by reducing the surface friction.
- Protection of workpiece by a fixed locating surface.
- Little setting due to higher pre-clamping force of bolt resp. thread.

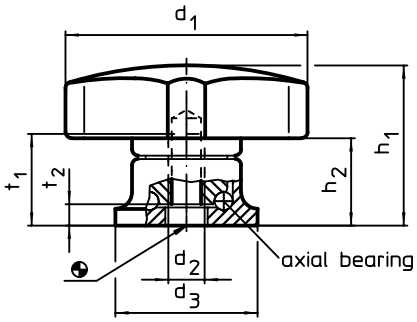
Material

Handle
- Thermoplastic PA

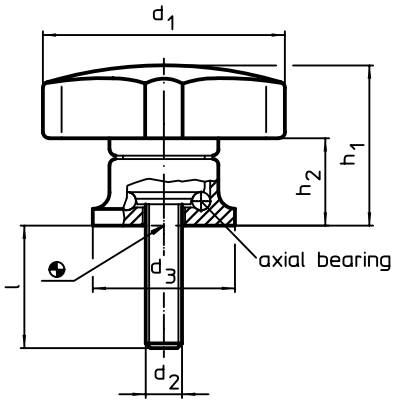
Inner part
- Steel, nitrided, blackened

Screw
- Steel, blackened, quality 8.8

DRAWING



picture 1

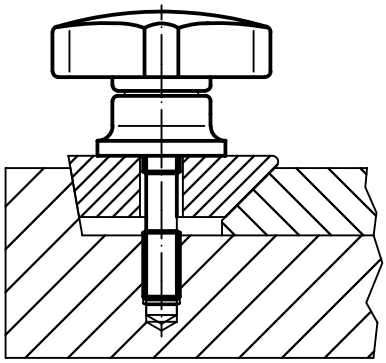


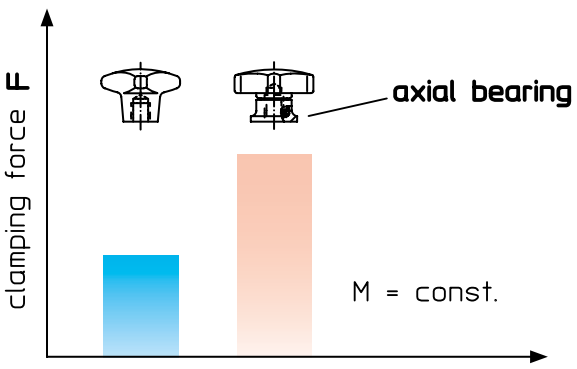
picture 2

ORDER INFORMATION

Dimensions										Art. No.
d_1	d_2	l +2	d_3	h_1 ~	h_2 ~	t_1 min.	t_2	max. [°C]	[g]	
		[mm]								
with female thread – picture 1										
40	**M 6**	**–**	24	27	15,0	12,5	5,0	80	45	24700.0040
50	**M 8**	**–**	25	34	22,5	14,0	4,2	80	68	24700.0050
63	**M10**	**–**	30	41	26,5	18,0	5,4	80	111	24700.0063
80	**M12**	**–**	35	54	34,0	26,5	6,6	80	218	24700.0080
with screw – picture 2										
40	**M 6**	**15**	24	27	15,0	–	–	80	50	24700.0042
		25	24	27	15,0	–	–	80	52	24700.0044
50	**M 8**	**20**	25	34	22,5	–	–	80	81	24700.0053
		35	25	34	22,5	–	–	80	86	24700.0056
63	**M10**	**30**	30	41	26,5	–	–	80	137	24700.0066
		40	30	41	26,5	–	–	80	142	24700.0068
80	**M12**	**30**	35	54	34,0	–	–	80	258	24700.0083
		50	35	54	34,0	–	–	80	276	24700.0087

APPLICATION EXAMPLE





Grub Screws with Palm Grip • DIN 6335 plastic

EH 24730.



PRODUCT DESCRIPTION

Material

Handle

- DIN 7708 - thermosetting plastic (PF 31), black similar to RAL 9005

Screw

- Steel, zinc-plated by galvanization
- Stainless steel A2

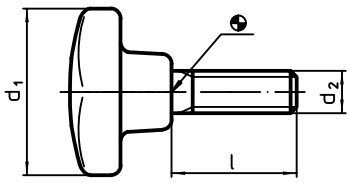
MORE INFORMATION

Notes

Special types, e.g. differing lengths or threaded pins from brass / stainless steel on request.

4

DRAWING



ORDER INFORMATION

Dimensions			max.		Art. No.	
d_1	d_2	l			steel	stainless steel
[mm]			[°C]	[g]		
form L						
25	**M 5**	**10**	110	6,7	24730.0051	24730.1051
		15	110	7,0	24730.0053	24730.1053
		20	110	7,5	24730.0056	24730.1056
		25	110	8,1	24730.0058	24730.1058
		30	110	8,9	24730.0059	24730.1059
32	**M 6**	**15**	110	11,0	24730.0101	24730.1101
		20	110	12,0	24730.0104	24730.1104
		25	110	15,0	24730.0106	24730.1106
		30	110	16,0	24730.0107	24730.1107
		40	110	16,0	24730.0110	24730.1110
40	**M 8**	**20**	110	24,0	24730.0152	24730.1152
		25	110	25,0	24730.0154	24730.1154
		30	110	26,0	24730.0155	24730.1155
		40	110	30,0	24730.0158	24730.1158
		50	110	32,0	24730.0160	24730.1160
50	**M10**	**25**	110	41,0	24730.0202	24730.1202
		30	110	48,0	24730.0203	24730.1203
		40	110	51,0	24730.0206	24730.1206
		50	110	56,0	24730.0208	24730.1208
		60	110	68,0	24730.0209	24730.1209
63	**M12**	**30**	110	86,0	24730.0251	24730.1251
		40	110	93,0	24730.0254	24730.1254
		50	110	99,0	24730.0256	24730.1256
		60	110	105,0	24730.0257	24730.1257
		80	110	112,0	24730.0260	24730.1260
80	**M16**	**40**	110	198,0	24730.0302	24730.1302
		50	110	175,0	24730.0304	24730.1304
		60	110	219,0	24730.0305	24730.1305
		80	110	251,0	24730.0308	24730.1308

Torque Handles

EH 24710.



PRODUCT DESCRIPTION

The handle with integrated torque mechanism allows a defined torque limination during tightening.
Reaching the torque results in an "over-locking". For releasing the torque is transmitted indefinitely.

Material

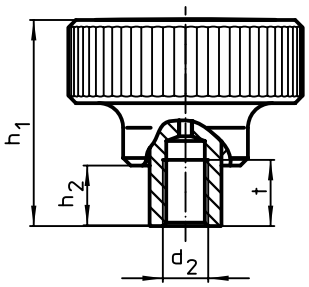
Cap
- Thermoplastic PA 6, light grey, similar to RAL 7035

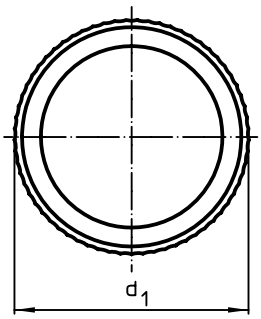
Torque mechanism
- Steel, hardened

Body
- Aluminium, black anodised

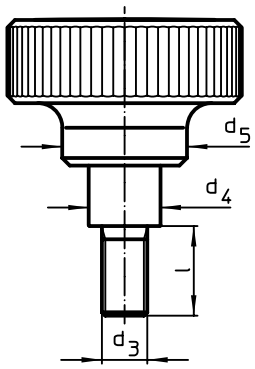
Inner part
- Steel, blackened

DRAWING

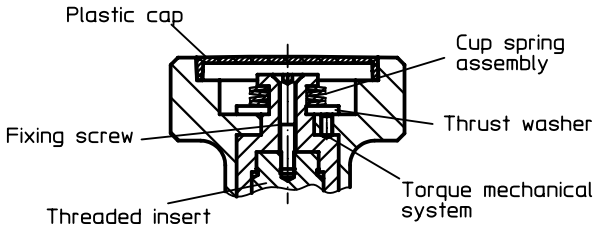




picture 1



picture 2



ORDER INFORMATION

Dimensions									Tightening torque +/- 10% max.		Art. No.
d_1	d_2	d_3	l	d_4	d_5	h_1	h_2	t	max. [°C]	[Nm]	[g]	
[mm]												
with female thread – picture 1												
34	M 3	–	–	10,0	21	37,5	9,5	7	100	1,0	48	24710.0020
	M 4	–	–	10,0	21	37,5	9,5	9	100	1,0	48	24710.0022
	M 5	–	–	10,0	21	37,5	9,5	9	100	1,0	48	24710.0024
	M 6	–	–	10,0	21	37,5	9,5	9	100	1,0	48	24710.0026
42	M 6	–	–	13,5	27	43,5	11,5	11	100	2,0	127	24710.0030
	M 8	–	–	13,5	27	43,5	11,5	11	100	2,0	127	24710.0032
52	M10	–	–	19,0	32	54,0	15,5	17	100	3,0	206	24710.0040
	M12	–	–	19,0	32	54,0	15,5	17	100	3,0	206	24710.0042
62	M10	–	–	19,0	33	54,0	15,5	17	100	4,0	285	24710.0050
	M12	–	–	19,0	33	54,0	15,5	17	100	4,0	285	24710.0052
	M10	–	–	19,0	33	54,0	15,5	17	100	5,5	285	24710.0060
	M12	–	–	19,0	33	54,0	15,5	17	100	5,5	285	24710.0062

→

Dimensions										Tightening torque +/- 10% max.		Art. No.
d_1	d_2	d_3	l	d_4	d_5	h_1	h_2	t	max. [°C]	[Nm]	[g]	
			[mm]									
with screw – picture 2												
34	–	**M 5**	**12**	10,0	21	37,5	9,5	–	100	1,0	62	24710.0300
			16	10,0	21	37,5	9,5	–	100	1,0	63	24710.0301
			20	10,0	21	37,5	9,5	–	100	1,0	63	24710.0302
			25	10,0	21	37,5	9,5	–	100	1,0	64	24710.0303
			32	10,0	21	37,5	9,5	–	100	1,0	65	24710.0304
		M 6	**12**	10,0	21	37,5	9,5	–	100	1,0	64	24710.0305
			16	10,0	21	37,5	9,5	–	100	1,0	65	24710.0306
			20	10,0	21	37,5	9,5	–	100	1,0	66	24710.0307
			25	10,0	21	37,5	9,5	–	100	1,0	67	24710.0308
			32	10,0	21	37,5	9,5	–	100	1,0	68	24710.0309
42	–	**M 8**	**16**	13,5	27	43,5	11,5	–	100	2,0	152	24710.0400
			20	13,5	27	43,5	11,5	–	100	2,0	153	24710.0401
			25	13,5	27	43,5	11,5	–	100	2,0	155	24710.0402
			32	13,5	27	43,5	11,5	–	100	2,0	158	24710.0403
			40	13,5	27	43,5	11,5	–	100	2,0	161	24710.0404
		M10	**20**	13,5	27	43,5	11,5	–	100	2,0	165	24710.0405
			25	13,5	27	43,5	11,5	–	100	2,0	170	24710.0406
			32	13,5	27	43,5	11,5	–	100	2,0	173	24710.0407
			40	13,5	27	43,5	11,5	–	100	2,0	179	24710.0408
			50	13,5	27	43,5	11,5	–	100	2,0	187	24710.0409
52	–	**M10**	**25**	19,0	32	54,0	15,5	–	100	3,0	241	24710.0500
			32	19,0	32	54,0	15,5	–	100	3,0	246	24710.0501
			40	19,0	32	54,0	15,5	–	100	3,0	248	24710.0502
			50	19,0	32	54,0	15,5	–	100	3,0	254	24710.0503
			63	19,0	32	54,0	15,5	–	100	3,0	262	24710.0504
		M12	**25**	19,0	32	54,0	15,5	–	100	3,0	251	24710.0505
			32	19,0	32	54,0	15,5	–	100	3,0	254	24710.0506
			40	19,0	32	54,0	15,5	–	100	3,0	262	24710.0507
			50	19,0	32	54,0	15,5	–	100	3,0	270	24710.0508
			63	19,0	32	54,0	15,5	–	100	3,0	274	24710.0509
62	–	**M10**	**25**	19,0	33	54,0	15,5	–	100	4,0	334	24710.0600
			32	19,0	33	54,0	15,5	–	100	4,0	339	24710.0601
			40	19,0	33	54,0	15,5	–	100	4,0	341	24710.0602
			50	19,0	33	54,0	15,5	–	100	4,0	347	24710.0603
			63	19,0	33	54,0	15,5	–	100	4,0	355	24710.0604
		M12	**25**	19,0	33	54,0	15,5	–	100	4,0	344	24710.0605
			32	19,0	33	54,0	15,5	–	100	4,0	347	24710.0606
			40	19,0	33	54,0	15,5	–	100	4,0	355	24710.0607
			50	19,0	33	54,0	15,5	–	100	4,0	363	24710.0608
			63	19,0	33	54,0	15,5	–	100	4,0	367	24710.0609
		M10	**25**	19,0	33	54,0	15,5	–	100	5,5	334	24710.0700
			32	19,0	33	54,0	15,5	–	100	5,5	339	24710.0701
			40	19,0	33	54,0	15,5	–	100	5,5	341	24710.0702
			50	19,0	33	54,0	15,5	–	100	5,5	347	24710.0703
			63	19,0	33	54,0	15,5	–	100	5,5	355	24710.0704
		M12	**25**	19,0	33	54,0	15,5	–	100	5,5	344	24710.0705
			32	19,0	33	54,0	15,5	–	100	5,5	347	24710.0706
			40	19,0	33	54,0	15,5	–	100	5,5	355	24710.0707
			50	19,0	33	54,0	15,5	–	100	5,5	363	24710.0708
			63	19,0	33	54,0	15,5	–	100	5,5	367	24710.0709

Disc-Type Handwheels • DIN 3670

EH 24570.



PRODUCT DESCRIPTION

There are gripping indentations on the rear sides.
Hub machined, rim turned and mirror-finished on all sides, non-machined surfaces cleanly blasted.

Material

Handwheel
- Aluminium permanent-mould casting

Assembly

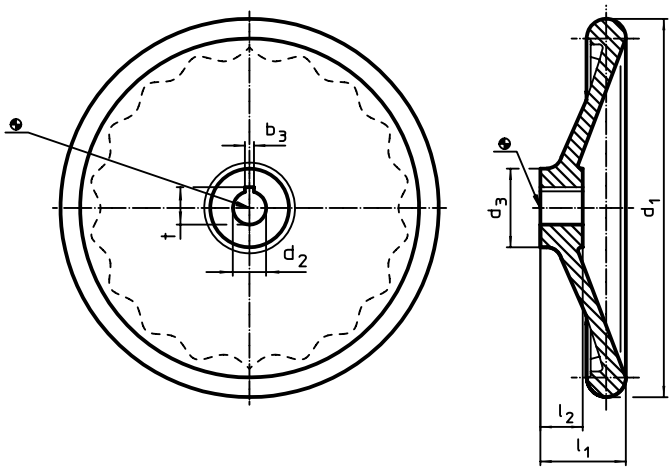
Shaft-end washers EH 22270. for axial fastening.

MORE INFORMATION

Further products

Shaft-End Washers . . . . . → p. 178

DRAWING



The orientation of the hub keyway may be different than shown in the drawing.

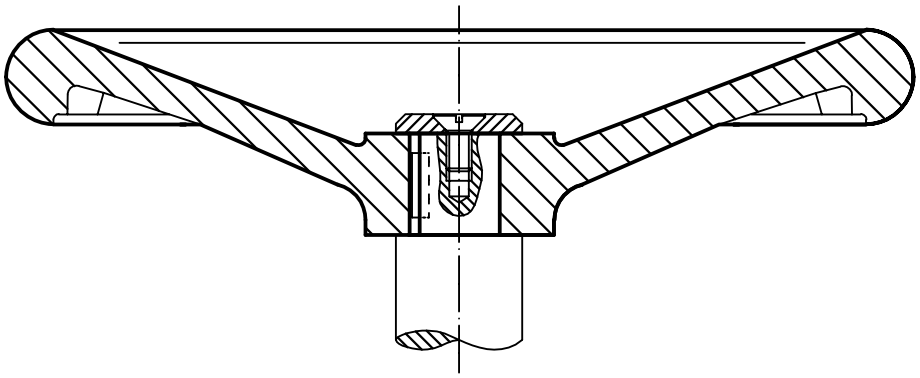
ORDER INFORMATION

Dimensions					Hub keyway, DIN 6885 sheet 1			Art. No.
d_1	d_2 H7	d_3	l_1 ~	l_2	b_3	t		
[mm]					[mm]		[g]	
without steel bushing, form B, without keyway								
80	**10**	26	29	16	–	–	119	24570.0103
	12	26	29	16	–	–	116	24570.0104
100	**10**	28	33	17	–	–	194	24570.0105
	12	28	33	17	–	–	194	24570.0106
125	**12**	31	36	18	–	–	288	24570.0110
	14	31	36	18	–	–	288	24570.0111
160	**14**	36	40	20	–	–	477	24570.0120
	16	36	40	20	–	–	477	24570.0121
200	**18**	42	45	24	–	–	955	24570.0130
	22	42	45	24	–	–	955	24570.0131
250	**22**	48	50	28	–	–	1685	24570.0140
	26	48	50	28	–	–	1685	24570.0141
315	**26**	56	56	33	–	–	2710	24570.0150
	28	56	56	33	–	–	2700	24570.0151
400	**30**	65	63	38	–	–	4720	24570.0160
	32	65	63	38	–	–	4660	24570.0161

→

Dimensions					Hub keyway, DIN 6885 sheet 1			Art. No.
d_1	d_2 H7	d_3	l_1 ~	l_2	b_3	t		
[mm]					[mm]		[g]	
without steel bushing, form N, with keyway								
80	**10**	26	29	16	3	11,4	120	24570.0303
	12	26	29	16	4	13,8	129	24570.0304
100	**10**	28	33	17	3	11,4	190	24570.0305
	12	28	33	17	4	13,8	190	24570.0306
125	**12**	31	36	18	4	13,8	250	24570.0310
	14	31	36	18	5	16,3	250	24570.0311
160	**14**	36	40	20	5	16,3	491	24570.0320
	16	36	40	20	5	18,3	491	24570.0321
200	**18**	42	45	24	6	20,8	933	24570.0330
	22	42	45	24	6	24,8	933	24570.0331
250	**22**	48	50	28	6	24,8	1662	24570.0340
	26	48	50	28	8	29,3	1662	24570.0341
315	**26**	56	56	33	8	29,3	2700	24570.0350
	28	56	56	33	8	31,3	2670	24570.0351
400	**30**	65	63	38	8	33,3	4760	24570.0360
	32	65	63	38	10	35,3	4720	24570.0361

APPLICATION EXAMPLE



Handwheels • DIN 950 cast iron

EH 24580.



PRODUCT DESCRIPTION

Hub machined, rim turned and mirror-finished on all sides, non-machined surfaces cleanly blasted.

Material

Handwheel
- Grey cast iron GG

Machine handle DIN 39 EH 24450.
- Steel, turned, zinc-plated by galvanization, passivated

Rotating machine handle DIN 98 EH 24460.
- Steel, turned, zinc-plated by galvanization, passivated

Assembly

Shaft-end washers EH 22270. for axial fastening.

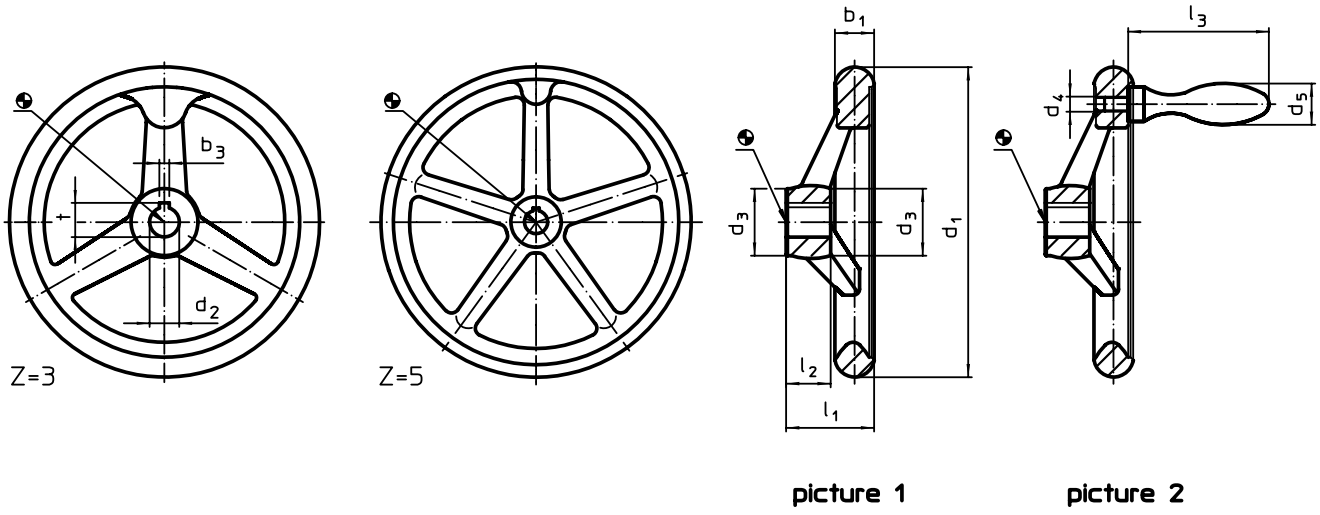
MORE INFORMATION

Further products

Shaft-End Washers . . . . . → p. 178
Rotating Machine Handles, DIN 98 . . . → p. 601

4

DRAWING



picture 1 picture 2

The orientation of the hub keyway may be different than shown in the drawing.

ORDER INFORMATION

Dimensions [mm]								Hub keyway, DIN 6885 sheet 1 [mm]		Number of spokes z	Corresponding machine handle DIN 39 / DIN 98 [mm]	[g]	Art. No.
d_1	d_2 H7	d_3	d_4	d_5	l_1 ~	l_2	l_3 ~	b_3	t				
without keyway, without handle, form B-F/A (formerly: A 4) – picture 1													
80	**10**	24	–	–	29	16	–	–	–	3	–	304	24580.0000
	12	24	–	–	29	16	–	–	–	3	–	311	24580.0001
100	**10**	26	–	–	33	17	–	–	–	3	–	486	24580.0005
	12	26	–	–	33	17	–	–	–	3	–	486	24580.0006
125	**12**	28	–	–	36	18	–	–	–	3	–	720	24580.0010
	14	28	–	–	36	18	–	–	–	3	–	720	24580.0011
140	**14**	30	–	–	39	19	–	–	–	3	–	879	24580.0015
	16	30	–	–	39	19	–	–	–	3	–	879	24580.0016
160	**14**	32	–	–	40	20	–	–	–	3	–	1151	24580.0020
	16	32	–	–	40	20	–	–	–	3	–	1151	24580.0021
200	**18**	38	–	–	45	24	–	–	–	3	–	2218	24580.0030
	22	38	–	–	45	24	–	–	–	3	–	2218	24580.0031
250	**22**	45	–	–	50	28	–	–	–	5	–	3735	24580.0040
	26	45	–	–	50	28	–	–	–	5	–	3735	24580.0041
315	**26**	53	–	–	56	33	–	–	–	5	–	6180	24580.0045
	30	53	–	–	56	33	–	–	–	5	–	6180	24580.0046
400	**30**	65	–	–	63	38	–	–	–	5	–	9500	24580.0050
	34	65	–	–	63	38	–	–	–	5	–	9500	24580.0051

→

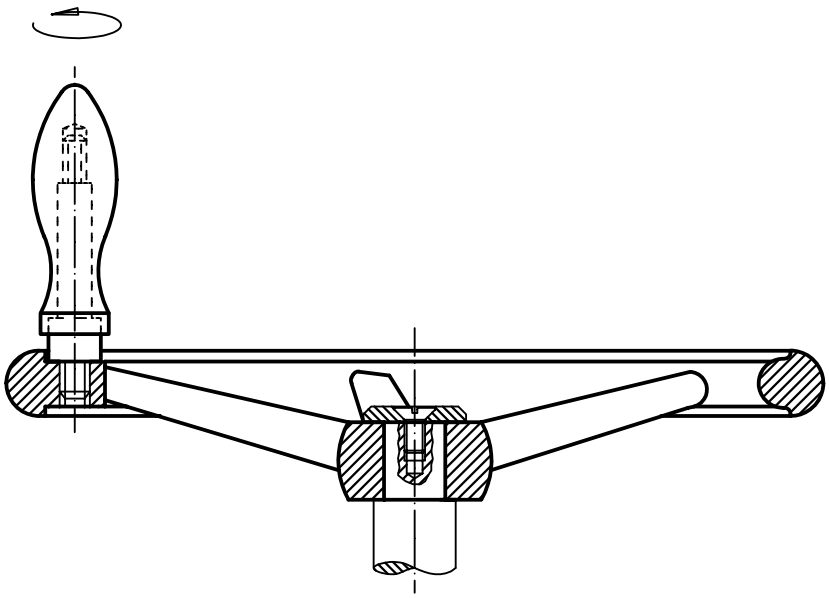
4

Dimensions								Hub keyway, DIN 6885 sheet 1		Number of spokes	Corresponding machine handle		Art. No.
d_1	d_2 H7	d_3	d_4	d_5	l_1 ~	l_2	l_3 ~	b_3	t	z	DIN 39 / DIN 98		
[mm]								[mm]			[mm]	[g]	
with keyway, without handle form N-F/A (formerly: A 3) – picture 1													
80	**10**	24	–	–	29	16	–	3	11,4	3	–	360	24580.0100
	12	24	–	–	29	16	–	4	13,8	3	–	360	24580.0101
100	**10**	26	–	–	33	17	–	3	11,4	3	–	500	24580.0105
	12	26	–	–	33	17	–	4	13,8	3	–	500	24580.0106
125	**12**	28	–	–	36	18	–	4	13,8	3	–	750	24580.0110
	14	28	–	–	36	18	–	5	16,3	3	–	750	24580.0111
140	**14**	30	–	–	39	19	–	5	16,3	3	–	902	24580.0115
	16	30	–	–	39	19	–	5	18,3	3	–	902	24580.0116
160	**14**	32	–	–	40	20	–	5	16,3	3	–	1139	24580.0120
	16	32	–	–	40	20	–	5	18,3	3	–	1139	24580.0121
200	**18**	38	–	–	45	24	–	6	20,8	3	–	2142	24580.0130
	22	38	–	–	45	24	–	6	24,8	3	–	2142	24580.0131
250	**22**	45	–	–	50	28	–	6	24,8	5	–	3652	24580.0140
	26	45	–	–	50	28	–	8	29,3	5	–	3652	24580.0141
315	**26**	53	–	–	56	33	–	8	29,3	5	–	5800	24580.0145
	30	53	–	–	56	33	–	8	33,3	5	–	5800	24580.0146
400	**30**	65	–	–	63	38	–	8	33,3	5	–	9500	24580.0150
	34	65	–	–	63	38	–	10	37,3	5	–	9500	24580.0151
without keyway, with rotating handle EH 24460., assembled form B-F/G (formerly: D 4) – picture 2													
80	**10**	24	M 6	16	29	16	49	–	–	3	16	410	24580.0200
	12	24	M 6	16	29	16	49	–	–	3	16	410	24580.0201
100	**10**	26	M 6	16	33	17	49	–	–	3	16	550	24580.0205
	12	26	M 6	16	33	17	49	–	–	3	16	550	24580.0206
125	**12**	28	M 8	20	36	18	61	–	–	3	20	850	24580.0210
	14	28	M 8	20	36	18	61	–	–	3	20	850	24580.0211
140	**14**	30	M 8	20	39	19	61	–	–	3	20	1040	24580.0215
	16	30	M 8	20	39	19	61	–	–	3	20	1040	24580.0216
160	**14**	32	M10	25	40	20	75	–	–	3	25	1390	24580.0220
	16	32	M10	25	40	20	75	–	–	3	25	1390	24580.0221
200	**18**	38	M10	25	45	24	75	–	–	3	25	2190	24580.0230
	22	38	M10	25	45	24	75	–	–	3	25	2190	24580.0231
250	**22**	45	M12	32	50	28	95	–	–	5	32	4185	24580.0240
	26	45	M12	32	50	28	95	–	–	5	32	4185	24580.0241
315	**26**	53	M12	32	56	33	95	–	–	5	32	6185	24580.0245
	30	53	M12	32	56	33	95	–	–	5	32	6185	24580.0246
400	**30**	65	M16	36	63	38	106	–	–	5	36	10500	24580.0250
	34	65	M16	36	63	38	106	–	–	5	36	10500	24580.0251
with keyway, with rotating handle EH 24460. assembled, form N-F/G (formerly: D 3) – picture 2													
80	**10**	24	M 6	16	29	16	49	3	11,4	3	16	410	24580.0300
	12	24	M 6	16	29	16	49	4	13,8	3	16	410	24580.0301
100	**10**	26	M 6	16	33	17	49	3	11,4	3	16	550	24580.0305
	12	26	M 6	16	33	17	49	4	13,8	3	16	550	24580.0306
125	**12**	28	M 8	20	36	18	61	4	13,8	3	20	850	24580.0310
	14	28	M 8	20	36	18	61	5	16,3	3	20	850	24580.0311
140	**14**	30	M 8	20	39	19	61	5	16,3	3	20	1040	24580.0315
	16	30	M 8	20	39	19	61	5	18,3	3	20	1040	24580.0316
160	**14**	32	M10	25	40	20	75	5	16,3	3	25	1390	24580.0320
	16	32	M10	25	40	20	75	5	18,3	3	25	1390	24580.0321
200	**18**	38	M10	25	45	24	75	6	20,8	3	25	2190	24580.0330
	22	38	M10	25	45	24	75	6	24,8	3	25	2190	24580.0331
250	**22**	45	M12	32	50	28	95	6	24,8	5	32	4185	24580.0340
	26	45	M12	32	50	28	95	8	29,3	5	32	4185	24580.0341
315	**26**	53	M12	32	56	33	95	8	29,3	5	32	6185	24580.0345
	30	53	M12	32	56	33	95	8	33,3	5	32	6185	24580.0346
400	**30**	65	M16	36	63	38	106	8	33,3	5	36	10500	24580.0350
	34	65	M16	36	63	38	106	10	37,3	5	36	10500	24580.0351

→

Dimensions								Hub keyway, DIN 6885 sheet 1		Number of spokes	Corresponding machine handle DIN 39 / DIN 98		Art. No.
d_1	d_2 H7	d_3	d_4	d_5	l_1 ~	l_2	l_3 ~	b_3	t	z			
[mm]								[mm]			[mm]	[g]	
without keyway, with machine handle EH 24450., assembled, form B-F/G (formerly: F 4) – picture 2													
80	**10**	24	M 6	16	29	16	50	–	–	3	16	410	**24580.0400**
	12	24	M 6	16	29	16	50	–	–	3	16	410	**24580.0401**
100	**10**	26	M 6	16	33	17	50	–	–	3	16	550	**24580.0405**
	12	26	M 6	16	33	17	50	–	–	3	16	550	**24580.0406**
125	**12**	28	M 8	20	36	18	64	–	–	3	20	835	**24580.0410**
	14	28	M 8	20	36	18	64	–	–	3	20	835	**24580.0411**
140	**14**	30	M 8	20	39	19	64	–	–	3	20	1025	**24580.0415**
	16	30	M 8	20	39	19	64	–	–	3	20	1025	**24580.0416**
160	**14**	32	M10	25	40	20	80	–	–	3	25	1380	**24580.0420**
	16	32	M10	25	40	20	80	–	–	3	25	1380	**24580.0421**
200	**18**	38	M10	25	45	24	80	–	–	3	25	2180	**24580.0430**
	22	38	M10	25	45	24	80	–	–	3	25	2180	**24580.0431**
250	**22**	45	M12	32	50	28	100	–	–	5	32	4160	**24580.0440**
	26	45	M12	32	50	28	100	–	–	5	32	4160	**24580.0441**
315	**26**	53	M12	32	56	33	100	–	–	5	32	6160	**24580.0445**
	30	53	M12	32	56	33	100	–	–	5	32	6160	**24580.0446**
400	**30**	65	M16	36	63	38	112	–	–	5	36	10460	**24580.0450**
	34	65	M16	36	63	38	112	–	–	5	36	10460	**24580.0451**
with keyway, with machine handle EH 24450. assembled, form N-F/G (formerly: F 3) – picture 2													
80	**10**	24	M 6	16	29	16	50	3	11,4	3	16	410	**24580.0500**
	12	24	M 6	16	29	16	50	4	13,8	3	16	410	**24580.0501**
100	**10**	26	M 6	16	33	17	50	3	11,4	3	16	550	**24580.0505**
	12	26	M 6	16	33	17	50	4	13,8	3	16	550	**24580.0506**
125	**12**	28	M 8	20	36	18	64	4	13,8	3	20	835	**24580.0510**
	14	28	M 8	20	36	18	64	5	16,3	3	20	835	**24580.0511**
140	**14**	30	M 8	20	39	19	64	5	16,3	3	20	1025	**24580.0515**
	16	30	M 8	20	39	19	64	5	18,3	3	20	1025	**24580.0516**
160	**14**	32	M10	25	40	20	80	5	16,3	3	25	1380	**24580.0520**
	16	32	M10	25	40	20	80	5	18,3	3	25	1380	**24580.0521**
200	**18**	38	M10	25	45	24	80	6	20,8	3	25	2180	**24580.0530**
	22	38	M10	25	45	24	80	6	24,8	3	25	2180	**24580.0531**
250	**22**	45	M12	32	50	28	100	6	24,8	5	32	4160	**24580.0540**
	26	45	M12	32	50	28	100	8	29,3	5	32	4160	**24580.0541**
315	**26**	53	M12	32	56	33	100	8	29,3	5	32	6160	**24580.0545**
	30	53	M12	32	56	33	100	8	33,3	5	32	6160	**24580.0546**
400	**30**	65	M16	36	63	38	112	8	33,3	5	36	10460	**24580.0550**
	34	65	M16	36	63	38	112	10	37,3	5	36	10460	**24580.0551**

APPLICATION EXAMPLE



Handwheels • DIN 950 light metal

EH 24590.



PRODUCT DESCRIPTION

Hub machined, rim turned and mirror-finished on all sides, non-machined surfaces cleanly blasted.

Material

Handwheel
- Light metal Al

Machine handle DIN 39 EH 24450.
- Steel, turned, zinc-plated by galvanization, passivated

Rotating machine handle DIN 98 EH 24460.
- Steel, turned, zinc-plated by galvanization, passivated

Assembly

Shaft-end washers EH 22270. for axial fastening.

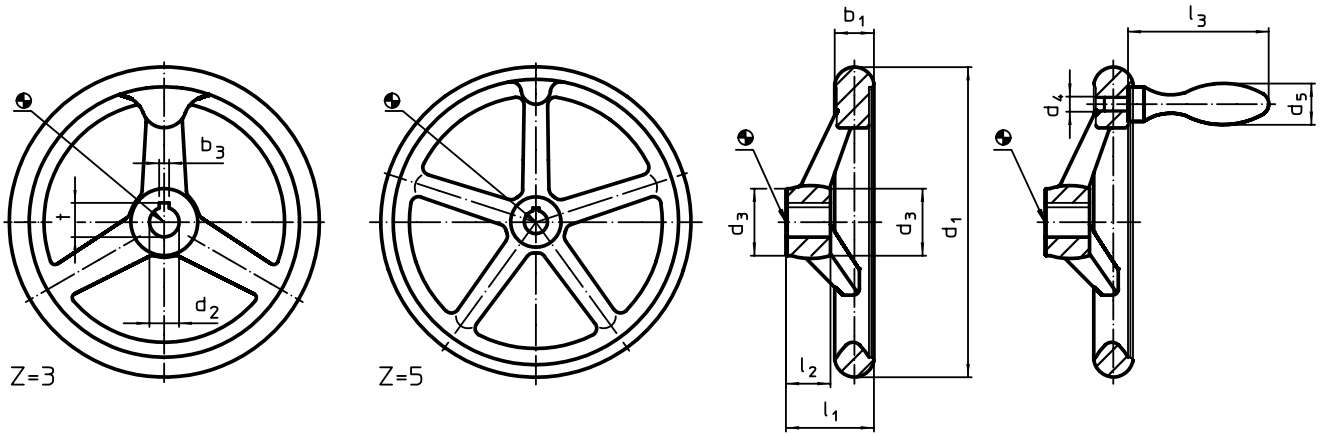
MORE INFORMATION

Further products

Shaft-End Washers . . . . . → p. 178
Rotating Machine Handles, DIN 98 . . . → p. 601

4

DRAWING



picture 1 picture 2

The orientation of the hub keyway may be different than shown in the drawing.

ORDER INFORMATION

Dimensions								Hub keyway, DIN 6885 sheet 1		Number of spokes z	Corresponding machine handle DIN 39 / DIN 98		Art. No.
d_1	d_2 H7	d_3	d_4	d_5	l_1 ~	l_2	l_3 ~	b_3	t				
[mm]								[mm]			[mm]	[g]	
without keyway, without handle, form B-F/A (formerly: A 4) – picture 1													
80	**10**	24	–	–	29	16	–	–	–	3	–	92	24590.0000
	12	24	–	–	29	16	–	–	–	3	–	92	24590.0001
100	**10**	26	–	–	33	17	–	–	–	3	–	160	24590.0005
	12	26	–	–	33	17	–	–	–	3	–	160	24590.0006
125	**12**	28	–	–	36	18	–	–	–	3	–	237	24590.0010
	14	28	–	–	36	18	–	–	–	3	–	237	24590.0011
140	**14**	30	–	–	39	19	–	–	–	3	–	295	24590.0015
	16	30	–	–	39	19	–	–	–	3	–	295	24590.0016
160	**14**	32	–	–	40	20	–	–	–	3	–	435	24590.0020
	16	32	–	–	40	20	–	–	–	3	–	471	24590.0021
200	**18**	38	–	–	45	24	–	–	–	3	–	783	24590.0030
	22	38	–	–	45	24	–	–	–	3	–	783	24590.0031
250	**22**	45	–	–	50	28	–	–	–	5	–	1509	24590.0040
	26	45	–	–	50	28	–	–	–	5	–	1509	24590.0041
315	**26**	53	–	–	56	33	–	–	–	5	–	2440	24590.0045
	30	53	–	–	56	33	–	–	–	5	–	2440	24590.0046
400	**30**	65	–	–	63	38	–	–	–	5	–	3740	24590.0050
	34	65	–	–	63	38	–	–	–	5	–	3740	24590.0051

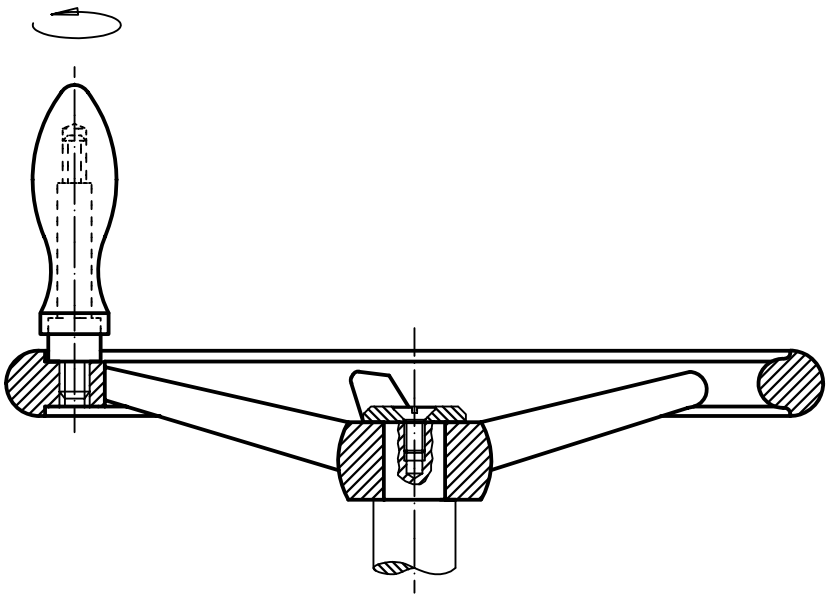
→

Dimensions								Hub keyway, DIN 6885 sheet 1		Number of spokes	Corresponding machine handle DIN 39 / DIN 98		Art. No.
d_1	d_2 H7	d_3	d_4	d_5	l_1 ~	l_2	l_3 ~	b_3	t	z			
[mm]								[mm]			[mm]	[g]	
with keyway, without handle form N-F/A (formerly: A 3) – picture 1													
80	**10**	24	–	–	29	16	–	3	11,4	3	–	99	24590.0100
	12	24	–	–	29	16	–	4	13,8	3	–	99	24590.0101
100	**10**	26	–	–	33	17	–	3	11,4	3	–	171	24590.0105
	12	26	–	–	33	17	–	4	13,8	3	–	171	24590.0106
125	**12**	28	–	–	36	18	–	4	13,8	3	–	232	24590.0110
	14	28	–	–	36	18	–	5	16,3	3	–	232	24590.0111
140	**14**	30	–	–	39	19	–	5	16,3	3	–	309	24590.0115
	16	30	–	–	39	19	–	5	18,3	3	–	309	24590.0116
160	**14**	32	–	–	40	20	–	5	16,3	3	–	422	24590.0120
	16	32	–	–	40	20	–	5	18,3	3	–	422	24590.0121
200	**18**	38	–	–	45	24	–	6	20,8	3	–	779	24590.0130
	22	38	–	–	45	24	–	6	24,8	3	–	779	24590.0131
250	**22**	45	–	–	50	28	–	6	24,8	5	–	1511	24590.0140
	26	45	–	–	50	28	–	8	29,3	5	–	1511	24590.0141
315	**26**	53	–	–	56	33	–	8	29,3	5	–	2500	24590.0145
	30	53	–	–	56	33	–	8	33,3	5	–	2500	24590.0146
400	**30**	65	–	–	63	38	–	8	33,3	5	–	3600	24590.0150
	34	65	–	–	63	38	–	10	37,3	5	–	3600	24590.0151
without keyway, with rotating handle EH 24460., assembled form B-F/G (formerly: D 4) – picture 2													
80	**10**	24	M 6	16	29	16	49	–	–	3	16	150	24590.0200
	12	24	M 6	16	29	16	49	–	–	3	16	150	24590.0201
100	**10**	26	M 6	16	33	17	49	–	–	3	16	210	24590.0205
	12	26	M 6	16	33	17	49	–	–	3	16	210	24590.0206
125	**12**	28	M 8	20	36	18	61	–	–	3	20	340	24590.0210
	14	28	M 8	20	36	18	61	–	–	3	20	340	24590.0211
140	**14**	30	M 8	20	39	19	61	–	–	3	20	430	24590.0215
	16	30	M 8	20	39	19	61	–	–	3	20	430	24590.0216
160	**14**	32	M10	25	40	20	75	–	–	3	25	615	24590.0220
	16	32	M10	25	40	20	75	–	–	3	25	615	24590.0221
200	**18**	38	M10	25	45	24	75	–	–	3	25	970	24590.0230
	22	38	M10	25	45	24	75	–	–	3	25	970	24590.0231
250	**22**	45	M12	32	50	28	95	–	–	5	32	1885	24590.0240
	26	45	M12	32	50	28	95	–	–	5	32	1885	24590.0241
315	**26**	53	M12	32	56	33	95	–	–	5	32	2885	24590.0245
	30	53	M12	32	56	33	95	–	–	5	32	2885	24590.0246
400	**30**	65	M16	36	63	38	106	–	–	5	36	4250	24590.0250
	34	65	M16	36	63	38	106	–	–	5	36	4250	24590.0251
with keyway, with rotating handle EH 24460. assembled, form N-F/G (formerly: D 3) – picture 2													
80	**10**	24	M 6	16	29	16	49	3	11,4	3	16	150	24590.0300
	12	24	M 6	16	29	16	49	4	13,8	3	16	150	24590.0301
100	**10**	26	M 6	16	33	17	49	3	11,4	3	16	210	24590.0305
	12	26	M 6	16	33	17	49	4	13,8	3	16	210	24590.0306
125	**12**	28	M 8	20	36	18	61	4	13,8	3	20	340	24590.0310
	14	28	M 8	20	36	18	61	5	16,3	3	20	340	24590.0311
140	**14**	30	M 8	20	39	19	61	5	16,3	3	20	430	24590.0315
	16	30	M 8	20	39	19	61	5	18,3	3	20	430	24590.0316
160	**14**	32	M10	25	40	20	75	5	16,3	3	25	615	24590.0320
	16	32	M10	25	40	20	75	5	18,3	3	25	615	24590.0321
200	**18**	38	M10	25	45	24	75	6	20,8	3	25	970	24590.0330
	22	38	M10	25	45	24	75	6	24,8	3	25	970	24590.0331
250	**22**	45	M12	32	50	28	95	6	24,8	5	32	1885	24590.0340
	26	45	M12	32	50	28	95	8	29,3	5	32	1885	24590.0341
315	**26**	53	M12	32	56	33	95	8	29,3	5	32	2885	24590.0345
	30	53	M12	32	56	33	95	8	33,3	5	32	2885	24590.0346
400	**30**	65	M16	36	63	38	106	8	33,3	5	36	4250	24590.0350
	34	65	M16	36	63	38	106	10	37,3	5	36	4250	24590.0351

→

Dimensions								Hub keyway, DIN 6885 sheet 1		Number of spokes	Corresponding machine handle		Art. No.
d_1	d_2 H7	d_3	d_4	d_5	l_1 ~	l_2	l_3 ~	b_3	t	z	DIN 39 / DIN 98		
[mm]								[mm]			[mm]	[g]	
without keyway, with machine handle EH 24450., assembled, form B-F/G (formerly: F 4) – picture 2													
80	**10**	24	M 6	16	29	16	50	–	–	3	16	150	24590.0400
	12	24	M 6	16	29	16	50	–	–	3	16	150	24590.0401
100	**10**	26	M 6	16	33	17	50	–	–	3	16	210	24590.0405
	12	26	M 6	16	33	17	50	–	–	3	16	210	24590.0406
125	**12**	28	M 8	20	36	18	64	–	–	3	20	340	24590.0410
	14	28	M 8	20	36	18	64	–	–	3	20	340	24590.0411
140	**14**	30	M 8	20	39	19	64	–	–	3	20	420	24590.0415
	16	30	M 8	20	39	19	64	–	–	3	20	420	24590.0416
160	**14**	32	M10	25	40	20	80	–	–	3	25	615	24590.0420
	16	32	M10	25	40	20	80	–	–	3	25	615	24590.0421
200	**18**	38	M10	25	45	24	80	–	–	3	25	970	24590.0430
	22	38	M10	25	45	24	80	–	–	3	25	970	24590.0431
250	**22**	45	M12	32	50	28	100	–	–	5	32	1860	24590.0440
	26	45	M12	32	50	28	100	–	–	5	32	1860	24590.0441
315	**26**	53	M12	32	56	33	100	–	–	5	32	2860	24590.0445
	30	53	M12	32	56	33	100	–	–	5	32	2860	24590.0446
400	**30**	65	M16	36	63	38	112	–	–	5	36	4210	24590.0450
	34	65	M16	36	63	38	112	–	–	5	36	4210	24590.0451
with keyway, with machine handle EH 24450., assembled, form N-F/G (formerly: F 3) – picture 2													
80	**10**	24	M 6	16	29	16	50	3	11,4	3	16	150	24590.0500
	12	24	M 6	16	29	16	50	4	13,8	3	16	150	24590.0501
100	**10**	26	M 6	16	33	17	50	3	11,4	3	16	210	24590.0505
	12	26	M 6	16	33	17	50	4	13,8	3	16	210	24590.0506
125	**12**	28	M 8	20	36	18	64	4	13,8	3	20	330	24590.0510
	14	28	M 8	20	36	18	64	5	16,3	3	20	330	24590.0511
140	**14**	30	M 8	20	39	19	64	5	16,3	3	20	420	24590.0515
	16	30	M 8	20	39	19	64	5	18,3	3	20	420	24590.0516
160	**14**	32	M10	25	40	20	80	5	16,3	3	25	610	24590.0520
	16	32	M10	25	40	20	80	5	18,3	3	25	610	24590.0521
200	**18**	38	M10	25	45	24	80	6	20,8	3	25	960	24590.0530
	22	38	M10	25	45	24	80	6	24,8	3	25	960	24590.0531
250	**22**	45	M12	32	50	28	100	6	24,8	5	32	1860	24590.0540
	26	45	M12	32	50	28	100	8	29,3	5	32	1860	24590.0541
315	**26**	53	M12	32	56	33	100	8	29,3	5	32	2860	24590.0545
	30	53	M12	32	56	33	100	8	33,3	5	32	2860	24590.0546
400	**30**	65	M16	36	63	38	112	8	33,3	5	36	4210	24590.0550
	34	65	M16	36	63	38	112	10	37,3	5	36	4210	24590.0551

APPLICATION EXAMPLE



Handwheels • similar to DIN 950, stainless steel

EH 24591.



PRODUCT DESCRIPTION

Hub machined, rim turned and mirror-finished on all sides, non-machined surfaces cleanly blasted.

Material

Handwheel
- Stainless steel A4

Machine handle
- Stainless steel A4

Assembly

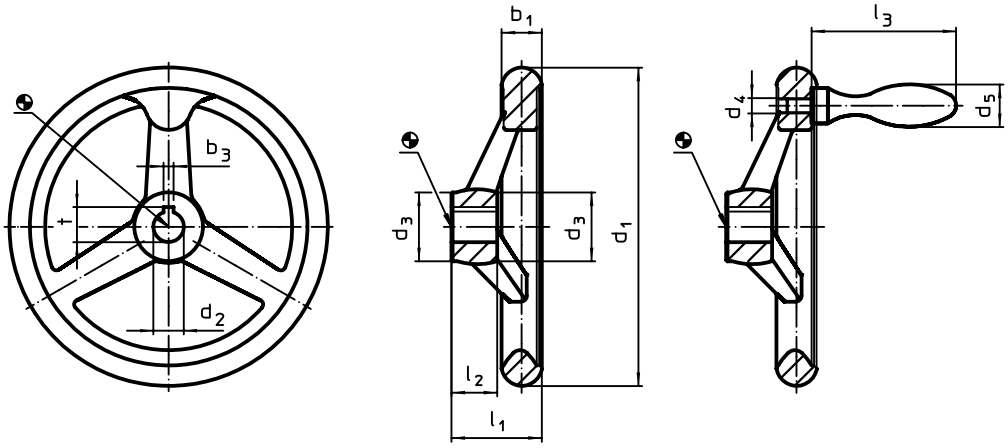
Shaft-end washers EH 22270. for axial fastening.

MORE INFORMATION

Further products

Shaft-End Washers . . . . . → p. 178

DRAWING



picture 1 picture 2

The orientation of the hub keyway may be different than shown in the drawing.

ORDER INFORMATION

Dimensions								Hub keyway, DIN 6885 sheet 1		Number of spokes	Corresponding machine handle DIN 39		Art. No.
d_1	d_2 H9	d_3	d_4	d_5	l_1	l_2	l_3 ~	b_3	t				
[mm]								[mm]			[mm]	[g]	
without keyway, without handle, form B-F/A (formerly: A 4) – picture 1													
100	10	25,5	–	–	33,0	17	–	–	–	3	–	431	24591.0005
125	12	27,0	–	–	35,5	18	–	–	–	3	–	655	24591.0010
140	14	29,0	–	–	38,5	19	–	–	–	3	–	851	24591.0015
160	14	31,0	–	–	39,5	20	–	–	–	3	–	1112	24591.0020
200	18	37,0	–	–	44,5	24	–	–	–	3	–	1877	24591.0030
with keyway, without handle form N-F/A (formerly: A 3) – picture 1													
100	10	25,5	–	–	33,0	17	–	3	11,4	3	–	434	24591.0105
125	12	27,0	–	–	35,5	18	–	4	13,8	3	–	659	24591.0110
140	14	29,0	–	–	38,5	19	–	5	16,3	3	–	854	24591.0115
160	14	31,0	–	–	39,5	20	–	5	16,3	3	–	1115	24591.0120
200	18	37,0	–	–	44,5	24	–	6	20,8	3	–	1882	24591.0130
without keyway, with machine handle EH 24450., assembled, form B-F/G (formerly: F 4) – picture 2													
100	10	25,5	M 6	16	33,0	17	50	–	–	3	16	472	24591.0405
125	12	27,0	M 8	20	35,5	18	64	–	–	3	20	748	24591.0410
140	14	29,0	M 8	20	38,5	19	64	–	–	3	20	939	24591.0415
160	14	31,0	M10	25	39,5	20	80	–	–	3	25	1273	24591.0420
200	18	37,0	M10	25	44,5	24	80	–	–	3	25	2044	24591.0430
with keyway, with machine handle EH 24450., assembled, form N-F/G (formerly: F 3) – picture 2													
100	10	25,5	M 6	16	33,0	17	50	3	11,4	3	16	473	24591.0505
125	12	27,0	M 8	20	35,5	18	64	4	13,8	3	20	753	24591.0510
140	14	29,0	M 8	20	38,5	19	64	5	16,3	3	20	939	24591.0515
160	14	31,0	M10	25	39,5	20	80	5	16,3	3	25	1282	24591.0520
200	18	37,0	M10	25	44,5	24	80	6	20,8	3	25	2049	24591.0530

Disc-Type Handwheels • light metal

EH 24600.



PRODUCT DESCRIPTION

There are gripping indentations on the rear sides.
For all handwheels, the hub is machined, rim is turned and mirror-finished on all sides. The unmachined raw surfaces have been blasted clean. Together with their mirror-polished rim, these handwheels therefore present a finish which generally does not require additional lacquering.

Material

Axle part
- Steel, zinc-plated by galvanization

Handwheel
- Aluminium permanent-mould casting

Cylindrical handle EH 24530
- DIN 7708 - thermosetting plastic (PF 31), black similar to RAL 9005

Assembly

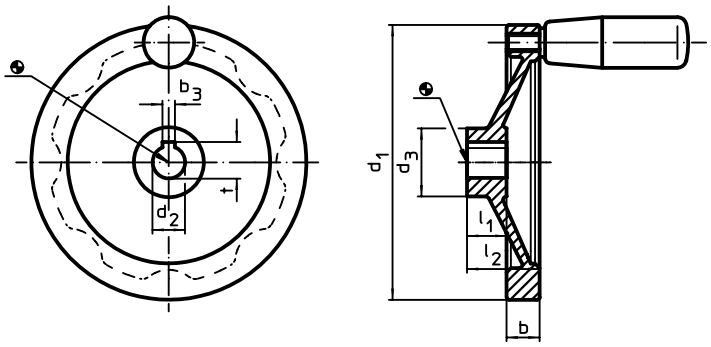
Shaft-end washers EH 22270. for axial fastening.

MORE INFORMATION

Further products

Shaft-End Washers . . . . . → p. 178
Cylindrical Handles, rotating . . . . . → p. 602

DRAWING



The orientation of the hub keyway may be different than shown in the drawing.

ORDER INFORMATION

Dimensions						Hub keyway, DIN 6885 sheet 1		Corresponding cylinidrical handle EH 24530.	max.		Art. No.
d_1	d_2 H7	d_3	b	l_1	l_2 ~	b_3	t				
[mm]						[mm]		[mm]	[°C]	[g]	
without keyway, without cylindrical handle											
80	**10**	26	13,0	16	26	–	–	–	–	121	24600.0000
	12	26	13,0	16	26	–	–	–	–	130	24600.0001
100	**10**	28	14,0	17	30	–	–	–	–	203	24600.0005
	12	28	14,0	17	30	–	–	–	–	203	24600.0006
125	**12**	31	15,0	18	33	–	–	–	–	307	24600.0010
	14	31	15,0	18	33	–	–	–	–	307	24600.0011
140	**14**	36	16,5	19	36	–	–	–	–	430	24600.0015
	16	36	16,5	19	36	–	–	–	–	430	24600.0016
160	**14**	36	18,0	20	39	–	–	–	–	540	24600.0020
	16	36	18,0	20	39	–	–	–	–	540	24600.0021
200	**18**	42	20,5	24	45	–	–	–	–	849	24600.0030
	20	42	20,5	24	45	–	–	–	–	849	24600.0031
250	**22**	48	23,0	28	51	–	–	–	–	1495	24600.0040
	26	48	23,0	28	51	–	–	–	–	1495	24600.0041

→

Dimensions						Hub keyway, DIN 6885 sheet 1		Corresponding cylinidrical handle EH 24530.	max.		Art. No.
d_1	d_2 H7	d_3	b	l_1	l_2 ~	b_3	t				
[mm]						[mm]		[mm]	[°C]	[g]	
with keyway, without cylindrical handle											
80	**10**	26	13,0	16	26	3	11,4	–	–	139	**24600.0100**
	12	26	13,0	16	26	4	13,8	–	–	139	**24600.0101**
100	**10**	28	14,0	17	30	3	11,4	–	–	190	**24600.0105**
	12	28	14,0	17	30	4	13,8	–	–	190	**24600.0106**
125	**12**	31	15,0	18	33	4	13,8	–	–	291	**24600.0110**
	14	31	15,0	18	33	5	16,3	–	–	291	**24600.0111**
140	**14**	36	16,5	19	36	5	16,3	–	–	413	**24600.0115**
	16	36	16,5	19	36	5	18,3	–	–	413	**24600.0116**
160	**14**	36	18,0	20	39	5	16,3	–	–	529	**24600.0120**
	16	36	18,0	20	39	5	18,3	–	–	529	**24600.0121**
200	**18**	42	20,5	24	45	6	20,8	–	–	880	**24600.0130**
	20	42	20,5	24	45	6	22,8	–	–	880	**24600.0131**
250	**22**	48	23,0	28	51	6	24,8	–	–	1515	**24600.0140**
	26	48	23,0	28	51	8	29,3	–	–	1515	**24600.0141**
without keyway, with cylindrical handle EH 24530.											
80	**10**	26	13,0	16	26	–	–	18 x M 6	110	160	**24600.0200**
	12	26	13,0	16	26	–	–	18 x M 6	110	160	**24600.0201**
100	**10**	28	14,0	17	30	–	–	21 x M 6	110	255	**24600.0205**
	12	28	14,0	17	30	–	–	21 x M 6	110	255	**24600.0206**
125	**12**	31	15,0	18	33	–	–	23 x M 8	110	390	**24600.0210**
	14	31	15,0	18	33	–	–	23 x M 8	110	390	**24600.0211**
140	**14**	36	16,5	19	36	–	–	23 x M 8	110	510	**24600.0215**
	16	36	16,5	19	36	–	–	23 x M 8	110	510	**24600.0216**
160	**14**	36	18,0	20	39	–	–	26 x M10	110	675	**24600.0220**
	16	36	18,0	20	39	–	–	26 x M10	110	675	**24600.0221**
200	**18**	42	20,5	24	45	–	–	26 x M10	110	995	**24600.0230**
	20	42	20,5	24	45	–	–	26 x M10	110	995	**24600.0231**
250	**22**	48	23,0	28	51	–	–	28 x M10	110	1625	**24600.0240**
	26	48	23,0	28	51	–	–	28 x M10	110	1625	**24600.0241**
with keyway, with cylindrical handle EH 24530.											
80	**10**	26	13,0	16	26	3	11,4	18 x M 6	110	160	**24600.0300**
	12	26	13,0	16	26	4	13,8	18 x M 6	110	160	**24600.0301**
100	**10**	28	14,0	17	30	3	11,4	21 x M 6	110	255	**24600.0305**
	12	28	14,0	17	30	4	13,8	21 x M 6	110	255	**24600.0306**
125	**12**	31	15,0	18	33	4	13,8	23 x M 8	110	390	**24600.0310**
	14	31	15,0	18	33	5	16,3	23 x M 8	110	390	**24600.0311**
140	**14**	36	16,5	19	36	5	16,3	23 x M 8	110	510	**24600.0315**
	16	36	16,5	19	36	5	18,3	23 x M 8	110	510	**24600.0316**
160	**14**	36	18,0	20	39	5	16,3	26 x M10	110	675	**24600.0320**
	16	36	18,0	20	39	5	18,3	26 x M10	110	675	**24600.0321**
200	**18**	42	20,5	24	45	6	20,8	26 x M10	110	995	**24600.0330**
	20	42	20,5	24	45	6	22,8	26 x M10	110	995	**24600.0331**
250	**22**	48	23,0	28	51	6	24,8	28 x M10	110	1625	**24600.0340**
	26	48	23,0	28	51	8	29,3	28 x M10	110	1625	**24600.0341**

Spoked Handwheels • light metal

EH 24610.



PRODUCT DESCRIPTION

For all handwheels, the hub is machined, rim is turned and mirror-finished on all sides. The unmachined raw surfaces have been blasted clean. Together with their mirror-polished rim, these handwheels therefore present a finish which generally does not require additional lacquering.

Material

Axle part
- Steel, zinc-plated by galvanization

Handwheel
- Aluminium permanent-mould casting

Cylindrical handle EH 24530
- DIN 7708 - thermosetting plastic (PF 31), black similar to RAL 9005

Assembly

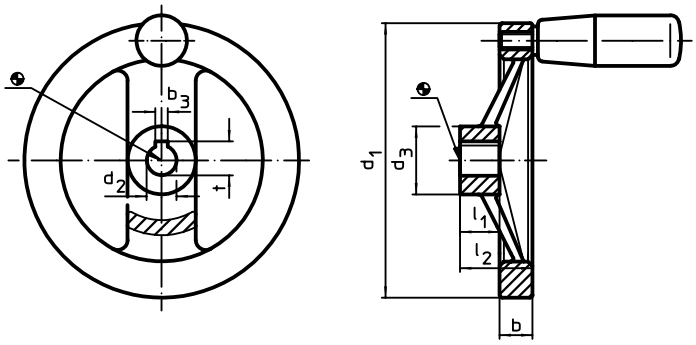
Shaft-end washers EH 22270. for axial fastening.

MORE INFORMATION

Further products

Shaft-End Washers . . . . . → p. 178
Cylindrical Handles, rotating . . . . . → p. 602

DRAWING



The orientation of the hub keyway may be different than shown in the drawing.

ORDER INFORMATION

Dimensions						Hub keyway, DIN 6885 sheet 1		Corresponding cylinidrical handle EH 24530.	max.		Art. No.
d_1	d_2 H7	d_3	b	l_1	l_2 ~	b_3	t				
[mm]						[mm]		[mm]	[°C]	[g]	
without keyway, without cylindrical handle											
125	**12**	31	15,0	18	33	–	–	–	–	301	24610.0010
	14	31	15,0	18	33	–	–	–	–	301	24610.0011
140	**14**	36	16,5	19	36	–	–	–	–	400	24610.0015
	16	36	16,5	19	36	–	–	–	–	400	24610.0016
160	**14**	36	18,0	20	39	–	–	–	–	520	24610.0020
	16	36	18,0	20	39	–	–	–	–	520	24610.0021
200	**18**	42	20,5	24	45	–	–	–	–	886	24610.0030
	20	42	20,5	24	45	–	–	–	–	886	24610.0031
250	**22**	48	23,0	28	51	–	–	–	–	1454	24610.0040
	26	48	23,0	28	51	–	–	–	–	1454	24610.0041
with keyway, without cylindrical handle											
125	**12**	31	15,0	18	33	4	13,8	–	–	303	24610.0110
	14	31	15,0	18	33	5	16,3	–	–	303	24610.0111
140	**14**	36	16,5	19	36	5	16,3	–	–	406	24610.0115
	16	36	16,5	19	36	5	18,3	–	–	406	24610.0116
160	**14**	36	18,0	20	39	5	16,3	–	–	542	24610.0120
	16	36	18,0	20	39	5	18,3	–	–	542	24610.0121
200	**18**	42	20,5	24	45	6	20,8	–	–	914	24610.0130
	20	42	20,5	24	45	6	22,8	–	–	914	24610.0131
250	**22**	48	23,0	28	51	6	24,8	–	–	1446	24610.0140
	26	48	23,0	28	51	8	29,3	–	–	1446	24610.0141

→

Dimensions						Hub keyway, DIN 6885 sheet 1		Corresponding cylinidrical handle EH 24530.	max.		Art. No.
d_1	d_2 H7	d_3	b	l_1	l_2 ~	b_3	t				
[mm]						[mm]		[mm]	[°C]	[g]	
without keyway, with cylindrical handle EH 24530.											
125	**12**	31	15,0	18	33	–	–	23 x M 8	110	390	**24610.0210**
	14	31	15,0	18	33	–	–	23 x M 8	110	390	**24610.0211**
140	**14**	36	16,5	19	36	–	–	23 x M 8	110	490	**24610.0215**
	16	36	16,5	19	36	–	–	23 x M 8	110	490	**24610.0216**
160	**14**	36	18,0	20	39	–	–	26 x M10	110	645	**24610.0220**
	16	36	18,0	20	39	–	–	26 x M10	110	645	**24610.0221**
200	**18**	42	20,5	24	45	–	–	26 x M10	110	1000	**24610.0230**
	20	42	20,5	24	45	–	–	26 x M10	110	1000	**24610.0231**
250	**22**	48	23,0	28	51	–	–	28 x M10	110	1585	**24610.0240**
	26	48	23,0	28	51	–	–	28 x M10	110	1585	**24610.0241**
with keyway, with cylindrical handle EH 24530.											
125	**12**	31	15,0	18	33	4	13,8	23 x M 8	110	390	**24610.0310**
	14	31	15,0	18	33	5	16,3	23 x M 8	110	390	**24610.0311**
140	**14**	36	16,5	19	36	5	16,3	23 x M 8	110	490	**24610.0315**
	16	36	16,5	19	36	5	18,3	23 x M 8	110	490	**24610.0316**
160	**14**	36	18,0	20	39	5	16,3	26 x M10	110	645	**24610.0320**
	16	36	18,0	20	39	5	18,3	26 x M10	110	645	**24610.0321**
200	**18**	42	20,5	24	45	6	20,8	26 x M10	110	1000	**24610.0330**
	20	42	20,5	24	45	6	22,8	26 x M10	110	1000	**24610.0331**
250	**22**	48	23,0	28	51	6	24,8	28 x M10	110	1585	**24610.0340**
	26	48	23,0	28	51	8	29,3	28 x M10	110	1585	**24610.0341**

Clamping Screws DIN 6332 • headless pin combined with different handles

EH 24890.

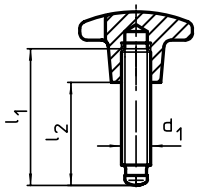


CLAMPING SCREWS ACCORDING TO DIN - UPON REQUEST

PRODUCT DESCRIPTION

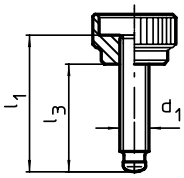
Clamping screws are manufactured to order. Single parts, however, are in stock.
Description from order example only. No reference numbers.

DIMENSIONED DRAWING

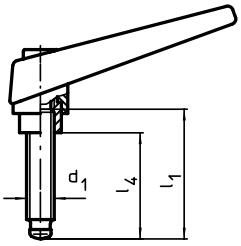


Picture 1
Clamping screw with

- palm grip DIN 6335 from cast iron or plastic
- star grip DIN 6336 from cast iron or plastic

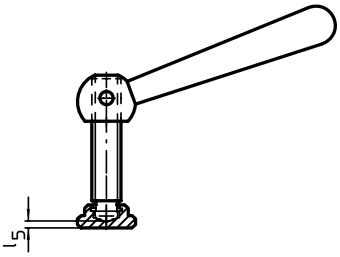


Picture 2
Clamping screw with knurled nut DIN 6303



Picture 3
Clamping screw with

- clamping lever DIN 99
- adjustable clamping lever EH 24400.
- clamping lever EH 24430.
- clamping lever EH 24440.



Picture 4
Clamping screw with thrust pad DIN 6311

Clamping Screws DIN 6332 • headless pin combined with different handles

EH 24890.

ORDER INFORMATION

d_1	l_1 DIN 6332 **picture 1**	l_2 Nominal thread lengths **picture 1**	l_3 Nominal thread lengths **picture 2**	l_4 Nominal thread lengths **picture 3**	l_5 Nominal thread lengthss **picture 4**
M 8	40	27	30	28	3,0
M 8	60	47	50	48	3,0
M 10	60	44	48	45	3,6
M 10	80	64	68	65	3,6
M 12	60	40	46	41	4,6
M 12	80	60	66	61	4,6
M 12	100	80	86	81	4,6
M 16	80	55	-	55	5,4
M 16	100	75	-	75	5,4
M 16	125	100	-	100	5,4
M 20	100	-	-	70	5,5
M 20	125	-	-	95	5,5
M 20	150	-	-	120	5,5

Order example
Clamping screw consisting of palm grip
DIN 6336 GG and headless pin M 10 x 60 DIN 6332,
without thrust pad DIN 6311

Description
Clamping screw M10 x 60 DIN 6332
with DIN 6336 case iron without thrust pad

Type
Headless pin glued with handle part, DIN 99
additionally pined together.
Clamping screws available without or with thrust
pad DIN 6311, please indicate in order.

5 MACHINE ELEMENTS



	Product group	Page
	Initiator Elements	660
	Tapered Shaft Elements	663
	Set Collars	673
	Locking Nuts	677
	Quick Plug Couplings	679
	Levelling Feet	683
	Damping Elements	686
	Hinges	696



Sensing Elements • with sensor adapter

EH 25010.



PRODUCT DESCRIPTION

Spring plunger in robust and compact design with fine-pitch thread and integrated position sensing using standard proximity sensors. Suitable for multiple applications, e.g. for locking including position control and for proximity sensors with **flush contact.** Switching range adjustable via screwed position of sensor. Sensitivity of switching operations can be adjusted throughout the entire stroke.

Material

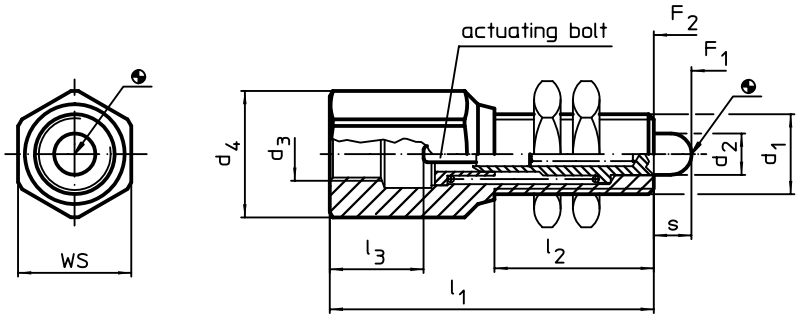
Pin
- Stainless steel 1.4305

Housing
- Stainless steel 1.4305

Nut
- Brass (ISO 4035), nickel-plated

Spring
- Stainless steel

DRAWING

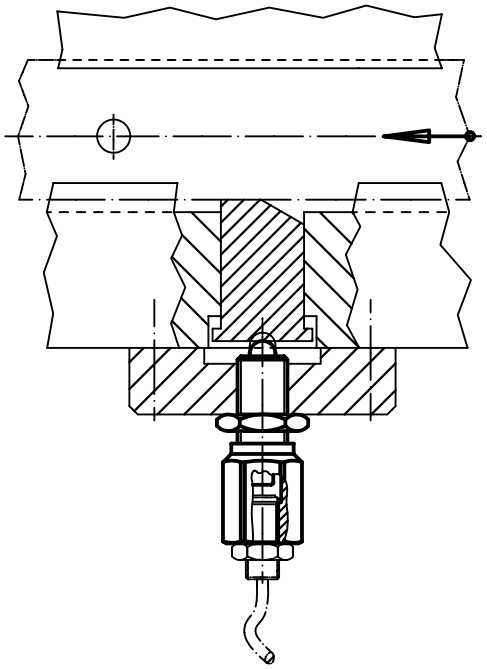


ORDER INFORMATION

Dimensions								WS	Spring load[1]			Art. No.
d_1	d_2	d_3	d_4	l_1	l_2	l_3 ~	s		F_1 ~	F_2 ~		
[mm]								[mm]	[N]		[g]	
M12 x 1	6,2	M 8 x 1	19,0	44	20	15,5	5,6	17	24,0	41,5	57	25010.0012
M16 x 1	8,5	M12 x 1	21,5	65	32	20,0	7,5	19	32,5	65,5	103	25010.0016

[1] statistical average value

APPLICATION EXAMPLE



Sensing Elements • with actuating bolt, protected against rotating

EH 25020.



PRODUCT DESCRIPTION

Spring plunger with position sensing by means of an actuating bolt which is protected against rotating. Suitable for multiple applications, e.g. as lift-off pin in tools with position control. Depending on the selected version, the tip is either round or pointed or fitted with a connection thread for all-purpose use. At the fastening thread of the actuating bolt, a switching element can be fitted which is secured against rotating and suitable for all commonly used switches.

Material

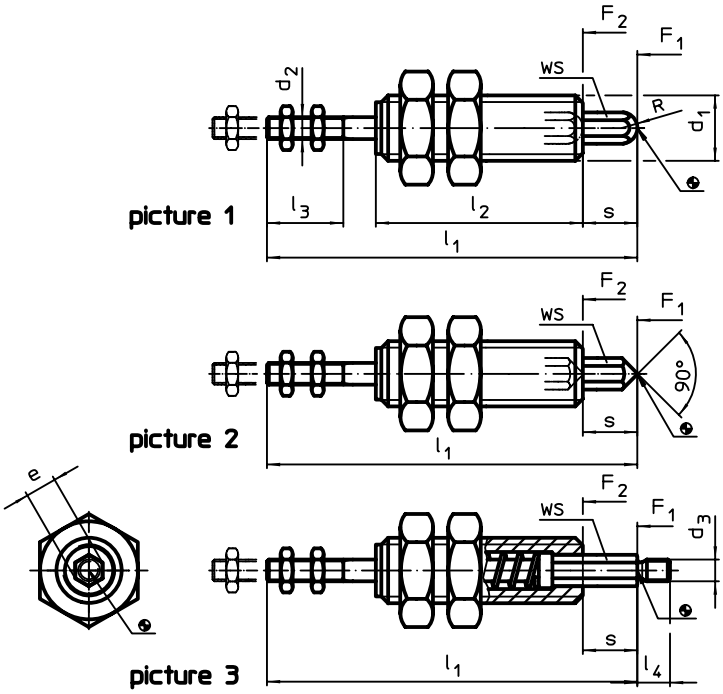
Body
- Free cutting steel, blackened

Nut
- Steel, black (ISO 4035)

Actuating bolt
- Steel, nitrided, black

Spring
- Stainless steel

DRAWING



ORDER INFORMATION

Dimensions										WS	Spring load[1]			Art. No.
d_1	s	d_2	d_3	e ~	l_1	l_2	l_3 min.	l_4	R		F_1 ~	F_2 ~		
[mm]										[mm]	[N]		[g]	
tip, round – picture 1														
M 8	6	M2,5	–	3,5	50	32	9	–	1,75	3	4,1	7,6	15	25020.0008
M10	8	M3	–	4,6	59	35	11	–	2,30	4	5,0	9,0	28	25020.0010
M12	10	M4	–	5,8	68	38	14	–	2,90	5	5,1	11,0	44	25020.0012
M16	12	M5	–	6,9	78	42	16	–	3,50	6	7,5	13,8	87	25020.0016
tip, pointed – picture 2														
M 8	6	M2,5	–	3,5	50	32	9	–	–	3	4,1	7,6	14	25020.0058
M10	8	M3	–	4,6	59	35	11	–	–	4	5,0	9,0	29	25020.0060
M12	10	M4	–	5,8	68	38	14	–	–	5	5,1	11,0	44	25020.0062
M16	12	M5	–	6,9	78	42	16	–	–	6	7,5	13,8	87	25020.0066
tip with connection thread – picture 3														
M 8	6	M2,5	M2,5	3,5	50	32	9	4	–	3	4,1	7,6	15	25020.0108
M10	8	M3	M3	4,6	59	35	11	5	–	4	5,0	9,0	29	25020.0110
M12	10	M4	M4	5,8	68	38	14	6	–	5	5,1	11,0	44	25020.0112
M16	12	M5	M5	6,9	78	42	16	7	–	6	7,5	13,8	89	25020.0116

[1] statistical average value

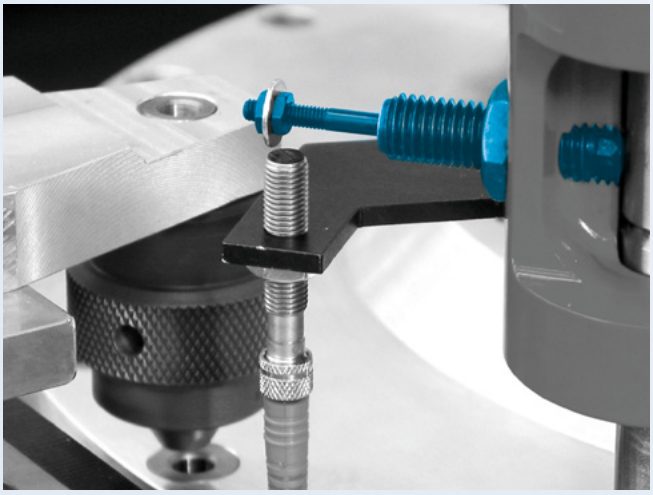
Sensing Elements • with sensor adapter

EH 25010./EH 25020.

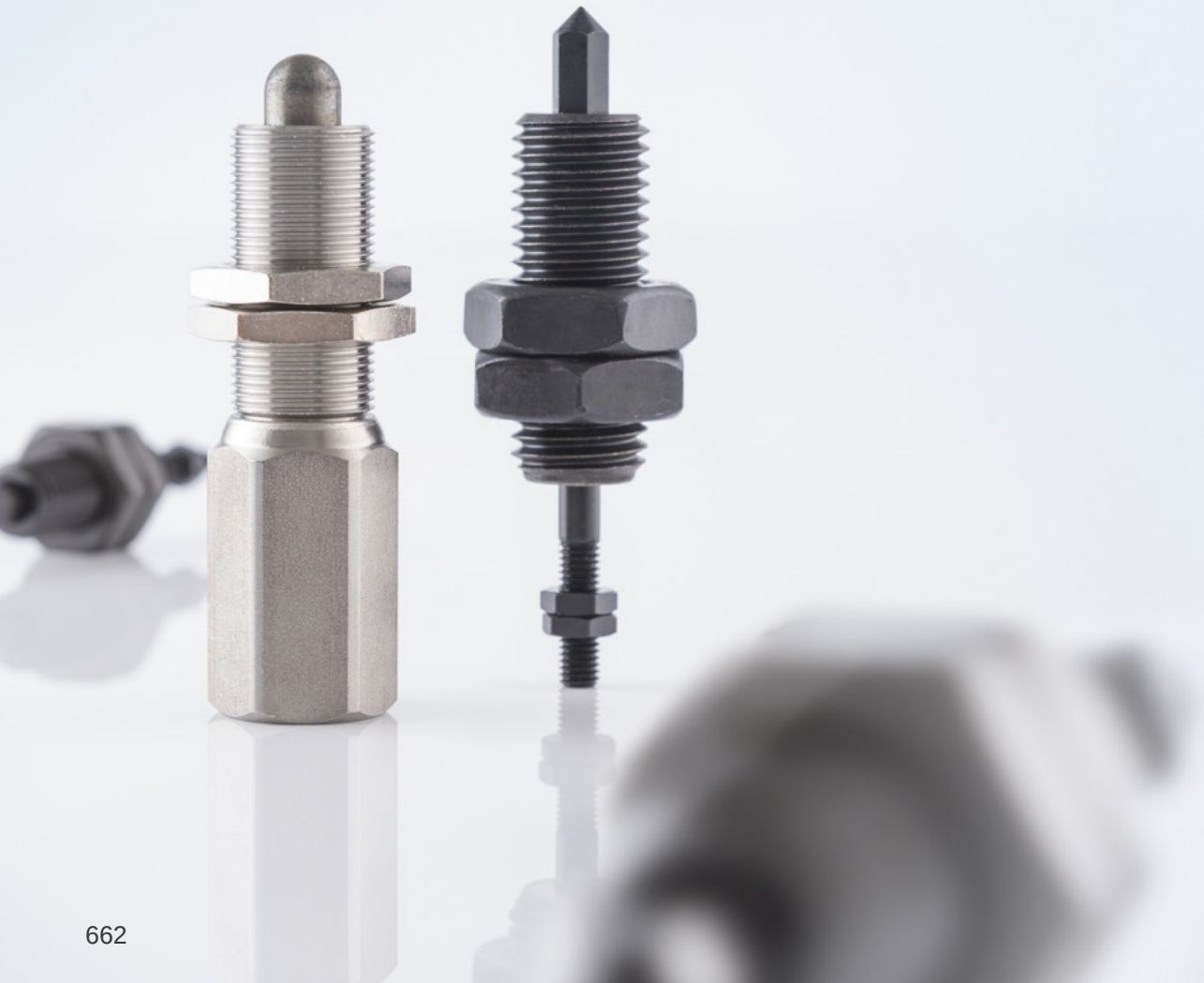
INSTALLATION EXAMPLES



Sensing elements designed for position sensing using standard proximity sensors. The image shows the model with a compact design and fine-pitch thread.

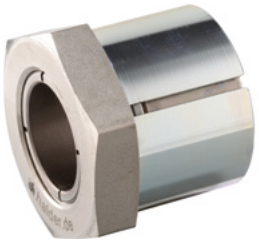


The tools are also available with an actuating bolt that is protected against rotating.



Tapered Shaft Hubs • no lock nut

EH 25050.



PRODUCT DESCRIPTION

By using tapered shaft hubs, all shaft-hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently established. It is a self-centering and non-floating tapered shaft hub in corrosion-protected design with a hexagon nut.
The rotational accuracy is 0,03 mm.

Material

External part
- Steel, zinc-plated by galvanization

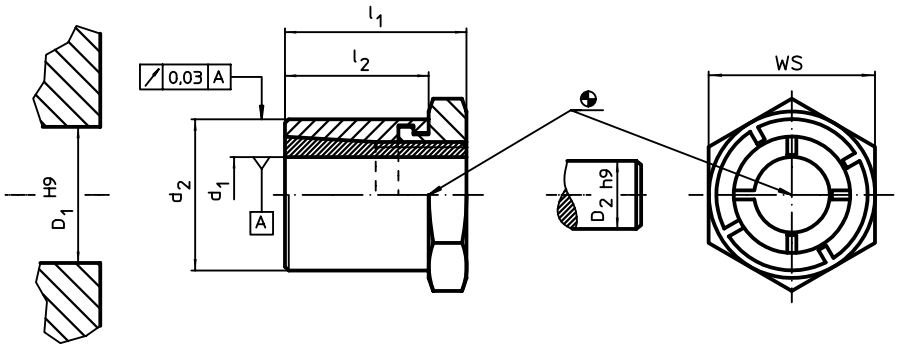
Inner part
- Steel, nickel-plated

Nut
- Steel, nickel-plated

MORE INFORMATION

References
Comply with mounting instructions, mounting examples, and technical data.

DRAWING



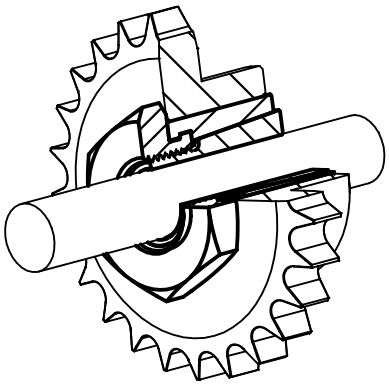
ORDER INFORMATION

Dimensions d_1	d_2	l_1	l_2 [mm]	WS [mm]	Tightening torque of the nut T_A max. [Nm]	Transferable torque M max. [Nm]	Transferable axial load F_a max. [kN]	Surface pressure of shaft p_W max. [N/mm²]	Surface pressure of hub p_N max. [N/mm²]	Hub bore D_1 H9 [mm]	Shaft diameter D_2 h9 [mm]	[g]	Art. No.
5	**14**	19	15	14	9,9	10,1	4,0	264	96	14	5	20	25050.0005
6	**14**	19	15	14	9,9	12,1	4,0	220	96	14	6	19	25050.0006
8	**16**	22	17	16	16,9	23,4	5,8	179	91	16	8	26	25050.0008
9	**20**	24	19	22	34,9	43,7	9,7	245	115	20	9	47	25050.0009
10	**20**	24	19	22	34,9	48,6	9,7	221	115	20	10	46	25050.0010
11	**22**	24	19	22	43,8	59,9	10,9	225	117	22	11	51	25050.0011
12	**22**	24	19	22	43,8	65,3	10,9	206	117	22	12	49	25050.0012
14	**26**	28	22	27	65,0	93,0	13,3	178	99	26	14	83	25050.0014
15	**26**	28	22	27	65,0	99,0	13,3	166	99	26	15	78	25050.0015
16	**26**	28	22	27	65,0	106,0	13,3	156	99	26	16	73	25050.0016
18	**35**	36	27	36	161,0	223,0	24,8	224	125	35	18	201	25050.0018
19	**35**	36	27	36	161,0	235,0	24,8	212	125	35	19	189	25050.0019
20	**35**	36	27	36	161,0	248,0	24,8	201	125	35	20	186	25050.0020
22	**42**	41	30	46	250,0	349,0	31,8	197	110	42	22	346	25050.0022
24	**42**	41	30	46	250,0	381,0	31,8	180	110	42	24	326	25050.0024
25	**42**	41	30	46	250,0	397,0	31,8	173	110	42	25	315	25050.0025
28	**47**	44	33	50	355,0	565,0	40,4	174	110	47	28	403	25050.0028
30	**47**	44	33	50	355,0	605,0	40,4	162	110	47	30	378	25050.0030
32	**55**	51	38	55	490,0	764,0	47,8	166	102	55	32	632	25050.0032
35	**55**	51	38	55	490,0	836,0	47,8	151	102	55	35	571	25050.0035
38	**62**	58	43	65	720,0	1179,0	62,1	159	111	62	38	897	25050.0038
40	**62**	58	43	65	720,0	1241,0	62,1	151	111	62	40	842	25050.0040

ACCESSORIES

	WS [mm]	[g]	Art. No.
special fork wrench			
	**14**	45	25050.0814
	16	51	25050.0816
	22	195	25050.0822
	27	195	25050.0827
	36	428	25050.0836
	46	612	25050.0846
	50	870	25050.0850
	55	1125	25050.0855
	65	1295	25050.0865

APPLICATION EXAMPLE



Tapered Shaft Hubs • without lock nut, stainless steel

EH 25050.



PRODUCT DESCRIPTION

By using tapered shaft hubs, all shaft-hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently established. It is a self-centering and non-floating tapered shaft hub in corrosion-protected design with a hexagon nut.
The rotational accuracy is 0,03 mm.

Material

External part
- Stainless steel, nickel-plated

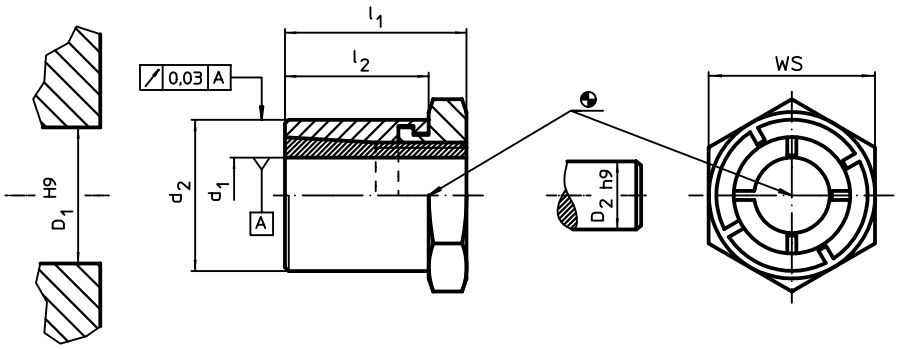
Inner part
- Stainless steel, nickel-plated

Nut
- Stainless steel, nickel-plated, hardened

MORE INFORMATION

References
Comply with mounting instructions, mounting examples, and technical data.

DRAWING



ORDER INFORMATION

Dimensions d_1	d_2	l_1	l_2 [mm]	WS [mm]	Tightening torque of the nut T_A max. [Nm]	Transferable torque M max. [Nm]	Transferable axial load F_a max. [kN]	Surface pressure of shaft p_W max. [N/mm²]	Surface pressure of hub p_N max. [N/mm²]	Hub bore D_1 H9 [mm]	Shaft diameter D_2 h9 [mm]	[g]	Art. No.
6	**14**	19	15	14	7	8,5	2,8	154	67	14	6	19	25050.0206
8	**16**	22	17	16	12	16,4	4,1	125	64	16	8	26	25050.0208
10	**20**	24	19	22	24	34,0	6,8	155	81	20	10	46	25050.0210
12	**22**	24	19	22	31	45,7	7,6	144	82	22	12	49	25050.0212
16	**26**	28	22	27	46	74,2	9,3	109	69	26	16	73	25050.0216
20	**35**	36	27	36	113	173,6	17,4	141	88	35	20	186	25050.0220
25	**42**	41	30	46	175	277,9	22,3	121	77	42	25	315	25050.0225
30	**47**	44	33	50	249	423,5	28,3	113	77	47	30	378	25050.0230

ACCESSORIES

	WS [mm]	[g]	Art. No.
special fork wrench			
	**14**	45	25050.0814
	16	51	25050.0816
	22	195	25050.0822
	27	195	25050.0827
	36	428	25050.0836
	46	612	25050.0846
	50	870	25050.0850

Tapered Shaft Hubs • with lock nut

EH 25050.



PRODUCT DESCRIPTION

It is a self-centering and non-floating tapered shaft hub in corrosion-protected design with a hexagon nut and a lock nut.
The rotational accuracy is 0,03 mm.
By using tapered shaft hubs, all shaft-hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently established.

Material

External part
- Steel, zinc-plated by galvanization

Inner part
- Steel, nickel-plated

Nut
- Steel, nickel-plated

Assembly

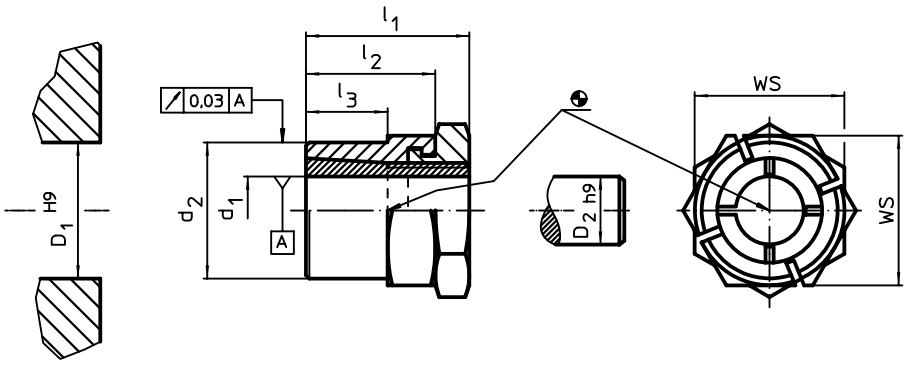
The lock nut at the outer part facilitates locking of the shaft-hub joint if freely rotating shafts are involved. For mounting, a cresent wrench (thickness max. l_2 - l_3) is used.

MORE INFORMATION

References

Comply with mounting instructions, mounting examples, and technical data.

DRAWING



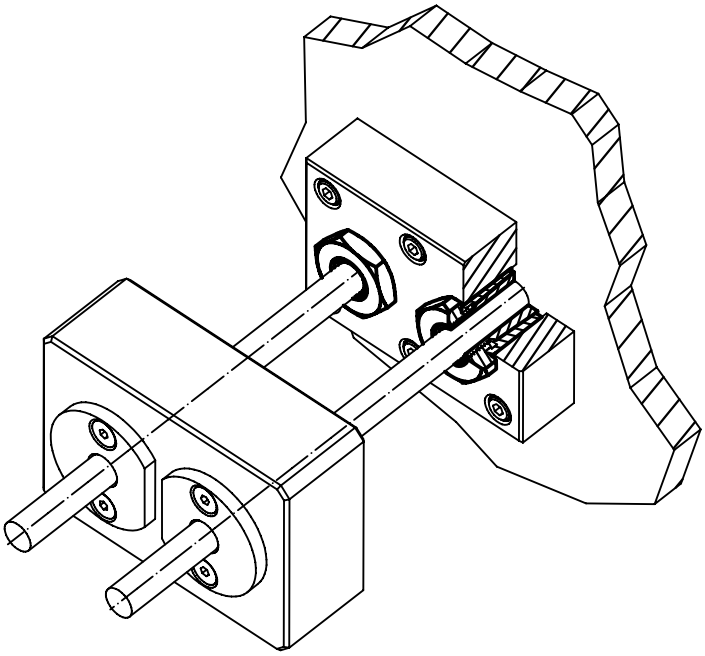
ORDER INFORMATION

Dimensions d_1	d_2	l_1	l_2	l_3 [mm]	WS [mm]	Tightening torque of the nut T_A max. [Nm]	Transferable torque M max. [Nm]	Transferable axial load F_a max. [kN]	Surface pressure of shaft p_W max. [N/mm²]	Surface pressure of hub p_N max. [N/mm²]	Hub bore D_1 H9 [mm]	Shaft diameter D_2 h9 [mm]	[g]	Art. No.
5	**12**	19	15	9	14	9,9	10,1	4,0	264	119	12	5	18	25050.0105
6	**12**	19	15	9	14	9,9	12,1	4,0	220	119	12	6	17	25050.0106
8	**14**	22	17	11	16	16,9	23,4	5,8	179	121	14	8	23	25050.0108
9	**18**	24	19	12	22	34,9	43,7	9,7	245	127	18	9	47	25050.0109
10	**18**	24	19	12	22	34,9	48,6	9,7	221	127	18	10	46	25050.0110
11	**20**	24	19	12	22	43,8	59,9	10,9	225	128	20	11	47	25050.0111
12	**20**	24	19	12	22	43,8	65,3	10,9	206	128	20	12	45	25050.0112
14	**24**	28	22	15	27	65,0	93,0	13,3	178	107	24	14	78	25050.0114
15	**24**	28	22	15	27	65,0	99,0	13,3	166	107	24	15	75	25050.0115
16	**24**	28	22	15	27	65,0	106,0	13,3	156	107	24	16	70	25050.0116
18	**30**	36	27	17	36	161,0	223,0	24,8	224	145	30	18	179	25050.0118
19	**30**	36	27	17	36	161,0	235,0	24,8	212	145	30	19	169	25050.0119
20	**30**	36	27	17	36	161,0	248,0	24,8	201	145	30	20	213	25050.0120
22	**38**	41	30	20	46	250,0	349,0	31,8	197	122	38	22	341	25050.0122
24	**38**	41	30	20	46	250,0	381,0	31,8	180	122	38	24	320	25050.0124
25	**38**	41	30	20	46	250,0	397,0	31,8	173	122	38	25	310	25050.0125
28	**42**	44	33	23	50	355,0	565,0	40,4	174	123	42	28	370	25050.0128
30	**42**	44	33	23	50	355,0	605,0	40,4	162	123	42	30	348	25050.0130
32	**50**	51	38	28	55	490,0	764,0	47,8	166	112	50	32	555	25050.0132
35	**50**	51	38	28	55	490,0	836,0	47,8	151	112	50	35	501	25050.0135

ACCESSORIES

	WS [mm]	[g]	Art. No.
special fork wrench			
	**14**	45	25050.0814
	16	51	25050.0816
	22	195	25050.0822
	27	195	25050.0827
	36	428	25050.0836
	46	612	25050.0846
	50	870	25050.0850
	55	1125	25050.0855

APPLICATION EXAMPLE



Tapered Shaft Hubs • with lock nut, stainless steel

EH 25050.



PRODUCT DESCRIPTION

It is a self-centering and non-floating tapered shaft hub in corrosion-protected design with a hexagon nut and a lock nut.
The rotational accuracy is 0,03 mm.
By using tapered shaft hubs, all shaft-hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently established.

Material

External part
- Stainless steel, nickel-plated

Inner part
- Stainless steel, nickel-plated

Nut
- Stainless steel, nickel-plated, hardened

Assembly

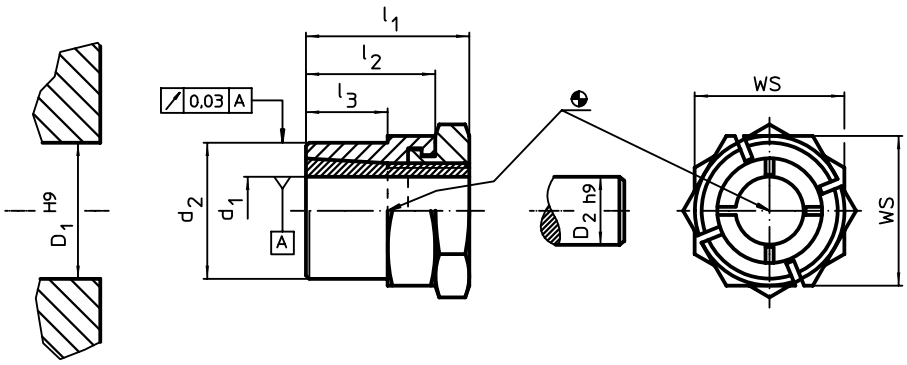
The lock nut at the outer part facilitates locking of the shaft-hub joint if freely rotating shafts are involved. For mounting, a cresent wrench (thickness max. l_2 - l_3) is used.

MORE INFORMATION

References

Comply with mounting instructions, mounting examples, and technical data.

DRAWING



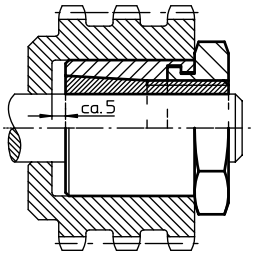
ORDER INFORMATION

Dimensions d_1	d_2	l_1	l_2	l_3 [mm]	WS [mm]	Tightening torque of the nut T_A max. [Nm]	Transferable torque M max. [Nm]	Transferable axial load F_a max. [kN]	Surface pressure of shaft p_W max. [N/mm²]	Surface pressure of hub p_N max. [N/mm²]	Hub bore D_1 H9 [mm]	Shaft diameter D_2 h9 [mm]	[g]	Art. No.
6	**12**	19	15	9	14	7	8,5	2,8	154	119	12	6	17	25050.0306
8	**14**	22	17	11	16	12	16,4	4,1	125	121	14	8	23	25050.0308
10	**18**	24	19	12	22	24	34,0	6,8	155	127	18	10	46	25050.0310
12	**20**	24	19	12	22	31	45,7	7,6	144	128	20	12	45	25050.0312
16	**24**	28	22	15	27	46	74,2	9,3	109	107	24	16	70	25050.0316
20	**30**	36	27	17	36	113	173,6	17,4	141	145	30	20	213	25050.0320
25	**38**	41	30	20	46	175	277,9	22,3	121	122	38	25	310	25050.0325
30	**42**	44	33	23	50	249	423,5	28,3	113	123	42	30	348	25050.0330

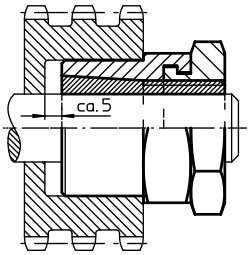
ACCESSORIES

	WS [mm]	[g]	Art. No.
special fork wrench			
	**14**	45	25050.0814
	16	51	25050.0816
	22	195	25050.0822
	27	195	25050.0827
	36	428	25050.0836
	46	612	25050.0846
	50	870	25050.0850

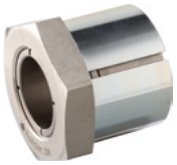
MOUNTING ARRANGEMENTS TAPERED SHAFT HUBS



Tapered shaft hub with hexagon nut



Tapered shaft hub with hexagon nut and lock nut





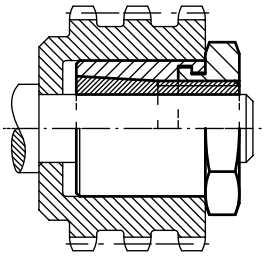


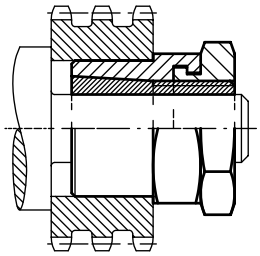


PRE-CENTERING

If longer hubs are used, additional support on the shaft can be achieved as shown in the accompanying drawings.

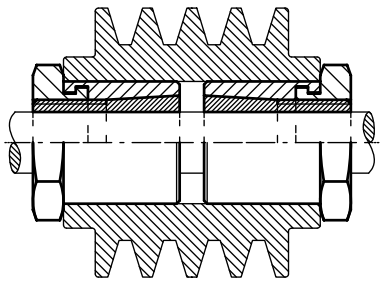
- Due to this support, forces acting outside the useful length of the tapered shaft hub can also be taken up.
- An increased rotational accuracy is achieved.





NO AXIAL SHIFT

If, on mounting, the hub sits close to a collar, an axial offset is not possible when tightening the tapered shaft hub.
In this case, only 60 % of the forces mentioned in the charts can be transmitted.



TWO TAPERED SHAFT HUBS IN ONE HUB

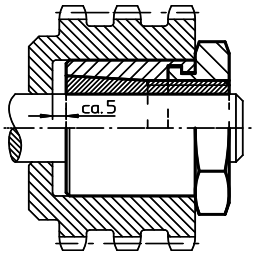
When using this version, the tapered shaft hub which is tightened first transmits 100 % of the forces mentioned in the charts.
When tightening the second tapered shaft hub, an axial offset of the hub is not possible. Therefore, this tapered shaft hub is able to transmit only 60 % of the forces.

Tapered Shaft Hubs

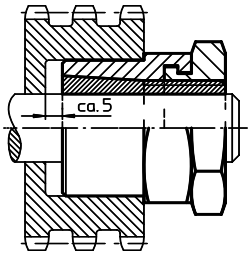
EH 25050.



ASSEMBLY INSTRUCTIONS TAPERED SHAFT HUBS



Tapered shaft hub with hexagon nut



Tapered shaft hub with hexagon nut and lock nut

By using tapered shaft hubs, all shaft hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently established. Tapered shaft hubs are available with or without lock nut.

ASSEMBLY

1. The contact surfaces of the shaft and the hub must be free from oil and dirt.
2. Rotate nut to the left until the inner part protrudes approximately 3-5 mm over the outer part.
3. Install tapered shaft hub in the hub hole.
4. Slightly tighten the nut when located in the desired position. Compensate the axial offset thus produced with a soft-face mallet. Tighten the tapered shaft hub.

DISASSEMBLY

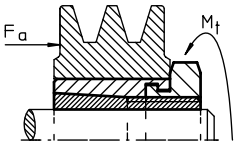
Release tapered shaft hub by turning the nut to the left until the inner part protrudes approximately 3-5 mm over the outer part.

Tapered Shaft Hubs
EH 25050.

TECHNICAL DATA



SIMULTANEOUS EXPOSURE TO DIFFERENT FORCES



If torques (M_t) and axial forces (F_a) are transmitted simultaneously, a resultant total torque (M_r) is obtained which must be less than or equal to the maximum torque (M_{max}) indicated in the charts. ($M_r \leq M_{max}$).

$$M_r = \sqrt{M_t^2 + \left(F_a \times \frac{d_1}{2 \times 1000}\right)^2} \times v \text{ [Nm]}$$

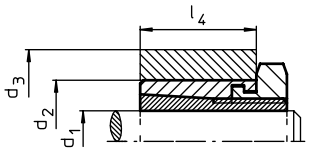
(M_r) = Resultant total torque
(M_t) = Torque
Fa = Axial force
d_1 = Shaft diameter
v = Safety factor

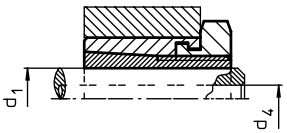
Example
Shaft hub 25050.0125
M_t = 150 Nm
F_a = 5 kN
d_1 = 25 mm
v = 2

$$M_r = \sqrt{150^2 \text{ Nm}^2 + \left(5000 \text{ N} \times \frac{25 \text{ mm}}{2 \times 1000 \text{ mm/m}}\right)^2} \times 2 = 325 \text{ Nm}$$

A maximum torque (M_{max}) of 397 Nm is transmitted by the tapered shaft hub 25050.0125.
The forces can be transmitted because M_r (325 Nm) is less than M_{max} .

OUTSIDE DIAMETER OF HUB AND INSIDE DIAMETER OF HOLLOW SHAFT





When fitting tapered shaft hubs, the outside diameter of the hub and the inside diameter of the hollow shaft have to be taken into account.

SMALLEST POSSIBLE OUTSIDE DIAMETER OF HUB

$$d_3 \geq d_2 \times \sqrt{\frac{R_e + P_N \times C_N}{R_e - P_N \times C_N}} \text{ [mm]}$$

d_1 = Shaft diameter
d_2 = Hub hole
d_3 = Outside diameter of hub
d_4 = Inside diameter of hollow shaft
R_e = Apparent yielding point
$Rp_{0,2}$, $Rp_{0,1}$ = Permanent elongation limit

$$d_3 \geq 42 \text{ mm} \times \sqrt{\frac{165 \text{ N/mm}^2 + 103 \text{ N/mm}^2 \times 1}{165 \text{ N/mm}^2 - 103 \text{ N/mm}^2 \times 1}} \geq 87{,}4 \text{ mm}$$

Example
Tapered shaft hub 25050.0025, hub material GG25;
$R_{p0,1}$ = 165 N/mm² C_N = 1

LARGEST POSSIBLE INSIDE DIAMETER OF HOLLOW SHAFT

$$d_4 \leq d_1 \times \sqrt{\frac{R_e + 2p_w}{R_e \ (R_e)}} \text{ [mm]}$$

p_N = Surface pressure hub
p_w = Surface pressure shaft
C_N = Factor [is “1”, if the hub length is ≥ the fitting length of the tapered shaft hub ($L_N \geq L_2$)]

$$d_4 \leq 25 \text{ mm} \times \sqrt{\frac{380 \text{ N/mm}^2 - 2 \times 174 \text{ N/mm}^2 \times 1}{380 \text{ N/mm}^2}} \leq 7{,}2 \text{ mm}$$

Example
Tapered shaft hub 25050.0025, shaft materialCk45;
R_e = 380 N/mm² C_N = 1

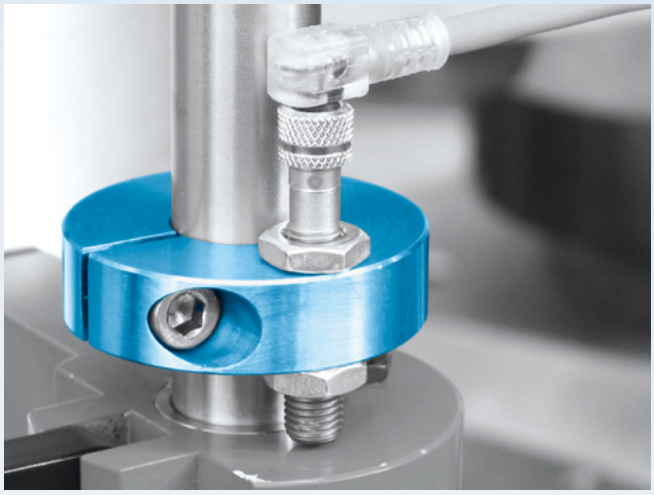
MATERIAL CHART

				Material							
	St 37-2 Ust 37-2	St 50-2	Ck 35	Ck 45	11 SMn 30 11 SMn Pb 30	GG 15	GG 20	GG 25	GGG-40	AlMg 3 F 25	
Diameter				**Minimum strength values in N/mm²**							
	R_e	R_e	R_e	R_e	R_e	R_e	R_p 0,1	R_p 0,1	R_p 0,1	R_p 0,2	Re
16 < d_1 ≤ 40	225	285	320	380	375	90	130	165	250	180	
40 < d_1 ≤100	205	265	260	300	245	90	130	165	250	180	

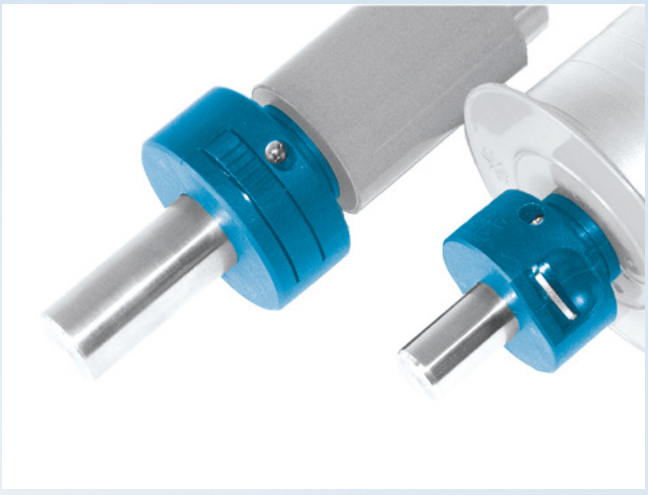
Set Collars

EH 25069. – EH 25071.

INSTALLATION EXAMPLES



Set collars offer universal applicability, e.g. as a fixed stop. The image shows the model with sensor adapter.



The tools are also available as quick-setting models.



Set Collars

EH 25069.



PRODUCT DESCRIPTION

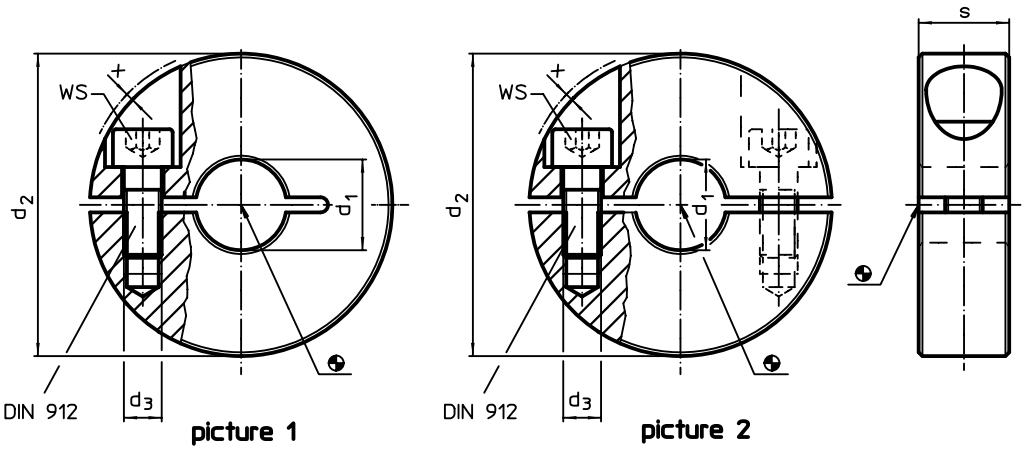
Set collars with universal applicability, e.g. as a fixed stop.
Set collars with strong clamping force.

Material

Screw
- Steel
- Stainless steel

Set collar
- Steel, black, steam oxidized
- Stainless steel 1.4404

DRAWING



ORDER INFORMATION

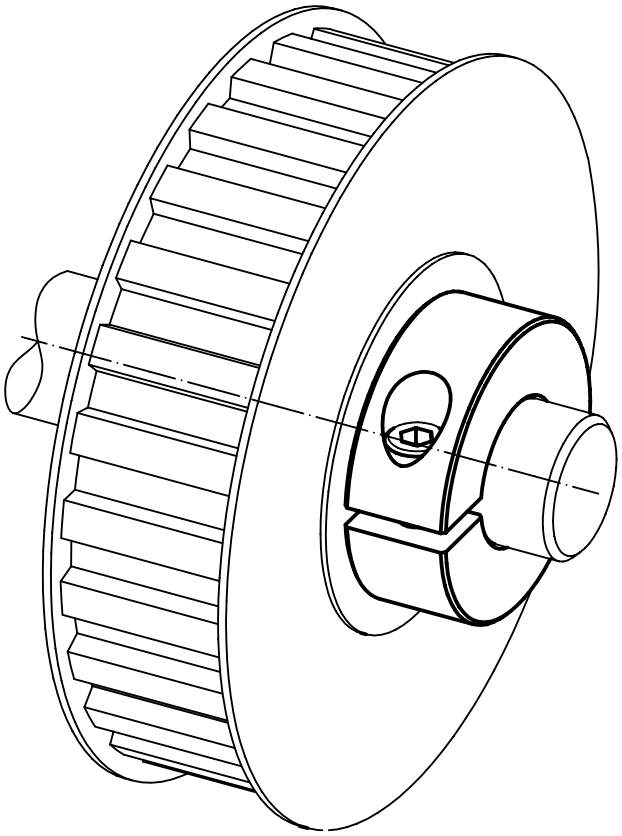
Dimensions					WS		Art. No.	
d_1 H10	d_2	d_3	s	x			steel	stainless steel
[mm]					[mm]	[g]		
slotted – picture 1								
6	20	M3	9	1,2	2,5	20	25069.0006	25069.0106
8	22	M3	9	1,0	2,5	18	25069.0008	25069.0108
10	26	M4	11	1,6	3,0	33	25069.0010	25069.0110
12	30	M4	11	0,7	3,0	42	25069.0012	25069.0112
14	32	M4	11	0,7	3,0	40	25069.0014	25069.0114
15	36	M5	13	1,4	4,0	73	25069.0015	25069.0115
16	36	M5	13	1,4	4,0	66	25069.0016	25069.0116
18	42	M5	15	0,6	4,0	120	25069.0018	25069.0118
20	42	M5	15	0,6	4,0	104	25069.0020	25069.0120
22	48	M5	15	0,0	4,0	139	25069.0022	25069.0122
25	48	M5	15	0,0	4,0	130	25069.0025	25069.0125
28	55	M6	15	0,5	5,0	171	25069.0028	25069.0128
30	55	M6	15	0,5	5,0	162	25069.0030	25069.0130
32	60	M6	15	0,4	5,0	196	25069.0032	25069.0132
35	60	M6	15	0,4	5,0	180	25069.0035	25069.0135
40	65	M6	15	0,5	5,0	183	25069.0040	25069.0140

→

Dimensions					WS		Art. No.	
d_1 H10	d_2	d_3	s	x			steel	stainless steel
[mm]					[mm]	[g]		
divided – picture 2								
6	20	M3	9	1,2	2,5	18	25069.0206	25069.0306
8	22	M3	9	1,0	2,5	20	25069.0208	25069.0308
10	26	M4	11	1,6	3,0	20	25069.0210	25069.0310
12	30	M4	11	0,7	3,0	39	25069.0212	25069.0312
14	32	M4	11	0,7	3,0	43	25069.0214	25069.0314
15	36	M5	13	1,4	4,0	65	25069.0215	25069.0315
16	36	M5	13	1,4	4,0	64	25069.0216	25069.0316
18	42	M5	15	0,6	4,0	103	25069.0218	25069.0318
20	42	M5	15	0,6	4,0	100	25069.0220	25069.0320
22	48	M5	15	0,0	4,0	135	25069.0222	25069.0322
25	48	M5	15	0,0	4,0	125	25069.0225	25069.0325
28	55	M6	15	0,5	5,0	165	25069.0228	25069.0328
30	55	M6	15	0,5	5,0	156	25069.0230	25069.0330
32	60	M6	15	0,4	5,0	187	25069.0232	25069.0332
35	60	M6	15	0,4	5,0	170	25069.0235	25069.0335
40	65	M6	15	0,5	5,0	189	25069.0240	25069.0340

5

APPLICATION EXAMPLE



Set Collars • with sensor adapter

EH 25070.





PRODUCT DESCRIPTION

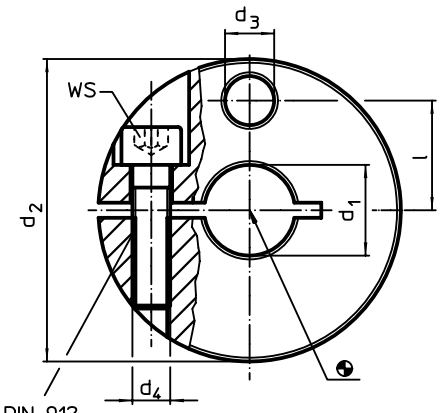
Clamping rings are provided with a fastening possibility for sensors, switches etc. Universal applicability, e.g. as a limit switch on a piston rod.
Clamping ring made of stainless steel with strong clamping force.

Material

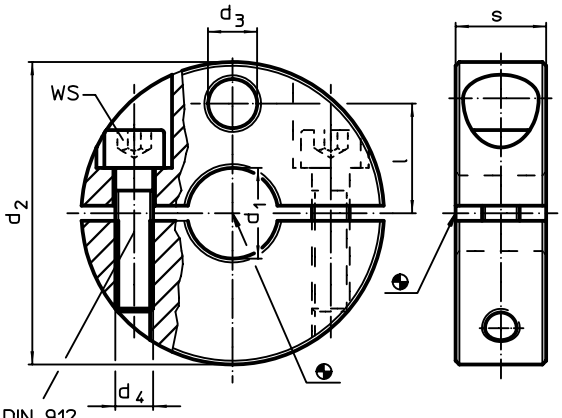
Screw
- Stainless steel

Set collar
- Stainless steel 1.4021

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions						WS		Art. No.
d_1 H8	d_2 -0,5	d_3	d_4	l	s			
[mm]						[mm]	[g]	
slotted – picture 1								
10	40	6,5	M5	14,5	12	4	99	25070.0010
12	40	6,5	M5	14,5	12	4	94	25070.0012
14	45	9,0	M6	16,5	13	5	125	25070.0014
15	45	9,0	M6	16,5	13	5	122	25070.0015
16	45	9,0	M6	16,5	13	5	120	25070.0016
18	50	9,0	M6	18,5	13	5	151	25070.0018
20	50	9,0	M6	18,5	13	5	144	25070.0020
22	65	13,0	M8	23,5	18	6	359	25070.0022
24	65	13,0	M8	23,5	18	6	349	25070.0024
25	65	13,0	M8	23,5	18	6	345	25070.0025
30	75	13,0	M8	27,0	20	6	507	25070.0030
32	80	13,0	M8	30,0	20	6	588	25070.0032
35	80	13,0	M8	30,0	20	6	566	25070.0035
divided – picture 2								
10	40	6,5	M5	14,5	12	4	94	25070.0110
12	40	6,5	M5	14,5	12	4	90	25070.0112
14	45	9,0	M6	16,5	13	5	114	25070.0114
15	45	9,0	M6	16,5	13	5	112	25070.0115
16	45	9,0	M6	16,5	13	5	110	25070.0116
18	50	9,0	M6	18,5	13	5	142	25070.0118
20	50	9,0	M6	18,5	13	5	139	25070.0120
22	65	13,0	M8	23,5	18	6	341	25070.0122
24	65	13,0	M8	23,5	18	6	330	25070.0124
25	65	13,0	M8	23,5	18	6	330	25070.0125
30	75	13,0	M8	27,0	20	6	488	25070.0130
32	80	13,0	M8	30,0	20	6	564	25070.0132
35	80	13,0	M8	30,0	20	6	542	25070.0135

Set Collars • for quick setting

EH 25071.



PRODUCT DESCRIPTION

To be used for positioning, gripping, clamping and as a quick adjustment element on shafts. Quick, self-clamping and vibration-free mounting by one-hand operation in pull-direction.

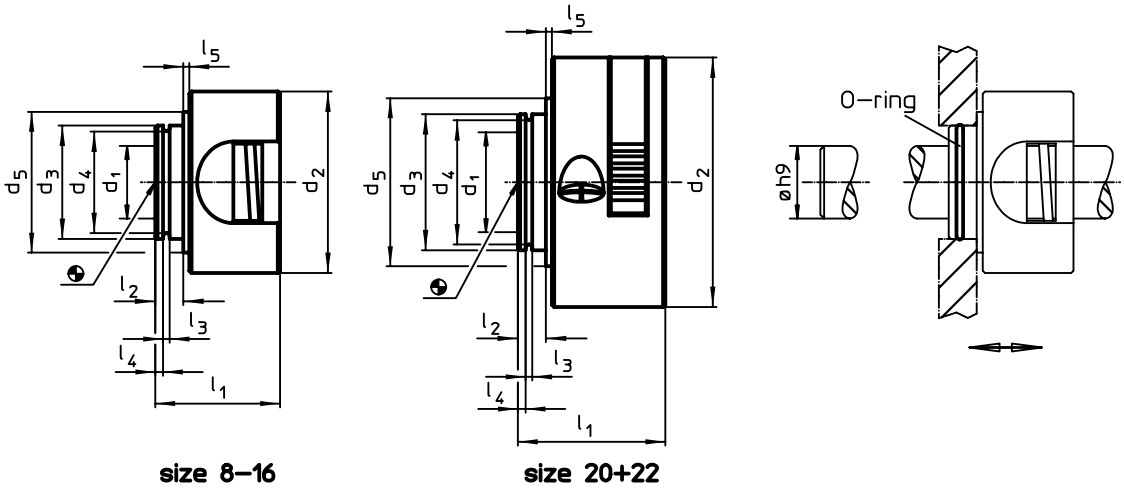
Material

Body
- Thermoplastic PA 6, black

Inner parts
- Stainless steel

O-ring
- NBR

DRAWING



ORDER INFORMATION

Dimensions										F			Art. No.
d_1 +0,1	d_2	d_3	d_4	d_5	l_1	l_2	l_3	l_4	l_5	Holding force axial, one-sided	max.		
[mm]										[N]	[°C]	[g]	
8	40	25	22,4	31	27,5	7	1,7	3,15	0,5	250	80	31	25071.0008
10	40	25	22,4	31	27,5	7	1,7	3,15	0,5	250	80	30	25071.0010
12	40	25	22,4	31	27,5	7	1,7	3,15	0,5	350	80	30	25071.0012
15	40	25	22,4	31	27,5	7	1,7	3,15	0,5	350	80	28	25071.0015
16	40	25	22,4	31	27,5	7	1,7	3,15	0,5	380	80	27	25071.0016
20	55	30	27,4	37	32,5	7	1,7	2,65	0,5	320	80	51	25071.0020
22	55	30	27,4	37	32,5	7	1,7	2,65	0,5	320	80	50	25071.0022

ACCESSORIES

	Dimensions d [mm]	Suitable for size [mm]	[g]	Art. No.
O-ring				
	**22 x 1,5**	8, 10, 12, 15, 16	0,17	25071.0052
	27 x 1,5	20, 22	0,20	25071.0054

Clamping Nuts • self-locking

EH 25030.



PRODUCT DESCRIPTION

Clamping nuts are used for rotating parts, especially for reversible shafts, for example for fixing the grinding wheel. The compact construction ensures a safe function and allows quick installation using a face wrench.
Compared with other backup methods, the clamping nut has the following advantages:

- Self-locking (even with changing direction of rotation of the shaft)
- Easy installation / dismantling
- Also for repetitive clamping operations

Material

- Heat-treated steel, blackened

Assembly

The clamping nut consists of an outer and inner ring, which form a unit.
The outer ring has a conical bore, the slotted inner ring has a conical outer surface and a female thread.

When tightening the clamping nut using a face pin wrench, the two conical surfaces move against each other. As a result, the slotted inner ring narrows like a collet. The nut clamps itself on the flanks of the thread so much, that they do not detach even with opposite axis rotation.

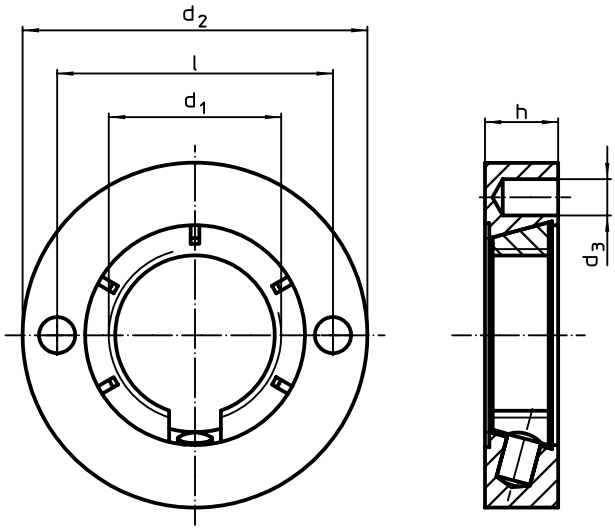
MORE INFORMATION

Notes

Further dimensions on request.

5

DRAWING



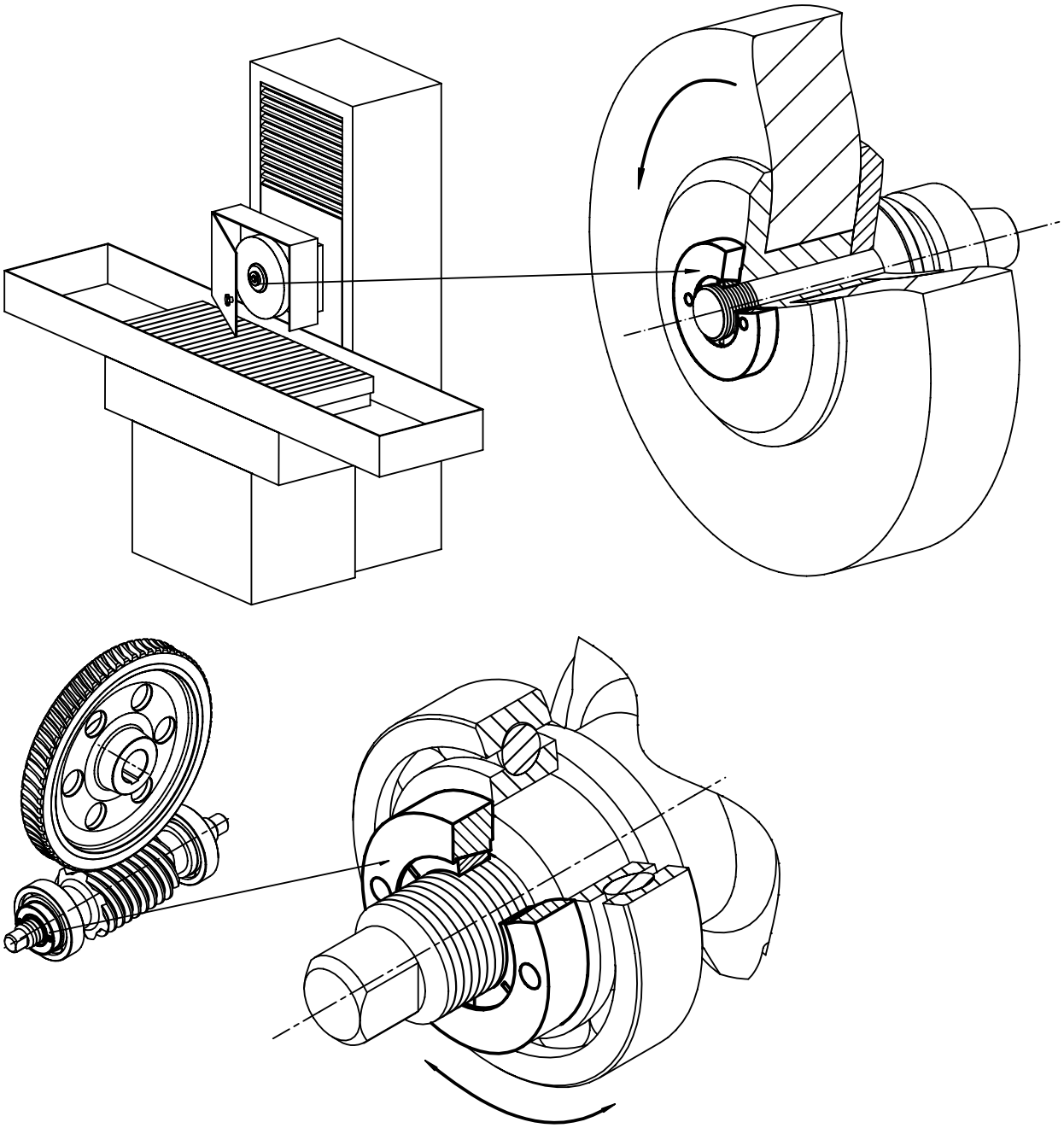
ORDER INFORMATION

Dimensions						Art. No.
d_1	d_2	d_3 [mm]	h	l	[g]	
M20 x 1,5	40	4,1	8,5	32	58	25030.0020
	50	4,1	8,5	32	104	25030.0021

ACCESSORIES

	[g]	Art. No.
adjustable face wrench, offset		
	120	25030.0022

APPLICATION EXAMPLE



Quick Plug Couplings • with radial offset compensation

EH 25100.



PRODUCT DESCRIPTION

Quick plug coupling with radial offset compensation for multiple applications, e.g. as a link between a piston rod and a linear movement unit.

Material

Claw
- Heat-treated steel, tempered, phosphated

Coupling part
- Heat-treated steel, tempered, phosphated

Lock nut
- Steel, black (ISO 4035/8675)

Assembly

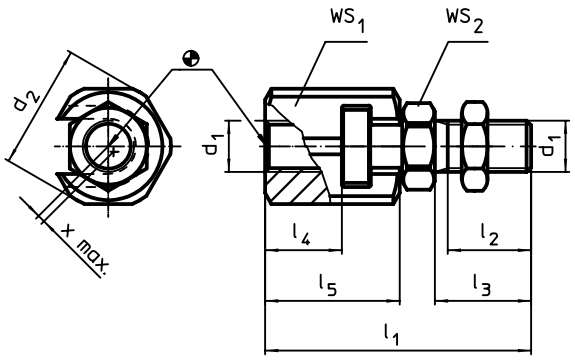
Assembly and disassembly of this simple, solid and two-part coupling is by means of a T-slot; a manual re-adjustment is not necessary.
The quick plug coupling can be linked to all commonly used pneumatic and hydraulic lifting cylinders via the connecting thread.

MORE INFORMATION

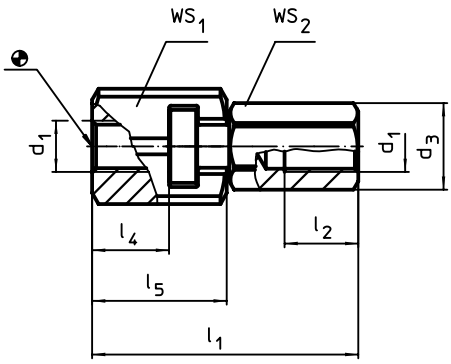
Notes

The quick plug coupling does not transmit any torque.

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions								WS		Axial offset x max.	Maximum tensile and compressive load max.		Art. No.
d_1	d_2	d_3	l_1 ~	l_2 min.	l_3	l_4 min.	l_5	WS_1	WS_2				
[mm]								[mm]		[mm]	[kN]	[g]	
with coupling screw – picture 1													
M 6	21,0	–	37,5	11,0	14	9,0	18,0	19	10	0,6	2,5	44	25100.0006
M 8	26,0	–	45,0	13,5	17	11,5	22,5	24	13	0,7	4,5	86	25100.0008
M10	30,0	–	56,2	16,0	20	16,0	29,0	27	17	0,7	6,5	147	25100.0010
M12	32,5	–	66,7	21,0	25	17,0	34,0	30	19	0,8	10,0	208	25100.0012
M16	39,0	–	83,0	25,0	30	23,0	42,0	36	24	1,0	18,0	383	25100.0016
M20	44,0	–	93,5	29,0	35	23,5	45,5	41	30	1,0	30,0	571	25100.0020
M10 x 1,25	30,0	–	56,2	16,0	20	16,0	29,0	27	17	0,7	6,5	147	25100.0030
M12 x 1,25	32,5	–	66,7	21,0	25	17,0	34,0	30	19	0,8	10,0	207	25100.0032
M16 x 1,5	39,0	–	83,0	25,0	30	23,0	42,0	36	24	1,0	18,0	384	25100.0036
M20 x 1,5	44,0	–	93,5	29,0	35	23,5	45,5	41	30	1,0	30,0	576	25100.0040
with coupling nut – picture 2													
M 6	21,0	11,0	37,5	11,0	–	9,0	18,0	19	10	0,6	2,5	47	25100.0056
M 8	26,0	14,4	45,0	13,5	–	11,5	22,5	24	13	0,7	4,5	91	25100.0058
M10	30,0	19,0	56,2	15,0	–	16,0	29,0	27	17	0,7	6,5	160	25100.0060
M12	32,5	21,2	66,7	17,5	–	17,0	34,0	30	19	0,8	10,0	223	25100.0062
M16	39,0	27,0	83,0	22,0	–	23,0	42,0	36	24	1,0	18,0	401	25100.0066
M20	44,0	34,0	93,5	25,0	–	23,5	45,5	41	30	1,0	30,0	606	25100.0070
M10 x 1,25	30,0	19,0	56,2	15,0	–	16,0	29,0	27	17	0,7	6,5	159	25100.0080
M12 x 1,25	32,5	21,2	66,7	17,5	–	17,0	34,0	30	19	0,8	10,0	222	25100.0082
M16 x 1,5	39,0	27,0	83,0	22,0	–	23,0	42,0	36	24	1,0	18,0	400	25100.0086
M20 x 1,5	44,0	34,0	93,5	25,0	–	23,5	45,5	41	30	1,0	30,0	601	25100.0090

Quick Plug Couplings • with radial offset compensation and screwed flange

EH 25100.





PRODUCT DESCRIPTION

Quick plug coupling with radial offset compensation requiring only little space. Suitable for multiple applications, e.g. as a link between a piston rod and a linear-movement unit.

Material

Flange
- Heat-treated steel, tempered, phosphated

Coupling part
- Heat-treated steel, tempered, phosphated

Lock nut
- Steel, black (ISO 4035/8675)

Assembly

Assembly and disassembly of this simple, solid and two-part coupling is by means of a T-slot; a manual re-adjustment is not necessary.
The quick plug coupling can be linked to all commonly used pneumatic and hydraulic lifting cylinders via the connecting thread.

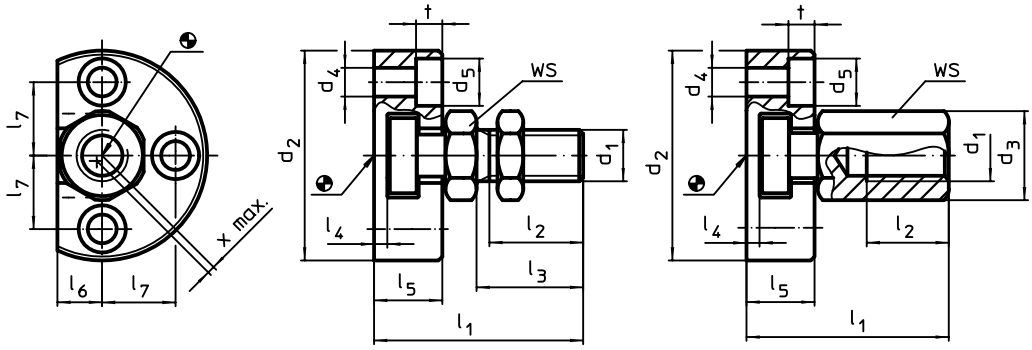
MORE INFORMATION

Notes

The quick plug coupling does not transmit any torque.

5

DRAWING



picture 1 picture 2

ORDER INFORMATION

Dimensions														WS	Axial offset x max.	Maximum tensile and compressive load max.		Art. No.
d_1	d_2	d_3	d_4	d_5	l_1 ~	l_2 min.	l_3	l_4	l_5	l_6	l_7	t						
[mm]														[mm]	[mm]	[kN]	[g]	
with coupling screw – picture 1																		
M 6	42	–	5,5	10	30,5	11,0	14	3,0	11,0	7,0	14,0	5,4		10	0,6	2,5	75	25100.0206
M 8	48	–	6,6	11	35,5	13,5	17	3,0	13,0	8,0	16,0	6,4		13	0,7	4,5	116	25100.0208
M10	50	–	6,6	11	43,2	16,0	20	4,2	16,0	9,0	17,0	6,4		17	0,7	6,5	175	25100.0210
M12	55	–	6,6	11	53,2	21,0	25	4,2	20,5	10,0	19,0	6,4		19	0,8	10,0	281	25100.0212
M16	65	–	9,0	15	64,0	25,0	30	5,0	23,0	12,5	22,5	8,5		24	1,0	18,0	458	25100.0216
M20	80	–	11,0	18	74,0	29,0	35	5,0	26,0	17,0	28,0	10,0		30	1,0	30,0	817	25100.0220
M10 x 1,25	50	–	6,6	11	43,2	16,0	20	4,2	16,0	9,0	17,0	6,4		17	0,7	6,5	176	25100.0230
M12 x 1,25	55	–	6,6	11	53,2	21,0	25	4,2	20,5	10,0	19,0	6,4		19	0,8	10,0	280	25100.0232
M16 x 1,5	65	–	9,0	15	64,0	25,0	30	5,0	23,0	12,5	22,5	8,5		24	1,0	18,0	454	25100.0236
M20 x 1,5	80	–	11,0	18	74,0	29,0	35	5,0	26,0	17,0	28,0	10,0		30	1,0	30,0	850	25100.0240
with coupling nut – picture 2																		
M 6	42	11,0	5,5	10	30,5	11,0	–	3,0	11,0	7,0	14,0	5,4		10	0,6	2,5	77	25100.0256
M 8	48	14,4	6,6	11	35,5	13,5	–	3,0	13,0	8,0	16,0	6,4		13	0,7	4,5	123	25100.0258
M10	50	19,0	6,6	11	43,2	15,0	–	4,2	16,0	9,0	17,0	6,4		17	0,7	6,5	187	25100.0260
M12	55	21,2	6,6	11	53,2	17,5	–	4,2	20,5	10,0	19,0	6,4		19	0,8	10,0	295	25100.0262
M16	65	27,0	9,0	15	64,0	22,0	–	5,0	23,0	12,5	22,5	8,5		24	1,0	18,0	472	25100.0266
M20	80	34,0	11,0	18	74,0	25,0	–	5,0	26,0	17,0	28,0	10,0		30	1,0	30,0	849	25100.0270
M10 x 1,25	50	19,0	6,6	11	43,2	15,0	–	4,2	16,0	9,0	17,0	6,4		17	0,7	6,5	187	25100.0280
M12 x 1,25	55	21,2	6,6	11	53,2	17,5	–	4,2	20,5	10,0	19,0	6,4		19	0,8	10,0	298	25100.0282
M16 x 1,5	65	27,0	9,0	15	64,0	22,0	–	5,0	23,0	12,5	22,5	8,5		24	1,0	18,0	477	25100.0286
M20 x 1,5	80	34,0	11,0	18	74,0	25,0	–	5,0	26,0	17,0	28,0	10,0		30	1,0	30,0	852	25100.0290

Quick Plug Couplings • with angular and radial offset compensation

EH 25100.



PRODUCT DESCRIPTION

Quick plug coupling, adjustable without axial play, including angular and radial offset compensation. Suitable for multiple applications, e.g. for non-aligned linear movements. Solid and compact design, no loose elements.

Material

Claw
- Heat-treated steel, tempered, phosphated

Seat
- Heat-treated steel, tempered, phosphated

Coupling part
- Heat-treated steel, nitrided, black

Nut
- Heat-treated steel, phosphated

Lock nut
- Steel, black (ISO 4035/8675)

Spring
- Stainless steel

Assembly

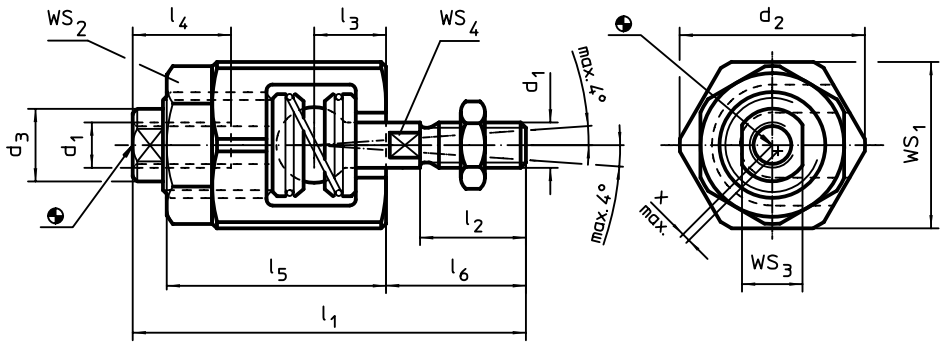
Assembly and disassembly is by means of a T-slot; a manual re-adjustment is not necessary.
The quick plug coupling can be linked to all commonly used pneumatic and hydraulic lifting cylinders via the connecting thread.

MORE INFORMATION

Notes

The quick plug coupling does not transmit any torque.

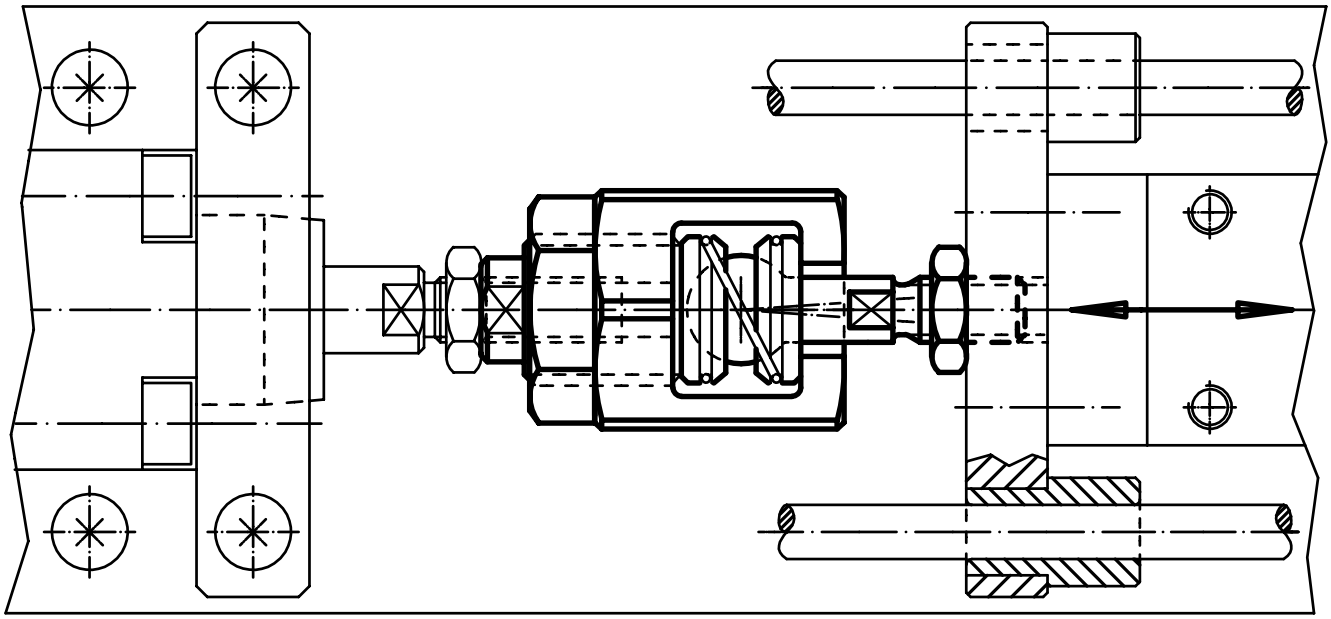
DRAWING



ORDER INFORMATION

Dimensions									WS				Radial offset compensation x max.	Maximum tensile and compressive load max.		Art. No.
d_1	d_2	d_3	l_1 ~	l_2	l_3	l_4 min.	l_5	l_6	WS_1	WS_2	WS_3	WS_4				
[mm]									[mm]				[mm]	[kN]	[g]	
M 6	24,5	9,6	52	14	9,5	13	29	18,5	22	19	8	5	0,6	2,5	74	25100.0406
M 8	30,0	15,0	63	18	11,5	16	33	23,5	27	24	13	7	0,6	4,5	137	25100.0408
M10	44,0	21,0	81	22	16,0	24	43	30,5	41	36	18	12	0,7	6,5	401	25100.0410
M12	44,0	21,0	85	26	16,0	24	43	34,5	41	36	18	12	0,7	10,0	405	25100.0412
M16	60,0	32,0	121	34	26,0	34	62	45,0	55	46	27	18	1,0	18,0	1127	25100.0416
M20	60,0	32,0	129	42	26,0	34	62	53,0	55	46	27	18	1,0	30,0	1152	25100.0420
M10 x 1,25	44,0	21,0	81	22	16,0	24	43	30,5	41	36	18	12	0,7	6,5	403	25100.0430
M12 x 1,25	44,0	21,0	85	26	16,0	24	43	34,5	41	36	18	12	0,7	10,0	406	25100.0432
M16 x 1,5	60,0	32,0	121	34	26,0	34	62	45,0	55	46	27	18	1,0	18,0	1128	25100.0436
M20 x 1,5	60,0	32,0	129	42	26,0	34	62	53,0	55	46	27	18	1,0	30,0	1155	25100.0440

APPLICATION EXAMPLE



Height Adjusting Elements

EH 25120.



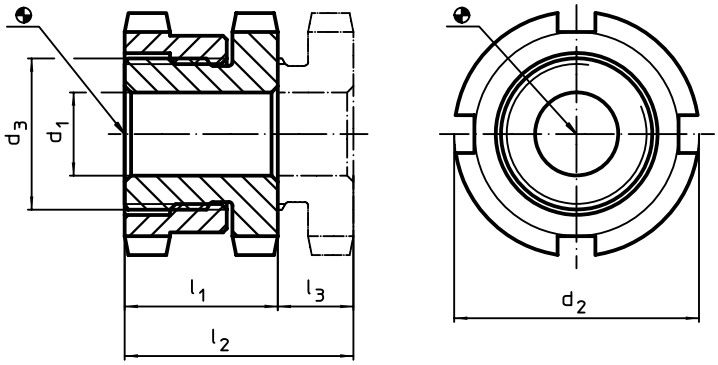
PRODUCT DESCRIPTION

For levelling of machines and installations.
For vertical adjustment, the self-locking height adjusting elements are fitted with a fine-pitch thread. All elements have a throughgoing bore for fastening purposes. A turn-out lock serves as height limit for the maximum adjustment height.

Material

- Heat-treated steel, zinc-plated by galvanization, chromalized

DRAWING



ORDER INFORMATION

Dimensions					Stroke	For screw	Load capacity for static load max.	Carrying force max.		Art. No.
d_1	d_2	d_3	l_1 ~	l_2 ~	l_3 ~					
[mm]					[mm]	[mm]	[kN]	[kN]	[g]	
6,6	25	M15 x 1	15	19	4	M 6	40	30,7	43	25120.0006
	32	M20 x 1	18	23	5	M 6	65	55,7	95	25120.0012
9,0	32	M20 x 1	18	23	5	M 8	65	48,0	86	25120.0014
11,0	32	M20 x 1	18	23	5	M10	65	37,9	79	25120.0016
	45	M30 x 1,5	22	29	7	M10	120	92,9	246	25120.0022
13,5	45	M30 x 1,5	22	29	7	M12	120	80,4	236	25120.0024
17,5	45	M30 x 1,5	22	29	7	M16	120	45,5	219	25120.0026
	58	M40 x 1,5	28	37	9	M16	210	136,0	450	25120.0032
22,0	58	M40 x 1,5	28	37	9	M20	210	90,0	434	25120.0034
26,0	58	M40 x 1,5	28	37	9	M24	210	37,0	364	25120.0036
22,0	70	M50 x 1,5	33	43	10	M20	330	210,0	773	25120.0042
26,0	70	M50 x 1,5	33	43	10	M24	330	157,0	748	25120.0044
33,0	70	M50 x 1,5	33	43	10	M30	330	53,0	640	25120.0046

ACCESSORIES

	For height adjusting element size d_2	Dimensions of sickle spanner DIN 1810, form A		Art. No.
	[mm]	[mm]	[g]	
sickle spanner for vertical adjustment				
	**25**	25 – 28	45	25120.0981
	32	30 – 32	46	25120.0982
	45	45 – 50	156	25120.0983
	58	58 – 62	250	25120.0984
	70	68 – 75	253	25120.0985

Height Adjusting Elements • high

EH 25120.



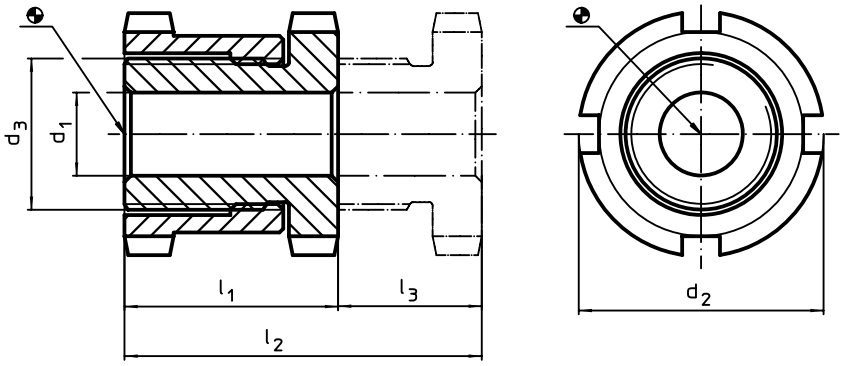
PRODUCT DESCRIPTION

For levelling of machines and installations.
For vertical adjustment, the self-locking height adjusting elements are fitted with a fine-pitch thread. All elements have a throughgoing bore for fastening purposes. A turn-out lock serves as height limit for the maximum adjustment height.

Material

- Heat-treated steel, zinc-plated by galvanization, chromalized

DRAWING



ORDER INFORMATION

Dimensions d_1	d_2	d_3	l_1 ~	l_2 ~	Stroke l_3 ~	For screw	Load capacity for static load max.	Carrying force max.		Art. No.
[mm]					[mm]	[mm]	[kN]	[kN]	[g]	
6,6	**25**	M15 x 1	28	43	15	M 6	40	30,7	68	25120.0106
	32	M20 x 1	35	55	20	M 6	65	55,7	161	25120.0112
9,0	**32**	M20 x 1	35	55	20	M 8	65	48,0	152	25120.0114
11,0	**32**	M20 x 1	35	55	20	M10	65	37,9	142	25120.0116
	45	M30 x 1,5	42	67	25	M10	120	92,9	371	25120.0122
13,5	**45**	M30 x 1,5	42	67	25	M12	120	80,4	357	25120.0124
17,5	**45**	M30 x 1,5	42	67	25	M16	120	45,5	321	25120.0126
	58	M40 x 1,5	54	86	32	M16	210	136,0	835	25120.0132
22,0	**58**	M40 x 1,5	54	86	32	M20	210	90,0	771	25120.0134
26,0	**58**	M40 x 1,5	54	86	32	M24	210	37,0	705	25120.0136
22,0	**70**	M50 x 1,5	66	106	40	M20	330	210,0	1421	25120.0142
26,0	**70**	M50 x 1,5	66	106	40	M24	330	157,0	1428	25120.0144
33,0	**70**	M50 x 1,5	66	106	40	M30	330	53,0	1167	25120.0146

ACCESSORIES

	For height adjusting element size d_2 [mm]	Dimensions of sickle spanner DIN 1810, form A [mm]	[g]	Art. No.
sickle spanner for vertical adjustment				
	**25**	25 – 28	45	25120.0981
	32	30 – 32	46	25120.0982
	45	45 – 50	156	25120.0983
	58	58 – 62	250	25120.0984
	70	68 – 75	253	25120.0985

Height Adjusting Elements • orienting

EH 25120.



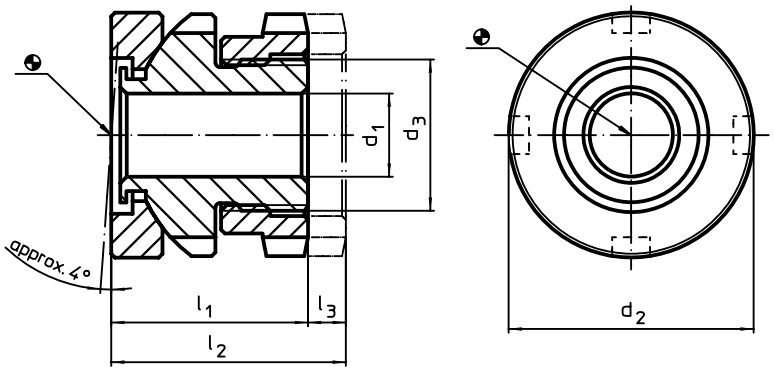
PRODUCT DESCRIPTION

For levelling of machines and installations when seating areas are not parallel.
For vertical adjustment, the self-locking height adjusting elements are fitted with a fine-pitch thread. All elements have a throughgoing bore for fastening purposes. A turn-out lock serves as height limit for the maximum adjustment height.

Material

- Heat-treated steel, zinc-plated by galvanization, chromalized

DRAWING



ORDER INFORMATION

Dimensions d_1	d_2	d_3	l_1 ~	l_2 ~	Stroke l_3 ~	For screw	Load capacity for static load max.	Carrying force max.		Art. No.
[mm]					[mm]	[mm]	[kN]	[kN]	[g]	
6,6	25	M15 x 1	22	26	4	M 6	40	30,7	66	25120.0206
	32	M20 x 1	26	31	5	M 6	65	55,7	133	25120.0212
9,0	32	M20 x 1	26	31	5	M 8	65	48,0	126	25120.0214
11,0	32	M20 x 1	26	31	5	M10	65	37,9	118	25120.0216
	45	M30 x 1,5	34	41	7	M10	120	92,9	340	25120.0222
13,5	45	M30 x 1,5	34	41	7	M12	120	80,4	316	25120.0224
17,5	45	M30 x 1,5	34	41	7	M16	120	45,5	324	25120.0226
	58	M40 x 1,5	44	53	9	M16	210	136,0	775	25120.0232
22,0	58	M40 x 1,5	44	53	9	M20	210	90,0	668	25120.0234
26,0	58	M40 x 1,5	44	53	9	M24	210	37,0	617	25120.0236
22,0	70	M50 x 1,5	50	60	10	M20	330	210,0	1157	25120.0242
26,0	70	M50 x 1,5	50	60	10	M24	330	157,0	1114	25120.0244
33,0	70	M50 x 1,5	50	60	10	M30	330	53,0	990	25120.0246

ACCESSORIES

	For height adjusting element size d_2 [mm]	Dimensions of sickle spanner DIN 1810, form A [mm]	[g]	Art. No.
sickle spanner for vertical adjustment				
	**25**	25 – 28	45	25120.0981
	32	30 – 32	46	25120.0982
	45	45 – 50	156	25120.0983
	58	58 – 62	250	25120.0984
	70	68 – 75	253	25120.0985

Rubber Metal Buffers

EH 25150.



PRODUCT DESCRIPTION

To be used for elastic bearing of motors, compressors, pumps etc.
The hardness is 55 ±5° shore A. Further shore hardnesses (40 ±5° shore A and 70 ±5° shore A) on request.

Material

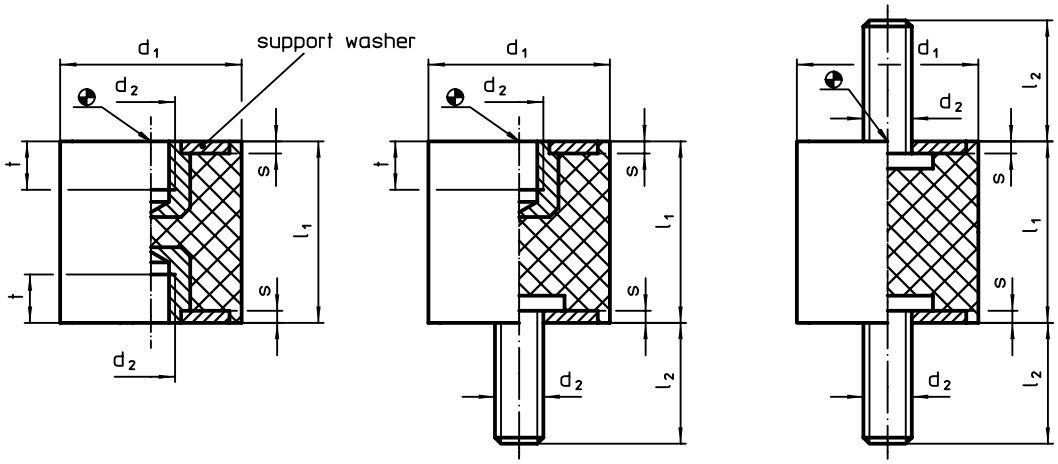
Support washer
- Steel, zinc-plated, blue chromated

Threaded bushing
- Steel, zinc-plated, blue chromated

Body
- Rubber natural caoutchouc (NR), black

Screw
- Steel, zinc-plated, blue chromated

DRAWING



picture 1 picture 2 picture 3

ORDER INFORMATION

Dimensions						Spring rate R ~	Load capacity max.	Spring range ~				Art. No.
d_1 ±1,5	l_1 ±1,5	d_2	l_2	s	t min.				min.	max.		
[mm]						[N/mm]	[N]	[mm]	[°C]		[g]	
with female thread, on both sides – picture 1												
8	**8**	M 3	–	1,0	3,0	38	75	2,00	-30	80	0,98	25150.0003
10	**10**	M 4	–	1,2	4,0	36	90	2,50	-30	80	1,77	25150.0006
	15	M 4	–	1,2	4,0	17	65	3,75	-30	80	2,26	25150.0007
15	**10**	M 4	–	1,4	4,0	80	200	2,50	-30	80	5,00	25150.0008
	15	M 4	–	1,4	4,0	36	135	3,75	-30	80	6,00	25150.0009
	20	M 4	–	1,4	4,0	30	152	5,00	-30	80	7,00	25150.0010
20	**15**	M 6	–	2,0	5,0	95	355	3,75	-30	80	10,00	25150.0021
	20	M 6	–	2,0	5,0	53	267	5,00	-30	80	20,00	25150.0022
	25	M 6	–	2,0	5,0	50	315	6,25	-30	80	20,00	25150.0023
25	**20**	M 6	–	2,0	5,0	121	605	5,00	-30	80	30,00	25150.0026
	25	M 6	–	2,0	5,0	85	530	6,25	-30	80	30,00	25150.0027
	30	M 6	–	2,0	5,0	77	575	7,50	-30	80	30,00	25150.0028
30	**30**	M 8	–	2,0	6,5	114	855	7,50	-30	80	50,00	25150.0031
	40	M 8	–	2,0	6,5	76	757	10,00	-30	80	50,00	25150.0032
40	**30**	M 8	–	2,0	6,5	205	1535	7,50	-30	80	80,00	25150.0041
	40	M 8	–	2,0	6,5	164	1635	10,00	-30	80	100,00	25150.0042
50	**30**	M10	–	2,0	7,0	343	2570	7,50	-30	80	130,00	25150.0051
	40	M10	–	2,0	7,0	245	2445	10,00	-30	80	150,00	25150.0052
	50	M10	–	2,0	7,0	178	2225	12,50	-30	80	130,00	25150.0053
60	**30**	M10	–	2,0	7,0	453	3400	7,50	-30	80	190,00	25150.0061
	40	M10	–	2,0	7,0	330	3300	10,00	-30	80	220,00	25150.0062
70	**45**	M10	–	3,0	7,0	356	4000	11,25	-30	80	340,00	25150.0071
75	**40**	M12	–	3,0	9,0	465	4650	10,00	-30	80	360,00	25150.0076
	55	M12	–	3,0	9,0	327	4500	13,75	-30	80	450,00	25150.0077

→

Dimensions						Spring rate R ~	Load capacity max.	Spring range ~				Art. No.
d_1 ±1,5	l_1 ±1,5	d_2	l_2	s	t min.				min.	max.		
[mm]						[N/mm]	[N]	[mm]	[°C]		[g]	
with female thread and screw – picture 2												
8	**8**	M 3	6	1,0	3,0	38	75	2,00	-30	80	1,11	25150.0103
10	**10**	M 4	10	1,2	4,0	36	90	2,50	-30	80	2,39	25150.0106
	15	M 4	10	1,2	4,0	17	65	3,75	-30	80	2,84	25150.0107
15	**10**	M 4	10	1,4	4,0	80	200	2,50	-30	80	6,00	25150.0108
	15	M 4	10	1,4	4,0	35	130	3,75	-30	80	7,00	25150.0109
	20	M 4	10	1,4	4,0	30	150	5,00	-30	80	8,00	25150.0110
20	**15**	M 6	18	2,0	5,0	95	355	3,75	-30	80	15,00	25150.0121
	20	M 6	18	2,0	5,0	53	265	5,00	-30	80	17,00	25150.0122
	25	M 6	18	2,0	5,0	50	315	6,25	-30	80	18,00	25150.0123
25	**15**	M 6	18	2,0	5,0	184	690	3,75	-30	80	26,00	25150.0126
	20	M 6	18	2,0	5,0	121	605	5,00	-30	80	28,00	25150.0127
	30	M 6	18	2,0	5,0	76	570	7,50	-30	80	36,00	25150.0128
30	**15**	M 8	20	2,0	6,5	143	535	3,75	-30	80	41,00	25150.0131
	30	M 8	20	2,0	6,5	113	850	7,50	-30	80	50,00	25150.0132
40	**20**	M 8	23	2,0	6,5	302	1510	5,00	-30	80	72,00	25150.0141
	30	M 8	23	2,0	6,5	204	1530	7,50	-30	80	85,00	25150.0142
	40	M 8	23	2,0	6,5	163	1630	10,00	-30	80	98,00	25150.0143
50	**20**	M10	28	2,0	7,0	720	3600	5,00	-30	80	115,00	25150.0151
	30	M10	28	2,0	7,0	343	2575	7,50	-30	80	135,00	25150.0152
	40	M10	28	2,0	7,0	244	2440	10,00	-30	80	160,00	25150.0153
	50	M10	28	2,0	7,0	176	2200	12,50	-30	80	185,00	25150.0154
60	**30**	M10	28	2,0	7,0	453	3400	7,50	-30	80	200,00	25150.0161
	40	M10	28	2,0	7,0	333	3330	10,00	-30	80	220,00	25150.0162
70	**45**	M10	27	3,0	7,0	356	4000	11,25	-30	80	372,00	25150.0171
75	**40**	M12	37	3,0	9,0	460	4600	10,00	-30	80	385,00	25150.0176
	55	M12	37	3,0	9,0	328	4510	13,75	-30	80	450,00	25150.0177
with screw, on both sides – picture 3												
8	**8**	M 3	6	1,0	–	35	70	2,00	-30	80	1,41	25150.0203
10	**10**	M 4	10	1,2	–	36	89	2,50	-30	80	2,99	25150.0206
	15	M 4	10	1,2	–	16	60	3,75	-30	80	3,50	25150.0207
15	**10**	M 4	10	1,4	–	79	198	2,50	-30	80	6,00	25150.0208
	15	M 4	10	1,4	–	33	125	3,75	-30	80	7,00	25150.0209
	20	M 4	10	1,4	–	29	145	5,00	-30	80	8,00	25150.0210
20	**15**	M 6	18	2,0	–	94	352	3,75	-30	80	18,00	25150.0221
	20	M 6	18	2,0	–	52	260	5,00	-30	80	25,00	25150.0222
	25	M 6	18	2,0	–	50	310	6,25	-30	80	20,00	25150.0223
25	**15**	M 6	18	2,0	–	183	687	3,75	-30	80	28,00	25150.0226
	20	M 6	18	2,0	–	120	602	5,00	-30	80	32,00	25150.0227
	30	M 6	18	2,0	–	75	562	7,50	-30	80	39,00	25150.0228
30	**15**	M 8	20	2,0	–	142	534	3,75	-30	80	45,00	25150.0231
	30	M 8	20	2,0	–	112	843	7,50	-30	80	58,00	25150.0232
40	**20**	M 8	23	2,0	–	300	1500	5,00	-30	80	80,00	25150.0241
	30	M 8	23	2,0	–	204	1527	7,50	-30	80	95,00	25150.0242
	40	M 8	23	2,0	–	162	1620	10,00	-30	80	100,00	25150.0243
50	**20**	M10	28	2,0	–	718	3589	5,00	-30	80	130,00	25150.0251
	30	M10	28	2,0	–	343	2570	7,50	-30	80	150,00	25150.0252
	40	M10	28	2,0	–	244	2436	10,00	-30	80	170,00	25150.0253
	50	M10	28	2,0	–	176	2198	12,50	-30	80	187,00	25150.0254
60	**30**	M10	28	2,0	–	453	3400	7,50	-30	80	210,00	25150.0261
	40	M10	28	2,0	–	330	3300	10,00	-30	80	236,00	25150.0262
70	**45**	M10	27	3,0	–	356	4000	11,25	-30	80	380,00	25150.0271
75	**40**	M12	37	3,0	–	450	4500	10,00	-30	80	410,00	25150.0276
	55	M12	37	3,0	–	320	4400	13,75	-30	80	515,00	25150.0277

Rubber Endstop Buffers • cylindrical

EH 25150.



PRODUCT DESCRIPTION

To be used as an elastic end-stop, bearing foot etc.
The hardness is 55 ±5° shore A. Further shore hardnesses (40 ±5° shore A and 70 ±5° shore A) on request.

Material

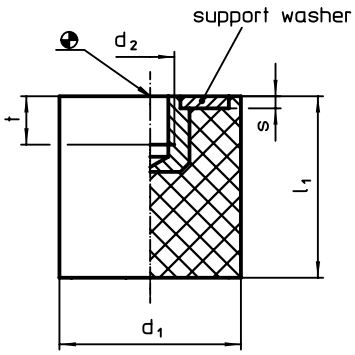
Support washer
- Steel, zinc-plated, blue chromated
- Stainless steel 1.4301

Threaded bushing
- Steel, zinc-plated, blue chromated
- Stainless steel 1.4301

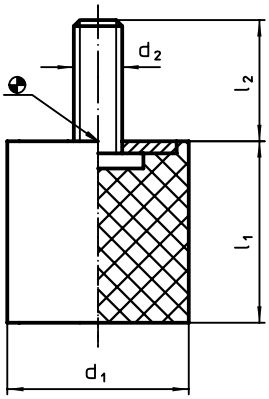
Body
- Rubber natural caoutchouc (NR), black

Screw
- Steel, zinc-plated, blue chromated
- Stainless steel 1.4301

DRAWING



picture 1



picture 2

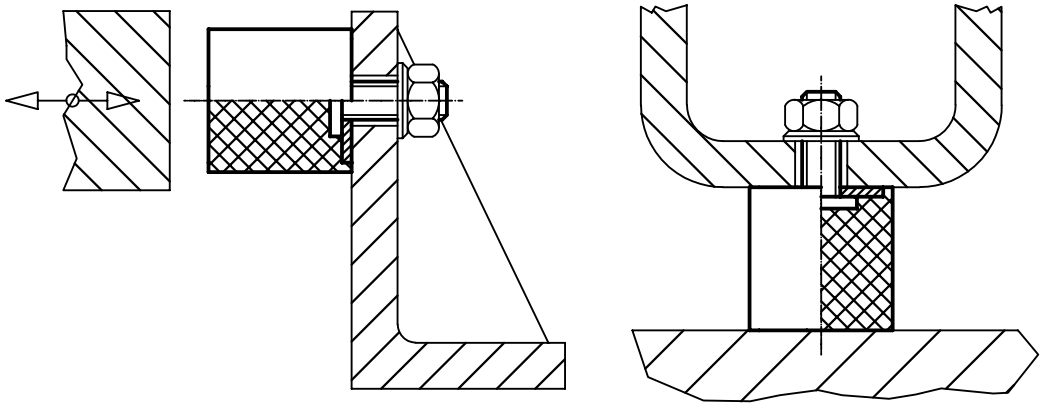
ORDER INFORMATION

Dimensions						Spring rate R ~	Load capacity max.	Spring range ~				Art. No.	
d_1	l_1	d_2	l_2	s	t				min.	max.		steel	stainless steel
[mm]						[N/mm]	[N]	[mm]	[°C]		[g]		
with female thread – picture 1													
10	10	M 4	–	1,2	4,0	24	59	2,50	-30	80	1,3	25150.0306	25150.1306
15	15	M 4	–	1,4	4,0	64	241	3,75	-30	80	4,6	25150.0309	25150.1309
	20	M 4	–	1,4	4,0	57	287	5,00	-30	80	6,0	25150.0310	25150.1310
20	15	M 6	–	2,0	5,0	77	289	3,75	-30	80	10,0	25150.0321	25150.1321
	20	M 6	–	2,0	5,0	60	302	5,00	-30	80	10,0	25150.0322	25150.1322
	25	M 6	–	2,0	5,0	48	297	6,25	-30	80	10,0	25150.0323	25150.1323
25	15	M 6	–	2,0	5,0	163	612	3,75	-30	80	20,0	25150.0326	25150.1326
	20	M 6	–	2,0	5,0	112	560	5,00	-30	80	20,0	25150.0327	25150.1327
	30	M 6	–	2,0	5,0	68	509	7,50	-30	80	20,0	25150.0328	25150.1328
30	15	M 8	–	2,0	6,5	294	934	3,75	-30	80	20,0	25150.0331	25150.1331
	20	M 8	–	2,0	6,5	185	924	5,00	-30	80	30,0	25150.0332	25150.1332
	30	M 8	–	2,0	6,5	117	876	7,50	-30	80	30,0	25150.0333	25150.1333
40	20	M 8	–	2,0	6,5	247	1235	5,00	-30	80	50,0	25150.0341	25150.1341
	30	M 8	–	2,0	6,5	213	1600	7,50	-30	80	70,0	25150.0342	25150.1342
	40	M 8	–	2,0	6,5	182	1820	10,00	-30	80	80,0	25150.0343	25150.1343
50	20	M10	–	2,0	7,0	517	2587	5,00	-30	80	80,0	25150.0351	25150.1351
	30	M10	–	2,0	7,0	327	2453	7,50	-30	80	100,0	25150.0352	25150.1352
	40	M10	–	2,0	7,0	247	2468	10,00	-30	80	120,0	25150.0353	25150.1353
60	30	M10	–	2,0	7,0	467	3500	7,50	-30	80	140,0	25150.0361	25150.1361
	50	M10	–	2,0	7,0	269	3367	12,50	-30	80	210,0	25150.0362	25150.1362
70	40	M10	–	3,0	7,0	410	4100	10,00	-30	80	260,0	25150.0371	25150.1371
	55	M10	–	3,0	7,0	327	4500	13,75	-30	80	340,0	25150.0372	25150.1372
75	30	M12	–	3,0	9,0	600	4500	7,50	-30	80	210,0	25150.0376	25150.1376
	40	M12	–	3,0	9,0	450	4500	10,00	-30	80	290,0	25150.0377	25150.1377
	50	M12	–	3,0	9,0	352	4400	12,50	-30	80	350,0	25150.0378	25150.1378
100	40	M16	–	3,0	16,0	810	8100	10,00	-30	80	514,0	25150.0382	25150.1382
	50	M16	–	3,0	16,0	640	8000	12,50	-30	80	607,0	25150.0384	25150.1384
	60	M16	–	3,0	16,0	520	7800	15,00	-30	80	698,0	25150.0386	25150.1386

→

Dimensions						Spring rate R ~	Load capacity max.	Spring range ~				Art. No.	
d_1	l_1	d_2	l_2	s	t				min.	max.		steel	stainless steel
[mm]						[N/mm]	[N]	[mm]	[°C]		[g]		
with screw – picture 2													
8	**8**	M 3	6	1,0	–	20	40	2,00	-30	80	1,0	25150.0403	25150.1403
10	**10**	M 4	10	1,2	–	24	59	2,50	-30	80	1,9	25150.0406	25150.1406
	15	M 4	10	1,2	–	21	78	3,75	-30	80	2,0	25150.0407	25150.1407
15	**10**	M 4	10	1,4	–	77	154	2,00	-30	80	4,0	25150.0408	25150.1408
	15	M 4	10	1,4	–	64	241	3,75	-30	80	5,0	25150.0409	25150.1409
	20	M 4	10	1,4	–	57	287	5,00	-30	80	6,0	25150.0410	25150.1410
	30	M 4	10	1,4	–	48	300	6,25	-30	80	8,0	25150.0411	25150.1411
20	**10**	M 6	18	2,0	–	126	315	2,50	-30	80	15,0	25150.0421	25150.1421
	15	M 6	18	2,0	–	77	289	3,75	-30	80	10,0	25150.0422	25150.1422
	20	M 6	18	2,0	–	60	302	5,00	-30	80	13,0	25150.0423	25150.1423
	30	M 6	18	2,0	–	38	285	7,50	-30	80	20,0	25150.0424	25150.1424
25	**15**	M 6	18	2,0	–	163	612	3,75	-30	80	18,0	25150.0426	25150.1426
	20	M 6	18	2,0	–	112	560	5,00	-30	80	20,0	25150.0427	25150.1427
	30	M 6	18	2,0	–	68	509	7,50	-30	80	25,0	25150.0428	25150.1428
30	**15**	M 8	20	2,0	–	294	934	3,75	-30	80	28,0	25150.0431	25150.1431
	20	M 8	20	2,0	–	185	924	5,00	-30	80	35,0	25150.0432	25150.1432
	25	M 8	20	2,0	–	130	815	6,25	-30	80	38,0	25150.0433	25150.1433
	30	M 8	20	2,0	–	117	876	7,50	-30	80	43,0	25150.0434	25150.1434
40	**20**	M 8	23	2,0	–	247	1235	5,00	-30	80	55,0	25150.0441	25150.1441
	25	M 8	23	2,0	–	247	1546	6,25	-30	80	60,0	25150.0442	25150.1442
	30	M 8	23	2,0	–	213	1600	7,50	-30	80	73,0	25150.0443	25150.1443
	40	M 8	23	2,0	–	182	1820	10,00	-30	80	83,0	25150.0444	25150.1444
50	**20**	M10	28	2,0	–	517	2587	5,00	-30	80	90,0	25150.0451	25150.1451
	30	M10	28	2,0	–	327	2453	7,50	-30	80	118,0	25150.0452	25150.1452
	40	M10	28	2,0	–	247	2468	10,00	-30	80	140,0	25150.0453	25150.1453
60	**20**	M10	28	2,0	–	726	3630	5,00	-30	80	117,0	25150.0461	25150.1461
	40	M10	28	2,0	–	340	3400	10,00	-30	80	195,0	25150.0462	25150.1462
70	**40**	M10	27	3,0	–	410	4100	10,00	-30	80	265,0	25150.0471	25150.1471
	55	M10	27	3,0	–	327	4500	13,75	-30	80	357,0	25150.0472	25150.1472
75	**25**	M12	37	3,0	–	752	4700	6,25	-30	80	223,0	25150.0476	25150.1476
	40	M12	37	3,0	–	450	4500	10,00	-30	80	310,0	25150.0477	25150.1477
	50	M12	37	3,0	–	352	4400	12,50	-30	80	340,0	25150.0478	25150.1478
100	**40**	M16	41	3,0	–	810	8100	10,00	-30	80	570,0	25150.0482	25150.1482
	50	M16	41	3,0	–	640	8000	12,50	-30	80	656,0	25150.0484	25150.1484
	60	M16	41	3,0	–	520	7800	15,00	-30	80	750,0	25150.0486	25150.1486

APPLICATION EXAMPLE



Rubber Endstop Buffers • parabolic

EH 25150.



PRODUCT DESCRIPTION

To be used as an elastic end-stop.
Due to the parabolic form the absorption is first soft and raises progressively.
The hardness is 55 ±5° shore A. Further shore hardnesses (40 ±5° shore A and 70 ±5° shore A) on request.

Material

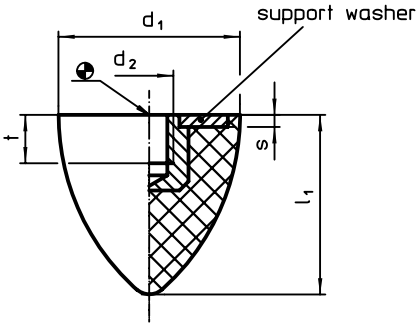
Support washer
- Steel, zinc-plated, blue chromated

Threaded bushing
- Steel, zinc-plated, blue chromated

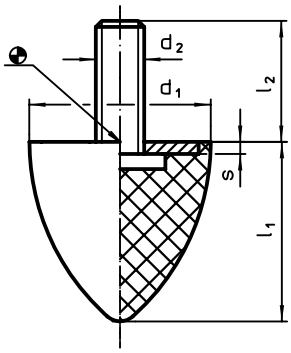
Body
- Rubber natural caoutchouc (NR), black

Screw
- Steel, zinc-plated, blue chromated

DRAWING



picture 1

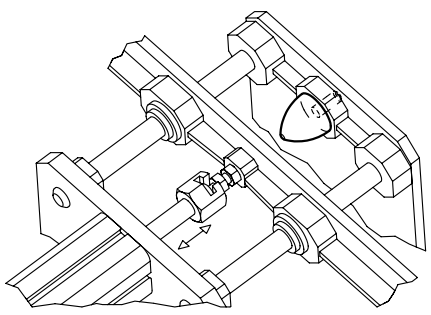


picture 2

ORDER INFORMATION

Dimensions						Average spring range ~	Load capacity max.	Spring range ~	min.	max.		Art. No.
d_1 ±1,5	l_1 ±1,5	d_2	l_2	s	t min.							
[mm]						[N/mm]	[N]	[mm]	[°C]		[g]	
with female thread – picture 1												
20	**24**	M 6	–	2	5,0	16,6	100	6,00	-30	80	10	25150.0522
30	**30**	M 8	–	2	6,5	24,0	150	6,25	-30	80	30	25150.0532
	36	M 8	–	2	6,5	26,6	200	7,50	-30	80	30	25150.0533
35	**40**	M 8	–	2	6,5	65,0	650	10,00	-30	80	40	25150.0537
50	**61**	M 8	–	2	6,5	50,0	750	15,00	-30	80	110	25150.0552
	68	M10	–	2	7,0	50,0	850	17,00	-30	80	120	25150.0553
with screw – picture 2												
20	**24**	M 6	18	2	–	16,6	100	6,00	-30	80	11	25150.0622
30	**30**	M 8	18	2	–	24,0	150	6,25	-30	80	20	25150.0632
	36	M 8	20	2	–	26,6	200	7,50	-30	80	39	25150.0633
35	**40**	M 8	23	2	–	65,0	650	10,00	-30	80	45	25150.0637
50	**61**	M 8	28	2	–	50,0	750	15,00	-30	80	114	25150.0652
	68	M10	28	2	–	50,0	850	17,00	-30	80	131	25150.0653

APPLICATION EXAMPLE



Rubber Endstop Buffers • truncated cone form

EH 25150.



PRODUCT DESCRIPTION

To be used as an elastic end-stop, bearing foot etc.
The hardness is 55 ±5° shore A. Further shore hardnesses (40 ±5° shore A and 70 ±5° shore A) on request.

Material

Support washer
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4301

Threaded bushing
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4301

Body
- NBR

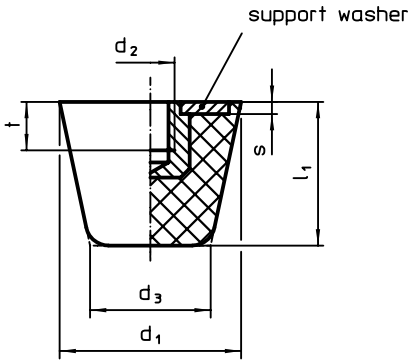
Screw
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4301

MORE INFORMATION

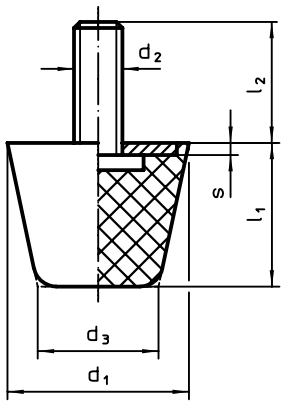
Further products

Silicone Endstop Buffers, truncated cone form. . . . . → p. 692

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions							Spring rate R ~	Load capacity max.	Spring range ~	min.	max.		Art. No.	
d_1	d_2	l_2	d_3	l_1	s	t							steel	stainless steel
[mm]							[N/mm]	[N]	[mm]	[°C]		[g]		
with female thread – picture 1														
19	**M 5**	–	12,0	16,0	2	5	28	110	4,00	-30	80	7	25150.0719	25150.0919
25	**M 6**	–	16,5	20,5	2	6	82	430	5,25	-30	80	13	25150.0725	25150.0925
32	**M 8**	–	21,0	26,0	2	8	140	910	6,50	-30	80	27	25150.0732	25150.0932
38	**M 8**	–	24,5	32,0	2	8	125	1200	9,50	-30	80	44	25150.0738	25150.0938
50	**M10**	–	32,0	43,0	2	10	155	1620	10,50	-30	80	95	25150.0750	25150.0950
with screw – picture 2														
19	**M 5**	**6**	12,0	16,0	2	–	28	110	4,00	-30	80	8	25150.0819	25150.1019
		10	12,0	16,0	2	–	28	110	4,00	-30	80	8	25150.0820	25150.1020
		20	12,0	16,0	2	–	28	110	4,00	-30	80	9	25150.0821	25150.1021
25	**M 6**	**8**	16,5	20,5	2	–	82	430	5,25	-30	80	16	25150.0825	25150.1025
		12	16,5	20,5	2	–	82	430	5,25	-30	80	17	25150.0826	25150.1026
		25	16,5	20,5	2	–	82	430	5,25	-30	80	19	25150.0827	25150.1027
32	**M 8**	**10**	21,0	26,0	2	–	140	910	6,50	-30	80	30	25150.0832	25150.1032
		16	21,0	26,0	2	–	140	910	6,50	-30	80	32	25150.0833	25150.1033
		30	21,0	26,0	2	–	140	910	6,50	-30	80	37	25150.0834	25150.1034
38	**M 8**	**10**	24,5	32,0	2	–	125	1200	9,50	-30	80	47	25150.0838	25150.1038
		16	24,5	32,0	2	–	125	1200	9,50	-30	80	49	25150.0839	25150.1039
		30	24,5	32,0	2	–	125	1200	9,50	-30	80	52	25150.0840	25150.1040
50	**M10**	**12**	32,0	43,0	2	–	155	1620	10,50	-30	80	100	25150.0850	25150.1050
		20	32,0	43,0	2	–	155	1620	10,50	-30	80	103	25150.0851	25150.1051
		40	32,0	43,0	2	–	155	1620	10,50	-30	80	114	25150.0852	25150.1052

Silicone Endstop Buffers • truncated cone form

EH 25151.



PRODUCT DESCRIPTION

Because of the high material purity, this version is suitable for all types of application which have demanding hygienic requirements (e.g. foodstuffs industry).
To be used as an elastic end-stop, bearing foot etc.
Endstop buffers made from silicone rubber have a wider temperature range for use than rubber endstop buffers.
The hardness is 55 ±5° shore A. Further shore hardnesses (40 ±5° shore A and 70 ±5° shore A) on request.

Material

Support washer
- Stainless steel 1.4301

Threaded bushing
- Stainless steel 1.4301

Body
- Silicone rubber

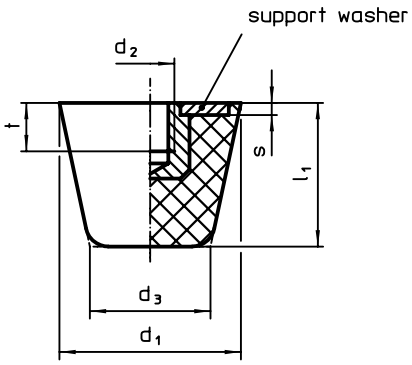
Screw
- Stainless steel 1.4301

MORE INFORMATION

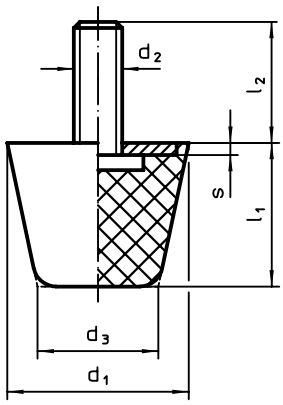
Further products

Rubber Endstop Buffers, truncated cone form. . . . . → p. 691

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions							Spring rate R ~	Load capacity max.	Spring range ~	min.	max.		Art. No.
d_1	d_2	l_2	d_3	l_1	s	t	[N/mm]	[N]	[mm]	[°C]		[g]	
with female thread – picture 1													
19	**M 5**	–	12,0	16,0	2	5	63	250	4,0	-30	200	7	25151.0019
25	**M 6**	–	16,5	20,5	2	6	90	460	5,1	-30	200	14	25151.0025
32	**M 8**	–	21,0	26,0	2	8	117	760	6,5	-30	200	20	25151.0032
38	**M 8**	–	24,5	32,0	2	8	113	900	8,0	-30	200	46	25151.0038
50	**M10**	–	32,0	43,0	2	10	148	1580	10,7	-30	200	96	25151.0050
with screw – picture 2													
19	**M 5**	**6**	12,0	16,0	2	–	63	250	4,0	-30	200	7	25151.0119
		10	12,0	16,0	2	–	63	250	4,0	-30	200	8	25151.0120
		20	12,0	16,0	2	–	63	250	4,0	-30	200	10	25151.0121
25	**M 6**	**8**	16,5	20,5	2	–	90	460	5,1	-30	200	15	25151.0125
		12	16,5	20,5	2	–	90	460	5,1	-30	200	16	25151.0126
		25	16,5	20,5	2	–	90	460	5,1	-30	200	19	25151.0127
32	**M 8**	**10**	21,0	26,0	2	–	117	760	6,5	-30	200	30	25151.0132
		16	21,0	26,0	2	–	117	760	6,5	-30	200	33	25151.0133
		30	21,0	26,0	2	–	117	760	6,5	-30	200	38	25151.0134
38	**M 8**	**10**	24,5	32,0	2	–	113	900	8,0	-30	200	47	25151.0138
		16	24,5	32,0	2	–	113	900	8,0	-30	200	50	25151.0139
		30	24,5	32,0	2	–	113	900	8,0	-30	200	56	25151.0140
50	**M10**	**12**	32,0	43,0	2	–	148	1580	10,7	-30	200	97	25151.0150
		20	32,0	43,0	2	–	148	1580	10,7	-30	200	100	25151.0151
		40	32,0	43,0	2	–	148	1580	10,7	-30	200	110	25151.0152

Rubber Endstop Buffers • low structure

EH 25150.



PRODUCT DESCRIPTION

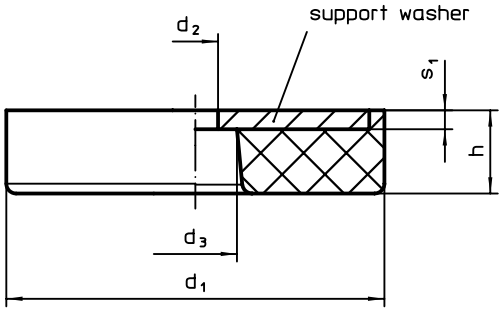
For elastic, damping, and noise-reducing bearings. They also protect the surfaces. The rubber endstop buffers can also be used as spacers and foot ends.
Hardness is 70 ±5° Shore A.

Material

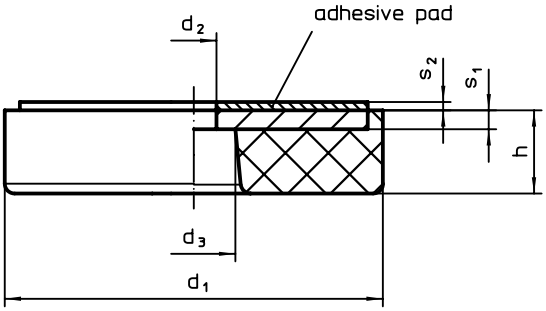
Support washer
- Steel, zinc-plated by galvanization, passivated

Body
- NBR

DRAWING



picture 1



picture 2

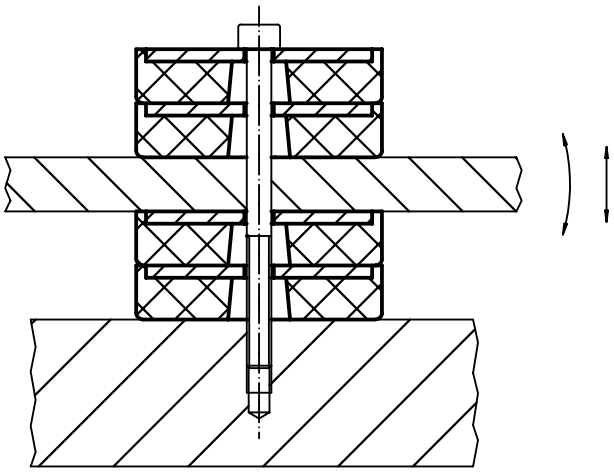
ORDER INFORMATION

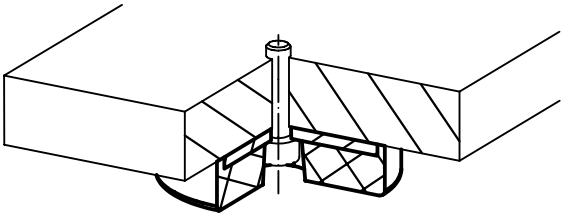
Dimensions						Spring rate R	Load capacity max.	Spring range				Art. No.
d_1	h	d_2 +0,5	d_3 +0,5	s_1	s_2				min.	max.		
[mm]						[N/mm]	[N]	[mm]	[°C]		[g]	
with through-bore – picture 1												
19	**3**	4	7,5	1,5	1,1	282	480	1,70	-30	120	3	25150.1119
	7	4	7,5	1,5	1,1	213	373	1,75	-30	120	4	25150.1120
	14	4	7,5	1,5	1,1	68	240	3,50	-30	120	6	25150.1121
25	**3**	4	7,5	1,5	1,1	1870	1870	1,00	-30	120	5	25150.1125
	8	4	7,5	1,5	1,1	349	698	2,00	-30	120	8	25150.1126
	16	4	7,5	1,5	1,1	135	540	4,00	-30	120	12	25150.1127
32	**4**	5	9,0	2,0	1,1	1680	1680	1,00	-30	120	12	25150.1132
	9	5	9,0	2,0	1,1	548	1233	2,25	-30	120	16	25150.1133
	18	5	9,0	2,0	1,1	212	850	4,00	-30	120	23	25150.1134
38	**4**	5	9,0	2,0	1,1	1500	1500	1,00	-30	120	17	25150.1138
	10	5	9,0	2,0	1,1	704	1760	2,50	-30	120	24	25150.1139
	20	5	9,0	2,0	1,1	230	920	4,00	-30	120	36	25150.1140
50	**5**	6	11,0	2,5	1,1	3600	3600	1,00	-30	120	40	25150.1150
	11	6	11,0	2,5	1,1	1223	3670	3,00	-30	120	56	25150.1151
	22	6	11,0	2,5	1,1	500	2500	5,00	-30	120	76	25150.1152
64	**5**	6	11,0	2,5	1,1	1460	1460	1,00	-30	120	66	25150.1164
	13	6	11,0	2,5	1,1	2016	6050	3,00	-30	120	94	25150.1165
	26	6	11,0	2,5	1,1	616	3700	6,00	-30	120	141	25150.1166

→

Dimensions						Spring rate R	Load capacity max.	Spring range				Art. No.
d_1	h	d_2 +0,5	d_3 +0,5	s_1	s_2				min.	max.		
[mm]						[N/mm]	[N]	[mm]	[°C]		[g]	
with through-bore and adhesive pad – picture 2												
19	**3**	4	7,5	1,5	1,1	282	480	1,70	-30	120	3	**25150.1219**
	7	4	7,5	1,5	1,1	213	373	1,75	-30	120	5	**25150.1220**
	14	4	7,5	1,5	1,1	68	240	3,50	-30	120	7	**25150.1221**
25	**3**	4	7,5	1,5	1,1	1870	1870	1,00	-30	120	7	**25150.1225**
	8	4	7,5	1,5	1,1	349	698	2,00	-30	120	9	**25150.1226**
	16	4	7,5	1,5	1,1	135	540	4,00	-30	120	13	**25150.1227**
32	**4**	5	9,0	2,0	1,1	1680	1680	1,00	-30	120	14	**25150.1232**
	9	5	9,0	2,0	1,1	548	1233	2,25	-30	120	18	**25150.1233**
	18	5	9,0	2,0	1,1	212	850	4,00	-30	120	25	**25150.1234**
38	**4**	5	9,0	2,0	1,1	1500	1500	1,00	-30	120	19	**25150.1238**
	10	5	9,0	2,0	1,1	704	1760	2,50	-30	120	26	**25150.1239**
	20	5	9,0	2,0	1,1	230	920	4,00	-30	120	38	**25150.1240**
50	**5**	6	11,0	2,5	1,1	3600	3600	1,00	-30	120	41	**25150.1250**
	11	6	11,0	2,5	1,1	1223	3670	3,00	-30	120	54	**25150.1251**
	22	6	11,0	2,5	1,1	500	2500	5,00	-30	120	77	**25150.1252**
64	**5**	6	11,0	2,5	1,1	1460	1460	1,00	-30	120	71	**25150.1264**
	13	6	11,0	2,5	1,1	2016	6050	3,00	-30	120	99	**25150.1265**
	26	6	11,0	2,5	1,1	616	3700	6,00	-30	120	141	**25150.1266**

APPLICATION EXAMPLE





Rubber Endstop Buffers • cylindrical, front mounting

EH 25150.



PRODUCT DESCRIPTION

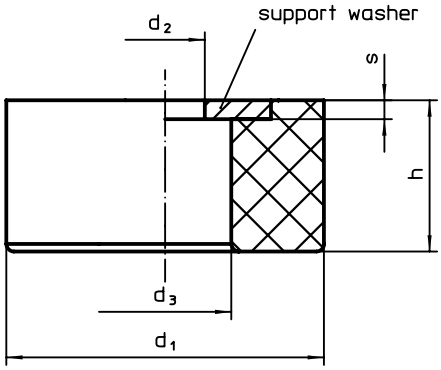
To be used as an elastic end-stop, bearing foot etc.
The hardness is 55 ±5° shore A. Further shore hardnesses (40 ±5° shore A and 70 ±5° shore A) on request.

Material

Body
- NBR

Support washer
- Stainless steel 1.4301

DRAWING



ORDER INFORMATION

Dimensions					Spring rate R ~	Load capacity max.	Spring range ~	Temperature		Weight	Art. No.
d_1	h	d_2	d_3	s				min.	max.		
[mm]					[N/mm]	[N]	[mm]	[°C]		[g]	
16	**8**	**4,3**	8,0	1,0	140	280	2,0	-30	120	2	**25150.1516**
20	**10**	**5,3**	9,5	1,2	148	370	2,5	-30	120	4	**25150.1520**
25	**12**	**6,4**	12,2	1,6	210	630	3,0	-30	120	8	**25150.1525**
35	**16**	**8,4**	14,0	2,0	345	1380	4,0	-30	120	20	**25150.1535**
42	**20**	**8,4**	17,5	2,0	360	1800	5,0	-30	120	30	**25150.1542**
		10,5	17,5	2,5	360	1800	5,0	-30	120	35	**25150.1543**
56	**24**	**8,4**	19,5	2,0	577	3460	6,0	-30	120	62	**25150.1556**
		13,0	19,5	3,0	577	3460	6,0	-30	120	76	**25150.1557**

Hinges

EH 25160.



PRODUCT DESCRIPTION

Hinges are characterised by their compact and stable construction.

Material

Body
- Zinc die-cast, chromed
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure
- Stainless steel 1.4308

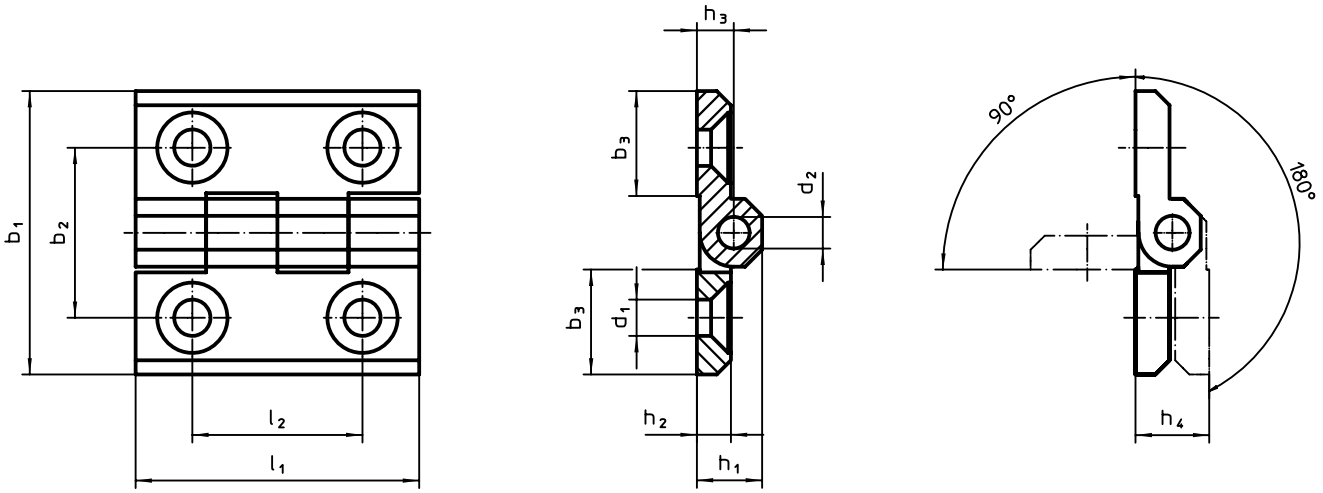
Axis
- Stainless steel

MORE INFORMATION

Further products

Spacer Plates, for hinges . . . . . → p. 699
Threaded Plates, for hinges . . . . . → p. 700
Stops, for hinges . . . . . → p. 701

DRAWING



ORDER INFORMATION

Dimensions												Art. No.			
b_1	b_2	b_3	d_1	d_2	h_1	h_2	h_3	h_4 +0,5	l_1	l_2		zinc die-cast, chromed	zinc die-cast, silver	zinc die-cast, black	stainless steel
[mm]											[g]				
30	18	10,7	4,3	3	7,5	4,5	4	8,5	30	18	25	25160.0005	25160.0105	25160.0205	25160.0305
40	25	14,0	5,3	4	9,0	5,5	5	11,0	40	25	60	25160.0010	25160.0110	25160.0210	25160.0310
50	30	18,5	6,4	6	11,5	6,5	6	13,0	50	30	107	25160.0015	25160.0115	25160.0215	25160.0315
60	36	21,5	8,3	8	15,0	8,5	8	17,0	60	36	200	25160.0020	25160.0120	25160.0220	25160.0320

Hinges • with mounting thread

EH 25160.



PRODUCT DESCRIPTION

Material

Threaded pin
- Stainless steel

Body
- Zinc die-cast, chromed
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure
- Stainless steel 1.4308

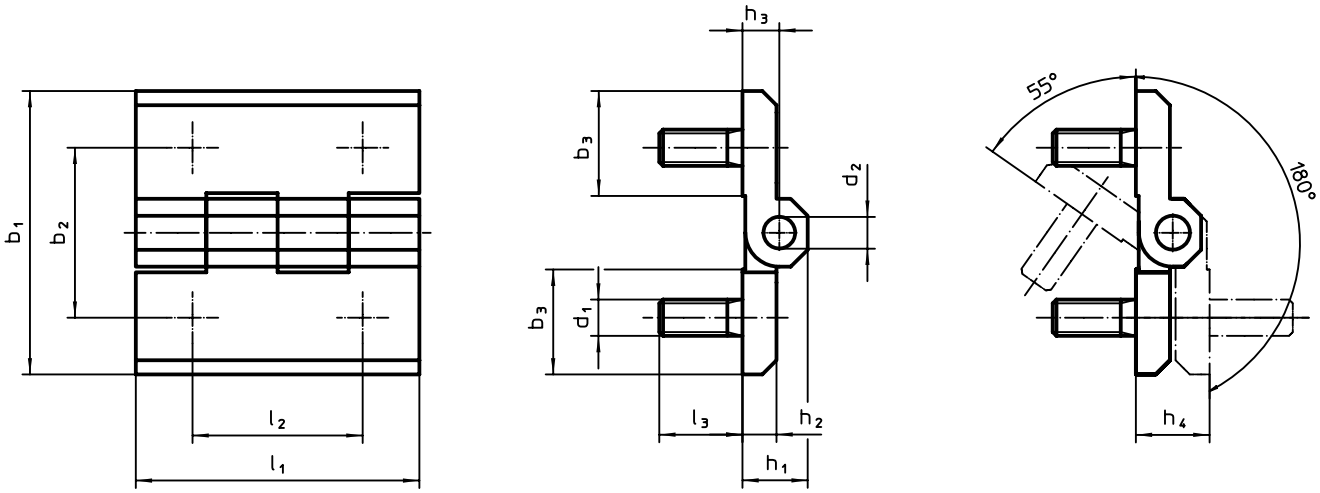
Axis
- Stainless steel

MORE INFORMATION

Further products

Spacer Plates, for hinges . . . . . → p. 699

DRAWING



ORDER INFORMATION

Dimensions													Art. No.			
b_1	b_2	b_3	d_1	d_2	h_1	h_2	h_3	h_4 +0,5	l_1	l_2	l_3	[g]	zinc die-cast, chromed	zinc die-cast, silver	zinc die-cast, black	stainless steel
[mm]																
40	25	14,0	M5	5,3	9,0	5,5	5	11	40	25	12	61	25160.0050	25160.0150	25160.0250	–
											11	69	–	–	–	25160.0350
50	30	18,5	M6	6,4	11,5	6,5	6	13	50	30	12	102	25160.0055	25160.0155	25160.0255	–
											13	128	–	–	–	25160.0355
60	36	21,5	M8	8,3	15,0	8,5	8	17	60	36	14	194	25160.0060	25160.0160	25160.0260	–
											17	240	–	–	–	25160.0360

Hinges • with adjustable friction resistance

EH 25160.



PRODUCT DESCRIPTION

Hinges are characterised by their compact and stable construction, and by the ability to set the friction.
The design ensures that the hinge has no play (either radially or axially).

Material

Friction cone
- Thermoplastic POM

Body
- Zinc die-cast, plastic coated, silver, similar to RAL 9006, matt structure
- Zinc die-cast, plastic coated, black, similar to RAL 9005, matt structure

Hinge pin
- Steel, zinc-plated by galvanization, passivated

Nut
- Steel, zinc-plated by galvanization, passivated

Assembly

Installation of the hinge of the component. The hinge's ease of pivoting can then be adjusted by tightening or loosening the hinge pin. This allows a constant braking torque to be applied throughout the pivot range.

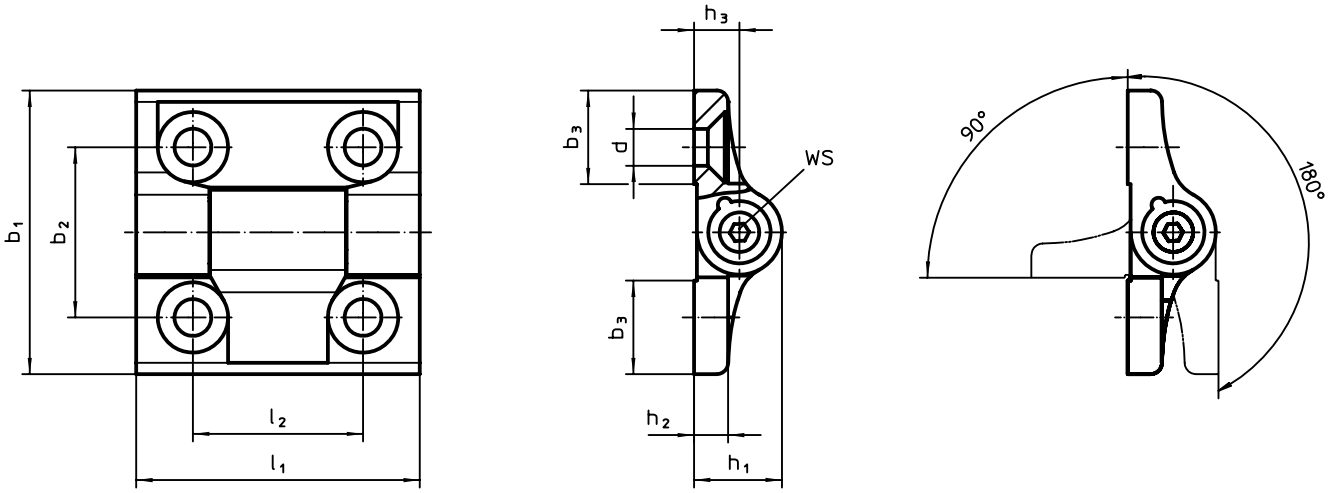
MORE INFORMATION

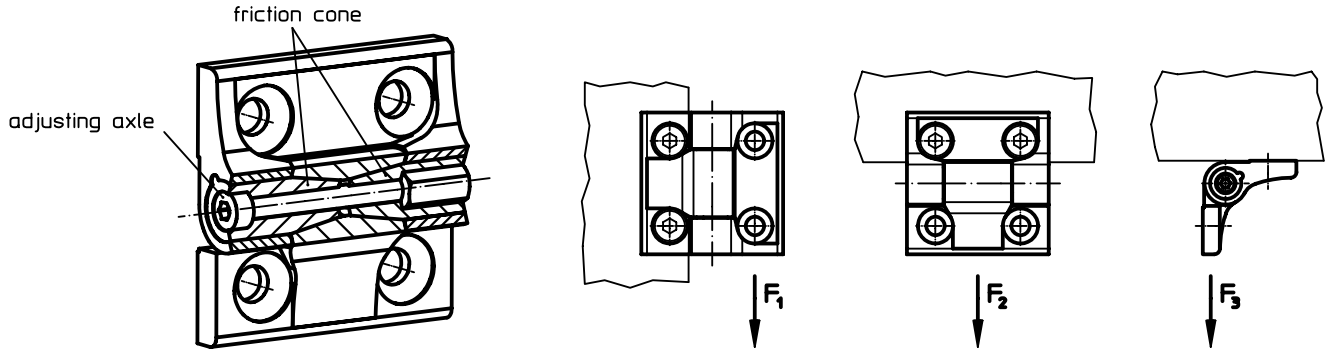
Further products

Spacer Plates, for hinges . . . . . → p. 699
Threaded Plates, for hinges . . . . . → p. 700
Stops, for hinges . . . . . → p. 701

5

DRAWING





ORDER INFORMATION

Dimensions									WS	Load capacity			Hinge pin				Art. No.	
b_1	b_2	b_3	d	h_1	h_2	h_3	l_1	l_2		Radial load bearing capacity F1 max.	Axial load bearing capacity F2 max.	Load capacity F3 max.	Tightening torque max.	Torque	max.		silver	black
[mm]									[mm]	[kN]			[Nm]		[°C]	[g]		
40	25	13,0	5,3	13,5	5,0	7,0	40	25	2,5	2,4	1,2	1,5	0,50	2,0	80	53	25160.0400	25160.0500
50	30	16,5	6,5	15,5	6,0	8,0	50	30	3,0	3,2	1,6	2,0	0,75	4,0	80	91	25160.0405	25160.0505
60	36	20,0	8,3	18,5	7,5	9,5	60	36	4,0	4,5	2,0	2,4	1,50	6,5	80	161	25160.0410	25160.0510

Spacer Plates • for hinges

EH 25160.



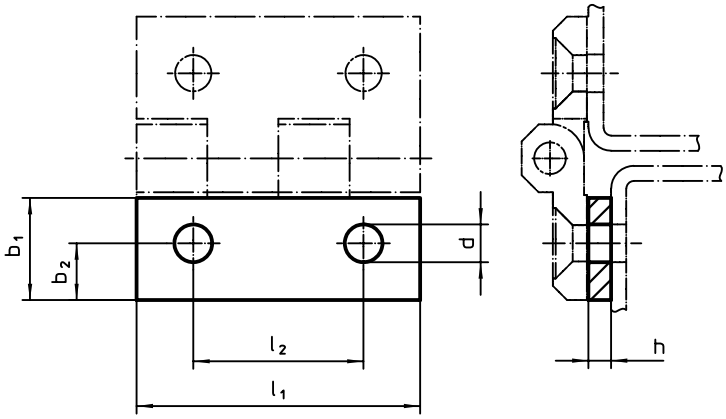
PRODUCT DESCRIPTION

Spacer plates are used for height compensation when installing hinges.

Material

- Stainless steel 1.4301, matt, vibratory ground

DRAWING



ORDER INFORMATION

Dimensions [mm]						[g]	Art. No.
l_1	b_1	h	b_2	d	l_2		
30	10,8	**1,0**	6,0	4	18	2	25160.0605
		1,5	6,0	4	18	3	25160.0610
		3,0	6,0	4	18	6	25160.0615
		5,0	6,0	4	18	10	25160.0620
40	14,5	**1,0**	7,5	5	25	4	25160.0625
		1,5	7,5	5	25	6	25160.0630
		3,0	7,5	5	25	12	25160.0635
		5,0	7,5	5	25	20	25160.0640
50	18,0	**1,0**	10,0	6	30	6	25160.0645
		1,5	10,0	6	30	15	25160.0650
		3,0	10,0	6	30	20	25160.0655
		5,0	10,0	6	30	31	25160.0660
60	21,5	**1,0**	12,5	8	36	9	25160.0665
		1,5	12,5	8	36	14	25160.0670
		3,0	12,5	8	36	27	25160.0675
		5,0	12,5	8	36	44	25160.0680

Threaded Plates • for hinges

EH 25160.



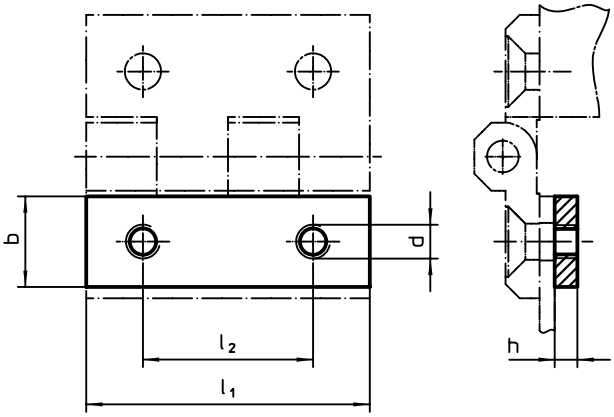
PRODUCT DESCRIPTION

Threaded plates simplify the installation of hinges, without requiring an additional nut or washer. Counter-holding while tightening is unnecessary.

Material

- Stainless steel 1.4301, matt, vibratory ground

DRAWING



ORDER INFORMATION

Dimensions [mm]					[g]	Art. No.
l_1	b	h	d	l_2		
30	**9**	**3**	M4	18	5	**25160.0705**
40	**12**	**3**	M5	25	10	**25160.0710**
50	**15**	**4**	M6	30	21	**25160.0715**
60	**18**	**4**	M8	36	29	**25160.0720**

Stops • for hinges

EH 25160.



PRODUCT DESCRIPTION

Stops are used in order to restrict the hinge's pivot angle. The component also acts as a damping stop element.

Material

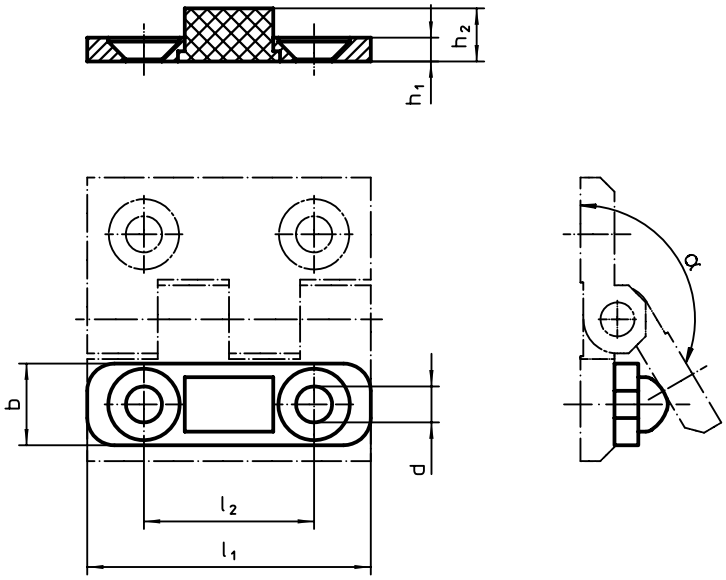
Holding plate
- Steel investment casting, galvanised, plastic coated, similar to RAL 9005, black, structural matt

Stop
- NBR

Assembly

The stop is screwed onto the hinge.

DRAWING



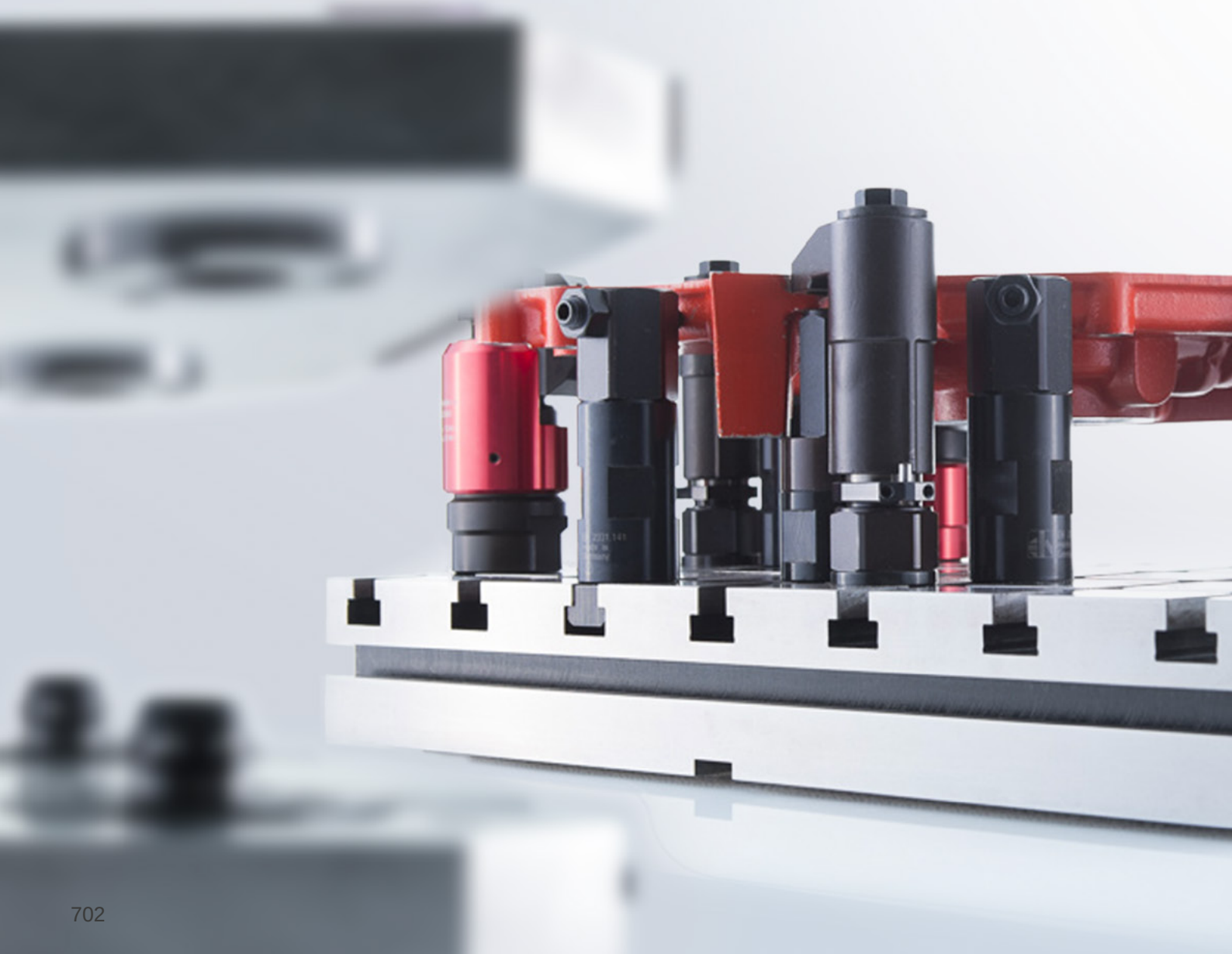
ORDER INFORMATION

Dimensions						α ~	max.		Art. No.
l_1	h_1	b	d	h_2	l_2				
[mm]							[°C]	[g]	
40	**3,5**	12	5,3	7,8	25	150°	120	10	25160.0805
50	**4,0**	15	6,3	9,2	30	150°	120	12	25160.0810
60	**5,0**	18	8,3	10,9	36	150°	120	21	25160.0815

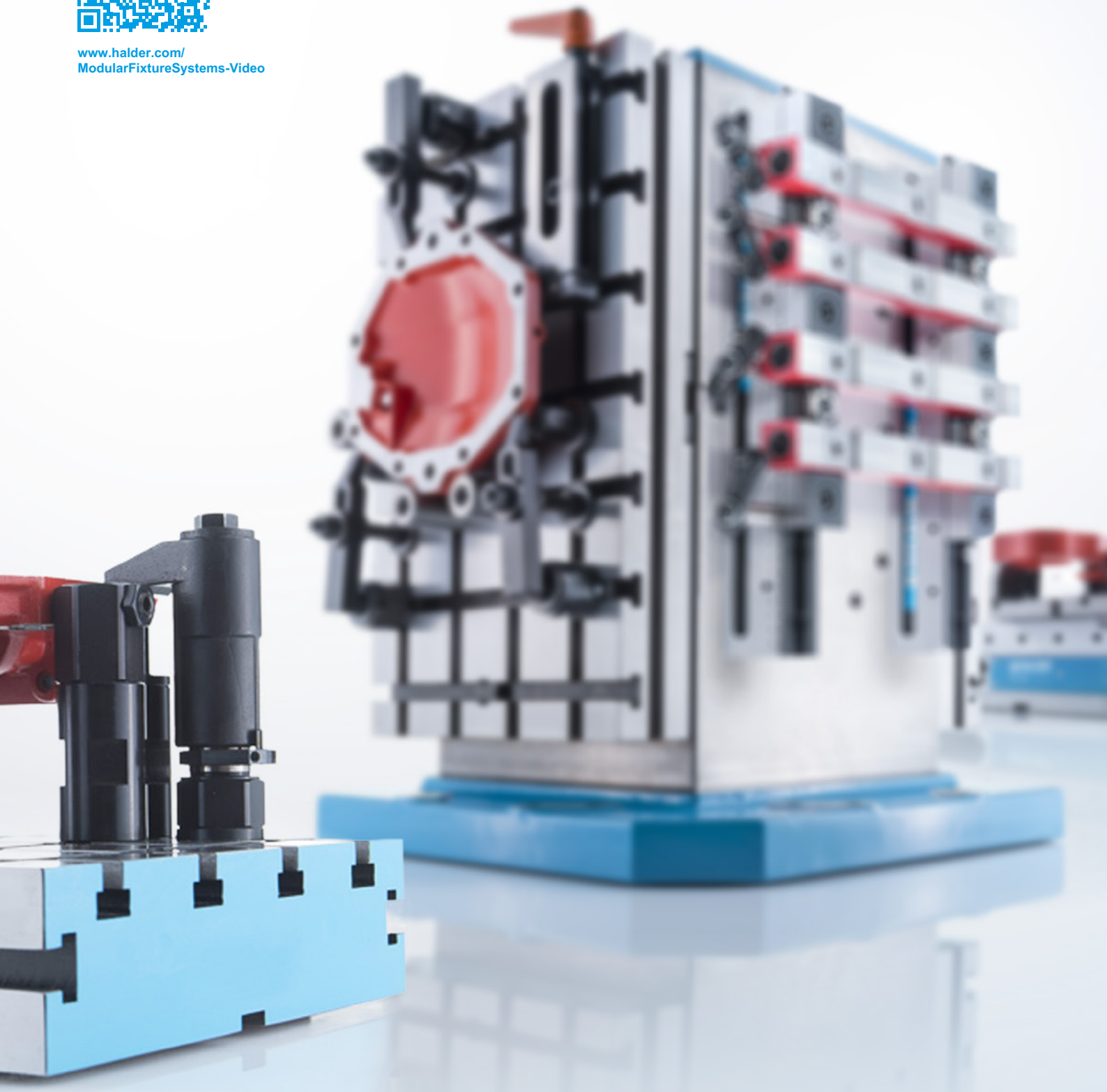
THE MOST EXCITING VARIETY IN THE REALM OF WORKPIECE CLAMPING

EVERYTHING FROM A SINGLE SOURCE

Finding the solution to a „clamping challenge“ is paramount to an optimised and efficient manufacturing process. Adapting to the constantly increasing demands in the marketplace for precision and flexibility ties up a great amount of resources, especially in the area of tool design and construction. All the more reason to team up with a partner who can help you succeed by affording you synergy effects that arise from long years of experience as well as an unsurpassed level of expertise and know-how. Offering a wide selection of products ranging from modular fixtures to basic elements to our innovative zero-point clamping system with individual combo elements, Erwin Halder KG is uniquely equipped to find the right solution to any requirement your customers can throw at you.



www.halder.com/
ModularFixtureSystems-Video



MODULAR FIXTURE SYSTEMS

THE RIGHT SOLUTION FOR ANY PURPOSE

Two systems that are effortlessly interchangeable allow you to perfectly adapt the fixture to the specific requirements at hand. The systems can be selected based on workpiece and production process and offer maximum flexibility thanks to their modular design.

T-SLOT SYSTEMS

Tempered base plates are fitted with a T-slot system. This feature makes it possible to fix system components in place and clamp them at the same time. A particularly good choice for machining complex workpieces.

HOLE AND DOWEL SYSTEMS

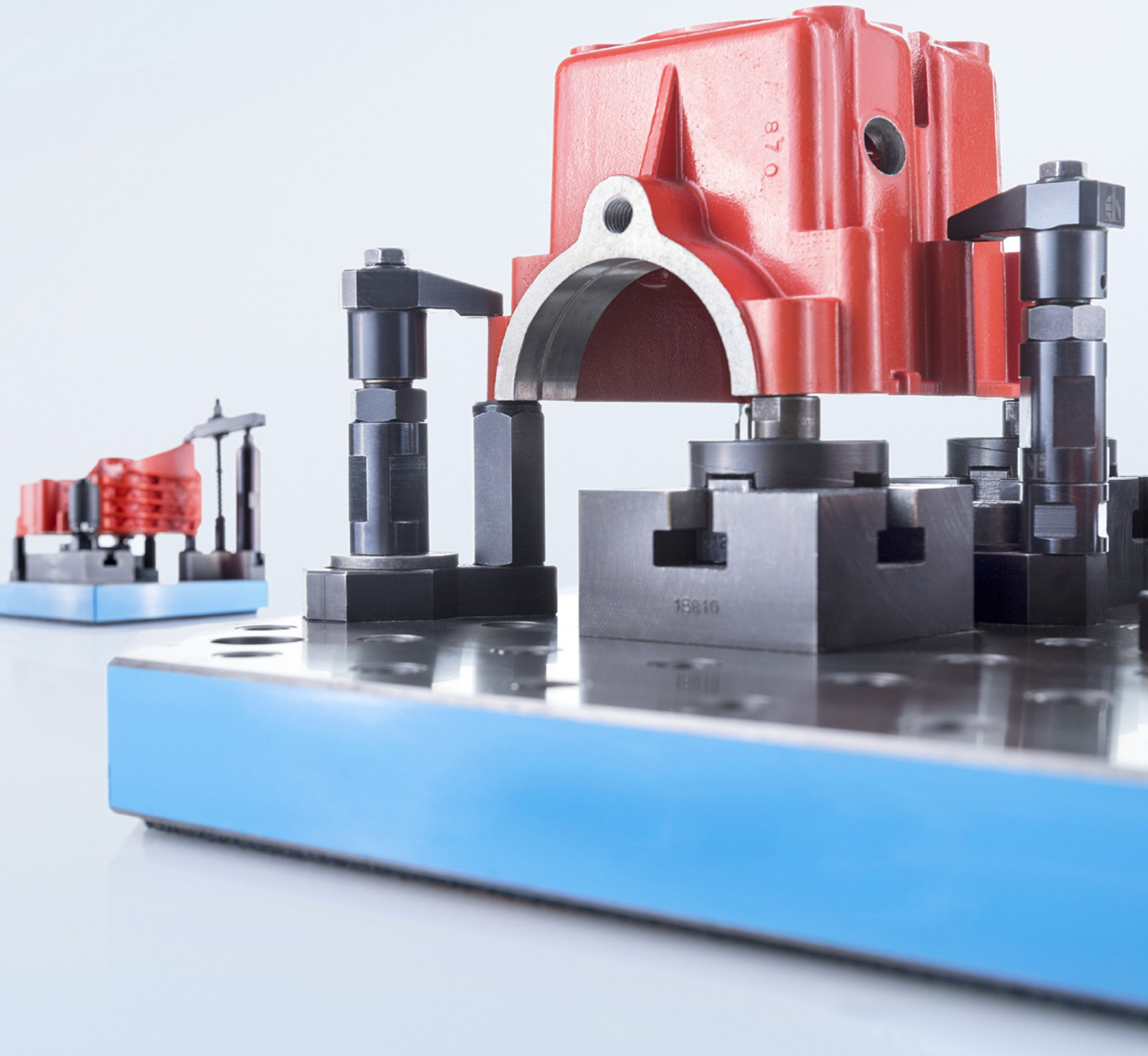
The base plates with hole and dowel system allow operators to quickly set up and precisely machine workpieces with simple geometries. Hole and dowel systems can achieve the flexibility of the T-slot sytstem through assembled combination parts.

PERSONALISED CUSTOMER SERVICE

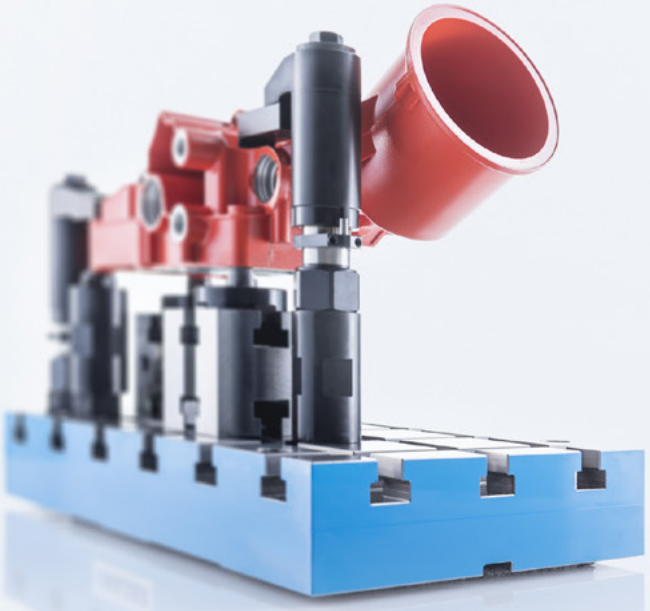
In an effort to furnish you with the resources you need to perfectly plan and implement your projects - especially in the area of modular fixture systems - we are offering you the following services:

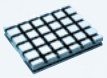
- Sample design of fixtures
- Mobile Showroom for on-site demonstrations
- Introductory seminars and user seminars.
- Training courses for customers at our training centre.





6 T-SLOT SYSTEMS



	Product group	Page
	Base Elements	710
	Mounting Elements	725
	Standard Ranges	761



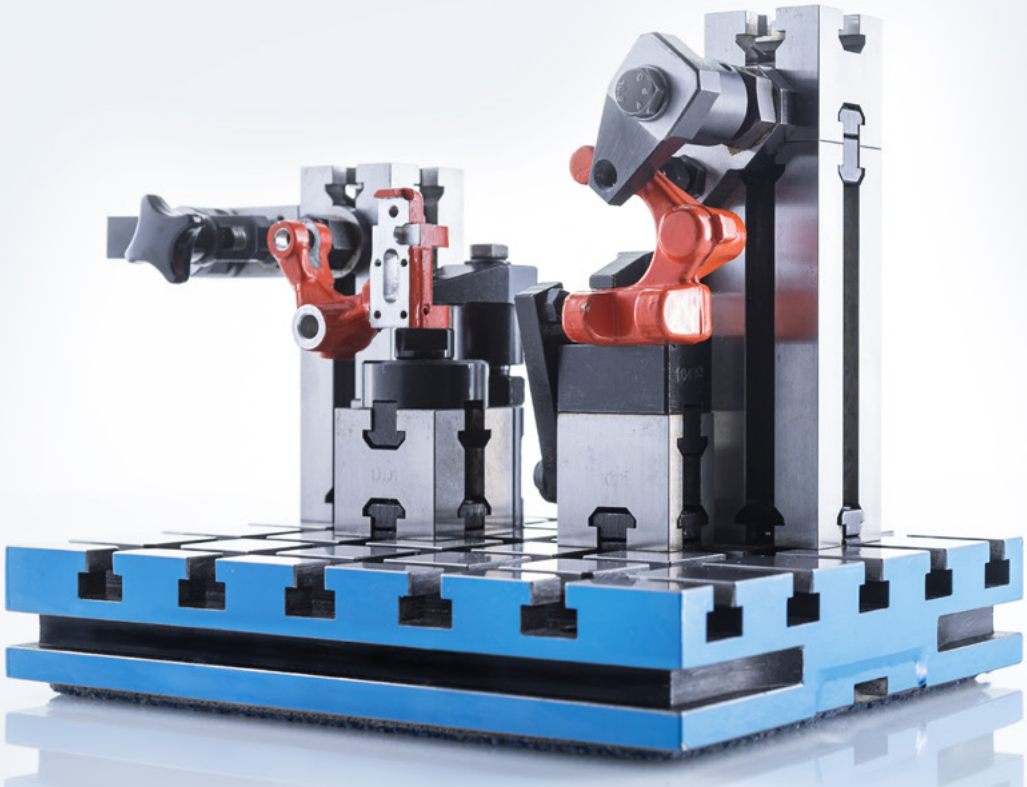
T-SLOT SYSTEMS

T-SLOT SYSTEMS V40/V70

Our V40 and V70 systems are the classics among T-slot systems and have proven their merits for years. The T-slot system is based on tempered base plates with grid dimensions of 40 mm or 70 mm.
Since the system parts can be fixed in place and clamped at the same time, you can set up the fixture quickly and with no effort at all. This outstanding level of flexibility during set-up makes the T-slot system a stellar choice for machining complex workpieces

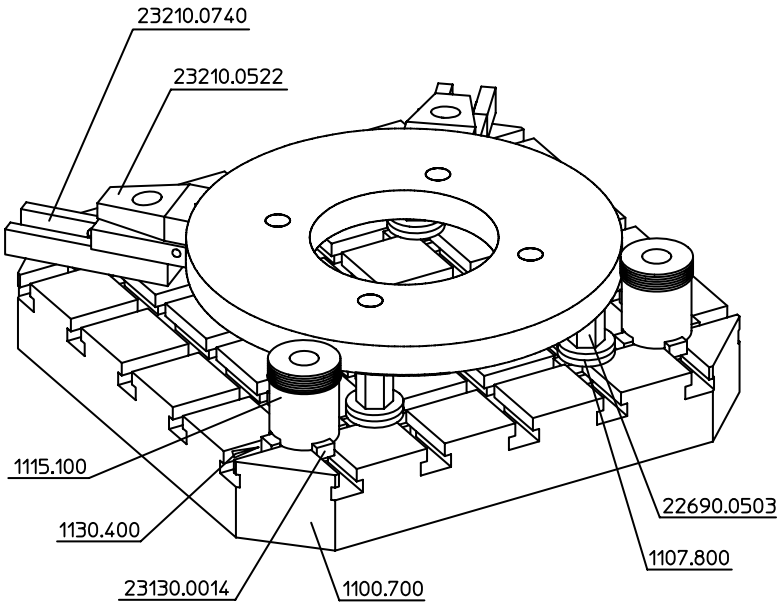
T-SLOT SYSTEM V70ECO

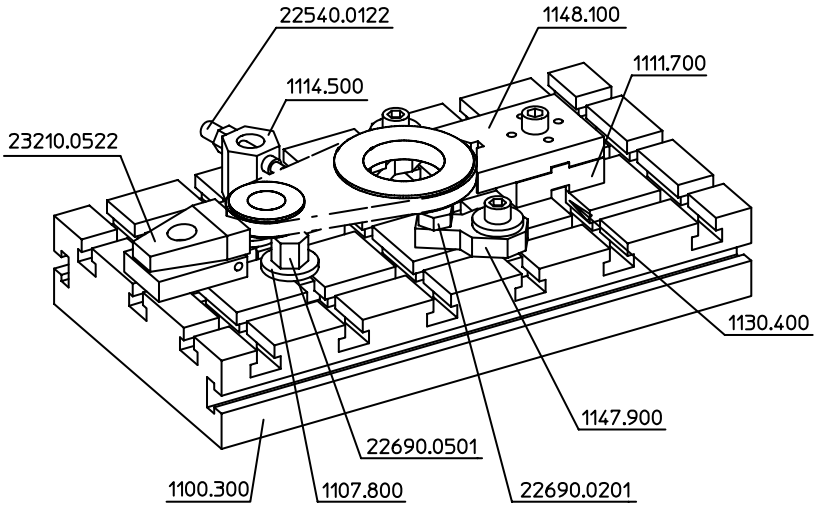
Taking the V70 series to the next level of performance, the V70eco delivers exceptional quality at unbeatable prices. The V70eco is composed of base plates made of high-strength steel with 70 mm grid dimensions and comes with mounting blocks that are fully compatible with the V70 system. **The cost benefit compared to the V70 T-slot system ranges up to 40%!**





APPLICATION SAMPLE





Base Plates

EH 1000.400 - EH 1000.500



PRODUCT DESCRIPTION

Material

- Steel, hardened, ground

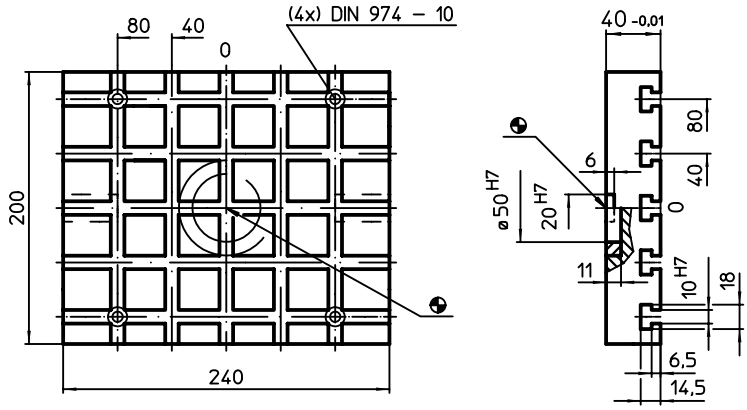
MORE INFORMATION

Notes

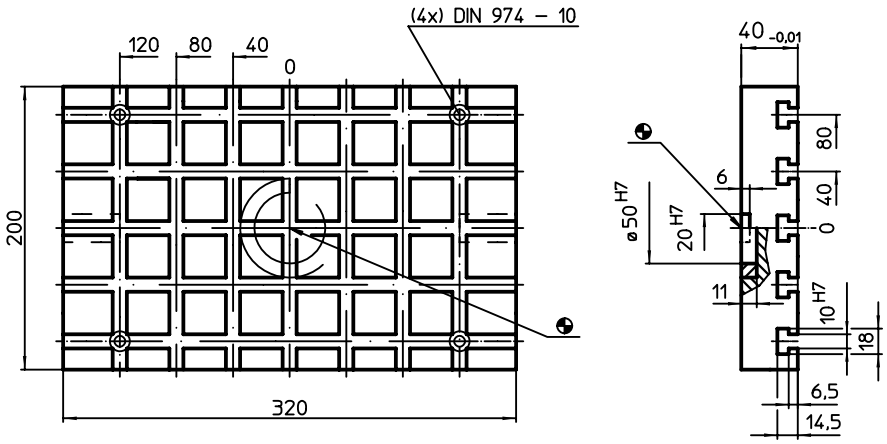
Special types on request.

DRAWING

1000.400



1000.500



Slot spacing 40 ±0,01.

ORDER INFORMATION

System	Dimensions					y	Number of T-slots		Art. No.
	b_1	b_2	l_1	l_2	y	[mm]		[kg]	
			[mm]						
V40	200	80	240	80	10	10	5 x 5	10,5	1000.400
			320	40	10	10	5 x 7	14,0	1000.500

Base Plates • overall dimensions same as pallets DIN 55 201

EH 1000.800



PRODUCT DESCRIPTION

Material

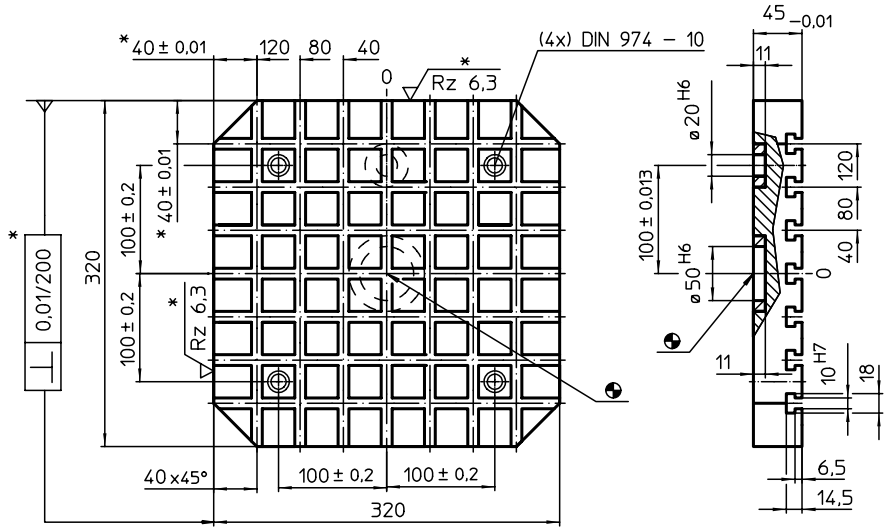
- Steel, hardened, ground

MORE INFORMATION

Notes

Special types on request.

DRAWING

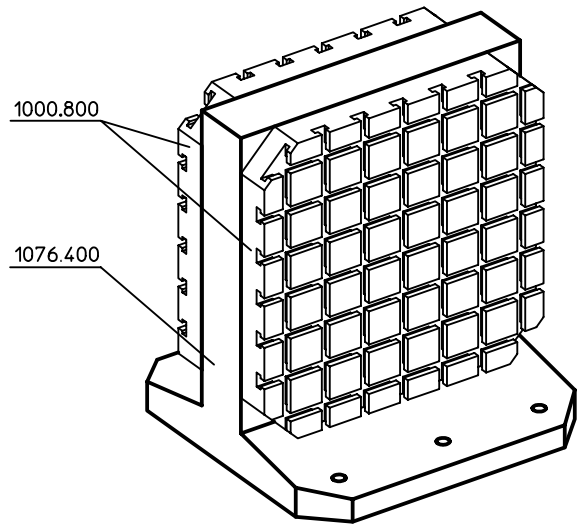


* These tolerances are valid only for optional exterior stop type. Slot spacing 40 ±0,01.

ORDER INFORMATION

System	Dimensions [mm]										y [mm]	Number of T-slots	[kg]	Art. No.
	a	b_1	b_2	b_3	c	d	l_1	l_2	l_3	y				
V40	100	320	100	40	40	20	320	100	40	10	10	7 x 7	24,5	1000.800

APPLICATION EXAMPLE



Base Plates

EH 1002.100



PRODUCT DESCRIPTION

Material

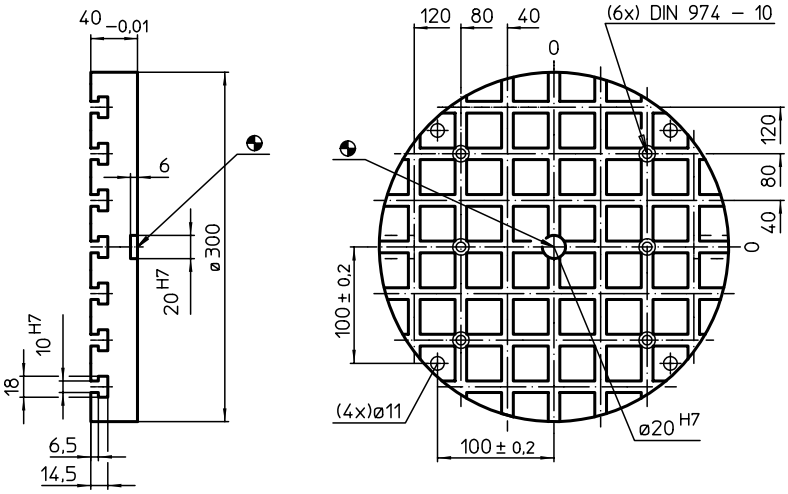
- Steel, hardened, ground

MORE INFORMATION

Notes

Special types on request.

DRAWING

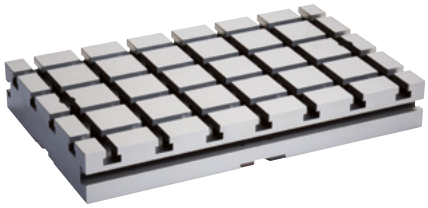


ORDER INFORMATION

System	Dimensions [mm]		Number of T-slots	[kg]	Art. No.
	b_1	d_1			
V40	100	300	7 x 7	15	1002.100

Base Plates

EH 1100.300 - EH 1100.500



PRODUCT DESCRIPTION

Material

- Steel, hardened, ground

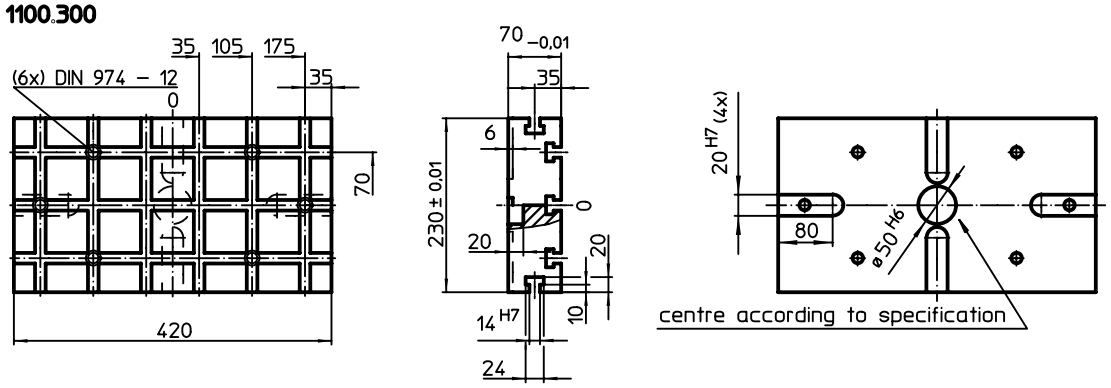
MORE INFORMATION

Notes

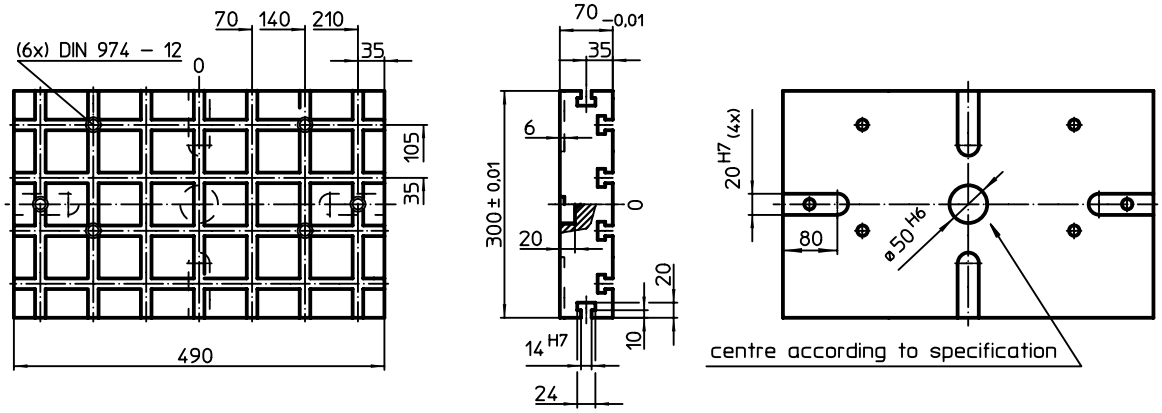
Special types on request.

DRAWING

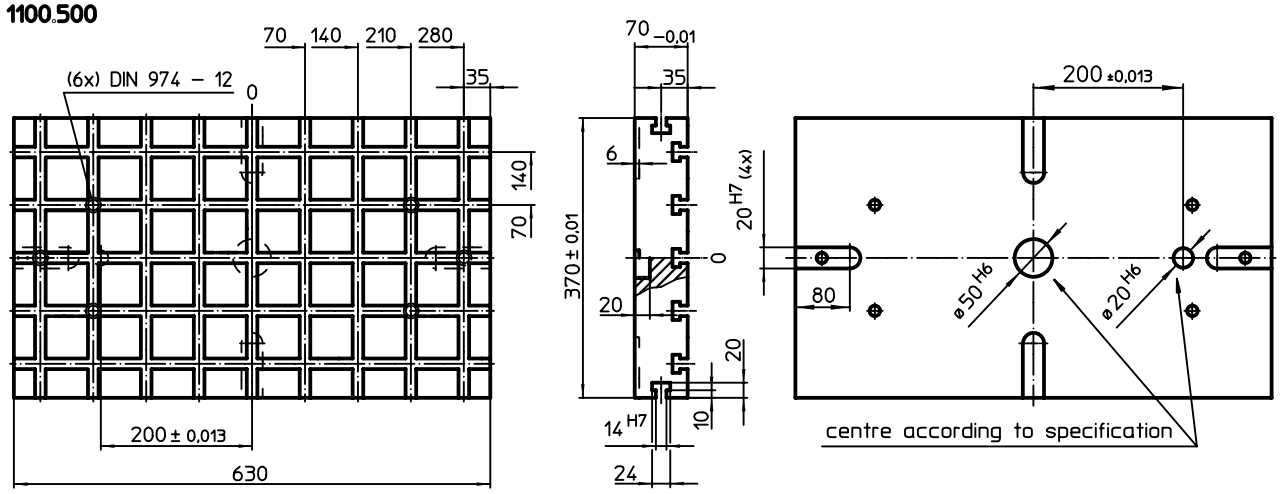
1100.300



1100.400



1100.500

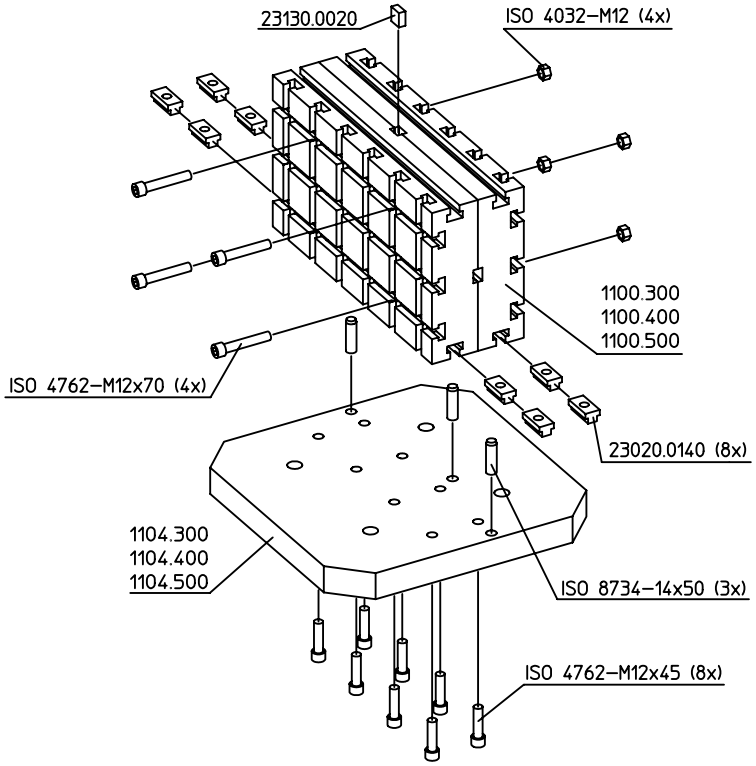


Slot spacing 70 ±0,01.

ORDER INFORMATION

System	Dimensions					y	Number of T-slots		Art. No.
	b_1	b_2	l_1	l_2	y				
	[mm]					[mm]		[kg]	
V70	230	70	420	105	12	12	3 x 6	40	1100.300
	300	140	490	140	12	12	4 x 7	60	1100.400
	370	70	630	210	12	12	5 x 9	95	1100.500

APPLICATION EXAMPLE



6

Base Plates • overall dimensions same as pallets DIN 55 201

EH 1100.700 - EH 1103.500



PRODUCT DESCRIPTION

Material

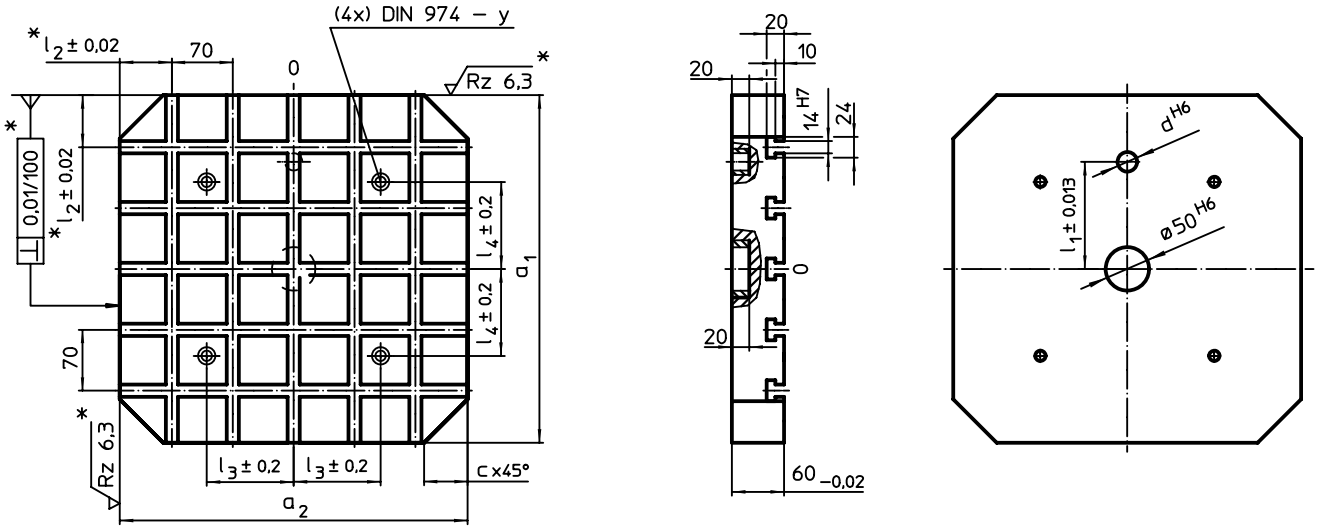
- Steel, hardened, ground

MORE INFORMATION

Notes

Special types on request.

DRAWING



* These tolerances are valid only for optional exterior stop type. Slot spacing 70 ±0,01.

ORDER INFORMATION

System	Dimensions							For screws	y	Number of T-slots		Art. No.
	a_1 x a_2	c	d	l_1	l_2	l_3	l_4	[mm]	[mm]		[kg]	
V70	400 x 400	50	20	150	60	100	100	M12	12	5 x 5	56	1100.700
	500 x 500	60	20	200	40	200	200	M12	12	7 x 7	84	1100.800
	630 x 630	70	25	200	35	200	200	M16	16	9 x 9	129	1100.900
	400 x 500	50	20	150	60/40	200	100	M12	12	5 x 7	69	1103.300
	500 x 630	60	20	200	40/35	200	200	M12	12	7 x 9	107	1103.500

Connecting Elements

EH 1101.300 - EH 1101.500

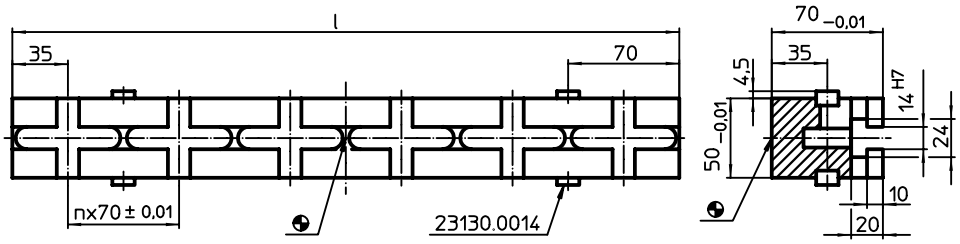


PRODUCT DESCRIPTION

Material

- Steel, hardened, ground

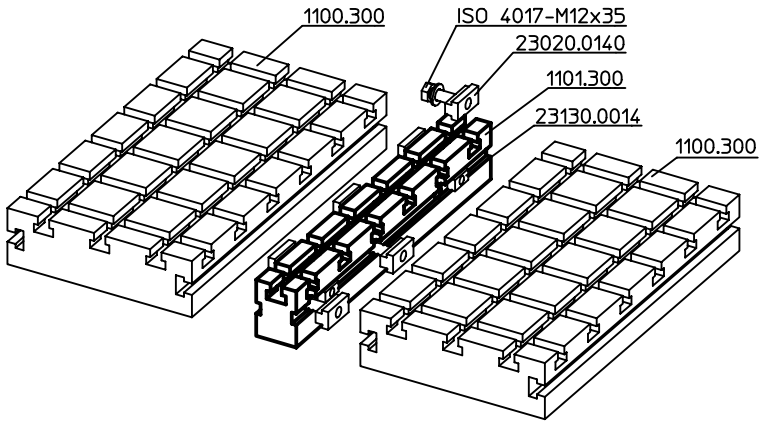
DRAWING



ORDER INFORMATION

System	Dimensions l [mm]	Amount n	Number of T-slots	For base plates	[kg]	Art. No.
V70	420	5	1 x 6	1100.300	8,0	1101.300
	490	6	1 x 7	1100.400	9,3	1101.400
	630	8	1 x 9	1100.500	11,8	1101.500

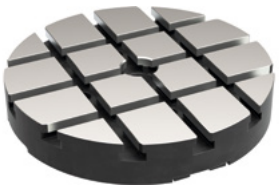
APPLICATION EXAMPLE



6

Base Plates

EH 1102.100 - EH 1102.200



PRODUCT DESCRIPTION

Material

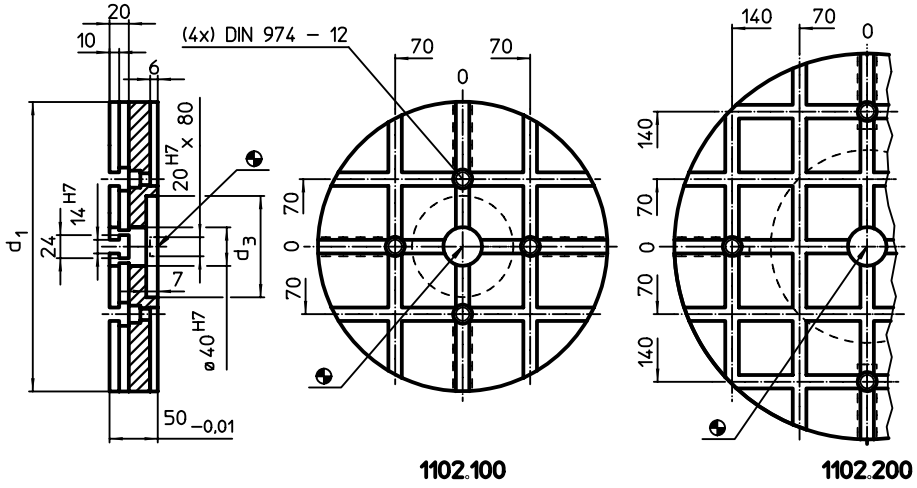
- Steel, hardened, ground

MORE INFORMATION

Notes

Special types on request.

DRAWING



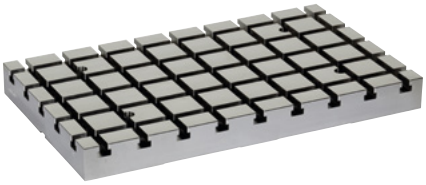
Slot spacing 70 ±0,01.

ORDER INFORMATION

System	Dimensions d_1 [mm]	Dimensions d_3 [mm]	Number of T-slots	[kg]	Art. No.
V70	300	105	3 x 3	21	1102.100
	400	200	5 x 5	37	1102.200

Base Plates • V70eco

EH 1200.300 - EH 1200.500



PRODUCT DESCRIPTION

V70eco base plates are a further development of the established V70 product line, optimized in quality and price.
They are fully compatible with the existing V70 T-slot system.

- Locating holes in quality H6 and slots in quality H8.
- Alignment of the base plate on the machine table by means of locating holes and/or centering slot.
- Fastening holes on a 100 mm pitch.
- High tensile tool steel.

Available options (delivery time approx. 10 working days):
a) Additional mounting holes on a 63 mm pitch
b) Additional mounting holes on a 125 mm pitch
c) Exterior stop
d) With connecting rings for Halder zero-point clamping system

Material

- Tool steel, high-strength

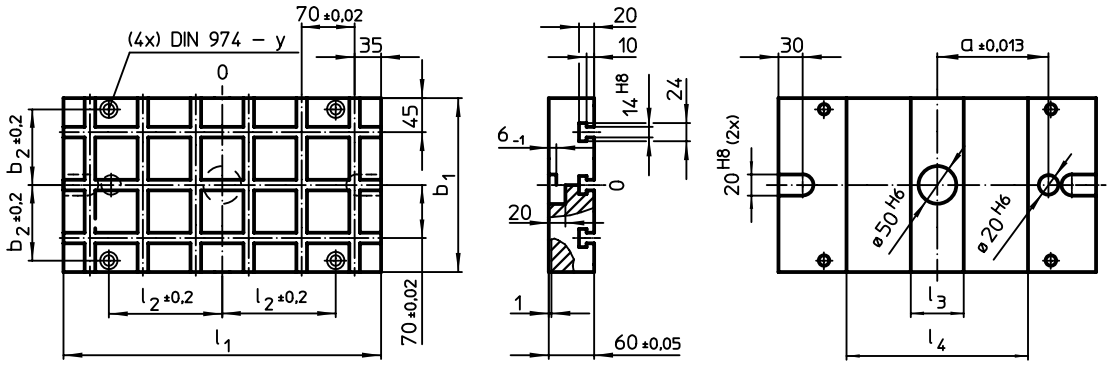
MORE INFORMATION

Notes

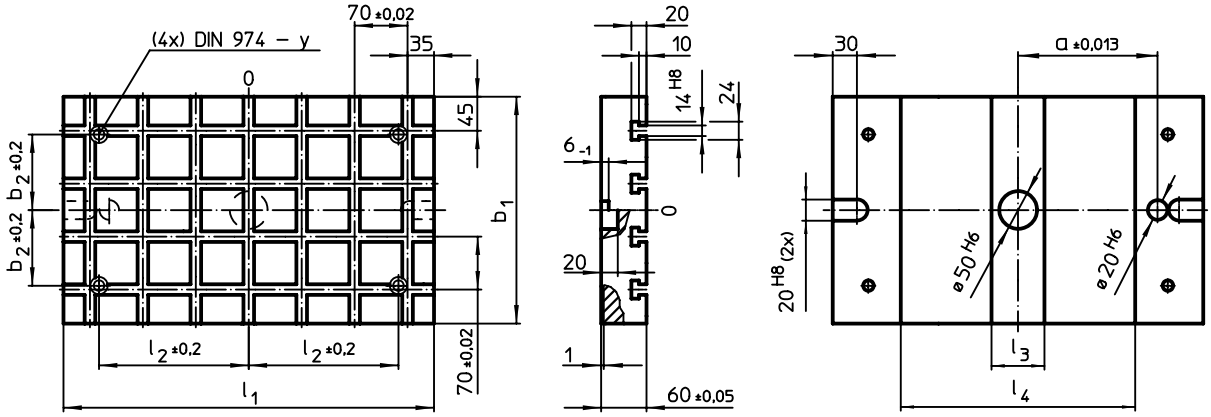
Special requests and larger dimensions are available on request.

DRAWING

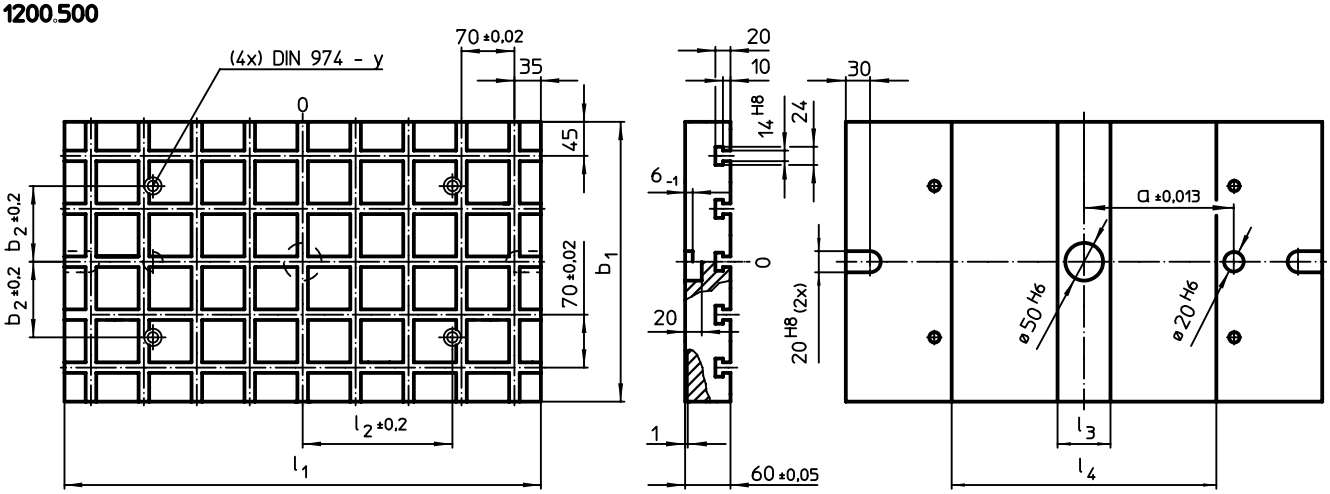
1200.300



1200.400



1200.500



ORDER INFORMATION

System	Dimensions								Number of connecting rings zero-point clamping system (optional)	Number of T-slots		Art. No.
	l_1	b_1	a ±0,013	b_2 ±0,2	l_2 ±0,2	l_3	l_4	y				
	[mm]										[kg]	
V70	420	230	150	100	150	70	240	12	2	3 x 6	38	1200.300
	490	300	200	100	200	70	310	12	2	4 x 7	57	1200.400
	630	370	200	100	200	70	350	12	4	5 x 9	92	1200.500

Base Plates • V70eco, overall dimensions same as pallets DIN 55201

EH 1200.700 - EH 1203.500



PRODUCT DESCRIPTION

V70eco base plates are a further development of the established V70 product line, optimized in quality and price.
They are fully compatible with the existing V70 T-slot System.

- Locating holes in quality H6 and slots in quality H8.
- Alignment of the base plate on the machine table by means of locating holes and/or centering slot.
- Fastening holes on a 100 mm pitch.
- High tensile tool steel.

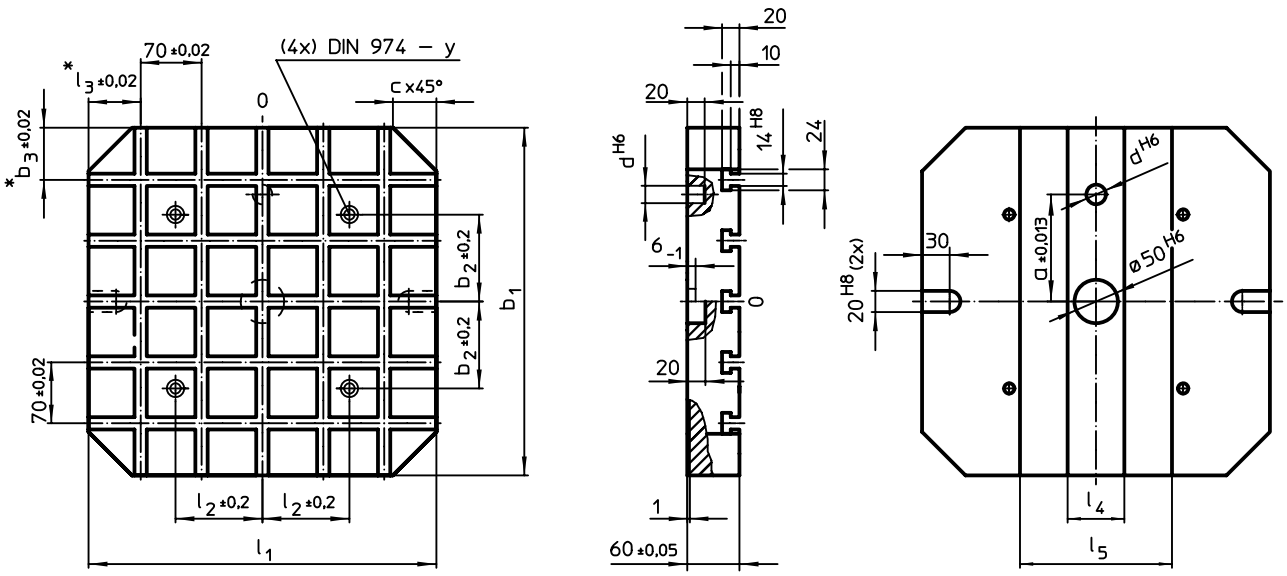
Available options (delivery time approx. 10 working days):
a) Additional mounting holes on a 63 mm pitch
b) Additional mounting holes on a 125 mm pitch
c) Exterior stop
d) With connecting rings for Halder zero-point clamping system

Material
- Tool steel, high-strength

MORE INFORMATION

Notes
Special types on request.

DRAWING



* These tolerances are valid only for optional exterior stop type.

ORDER INFORMATION

System	Dimensions [mm]												Number of connecting rings zero-point clamping system (optional)	Number of T-slots	[kg]	Art. No.
	l_1	b_1	a	b_2 ±0,2	b_3 ±0,02	c	d	l_2 ±0,2	l_3 ±0,02	l_4	l_5	y				
V70	400	400	150	100	60	50	20	100	–	65	175	12	4	5 x 5	61	1200.700
	500	500	200	200	40	60	20	200	–	70	310	12	4	7 x 7	95	1200.800
	630	630	200	200	35	70	25	200	–	70	340	16	4	9 x 9	152	1200.900
	500	400	150	100	60	50	20	200	40	70	310	12	4	5 x 7	77	1203.300
	630	500	200	200	40	60	20	200	35	70	340	12	4	7 x 9	120	1203.500

Supporting Plates • including accessories

EH 1104.300 - EH 1104.500

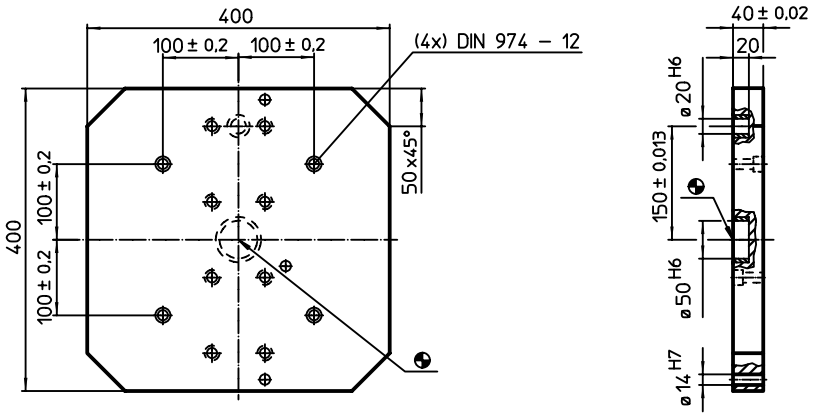


PRODUCT DESCRIPTION

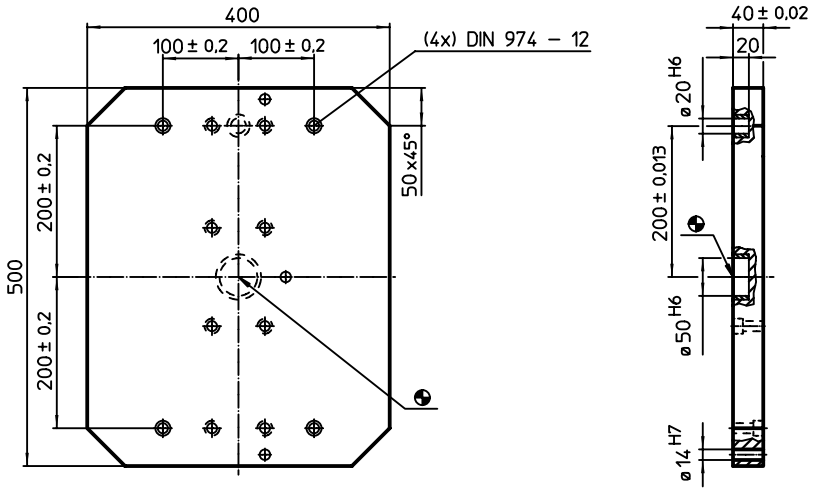
Material
- Grey cast iron GG

DRAWING

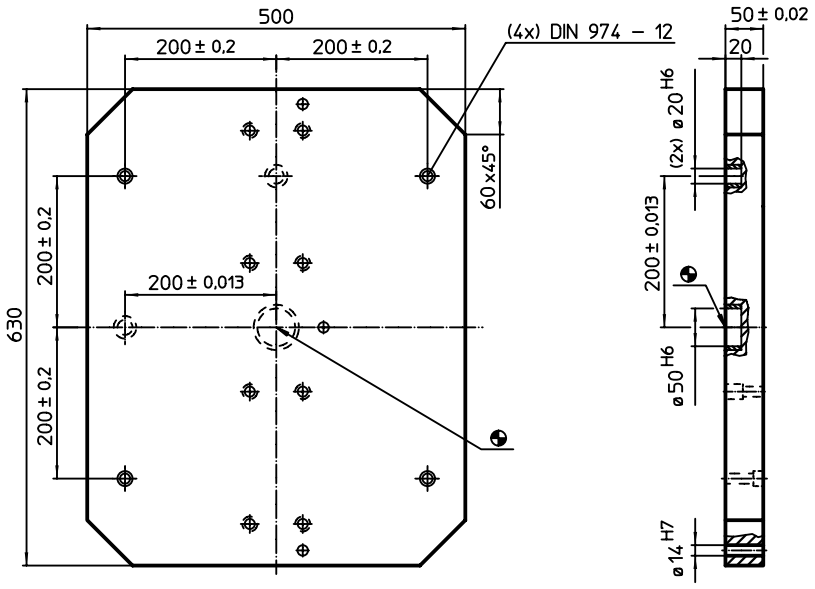
1104.300



1104.400



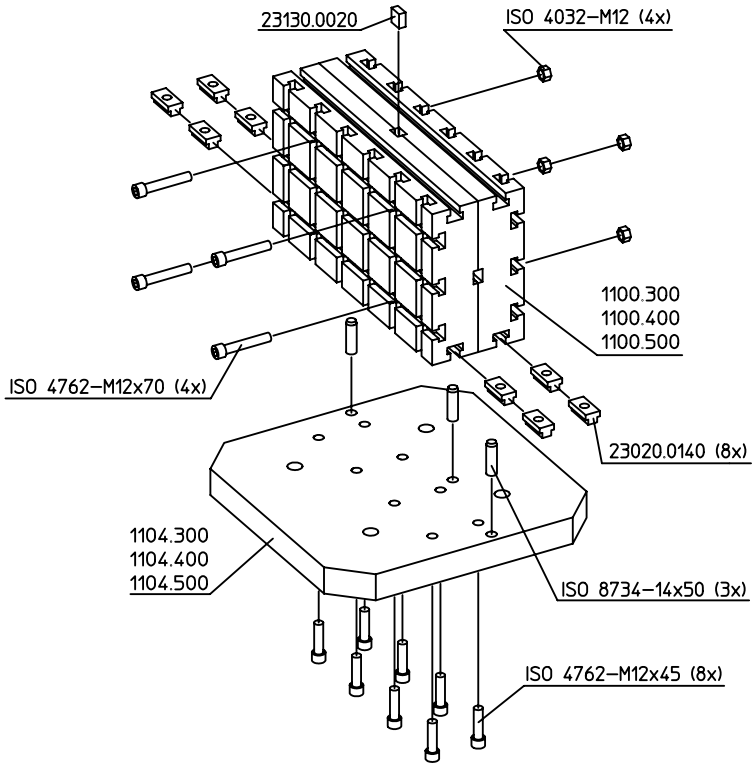
1104.500



ORDER INFORMATION

System	[kg]	Art. No.
V70	42	1104.300
	53	1104.400
	108	1104.500

APPLICATION EXAMPLE



Clamping Angles • modular design

EH 1104.700 - EH 1104.900



PRODUCT DESCRIPTION

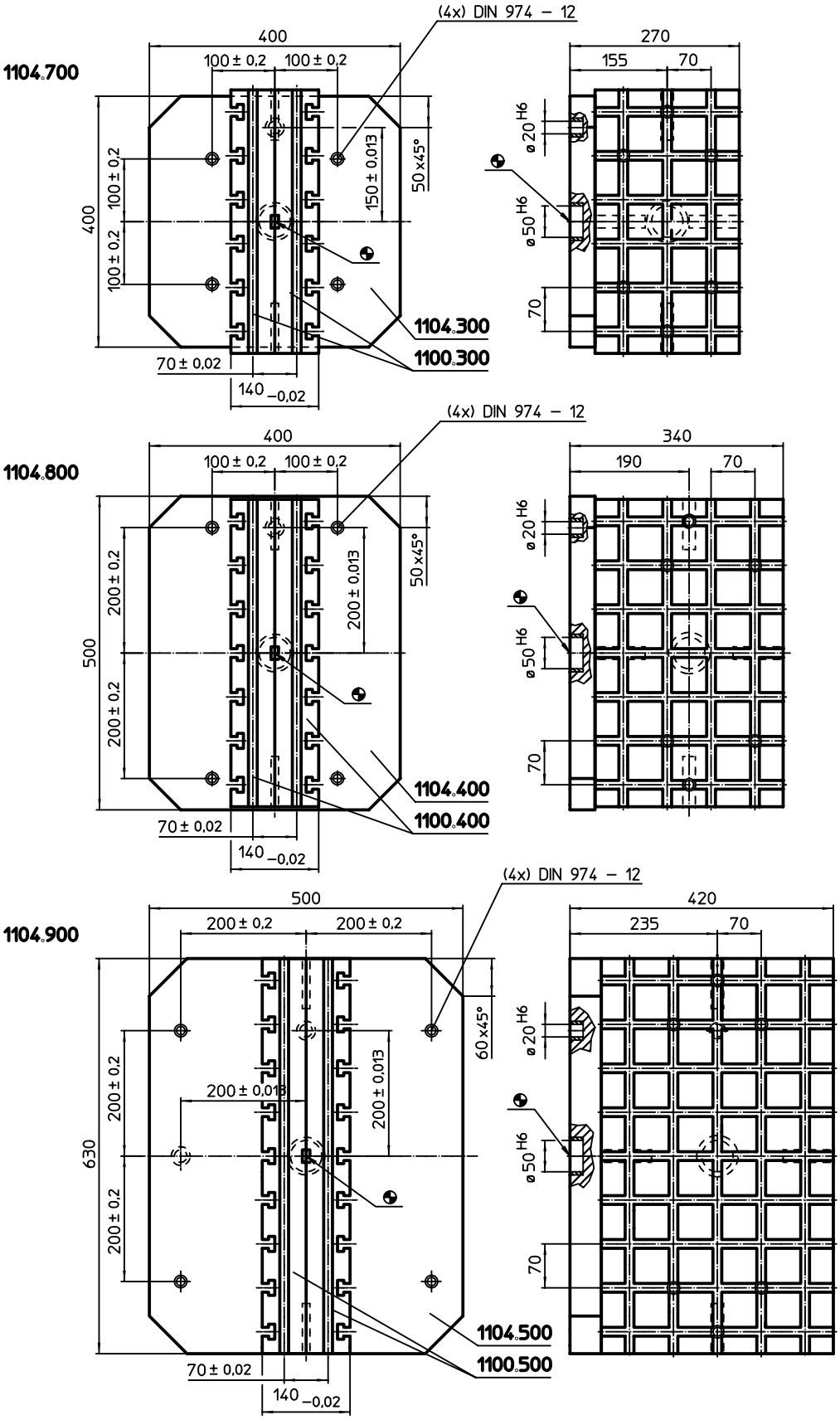
The modular clamping angle is a unit consisting of a support plate and two base plates. Assembly or disassembly is possible within a very short time. The base plates used correspond to the respective standard version.

Material

Body
- Grey cast iron GG

Base plate
- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	[kg]	Art. No.
V70	123	1104.700
	174	1104.800
	299	1104.900

Clamping Angles

EH 1105.200

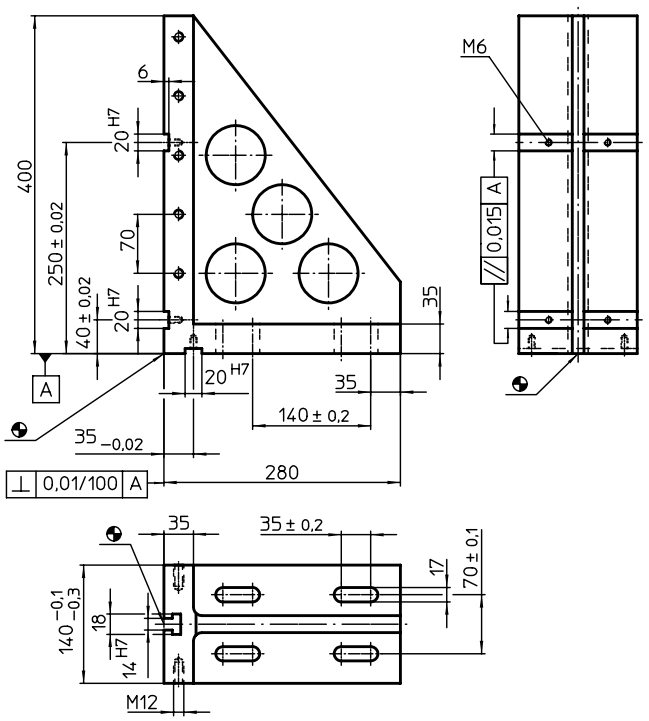


PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized

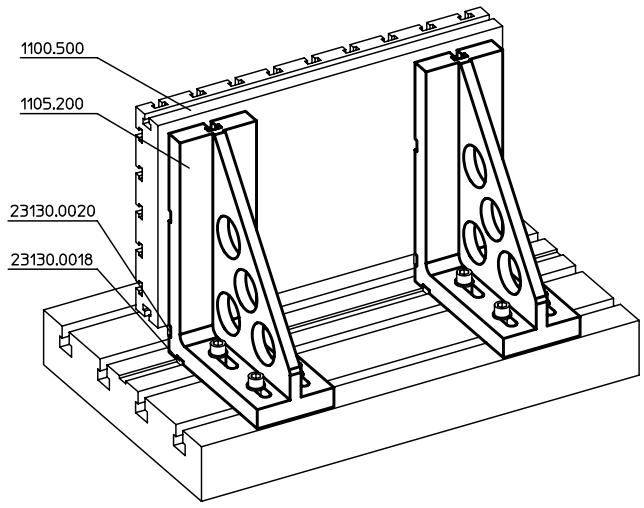
DRAWING



ORDER INFORMATION

System	[kg]	Art. No.
V70	26	1105.200

APPLICATION EXAMPLE



Clamping Angles

EH 1076.400



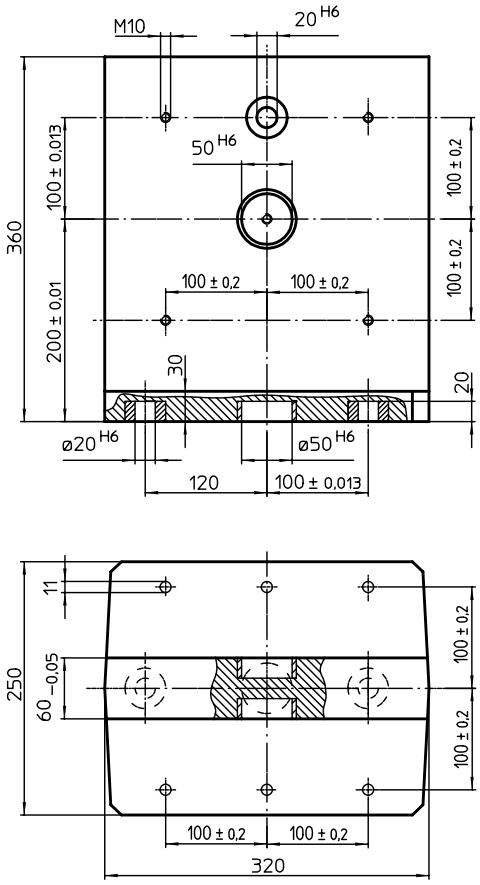
PRODUCT DESCRIPTION

Material
- Aluminium Al

MORE INFORMATION

Notes
Special types on request.

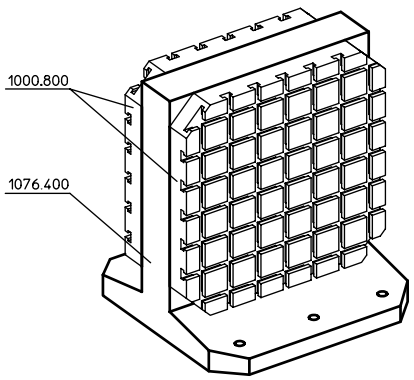
DRAWING



ORDER INFORMATION

System	[kg]	Art. No.
V40	21,5	1076.400

APPLICATION EXAMPLE



Spacers

EH 1007.400 - EH 1108.300

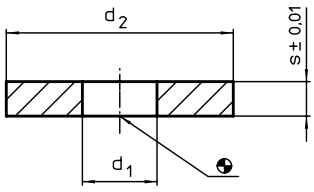


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions d_1	d_2 [mm]	s	[g]	Art. No.
V40	8,5	24,0	3	9	1007.400
		39,5	3	28	1007.500
		24,0	4	12	1007.600
		39,5	4	37	1007.700
		24,0	5	15	1007.800
		39,5	5	46	1007.900
V70/L12	13,0	39,5	3	26	1107.400
		59,5	3	63	1107.500
		39,5	4	35	1107.600
		59,5	4	85	1107.700
		39,5	5	44	1107.800
		59,5	5	107	1107.900
		39,5	10	85	1108.000
		59,5	10	208	1108.100
		39,5	20	170	1108.200
		59,5	20	416	1108.300

Mounting Blocks

EH 1010.100 - EH 1110.100

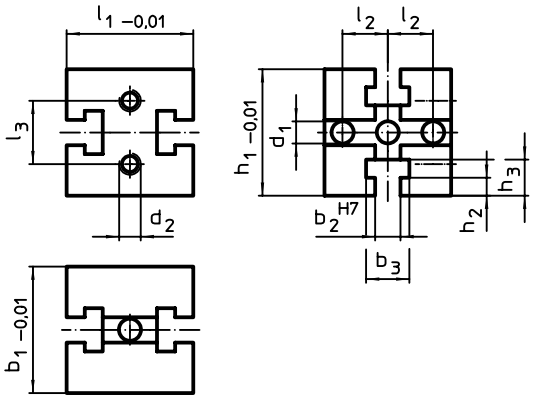


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



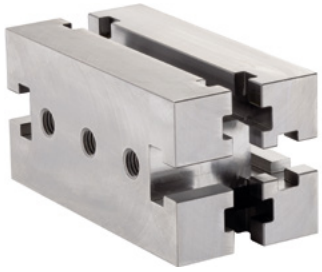
ORDER INFORMATION

System	Dimensions [mm]											[g]	Art. No.
	b_1	l_1	b_2	b_3	l_2	l_3	h_1	h_2	h_3	d_1	d_2		
V40	40	40	10	17	13	–	40	6,5	12,5	8,25	–	280	1010.100
V70	70	70	14	24	25	35	70	10,0	20,0	12,25	M12	1700	1110.100

6

Mounting Blocks

EH 1010.200 - EH 1110.300

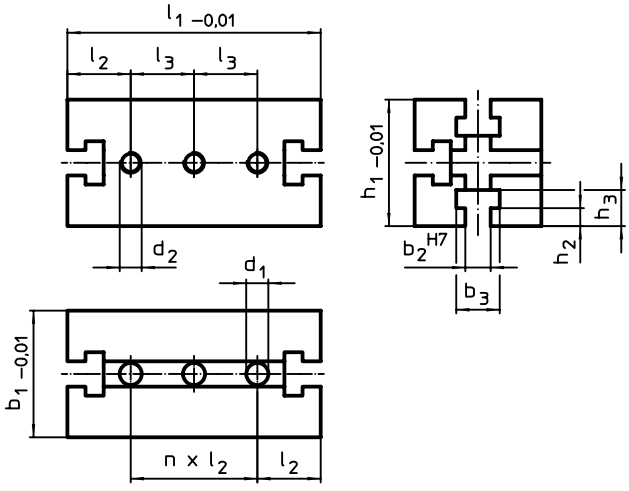


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

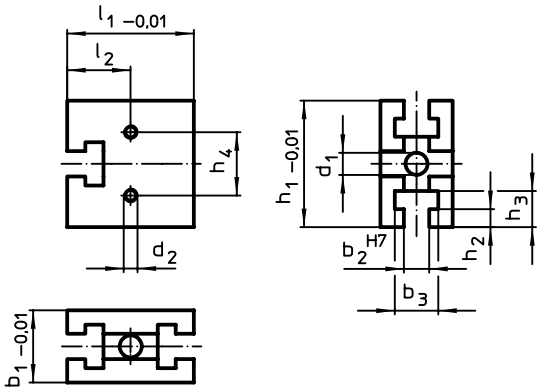
System	Dimensions [mm]											Amount n	[g]	Art. No.
	b_1	l_1	b_2	b_3	l_2	l_3	h_1	h_2	h_3	d_1	d_2			
V40	40	80	10	17	20	–	40	6,5	12,5	8,25	–	2	585	1010.200
		120	10	17	20	–	40	6,5	12,5	8,25	–	4	905	1010.300
V70	70	140	14	24	35	35	70	10,0	20,0	12,25	M12	2	3600	1110.200
		210	14	24	35	70	70	10,0	20,0	12,25	M12	4	5600	1110.300

Mounting Blocks
EH 1011.100 - EH 1111.100



PRODUCT DESCRIPTION
Material
- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

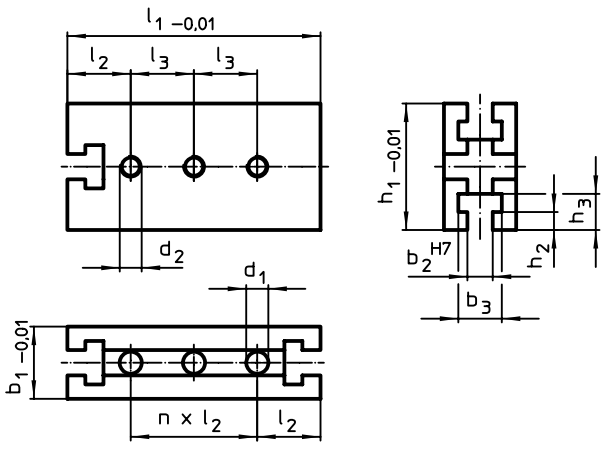
System	Dimensions											Amount n		Art. No.
	b_1	l_1	b_2	b_3	l_2	h_1	h_2	h_3	h_4	d_1	d_2			
	[mm]												[g]	
V40	25	40	10	17	20	40	6,5	12,5	–	8,25	–	1	147	1011.100
V70	40	70	14	24	35	70	10,0	20,0	35	12,25	M12	1	810	1111.100

Mounting Blocks
EH 1011.200 - EH 1111.300



PRODUCT DESCRIPTION
Material
- Steel, case-hardened, ground

DRAWING



6

ORDER INFORMATION

System	Dimensions [mm]											Amount n	[g]	Art. No.
	b_1	l_1	b_2	b_3	l_2	l_3	h_1	h_2	h_3	d_1	d_2			
V40	25	40	10	17	20	–	80	6,5	12,5	8,25	–	3	340	1011.200
							120	6,5	12,5	8,25	–	5	530	1011.300
V70	40	70	14	24	35	35	140	10,0	20,0	12,25	M12	3	1880	1111.200
						70	210	10,0	20,0	12,25	M12	5	2950	1111.300

Mounting Blocks • V70eco

EH 1210.100



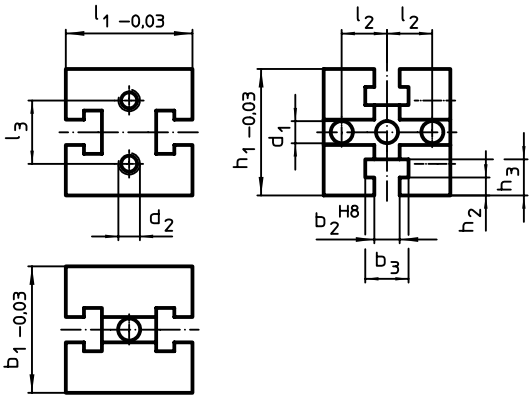
PRODUCT DESCRIPTION

V70eco mounting blocks are a further development of the established V70 product line, optimized in quality and price.
They are fully compatible with the existing V70 T-slot system.

Material

- Tool steel, high-strength

DRAWING

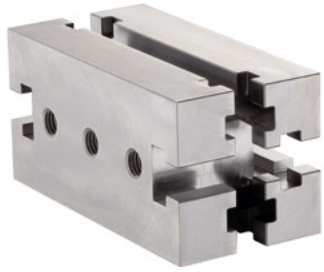


ORDER INFORMATION

System	Dimensions [mm]											[g]	Art. No.
	b_1	l_1	b_2	b_3	h_1	h_2	h_3	l_2	l_3	d_1	d_2		
V70	70	70	14	24	70	10	20	25	35	12,25	M12	1700	1210.100

Mounting Blocks • V70eco

EH 1210.200 - EH 1210.300



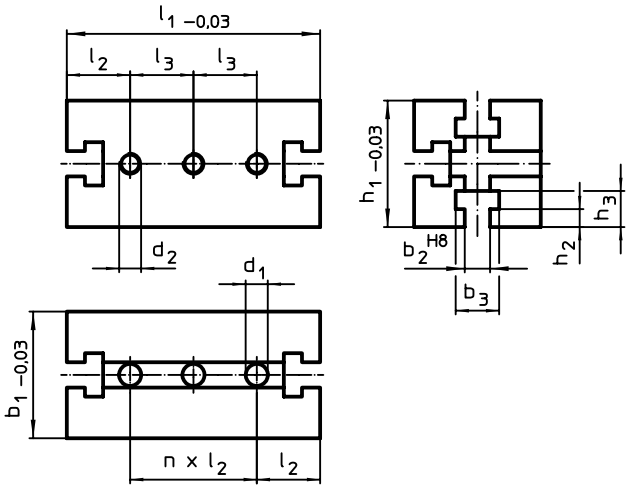
PRODUCT DESCRIPTION

V70eco mounting blocks are a further development of the established V70 product line, optimized in quality and price.
They are fully compatible with the existing V70 T-slot system.

Material

- Tool steel, high-strength

DRAWING



ORDER INFORMATION

System	Dimensions												Art. No.
	b_1	l_1	b_2	b_3	h_1	h_2	h_3	l_2	l_3	n	d_1	d_2	[g]	
	[mm]													
V70	70	140	14	24	70	10	20	35	35	2	12,25	M12	3600	1210.200
		210	14	24	70	10	20	35	70	4	12,25	M12	5600	1210.300

Mounting Blocks • V70eco

EH 1211.100



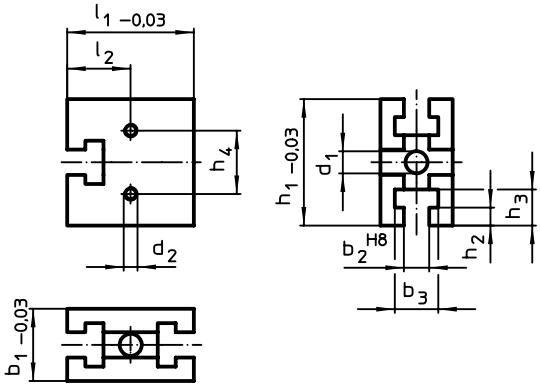
PRODUCT DESCRIPTION

V70eco mounting blocks are a further development of the established V70 product line, optimized in quality and price.
They are fully compatible with the existing V70 T-slot system.

Material

- Tool steel, high-strength

DRAWING



ORDER INFORMATION

System	Dimensions [mm]												Art. No.
	b_1	l_1	b_2	b_3	l_2	h_1	h_2	h_3	h_4	d_1	d_2	[g]	
V70	40	70	14	24	35	70	10	20	35	12,25	M8	810	1211.100

Mounting Blocks • V70eco

EH 1211.200 - EH 1211.300



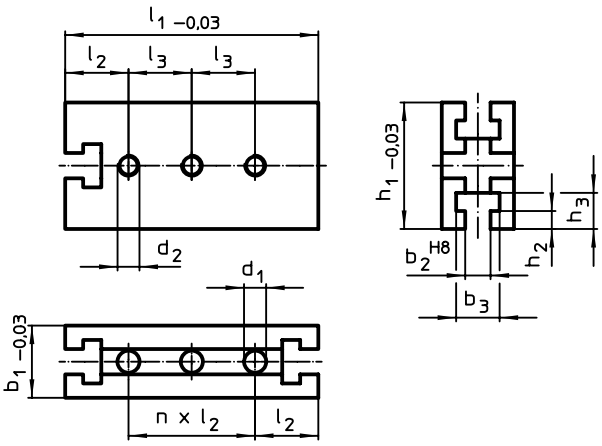
PRODUCT DESCRIPTION

V70eco mounting blocks are a further development of the established V70 product line, optimized in quality and price.
They are fully compatible with the existing V70 T-slot system.

Material

- Tool steel, high-strength

DRAWING

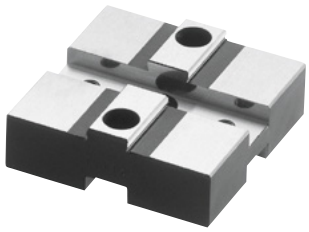


ORDER INFORMATION

System	Dimensions [mm]													Art. No.
	b_1	l_1	b_2	b_3	h_1	h_2	h_3	l_2	l_3	n	d_1	d_2	[g]	
V70	40	140	14	24	70	10	20	35	35	2	12,25	M12	1880	1211.200
		210	14	24	70	10	20	35	70	4	12,25	M12	2950	1211.300

Intermediate Plates

EH 1111.700 - EH 1111.800

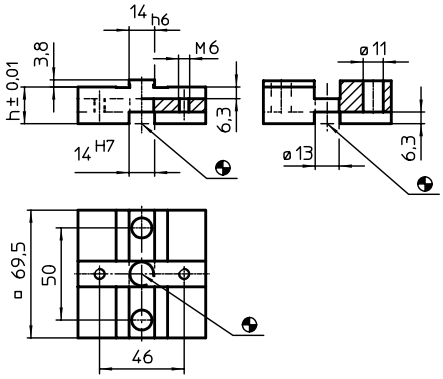


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

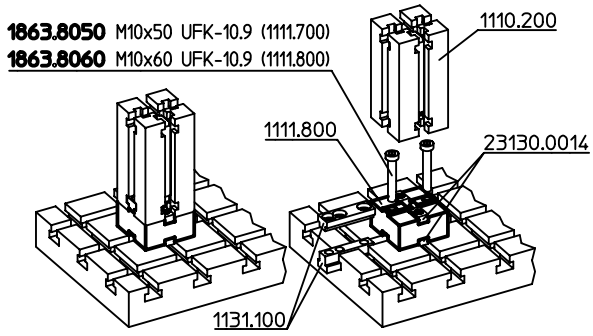
DRAWING



ORDER INFORMATION

System	Dimensions h [mm]	[g]	Art. No.
V70	20	607	1111.700
	30	1130	1111.800

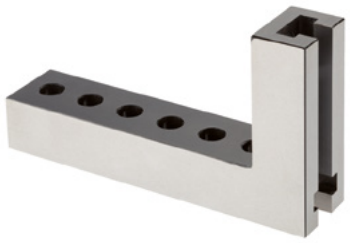
APPLICATION EXAMPLE



6

Slotted Clamping Angles

EH 1012.100 - EH 1112.400

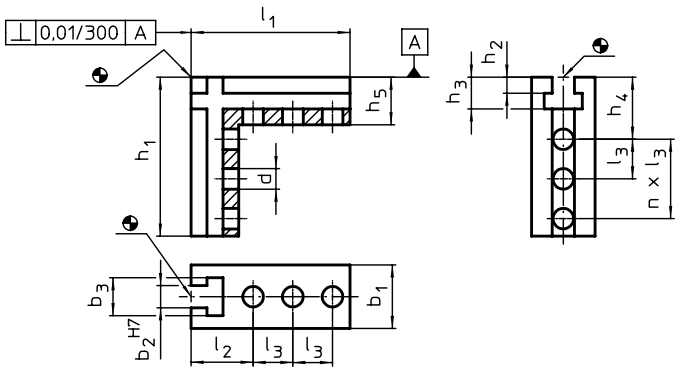


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

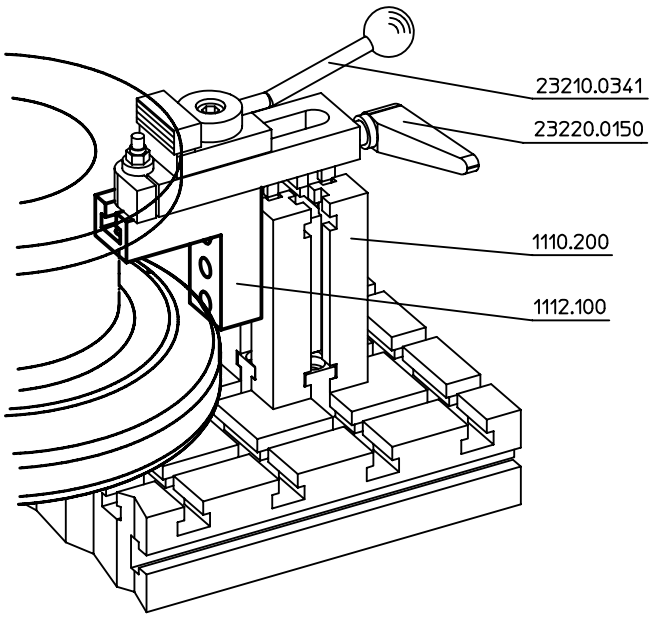
DRAWING



ORDER INFORMATION

System	Dimensions [mm]												Amount n	[g]	Art. No.
	b_1	h_1	l_1	l_2	l_3	b_2	b_3	h_2	h_3	h_4	h_5	d			
V40	25	63	63	29	26	10	18	6,5	14,5	29	22	8,25	1	246	1012.100
		105	63	29	26	10	18	6,5	14,5	45	22	8,25	2	353	1012.200
	40	63	63	29	26	10	18	6,5	14,5	29	22	8,25	1	520	1012.300
		105	63	29	26	10	18	6,5	14,5	45	22	8,25	2	733	1012.400
V70	40	100	100	39	25	14	24	10,0	20,0	39	30	13,00	2	1000	1112.100
		180	100	39	25	14	24	10,0	20,0	39	30	13,00	5	1450	1112.200
	70	100	100	39	25	14	24	10,0	20,0	39	30	13,00	2	2150	1112.300
		180	100	39	25	14	24	10,0	20,0	39	30	13,00	5	3240	1112.400

APPLICATION EXAMPLE



Intermediate Elements

EH 1112.600 - EH 1112.800

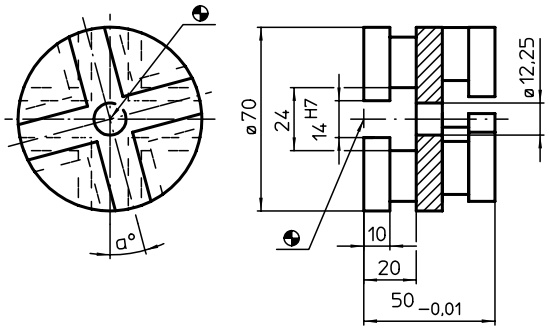


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	α	[g]	Art. No.
V70	15°	800	1112.600
	30°	800	1112.700
	45°	800	1112.800

Clamping Bars

EH 1013.600 - EH 1113.800

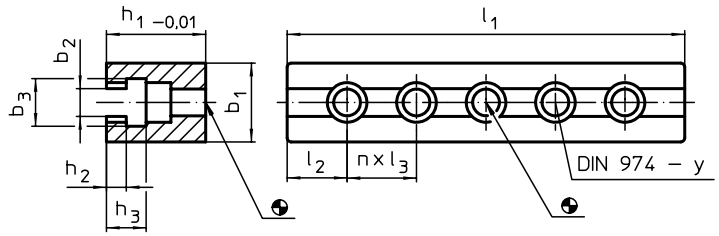


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING

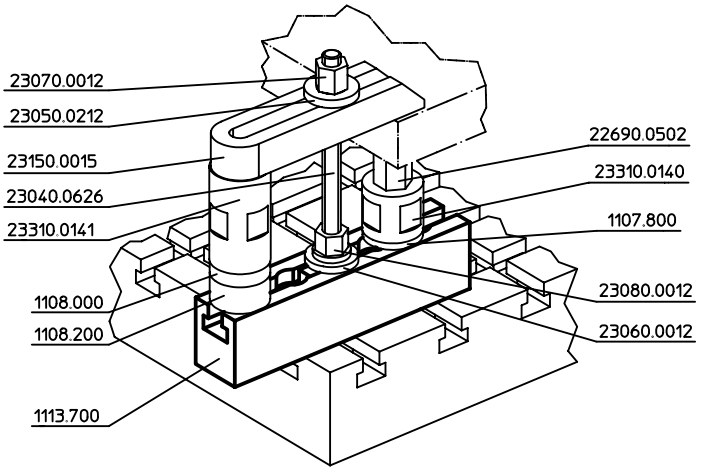


6

ORDER INFORMATION

System	Dimensions [mm]									Amount n	For screws [mm]	y [mm]	[g]	Art. No.
	l_1	b_1	b_2	b_3	h_1	h_2	h_3	l_2	l_3					
V40	80	24	10,3	18	30	6,5	14,5	20,0	40	1	M 8	8	300	1013.600
	120	24	10,3	18	30	6,5	14,5	20,0	40	2	M 8	8	450	1013.700
	160	24	10,3	18	30	6,5	14,5	20,0	40	3	M 8	8	600	1013.800
V70	140	40	14,3	24	50	10,0	20,0	35,0	35	2	M12	12	1550	1113.600
	200	40	14,3	24	50	10,0	20,0	30,0	35	4	M12	12	2130	1113.700
	300	40	14,3	24	50	10,0	20,0	27,5	35	7	M12	12	3360	1113.800

APPLICATION EXAMPLE



6

Support Clamping Bars

EH 1114.000 - EH 1114.100

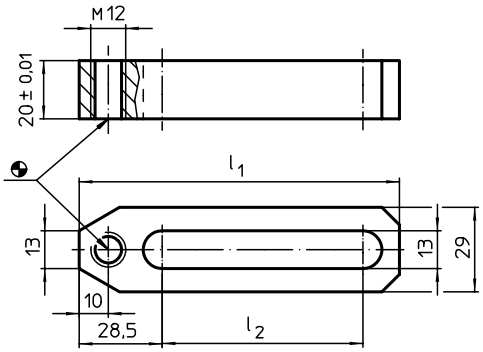


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions [mm]		[g]	Art. No.
	l_1	l_2		
V70/L12	110	69	300	1114.000
	150	109	400	1114.100

Stops

EH 1014.500 - EH 1114.500

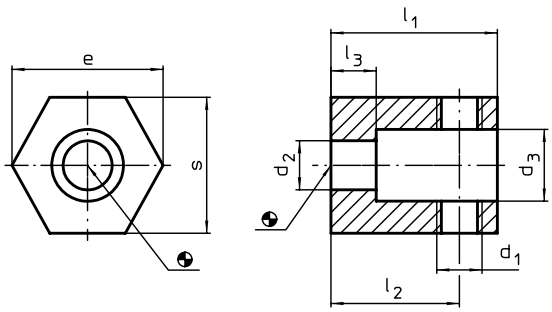


PRODUCT DESCRIPTION

Material

- Steel, blackened

DRAWING



ORDER INFORMATION

System	Dimensions									Art. No.
	d_1	d_2	d_3	l_1	l_2	l_3	s	e	[g]	
	[mm]									
V40	M 8	8,4	14	26	20	8	22	25,4	55	1014.500
V70/L12	M12	13,0	19	44	34	12	36	40,0	280	1114.500

Stops • cylindrical

EH 1115.100

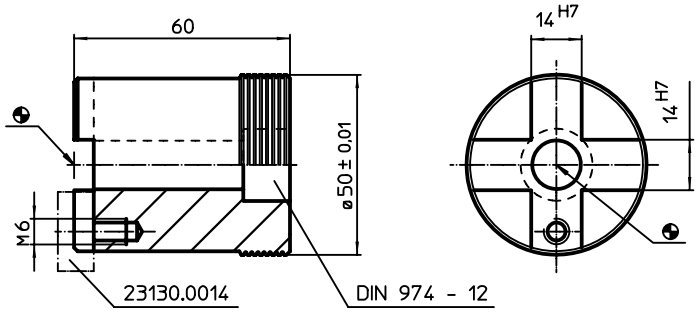


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70	750	1115.100

Stops

EH 1116.000 - EH 1116.100

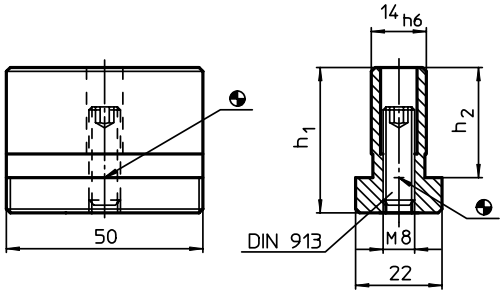


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions h_1 [mm]	Dimensions h_2 [mm]	[g]	Art. No.
V70	37	28	215	1116.000
	57	48	310	1116.100

Thrust Angles

EH 1020.300 - EH 1121.500

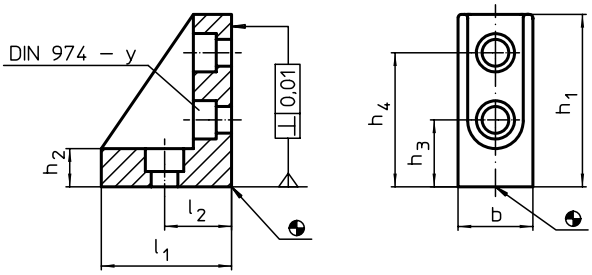


PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized, ground

DRAWING



ORDER INFORMATION

System	Dimensions							For screws	y		Art. No.
	b	l_1	l_2	h_1	h_2	h_3	h_4				
	[mm]							[mm]	[mm]	[g]	
V40	24,5	42	20	52	10,5	20	40	M 8	8	185	1020.300
	38,0	42	20	52	10,5	20	40	M 8	8	295	1021.500
V70	37,0	67	35	90	20,0	35	70	M12	12	870	1120.300
	66,0	67	35	90	20,0	35	70	M12	12	1710	1121.500

6

Thrust Angles

EH 1021.600 - EH 1021.700

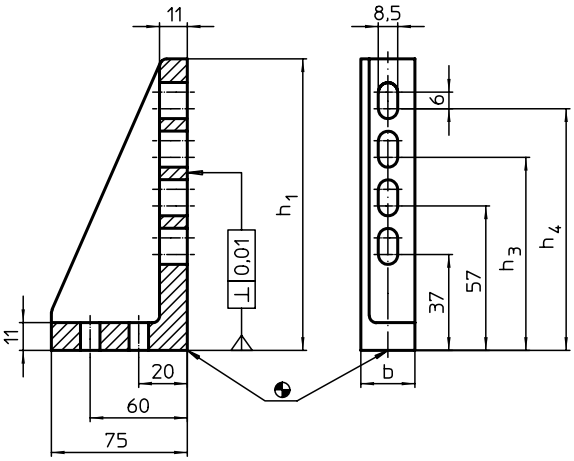


PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized, ground

DRAWING



ORDER INFORMATION

System	Dimensions				Position of web		Art. No.
	b	h_1	h_3	h_4			
	[mm]					[g]	
V40	39	75	–	–	left	460	1021.600
		115	77	97	left	700	1021.700

Thrust Angles

EH 1120.400 - EH 1122.300

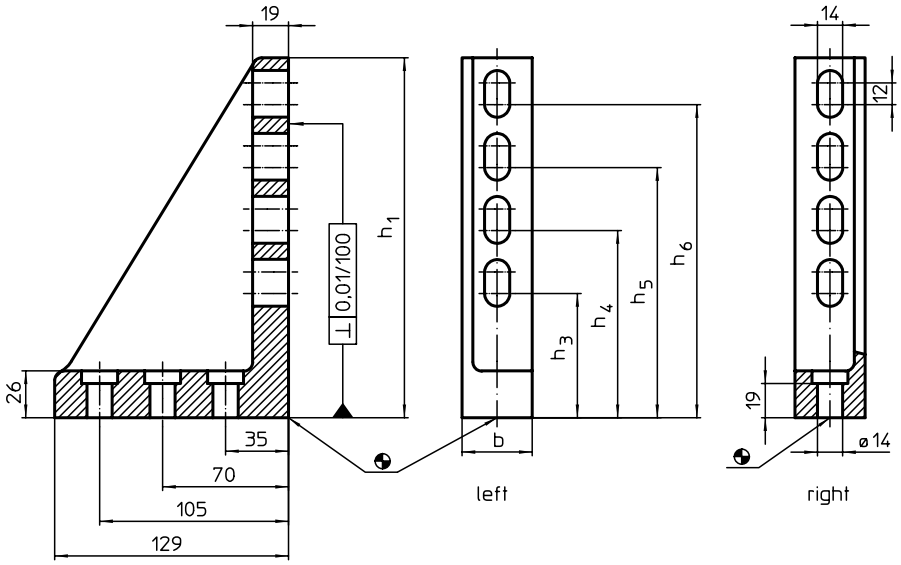


PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized, ground

DRAWING



ORDER INFORMATION

System	Dimensions						Position of web		Art. No.
	b	h_1	h_3	h_4	h_5	h_6			
	[mm]							[g]	
V70	37	140	69	104	–	–	left	1470	1120.400
		200	69	104	139	174	left	1820	1120.500
		140	69	104	–	–	right	1470	1121.000
		200	69	104	139	174	right	1820	1121.100
	66	140	69	104	–	–	left	2970	1121.600
		200	69	104	139	174	left	3720	1121.700
		140	69	104	–	–	right	2970	1122.200
		200	69	104	139	174	right	3720	1122.300

T-Slot Centering Blocks

EH 1029.600 - EH 1129.600

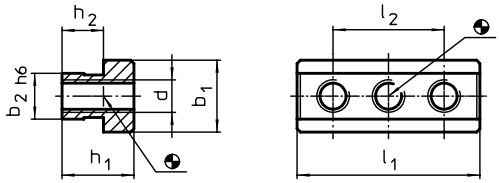


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions [mm]							[g]	Art. No.
	h_1	h_2	b_1	b_2	d	l_1	l_2		
V40	13,5	8,5	15	10	M 6	38	26	36	1029.600
V70	22,0	12,7	22	14	M10	56	34	130	1129.600

Nuts for T-Slots

EH 1030.000 - EH 1030.300

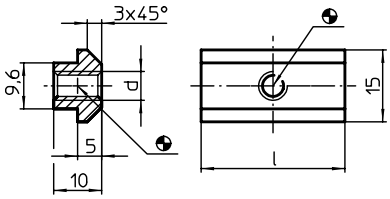


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, quality 10, black

DRAWING



ORDER INFORMATION

System	Dimensions [mm]		[g]	Art. No.
	l	d		
V40	15	M6	11	1030.000
		M8	9	1030.100
	30	M6	24	1030.200
		M8	23	1030.300

T-Blocks

EH 1130.400 - EH 1130.600

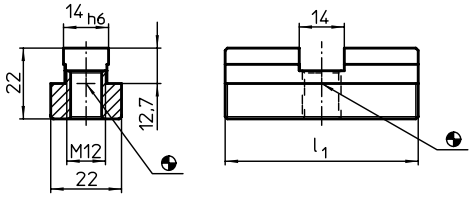


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

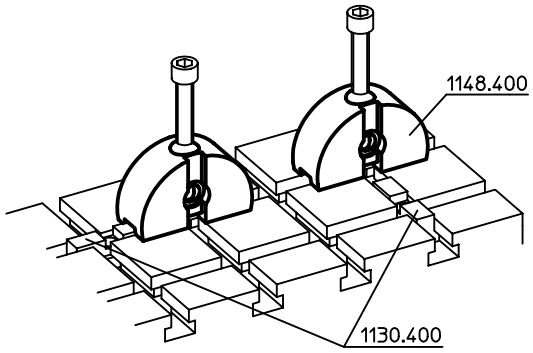
DRAWING



ORDER INFORMATION

System	Dimensions l_1 [mm]	[g]	Art. No.
V70	60	150	1130.400
	30	50	1130.600

APPLICATION EXAMPLE



6

T-Clamping Blocks

EH 1031.100 - EH 1131.200



PRODUCT DESCRIPTION

Material

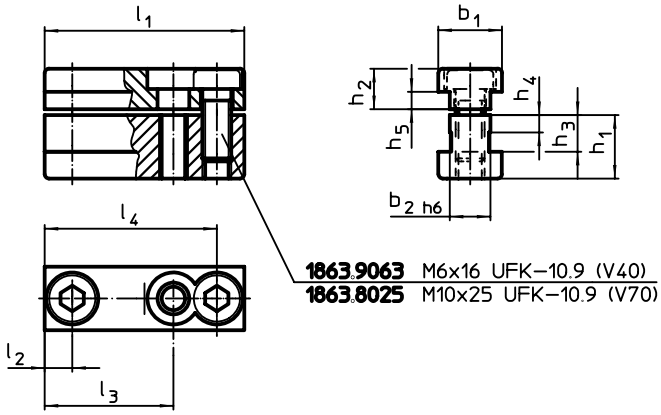
- Steel, case-hardened, ground

MORE INFORMATION

Further products

Wrenches . . . . . → p. 743

DRAWING



ORDER INFORMATION

System	Dimensions [mm]											[g]	Art. No.
	l_1	l_2	l_3	l_4	b_1	b_2	h_1	h_2	h_3	h_4	h_5		
V40	39,6	6,6	–	32,6	15	10	13,5	7,5	8,5	4	3,5	67	1031.100
	13,0	6,5	–	–	15	10	13,5	7,5	8,5	4	3,5	22	1031.200
	24,0	12,0	–	–	15	10	13,5	7,5	8,5	4	3,5	42	1031.300
V70	69,0	9,5	44,5	59,5	22	14	22,0	14,0	12,7	6	6,0	280	1131.100
	22,0	11,0	–	–	22	14	22,0	14,0	12,7	6	6,0	100	1131.200

T-Clamping Blocks

EH 1131.500 - EH 1131.700

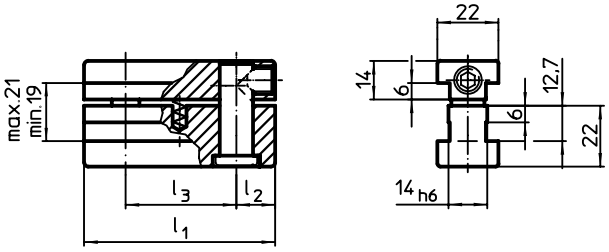


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions l_1	l_2	l_3		Art. No.
	[mm]			[g]	
V70	23,5	13,5	–	110	1131.500
	40,0	14,0	12	180	1131.600
	69,0	14,5	40	320	1131.700

Wrenches

EH 1032.100 - EH 1132.100

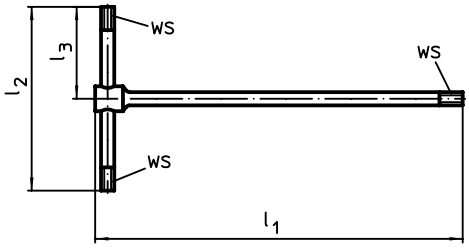


PRODUCT DESCRIPTION

Material

- Steel, case-hardened

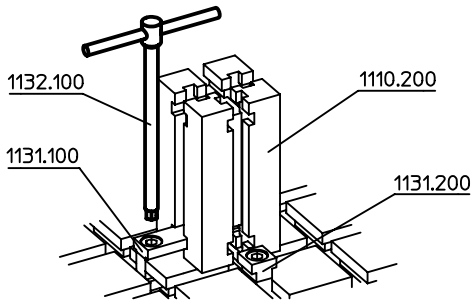
DRAWING



ORDER INFORMATION

System	Dimensions l_1	l_2	l_3	WS	Suitable for		Art. No.
	[mm]			[mm]	[mm]	[g]	
V40	210	105	52,5	5	M 6	100	1032.100
V70	250	125	62,5	8	M10	200	1132.100

APPLICATION EXAMPLE



Butt Straps

EH 1132.500 - EH 1132.800

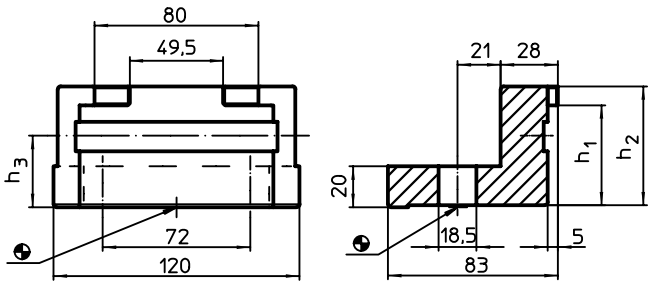


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, blackened

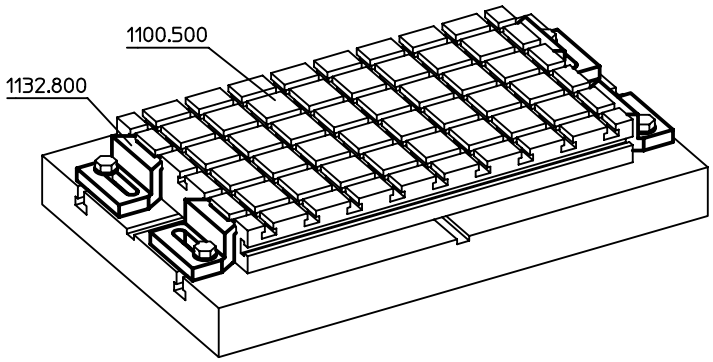
DRAWING



ORDER INFORMATION

System	Dimensions h_1	h_2	h_3	[g]	Art. No.
		[mm]			
V70	39,7	49	–	1610	1132.500
	49,7	59	35	1650	1132.800

APPLICATION EXAMPLE



Clamping Heads

EH 1132.900

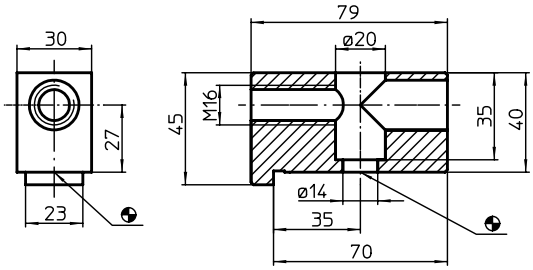


PRODUCT DESCRIPTION

Material

- Steel, blackened

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70	550	1132.900

Clamping Bars

EH 1133.000 - EH 1133.200

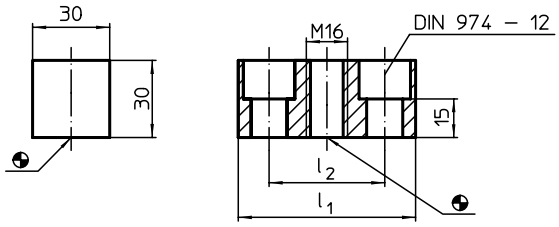


PRODUCT DESCRIPTION

Material

- Steel, blackened

DRAWING



ORDER INFORMATION

System	Dimensions l_1 [mm]	Dimensions l_2 [mm]	[g]	Art. No.
V70	69	45	330	1133.000
	94	70	500	1133.200

Clamping Vices • moveable jaw

EH 1137.300



PRODUCT DESCRIPTION

Max. torque 140 Nm, clamping power F = 30 kN

Material

- Steel, case-hardened, ground

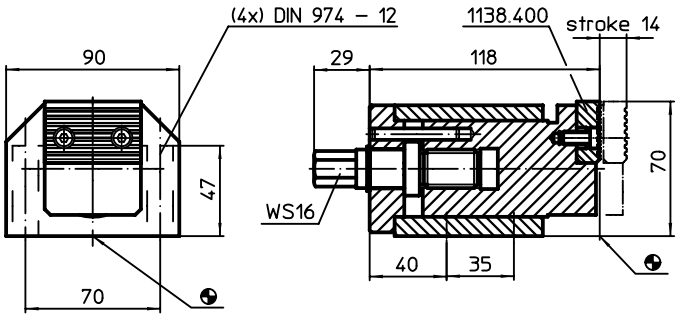
MORE INFORMATION

Further products

Clamping Vices . . . . . → p. 443

Clamping Vices, fixed jaw . . . . . → p. 746
Clamping Vices, replacement jaw, soft → p. 747
Clamping Vices, replacement jaw, ribbed/flat. . . . . → p. 747

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70	4600	1137.300

Clamping Vices • fixed jaw

EH 1137.400



PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

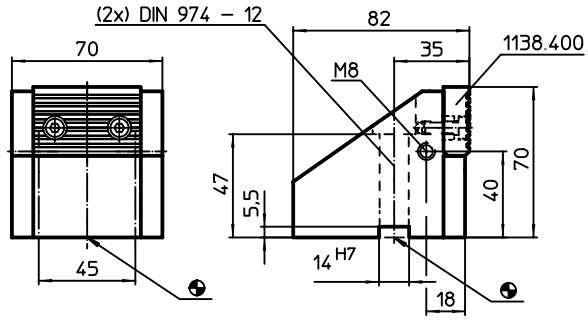
MORE INFORMATION

Further products

Clamping Vices . . . . . → p. 443

Clamping Vices, moveable jaw . . . . . → p. 746
Clamping Vices, replacement jaw, soft → p. 747
Clamping Vices, replacement jaw, ribbed/flat. . . . . → p. 747

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70	2000	1137.400

Clamping Vices • replacement jaw, soft

EH 1138.100



PRODUCT DESCRIPTION

Material

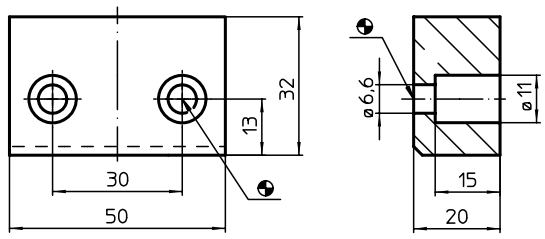
- Aluminium Al

MORE INFORMATION

Further products

Clamping Vices . . . . . → p. 443

DRAWING

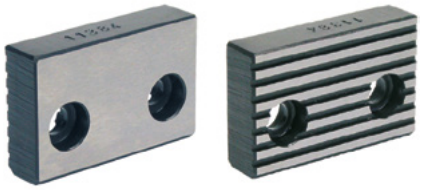


ORDER INFORMATION

System	[g]	Art. No.
V70	75	1138.100

Clamping Vices • replacement jaw, ribbed/flat

EH 1138.400



PRODUCT DESCRIPTION

Material

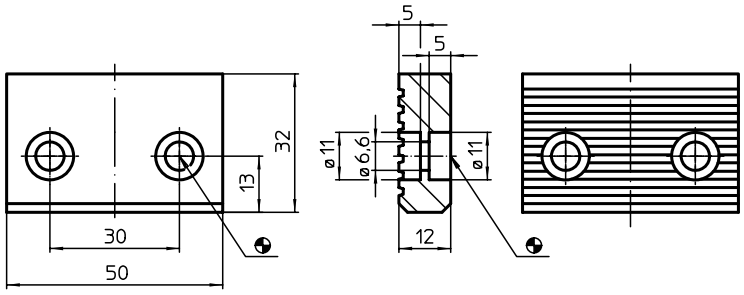
- Steel, case-hardened, blackened

MORE INFORMATION

Further products

Clamping Vices . . . . . → p. 443

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70	125	1138.400

Wrenches

EH 1139.400 - EH 1139.500

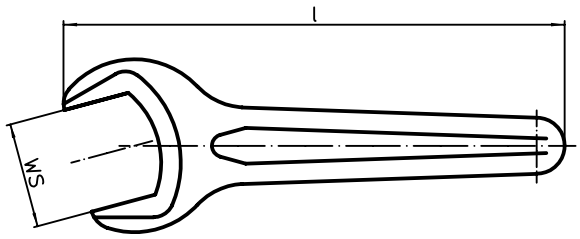


PRODUCT DESCRIPTION

Material

- Heat-treated steel, heat treated

DRAWING



ORDER INFORMATION

System	WS [mm]	Dimensions l [mm]	[g]	Art. No.
V70	36	300	390	1139.400
	46	300	960	1139.450
	55	300	930	1139.500

Locating Pins

EH 1040.300 - EH 1040.700

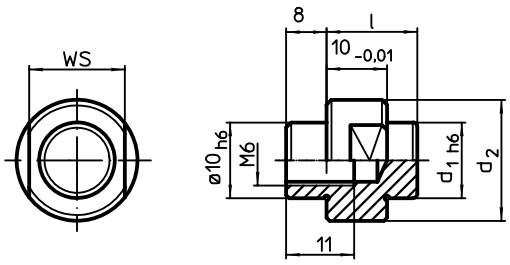


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions d_1	d_2 [mm]	l	WS [mm]	[g]	Art. No.
V40	6	15	14	13	17	1040.300
	10	19	14	13	23	1040.500
	13	19	15	17	29	1040.700

Locating Pins

EH 1140.300 - EH 1141.500

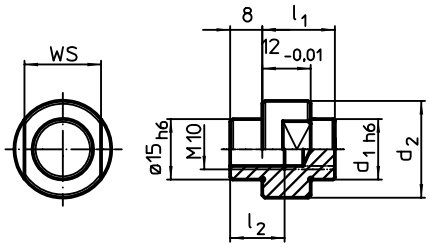


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

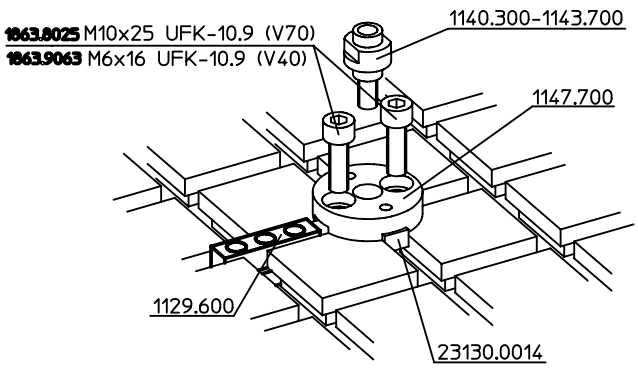
DRAWING

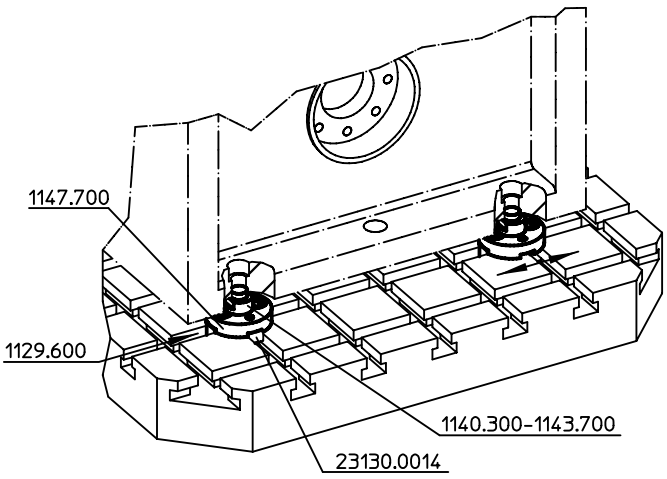


ORDER INFORMATION

System	Dimensions				WS		Art. No.
	d_1	d_2	l_1	l_2	[mm]	[g]	
V70	4	19	16	13,5	15	30	1140.300
	5	19	16	13,5	15	30	1140.400
	6	19	16	13,5	15	30	1140.500
	8	19	17	13,5	15	28	1140.600
	10	19	17	13,5	15	30	1140.700
	12	19	18	13,5	15	30	1140.800
	14	24	18	13,5	19	30	1140.900
	15	24	18	[throughgoing thread]	19	50	1141.000
	16	24	18	[throughgoing thread]	19	50	1141.100
	18	29	19	[throughgoing thread]	22	70	1141.200
	20	29	19	[throughgoing thread]	22	70	1141.300
	22	34	20	[throughgoing thread]	27	100	1141.400
	24	34	20	[throughgoing thread]	27	100	1141.500

APPLICATION EXAMPLE





6

Locating Pins

EH 1141.600 - EH 1143.700

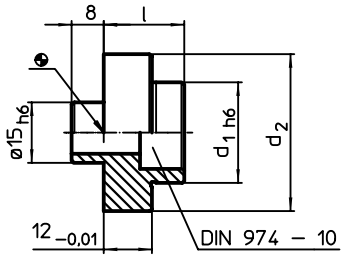


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions				Art. No.
	d_1	d_2	l		
	[mm]			[g]	
V70	25	39	20	100	1141.600
	26	39	20	110	1141.700
	28	39	20	110	1141.800
	30	49	22	200	1141.900
	32	49	22	200	1142.000
	34	49	22	200	1142.100
	35	49	22	200	1142.200
	36	49	22	210	1142.300
	38	49	22	230	1142.400
	40	59	24	330	1142.500
	42	59	24	340	1142.600
	44	59	24	350	1142.700
	45	59	24	360	1142.800
	46	59	24	370	1142.900
	48	59	24	380	1143.000
	50	69	26	520	1143.100
	52	69	26	530	1143.200
	54	69	26	550	1143.300
	55	69	26	560	1143.400
	56	69	26	580	1143.500
	58	69	26	600	1143.600
	60	69	26	610	1143.700

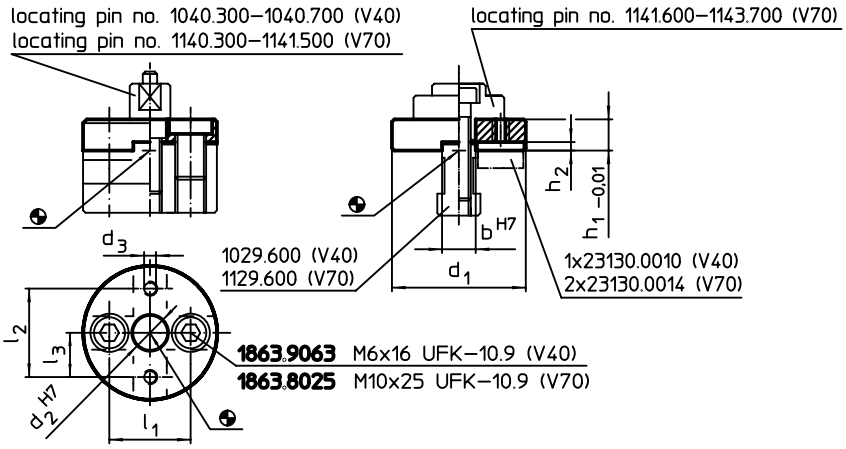
Intermediate Plates
EH 1047.700 - EH 1147.700



PRODUCT DESCRIPTION

Material
- Steel, case-hardened, ground

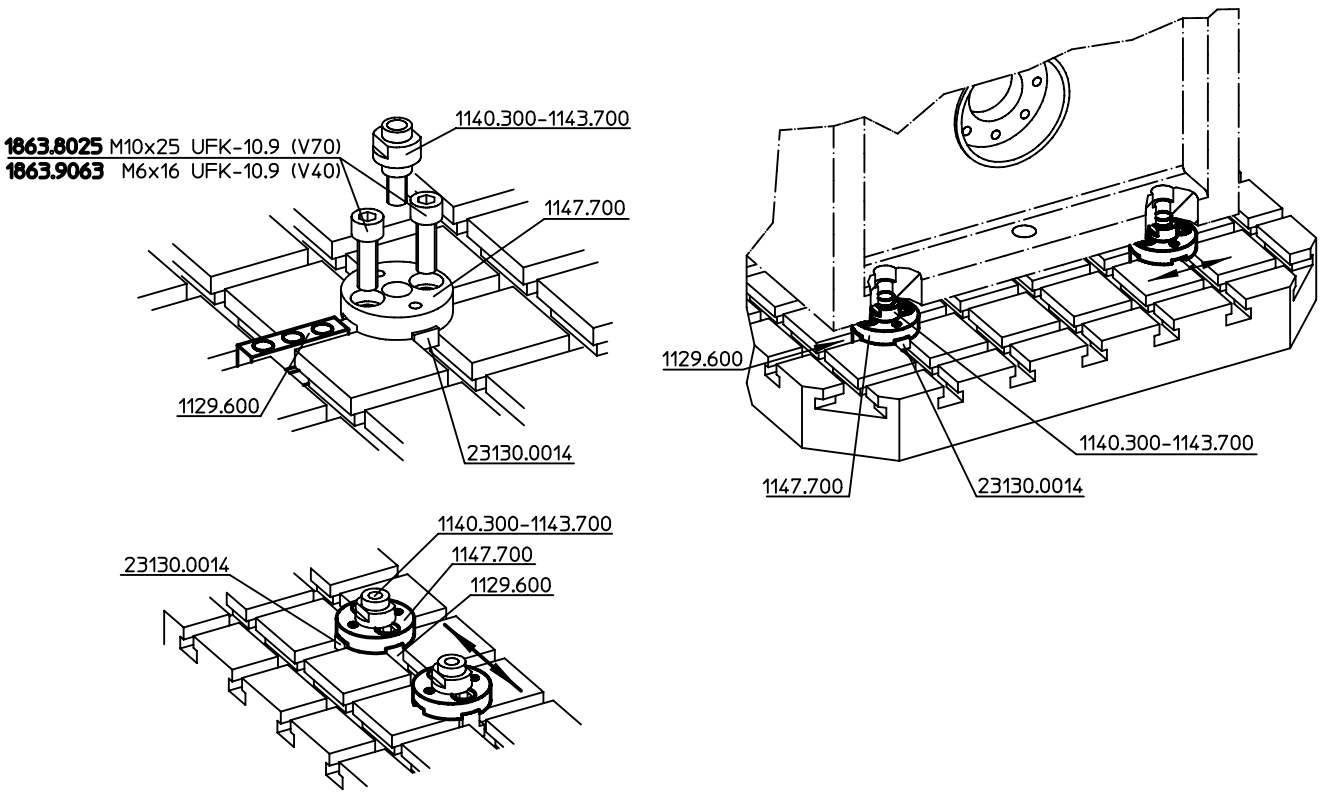
DRAWING



ORDER INFORMATION

System	Dimensions										Art. No.
	d_1	d_2	d_3	h_1	h_2	b	l_1	l_2	l_3		
	[mm]									[g]	
V40	40	10	M4	15	2,6	10	26	–	16	135	1047.700
V70	56	15	M6	13	3,5	14	34	37	–	160	1147.700

APPLICATION EXAMPLE



Support Clamping Bars

EH 1047.800 - EH 1147.800

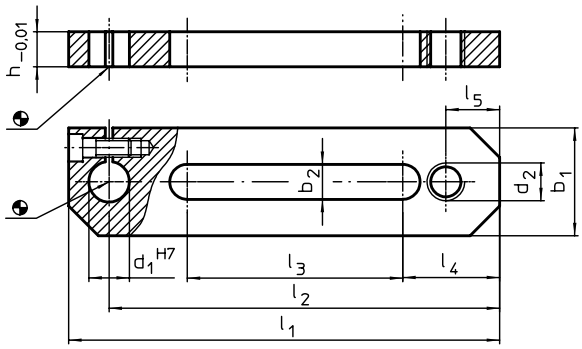


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions [mm]											Art. No.
	b_1	b_2	d_1	d_2	h	l_1	l_2	l_3	l_4	l_5	[g]	
V40	25	8,5	10	M 8	15	100	88	45	23	12	215	1047.800
V70	40	13,0	15	M12	13	160	145	80	36	20	470	1147.800

Supporting Plates

EH 1047.900 - EH 1147.900

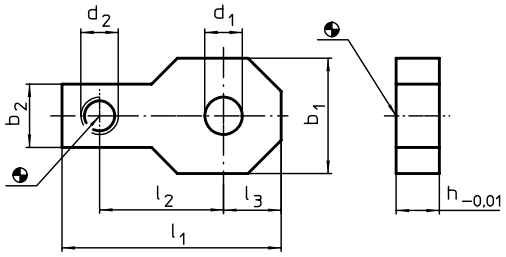


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions [mm]									Art. No.
	h	d_1	d_2	b_1	b_2	l_1	l_2	l_3	[g]	
V40	10	8,5	M 8	25	18	51	28	12,5	74	1047.900
V70	15	13,0	M12	40	22	76	43	20,0	230	1147.900

V-Blocks

EH 1048.200 - EH 1148.300

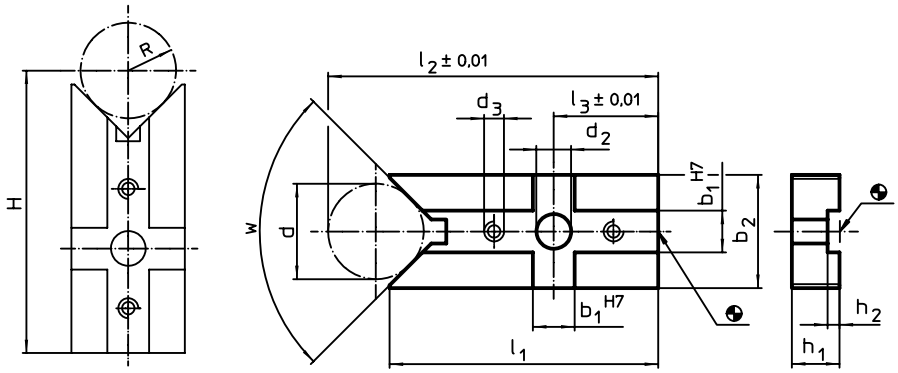


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING

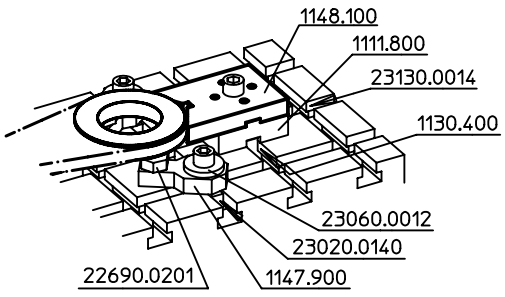


H = (R*1,414) + 49,497 [1048.200]
H = (R*1,414) + 48,996 [1048.300]
H = (R*1,155) + 77,025 [1148.000]
H = (R*1,155) + 81,204 [1148.100]
H = (R*1,414) + 72,872 [1148.200]
H = (R*1,414) + 73,159 [1148.300]

ORDER INFORMATION

System	Dimensions												w		Art. No.
	b_1	d	b_2	d_2	d_3	l_1	l_2	l_3	h_1	h_2	d min.	d max.			
	[mm]													[g]	
V40	10	20	25	6,6	M4	60	73,64	20	10	2,6	8	25	90°	94	1048.200
		30	38	6,6	M4	66	85,21	20	10	2,6	8	44	90°	158	1048.300
V70	14	32	38	13,0	M6	87	111,50	35	16	4,0	18	66	120°	330	1148.000
		62	68	13,0	M6	100	148,00	35	16	4,0	18	126	120°	690	1148.100
		32	38	13,0	M6	90	111,50	35	16	4,0	14	44	90°	325	1148.200
		62	68	13,0	M6	104	148,00	35	16	4,0	14	83	90°	695	1148.300

APPLICATION EXAMPLE



6

Locating Segments

EH 1048.400 - EH 1148.400

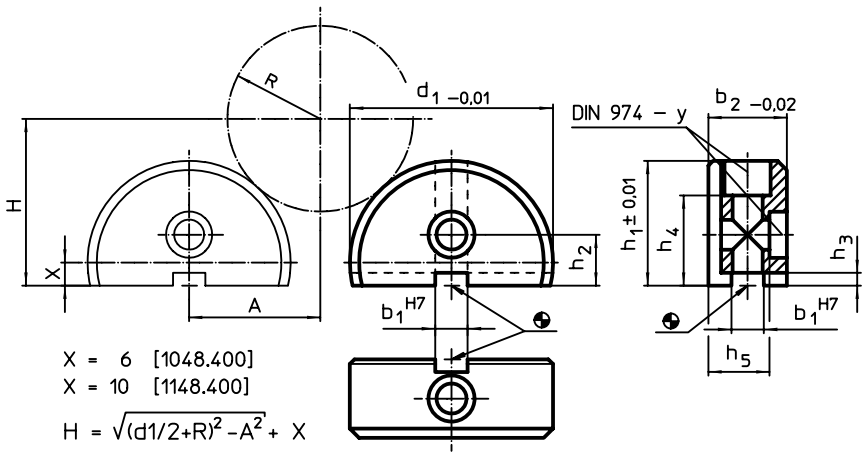


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

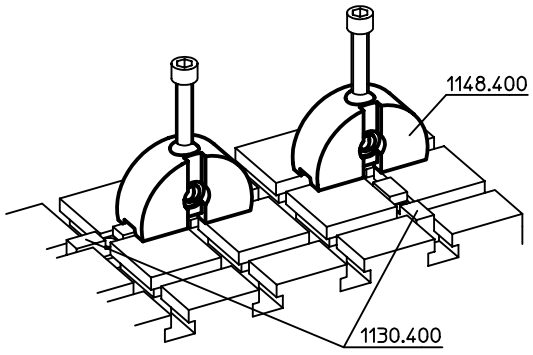
DRAWING



ORDER INFORMATION

System	Dimensions								For screws	y		Art. No.
	b_1	b_2	d_1	h_1	h_2	h_3	h_4	h_5				
	[mm]								[mm]	[mm]	[g]	
V40	10	20	50	31	13	2,6	21	17,0	M 6	6	160	1048.400
V70	14	34	88	54	22	6,0	39	26,5	M12	12	830	1148.400

APPLICATION EXAMPLE



V-Blocks

EH 1048.500 - EH 1148.500

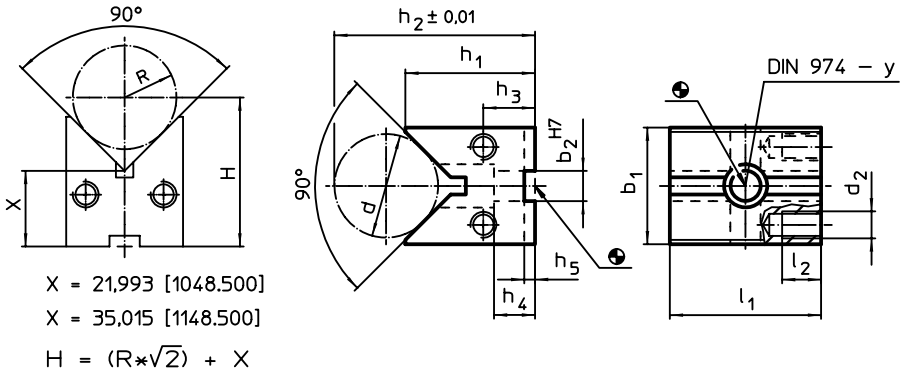


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



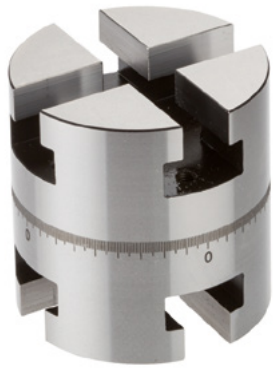
X = 21,993 [1048.500]
X = 35,015 [1148.500]
$H = (R * \sqrt{2}) + X$

ORDER INFORMATION

System	Dimensions													For screws	y		Art. No.
	l_1	b_1	b_2	h_1	h_2	h_3	h_4	h_5	l_2	d	d_2	d min.	d max.				
	[mm]													[mm]	[mm]	[g]	
V40	40	32	10	36	48,55	14,5	13	2,6	10	22	M 8	8	35	M 6	6	343	1048.500
V70	70	54	14	60	83,30	24,0	19	5,0	18	40	M12	12	67	M12	12	1640	1148.500

Adjustable Rotating Elements

EH 1048.600 - EH 1148.600

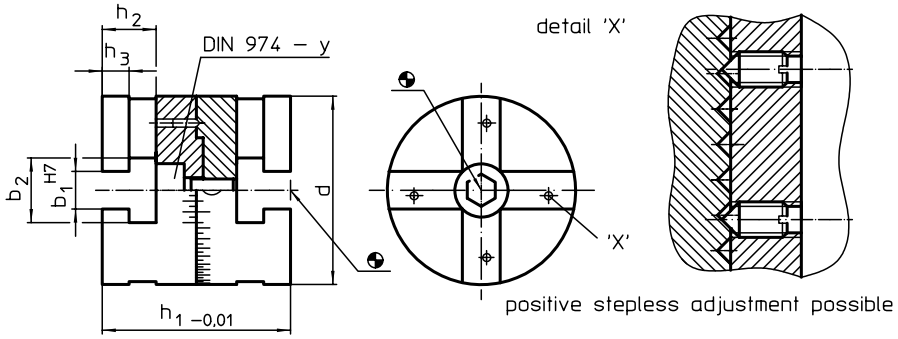


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions								Art. No.
	d	b_1	b_2	h_1	h_2	h_3	y		
	[mm]							[g]	
V40	40	10	17	40	12,5	6,5	6	270	1048.600
V70	70	14	24	70	20,0	10,0	12	1350	1148.600

Positioning Clamping Bars

EH 1149.000

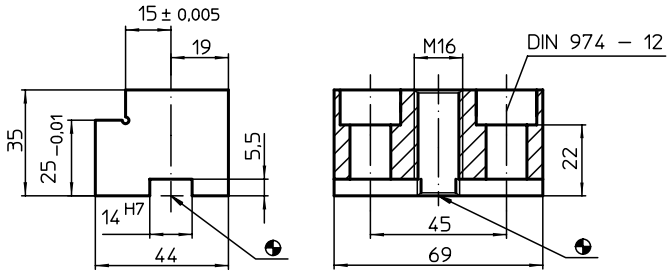


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

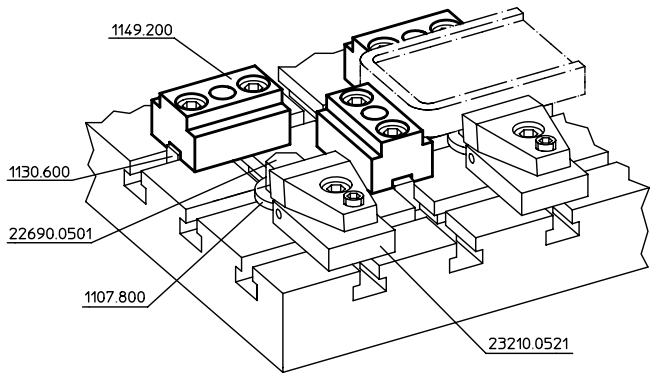
DRAWING



ORDER INFORMATION

System		Art. No.
	[g]	
V70	660	1149.000

APPLICATION EXAMPLE



Positioning Clamping Bars • two-sided

EH 1049.200 - EH 1149.200

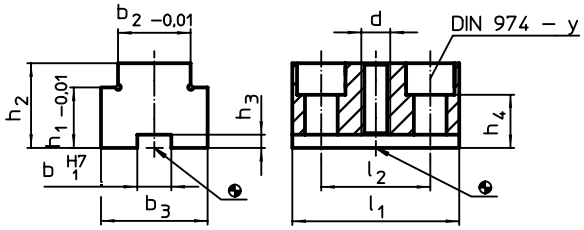


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING

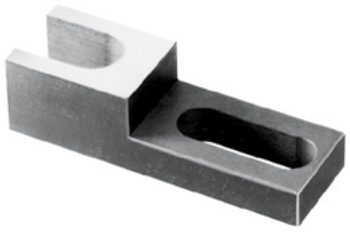


ORDER INFORMATION

System	Dimensions										y	For screws		Art. No.
	b_1	b_2	b_3	h_1	h_2	h_3	h_4	l_1	l_2	d	[mm]	[mm]	[g]	
V40	10	20	28	20	23	2,6	13	40	26	M 8	6	M 6	155	1049.200
V70	14	30	44	25	35	5,5	22	69	45	M12	12	M12	580	1149.200

Fixed Drilling Supports

EH 1162.000 - EH 1162.300

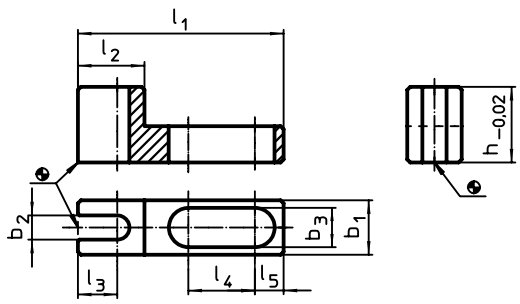


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions										Art. No.
	l_1	l_2	l_3	l_4	l_5	b_1	b_2	b_3	h	[g]	
					[mm]						
V70/L12	68	22	13	22	9,5	18	8	13	25	120	1162.000
	88	38	20	26	9,5	28	16	13	25	210	1162.100
	98	40	20	31	9,5	38	24	13	25	390	1162.200
	108	45	20	37	11,5	48	35	17	25	480	1162.300

Fixed Drilling Supports • adjustable

EH 1163.000 - EH 1163.300

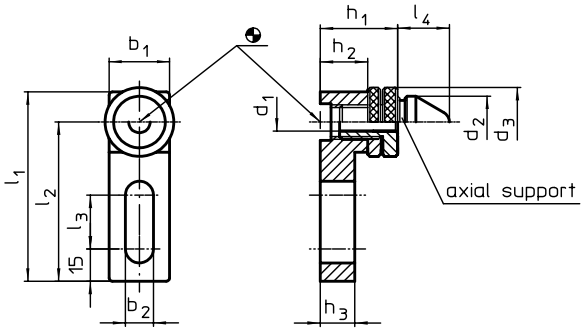


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions [mm]												Art. No.
	b_1	b_2	d_1	d_2	d_3	l_1	l_2	l_3	l_4	h_1	h_2	h_3	[g]	
V70/L12	28	13	9,9	24	32	88	74	25	24	36 – 45	22	16	390	1163.000
	38	13	16,9	30	42	108	89	40	27	44 – 54	26	20	785	1163.100
	48	17	24,8	45	55	108	84	25	27	54 – 68	32	26	1425	1163.200
	58	17	34,9	52	68	128	99	40	27	68 – 82	44	38	2550	1163.300

Adapter Slot Clamping Elements • system V40/V70

EH 1068.100 - EH 1068.300

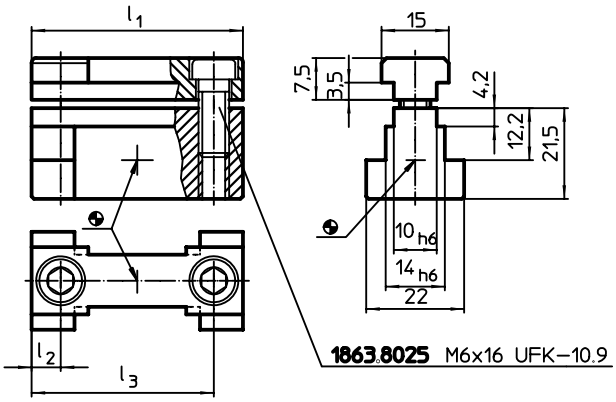


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions				Art. No.
	l_1	l_2	l_3		
	[mm]			[g]	
V40/V70	39,6	6,8	32,8	110	1068.100
	13,0	6,5	–	42	1068.200
	24,0	12,0	–	80	1068.300

6

Adapter Slot Centering Blocks • system V40/V70

EH 1068.600

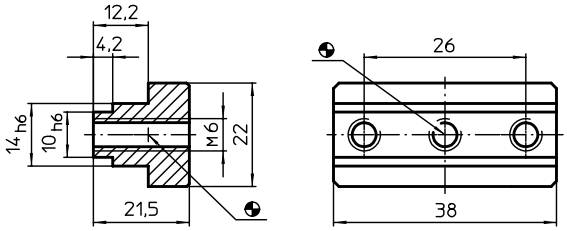


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V40/V70	81	1068.600

Adapter Slot Blocks • system V40/V70

EH 1068.800

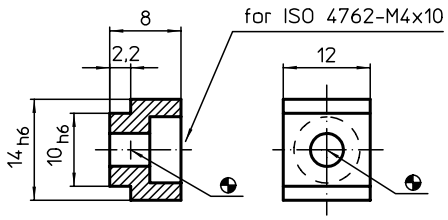


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V40/V70	8	1068.800

STANDARD ASSORTMENTS V40

ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 5 FIXTURES, ART. NO. 1090.140

Qty.	Description	Art. No.	Qty	Description	Art. No.
System parts			**Standard parts**		
2	Base plate	1000.400	3	Grub screw	22540.0381
5	Spacer	1007.400	3	Grub screw	22540.0382
5	Spacer	1007.600	3	Screwed rest button, plain	22690.0021
5	Spacer	1007.700	3	Screwed rest button, plain	22690.0321
5	Spacer	1007.800	3	Self-aligning pad, plain	22730.0013
5	Spacer	1007.900	3	Self-aligning pad, ribbed	22730.0313
6	Mounting block	1010.100	5	Stud for T-nuts	23040.0582
2	Mounting block	1010.200	3	Stud for T-nuts	23040.0583
1	Mounting block	1010.300	3	Stud for T-nuts	23040.0584
3	Mounting block	1011.100	2	Conical seat	23050.0208
1	Mounting block	1011.200	5	Plain washer	23060.0008
1	Mounting block	1011.300	5	Fixture nut	23070.0008
1	Clamping bar	1013.600	2	Collar nut	23080.0008
3	Stop	1014.500	5	Extension nut	23090.0008
4	T-slot centering block	1029.600	2	Clamp	23150.0009
10	T-nuts	1030.100	3	Clamp with nose	23180.0209
15	T-nuts	1030.300	2	Down-hold clamp	23210.0502
8	T-clamping block	1031.100	1	Bedding support	23220.0085
3	T-clamping block	1031.200	4	Height adjusting cylinder	23310.0125
4	T-clamping block	1031.300	2	Height adjusting cylinder	23310.0126
1	Wrench	1032.100	2	Height adjusting cylinder	23310.0127
2	Intermediate plate	1047.700			
1	Support clamping bar	1047.800			
3	Supporting plate	1047.900			

ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 3 FIXTURES, ART. NO. 1090.120

Qty	Description	Art. No.	Qty	Description	Art. No.
System parts			**Standard parts**		
2	Base plate	1000.400	5	Grub screw	22540.0381
1	Base plate	1000.500	5	Grub screw	22540.0382
5	Spacer	1007.400	4	Screwed rest button, plain	22690.0021
5	Spacer	1007.600	3	Screwed rest button, spherical	22690.0121
5	Spacer	1007.700	3	Screwed rest button, ribbed	22690.0221
20	Spacer	1007.800	4	Screwed rest button, plain	22690.0321
5	Spacer	1007.900	3	Screwed rest button, spherical	22690.0421
8	Mounting block	1010.100	3	Screwed rest button, spherical	22690.0423
4	Mounting block	1010.200	3	Screwed rest button, ribbed	22690.0521
2	Mounting block	1010.300	4	Self-aligning pad, plain	22730.0013
6	Mounting block	1011.100	3	Self-aligning pad, ribbed	22730.0313
4	Mounting block	1011.200	5	Stud for T-nut	23040.0582
2	Mounting block	1011.300	5	Stud for T-nut	23040.0583
1	Slotted clamping angle	1012.100	3	Stud for T-nut	23040.0584
1	Clamping bar	1013.600	3	Conical seat	23050.0208
1	Clamping bar	1013.700	10	Plain washer	23060.0008
6	Stop	1014.500	5	Fixture nut	23070.0008
1	Thrust angle	1020.300	3	Collar nut	23080.0008
1	Thrust angle	1021.600	5	Extension nut	23090.0008
1	Thrust angle	1021.700	2	Clamp	23150.0009
5	T-slot centering block	1029.600	3	Clamp with nose	23180.0209
20	T-nut	1030.100	2	Down-hold clamp	23210.0501
37	T-nut	1030.300	2	Down-hold clamp	23210.0502
15	T-clamping block	1031.100	2	Bedding support	23220.0085
5	T-clamping block	1031.200	2	Down-thrust clamp	23310.0025
5	T-clamping block	1031.300	6	Height adjusting cylinder	23310.0125
1	Wrench	1032.100	4	Height adjusting cylinder	23310.0126
2	Intermediate plate	1047.700	2	Height adjusting cylinder	23310.0127
2	Support clamping bar	1047.800			
6	Supporting plate	1047.900			

The specified ranges are intended as recommendations.
The required parts vary with the workpiece.
The ranges can be modified as necessary

STANDARD ASSORTMENTS V40

ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 5 FIXTURES, ART. NO. 1090.140

Qty.	Description	Art. No.	Qty.	Description	Art. No.
System parts			**Standard parts**		
3	Base plate	1000.400	10	Grub screw	22540.0381
2	Base plate	1000.500	10	Grub screw	22540.0382
5	Spacer	1007.400	4	Screwed rest button, plain	22690.0021
5	Spacer	1007.500	3	Screwed rest button, spherical	22690.0121
5	Spacer	1007.600	3	Screwed rest button, ribbed	22690.0221
15	Spacer	1007.700	4	Screwed rest button, plain	22690.0321
20	Spacer	1007.800	4	Screwed rest button, plain	22690.0323
5	Spacer	1007.900	3	Screwed rest button, spherical	22690.0421
12	Mounting block	1010.100	3	Screwed rest button, spherical	22690.0423
5	Mounting block	1010.200	3	Screwed rest button, ribbed	22690.0521
3	Mounting block	1010.300	3	Screwed rest button, ribbed	22690.0523
6	Mounting block	1011.100	5	Ball-ended thrust screw	22700.0584
5	Mounting block	1011.200	6	Self-aligning pad, plain	22730.0013
3	Mounting block	1011.300	6	Self-aligning pad, ribbed	22730.0313
2	Slotted clamping angle	1012.100	5	Stud for T-nut	23040.0582
2	Slotted clamping angle	1012.300	10	Stud for T-nut	23040.0583
1	Clamping bar	1013.700	10	Stud for T-nut	23040.0584
1	Clamping bar	1013.800	10	Conical seat	23050.0208
8	Stop	1014.500	50	Plain washer	23060.0008
1	Thrust angle	1020.300	15	Fixture nut	23070.0008
1	Thrust angle	1021.500	10	Collar nut	23080.0008
1	Thrust angle	1021.600	10	Extension nut	23090.0008
1	Thrust angle	1021.700	4	Clamp	23150.0009
8	T-slot centering block	1029.600	6	Clamp with nose	23180.0209
30	T-nut	1030.100	6	Down-hold clamp	23210.0501
55	T-nut	1030.300	2	Down-hold clamp	23210.0502
25	T-clamping block	1031.100	5	Bedding support	23220.0085
20	T-clamping block	1031.200	5	Down-thrust clamp	23310.0025
10	T-clamping block	1031.300	20	Height adjusting cylinder	23310.0125
1	Wrench	1032.100	10	Height adjusting cylinder	23310.0126
1	Locating pin	1040.300	6	Height adjusting cylinder	23310.0127
1	Locating pin	1040.500			
2	Intermediate plate	1047.700			
2	Support clamping bar	1047.800			
9	Supporting plate	1047.900			
2	V-block	1048.200			
2	V-block	1048.300			
2	Loacating segment	1048.400			
1	V-block	1048.500			
1	Adjustable rotating element	1048.600			
3	Positioning clamping bar, twinfaced	1049.200			

The specified ranges are intended as recommendations.
The required parts vary with the workpiece.
The ranges can be modified as necessary

STANDARD ASSORTMENTS V70

ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 2 FIXTURES, ART. NO. 1190.110 (V70) / 1290.110 (V70E-CO)

Qty.	Description	Art. No.	Qty.	Description	Art. No.
System parts			**Standard parts**		
2	Base plate	1100.700	2	Grub screw	22540.0401
5	Spacer	1107.400	3	Grub screw	22540.0422
5	Spacer	1107.600	1	Grub screw	22540.0423
5	Spacer	1107.700	3	Screwed rest button, plain	22690.0001
5	Spacer	1107.800	3	Screwed rest button, ribbed	22690.0201
5	Spacer	1107.900	3	Screwed rest button, plain	22690.0303
6	Mounting block	1110.100	3	Screwed rest button, ribbed	22690.0503
2	Mounting block	1110.200	3	Self-aligning pad, plain	22730.0020
1	Mounting block	1110.300	3	Self-aligning pad, ribbed	22730.0320
3	Mounting block	1111.100	10	T-nut	23010.0142
1	Mounting block	1111.200	20	T-nut, extended	23020.0140
1	Mounting block	1111.300	2	Stud for T-nut	23040.0602
1	Mounting block	1113.700	5	Stud for T-nut	23040.0623
4	Stop	1114.500	3	Stud for T-nut	23040.0625
2	T-slot centering block	1129.600	4	Conical seat	23050.0212
8	T-clamping block	1131.100	15	Plain washer	23060.0012
4	T-clamping block	1131.200	4	Fixture nut	23070.0012
2	T-clamping block	1131.500	6	Collar nut	23080.0012
2	T-clamping block	1131.600	5	Extension nut	23090.0012
2	T-clamping block	1131.700	2	Clamp	23150.0015
1	Wrench	1132.100	2	Down-hold clamp	23210.0522
1	Butt strap	1139.400	2	Bedding support	23220.0150
2	Clamping head	1147.700	3	Cylindrical stop	23280.0114
1	Support clamping bar	1147.800	6	Height adjusting cylinder	23310.0140
4	Supporting plate	1147.900	4	Height adjusting cylinder	23310.0141
4	Clamp	23180.0213	1	Height adjusting cylinder	23310.0142
4	Down-thrust clamp	23310.0054			
4	Positioning ring	23310.0350			

As required

	Locating pin	1140.300-1143.700

The specified ranges are intended as recommendations.
The required parts vary with the workpiece.
The ranges can be modified as necessary

STANDARD ASSORTMENTS V70

ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 3 FIXTURES, ART. NO. 1190.120 (V70) / 1290.120 (V70ECO)

Qty.	Description	Art. No.	Qty.	Description	Art. No.
System parts			**Standard parts**		
1	Base plate	1100.800	3	Grub screw	22540.0401
2	Base plate	1100.700	5	Grub screw	22540.0421
5	Spacer	1107.400	5	Grub screw	22540.0423
5	Spacer	1107.600	6	Screwed rest button, plain	22690.0001
10	Spacer	1107.700	3	Screwed rest button, plain	22690.0301
20	Spacer	1107.800	4	Screwed rest button, ribbed	22690.0201
8	Mounting block	1110.100	4	Screwed rest button, plain	22690.0303
4	Mounting block	1110.200	3	Screwed rest button, spherical	22690.0403
2	Mounting block	1110.300	3	Screwed rest button, ribbed	22690.0501
6	Mounting block	1111.100	3	Screwed rest button, ribbed	22690.0503
4	Mounting block	1111.200	3	Self-aligning pad, plain	22730.0020
2	Mounting block	1111.300	3	Self-aligning pad, ribbed	22730.0320
1	Clamping block	1113.600	3	Self-aligning pad	22740.0317
1	Clamping block	1113.700	20	T-nut	23010.0142
6	Stop	1114.500	50	T-nut, extended	23020.0140
2	Thrust angle	1120.300	5	T-nut, rhombus	23020.0640
1	Thrust angle	1120.400	3	Stud for T-nut	23040.0602
2	T-slot centering block	1129.600	6	Stud for T-nut	23040.0623
18	T-clamping block	1131.100	5	Stud for T-nut	23040.0624
7	T-clamping block	1131.200	6	Stud for T-nut	23040.0625
4	T-clamping block	1131.500	4	Stud for T-nut	23040.0626
4	T-clamping block	1131.600	6	Conical seat	23050.0212
2	T-clamping block	1131.700	20	Plain washer	23060.0012
1	Wrench	1132.100	6	Fixture nut	23070.0012
1	Wrench	1139.400	10	Collar nut	23080.0012
1	Wrench	1139.500	6	Extension nut	23090.0012
2	Intermediate plate	1147.700	2	Clamp	23150.0015
2	Support clamping bar	1147.800	2	Clamp	23150.0016
6	Supporting plate	1147.900	4	Clamp with nose	23180.0213
			2	Down-hold clamp	23210.0521
As required			2	Down-hold clamp	23210.0522
			3	Bedding support	23220.0150
	Locating pin	1140.300-1143.700	3	Cylindrical stop	23280.0114
			4	Down-thrust clamp	23310.0054
			8	Height adjusting cylinder	23310.0140
			6	Height adjusting cylinder	23310.0141
			2	Height adjusting cylinder	23310.0142
			2	Height adjusting cylinder	23310.0160
			4	Positioning ring	23310.0350

The specified ranges are intended as recommendations.
The required parts vary with the workpiece.
The ranges can be modified as necessary

STANDARD ASSORTMENTS V70

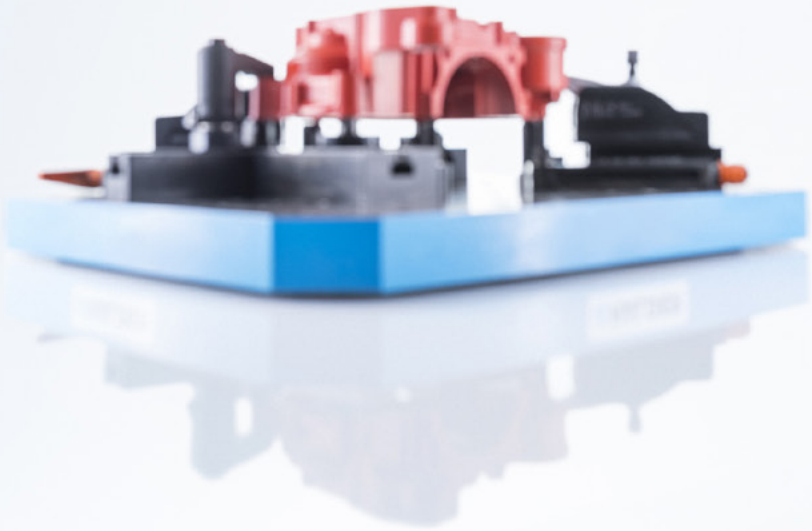
ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 5 FIXTURES, ART. NO. 1190.140 (V70) / 1290.140 (V70ECO)

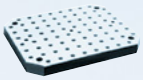
Qty.	Description	Art. No.
System parts		
2	Base plate	1100.700
2	Base plate	1100.800
1	Base plate	1100.500
5	Spacer	1107.400
5	Spacer	1107.500
5	Spacer	1107.600
5	Spacer	1107.700
20	Spacer	1107.800
5	Spacer	1107.900
10	Spacer	1108.000
5	Spacer	1108.200
12	Mounting block	1110.100
5	Mounting block	1110.200
3	Mounting block	1110.300
6	Mounting block	1111.100
5	Mounting block	1111.200
2	Mounting block	1111.300
1	Slotted clamping angle	1112.100
2	Clamping bar	1113.700
1	Clamping bar	1113.800
4	Support clamping bar	1114.000
12	Stop	1114.500
2	Thrust angle	1120.300
1	Thrust angle	1120.400
4	T-slot centering block	1129.600
3	T-block	1130.400
30	T-clamping block	1131.100
20	T-clamping block	1131.200
5	T-clamping block	1131.500
5	T-clamping block	1131.600
3	T-clamping block	1131.700
1	Wrench	1132.100
1	Wrench	1139.400
1	Wrench	1139.500
4	Intermediate plate	1147.700
3	Support clamping bar	1147.800
10	Supporting plate	1147.900
2	Locating segment	1148.400
1	V-block	1148.500
3	Positioning clamping bar	1149.000
As required		
	Locating pin	1140.300-1143.700

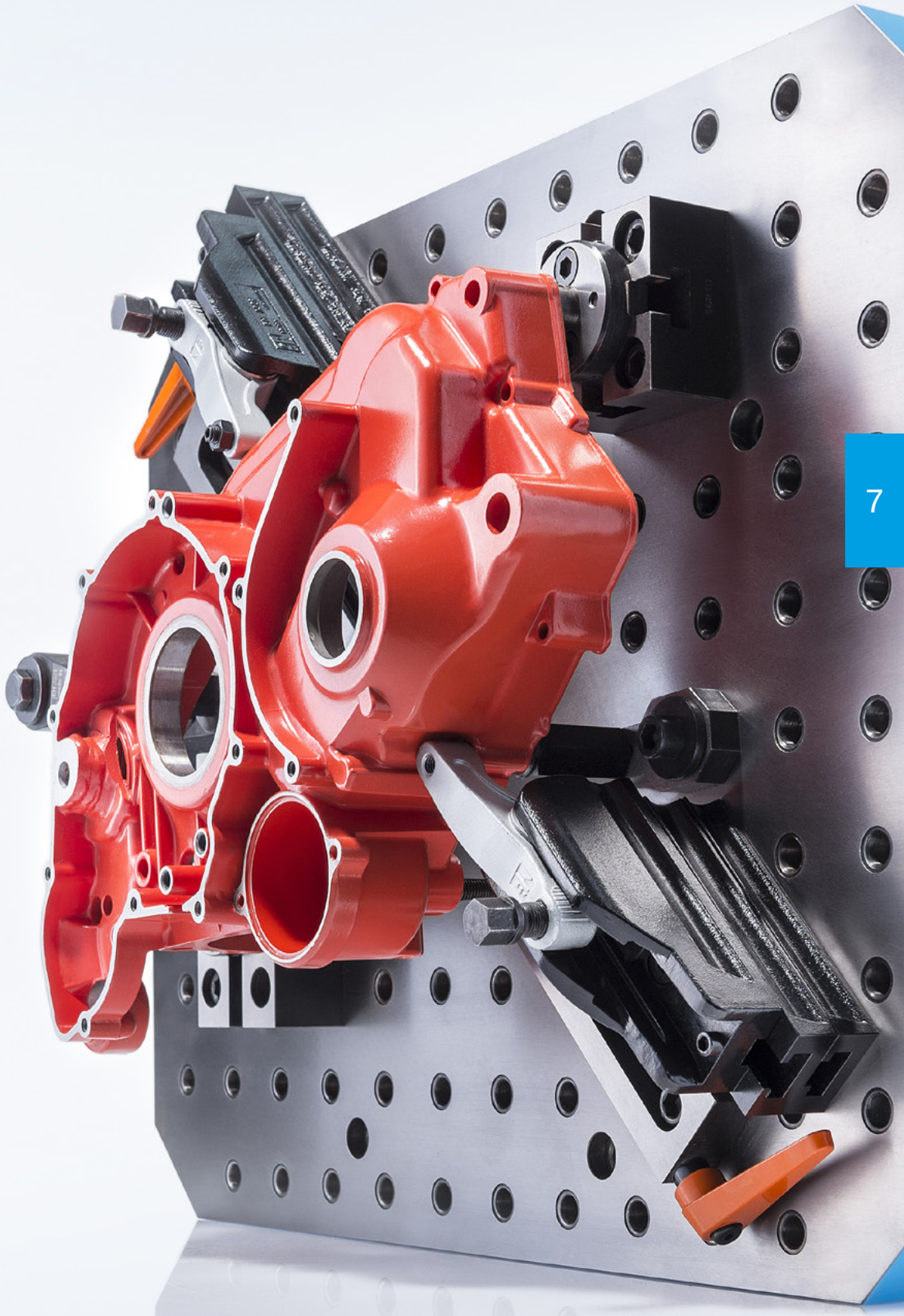
Qty.	Description	Art. No.
Standard parts		
5	Grub screw	22540.0401
10	Grub screw	22540.0421
10	Grub screw	22540.0422
10	Grub screw	22540.0423
6	Screwed rest button, plain	22690.0001
3	Screwed rest button, plain	22690.0002
4	Screwed rest button, ribbed	22690.0201
3	Screwed rest button, plain	22690.0301
6	Screwed rest button, plain	22690.0303
3	Screwed rest button, plain	22690.0305
3	Screwed rest button, spherical	22690.0401
3	Screwed rest button, spherical	22690.0403
3	Screwed rest button, ribbed	22690.0501
6	Screwed rest button, ribbed	22690.0503
3	Screwed rest button, ribbed	22690.0505
6	Self-aligning pad, plain	22730.0020
3	Self-aligning pad, plain	22740.0017
6	Self-aligning pad, ribbed	22730.0320
3	Self-aligning pad, ribbed	22740.0317
30	T-nut	23010.0142
80	T-nut, extended	23020.0140
10	T-nut, rhombus	23020.0640
5	Stud for T-nut	23040.0602
5	Stud for T-nut	23040.0622
10	Stud for T-nut	23040.0623
10	Stud for T-nut	23040.0624
10	Stud for T-nut	23040.0625
10	Stud for T-nut	23040.0626
10	Stud for T-nut	23040.0627
10	Conical seat	23050.0212
40	Plain washer	23060.0012
10	Fixture nut	23070.0012
15	Collar nut	23080.0012
10	Extension nut	23090.0012
3	Clamp	23150.0015
3	Clamp	23150.0016
6	Clamp with nose	23180.0213
4	Down-hold clamp	23210.0521
2	Down-hold clamp	23210.0522
5	Bedding support	23220.0150
3	Cylindrical stop	23280.0114
3	Cylindrical stop	23280.0214
2	Down-thrust clamp	23310.0051
4	Down-thrust clamp	23310.0054
2	Down-thrust clamp	23310.0057
15	Height adjusting cylinder	23310.0140
8	Height adjusting cylinder	23310.0141
4	Height adjusting cylinder	23310.0142
5	Height adjusting cylinder	23310.0160
4	Height adjusting cylinder	23310.0161
2	Height adjusting cylinder	23310.0162
8	Positioning ring	23310.0350

The specified ranges are intended as recommendations.
The required parts vary with the workpiece.
The ranges can be modified as necessary

7 HOLE AND DOWEL SYSTEMS



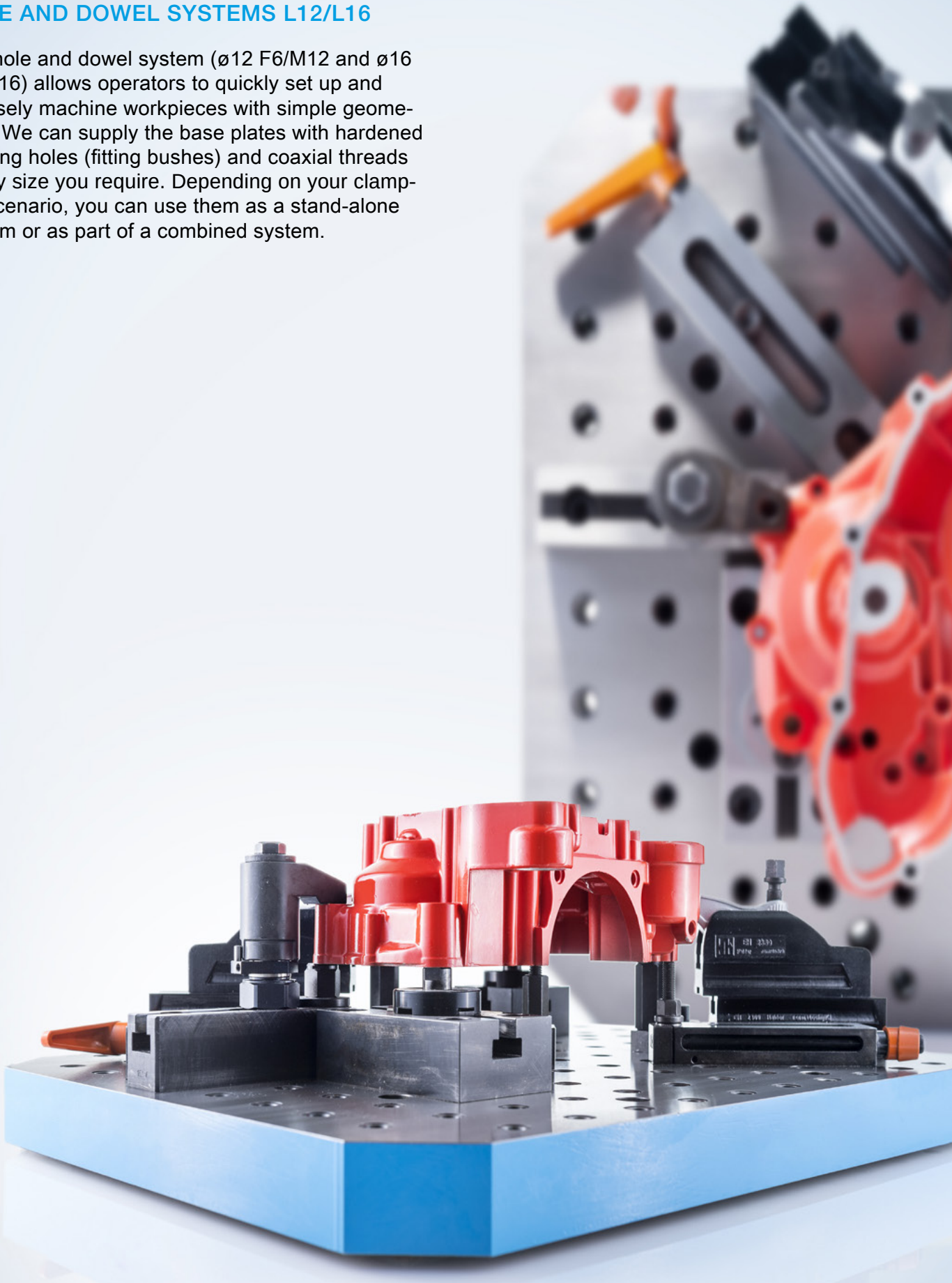
	Product group	Page
	Base Elements	769
	Mounting Elements	773
	Standard Ranges	793



HOLE AND DOWEL SYSTEMS

HOLE AND DOWEL SYSTEMS L12/L16

The hole and dowel system (ø12 F6/M12 and ø16 F6/M16) allows operators to quickly set up and precisely machine workpieces with simple geometries. We can supply the base plates with hardened locating holes (fitting bushes) and coaxial threads in any size you require. Depending on your clamping scenario, you can use them as a stand-alone system or as part of a combined system.



Base Plates

EH 1500.200 - EH 1600.900



PRODUCT DESCRIPTION

Material

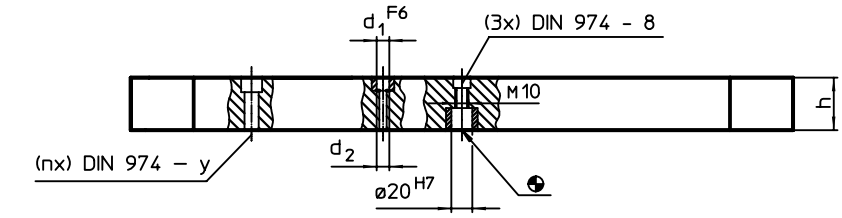
- Grey cast iron, ground

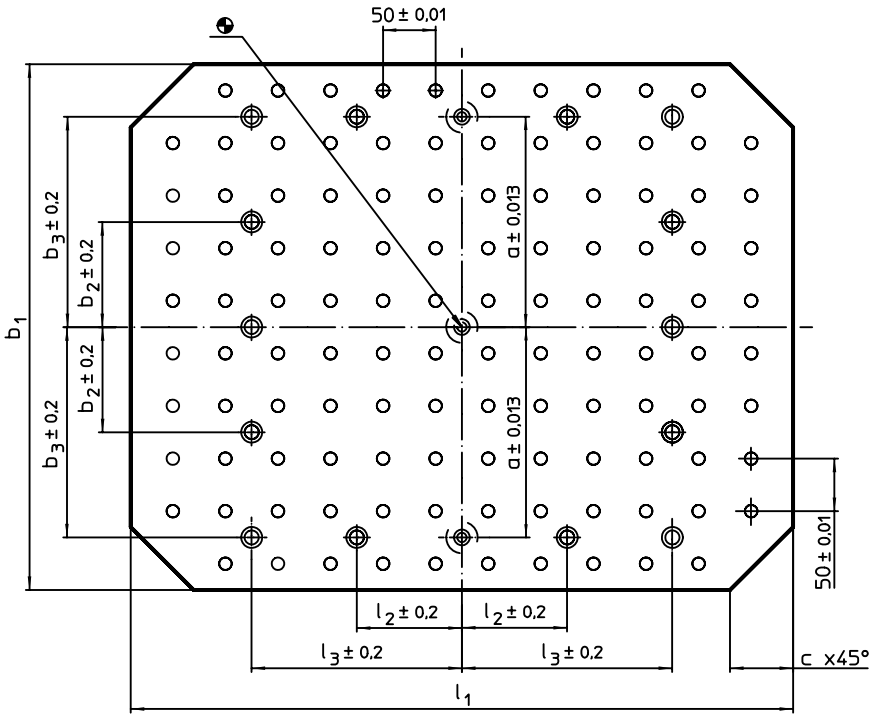
MORE INFORMATION

Notes

Special types on request.

DRAWING





ORDER INFORMATION

System	Dimensions										y	For screws	Number of fastening holes n	Number of hole rows		Art. No.
	b_1 x l_1	h	d_1	d_2	a	b_2	b_3	c	l_2	l_3						
	[mm]										[mm]	[mm]			[kg]	
L12	400 x 400	40 ±0,02	12	M12	150	–	150	50	–	100	12	M12	4	8 x 8	43	1500.200
	400 x 500	40 ±0,02	12	M12	150	–	150	50	–	200	12	M12	4	8 x 10	54	1500.300
	500 x 500	40 ±0,02	12	M12	200	100	200	60	100	200	12	M12	8	10 x 10	68	1500.400
	500 x 630	50 ±0,03	12	M12	200	100	200	60	100	200	12	M12	8	10 x 12	105	1500.500
	630 x 630	50 ±0,03	12	M12	200	–	200	70	–	200	16	M16	6	12 x 12	132	1500.600
L16	630 x 630	50 ±0,03	16	M16	200	–	200	70	–	200	16	M16	6	12 x 12	131	1600.600
	630 x 800	50 ±0,03	16	M16	200	–	200	70	–	300	16	M16	6	12 x 16	170	1600.700
	800 x 800	50 ±0,03	16	M16	300	100	300	100	100	300	16	M16	12	16 x 16	205	1600.800
	800 x 1000	60 ±0,03	16	M16	300	100	300	100	100	400	16	M16	12	16 x 20	325	1600.900

Base Plates

EH 1501.300 - EH 1501.500



PRODUCT DESCRIPTION

Material

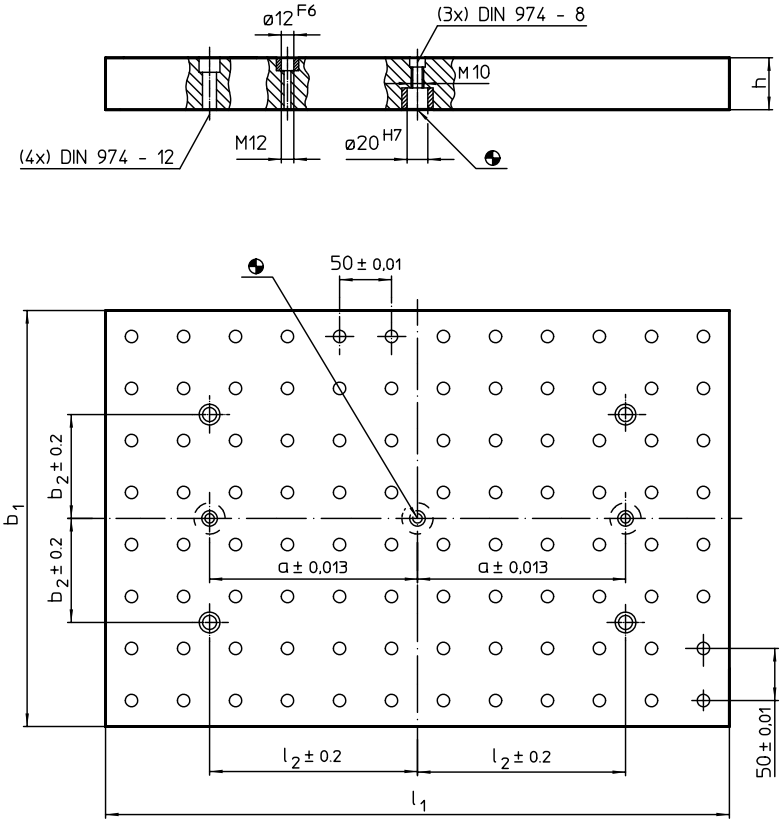
- Grey cast iron, ground

MORE INFORMATION

Notes

Special types on request.

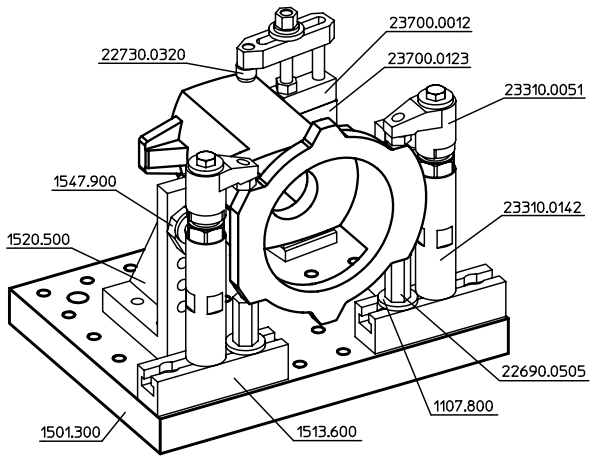
DRAWING



ORDER INFORMATION

System	Dimensions					Number of hole rows		Art. No.
	b_1 x l_1	h ±0,02	a	l_2	b_2			
	[mm]						[kg]	
L12	300 x 400	40	150	150	100	6 x 8	34	1501.300
	400 x 600	40	200	200	100	8 x 12	69	1501.500

APPLICATION EXAMPLE



Clamping Angles

EH 1506.200 - EH 1606.800



PRODUCT DESCRIPTION

Material

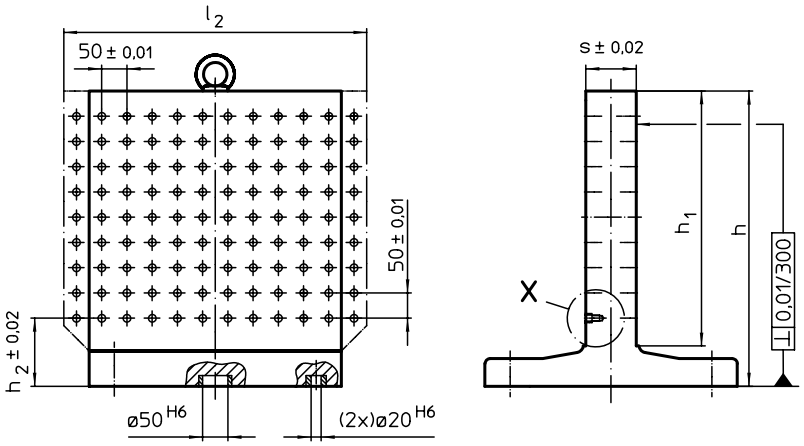
- Grey cast iron GG

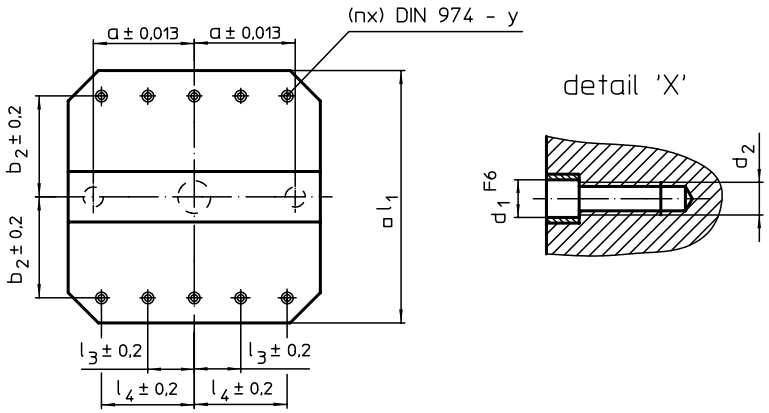
MORE INFORMATION

Notes

Special types on request.

DRAWING





ORDER INFORMATION

System	Dimensions												y	For screws	Number of fastening holes n	Number of hole rows		Art. No.
	l_1	l_2	h_1	h	h_2	d_1	d_2	a	b_2	l_3	l_4	s	[mm]	[mm]			[kg]	
L12	400	–	400	475	100	12	M12	150	150	–	150	80	12	M12	4	8 x 8	147	1506.200
		500	400	475	100	12	M12	150	150	–	150	80	12	M12	4	10 x 8	168	1506.300
	500	–	500	595	120	12	M12	200	200	–	200	100	12	M12	6	10 x 10	295	1506.400
		630	500	595	120	12	M12	200	200	–	200	100	12	M12	6	12 x 10	326	1506.500
L16	630	–	630	725	135	16	M16	200	200	–	200	130	16	M16	6	12 x 12	376	1606.600
	800	–	800	910	135	16	M16	300	300	100	300	150	16	M16	8	16 x 16	745	1606.800

Clamping Cubes

EH 1508.200 - EH 1608.600



PRODUCT DESCRIPTION

Material

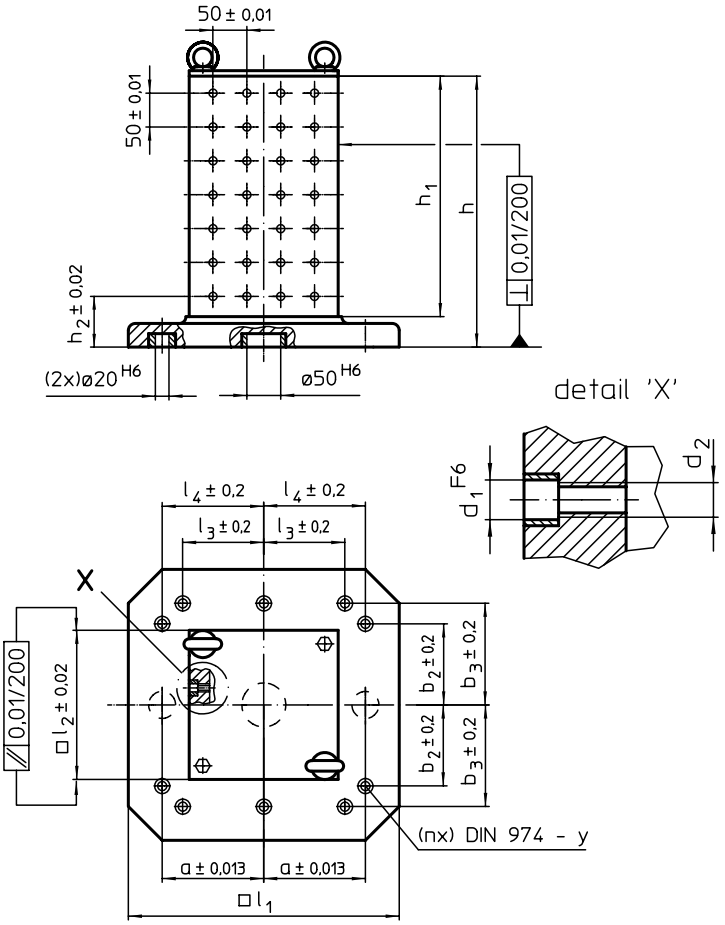
- Grey cast iron GG

MORE INFORMATION

Notes

Special types on request.

DRAWING



ORDER INFORMATION

System	Dimensions												y	For screws	Number of fastening holes n	Number of hole rows		Art. No.
	l_1	l_2	h_1	h	h_2	d_1	d_2	a	b_2	b_3	l_3	l_4	[mm]	[mm]			[kg]	
L12	400	230	358	408	75	12	M12	150	150	–	–	150	12	M12	4	4 x 7	97	1508.200
	500	330	510	565	85	12	M12	200	200	–	–	200	12	M12	6	6 x 10	204	1508.400
	630	450	640	700	100	12	M12	200	200	300	200	300	16	M16	8	8 x 12	426	1508.600
L16	630	450	640	700	100	16	M16	200	200	300	200	300	16	M16	8	8 x 12	420	1608.600

Clamping Angles

EH 1505.200 - EH 1605.400

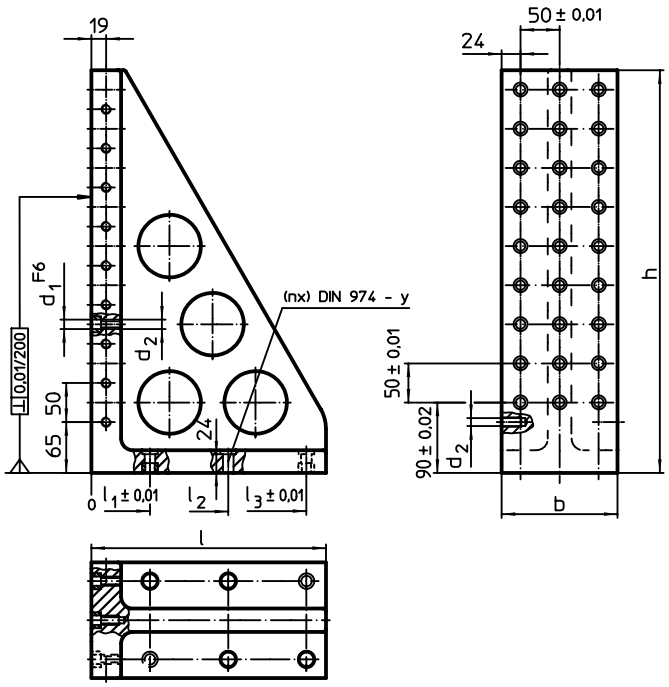


PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized

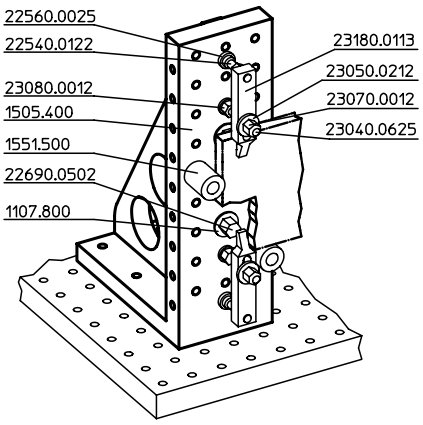
DRAWING



ORDER INFORMATION

System	Dimensions								y	For screws	Number of fastening holes n	Number of hole rows		Art. No.
	l	b	h	l_1	l_2	l_3	d_1	d_2						
	[mm]								[mm]	[mm]			[kg]	
L12	230	98	415	75	175	–	12	M12	12	M12	4	2 x 7	19,0	1505.200
	300	148	515	75	175	275	12	M12	12	M12	6	3 x 9	38,5	1505.400
L16	230	98	415	75	175	–	16	M16	16	M16	4	2 x 7	18,5	1605.200
	300	148	515	75	175	275	16	M16	16	M16	6	3 x 9	38,0	1605.400

APPLICATION EXAMPLE



Clamping Angles

EH 1605.700

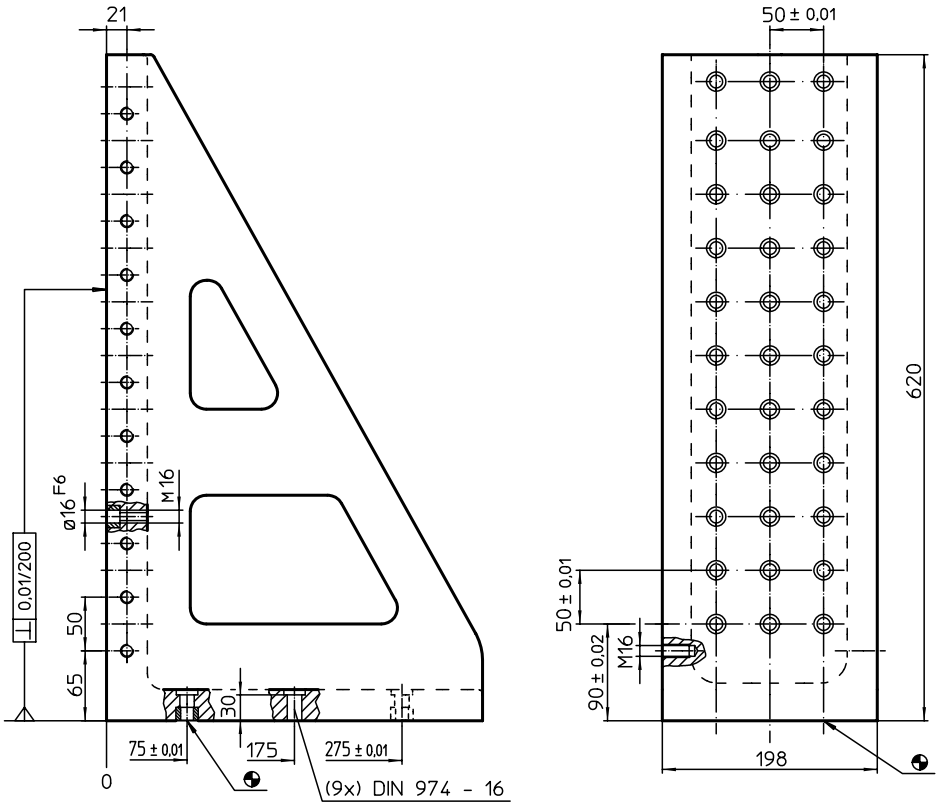


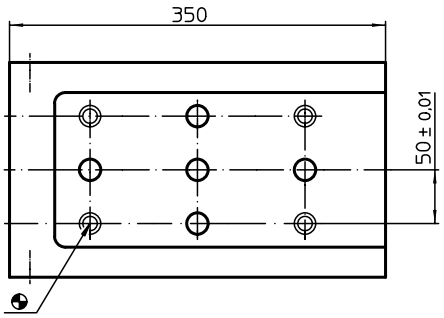
PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized

DRAWING





ORDER INFORMATION

System	[kg]	Art. No.
L16	76	1605.700

Consoles

EH 1510.100 - EH 1610.100

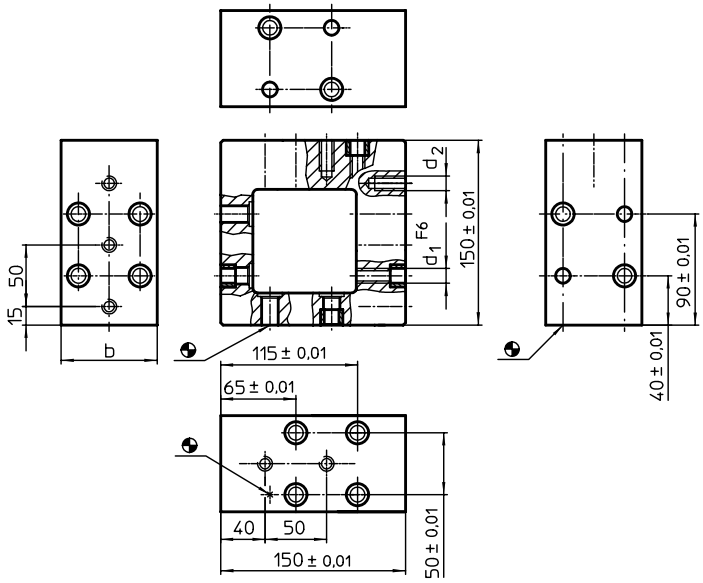


PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized

DRAWING



ORDER INFORMATION

System	Dimensions				Art. No.
	b	d_1	d_2	[g]	
		[mm]			
L12	78	12	M12	8000	1510.100
L16	98	16	M16	9800	1610.100

Consoles

EH 1510.200 - EH 1610.200

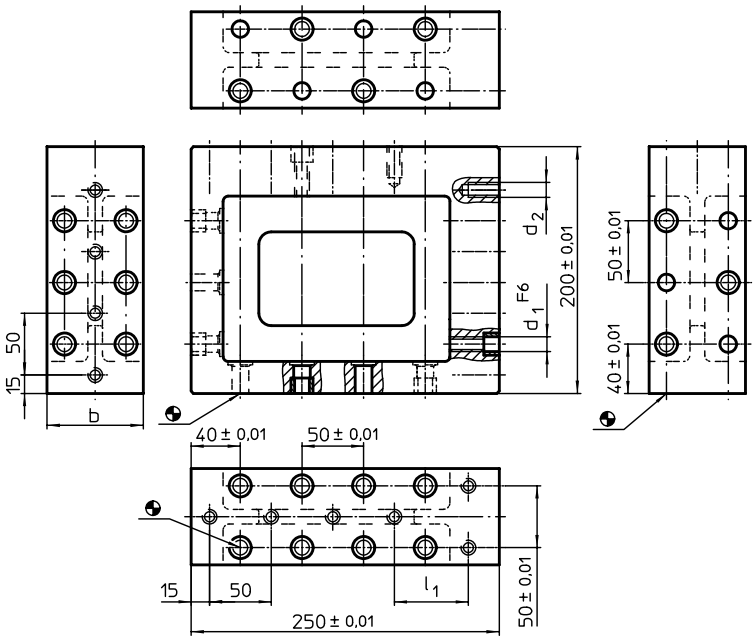


PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized

DRAWING



ORDER INFORMATION

System	Dimensions					Art. No.
	b	d_1	d_2	l_1	[kg]	
	[mm]					
L12	78	12	M12	–	14,5	1510.200
L16	98	16	M16	60	17,5	1610.200

Clamping Angles

EH 1511.500 - EH 1611.500

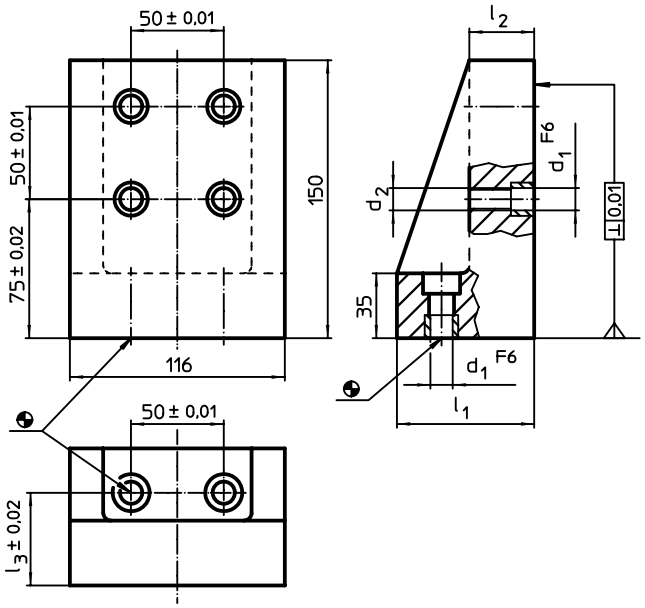


PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized

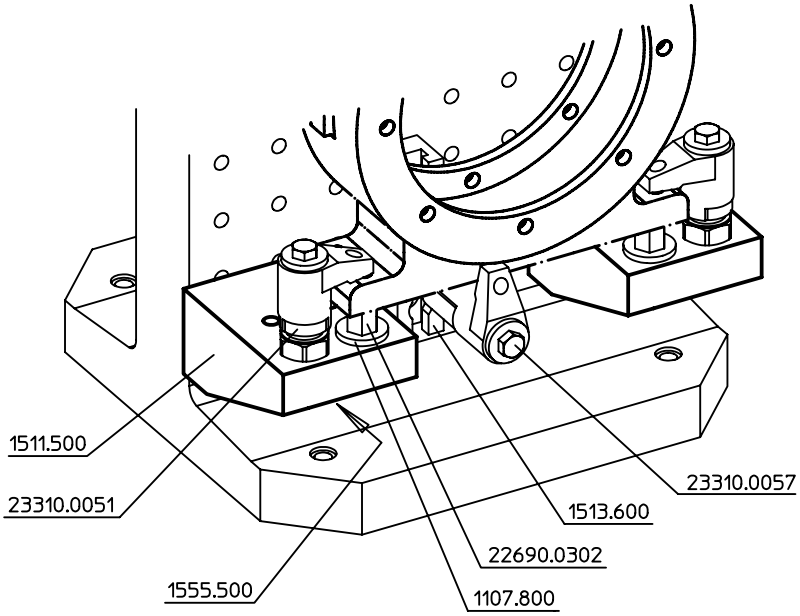
DRAWING



ORDER INFORMATION

System	Dimensions						Art. No.
	l_1	l_2	l_3	d_1	d_2		
	[mm]					[g]	
L12	74	35	50	12	M12	5950	1511.500
L16	79	40	55	16	M16	6395	1611.500

APPLICATION EXAMPLE



Mounting Elements

EH 1512.000 - EH 1612.400

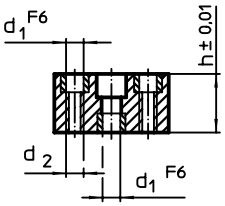


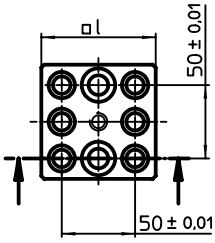
PRODUCT DESCRIPTION

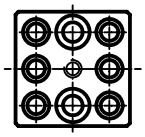
Material

- Grey cast iron, ground

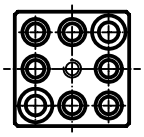
DRAWING



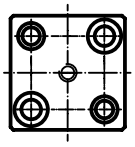




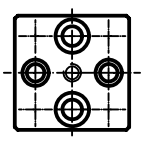
1512.000



1512.100



1612.200



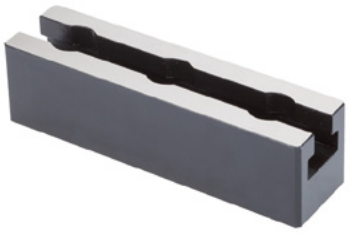
1612.400

ORDER INFORMATION

System	Dimensions [mm]				[g]	Art. No.
	l	h	d_1	d_2		
L12	74,8	40	12	M12	1400	1512.000
					1300	1512.100
L16	90,0	50	16	M16	2600	1612.200
					2400	1612.400

Clamping Bars

EH 1513.600 - EH 1613.800

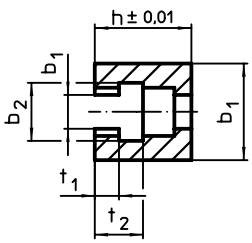


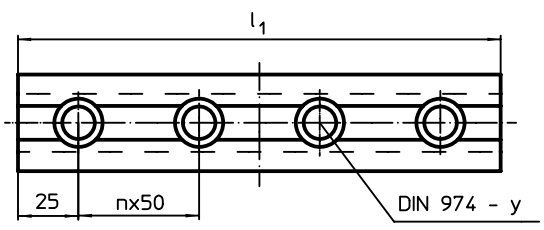
PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING

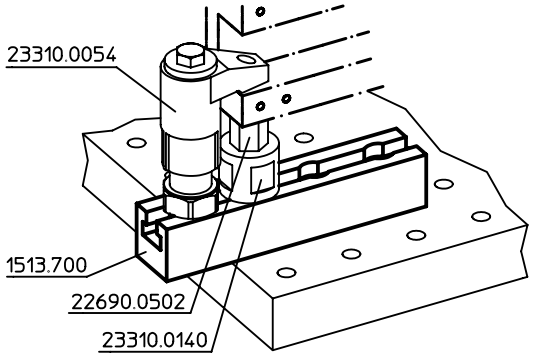




ORDER INFORMATION

System	Dimensions							y	For screws	Amount n		Art. No.
	l_1	b_1	b_2	b_3	h	t_1	t_2					
	[mm]							[mm]	[mm]		[g]	
L12	150	40	14,3	24	40	10	20	12	M12	2	1200	1513.600
	200	40	14,3	24	40	10	20	12	M12	3	1700	1513.700
L16	200	60	18,3	30	50	12	24	16	M16	3	3300	1613.700
	300	60	18,3	30	50	12	24	16	M16	5	5000	1613.800

APPLICATION EXAMPLE



Stops

EH 1614.500



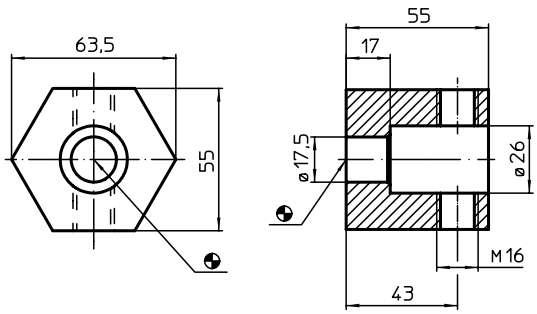
PRODUCT DESCRIPTION

For the L12 - hole and dowel system the abutment 1114.500 is used.

Material

- Steel, blackened

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
L16	900	1614.500

Clamping Heads

EH 1514.700 - EH 1614.700

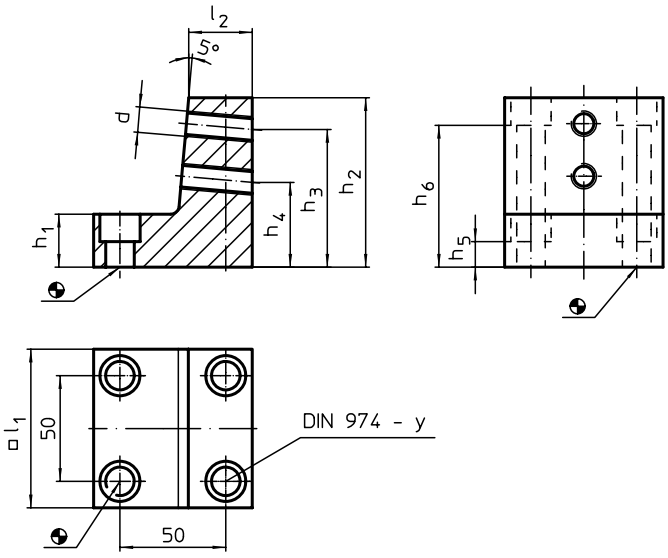


PRODUCT DESCRIPTION

Material

- Steel, blackened

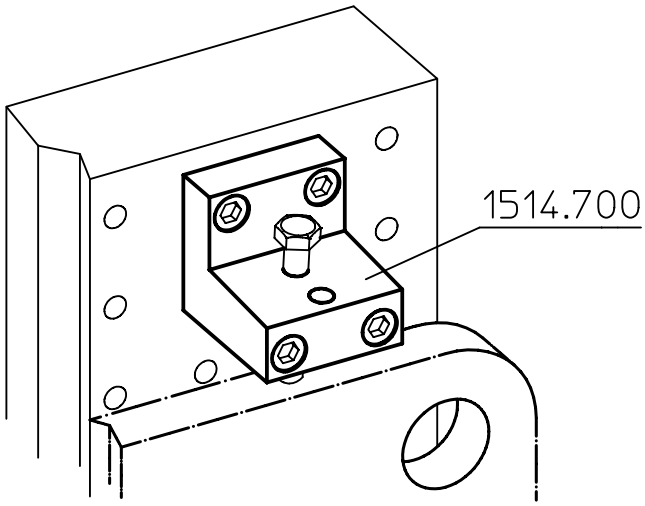
DRAWING



ORDER INFORMATION

System	Dimensions									y	For screws		Art. No.
	l_1	l_2	h_1	h_2	h_3	h_4	h_5	h_6	d				
	[mm]									[mm]	[mm]	[g]	
L12	74,8	30	25	80	65	40	12,0	67,0	M12	12	M12	1800	1514.700
L16	90,0	35	30	90	75	50	12,5	72,5	M16	16	M16	2770	1614.700

APPLICATION EXAMPLE



Spacers

EH 1617.400 - EH 1617.900



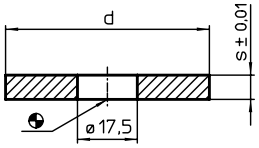
PRODUCT DESCRIPTION

For the L12 - hole and dowel system the disks 1107.400 - 1108.300 are used.

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions d [mm]	Dimensions s [mm]	[g]	Art. No.
L16	39,5	3	22	1617.400
	59,5	3	59	1617.500
	39,5	4	31	1617.600
	59,5	4	81	1617.700
	39,5	5	40	1617.800
	59,5	5	103	1617.900

Stop Angles

EH 1520.400 - EH 1621.700

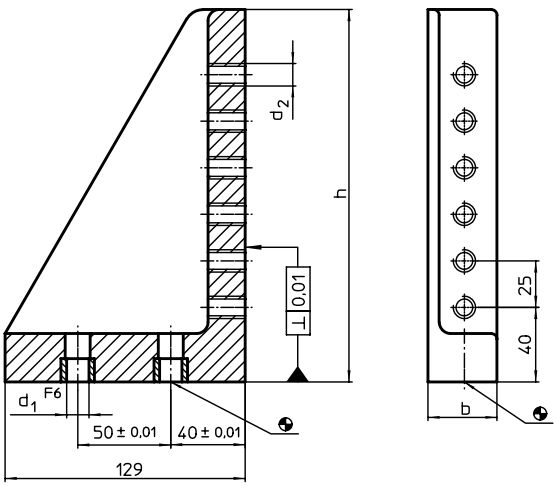


PRODUCT DESCRIPTION

Material

- Grey cast iron, phosphatized, ground

DRAWING



7

ORDER INFORMATION

System	Dimensions b	h	d_1	d_2 [mm]	Number of threads	[g]	Art. No.
L12	37	140	12	M12	4	1700	1520.400
		200	12	M12	6	2400	1520.500
L16	66	140	16	M16	4	2900	1621.600
		200	16	M16	6	3600	1621.700

Clamping Bars

EH 1533.000 - EH 1633.200

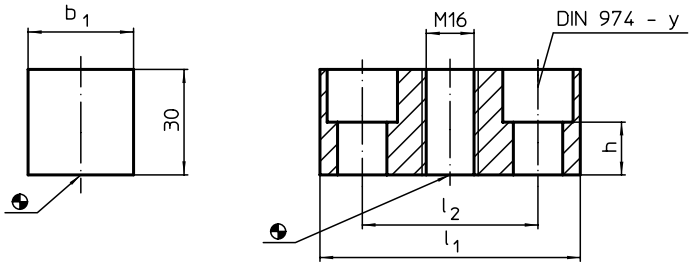


PRODUCT DESCRIPTION

Material

- Steel, blackened

DRAWING



ORDER INFORMATION

System	Dimensions l_1	b_1	l_2 [mm]	h	y [mm]	For screws [mm]	[g]	Art. No.
L12	74	30	50,0	15	12	M12	350	1533.000
	95	30	70,3	15	12	M12	500	1533.200
L16	85	35	50,0	14	16	M16	470	1633.000
	105	35	70,3	14	16	M16	630	1633.200

Thread Bolts

EH 1644.000

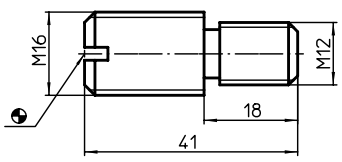


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, quality 10.9

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
L16	40	1644.000

Supporting Plates

EH 1547.900 - EH 1647.900

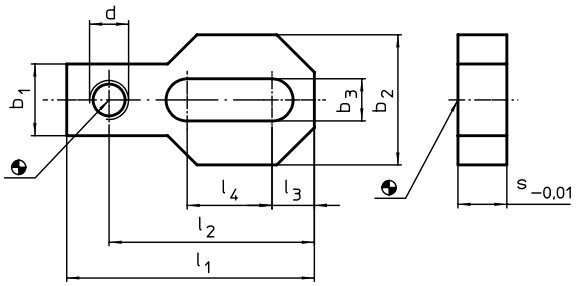


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions										Art. No.
	l_1	l_2	l_3	l_4	b_1	b_2	b_3	s	d	[g]	
	[mm]										
L12	76	63	13	26	22	40	13	15	M12	195	1547.900
L16	100	83	21	33	34	60	17	20	M16	570	1647.900

7

V-Blocks

EH 1548.100 - EH 1648.100

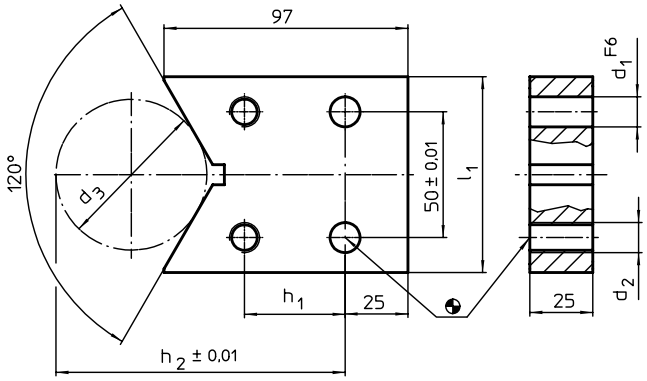


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

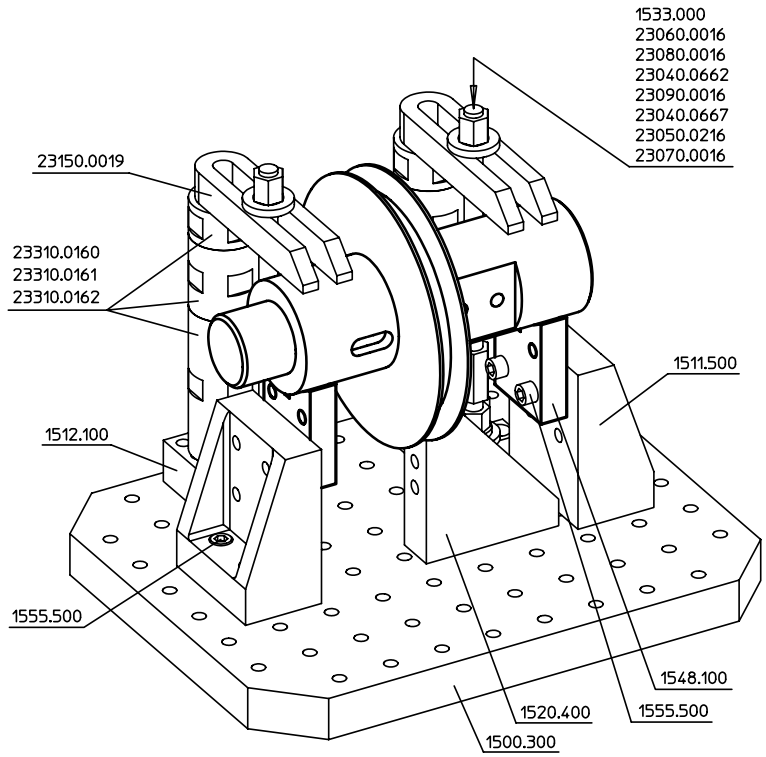
DRAWING



ORDER INFORMATION

System	Dimensions									Art. No.
	l_1	h_1	h_2	d_1	d_2	d_3	d_3 min.	d_3 max.		
	[mm]								[g]	
L12	78	40	115	12	M12	60	18	148	1230	1548.100
L16	98	35	152	16	M16	100	18	190	1440	1648.100

APPLICATION EXAMPLE



V-Blocks

EH 1548.500 - EH 1648.500

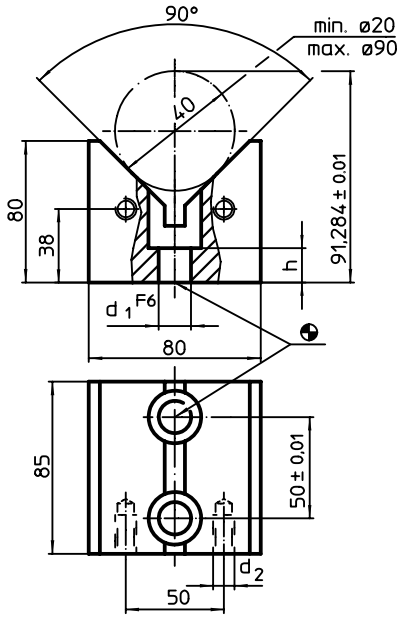


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions				Art. No.
	d_1	d_2	h	[g]	
		[mm]			
L12	12	M12	24	3000	1548.500
L16	16	M16	25	2900	1648.500

V-Block Elements right/left

EH 1548.700 - EH 1648.800

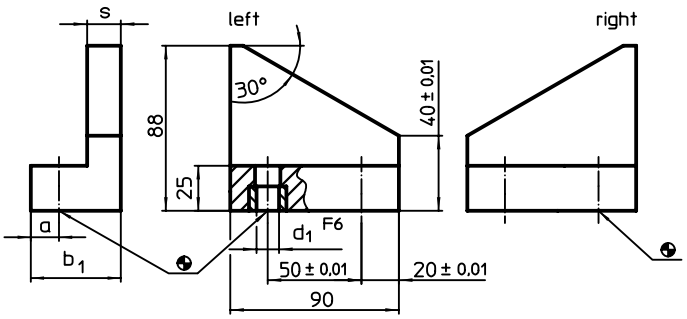


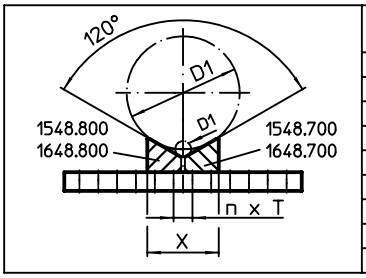
PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING





D1 (mm) ø-Area	nxT (mm) Distance	X
40-330	1x50= 50	190
140-430	2x50=100	240
240-530	3x50=150	290
340-630	4x50=200	340
440-730	5x50=250	390
540-830	6x50=300	440
640-930	7x50=350	490
740-1030	8x50=400	540
840-1130	9x50=450	590

ORDER INFORMATION

System	Dimensions [mm]				[g]	Art. No.
	b_1	d_1	s	a		
right – picture 2						
L12	48	12	18	15	1300	1548.700
L16	53	16	20	17	1500	1648.700
left – picture 1						
L12	48	12	18	15	1300	1548.800
L16	53	16	20	17	1500	1648.800

Positioning Clamping Bars

EH 1549.200 - EH 1649.200

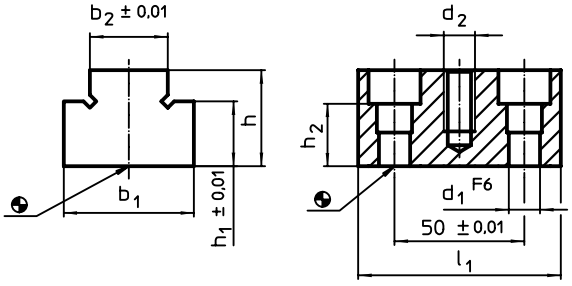


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

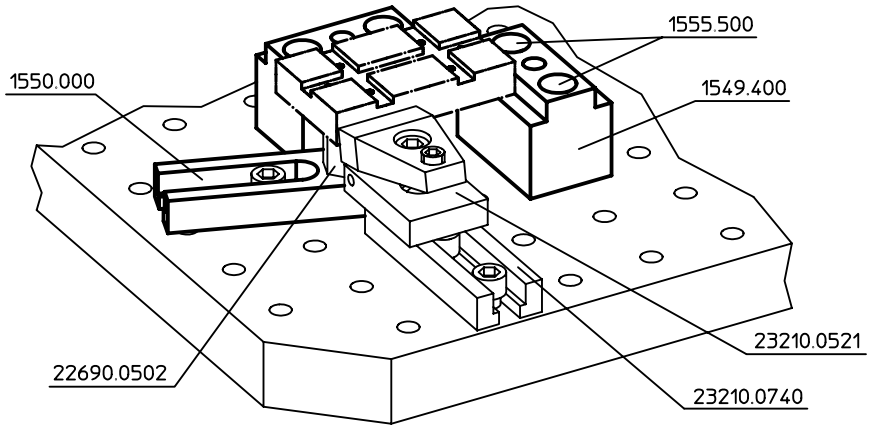
DRAWING



ORDER INFORMATION

System	Dimensions									Art. No.
	l_1	b_1	h	b_2	h_1	h_2	d_1	d_2	[g]	
	[mm]									
L12	78	50	37	30	25	24	12	M12	800	1549.200
			57	30	45	24	12	M12	1300	1549.400
L16	90	60	45	40	35	25	16	M16	1440	1649.200

APPLICATION EXAMPLE



7

Supporting Bars

EH 1550.000 - EH 1650.000

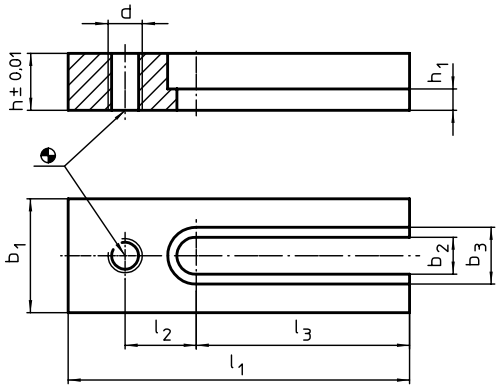


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions										Art. No.
	l_1	b_1	h	l_2	l_3	b_2	b_3	h_1	d	[g]	
	[mm]										
L12	120	40	20	25	75	13	20	7,5	M12	500	1550.000
L16	140	60	30	30	80	17	26	13,0	M16	1460	1650.000

Stops • cylindrical

EH 1551.500 - EH 1651.700

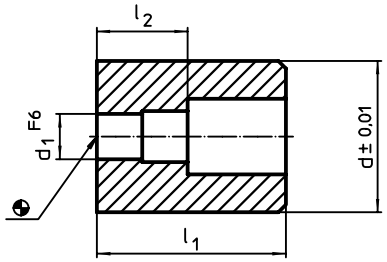


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	Dimensions					Art. No.
	l_1	l_2	d	d_1		
	[mm]				[g]	
L12	50	24	40	12	400	1551.500
	70	24	40	12	550	1551.700
L16	60	25	50	16	730	1651.500
	90	25	50	16	1070	1651.700

Positioning Clamping Cylinders

EH 1553.500 - EH 1653.500

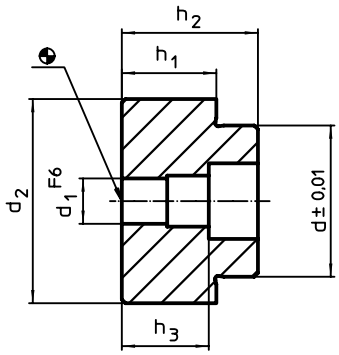


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

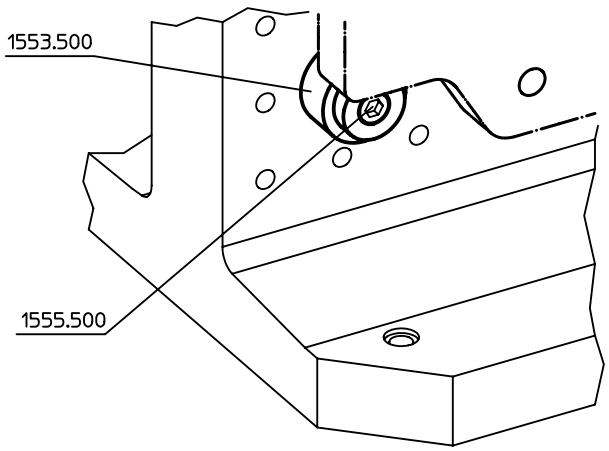
DRAWING



ORDER INFORMATION

System	Dimensions							Art. No.
	h_1 ±0,01	h_2	d	d_1	d_2	h_3		
	[mm]						[g]	
L12	25	36	40	12	54	24	500	1553.500
L16	35	46	50	16	70	25	1095	1653.500

APPLICATION EXAMPLE



Position Screws

EH 1555.500 - EH 1655.500

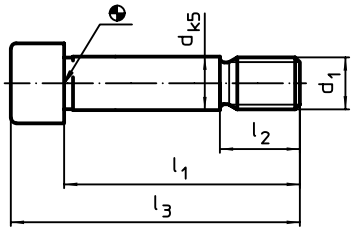


PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, quality 10.9

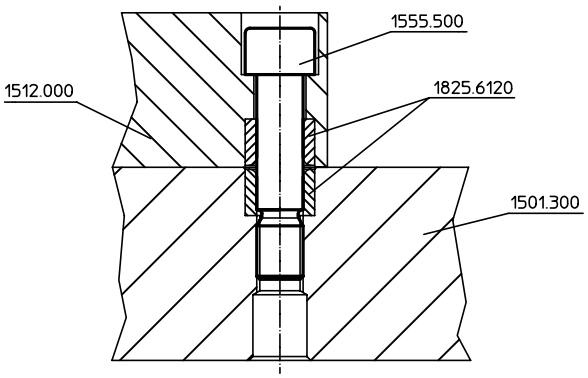
DRAWING



ORDER INFORMATION

System	Dimensions						Art. No.
	d_1	l_1	d	l_2	l_3		
			[mm]			[g]	
L12	M12	53	12	18	65	60	1555.500
L16	M16	64	16	24	80	130	1655.500

APPLICATION EXAMPLE



Screw Plugs

EH 1557.000 - EH 1657.000

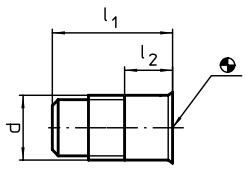


PRODUCT DESCRIPTION

Material

- Plastic

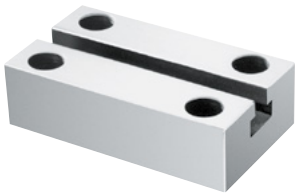
DRAWING



ORDER INFORMATION

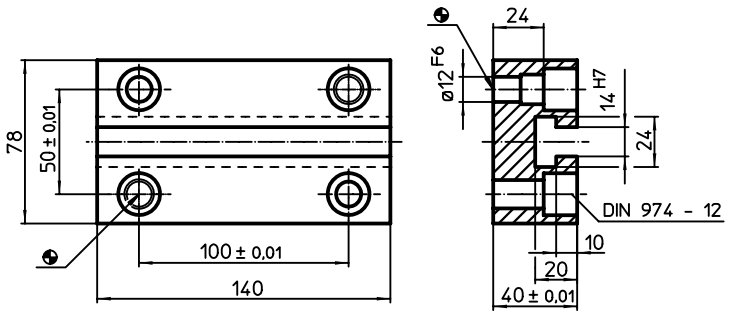
System	Dimensions				Art. No.
	d	l_1	l_2		
		[mm]		[g]	
L12	M12	25	10	5	1557.000
L16	M16	30	12	10	1657.000

System Adapter Plates
EH 1580.000



PRODUCT DESCRIPTION
Material
- Steel, case-hardened, ground

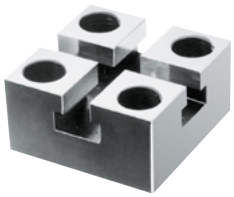
DRAWING



ORDER INFORMATION

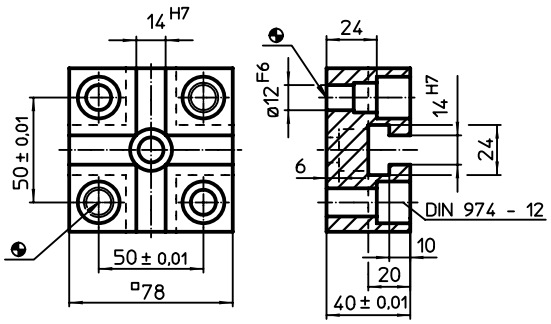
System	[g]	Art. No.
L12	2400	1580.000

System Adapter Plates
EH 1581.000



PRODUCT DESCRIPTION
Material
- Steel, case-hardened, ground

DRAWING



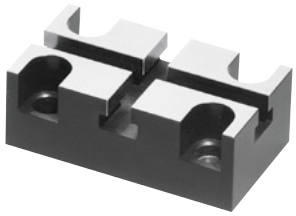
ORDER INFORMATION

System	[g]	Art. No.
L12	1200	1581.000

7

System Adapter Plates

EH 1681.000

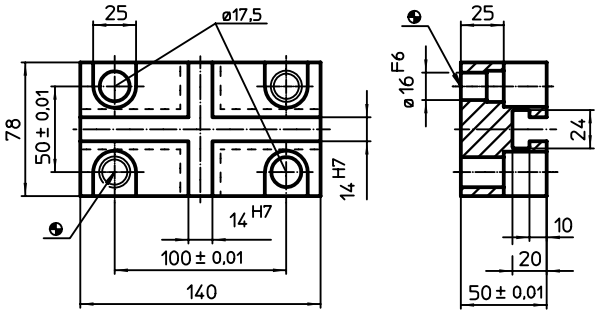


PRODUCT DESCRIPTION

Material

- Steel, case-hardened, ground

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
L16	3050	1681.000

7

STANDARD ASSORTMENTS L12

ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 2 FIXTURES, ART. NO. 1590.110

Qty.	Description	Art. No.	Qty.	Description	Art. No.
System parts			**Standard parts**		
2	Base plate	1501.300	2	Grub screw	22540.0421
1	Console	1510.100	2	Grub screw	22540.0422
3	Mounting element	1512.000	2	Grub screw	22540.0423
3	Clamping block	1513.600	2	Screwed rest button, plain	22690.0001
2	Clamping block	1513.700	2	Screwed rest button, spherical	22690.0102
1	Stop angle	1520.400	2	Screwed rest button, plain	22690.0302
1	Stop angle	1520.500	2	Screwed rest button, plain	22690.0304
3	Supporting plate	1547.900	3	Screwed rest button, ribbed	22690.0502
1	V-block	1548.500	1	Self-aligning pad, plain, adjustable	22740.0017
2	Positioning clamping bar	1549.400	8	T-nut	23010.0142
5	Supporting bar	1550.000	2	Stud for T-nut	23040.0624
3	Stop	1551.500	2	Stud for T-nut	23040.0625
3	Stop	1551.700	2	Stud for T-nut	23040.0626
3	Positioning clamping cylinder	1553.500	2	Stud for T-nut	23040.0627
20	Position screw	1555.500	4	Plain washer	23060.0012
100	Screw plug	1557.000	4	Collar nut	23080.0012
1	Nut-adapter	1581.000	4	Extension nut	23090.0012
2	Plain washer	1107.400	2	Clamp	23150.0015
4	Plain washer	1107.600	2	Clamp	23150.0016
8	Plain washer	1107.800	2	Down-hold clamp	23210.0521
2	Plain washer	1107.900	1	Down-thrust clamp	23310.0051
5	Cylindrical stop	1114.500	1	Down-thrust clamp	23310.0054
1	Wrench	1139.400	5	Height adjusting cylinder	23310.0140
2	Supporting plate	1147.900	3	Height adjusting cylinder	23310.0141
1	Adjustable drilling support	1163.000	1	Height adjusting cylinder	23310.0142

The specified ranges are intended as recommendations.
The required parts vary with the workpiece.
The ranges can be modified as necessary

STANDARD ASSORTMENTS L12

ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 5 FIXTURES, ART. NO. 1590.140

Qty.	Description	Art. No.	Qty.	Description	Art. No.
System parts			**Standard parts**		
3	Base plate	1501.300	5	Grub screw	22540.0421
2	Base plate	1501.500	5	Grub screw	22540.0422
2	Clamping angle	1505.200	5	Grub screw	22540.0423
6	Console	1510.100	3	Screwed rest button, plain	22690.0001
2	Console	1510.200	3	Screwed rest button, plain	22690.0002
8	Mounting element	1512.000	3	Screwed rest button, spherical	22690.0101
6	Clamping block	1513.600	3	Screwed rest button, spherical	22690.0102
6	Clamping block	1513.700	3	Screwed rest button, ribbed	22690.0201
3	Clamping head	1514.700	3	Screwed rest button, ribbed	22690.0202
3	Stop angle	1520.400	3	Screwed rest button, plain	22690.0302
3	Stop angle	1520.500	3	Screwed rest button, plain	22690.0303
5	Clamping block	1533.000	2	Screwed rest button, spherical	22690.0402
3	Clamping block	1533.200	3	Screwed rest button, spherical	22690.0404
6	Supporting plate	1547.900	3	Screwed rest button, ribbed	22690.0502
2	V-block	1548.100	3	Screwed rest button, ribbed	22690.0504
2	V-block	1548.500	2	Ball-ended thrust screw	22700.0624
2	V-Block element right	1548.700	2	Ball-ended thrust screw	22700.0626
2	V-Block element left	1548.800	3	Self-aligning pad, plain,	22730.0020
3	Positioning clamping bar	1549.200	2	Self-aligning pad, plain, adjustable	22740.0017
3	Positioning clamping bar	1549.400	15	T-nut	23010.0142
12	Supporting bar	1550.000	5	Stud for T-nut	23040.0624
6	Stop	1551.500	5	Stud for T-nut	23040.0625
6	Stop	1551.700	5	Stud for T-nut	23040.0626
6	Positioning clamping cylinder	1553.500	5	Stud for T-nut	23040.0627
30	Position screw	1555.500	3	Stud for T-nut	23040.0664
300	Screw plug	1557.000	3	Stud for T-nut	23040.0665
4	Nut-adapter	1580.000	3	Stud for T-nut	23040.0666
4	Nut-adapter	1581.000	6	Conical seat	23050.0212
5	Plain washer	1107.400	4	Conical seat	23050.0216
10	Plain washer	1107.600	25	Plain washer	23060.0012
20	Plain washer	1107.800	10	Plain washer	23060.0016
10	Plain washer	1107.900	6	Fixture nut	23070.0012
1	Slotted clamping angle	1112.100	4	Fixture nut	23070.0016
1	Slotted clamping angle	1112.400	10	Collar nut	23080.0012
10	Cylindrical stop	1114.500	10	Collar nut	23080.0016
2	T-slot centering block	1129.600	6	Extension nut	23090.0012
1	Wrench	1139.400	4	Extension nut	23090.0016
1	Locating pin	1140.700	4	Clamp	23150.0015
1	Locating pin	1140.800	4	Clamp	23150.0016
2	Intermediate plate	1147.700	2	Clamp	23150.0019
2	Support clamping bar	1147.800	2	Clamp	23150.0020
5	Supporting plate	1147.900	3	Clamp with nose	23180.0213
1	Adjustable drilling support	1163.000	2	Down-hold clamp	23210.0521
1	Adjustable drilling support	1163.100	2	Down-hold clamp	23210.0522
			2	Bedding support	23220.0150
			2	Down-thrust clamp	23310.0051
			1	Down-thrust clamp	23310.0054
			1	Down-thrust clamp	23310.0057
			16	Height adjusting cylinder	23310.0140
			8	Height adjusting cylinder	23310.0141
			6	Height adjusting cylinder	23310.0142

The specified ranges are intended as recommendations.
The required parts vary with the workpiece.
The ranges can be modified as necessary

STANDARD ASSORTMENTS L16

ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 2 FIXTURES, ART. NO. 1690.110

Qty.	Description	Art. No.	Qty.	Description	Art. No.
System parts			**Standard parts**		
2	Base plate	1600.600	2	Grub screw	22540.0462
2	Console	1610.100	2	Grub screw	22540.0463
2	Mounting element	1612.200	2	Screwed rest button, plain	22690.0042
2	Mounting element	1612.400	2	Screwed rest button, spherical	22690.0142
2	Clamping block	1613.700	2	Screwed rest button, plain	22690.0343
5	Cylindrical stop	1614.500	2	Screwed rest button, plain	22690.0345
4	Plain washer	1617.400	2	Screwed rest button, ribbed	22690.0543
4	Plain washer	1617.600	3	Self-aligning pad, plain	22730.0030
6	Plain washer	1617.800	2	Self-aligning pad, plain, adjustable	22740.0240
4	Plain washer	1617.900	5	T-nut	23010.0182
1	Stop angle	1621.600	2	Stud for T-nut	23040.0662
1	Stop angle	1621.700	2	Stud for T-nut	23040.0664
2	Clamping block	1633.000	2	Stud for T-nut	23040.0065
1	Clamping block	1633.200	2	Stud for T-nut	23040.0666
4	Thread bolt	1644.000	2	Stud for T-nut	23040.0667
3	Supporting plate	1647.900	10	Plain washer	23060.0016
1	V-block	1648.500	5	Collar nut	23080.0016
4	Supporting bar	1650.000	4	Extension nut	23090.0016
3	Stop	1651.500	2	Clamp	23150.0019
3	Positioning clamping cylinder	1653.500	2	Clamp	23150.0020
12	Position screw	1655.500	3	Clamp	23180.0217
100	Screw plug	1657.000	5	Height adjusting cylinder	23310.0165
			3	Height adjusting cylinder	23310.0166
			2	Height adjusting cylinder	23310.0167

The specified ranges are intended as recommendations.
The required parts vary with the workpiece.
The ranges can be modified as necessary

STANDARD ASSORTMENTS L16

ASSORTMENT FOR THE SIMULTANEOUS CONSTRUCTION OF 4 FIXTURES, ART. NO. 1690.130

Qty.	Description	Art. No.	Qty.	Description	Art. No.
System parts			**Standard parts**		
3	Base plate	1600.600	5	C-washer	22290.0016
1	Base plate	1600.700	5	Grub screw	22540.0462
2	Clamping angle	1605.200	5	Grub screw	22540.0463
6	Console	1610.100	3	Screwed rest button, plain	22690.0042
2	Console	1610.200	3	Screwed rest button, plain	22690.0043
6	Mounting element	1612.200	3	Screwed rest button, spherical	22690.0142
4	Mounting element	1612.400	3	Screwed rest button, spherical	22690.0143
4	Clamping block	1613.700	3	Screwed rest button, ribbed	22690.0242
4	Clamping block	1613.800	3	Screwed rest button, ribbed	22690.0243
10	Cylindrical stop	1614.500	3	Screwed rest button, plain	22690.0343
3	Clamping head	1614.700	3	Screwed rest button, plain	22690.0345
5	Plain washer	1617.400	3	Screwed rest button, spherical	22690.0443
5	Plain washer	1617.500	3	Screwed rest button, spherical	22690.0445
10	Plain washer	1617.600	3	Screwed rest button, ribbed	22690.0543
5	Plain washer	1617.700	3	Screwed rest button, ribbed	22690.0545
20	Plain washer	1617.800	3	Self-aligning pad, plain	22730.0030
10	Plain washer	1617.900	3	Self-aligning pad, ribbed	22730.0330
2	Stop angle	1621.600	2	Self-aligning pad, plain, adjustable	22740.0024
2	Stop angle	1621.700	10	T-nut	23010.0182
5	Clamping block	1633.000	4	Stud for T-nut	23040.0662
3	Clamping block	1633.200	4	Stud for T-nut	23040.0664
10	Thread bolt	1644.000	4	Stud for T-nut	23040.0665
6	Supporting plate	1647.900	4	Stud for T-nut	23040.0666
2	V-block	1648.100	4	Stud for T-nut	23040.0667
2	V-block	1648.500	4	Conical seat	23050.0216
2	V-Block element right	1648.700	30	Plain washer	23060.0016
2	V-Block element left	1648.800	5	Fixture nut	23070.0016
3	Positioning clamping bar	1649.200	10	Collar nut	23080.0016
12	Supporting bar	1650.000	10	Extension nut	23090.0016
6	Stop	1651.500	4	Clamp	23150.0018
3	Stop	1651.700	4	Clamp	23150.0019
5	Positioning clamping cylinder	1653.500	2	Clamp	23150.0020
25	Position screw	1655.500	3	Clamp	23180.0217
300	Screw plug	1657.000	2	Down-hold clamp	23210.0541
			8	Height adjusting cylinder	23310.0145
			4	Height adjusting cylinder	23310.0146
			3	Height adjusting cylinder	23310.0147
			8	Height adjusting cylinder	23310.0165
			4	Height adjusting cylinder	23310.0166
			3	Height adjusting cylinder	23310.0167

The specified ranges are intended as recommendations.
The required parts vary with the workpiece.
The ranges can be modified as necessary

NOTES

8 STANDARD PARTS FOR FIXTURE SYSTEMS



STANDARD PARTS

FOR FIXTURE SYSTEMS

We carry a comprehensive selection of clamping and fixture elements that complement our fixture systems.



Standard Parts for Fixture Systems

C-Washers • DIN 6372

EH 22290.



PRODUCT DESCRIPTION

Material

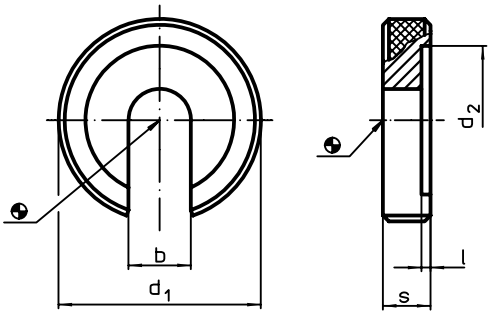
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . . → p. 180

DRAWING



ORDER INFORMATION

System	Nominal size	Dimensions						Art. No.
		b	d_1	d_2	l	s		
	[mm]	[mm]					[g]	
V40	**8**	8,4	28	21	1,0	7	23	**22290.0008**
V70/L12	**12**	13,0	40	30	1,8	9	56	**22290.0012**
V70/L16	**16**	17,0	56	37	1,8	12	164	**22290.0016**

Grub Screws • DIN 6332 with thrust point

EH 22540.



PRODUCT DESCRIPTION

For combination with thrust pads with snap ring DIN 6311 form S (EH 22560.) and clamping screws DIN 6332.

Material

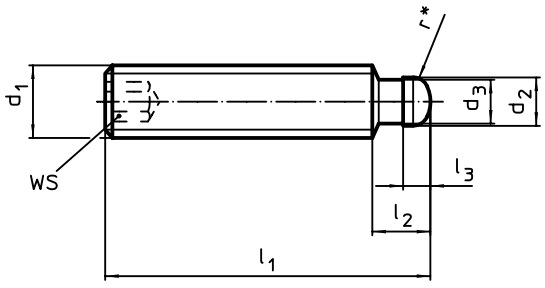
- Steel, blackened, quality 5.8, thrust point hardened

MORE INFORMATION

Further products

Complete Range . . . . . → p. 255
Thrust Pads, DIN 6311 and low model → p. 257

DRAWING



picture 2

Standard Parts for Fixture Systems

ORDER INFORMATION

System	Dimensions								WS		Art. No.
	d_1	l_1	d_2 h11	d_3	z_2	z_3	l_2 ~	l_3 ~			steel
	[mm]								[mm]	[g]	
with internal hexagon (IS) – picture 2											
V40	**M 8**	**40**	6	5,4	7,5	3,0	43,0	42,5	4	11	**22540.0381**
		60	6	5,4	7,5	3,0	63,0	62,5	4	17	**22540.0382**
V70	**M10**	**60**	8	7,2	9,0	4,5	63,6	62,6	5	26	**22540.0401**
V70/L12	**M12**	**60**	8	7,2	10,0	4,5	64,6	62,6	6	36	**22540.0421**
		80	8	7,2	10,0	4,5	84,6	82,6	6	50	**22540.0422**
		100	8	7,2	10,0	4,5	104,6	102,6	6	64	**22540.0423**
V70/L16	**M16**	**100**	12	11,0	12,0	5,0	105,4	102,9	8	118	**22540.0462**
		125	12	11,0	12,0	5,0	130,4	127,9	8	150	**22540.0463**

Seating Pins • ribbed or pointed

EH 22680.



PRODUCT DESCRIPTION

For workpieces showing a rough surface. Pointed type especially suitable for cast parts.

Material

Body

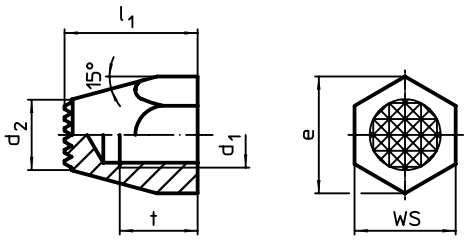
- Free cutting steel, case-hardened, blackened

MORE INFORMATION

Further products

Complete Range . . . . . → p. 286

DRAWING



picture 3

ORDER INFORMATION

System	Dimensions					WS	Tightening torque max.		Art. No.
	l_1	d_1	t	d_2	e				
	[mm]					[mm]	[Nm]	[g]	
case-hardened, ribbed, with female thread – picture 3									
V40	**20**	**M 8**	10	9	15,0	13	18	14	**22680.0142**
	25	**M 8**	10	9	15,0	13	18	20	**22680.0144**
V70/L12	**25**	**M12**	15	13	21,9	19	60	33	**22680.0184**
	30	**M12**	15	13	21,9	19	60	44	**22680.0186**
	40	**M12**	15	13	21,9	19	60	69	**22680.0188**

Standard Parts for Fixture Systems

Seating Pins • pin shape

EH 22680.



PRODUCT DESCRIPTION

To be used as solid and precise seat and stop. The pin-shaped form of this locating pin allows an application in components with narrow seating points.
Surface induction hardened and ground.

Material

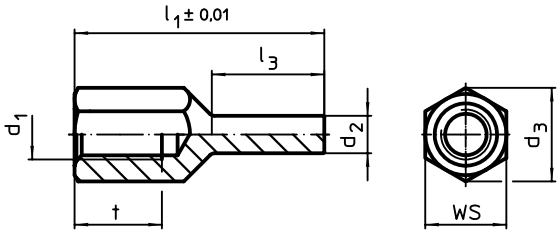
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . . → p. 287

DRAWING

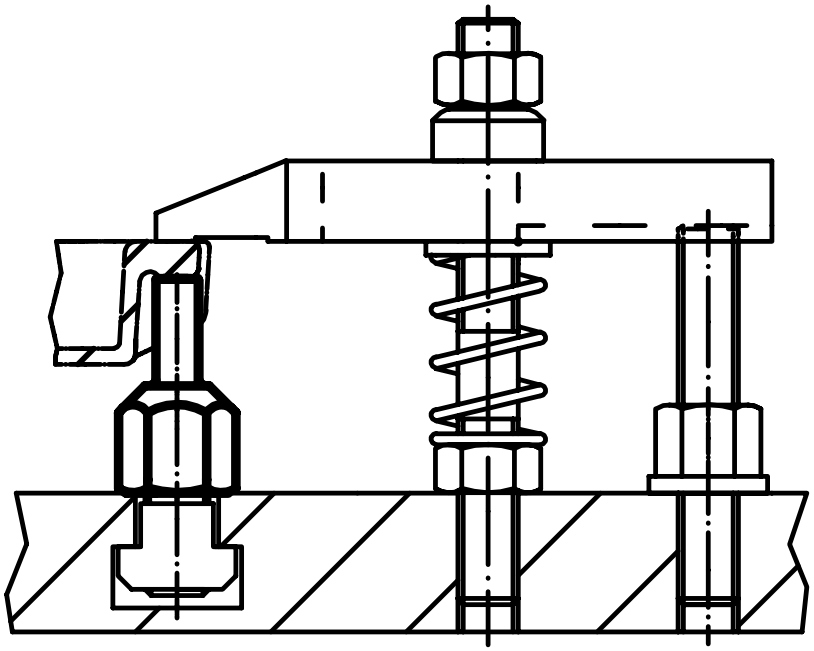


picture 2

ORDER INFORMATION

System	Dimensions						WS	Tightening torque max.		Art. No.
	l_1 ±0,01	d_1	d_2	l_3	t	d_3				
	[mm]						[mm]	[Nm]	[g]	
with female thread – picture 2										
V40	**30**	**M 8**	**4**	13	10	14,4	13	18	13	**22680.0462**
	40	**M 8**	**4**	18	14	14,4	13	18	18	**22680.0464**
V70/L12	**40**	**M12**	**8**	18	12	21,2	19	60	41	**22680.0486**
	60	**M12**	**8**	28	18	21,2	19	60	63	**22680.0488**

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Pins

EH 22690.



PRODUCT DESCRIPTION

To be used as seats, stops and thrust pads.

Material

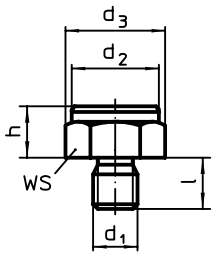
- Steel, case-hardened, blackened

MORE INFORMATION

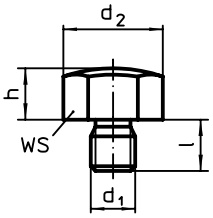
Further products

Complete Range . . . . . → p. 288

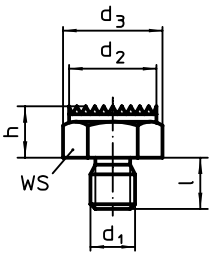
DRAWING



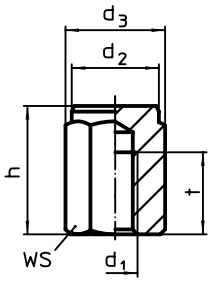
picture 1



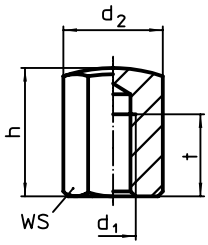
picture 2



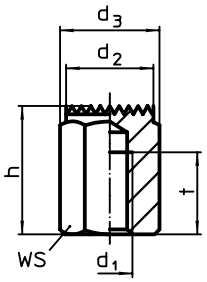
picture 3



picture 4



picture 5



picture 6

ORDER INFORMATION

System	Dimensions h	d_1	d_2	d_3	l	t	WS [mm]	Tightening torque max. [Nm]	[g]	Art. No.
with male thread and plain surface – picture 1										
V40	**10 ±0,01**	**M 8**	19,4	19,4	10	–	17	18	21	**22690.0021**
V70/L12	**10 ±0,01**	**M12**	25,2	25,2	14	–	22	60	34	**22690.0001**
	15 ±0,01	**M12**	25,2	25,2	14	–	22	60	56	**22690.0002**
L16	**15 ±0,01**	**M16**	33,0	33,0	19	–	30	140	110	**22690.0042**
	20 ±0,01	**M16**	33,0	33,0	19	–	30	140	140	**22690.0043**
with male thread and spherical surface – picture 2										
V40	**10 ±0,10**	**M 8**	19,4	19,4	10	–	17	18	20	**22690.0121**
V70	**10 ±0,10**	**M12**	25,2	25,2	14	–	22	60	37	**22690.0101**
	15 ±0,10	**M12**	25,2	25,2	14	–	22	60	53	**22690.0102**
L16	**15 ±0,10**	**M16**	33,0	33,0	19	–	30	140	105	**22690.0142**
	20 ±0,10	**M16**	33,0	33,0	19	–	30	140	135	**22690.0143**
with male thread and ribbed surface – picture 3										
V40	**10 ±0,10**	**M 8**	19,4	19,4	10	–	17	18	20	**22690.0221**
V70/L12	**10 ±0,10**	**M12**	25,2	25,2	14	–	22	60	38	**22690.0201**
	15 ±0,10	**M12**	25,2	25,2	14	–	22	60	54	**22690.0202**
L16	**15 ±0,10**	**M16**	33,0	33,0	19	–	30	140	106	**22690.0242**
	20 ±0,10	**M16**	33,0	33,0	19	–	30	140	136	**22690.0243**

[1] The tightening torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length. →

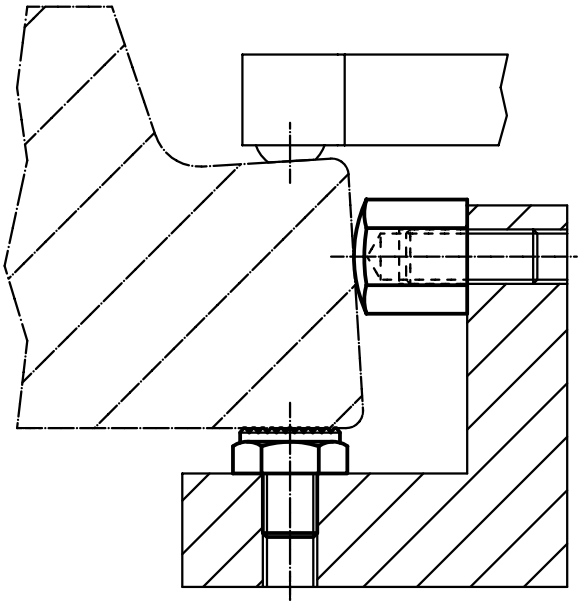
8

Standard Parts for Fixture Systems

System	Dimensions h	d_1	d_2	d_3	l	t	WS	Tightening torque max.		Art. No.
	[mm]						[mm]	[Nm]	[g]	
with female thread and plain surface tolerance l_1 = ±0,01 – picture 4										
V40	**15 ±0,01**	**M 8**	19,4	19,4	15	6	17	25[1)]	25	**22690.0321**
	25 ±0,01	**M 8**	19,4	19,4	25	12	17	25[1)]	42	**22690.0323**
V70/L12	**20 ±0,01**	**M12**	25,2	25,2	20	10	22	82[1)]	52	**22690.0301**
	25 ±0,01	**M12**	25,2	25,2	25	15	22	82[1)]	65	**22690.0302**
	30 ±0,01	**M12**	25,2	25,2	30	18	22	82[1)]	79	**22690.0303**
	40 ±0,01	**M12**	25,2	25,2	40	18	22	82[1)]	111	**22690.0304**
	50 ±0,01	**M12**	25,2	25,2	50	18	22	82[1)]	142	**22690.0305**
L16	**30 ±0,01**	**M16**	33,0	33,0	30	20	30	206[1)]	140	**22690.0343**
	50 ±0,01	**M16**	33,0	33,0	50	24	30	206[1)]	257	**22690.0345**
with female thread and spherical surface – picture 5										
V40	**15 ±0,10**	**M 8**	19,4	19,4	15	6	17	25[1)]	24	**22690.0421**
	25 ±0,10	**M 8**	19,4	19,4	25	12	17	25[1)]	41	**22690.0423**
V70/L12	**20 ±0,10**	**M12**	25,2	25,2	20	10	22	82[1)]	50	**22690.0401**
	25 ±0,10	**M12**	25,2	25,2	25	15	22	82[1)]	62	**22690.0402**
	30 ±0,10	**M12**	25,2	25,2	30	18	22	82[1)]	76	**22690.0403**
	40 ±0,10	**M12**	25,2	25,2	40	18	22	82[1)]	109	**22690.0404**
	50 ±0,10	**M12**	25,2	25,2	50	18	22	82[1)]	141	**22690.0405**
L16	**30 ±0,10**	**M16**	33,0	33,0	30	20	30	206[1)]	136	**22690.0443**
	50 ±0,10	**M16**	33,0	33,0	50	24	30	206[1)]	252	**22690.0445**
with female thread and ribbed surface – picture 6										
V40	**15 ±0,10**	**M 8**	19,4	19,4	15	6	17	25[1)]	24	**22690.0521**
	25 ±0,10	**M 8**	19,4	19,4	25	12	17	25[1)]	41	**22690.0523**
V70/L12	**20 ±0,10**	**M12**	25,2	25,2	20	10	22	82[1)]	50	**22690.0501**
	25 ±0,10	**M12**	25,2	25,2	25	15	22	82[1)]	63	**22690.0502**
	30 ±0,10	**M12**	25,2	25,2	30	18	22	82[1)]	77	**22690.0503**
	40 ±0,10	**M12**	25,2	25,2	40	18	22	82[1)]	109	**22690.0504**
	50 ±0,10	**M12**	25,2	25,2	50	18	22	82[1)]	141	**22690.0505**
L16	**30 ±0,10**	**M16**	33,0	33,0	30	20	30	206[1)]	137	**22690.0543**
	50 ±0,10	**M16**	33,0	33,0	50	24	30	206[1)]	254	**22690.0545**

[1)] The tightening torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length.

APPLICATION EXAMPLE



Ball-Ended Thrust Screws • headless, ball protected against rotating

EH 22700.



PRODUCT DESCRIPTION

For clamping and supporting of surfaces that are not exactly parallel.
Maximised load transmission due to moveable ball.

Material

Ball
- Ball-bearing steel, hardened

Screw
- Heat-treated steel, 1200 ±100 N/mm²

MORE INFORMATION

Notes

Ball protected against rotating.
Special types on request.

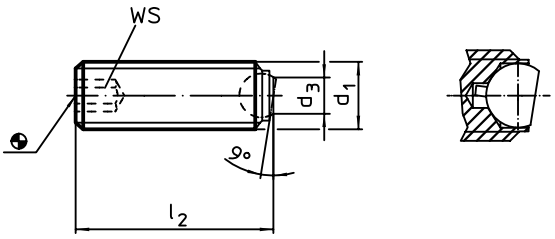
References

Thread lock on request, please refer to appendix - Technical Data -

Further products

Complete Range . . . . . → p. 297
Ball-Ended Thrust Screws, headless, flat-faced ball . . . . . → p. 304
Ball-Ended Thrust Screws, headless, with fine-pitch thread . . . . . → p. 307
Ball-Ended Thrust Screws, headless, flat-faced ball and hexalobular socket → p. 310

DRAWING



ORDER INFORMATION

System	Dimensions				WS	Load capacity for static load[1] max.		Art. No.
	d_1	l_2	d_3	Ball				heat-treated steel
	[mm]				[mm]	[kN]	[g]	
flat-faced ball, plain surface								
V40	**M 8**	**20**	4,5	5,5	4	9	5,1	22700.0584
V70/L12	**M12**	**30**	7,2	8,5	6	18	18,0	22700.0624
		40	7,2	8,5	6	18	24,0	22700.0626
V70/L16	**M16**	**50**	10,7	12,0	8	36	60,0	22700.0666
flat-faced ball, ribbed surface								
V70/L12	**M12**	**30**	7,2	8,5	6	18	18,0	22700.0724
		40	7,2	8,5	6	18	24,0	22700.0726
V70/L16	**M16**	**50**	10,7	12,0	8	36	60,0	22700.0766

[1] Statements on load capacity are not valid for the stainless steel type.

8

Standard Parts for Fixture Systems

Self-Aligning Pads

EH 22730.



PRODUCT DESCRIPTION

Self-aligning pads are used as stop, support and thrust pad and are suitable for installation in clamping elements.

Material

Ball
- Ball-bearing steel, hardened, bright

Body
- Heat-treated steel, tempered, phosphated

MORE INFORMATION

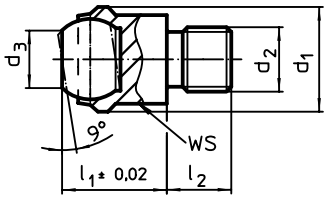
Notes

Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.

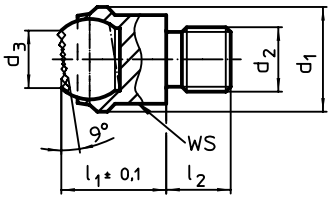
Further products

Complete Range . . . . . → p. 315

DRAWING



picture 1



picture 2

ORDER INFORMATION

System	Dimensions						WS	Load capacity for static load max.	Tightening torque max.		Art. No.
	d_1	d_2	d_3	l_1	l_2 -0,5	Ball					heat-treated steel
	[mm]						[mm]	[kN]	[Nm]	[g]	
with male thread, flat-faced ball, plain surface – picture 1											
V40	**13**	**M 8**	7,2	13	8	10	11	10	25	13	**22730.0013**
V70/L12	**20**	**M12**	10,5	18	12	16	17	25	82	44	**22730.0020**
V70/L16	**30**	**M16**	20,0	27	16	25	27	90	206	151	**22730.0030**
with male thread, flat-faced ball, ribbed surface – picture 2											
V40	**13**	**M 8**	7,2	13	8	10	11	10	25	13	**22730.0313**
V70/L12	**20**	**M12**	10,5	18	12	16	17	25	82	43	**22730.0320**
V70/L16	**30**	**M16**	20,0	27	16	25	27	90	206	150	**22730.0330**

8

Self-Aligning Pads • self-resetting

EH 22731.



PRODUCT DESCRIPTION

Self-aligning pads are used as stop, support and thrust pad and are suitable for installation in clamping elements.
By resetting to the parallel position the contact point of the self-aligning pad provides a defined initial position, thus preventing the pad clamping in an oblique position when inserting the workpiece.

Material

Spring element
- Thermoplastic PUR

Ball
- Ball-bearing steel, hardened, bright

Body
- Heat-treated steel, tempered, phosphated

MORE INFORMATION

Notes

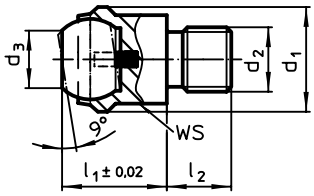
Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.

Further products

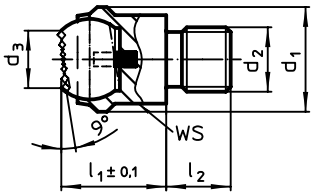
Complete Range . . . . . → p. 317

Standard Parts for Fixture Systems

DRAWING



picture 1

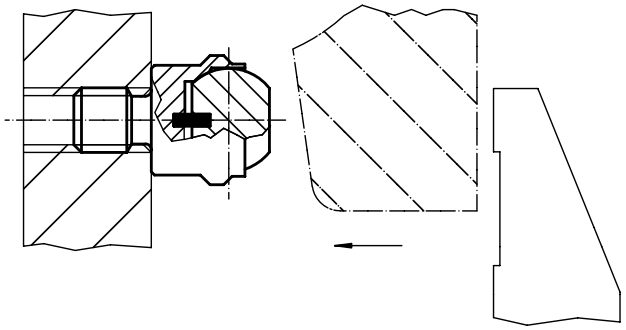


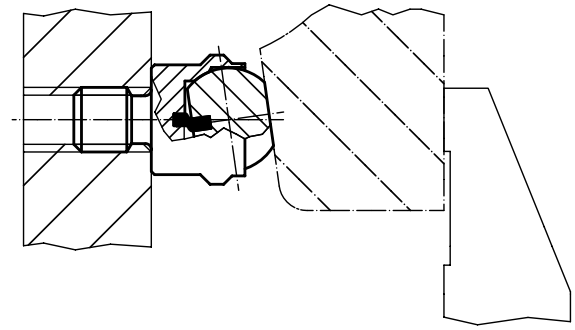
picture 2

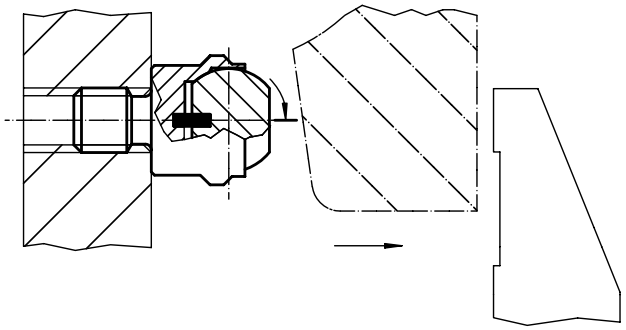
ORDER INFORMATION

System	Dimensions						WS	Load capacity for static load max.	Tightening torque max.		Art. No. heat-treated steel
	d_1	d_2	d_3	l_1	l_2 -0,5	Ball					
	[mm]						[mm]	[kN]	[Nm]	[g]	
with male thread, flat-faced ball, plain surface – picture 1											
V40	**13**	**M 8**	7,2	13	8	10	11	10	25	14	**22731.0013**
	20	**M 8**	10,5	18	10	16	17	25	25	39	**22731.0018**
V70/L12	**20**	**M12**	10,5	18	12	16	17	25	82	44	**22731.0020**
V70/L16	**30**	**M16**	20,0	27	16	25	27	90	206	153	**22731.0030**
with male thread, flat-faced ball, ribbed surface – picture 2											
V40	**13**	**M 8**	7,2	13	8	10	11	10	25	14	**22731.0313**
	20	**M 8**	10,5	18	10	16	17	25	25	39	**22731.0318**
V70/L12	**20**	**M12**	10,5	18	12	16	17	25	82	44	**22731.0320**
V70/L16	**30**	**M16**	20,0	27	16	25	27	90	206	152	**22731.0330**

APPLICATION EXAMPLE







Standard Parts for Fixture Systems

Self-Aligning Pads • adjustable

EH 22740.



PRODUCT DESCRIPTION

Self-aligning pads are used as stop, support and thrust pad and are suitable for installation in clamping elements.

Material

Ball
- Ball-bearing steel, hardened, bright

Body
- Heat-treated steel, tempered, phosphated

Nut
- Steel, blackened (ISO 4035)

MORE INFORMATION

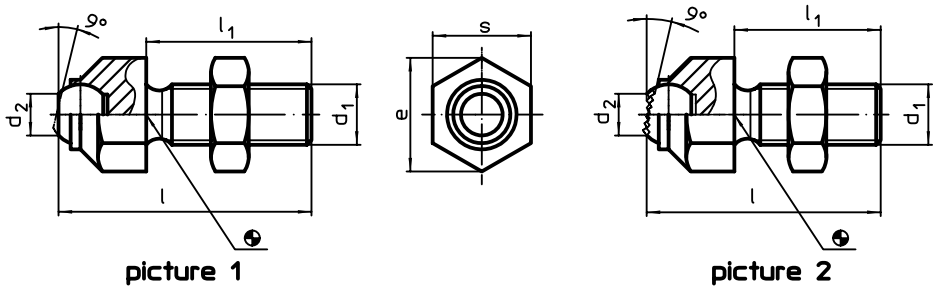
Notes

Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.
Special types on request.

Further products

Complete Range . . . . . → p. 320

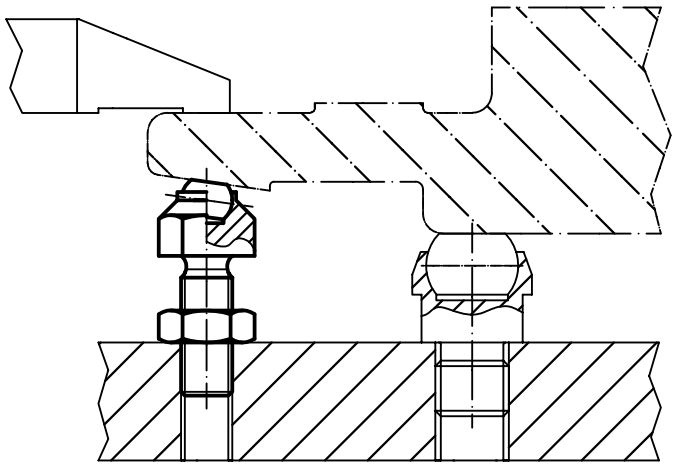
DRAWING



ORDER INFORMATION

System	Dimensions							Load capacity for static load max.	Tightening torque max.		Art. No.
	s	d_1	l	l_1	d_2	e	Ball				heat-treated steel
	[mm]							[kN]	[Nm]	[g]	
with flat-faced ball, plain surface – picture 1											
V40	**13**	**M 8**	36,6	25	5,8	14,5	8,5	8	25	20	22740.0013
V70	**17**	**M10**	45,7	30	8,6	19,0	12,0	8	46	44	22740.0016
V70/L12	**17**	**M12**	50,7	35	8,6	19,0	12,0	15	82	56	22740.0017
V70/L16	**24**	**M16**	60,7	40	10,5	27,0	16,0	25	206	128	22740.0024
with flat-faced ball, ribbed surface – picture 2											
V40	**13**	**M 8**	36,6	25	5,8	14,5	8,5	8	25	20	22740.0313
V70	**17**	**M10**	45,7	30	8,6	19,0	12,0	8	46	44	22740.0316
V70/L12	**17**	**M12**	50,7	35	8,6	19,0	12,0	15	82	56	22740.0317
V70/L16	**24**	**M16**	60,7	40	10,5	27,0	16,0	25	206	128	22740.0324

APPLICATION EXAMPLE



Self-Aligning Pads • adjustable, self-resetting

EH 22741.



PRODUCT DESCRIPTION

Self-aligning pads are used as stop, support and thrust pad and are suitable for installation in clamping elements.
By resetting to the parallel position the contact point of the self-aligning pad provides a defined initial position, thus preventing the pad clamping in an oblique position when inserting the workpiece.

Material

Spring element
- Thermoplastic PUR

Ball
- Ball-bearing steel, hardened, bright

Body
- Heat-treated steel, tempered, phosphated

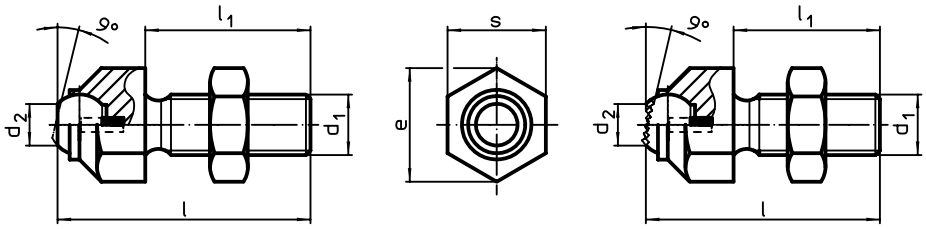
Nut
- Steel, blackened (ISO 4035)

MORE INFORMATION

Notes
Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.
Special types on request.

Further products
Complete Range . . . . . → p. 321

DRAWING



picture 1 picture 2

ORDER INFORMATION

System	Dimensions							Load capacity for static load max.	Tightening torque max.		Art. No.
	s	d_1	l	l_1	d_2	e	Ball				heat-treated steel
	[mm]							[kN]	[Nm]	[g]	
with flat-faced ball, plain surface – picture 1											
V40	**13**	**M 8**	36,6	25	5,8	14,5	8,5	8	25	19	22741.0013
V70	**17**	**M10**	45,7	30	8,6	19,0	12,0	8	46	43	22741.0016
V70/L12	**17**	**M12**	50,7	35	8,6	19,0	12,0	15	82	55	22741.0017
V70/L16	**24**	**M16**	60,7	40	10,5	27,0	16,0	25	206	124	22741.0024
with flat-faced ball, ribbed surface – picture 2											
V40	**13**	**M 8**	36,6	25	5,8	14,5	8,5	8	25	19	22741.0313
V70	**17**	**M10**	45,7	30	8,6	19,0	12,0	8	46	43	22741.0316
V70/L12	**17**	**M12**	50,7	35	8,6	19,0	12,0	15	82	55	22741.0317
V70/L16	**24**	**M16**	60,7	40	10,5	27,0	16,0	25	206	124	22741.0324

Standard Parts for Fixture Systems

Nuts for T-Slots • DIN 508

EH 23010.



PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, quality 10, blackened

Assembly

The entire loading capacity of the T-nut can only be applied if the screwing is guaranteed to be made over the total thread length of the T-nut.

MORE INFORMATION

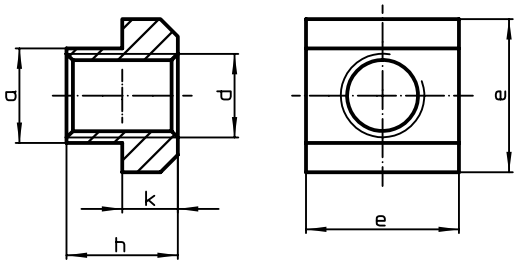
Notes

Special types on request.

Further products

Complete Range . . . . . → p. 362

DRAWING



ORDER INFORMATION

System	T-slot size	Dimensions d	a	e	h	k	For T-slots DIN 650	Testing force to DIN 508 F min.		Art. No. heat-treated steel
	[mm]	[mm]					[mm]	[kN]	[g]	
V70	14	M 6	13,6	22	16	8	14	16	46	23010.0146[1]
		M 8	13,6	22	16	8	14	29	41	23010.0145[1]
		M10	13,6	22	16	8	14	46	37	23010.0144[1]
		M12	13,6	22	16	8	14	67	34	23010.0142
L16	18	M16	17,6	28	20	10	18	128	68	23010.0182

[1] DIN standards do not include these dimensions.

8

Nuts for T-Slots • extended

EH 23020.



PRODUCT DESCRIPTION

Material

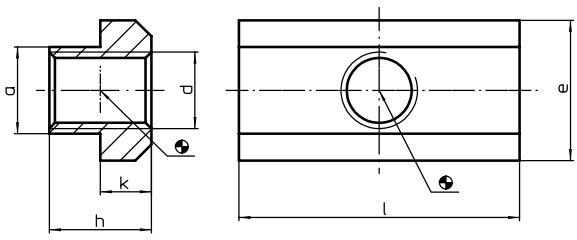
- Heat-treated steel, tempered, quality 10, blackened

MORE INFORMATION

Further products

Complete Range . . . . . → p. 366

DRAWING

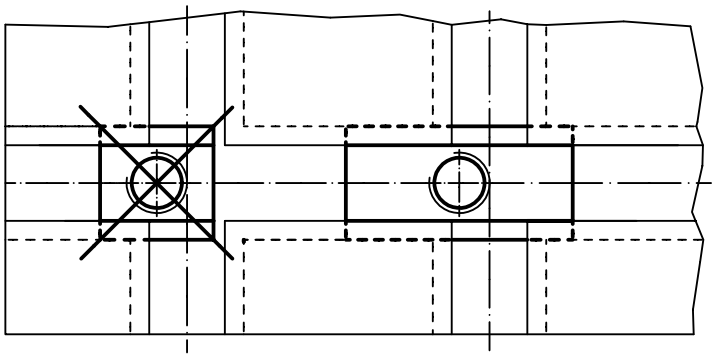


ORDER INFORMATION

System	T-slot size	Dimensions d	a	e	l	h	k		Art. No.
	[mm]	[mm]						[g]	
V70	14	M 6	13,6	22	44	16	8	95	23020.0146
		M12	13,6	22	44	16	8	81	23020.0140
L16	18	M16	17,6	28	56	20	10	164	23020.0180

Standard Parts for Fixture Systems

APPLICATION EXAMPLE



Nuts for T-Slots • rhombus

EH 23020.



PRODUCT DESCRIPTION

Material

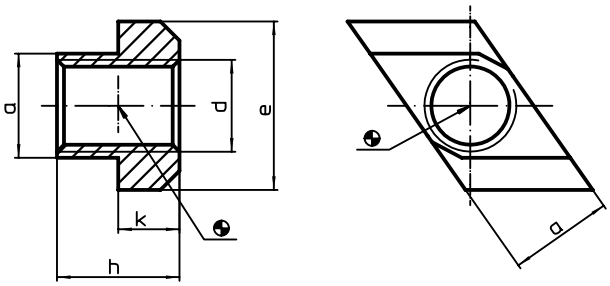
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . . → p. 367

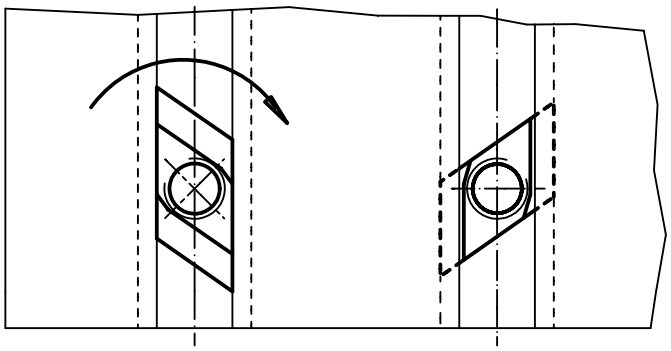
DRAWING



ORDER INFORMATION

System	T-slot size	Dimensions						Art. No.
		d	a	e	h	k		
	[mm]	[mm]					[g]	
V70	**14**	**M12**	13,6	22	16	8	23	**23020.0640**

APPLICATION EXAMPLE



Studs • DIN 6379 b_1 long for T-nuts

EH 23040.



PRODUCT DESCRIPTION

Studs combined with T-nuts DIN 508 (EH 23010./23020.), fixture nuts DIN 6330 (EH 23070.) and plain washers DIN 6340 (EH 23060.) become complete clamping studs.

Material

- Heat-treated steel

MORE INFORMATION

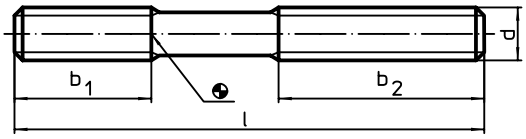
References

For torques and strengths please refer to appendix - Technical Data -

Further products

Complete Range . . . . . → p. 373
Nuts for T-Slots, DIN 508 . . . . . → p. 362
Studs, DIN 6379 for T-Nuts . . . . . → p. 371
Shaft / Plain Washers, DIN 6340 heat-treated . . . . . → p. 380
Fixture Nuts, DIN 6330 (height 1,5 d) . → p. 383

DRAWING



ORDER INFORMATION

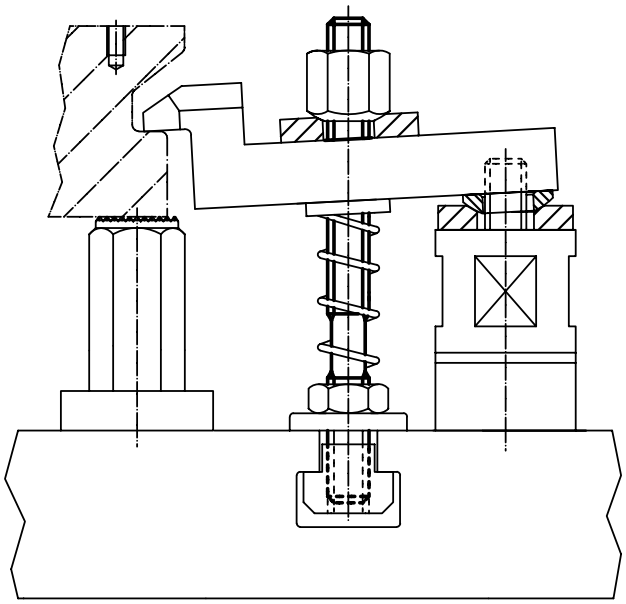
System	Dimensions d	l [mm]	b_1 [mm]	b_2 [mm]	[g]	Art. No.
quality 10.9						
V40	**M 8**	**63**	20	40	19	23040.0582
		100	20	63	31	23040.0583
		160	20	100	49	23040.0584
V70	**M10**	**80**	25	50	39	23040.0602
		100	25	75	49	23040.0603
		125	25	75	61	23040.0604
		160	25	100	78	23040.0605[1]
		200	25	122	98	23040.0606
V70/L12	**M12**	**63**[2]	–	–	44	23040.0622
		80[2]	–	–	56	23040.0623
		100	30	63	70	23040.0624[1]
		125	30	75	88	23040.0625
		160	30	100	112	23040.0626
		200	30	122	140	23040.0627
quality 8.8						
V70/L16	**M16**	**80**[2]	–	–	103	23040.0662
		125	40	63	161	23040.0664
		160	40	75	207	23040.0665
		200	40	100	260	23040.0666[1]
		250	40	125	325	23040.0667

[1] DIN standards do not include these dimensions.
[2] Throughgoing thread

8

Standard Parts for Fixture Systems

APPLICATION EXAMPLE



Spherical Washers / Conical Seats • DIN 6319

EH 23050.



PRODUCT DESCRIPTION

Material

Conical seat
- Heat-treated steel, tempered, manganese phosphated

Spherical washer
- Case-hardened steel, case-hardened, manganese phosphate treated

Assembly

Conical seats form D are to be used only for plain, closed round areas.
For larger holes only use form G!

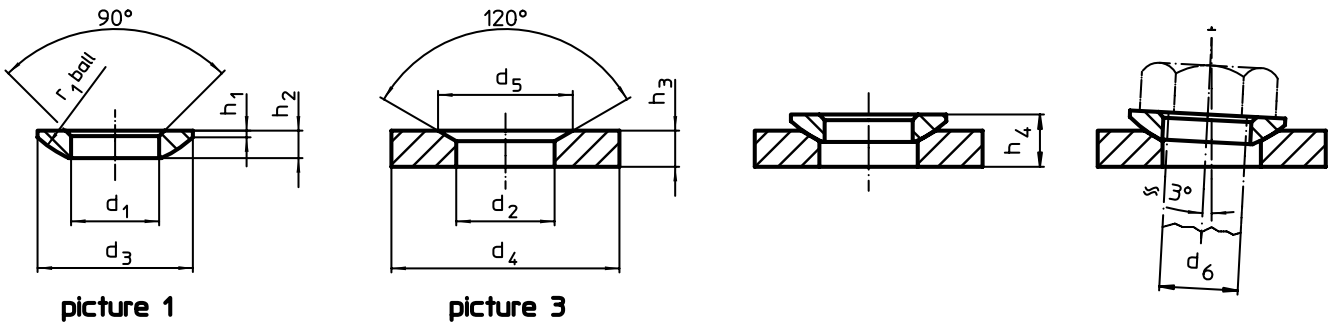
MORE INFORMATION

Further products

Complete Range . . . . . → p. 375
Spherical Washers / Conical Seats, DIN 6319 . . . . . → p. 375
Spherical Washers / Conical Seats, similar to DIN 6319, stainless steel . . . → p. 377
Fixture Nuts, DIN 6330 (height 1,5 d) . → p. 383

8

DRAWING



ORDER INFORMATION

System	Dimensions										For pins d_6	For screws d_6	Load capacity for static load max.	Torque for screwed connections[1] max.		Art. No.
	d_1 H13	d_2 H13	d_3	d_4	d_5	h_1	h_2	h_3	h_4 with conical seat form G ~	r_1						
	[mm]										[mm]	[mm]	[kN]	[Nm]	[g]	
spherical washers from case-hardened steel, form C – picture 1																
V40	**8,4**	–	17	–	–	0,6	3,2	–	7,1	12	8	M 8	17	25	2,8	**23050.0008**
V70	**10,5**	–	21	–	–	0,8	4,0	–	7,3	15	10	M10	26	46	5,3	**23050.0010**
V70/L12	**13,0**	–	24	–	–	1,1	4,6	–	9,0	17	12	M12	38	82	7,6	**23050.0012**
V70/L16	**17,0**	–	30	–	–	1,3	5,3	–	10,4	22	16	M16	73	206	13,0	**23050.0016**

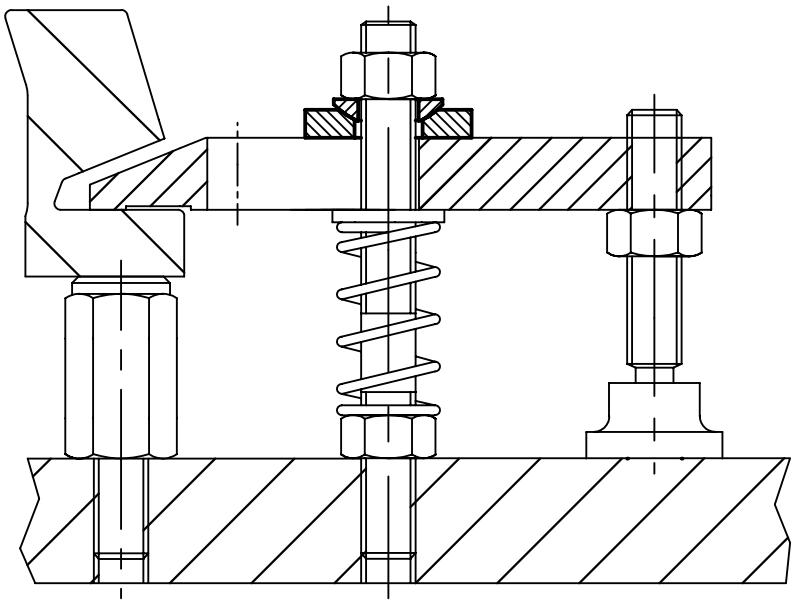
[1] Torques of screws 8.8, eventual pre-loads to be conisdered, coefficient of friction μ_{total} 0,14.

Standard Parts for Fixture Systems

System	Dimensions										For pins	For screws	Load capacity for static load	Torque for screwed connec-tions[1]		Art. No.
	d_1 H13	d_2 H13	d_3	d_4	d_5	h_1	h_2	h_3	h_4 with conical seat form G ~	r_1	d_6	d_6	max.	max.		
	[mm]										[mm]	[mm]	[kN]	[Nm]	[g]	
conical seats from heat-treated steel, form G – picture 3																
V40	–	**9,6**	–	24	14,5	–	–	5	–	–	8	M 8	17	25	14,0	23050.0208
V70	–	**12,0**	–	30	18,5	–	–	5	–	–	10	M10	26	46	22,0	23050.0210
V70/L12	–	**14,2**	–	36	20,0	–	–	6	–	–	12	M12	38	82	39,0	23050.0212
V70/L16	–	**19,0**	–	44	26,0	–	–	7	–	–	16	M16	73	206	65,0	23050.0216

[1] Torques of screws 8.8, eventual pre-loads to be conisdered, coefficient of friction μ_{total} 0,14.

APPLICATION EXAMPLE



Shaft / Plain Washers • DIN 6340 heat-treated

EH 23060.



PRODUCT DESCRIPTION

Material

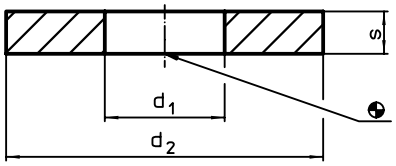
- Heat-treated steel, tempered, punched, mechanically trued, phosphatized

MORE INFORMATION

Further products

Complete Range . . . . . → p. 380

DRAWING



ORDER INFORMATION

System	Dimensions			For screws		Art. No.
	d_1	d_2	s			
	[mm]			[mm]	[g]	
V40	**8,4**	23	4	M 8	9,8	23060.0008
V70	**10,5**	28	4	M10	14,0	23060.0010
V70/L12	**13,0**	35	5	M12	28,0	23060.0012
V70/L16	**17,0**	45	6	M16	55,0	23060.0016

Fixture Nuts • DIN 6330 (height 1,5 d)

EH 23070.



PRODUCT DESCRIPTION

The spherical face matches DIN 6319 conical seats (EH 23050.).
This combination enables compensating for uneven surfaces.

Material

- Heat-treated steel, tempered, quality 10, phosphated

MORE INFORMATION

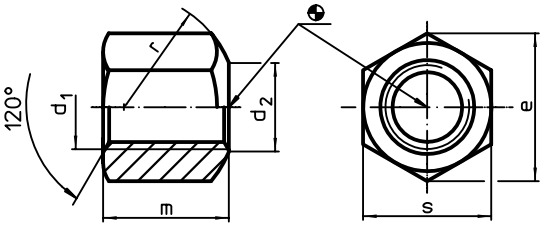
References

For torques and strengths please refer to appendix - Technical Data -

Further products

Complete Range . . . . . → p. 383

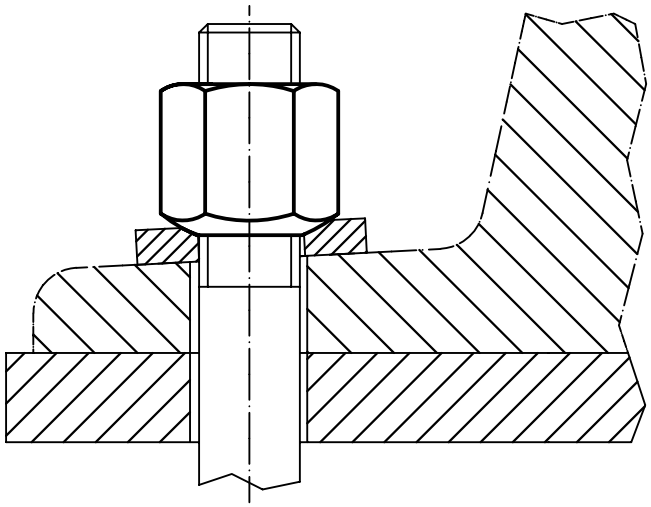
DRAWING



ORDER INFORMATION

System	Dimensions							Art. No.
	d_1	d_2	e	m	r	s		heat-treated steel
	[mm]						[g]	
with lateral spherical bearing surface, form B								
V40	**M 8**	9,0	15,0	12	11	13	8,4	23070.0008
V70	**M10**	11,5	18,5	15	15	16	17,0	23070.0010
V70/L12	**M12**	14,0	20,8	18	17	18	24,0	23070.0012
V70/L16	**M16**	18,0	27,7	24	22	24	55,0	23070.0016

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Collar Nuts • DIN 6331 (height 1,5 d)

EH 23080.



PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, quality 10, phosphated

MORE INFORMATION

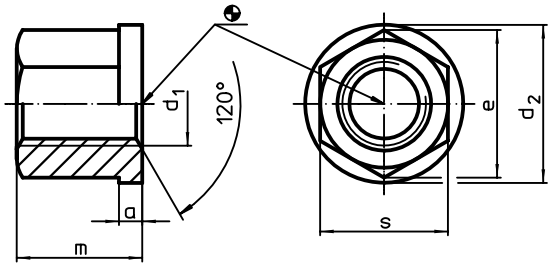
References

For torques and strengths please refer to appendix - Technical Data -

Further products

Complete Range . . . . . → p. 384

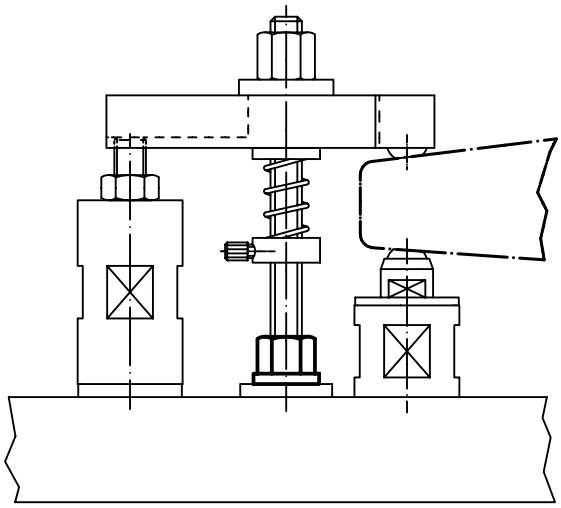
DRAWING

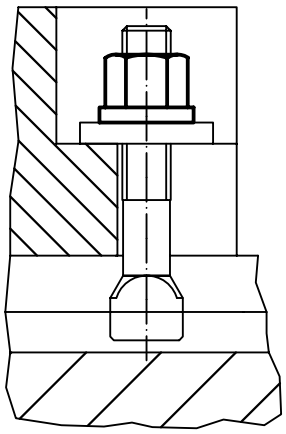


ORDER INFORMATION

System	Dimensions							Art. No.
	d_1	a	d_2	e	m	s		heat-treated steel
	[mm]						[g]	
V40	**M 8**	3,5	18	15,0	12	13	12	23080.0008
V70	**M10**	4,0	22	18,5	15	16	22	23080.0010
V70/L12	**M12**	4,0	25	20,8	18	18	30	23080.0012
V70/L16	**M16**	5,0	31	27,7	24	24	67	23080.0016

APPLICATION EXAMPLE





8

Standard Parts for Fixture Systems

Collar Nuts with Conical Seat

EH 23080.





PRODUCT DESCRIPTION

Material

Conical seat
- Heat-treated steel, tempered, blackened

Nut
- Heat-treated steel, tempered, blackened

MORE INFORMATION

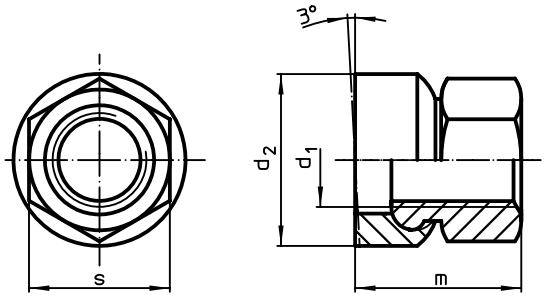
References

For torques and strengths please refer to appendix - Technical Data -

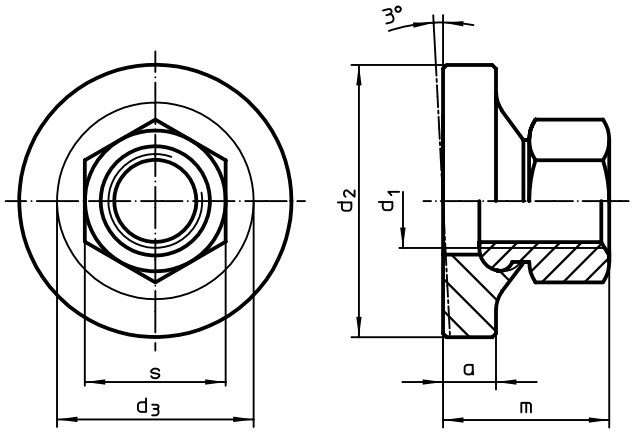
Further products

Complete Range . . . . . → p. 385

DRAWING



picture 1

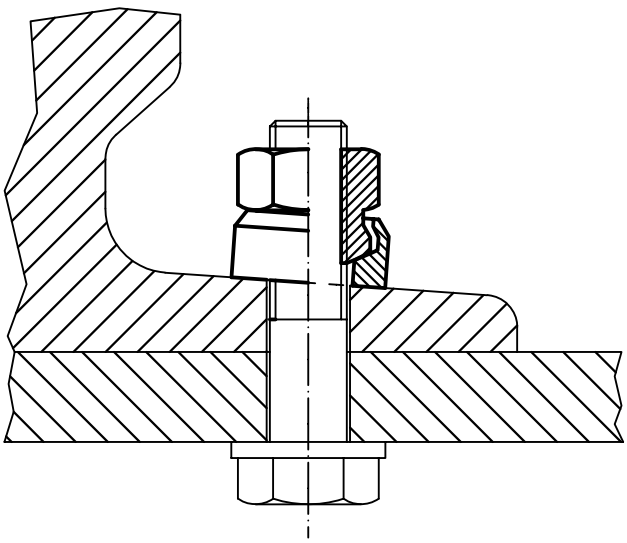


picture 2

ORDER INFORMATION

System	Dimensions					s		Art. No.
	d_1	a	d_2	d_3	m ~			
	[mm]					[mm]	[g]	
with small surface – picture 1								
V40	**M 8**	–	17	–	14,0	13	13	23080.0508
V70	**M10**	–	21	–	17,5	16	24	23080.0510
V70/L12	**M12**	–	24	–	21,5	18	38	23080.0512
V70/L16	**M16**	–	30	–	28,0	24	75	23080.0516
with large surface – picture 2								
V40	**M 8**	4,0	24	17,8	14,0	13	20	23080.0608
V70	**M10**	5,5	30	21,2	17,5	16	40	23080.0610
V70/L12	**M12**	7,0	36	25,2	21,5	18	69	23080.0612
V70/L16	**M16**	8,0	44	30,9	28,0	24	126	23080.0616

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Extension Nuts • (height 3 d)

EH 23090.



PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, quality 10, phosphated

MORE INFORMATION

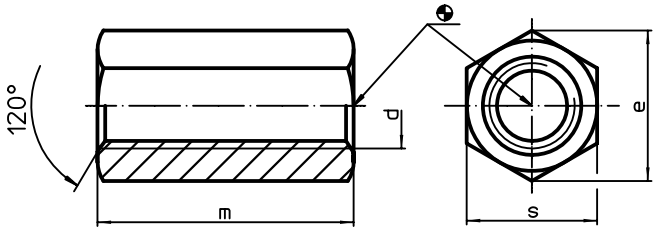
References

For torques and strengths please refer to appendix - Technical Data -

Further products

Complete Range . . . . . → p. 386

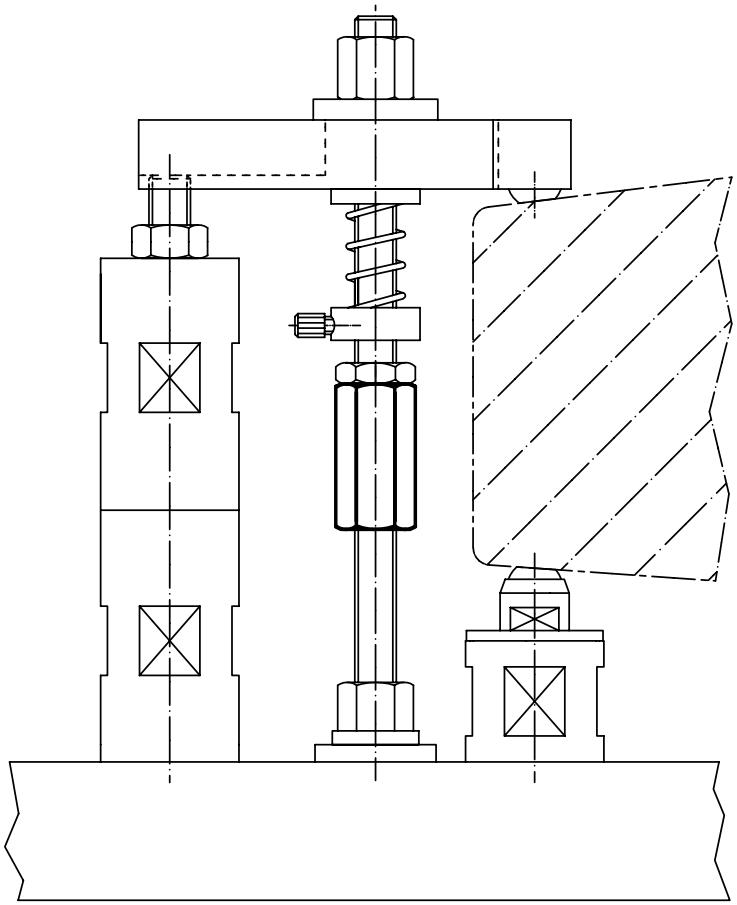
DRAWING



ORDER INFORMATION

System	Dimensions					Art. No.
	d	e	m	s		
		[mm]			[g]	
V40	**M 8**	15,0	24	13	19	**23090.0008**
V70	**M10**	18,5	30	16	35	**23090.0010**
V70/L12	**M12**	20,8	36	18	49	**23090.0012**
V70/L16	**M16**	27,7	48	24	119	**23090.0016**

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Fixed Slot Tenons • with cylindrical fastening

EH 23110.



PRODUCT DESCRIPTION

To be used for locating fixtures and clamping elements onto mounting pallets or pallets with cylindrical location holes.
They can be inserted in holes as well as in slots.

Material

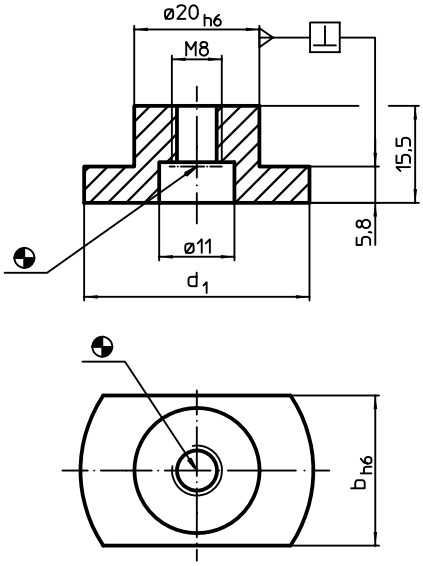
- Steel, case-hardened, blackened, ground

MORE INFORMATION

Further products

Complete Range . . . . . → p. 389

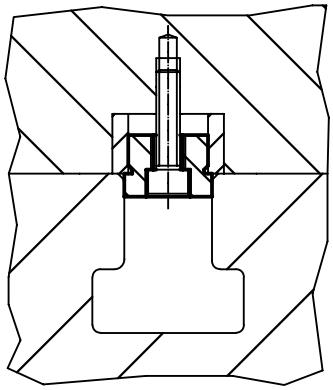
DRAWING



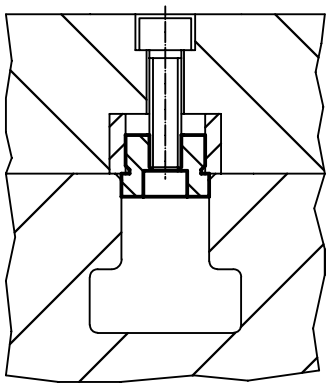
ORDER INFORMATION

System	T-slot size machine b h6 [mm]	Dimensions d_1 [mm]	For screws ISO 4762 (picture 1) [mm]	For screws ISO 4762 (picture 2) [mm]	[g]	Art. No.
V40/V70/L12/L16	**12**	30	M6	M8	39	23110.0112
	14	30	M6	M8	41	23110.0114
	16	30	M6	M8	36	23110.0116
	18	30	M6	M8	45	23110.0118
	20	36	M6	M8	48	23110.0120

APPLICATION EXAMPLE



picture 1



picture 2

Standard Parts for Fixture Systems

Centering Pins

EH 23110.



PRODUCT DESCRIPTION

The centering pins are used for centering fixtures on pallets.

Material

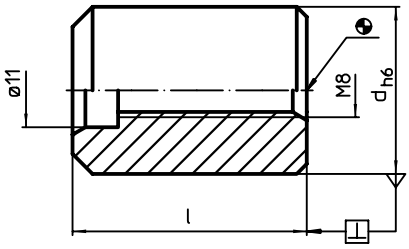
- Alloyed case-hardened steel, case hardened, ground

MORE INFORMATION

Further products

Complete Range . . . . . → p. 390

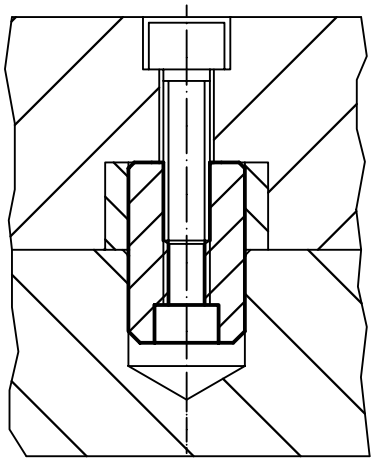
DRAWING

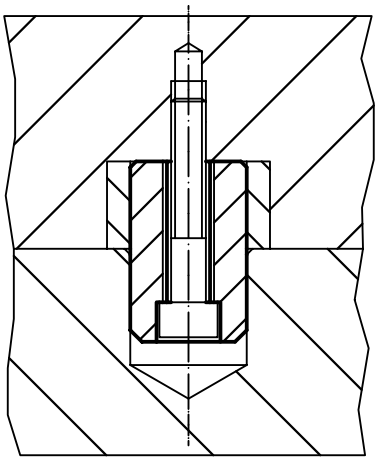


ORDER INFORMATION

System	Dimensions d h6 [mm]	Dimensions l [mm]	[g]	Art. No.
V40/V70/L12/L16	**20**	**31**	70	**23110.0510**
V70	**25**	**35**	118	**23110.0520**
V40/V70	**50**	**31**	473	**23110.0530**
V70	**50**	**45**	672	**23110.0540**

APPLICATION EXAMPLE





Centering Pins • stepped
EH 23110.

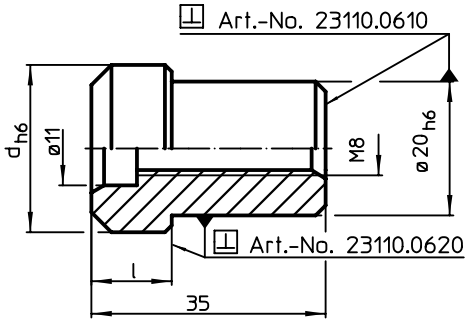


PRODUCT DESCRIPTION
The stepped centering pins are used for centering fixtures on pallets.

Material
- Alloyed case-hardened steel, case hardened, ground

MORE INFORMATION
Further products
Complete Range . . . . . → p. 391

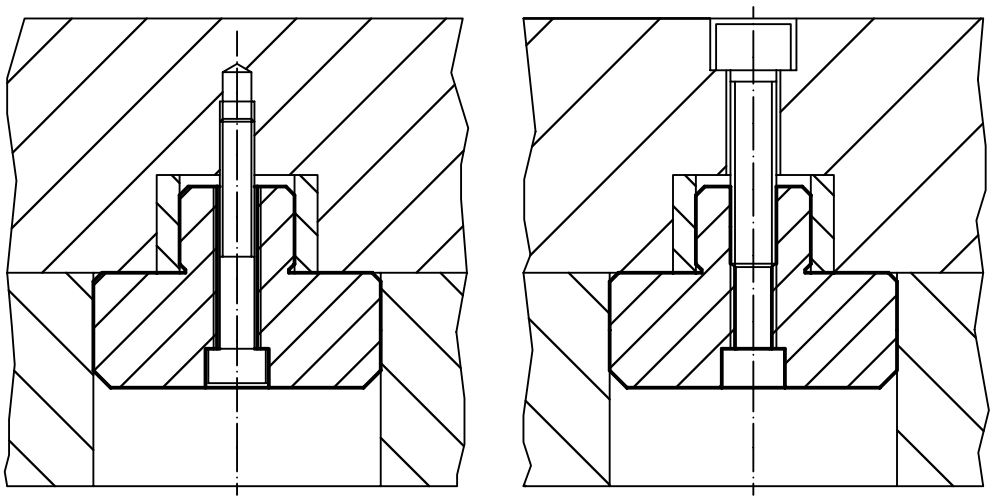
DRAWING



ORDER INFORMATION

System	Dimensions d h6 [mm]	Dimensions l [mm]	[g]	Art. No.
V70/L12/L16	**25**	**12**	87	**23110.0610**
	50	**20**	330	**23110.0620**

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Loose Slot Tenons • DIN 6323

EH 23120.



PRODUCT DESCRIPTION

To be used for locating fixtures and clamping elements onto machine tables with T-slots to DIN 650.
Being simply pushed into position after fixture or clamping element has been roughly positioned, they cannot cause damage to the machine as could protruding fixed slot tenons or low slot tenons.

Material

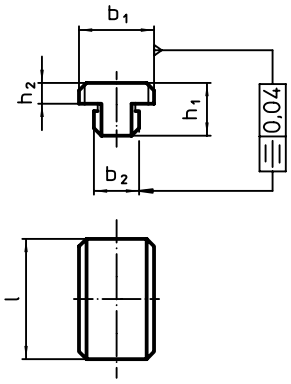
- Steel, case-hardened, blackened, ground

MORE INFORMATION

Further products

Complete Range . . . . . → p. 392

DRAWING

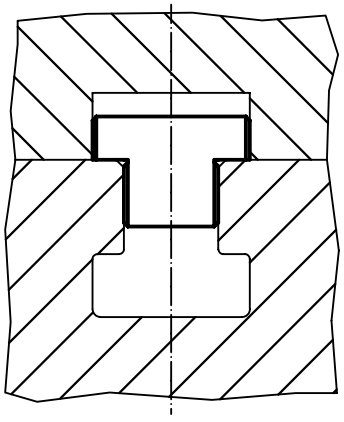


picture 1

ORDER INFORMATION

System	T-slot size fixture b_1 h6	T-slot size machine b_2 h6	Dimensions h_1	h_2	l		Art. No.
	[mm]	[mm]		[mm]		[g]	
form A, $b_1 > b_2$ – picture 1							
V40/V70	**20**	**12**	14	5,5	32	52	23120.0012
		14	14	5,5	32	56	23120.0014
		16	14	5,5	32	60	23120.0016
		18	14	5,5	32	65	23120.0018

APPLICATION EXAMPLE



Clamps • DIN 6315 B forked

EH 23150.



PRODUCT DESCRIPTION

Material

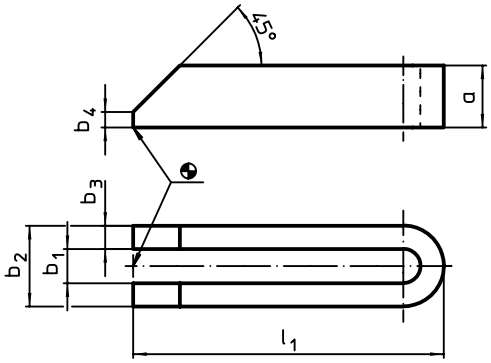
- Heat-treated steel, varnished

MORE INFORMATION

Further products

Complete Range . . . . . → p. 408

DRAWING



ORDER INFORMATION

System	Nominal dimension b_1	Dimensions					For screws			Art. No.
		l_1	a	b_2	b_3	b_4				
	[mm]	[mm]					[mm]	[inch]	[g]	
V40	**9**	**80**	15	25	8	4	M 8	5/16	141	23150.0009
V70/L12	**14**	**125**	25	38	12	6	M12, M14	1/2	578	23150.0014
		160	25	38	12	6	M12, M14	1/2	715	23150.0015
		200	25	38	12	6	M12, M14	1/2	905	23150.0016
	18	**160**	30	48	15	8	M16, M18	5/8	1077	23150.0018
		200	30	48	15	8	M16, M18	5/8	1346	23150.0019
		250	40	48	15	10	M16, M18	5/8	2300	23150.0020

Standard Parts for Fixture Systems

Clamps • with nose

EH 23180.



PRODUCT DESCRIPTION

Material

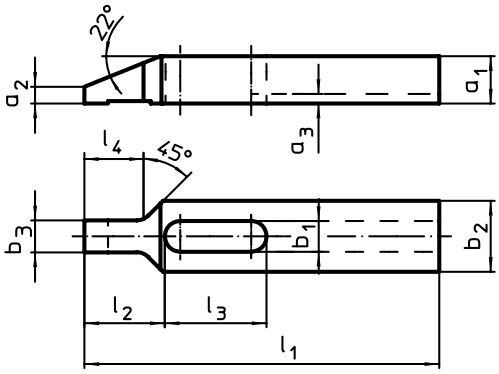
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . . → p. 413

DRAWING

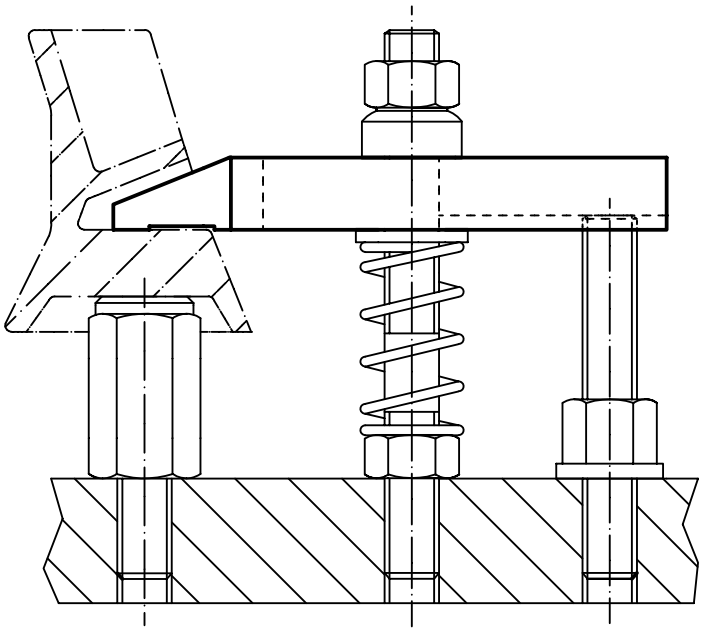


picture 2

ORDER INFORMATION

System	Nominal dimension b_1	Dimensions										Art. No.
	[mm]	l_1	a_1	a_2	a_3	b_2	b_3	l_2	l_3	l_4	[g]	
with keyway – picture 2												
V40	**9**	**100**	12	4	3,0	20	9,5	22	29	17	127	**23180.0209**
V70	**11**	**125**	15	5	3,5	25	11,5	28	36	21	251	**23180.0211**
V70/L12	**13**	**150**	20	7	4,0	30	13,5	34	43	25	488	**23180.0213**
V70/L16	**17**	**175**	25	9	4,5	35	15,5	40	52	29	812	**23180.0217**

APPLICATION EXAMPLE



Clamping Element Systems

EH 23700.



PRODUCT DESCRIPTION

Material

Body
- Steel, blackened

Wearing parts
- Heat-treated steel

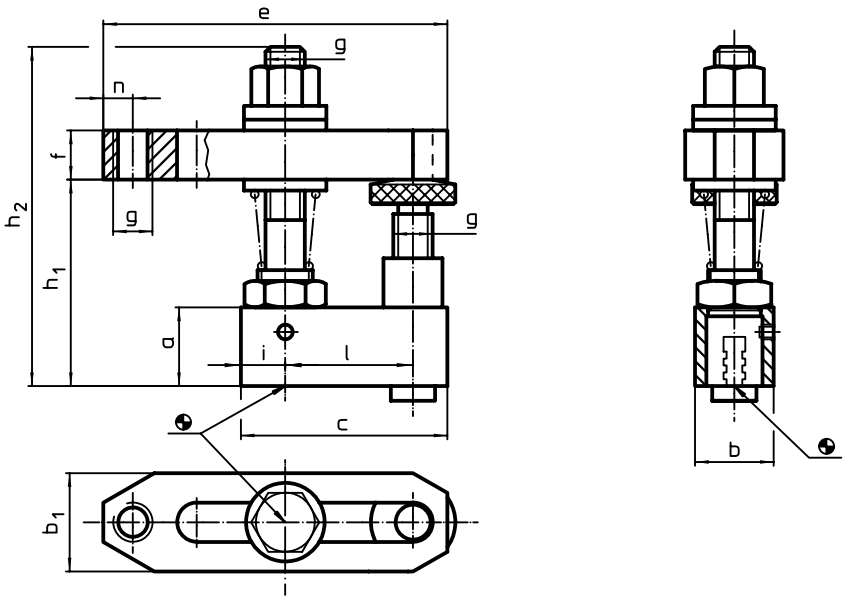
Pull-rod
- Special steel

MORE INFORMATION

Further products

Complete Range . . . . . → p. 424
Straight Clamps, long . . . . . → p. 427
Intermediate Elements. . . . . → p. 428
Intermediate Elements, with support . . → p. 429
Base Elements . . . . . → p. 430
Base Elements, swivelling. . . . . → p. 431
Base Elements, low. . . . . → p. 432
Base Elements, for location hole. . . . . → p. 433

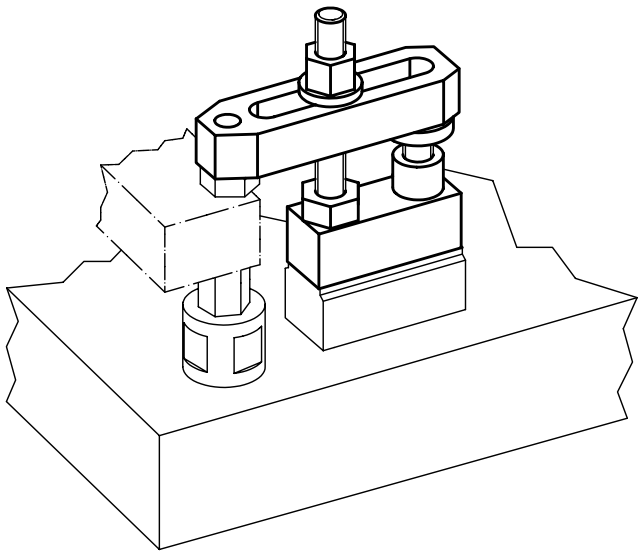
DRAWING



ORDER INFORMATION

System	Dimensions													Art. No.
	a	b	c	b_1	e	f	g	h_1	h_2	i	l	n		
	[mm]												[g]	
V70/L12	**25**	**25**	**65**	35	110	20	M12	48 – 78	112	12,5	40	10	860	23700.0012
L16	**30**	**30**	**78**	40	142	30	M16	60 – 96	145	14,0	50	13	1698	23700.0016

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Straight Clamps • long

EH 23700.



PRODUCT DESCRIPTION

Material

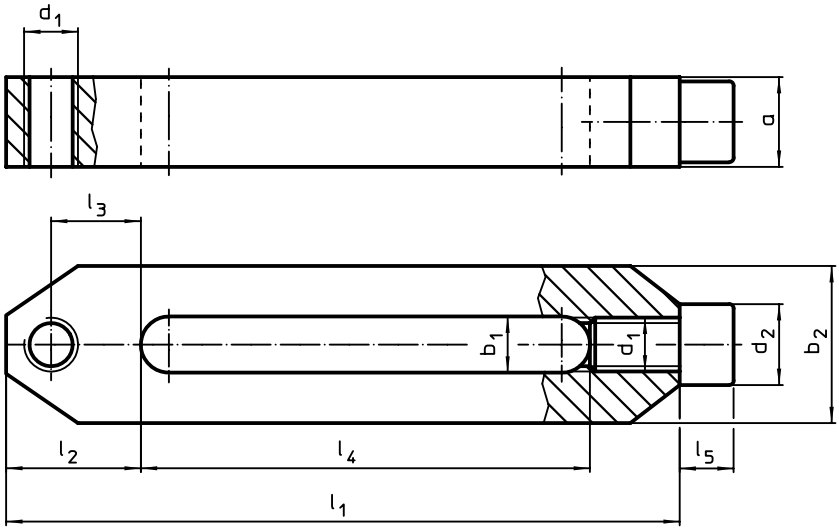
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . . → p. 427

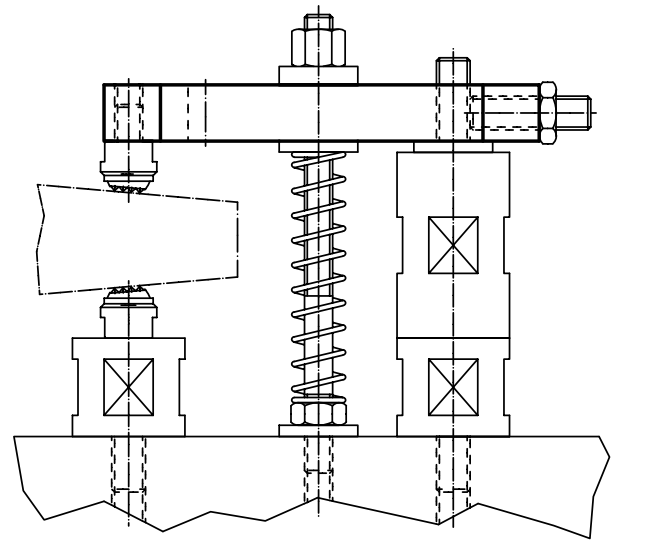
DRAWING

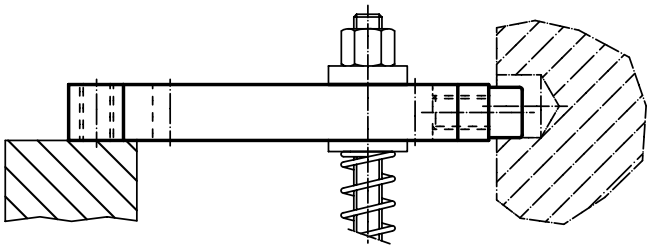


ORDER INFORMATION

System	Dimensions [mm]											Art. No.
	b_1	l_1	a	b_2	d_1	l_2	l_3	l_4	l_5	d_2	[g]	
V70/L12	**12,5**	**156**	20	35,0	M12	30	20	106	12	18	595	23700.0042
V70/L16	**17,0**	**196**	30	45,5	M16	35	22	136	16	24	1422	23700.0046

APPLICATION EXAMPLE





Intermediate Elements

EH 23700.



PRODUCT DESCRIPTION

Material

Body
- Steel, blackened

Wearing parts
- Heat-treated steel

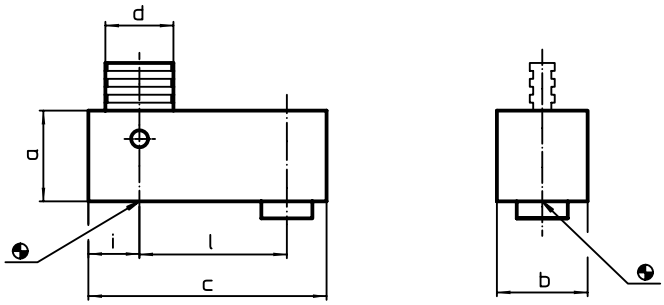
Pull-rod
- Special steel

MORE INFORMATION

Further products

Complete Range . . . . . → p. 428

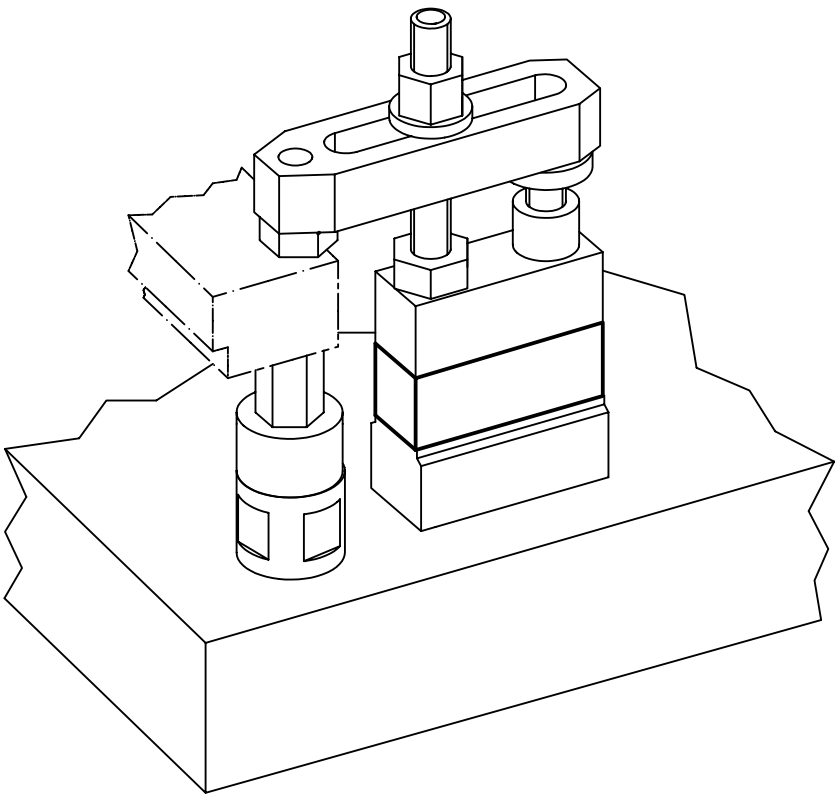
DRAWING



ORDER INFORMATION

System	Dimensions [mm]						[g]	Art. No.
	a	b	c	d	i	l		
V70/L12	**25**	**25**	**65**	16	12,5	40	261	**23700.0121**
	50	**25**	**65**	16	12,5	40	574	**23700.0122**
	100	**25**	**65**	16	12,5	40	1201	**23700.0123**
L16	**30**	**30**	**78**	22	14,0	50	468	**23700.0161**
	60	**30**	**78**	22	14,0	50	1032	**23700.0162**
	120	**30**	**78**	22	14,0	50	2100	**23700.0163**
	240	**30**	**78**	22	14,0	50	4340	**23700.0164**

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Base Elements

EH 23700.



PRODUCT DESCRIPTION

Material

Body
- Steel, blackened

Wearing parts
- Heat-treated steel

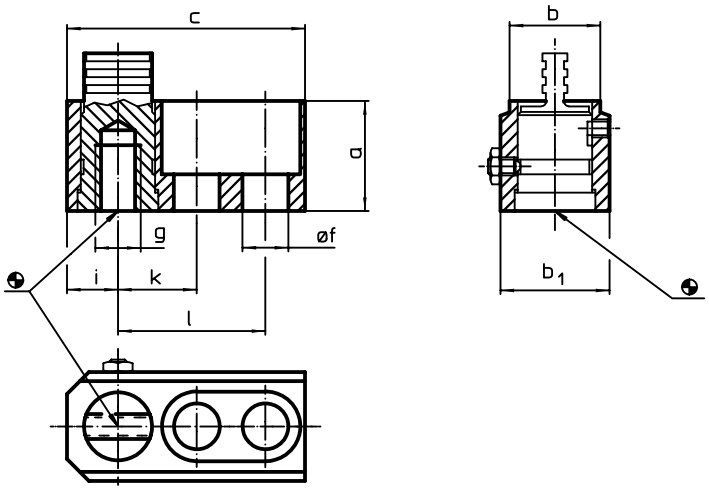
Pull-rod
- Special steel

MORE INFORMATION

Further products

Complete Range . . . . . → p. 430

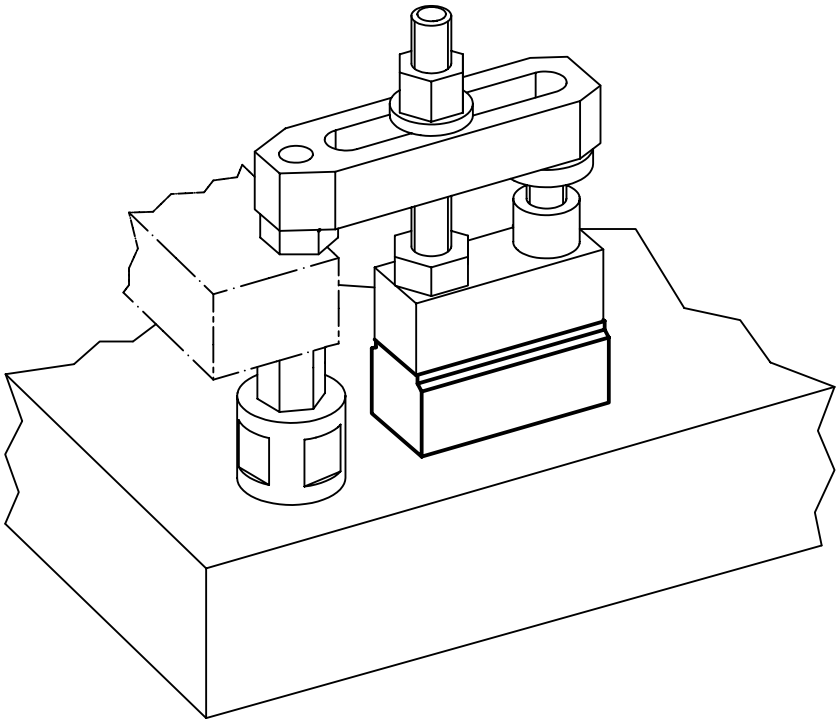
DRAWING



ORDER INFORMATION

System	Dimensions										Art. No.
	a	b	c	b_1	f	g	i	k	l	[g]	
	[mm]										
V70/L12	**30**	**25**	**65**	30	12,5	M12	12,5	20	40	297	23700.0312
L16	**40**	**30**	**80**	40	17,0	M16	16,0	25	50	641	23700.0316

APPLICATION EXAMPLE



Down-Hold Clamps • without clamping lever

EH 23210.



PRODUCT DESCRIPTION

By tightening the ball-ended thrust screw the workpiece is simultaneously pressed towards the stops and fixture plate. The favourable leverage enables high horizontal clamping forces. When using T-nuts EH 23010. / EH 23020. (DIN 508) they can also be applied to other slot sizes.

Material

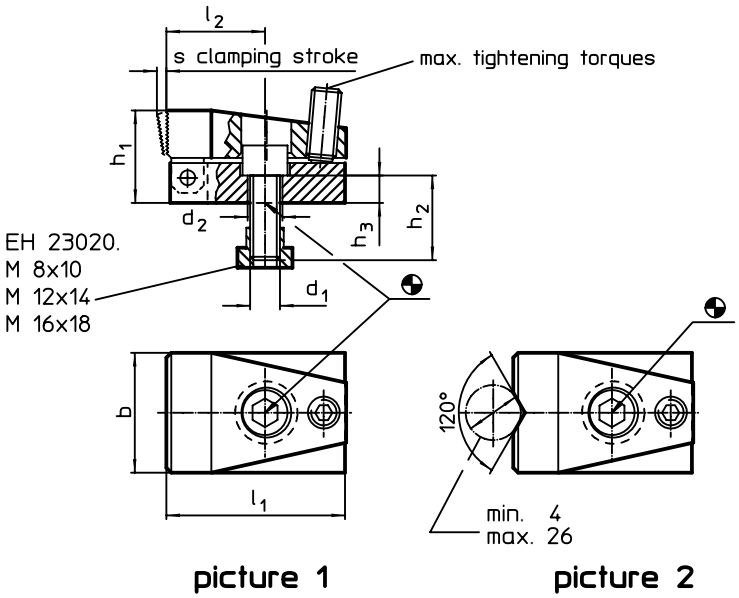
- Steel, case-hardened, blackened, ground

MORE INFORMATION

Further products

Complete Range . . . . . → p. 435
Nuts for T-Slots, DIN 508 . . . . . → p. 362
Nuts for T-Slots, extended. . . . . → p. 366

DRAWING

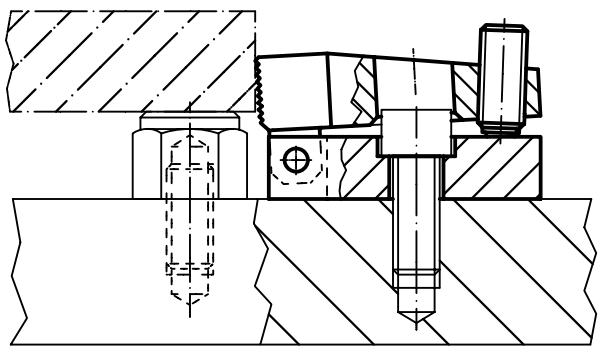


picture 1 picture 2

ORDER INFORMATION

System	T-slot size	Dimensions									Clamping force horizontal max.	Tightening torque max.		Art. No.
		d_1	d_2	b	h_1	h_2	h_3	l_1	l_2	s				
	[mm]	[mm]									[kN]	[Nm]	[g]	
with flat clamping jaw – picture 1														
V40	**10**	**M 8**	8,4	32	24	20	8	52	28	3	7,0	3	276	**23210.0501**
V70/ L12	**14**	**M12**	12,5	48	37	30	11	72	40	4	15,0	9	831	**23210.0521**
L16	**18**	**M16**	16,5	68	47	35	13	86	41	7	21,5	20	1749	**23210.0541**
with V-clamping jaw – picture 2														
V40	**10**	**M 8**	8,4	32	24	20	8	52	28	3	7,0	3	266	**23210.0502**
V70/ L12	**14**	**M12**	12,5	48	37	30	11	72	40	4	15,0	9	833	**23210.0522**
L16	**18**	**M16**	16,5	68	47	35	13	86	41	7	21,5	20	1730	**23210.0542**

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Stops • cylindrical

EH 23280.



PRODUCT DESCRIPTION

The T-slot guide enables a quick and precise location of the workpiece. The cylindrical form of the stop facilitates to determine the 0-point coordinate. The short form, which is ground to a height tolerance of ± 0,01 mm, can also be used for locating.

Material

Stop
- Steel, case-hardened, ground

Holding plate
- Steel, blackened

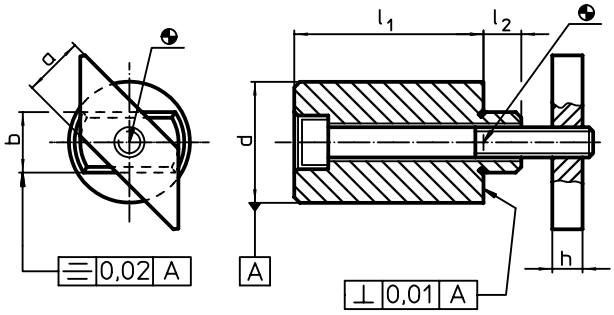
Screw
- Steel, quality 8.8 (ISO 4762)

MORE INFORMATION

Further products

Complete Range . . . . . → p. 453

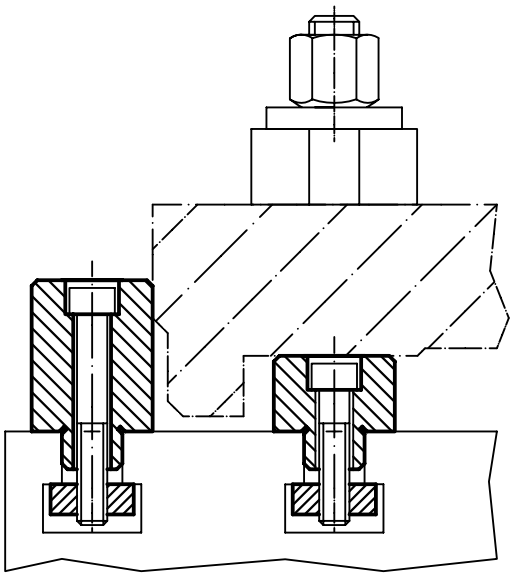
DRAWING



ORDER INFORMATION

System	T-slot size h6 [mm]	Dimensions [mm]					Screw ISO 4762 [mm]	[g]	Art. No.
		l_1	a -0,6	d ±0,01	h	l_2			
V70	**14**	**25 ±0,01**	14	32	8	9	M8 x 35	202	23280.0114
		50 ±0,20	14	32	8	9	M8 x 60	357	23280.0214

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Bedding Supports

EH 23220.



PRODUCT DESCRIPTION

The bedding support is used to **support** overdetermined clamping points on components.
The benefits of the bedding support are:

- Support for unstable components, without distortion
- Eliminate tool vibration during machining
- Compact, low construction
- Supports ribs, beads and shackles, for reinforcement of clamped components
- Distortion-free support of raw parts
- Easy handling
- Flat and long design allows clamping with adjustable clamping lever even outside the workpiece.

Material

Handle
- Zinc die-cast

Clamp
- Steel, case-hardened, blackened, ground

Operation

1. By releasing the clamping lever, the support bolt contacts the workpiece with a light spring load.
2. By clamping the clamping lever, the support pin is blocked without displacement.
3. The clamping lever is released after removal of the workpiece. Then push the support pin into the starting position and clamp using the lever.

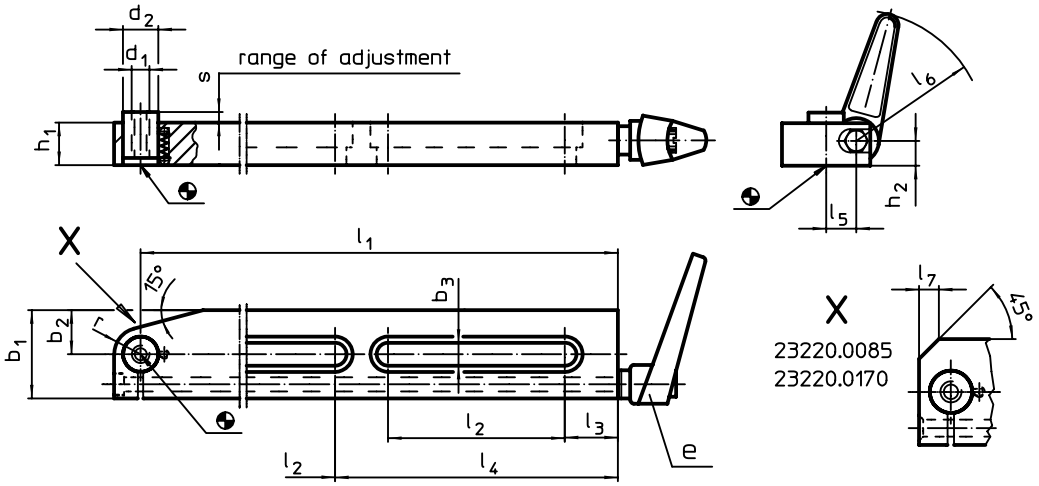
By screwing grub screws or supports into the support pin's female thread, the support height can be adjusted.

MORE INFORMATION

Further products

Complete Range . . . . . → p. 458

DRAWING



Sizes 8,5 x 75, 13 x 150 and 17 x 170 have only one slot.

ORDER INFORMATION

System	Dimensions [mm]															Stroke s [mm]	Load capacity max. [kN]	e	[g]	Art. No.
	b_3	l_1	l_2	l_3	l_4	l_5	l_6	l_7	b_1	b_2	d_1	d_2	h_1	h_2	r					
V40	**8,5**	**75**	35	13	–	13	62	5	30	10	M 8	13	19,5	11,5	–	3	0,5	24400.0311	342	23220.0085
V70/ L12	**13,0**	**150**	90	20	–	17	74	–	50	25	M10	20	24,0	14,0	15	6	2,5	24400.0411	1159	23220.0150
L16	**17,0**	**170**	100	25	–	27	108	11	60	20	M16	26	34,0	21,5	–	11	5,0	24400.0611	2534	23220.0170
V70/ L12	**13,0**	**300**	100	30	160	17	74	–	50	25	M10	20	24,0	14,0	15	6	2,5	24400.0411	2100	23220.0300

Standard Parts for Fixture Systems

Supporting Elements

EH 23220.



PRODUCT DESCRIPTION

The support element is used to **support** overdetermined clamping points on components.
The benefits of the support element are:

- Support for unstable components
- Eliminates tool vibration during machining
- Supports ribs, beads and shackles, for reinforcement of clamped components
- Distortion-free support of raw parts
- Easy handling

Material

Housing

- Aluminium, red anodised

Body

- Case hardened steel, nitrided, manganese phosphate treated and ground

Assembly

Fix the support element (2 x M 6 thread) onto the device. Pay attention to the operator's side!
Alternative: Dismantle the M 12 x 10 threaded pin and replace it by an M 12 x 30 threaded pin and assemble the support element with a wrench (WS 21), e.g. for T-slot mounting (no defined operator's side ensured). Threaded pin M 12 x 30 and T-nut DIN 508 M 12 x 14, quality 10, are part of the standard supply volume.
Lowering of the support element by 16 mm is possible.

Operation

By turning the clamping cam (WS 6 internal hexagon) on the outer surface of the red protective sleeve, the support pin contacts the workpiece with a slight spring load.

1. By turning on (15 Nm) as far as possible (lock), total of 180°, the clamping mechanism locks the support pin without moving. The support element has been placed onto the workpiece and locked.
2. If turned in the opposite direction (unlock), the clamping is released. If turned back as far as possible, i.e. total of 180° the support pin moves to the end position.

MORE INFORMATION

Notes

For safe functioning, the thread bore M 12 must always be closed.

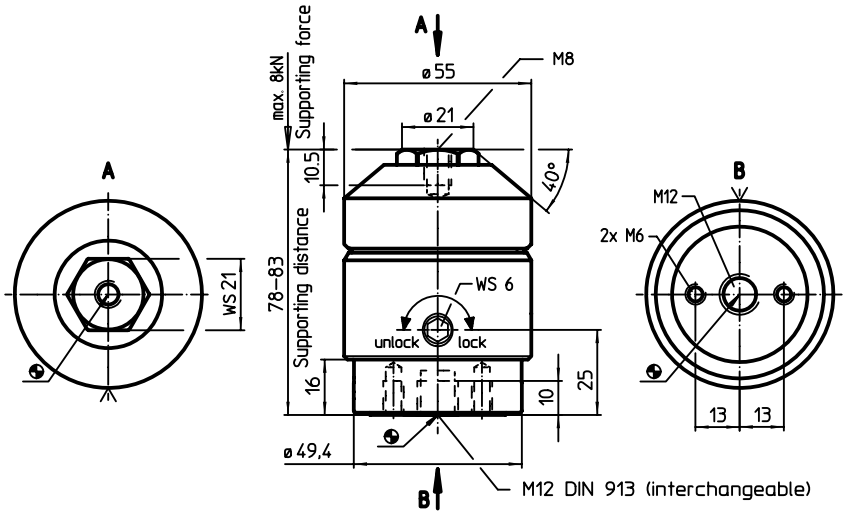
References

Additional flexible possibility of fitting with holding plate 23210.0740.
In the M 8 threaded pin on the support bolt various locating and seating pins (EH 22...) can be mounted. Custom-made extensions can also be fitted.
The clamping height can be increased using height adjusting cylinders EH 23310. and with spacers EH 1107. and EH 1108.

Further products

Complete Range . . . . . → p. 460
Holding Plates, for down-hold clamps . → p. 437
Height Adjusting Cylinders . . . . . → p. 505
Spacers . . . . . → p. 725

DRAWING

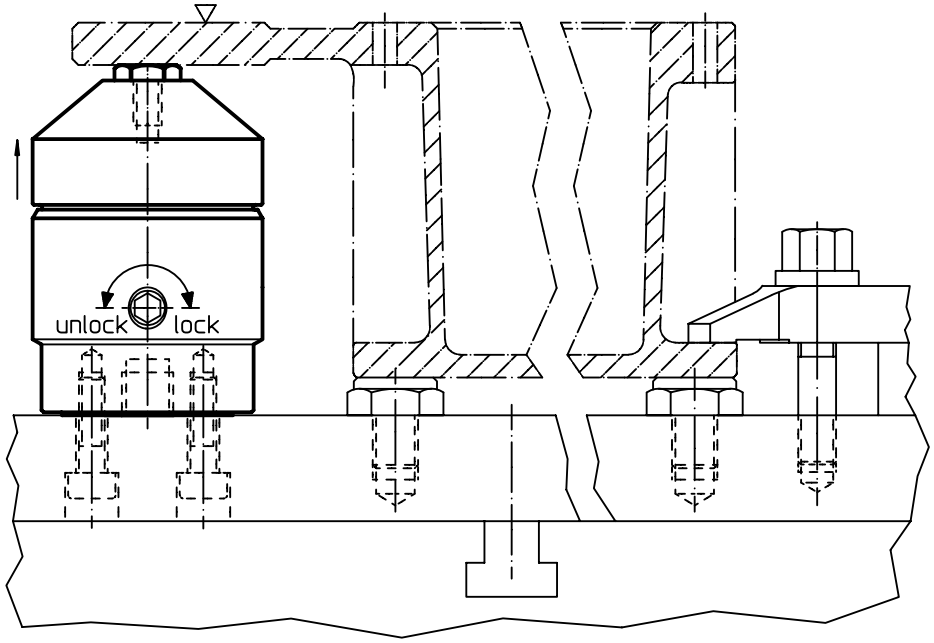


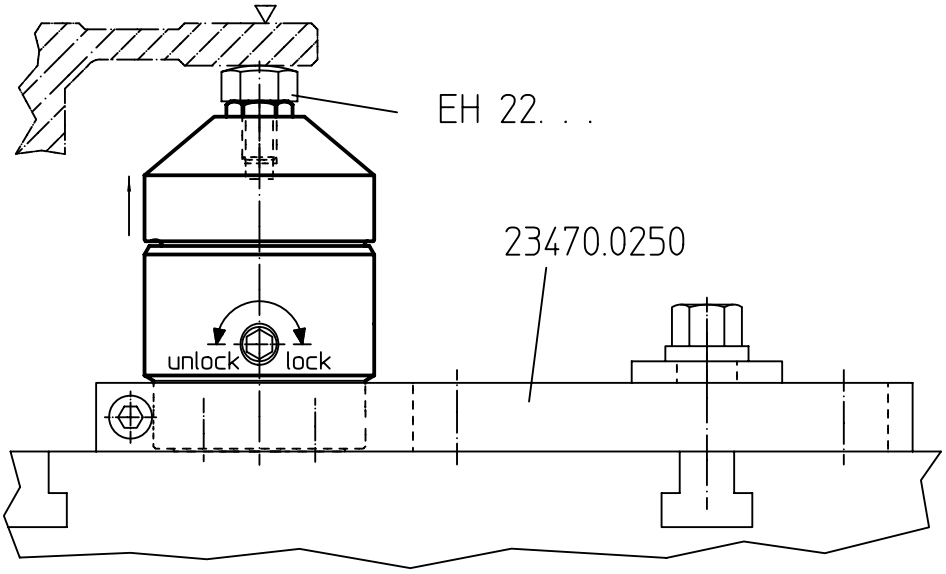
ORDER INFORMATION

System	[g]	Art. No.
V70/L12/L16	950	23220.0400

Standard Parts for Fixture Systems

APPLICATION EXAMPLE





Standard Parts for Fixture Systems

Floating Clamps • compact construction, combined clamping and locking M 12

EH 23320.



PRODUCT DESCRIPTION

The floating clamp is used to **clamp and support** additional clamping points on components.
The benefits of the floating clamp are:

- Avoids vibration during the processing
- Clamps ribs, beads and shackles to reinforce clamped components
- Distortion-free clamping of raw parts
- Compact version with reduced height

Material

Adjustable body
- Aluminium, red anodised

Body
- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaws
- Case hardened steel, nitrided, manganese phosphate treated

Assembly

1. Mount the floating clamp onto the device (mounting holes for M 6, see drawing).
2. Adjust the height limit stop and the rotating area with the sleeve, and clamp with set screw (4x WS 2.5). When setting the height limit upwards provide generous clearance (workpiece tolerance).

Operation

1. Push the floating clamp downwards.
2. Pivot the clamping jaws in as far as possible. The floating clamp contacts the bottom of the workpiece with a slight spring load.
3. Tighten the floating clamp with a hexagonal nut (WS 18) having a min. torque of 15 Nm and a maximum torque of 30 Nm. **In the clamping process, the workpiece is clamped and simultaneously supported.**
4. Releasing is done in reverse order.

MORE INFORMATION

Notes

For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalogue drawing: screw ISO 4762 - M8 - 12.9, M max. = 43 Nm).

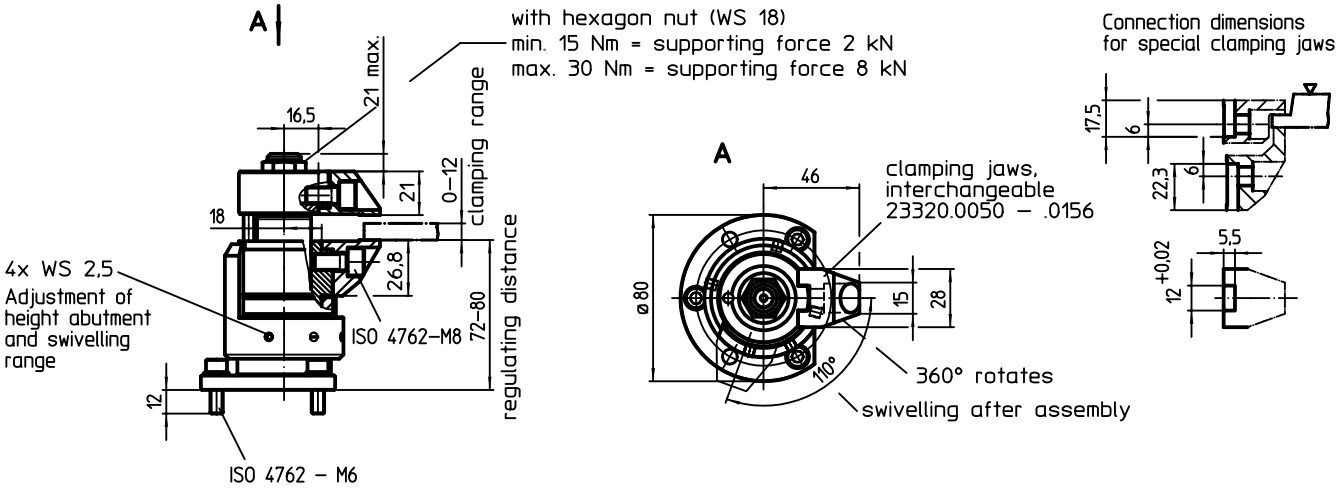
Accessories

As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050-.0058, as well as pivot jaws, refer to 23320.0148-.0156.

Further products

Complete Range . . . . . → p. 462
Nuts for T-Slots, DIN 508 . . . . . → p. 362
Nuts for T-Slots, extended. . . . . → p. 366
Standard Clamping Jaws, for floating clamp M 12 . . . . . → p. 471
Clamping Jaws, for floating clamp M 12. . . . . → p. 472

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70/L12/L16	1450	23320.0008

Floating Clamps • compact construction, separate clamping and locking M 12

EH 23320.



PRODUCT DESCRIPTION

Floating clamps with separate clamping and locking are used to clamp and support additional clamping points **on extremly pliable** workpieces. Both, clamping and supporting force can individually be designed.
The benefits of the floating clamp are:

- Avoids vibration during the processing
- Clamps ribs, beads and shackles to reinforce clamped components
- Distortion-free clamping of raw parts
- Compact version with reduced height

Material

Adjustable body
- Aluminium, blue anodised

Body
- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaws
- Case hardened steel, nitrided, manganese phosphate treated

Assembly

1. Mount the floating clamp onto the device (mounting holes for M 6, see drawing).
2. Adjust the height limit stop and the rotating area with the sleeve, and clamp with set screw (4x WS 2.5). When setting the height limit upwards provide generous clearance (workpiece tolerance).

Operation

1. Push the floating clamp downwards.
2. Pivot the clamping jaws inwards.
3. Release floating clamp. The bottom jaw contacts the workpiece with the force of the contact spring.
4. Tighten the fixture nut (WS 18) (max. torque 15 Nm). **The jaws clamp the workpiece - the clamp is still floating.**
5. Then tighten the hexagon collar nut (WS 10) (max. torque 10 Nm).
6. The workpiece clamping process is complete.
7. Releasing is performed in the reverse order: release hexagon collar nut (WS 10) - release hexagon nut (WS 18) - pivot out the clamping jaws
8. Floating clamp is in end position.

MORE INFORMATION

Notes

For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalogue drawing: screw ISO 4762 - M8 - 12.9, M max. = 43 Nm).

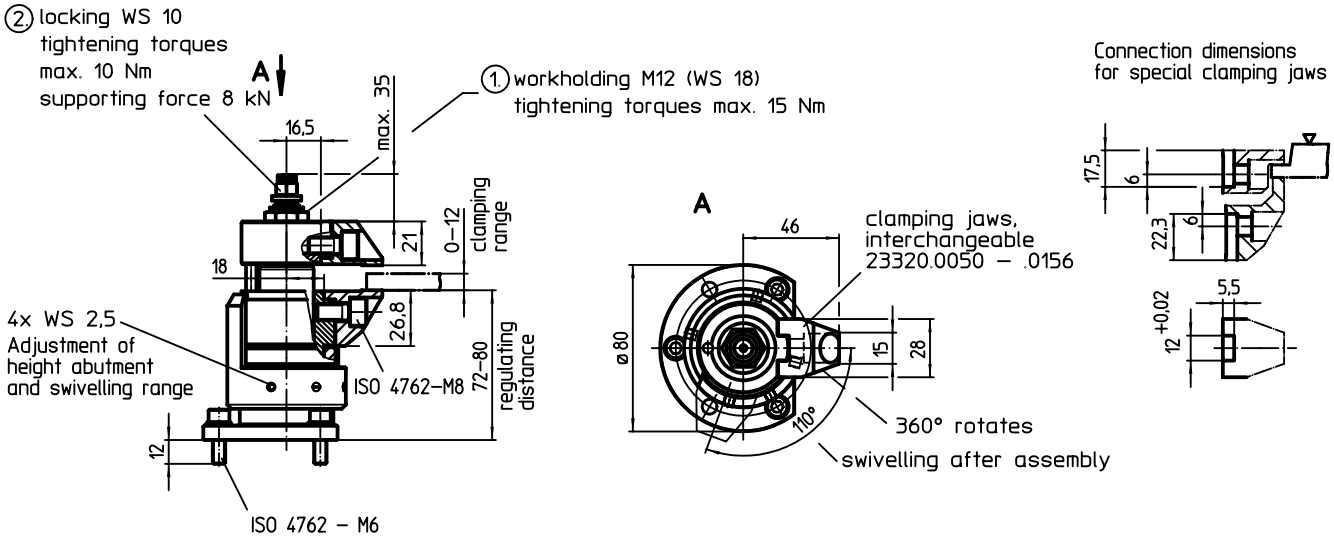
Accessories

As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050-.0058, as well as pivot jaws, refer to 23320.0148-.0156.

Further products

Complete Range . . . . . → p. 465
Nuts for T-Slots, DIN 508 . . . . . → p. 362
Nuts for T-Slots, extended. . . . . → p. 366
Standard Clamping Jaws, for floating clamp M 12 . . . . . → p. 471
Clamping Jaws, for floating clamp M 12. . . . . → p. 472

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70/L12/L16	1650	23320.0010

Standard Parts for Fixture Systems

Floating Clamps • combined clamping and locking M 12

EH 23320.



PRODUCT DESCRIPTION

The floating clamp is used to **clamp and support** additional clamping points on components.
The benefits of the floating clamp are:
- Avoids vibration during the processing
- Clamps ribs, beads and shackles to reinforce clamped components
- Distortion-free clamping of raw parts

Material

Adjustable body
- Aluminium, red anodised

Body
- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaws
- Case hardened steel, nitrided, manganese phosphate treated

Assembly

1. Mount the floating clamp (M 12 connection thread) onto the device with a wrench (WS 46).
2. Adjust the height limit stop and the rotating area with the red sleeve and clamp with a set screw (3 x WS 2.5). When setting the height limit, consider tolerance of workpiece.

Operation

1. Push the floating clamp downwards.
2. Pivot the clamping jaws in as far as possible. The floating clamp contacts the bottom of the workpiece with a slight spring load.
3. Tighten the floating clamp with a hexagonal nut (WS 18) having a min. torque of 15 Nm and a maximum torque of 30 Nm. **In the clamping process, the workpiece is clamped and simultaneously supported.**
4. Releasing is done in reverse order.

MORE INFORMATION

Notes

The thread bore must always be closed for safe functioning, e.g. set screw M 12 x 10. For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalogue drawing: screw ISO 4762 - M8 - 12.9, M max. = 43 Nm).

References

Additional flexible possibility of fitting with holder 23470.0250 or holding plate for down-hold clamps 23210.0740.

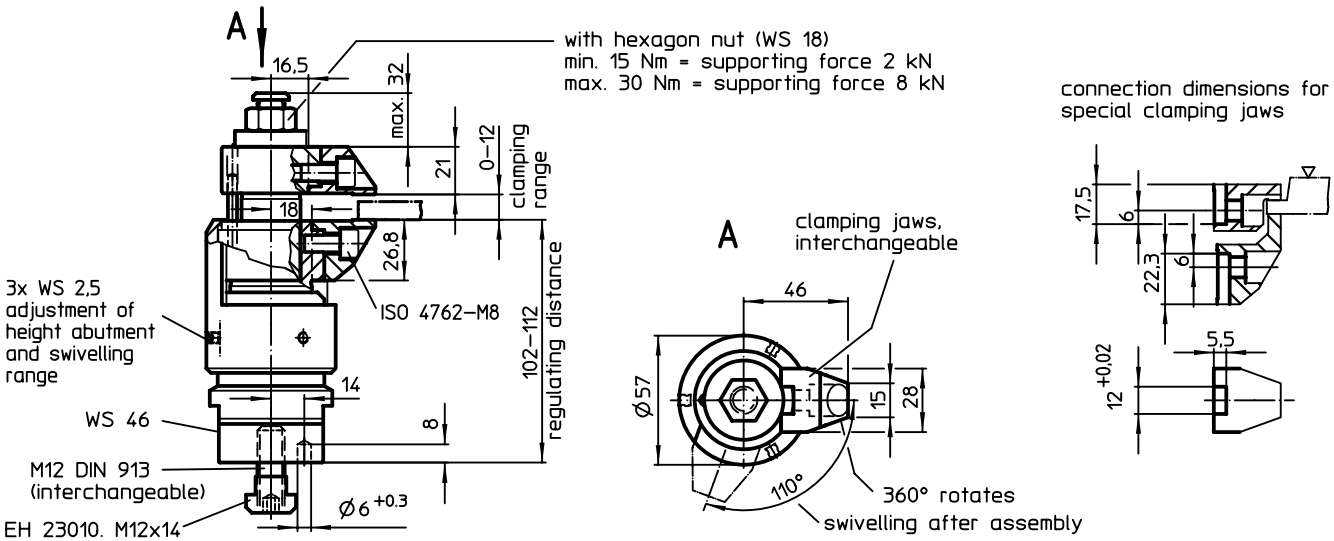
Accessories

As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050-.0058, as well as pivot jaws, refer to 23320.0148-.0156.

Further products

Complete Range . . . . . → p. 467
Holding Plates, for down-hold clamps . → p. 437
Floating Clamps, separate clamping and locking M 12 . . . . . → p. 469
Standard Clamping Jaws, for floating clamp M 12 . . . . . → p. 471
Clamping Jaws, for floating clamp M 12. . . . . → p. 472

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70/L12/L16	2076	23320.0012

Standard Parts for Fixture Systems

Floating Clamps • separate clamping and locking M 12

EH 23320.



PRODUCT DESCRIPTION

Floating clamps with separate clamping and locking are used to clamp and support additional clamping points **on extremly pliable** workpieces. Both, clamping and supporting force can individually be designed.
The benefits of the floating clamp are:

- Avoids vibration during the processing
- Clamps ribs, beads and shackles to reinforce clamped components
- Distortion-free clamping of raw parts

Material

Adjustable body
- Aluminium, blue anodised

Body
- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaws
- Case hardened steel, nitrided, manganese phosphate treated

Assembly

1. Mount the floating clamp (M 12 connection thread) onto the device with a wrench (WS 46).
2. Adjust the height limit stop and the rotating area with the blue sleeve and clamp with a set screw (3 x WS 2.5). When setting the height limit, consider tolerance of workpiece.

Operation

1. Push the floating clamp downwards.
2. Pivot the clamping jaws inwards.
3. Release floating clamp. The bottom jaw contacts the workpiece with the force of the contact spring.
4. Tighten the fixture nut (WS 18) (max. torque 15 Nm). **The jaws clamp the workpiece - the clamp is still floating.**
5. Then tighten the hexagon collar nut (WS 10) (max. torque 10 Nm).
6. The workpiece clamping process is complete.
7. Releasing is performed in the reverse order: release hexagon collar nut (WS 10) - release hexagon nut (WS 18) - pivot out the clamping jaws
8. Floating clamp is in end position.

MORE INFORMATION

Notes

The thread bore must always be closed for safe functioning, e.g. set screw M 12 x 10. For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalogue drawing: screw ISO 4762 - M8 - 12.9, M max. = 43 Nm).

References

Additional flexible possibility of fitting with holder 23470.0250 or holding plate for down-hold clamps 23210.0740.

Accessories

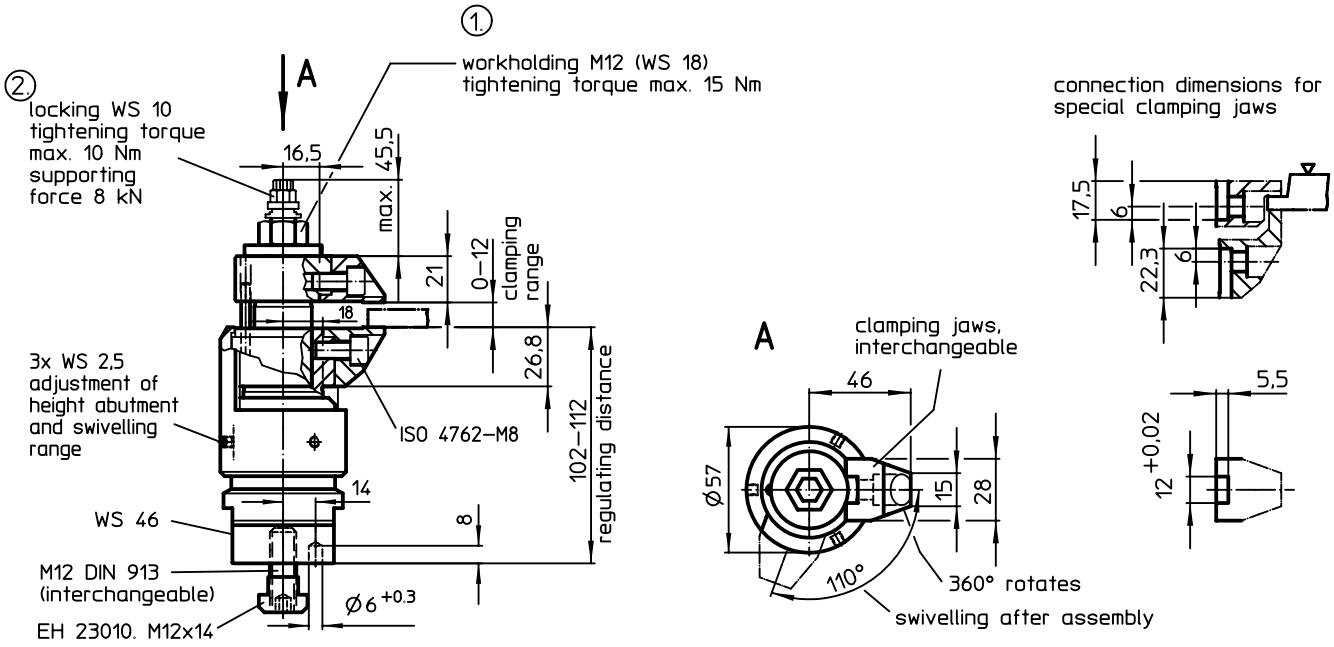
As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050-.0058, as well as pivot jaws, refer to 23320.0148-.0156.

Further products

Complete Range . . . . . → p. 469
Holding Plates, for down-hold clamps . → p. 437
Floating Clamps, combined clamping and locking M 12 . . . . . → p. 467
Standard Clamping Jaws, for floating clamp M 12 . . . . . → p. 471
Clamping Jaws, for floating clamp M 12. . . . . → p. 472

8

DRAWING

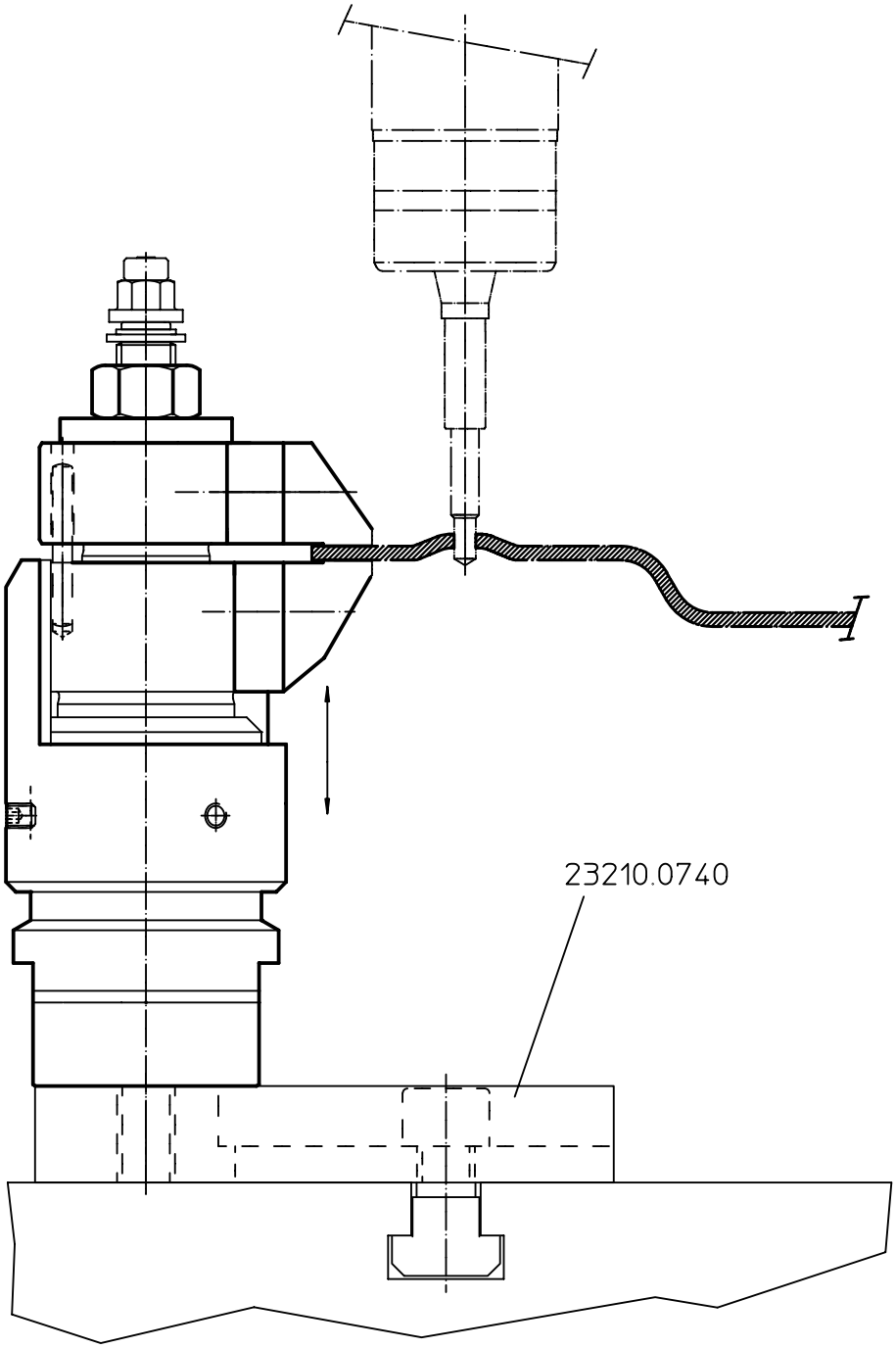


Standard Parts for Fixture Systems

ORDER INFORMATION

System	[g]	Art. No.
V70/L12/L16	1890	23320.0014

APPLICATION EXAMPLE



Standard Clamping Jaws • for floating clamp M 12

EH 23320.



PRODUCT DESCRIPTION

The clamping jaws can be used for floating clamps 23320.0008, 23320.0010, 23320.0012, and 23320.0014.

Material

- Case hardened steel, nitrided, manganese phosphate treated

Assembly

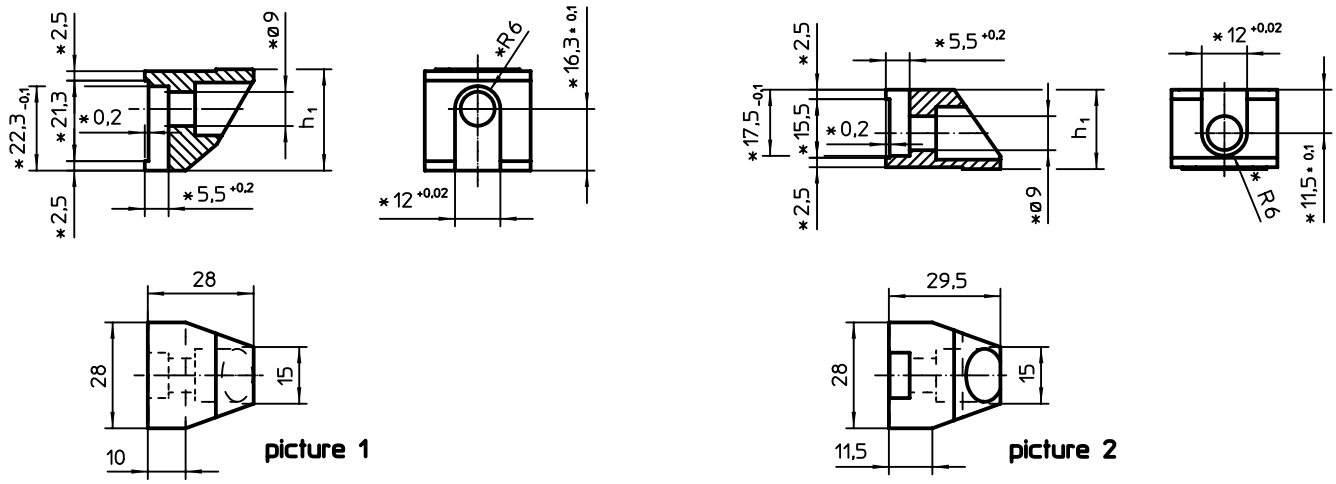
When using custom-made jaws, it is important to insert the tightening screw (M 8-12.9, 43 Nm) 10 mm deep into the clamp housing on the upper clamping jaw and 9 mm deep into the clamp housing on the lower clamping jaw.

MORE INFORMATION

Further products

Complete Range . . . . . → p. 471

DRAWING



* Specifications and material of especially designed jaws have to be taken into consideration.

ORDER INFORMATION

System	Clamping range [mm]	Dimensions h_1 -0,1 [mm]	[g]	Art. No.
lower standard clamping jaw – picture 1				
V70/L12/L16	–	26,8	83	23320.0050
upper standard clamping jaw – picture 2				
V70/L12/L16	**0 – 12**	21,0	69	23320.0052

8

Standard Parts for Fixture Systems

Clamping Jaws • for floating clamp M 12

EH 23320.



PRODUCT DESCRIPTION

The clamping jaws can be used for floating clamps 23320.0008, 2332.0010, 23320.0012, and 23320.0014.
The upper clamping jaw (23320.0054, 23320.0056, and 23320.0058 - picture 1 to 3) can be used to extend the clamping range.
Various standard parts can be screwed into in the upper clamping jaw as required, using female thread M 8 (23320.0154 / .0156 - picture 4 and 5) - see "Further products".
The lower clamping jaw with pivot function (23320.0148 - picture 6) adapts to the profiles of the workpiece.

Material

Ball
- Ball-bearing steel

Clamping jaws
- Case hardened steel, nitrided, manganese phosphate treated

MORE INFORMATION

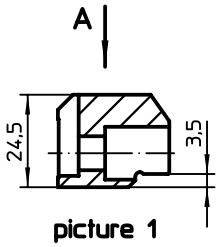
Notes

The tightening torque of the floating clamp must be adapted/reduced situationally.
Observe the surface pressure due the the reduced contact surface of the clamping jaws.

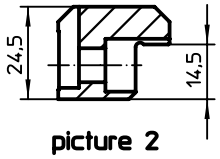
Further products

Complete Range . . . . . → p. 472
Seating Pins, ribbed or pointed . . . . . → p. 286
Ball-Ended Thrust Screws, headless, ball protected against rotating . . . . . → p. 297
Ball-Ended Thrust Screws, headless, flat-faced ball . . . . . → p. 304
Thrust Screws, with brass pad . . . . . → p. 311
Thrust Screws, with plastic pad . . . . . → p. 312
Self-Aligning Pads, adjustable . . . . . → p. 320
Self-Aligning Pads, adjustable with self-resetting . . . . . → p. 321

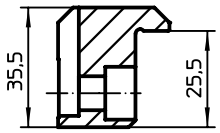
DRAWING



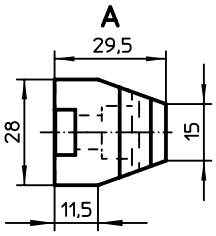
picture 1

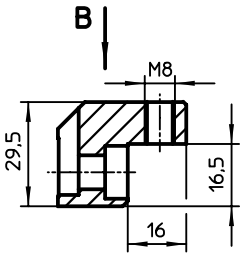


picture 2

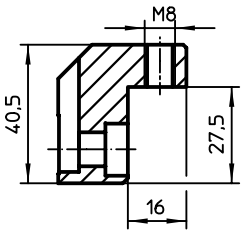


picture 3

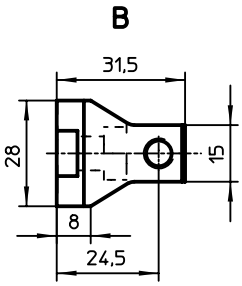


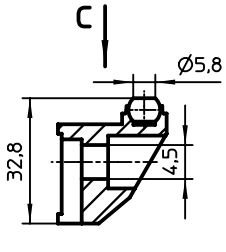


picture 4

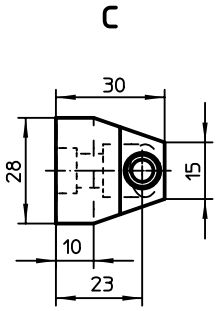


picture 5





picture 6

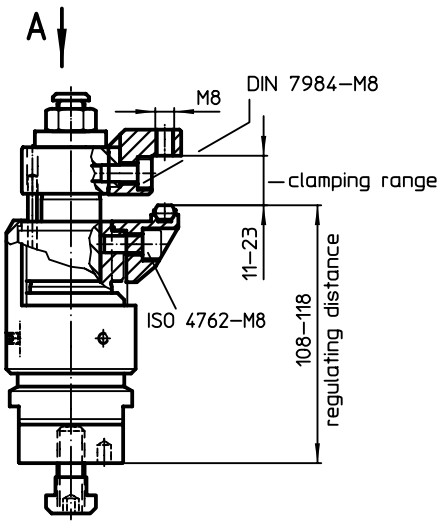


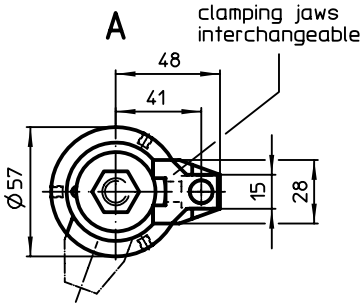
Standard Parts for Fixture Systems

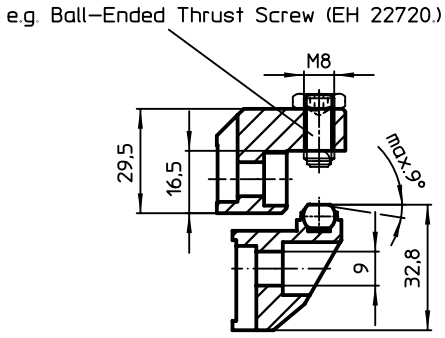
ORDER INFORMATION

System	Clamping range max. in combination with 23320.0050 [mm]	Clamping range max. in combination with 23320.0148 [mm]	[g]	Art. No.
upper exchange clamping jaw – picture 1				
V70/L12/L16	**4 – 16**	–	91	**23320.0054**
upper exchange clamping jaw – picture 2				
V70/L12/L16	**15 – 27**	–	88	**23320.0056**
upper exchange clamping jaw – picture 3				
V70/L12/L16	**26 – 38**	–	130	**23320.0058**
upper clamping jaw with location hole – picture 4				
V70/L12/L16	**29**	**23**	83	**23320.0154**
upper clamping jaw with location hole – picture 5				
V70/L12/L16	**40**	**34**	112	**23320.0156**
lower clamping jaw with flat-faced ball and pivot function, plain surface, protected against rotating – picture 6				
V70/L12/L16	–	–	98	**23320.0148**

APPLICATION EXAMPLE

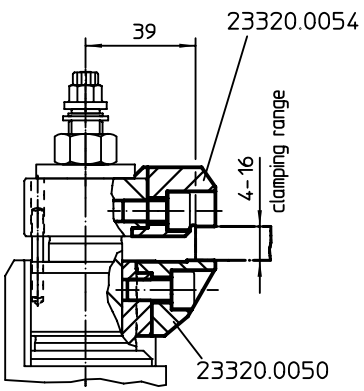


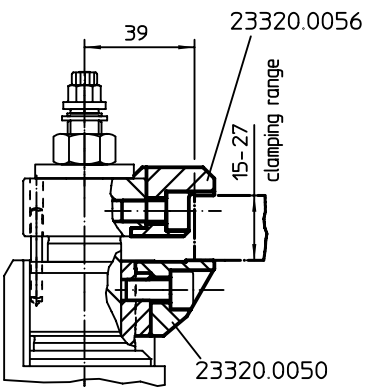


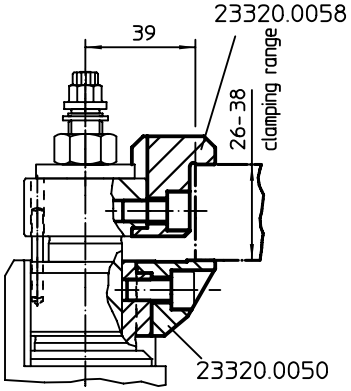


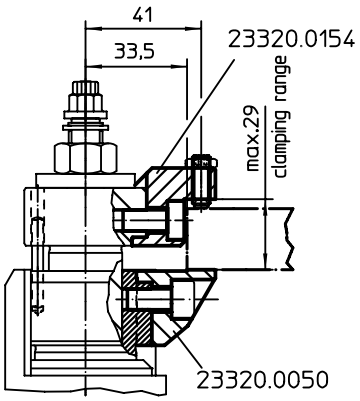
8

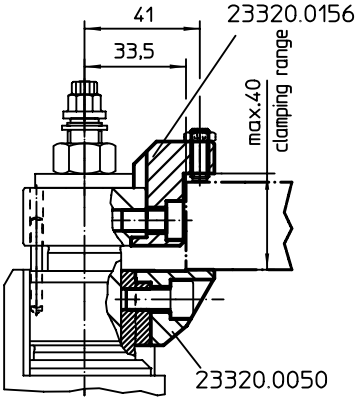
Standard Parts for Fixture Systems

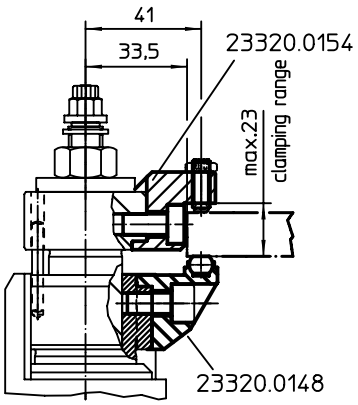


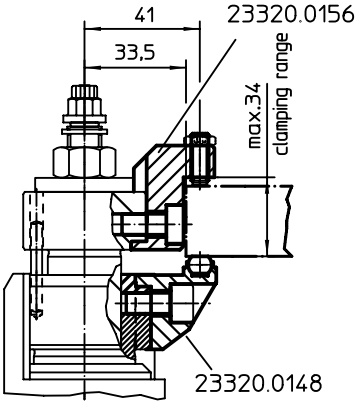












8

Down-Thrust Clamps • swivelling, size 25

EH 23310.



PRODUCT DESCRIPTION

Universal mechanical clamping element for fast and comfortable changing and clamping of workpieces by means of manually swivelling clamping claw.
The down-thrust clamps provide the following advantages:

- Rapid manual clamping by means of clamping screw, adjustable clamping lever or adjustable eccentric quick clamp.
- Easy and quick changing of the workpiece by swinging the clamping claw to the left or right.
- Reduced space requirements due to the compact design.
- Easy adaption even to larger clamping heights by means of height adjusting cylinders.

Material

- Case-hardened steel, case-hardened, blackened and ground

Assembly

Down-thrust clamps can be attached in two ways:

1. In a T-slot, using a nut for T-slots DIN 508 (EH 23010.)
2. With the set screw directly in the mounting plate of, for example, a fixture

The cylinder must make contact over the whole surface.

MORE INFORMATION

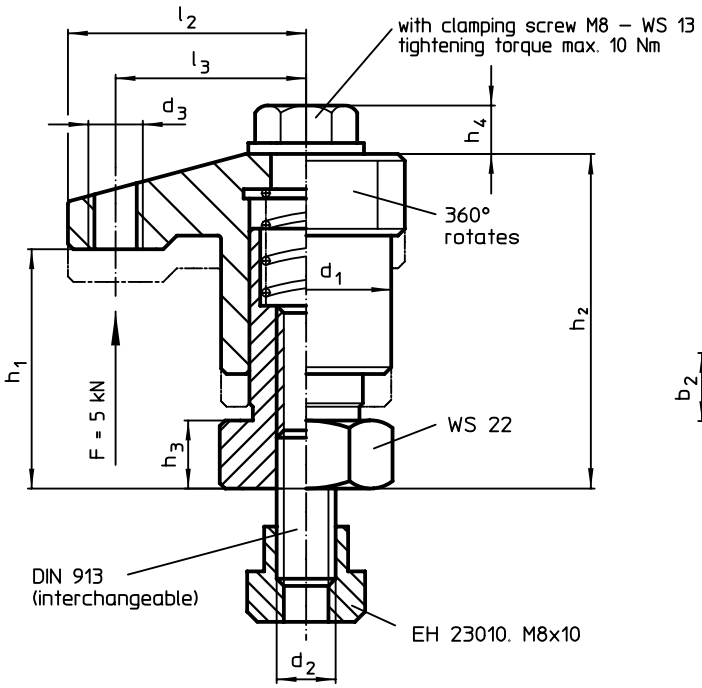
References

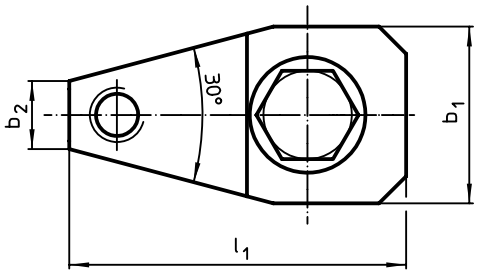
The clamping height can be increased with EH 23310. height adjusting cylinders and EH 1007. washers, and equally lowered by using clamping elements e.g. EH 22730.

Further products

Complete Range . . . . . → p. 492
Height Adjusting Cylinders . . . . . → p. 505
Spacers . . . . . → p. 725

DRAWING





picture 2

ORDER INFORMATION

System	Dimensions														Stroke		Art. No.
	d_1	b_1	b_2	d_2	d_3	h_1 min.	h_1 max.	h_2 min.	h_2 max.	h_3	h_4	l_1	l_2	l_3			
	[mm]														[mm]	[g]	
with clamping screw – picture 2																	
V40	**25**	26	10	M8	M8	30	35	44	49	10	6,9	49,5	35	28	5	227	23310.0025

Standard Parts for Fixture Systems

Down-Thrust Clamps • swivelling, size 40

EH 23310.



PRODUCT DESCRIPTION

Universal mechanical clamping element for fast and comfortable changing and clamping of workpieces by means of manually swivelling clamping claw.
The clamps provide the following advantages:

- Rapid manual clamping by means of the clamping screw, the adjustable clamping lever, or the double eccentric clamping lever.
- Easier and quicker workpiece change by swinging the clamping claw to the left or right. Continuously variable setting by means of positioning ring 23310.0350
- The use of positioning ring 23310.0350 allows a repeatable precise clamping. Here h_1 min. increases by at least 7 mm (stroke minus 7 mm).
- Compact design, therefore less space requirement when clamping.
- Easily adjustable even to large clamping heights, using the height adjusting cylinders.

Material

- Case-hardened steel, case-hardened, blackened and ground

Assembly

Down-thrust clamps can be attached in two ways:

1. In a T-slot, using a nut for T-slots DIN 508 (EH 23010.)
2. With the set screw directly in the mounting plate of, for example, a fixture

The cylinder must make contact over the whole surface.
Exceeding of the clamping height is inhibited by the height limitation.

MORE INFORMATION

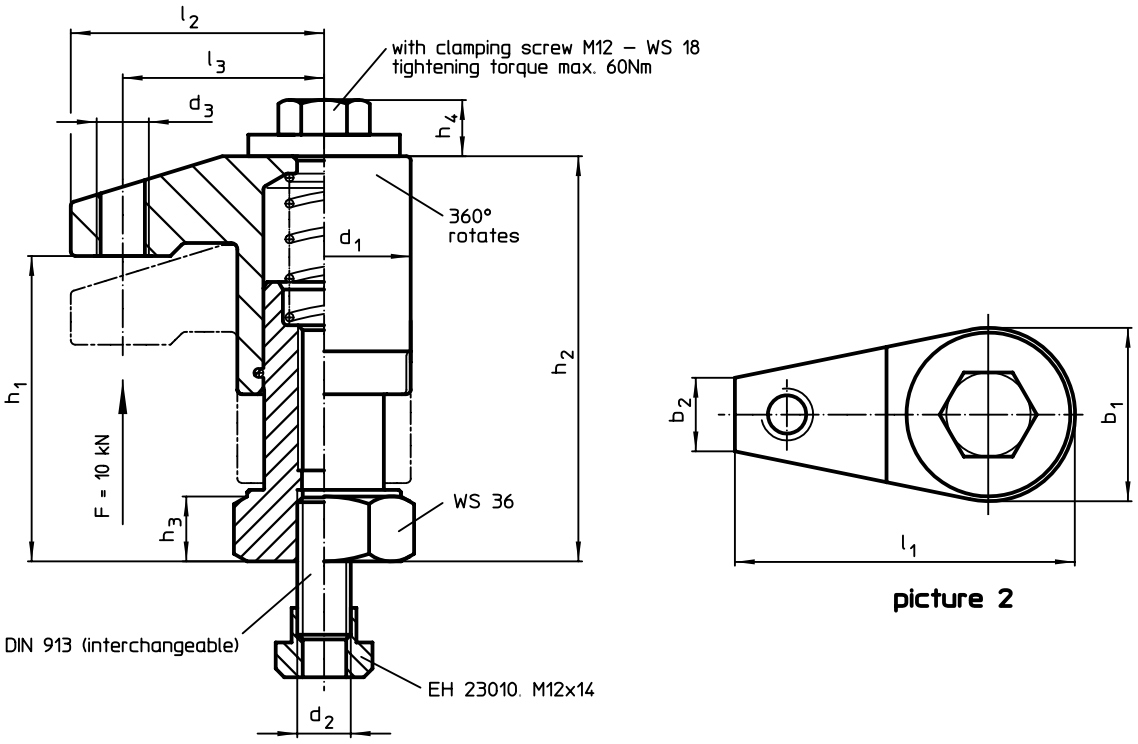
References

The clamping height can be increased by using height adjusting cylinders EH 23310. and disks EH 1107. and EH 1108. It can be reduced by employing clamping inserts, e.g. EH 22730.

Further products

Complete Range . . . . . → p. 494
Positioning Rings, for down-thrust clamp . . . . . → p. 504
Height Adjusting Cylinders . . . . . → p. 505
Spacers . . . . . → p. 725
Wrenches . . . . . → p. 748

DRAWING



picture 2

ORDER INFORMATION

System	Dimensions														Stroke		Art. No.
	d_1	b_1	b_2	d_2	d_3	h_1 min.	h_1 max.	h_2 min.	h_2 max.	h_3	h_4	l_1	l_2	l_3			
	[mm]														[mm]	[g]	
with clamping screw – picture 2																	
V70/ L12	**40**	40	17	M12	M12	50	70	73	93	15	13	75	55	43	20	876	23310.0051
						68	98	91	121	15	13	75	55	43	30	964	23310.0054
						95	135	118	158	22	13	75	55	43	40	1300	23310.0057

Standard Parts for Fixture Systems

Down-Thrust Clamps • moveable, size 40

EH 23310.



PRODUCT DESCRIPTION

The moveable downthrust clamps are used, amongst other things, when swivel movements are not possible because of the workpiece.
The clamps provide the following advantages:

- Easier and quicker workpiece change by moving the clamping claws forwards or backwards.
- The clamping range in horizontal direction is between l_1 min. and l_1 max..
- To change the workpiece, the clamping claw can be pushed back from l_1 max. by dimension l_2.
- Rapid manual clamping by means of the clamping screw, the adjustable clamping lever, or the double eccentric clamping lever.
- The use of positioning ring 23310.0350 allows the clamping position to be fixed. Here h_1 min. increases by at least 7 mm (stroke minus 7 mm).
- Compact design, therefore less space requirement when clamping.
- Easily adjustable even to large clamping heights, using the height adjusting cylinders.

Material

- Case-hardened steel, case-hardened, blackened and ground

Assembly

Down-thrust clamps can be attached in two ways:

1. In a T-slot, using a nut for T-slots DIN 508 (EH 23010.)
2. With the set screw directly in the mounting plate of, for example, a fixture

The cylinder must make contact over the whole surface.

Operation

1. Push clamping claw backwards.
2. Insert workpiece.
3. Push clamping claw forwards.
4. Adjust clamping position of clamping claw using the knurled screw.
5. Secure / lock the clamping position using the knurled nut.

MORE INFORMATION

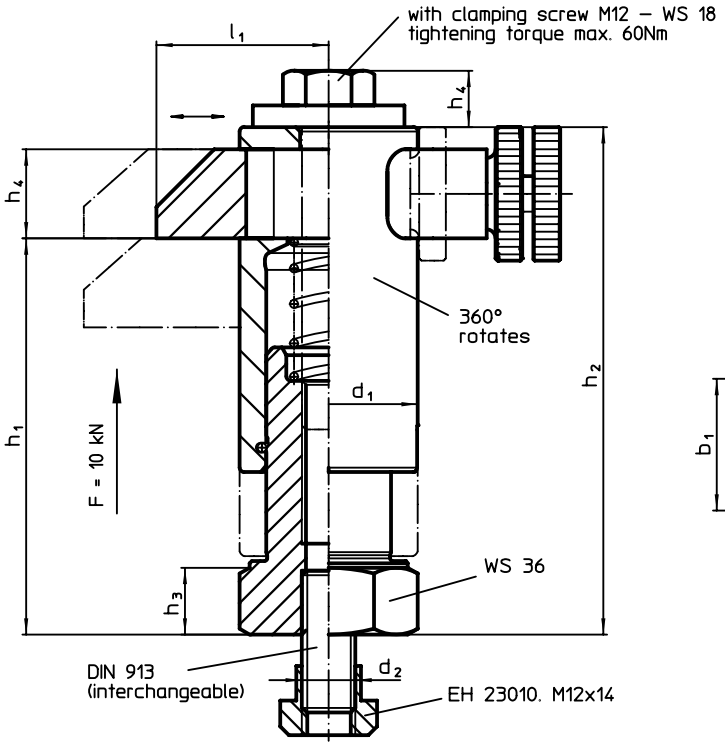
References

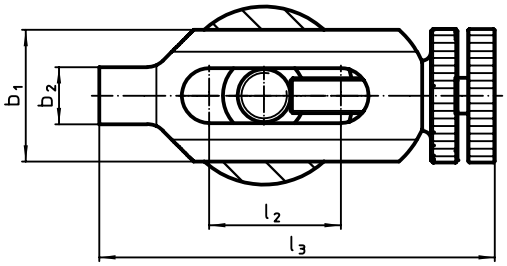
The clamping height can be increased by using height adjusting cylinders EH 23310. and disks EH 1107. and EH 1108. It can be reduced by employing clamping inserts, e.g. EH 22730.

Further products

Complete Range . . . . . → p. 502
Positioning Rings, for down-thrust clamp . . . . . → p. 504

DRAWING





picture 2

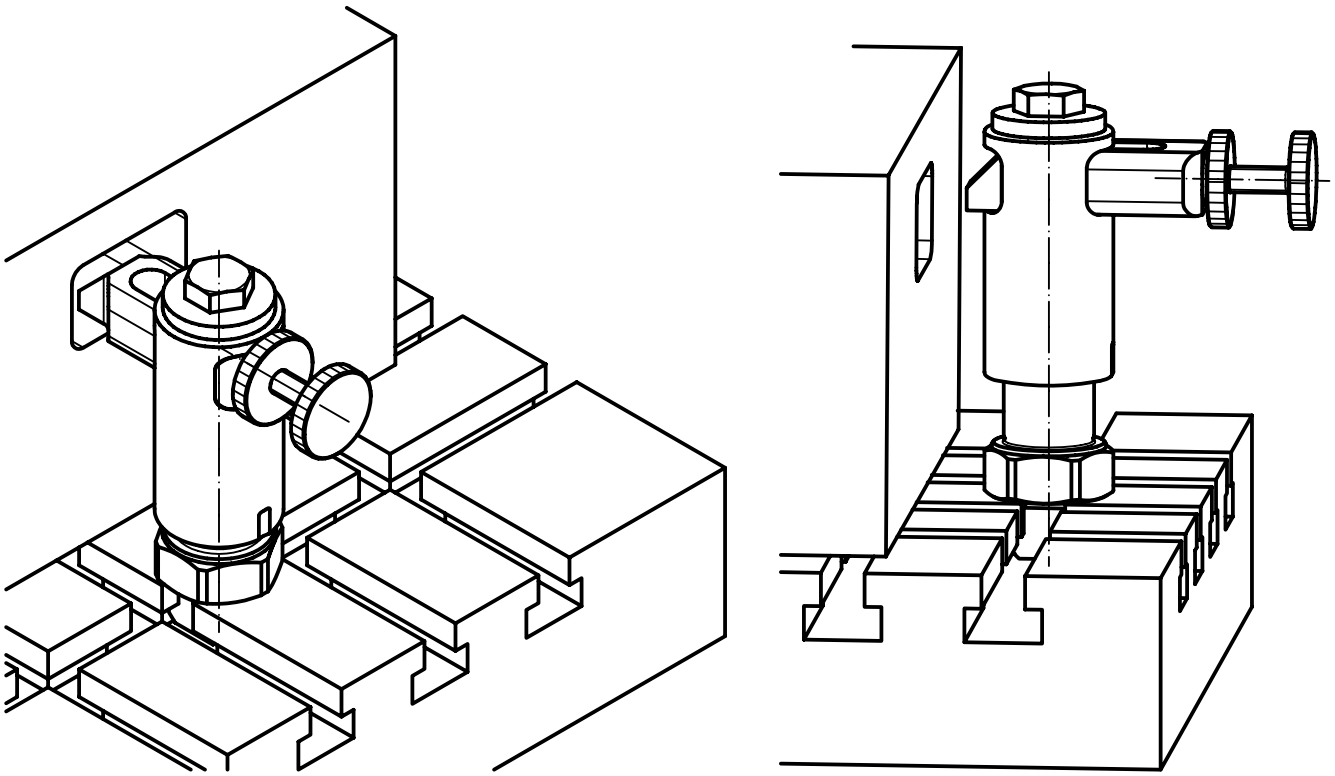
8

Standard Parts for Fixture Systems

ORDER INFORMATION

System	Dimensions															Stroke		Art. No.
	d_1	b_1	b_2	d_2	h_1 min.	h_1 max.	h_2 min.	h_2 max.	h_3	h_4	l_1 min.	l_1 max.	l_2	l_3 min.	l_3 max.			
	[mm]															[mm]	[g]	
with clamping screw – picture 2																		
V70/ L12	**40**	30	13	M12	70	90	95	115	15	13	38	55	30	90	107	30	1480	23310.0084
					88	118	113	143	15	13	38	55	30	90	107	20	1370	23310.0087
					70	90	95	115	15	13	38	55	30	90	107	30	1480	23310.0084
					88	118	113	143	15	13	38	55	30	90	107	20	1370	23310.0087

APPLICATION EXAMPLE



Positioning Rings • for down-thrust clamp

EH 23310.



PRODUCT DESCRIPTION

The positioning ring is an accessory for down-thrust clamps 23310.0050 - .0058, 23310.0083-0088 and 23310.0070.
After aligning, the clamp positioning ring is fitted on the spindle with the effect, that repeated clamping is always exactly on the same point. The positioning ring is rotating by 360° on down-thrust clamp. After mounting, the clamping claw can swing 110° to the left or right (only for the swivelling versions).

Material

- Steel, blackened

Assembly

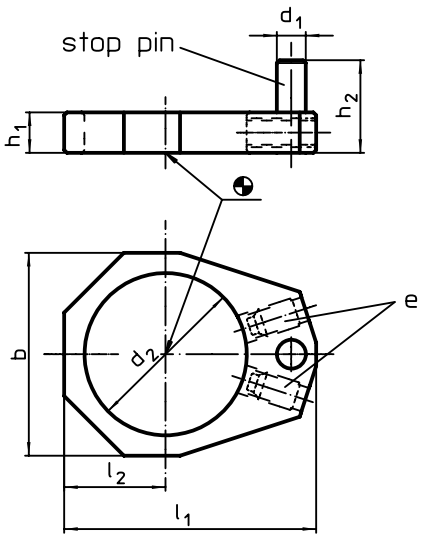
Before mounting the positioning ring, pull-off the clamping claw of down-thrust clamp.

MORE INFORMATION

Further products

Complete Range . . . . . → p. 504

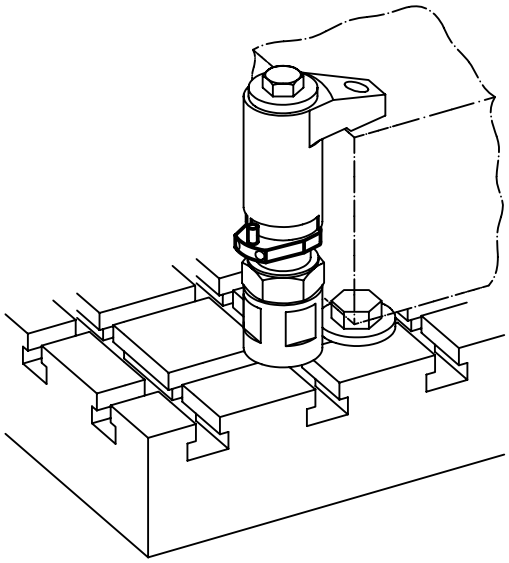
DRAWING



ORDER INFORMATION

System	Dimensions								For down-thrust clamp	[g]	Art. No.
	h_1	h_2	d_1	d_2	l_1	l_2	b	e			
	[mm]										
V70/L12	**7**	16	5	28	43,5	17,5	35	22760.0052	23310.0050-.0058/23310.0083-.0088	32	23310.0350

APPLICATION EXAMPLE



Standard Parts for Fixture Systems

Height Adjusting Cylinders

EH 23310.



PRODUCT DESCRIPTION

The height adjusting cylinders can be used for increasing the clamping height of down-thrust clamps EH 23310. They are also used in combination with seating pins (EH 22680.), pins (EH 22690.) and self-aligning pads (EH 22730. - EH 22741.).

Material

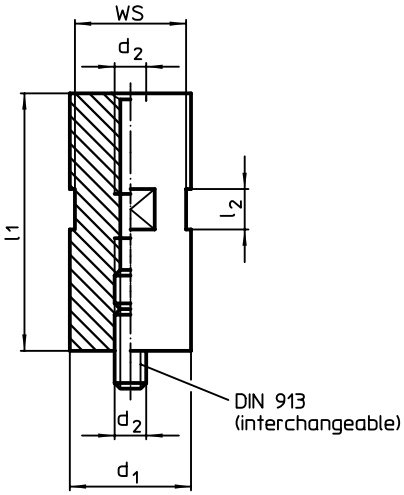
- Steel, case-hardened, blackened, ground

MORE INFORMATION

Further products

Complete Range . . . . . → p. 505
Seating Pins, ribbed or pointed . . . . . → p. 286
Seating Pins, pin shape. . . . . → p. 287
Pin . . . . . → p. 288
Seating Pins, adjustable . . . . . → p. 291
Self-Aligning Pads . . . . . → p. 315
Self-Aligning Pads, with hard metal ball, ribbed . . . . . → p. 316
Self-Aligning Pads, self-resetting. . . . . → p. 317
Self-Aligning Pads, with hard metal ball, ribbed and self-resetting . . . . . → p. 319
Self-Aligning Pads, adjustable. . . . . → p. 320
Self-Aligning Pads, adjustable with self-resetting . . . . . → p. 321

DRAWING



picture 1

ORDER INFORMATION

System	Dimensions d_1 h9	l_1 ±0,01	d_2	l_2	WS		Art. No.
	[mm]				[mm]	[g]	
picture 1							
V40	**25**	**20**	**M 8**	10	22	71	**23310.0125**
		40	**M 8**	20	22	139	**23310.0126**
		80	**M 8**	20	22	292	**23310.0127**
V70/L12	**40**	**35**	**M12**	20	36	319	**23310.0140**
		70	**M12**	20	36	644	**23310.0141**
		140	**M12**	20	36	1325	**23310.0142**
L16	**40**	**35**	**M16**	20	36	318	**23310.0145**
		70	**M16**	20	36	634	**23310.0146**
		140	**M16**	20	36	1307	**23310.0147**
V70/L12	**60**	**35**	**M12**	20	55	755	**23310.0160**
		70	**M12**	20	55	1460	**23310.0161**
		140	**M12**	20	55	3034	**23310.0162**
L16	**60**	**35**	**M16**	20	55	760	**23310.0165**
		70	**M16**	20	55	1493	**23310.0166**
		140	**M16**	20	55	3016	**23310.0167**

Standard Parts for Fixture Systems

Compact Clamps

EH 23690.



PRODUCT DESCRIPTION

The compact clamp is an all purpose clamping element. Due to the self-locking clamping lever application can either take place in horizontal or vertical position in both, machined and raw workpieces.

Features:

- Exact and position precise clamping
- Easy, universal handling
- High clamping force at low tightening torques, abrasion-resistant due to clamping lever with bearings
- Continuous, large clamping area
- Clamping lever entirely retractable for hindrance-free exchange of workpieces
- Clamping lever with mounting thread for various clamping elements, e.g. ball-ended thrust screws (EH 22700. - EH 22720.), self-aligning pads (EH 22730./EH 22740.) etc.
- Large adjusting range at constant clamping force
- Continuous increase of the clamping range by height adapters 23690.0112/.0116
- Easy and flexible mounting options
- Corrosion-resistant
- Resistant to dirt and chips

Material

Body

- Heat-treated steel, black coated

Clamping lever

- Heat-treated steel, tempered, silver coated

Assembly

Assembly and set-up:

1. Take out stop pin ISO 4762-M 6 x 10.
2. Move back and take out clamping lever.
3. Tightening by 2 screws with internal hexagon (included in supply volume).
4. Place clamping lever in sliding rail and then insert.
5. Tighten stop pin ISO 4762 - M 6 x 10.

Operation

Clamping process:

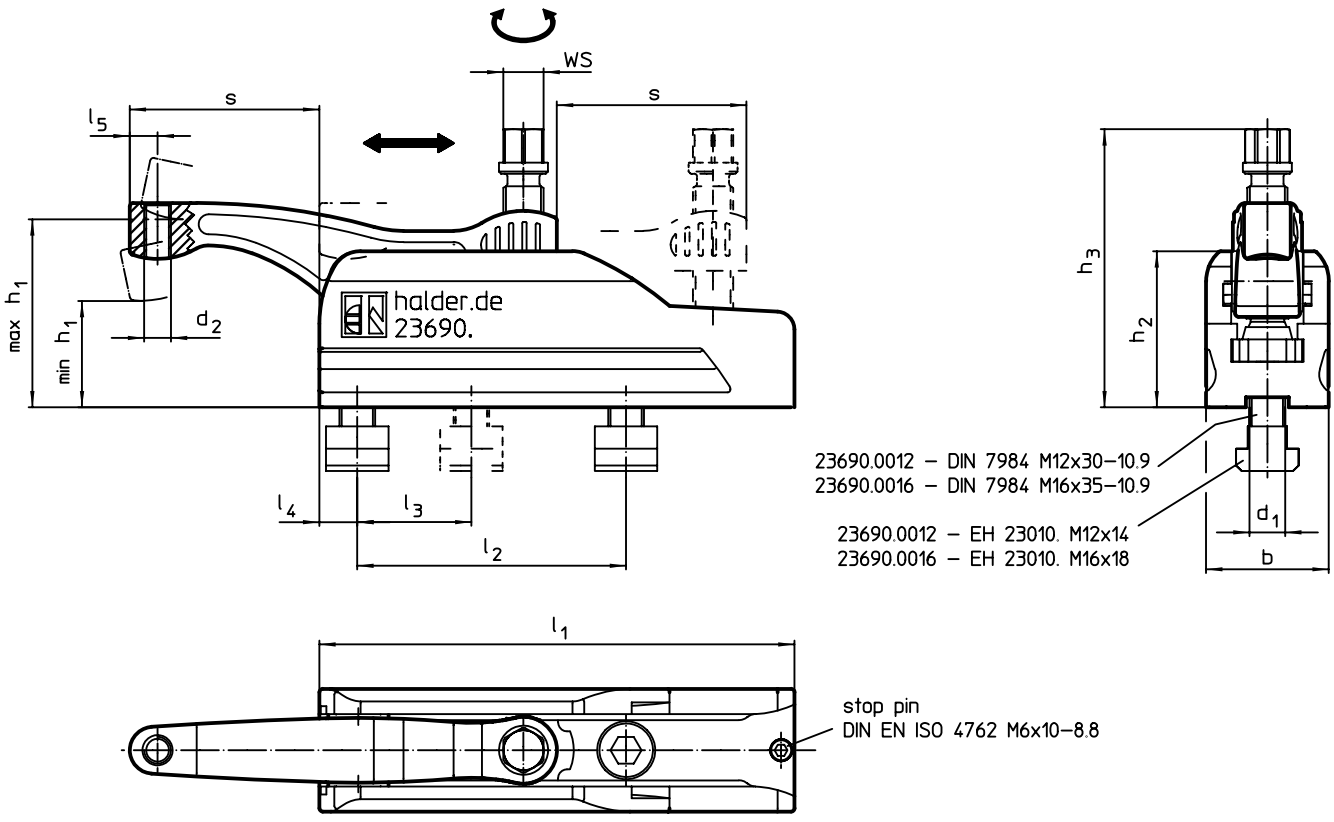
1. Slide clamping lever to clamping position.
2. Clamping is made via a hexagon collar screw.
3. Releasing is done in reverse order.

MORE INFORMATION

Further products

Complete Range . . . . . → p. 536
Height Adapters, for compact clamp . . → p. 538

DRAWING



8

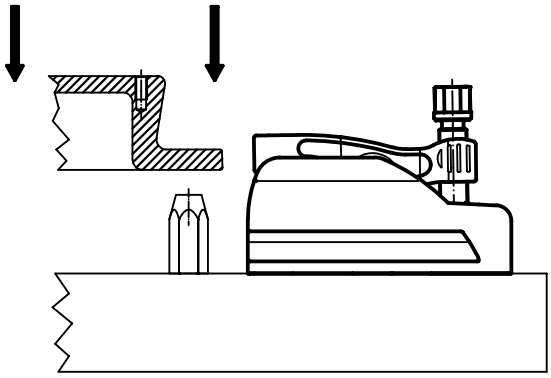
Standard Parts for Fixture Systems

ORDER INFORMATION

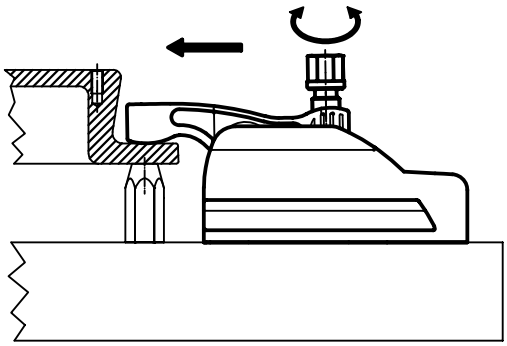
System	Dimensions													WS	Clamping force max.	Tightening torque max.		Art. No.
	d_1	d_2	h_1 min.	h_1 max.	h_2	h_3	s max.	l_1	l_2 +1	l_3	l_4	l_5	b					
	[mm]													[mm]	[kN]	[Nm]	[g]	
V70/L12	**M12**	M 8	40	60	59	95	43	134	70	50	13	10,0	45	16	15	45	1813	23690.0012
L16	**M16**	M12	47	85	70	126	85	213	120	50	17	12,5	55	18	25	75	4274	23690.0016

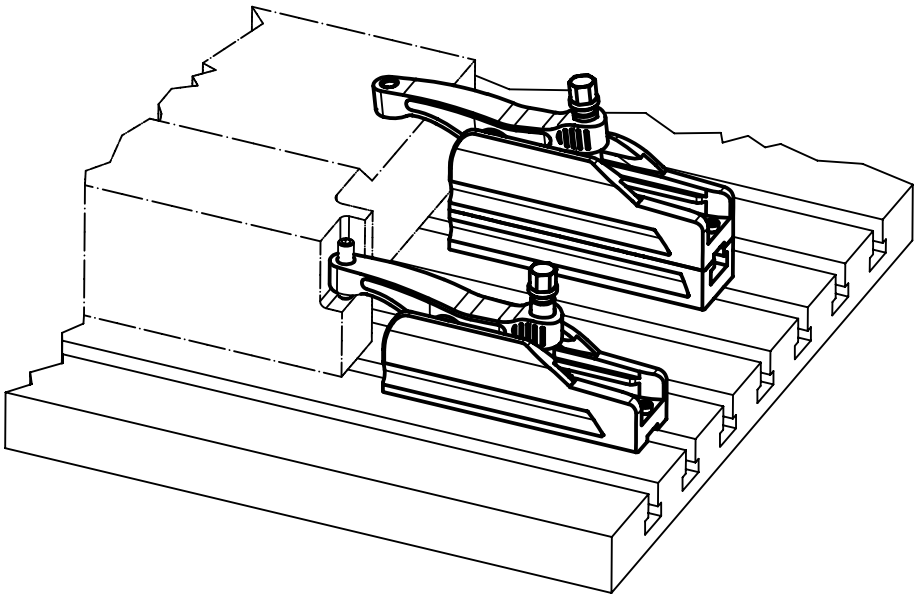
APPLICATION EXAMPLE

Ⅰ



Ⅱ





Standard Parts for Fixture Systems

Height Adapters • for compact clamp

EH 23690.



PRODUCT DESCRIPTION

The height adapter for compact clamps allows a clamping height increase and has the following characteristics:

- Continuous covering of clamping height
- T-slot in the height adapter allows exact positioning by moving the compact clamp at specified grid spacings
- Height can be expanded user-defined

Material

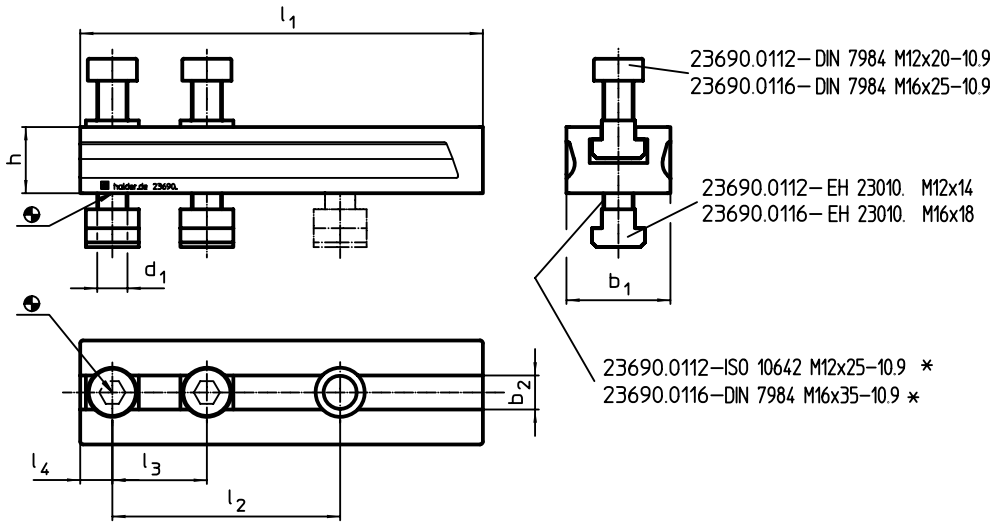
- Heat-treated steel, black coated

MORE INFORMATION

Further products

Complete Range . . . . . → p. 538

DRAWING

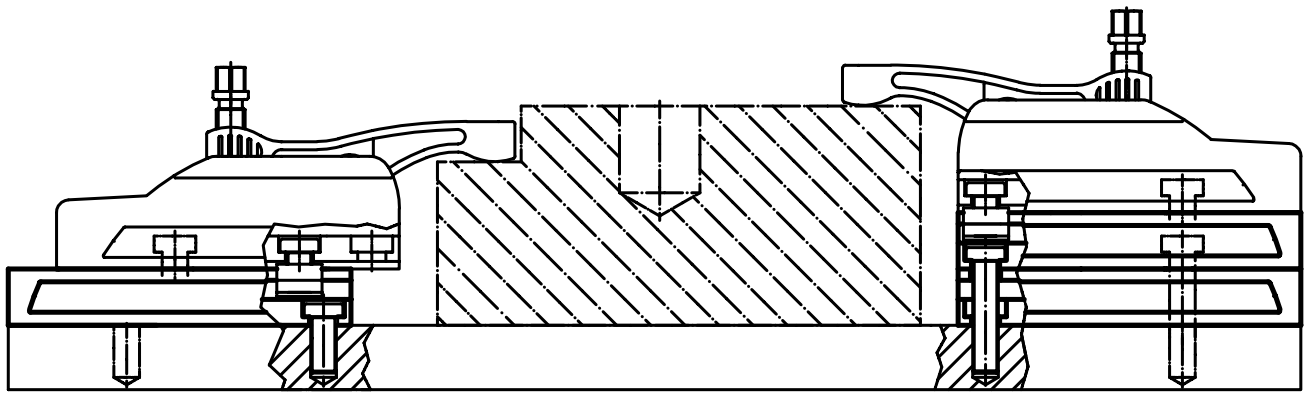


* When using more height adapters the screws ISO 10642 or DIN 7984 have to be replaced by screws extended by the dimension h.

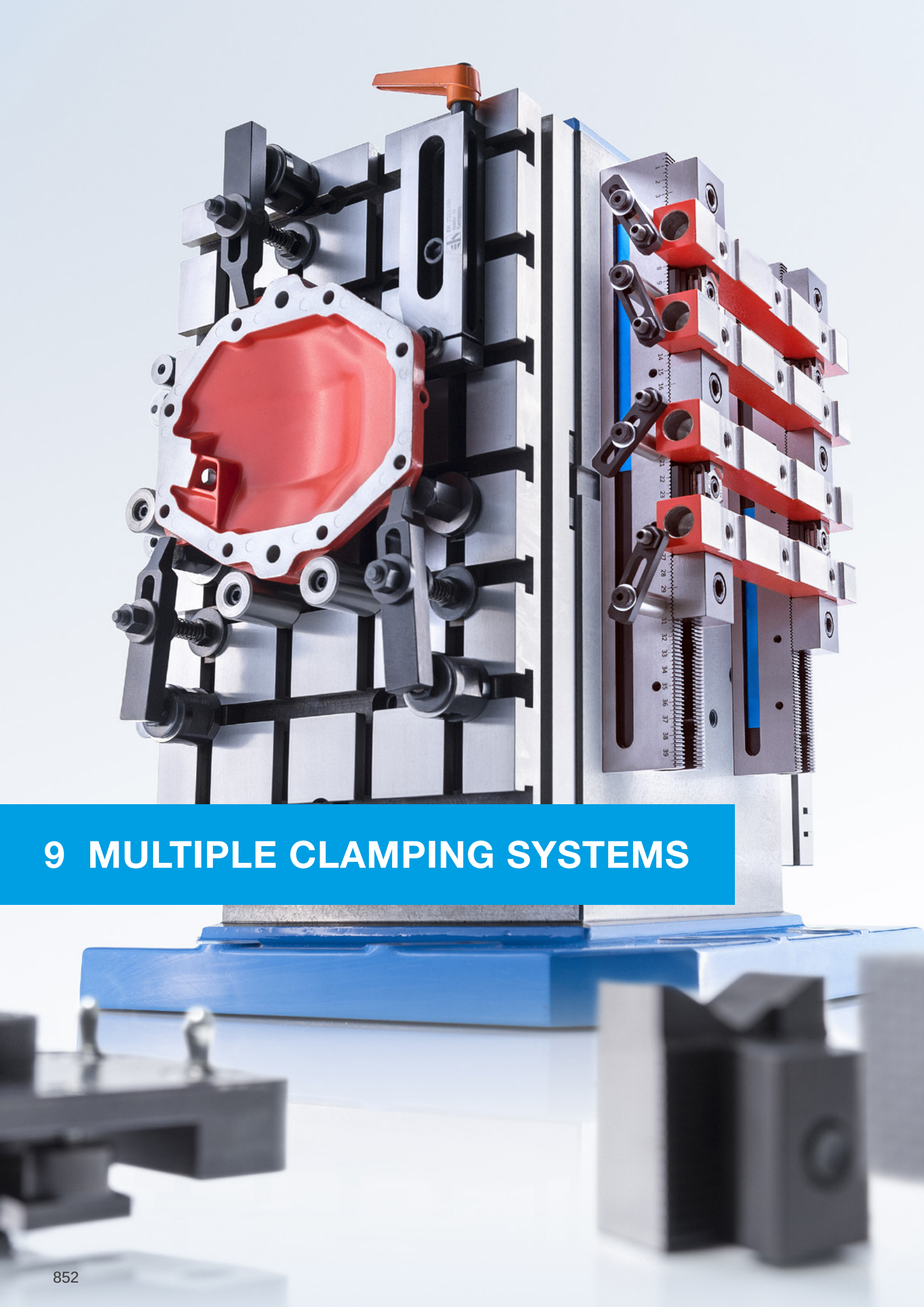
ORDER INFORMATION

System	Dimensions									Art. No.
	d_1	l_1	l_2 +1	l_3	l_4	h	b_1	b_2 H12	[g]	
	[mm]									
V70/L16	**M12**	134	70	50	13	20	45	14	874	23690.0112
L16	**M16**	213	120	50	17	35	55	18	2534	23690.0116

APPLICATION EXAMPLE



8



9 MULTIPLE CLAMPING SYSTEMS

	Product group	Page
	Components	855
	Clamping Units	877
	Standard Ranges	879

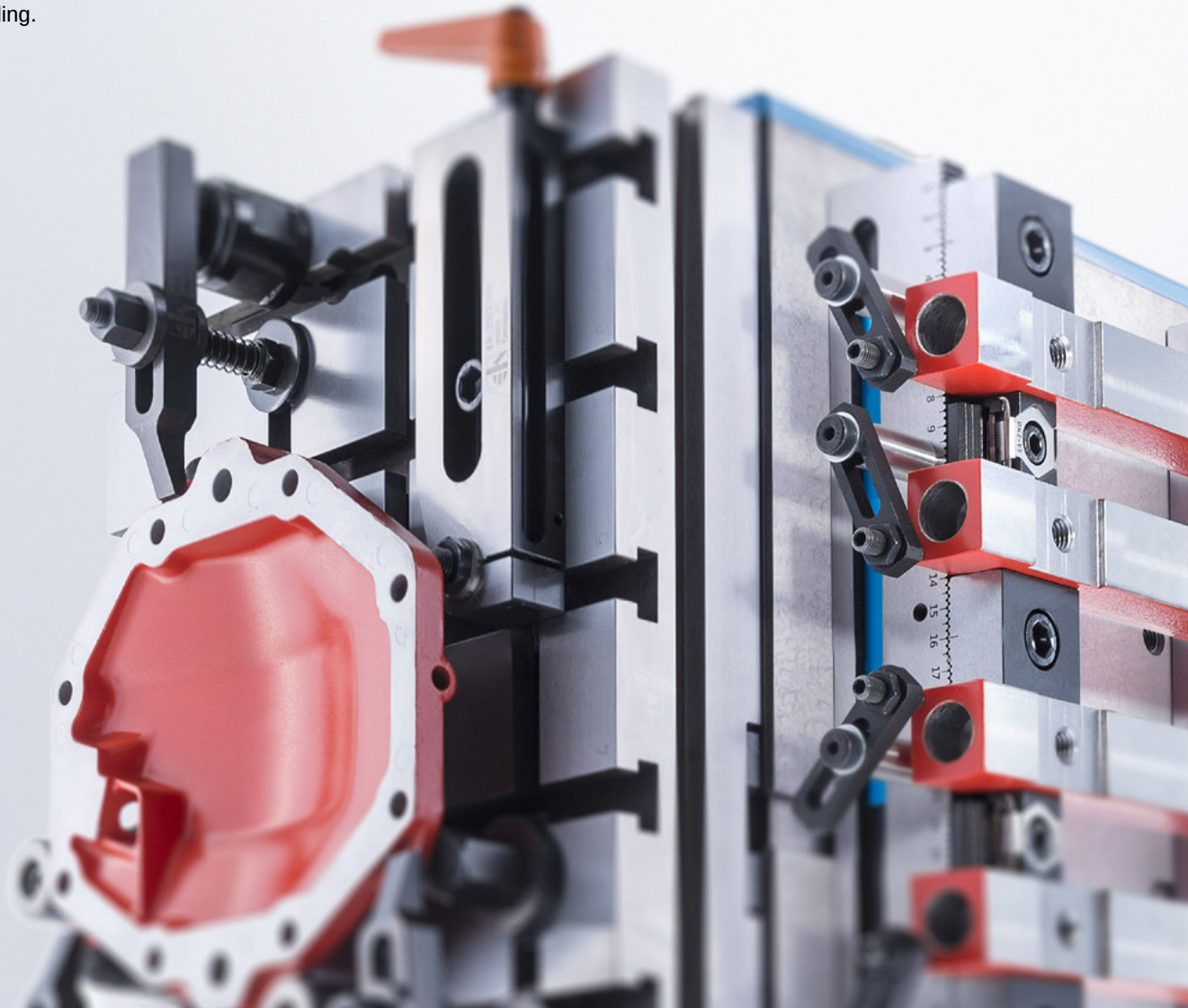


MULTIPLE CLAMPING SYSTEM

Boasting a modular design, our multiple clamping system lets you clamp workpieces in a quick and secure manner. The system is made up of serrated clamping bars, stops, taper clamping units, supports and a lateral stop. Thanks to our wide selection of single parts you can clamp workpiece of various dimensions with perfect ease – either one at a time or simultaneously as a batch of workpieces.

GENERAL PROPERTIES

- The clamping bars are designed to accommodate taper clamping units in the sizes of M8 and M12.
- Their serrated profile makes it possible to securely clamp components with a clamping force of up to 4 tonnes.
- The pitch of the serration amounts to 2.5 mm.
- The accuracy of each row of teeth relative to the positioning holes is +/- 0.01 mm
- In addition, the M6 threads fitted on both sides allow for the attachment of lateral stops.
- New: A magnetic version is also available - for fast assembly / dismantling.



Clamping Bars • length 100

EH 1585.

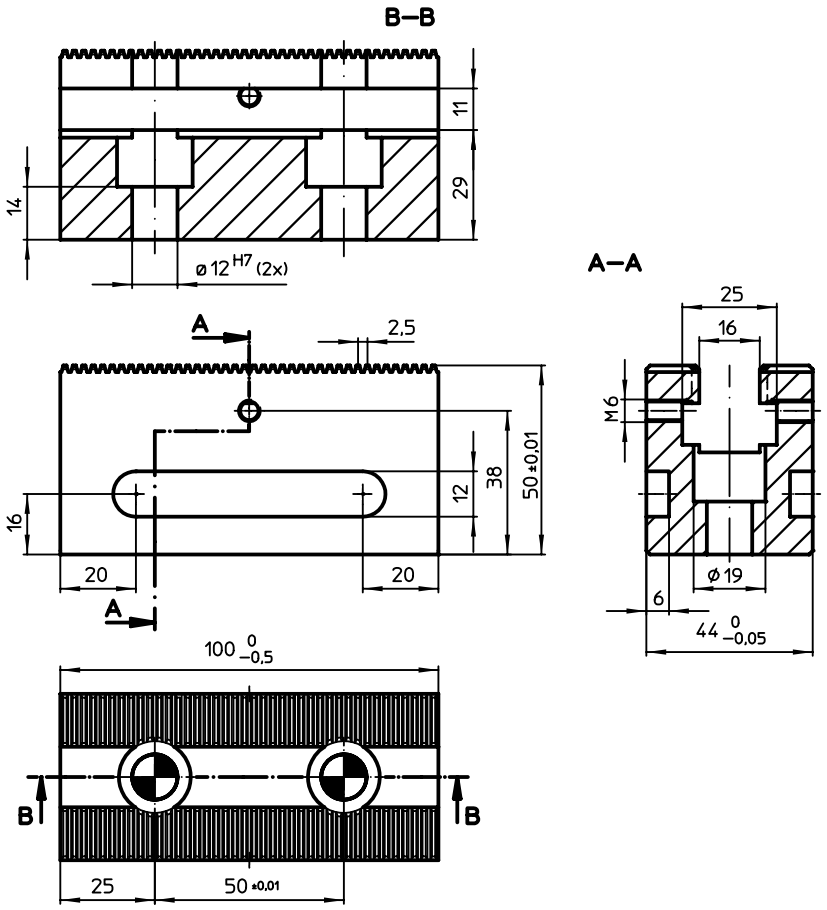


PRODUCT DESCRIPTION

Material

- Tool steel, hardened

DRAWING



ORDER INFORMATION

[g]	Art. No.
1160	1585.100

ACCESSORIES

	Number locating screws M12 x 45	[g]	Art. No.
fixing screws			
	2	106	1585.101

9

Clamping Bars • length 200

EH 1585.

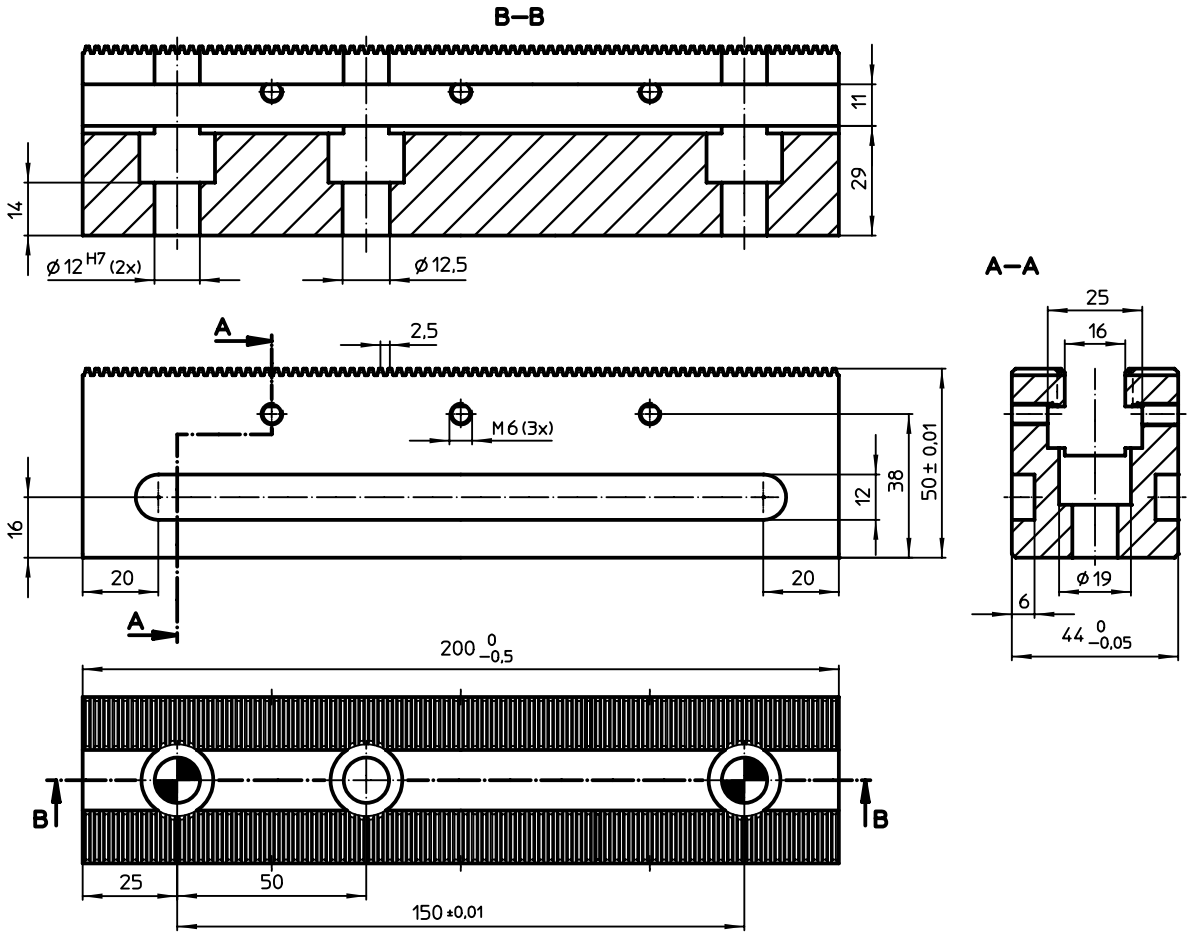


PRODUCT DESCRIPTION

Material

- Tool steel, hardened

DRAWING



ORDER INFORMATION

[g]	Art. No.
2320	1585.200

ACCESSORIES

	Number locating screws M12 x 45	Number cap screws M12 x 45	[g]	Art. No.
fixing screws				
	2	1	155	1585.201

Clamping Bars • length 300

EH 1585.

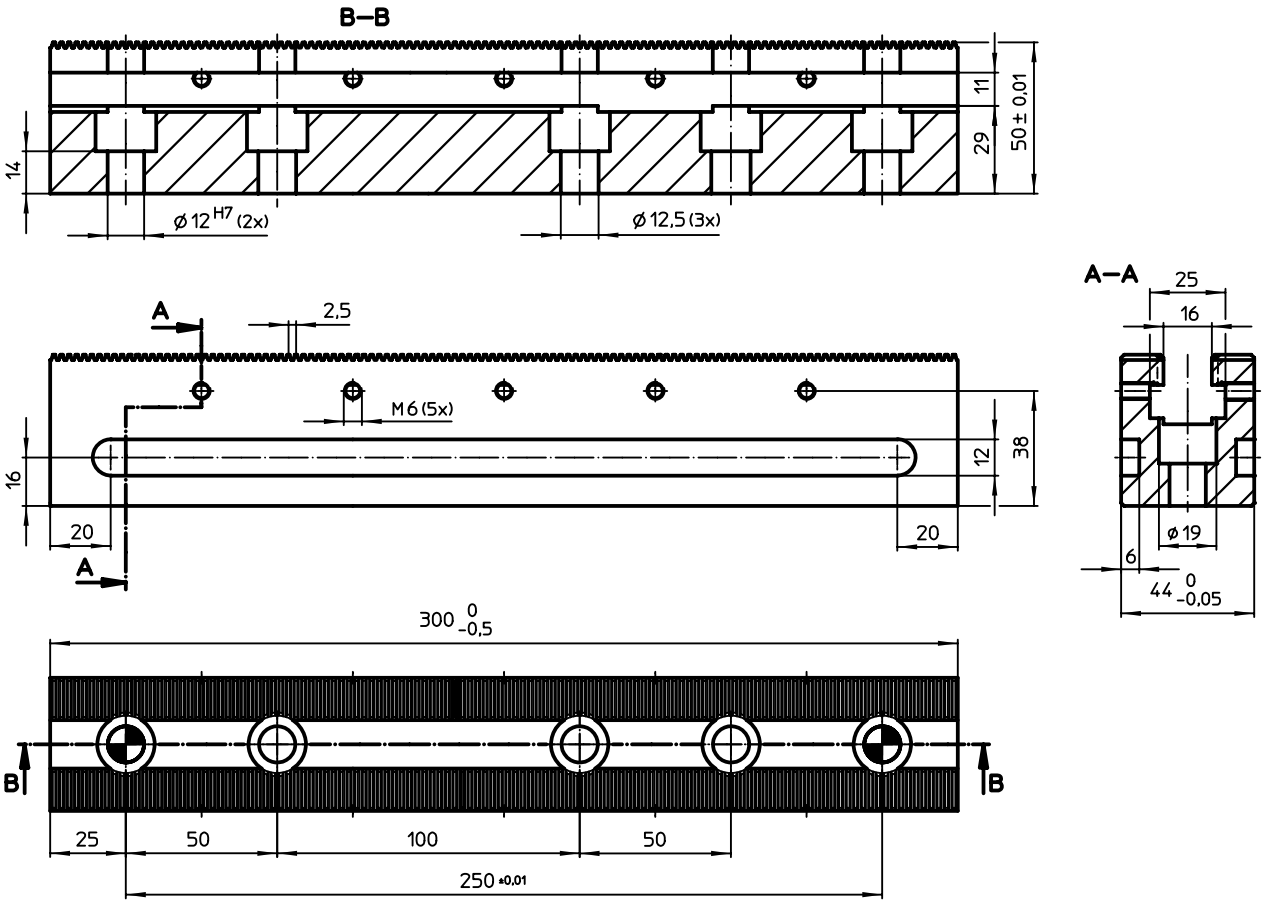


PRODUCT DESCRIPTION

Material

- Tool steel, hardened

DRAWING



ORDER INFORMATION

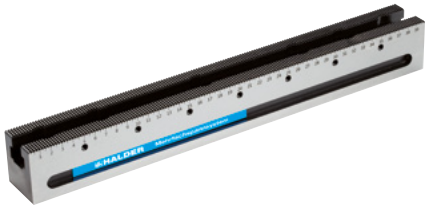
[g]	Art. No.
3450	1585.300

ACCESSORIES

	Number locating screws M12 x 45	Number cap screws M12 x 45	[g]	Art. No.
fixing screws				
	2	3	253	1585.301

Clamping Bars • length 400 - 700

EH 1585.

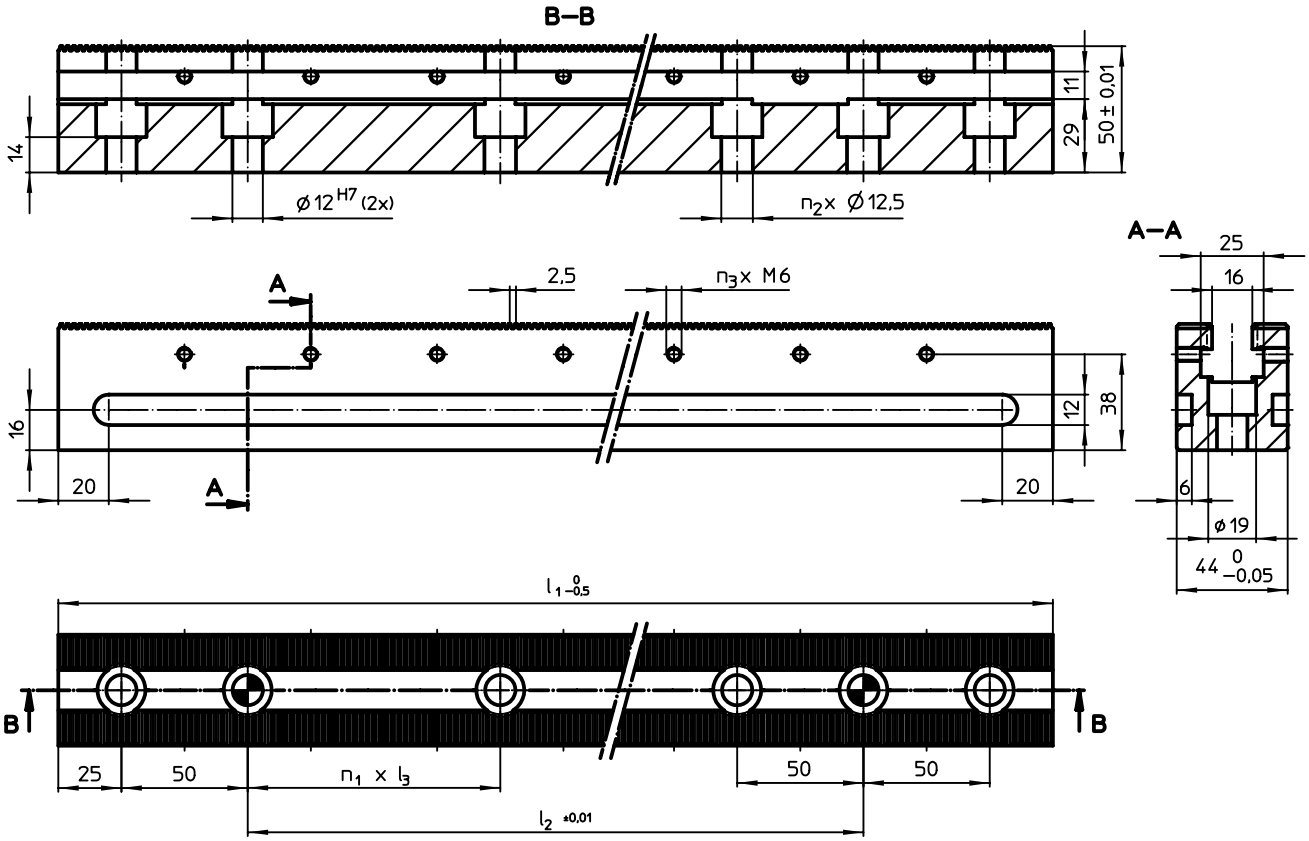


PRODUCT DESCRIPTION

Material

- Tool steel, hardened

DRAWING



ORDER INFORMATION

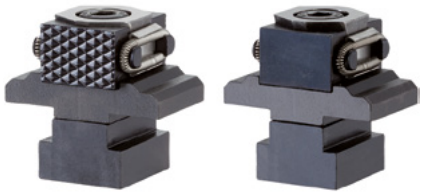
Dimensions			Amount				Art. No.
l_1	l_2	l_3	n_1	n_2	n_3	[g]	
[mm]							
400	250	100	2	4	7	4620	1585.400
500	350	100	3	5	9	5800	1585.500
600	450	100	4	6	11	6960	1585.600
700	550	100	5	7	13	8150	1585.700

ACCESSORIES

	Number locating screws M12 x 45	Number cap screws M12 x 45	[g]	Art. No.
fixing screws				
	2	4	302	1585.401
		5	351	1585.501
		6	400	1585.601
		7	449	1585.701

Taper Clamping Units • plain / ribbed, M8

EH 23250.



PRODUCT DESCRIPTION

Inserting the socket head screw moves the two clamping chucks outwards and presses the workpieces against a stop. Stroke of taper clamping units with M8 = +/- 0.5 mm, M12 = +/- 1 mm.

Material

Body
- Tool steel, hardened, bright

Screw
- Heat-treated steel, tempered, quality 12.9

Spring
- Spring steel wire

Clamping jaws
- Tool steel, hardened, blackened and ground

MORE INFORMATION

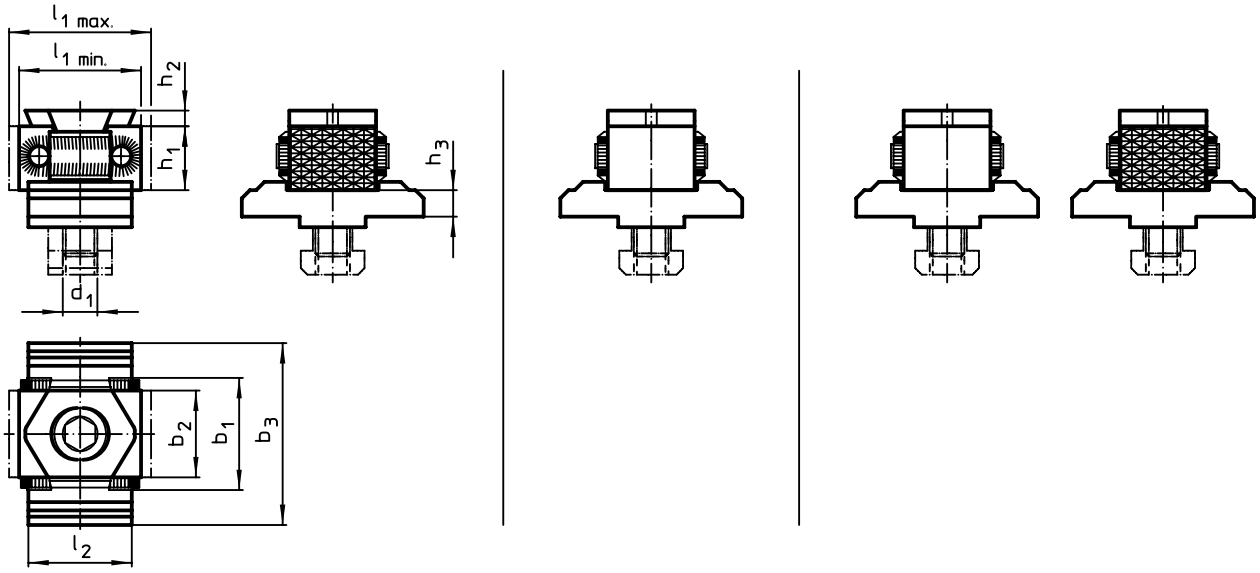
Notes

Clamping jaws protected against rotating

Further products

Taper Clamping Units . . . . . → p. 448

DRAWING



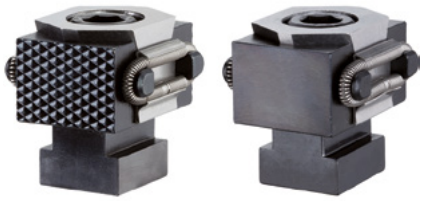
picture 1 picture 2 picture 3

ORDER INFORMATION

Dimensions											Art. No.
d_1	l_1 min.	l_1 max.	l_2	b_1	b_2	b_3	h_1	h_2	h_3	[g]	
				[mm]							
clamping jaw, ribbed on both sides – picture 1											
M8	27	31	25	29	21	44	15	2,5	6,4	200	23250.0501
clamping jaw, plain on both sides – picture 2											
M8	27	31	25	29	21	44	15	2,5	6,4	200	23250.0502
clamping jaw, plain and ribbed – picture 3											
M8	27	31	25	29	21	44	15	2,5	6,4	200	23250.0503

Taper Clamping Units • plain / ribbed, M12

EH 23250.



PRODUCT DESCRIPTION

Inserting the socket head screw moves the two clamping chucks outwards and presses the workpieces against a stop. Stroke of taper clamping units with M8 = +/- 0.5 mm, M12 = +/- 1 mm.

Material

Body
- Tool steel, hardened, bright

Screw
- Heat-treated steel, tempered, quality 12.9

Spring
- Spring steel wire

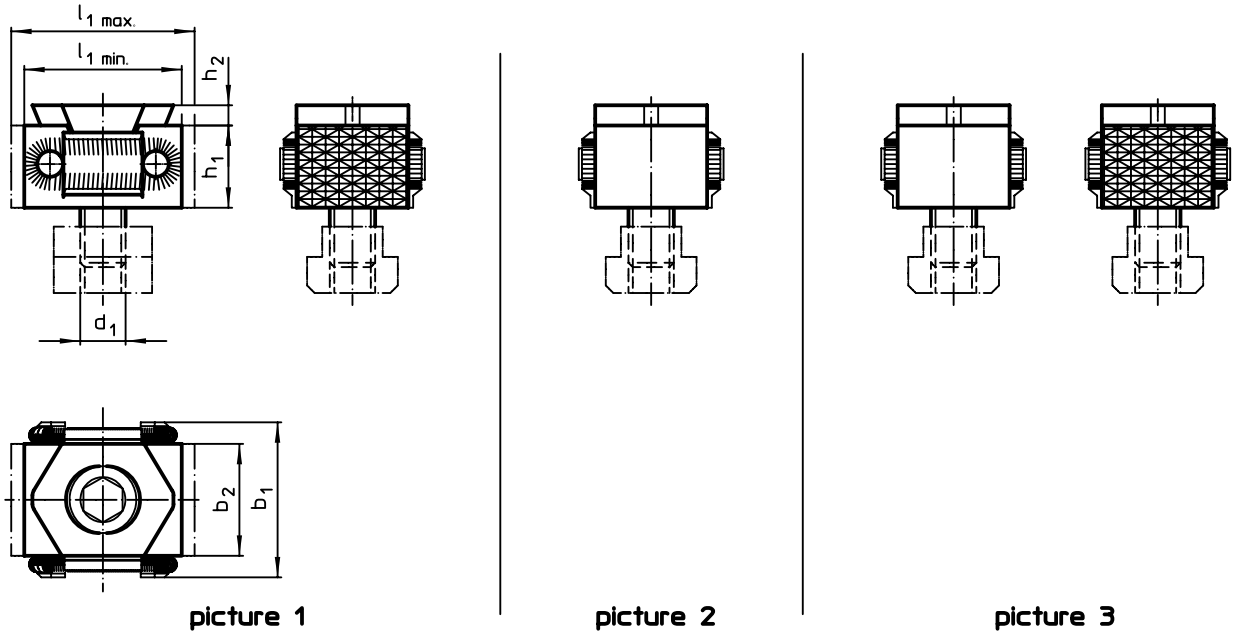
Clamping jaws
- Tool steel, hardened, blackened and ground

MORE INFORMATION

Further products

Taper Clamping Units . . . . . → p. 448

DRAWING



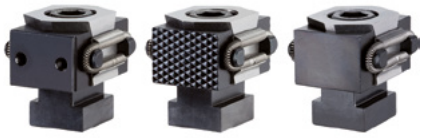
picture 1 picture 2 picture 3

ORDER INFORMATION

d_1	l_1 min.	l_1 max.	b_1	b_2	h_1	h_2		Art. No.
			[mm]				[g]	
clamping jaw, ribbed on both sides – picture 1								
M12	42	49	41	30	22	4	280,00	23250.0510
clamping jaw, plain on both sides – picture 2								
M12	42	49	41	30	22	4	280,84	23250.0511
clamping jaw, plain and ribbed – picture 3								
M12	42	49	41	30	22	4	280,00	23250.0512

Taper Clamping Units • with screw fastened thread, M12

EH 23250.



PRODUCT DESCRIPTION

Inserting the socket head screw moves the two clamping chucks outwards and presses the workpieces against a stop. Stroke of taper clamping units with M8 = +/- 0.5 mm, M12 = +/- 1 mm.

Material

Body
- Tool steel, hardened, bright

Screw
- Heat-treated steel, tempered, quality 12.9

Spring
- Spring steel wire

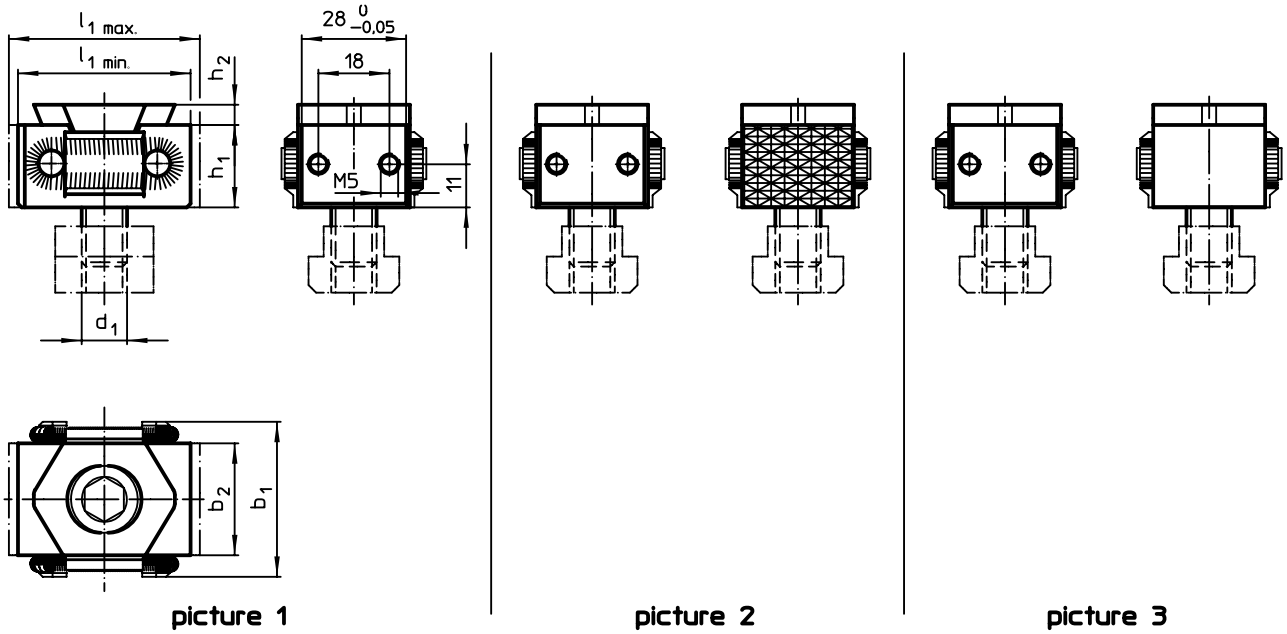
Clamping jaws
- Tool steel, hardened, blackened and ground

MORE INFORMATION

Further products

Taper Clamping Units . . . . . → p. 448

DRAWING



picture 1 picture 2 picture 3

ORDER INFORMATION

Dimensions								Art. No.
d_1	l_1 min.	l_1 max.	b_1	b_2	h_1	h_2	[g]	
			[mm]					
clamping jaw with mounting thread on both sides – picture 1								
M12	47,0	54,0	41	30	22	4	300	23250.0513
clamping jaw, ribbed and with mounting thread – picture 2								
M12	44,5	51,5	41	30	22	4	290	23250.0514
clamping jaw, plain and with mounting thread – picture 3								
M12	44,5	51,5	41	30	22	4	290	23250.0515

Adapters for Taper Clamping Units • for clamping bars

EH 23250.



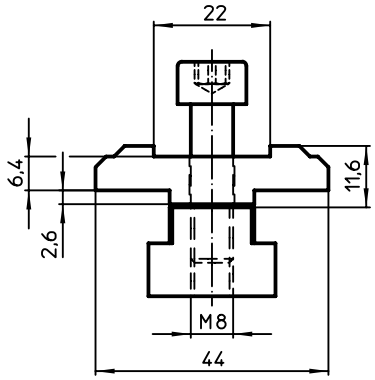
PRODUCT DESCRIPTION

With the adapter, all taper clamping units M8 - M12 can be mounted on the clamping bars. The adapter for the size M8 includes a twist-lock.

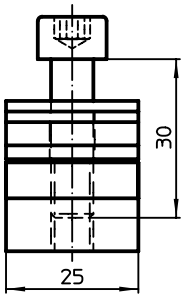
Material

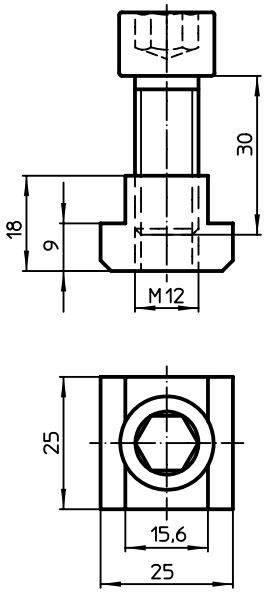
- Tool steel

DRAWING



picture 1





picture 2

ORDER INFORMATION

	[g]	Art. No.
picture 1		
	140	23250.0530
picture 2		
	100	23250.0531

Anti-Turn Locking Devices for Taper Clamping Units • for clamping bars

EH 23250.



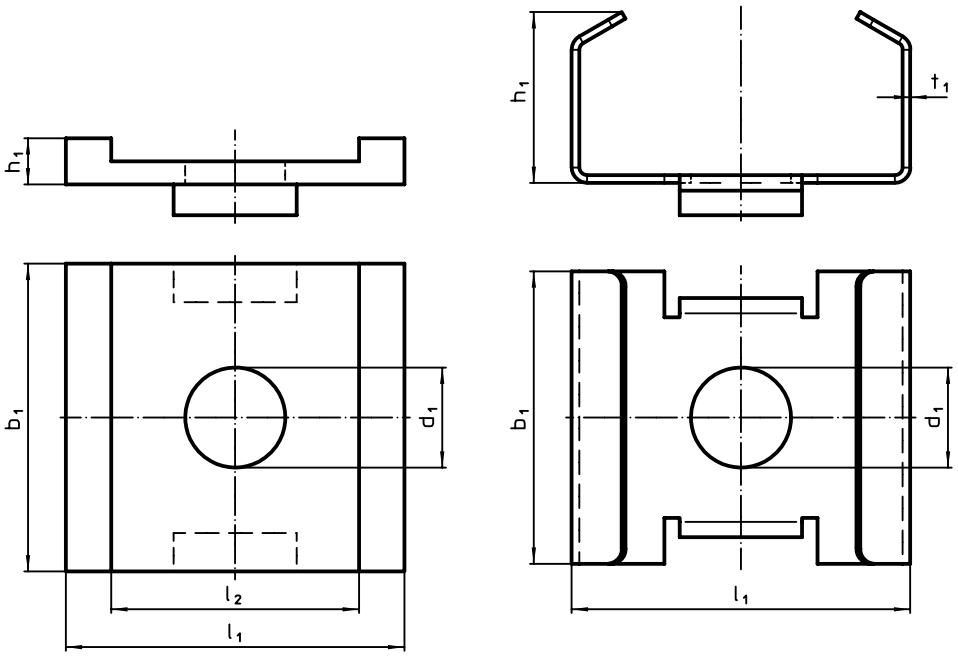
PRODUCT DESCRIPTION

Both versions prevent turning of the taper clamping unit on the clamping bar. The version "picture 2" additionally protects against damage from scales of wood and dirt.

Material

- Steel

DRAWING



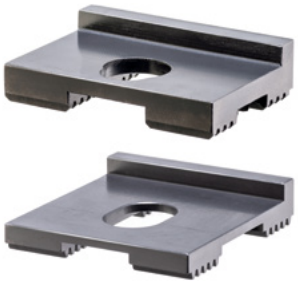
picture 1 picture 2

ORDER INFORMATION

Dimensions [mm]						[g]	Art. No.
d_1	b_1	h_1	l_1	l_2	t_1		
picture 1							
13	40	3	44	32,2	–	54	23250.0532
picture 2							
13	38	23	44	–	1	25	23250.0535

Stop Plates for Taper Clamping Units • for clamping bars

EH 23250.



PRODUCT DESCRIPTION

The stop plate is used when clamping only on one side of the taper clamping unit. One side of the taper clamping unit rests against the step of the stop plate and is thus fixed.

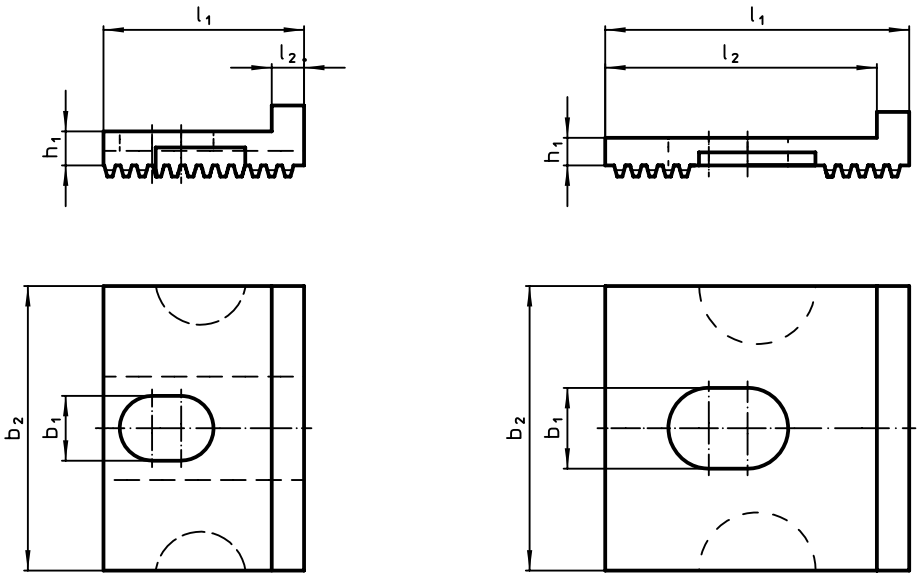
Material

- Tool steel, hardened

Assembly

The stop plate is mounted between the clamping bar and the taper clamping unit.

DRAWING



picture 1 picture 2

ORDER INFORMATION

Dimensions					For taper clamping units		Art. No.
l_1	l_2	b_1	b_2	h_1			
		[mm]				[g]	
picture 1							
31	5	10,0	44	6,4	23250.0501 - .0503	57	23250.0540
picture 2							
47	42	12,5	44	4,4	23250.0510 - .0515	60	23250.0541

9

Lateral Stops

EH 1586.





PRODUCT DESCRIPTION

Material

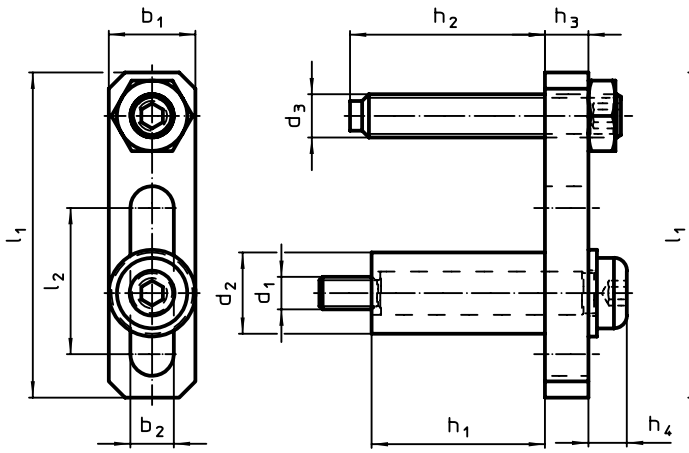
- Steel

Assembly

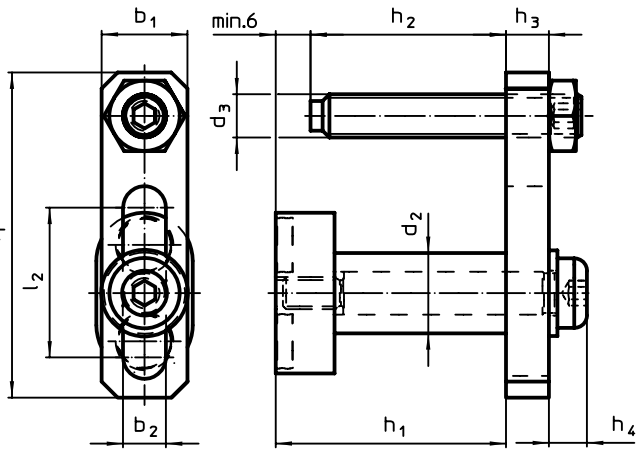
The stop can be mounted on both sides of the clamping bar.

Magnetic version- picture 2:
The stop can be quickly and easily removed before machining the workpiece due to the tool-free mounting.

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions [mm]												Art. No.
d_1	d_2	d_3	l_1	l_2	b_1	b_2	h_1	h_2	h_3	h_4 ~	[g]	
picture 1												
M6	15	M8	60	27	16	8	32	0 – 37	8	7	110	1586.250
picture 2												
–	15	M8	60	27	16	8	43	0 – 37	8	7	151	1586.252

Insertion Tools

EH 1586.



PRODUCT DESCRIPTION

Keeps the workpiece in position during the clamping process.

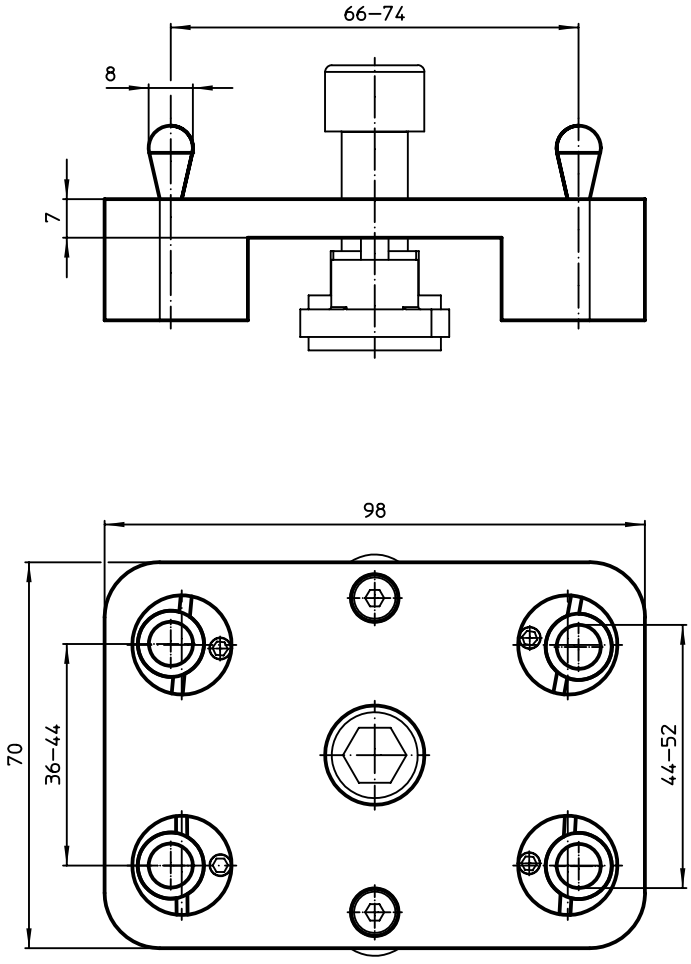
Material
- Steel, blackened

Assembly
The supports (Art. No. 1586.200, 1586.201 and 1586.202) are required.

MORE INFORMATION

Notes
Spring load of 100 N per lateral spring plunger.

DRAWING



ORDER INFORMATION

[g]	Art. No.
800	1586.260

Supports for Clamping Bar

EH 1586.

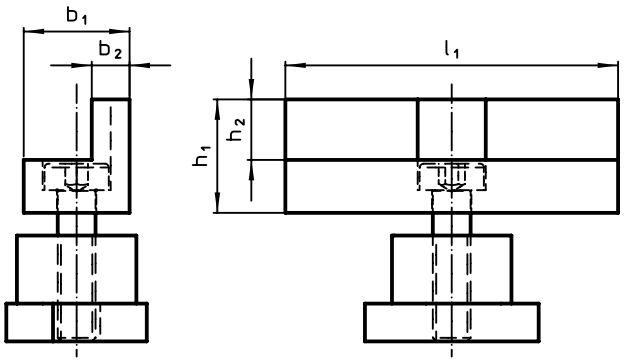


PRODUCT DESCRIPTION

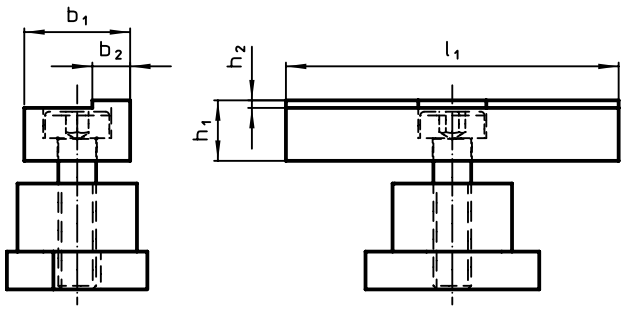
Material

- Tool steel, hardened

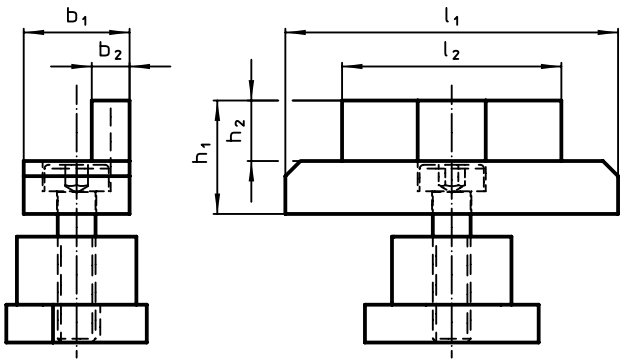
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

Dimensions [mm]						[g]	Art. No.
l_1	l_2	b_1	b_2	h_1	h_2		
high – picture 1							
44	–	14	5	15	8	70	1586.200
low – picture 2							
44	–	14	5	8	1	50	1586.202
high, width shortened – picture 3							
44	29	14	5	15	8	60	1586.201

Supports for Clamping Bar • with spring-loaded catch

EH 1586.

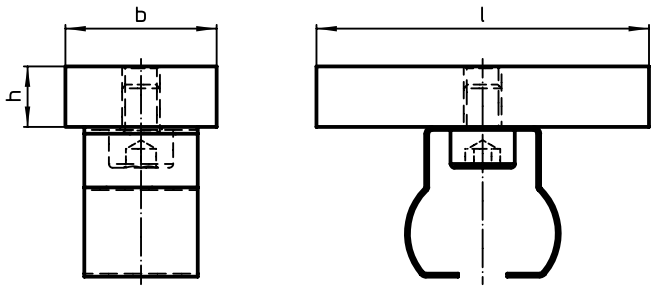


PRODUCT DESCRIPTION

Material

- Aluminium Al

DRAWING



ORDER INFORMATION

Dimensions				Art. No.
l	b	h		
	[mm]		[g]	
44	20	8	30	1586.210

Supports for Clamping Bar • magnetic

EH 1586.



PRODUCT DESCRIPTION

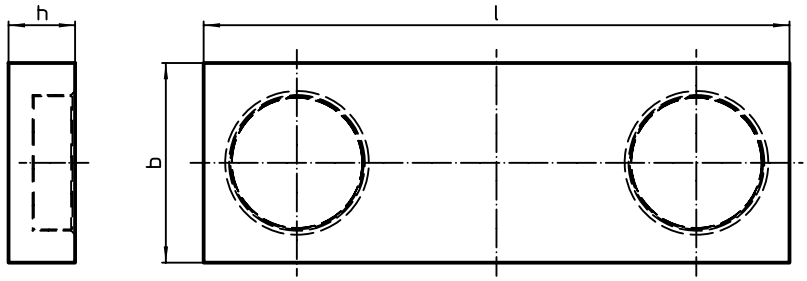
Material

- Tool steel, hardened

Assembly

Tool-free mounting on the clamping bar or a stop by means of an integrated magnet.

DRAWING



ORDER INFORMATION

Dimensions				Art. No.
l	b ±0,02	h ±0,01		
	[mm]		[g]	
44	15	5	25	1586.205

Stops • diamond coated

EH 1586.



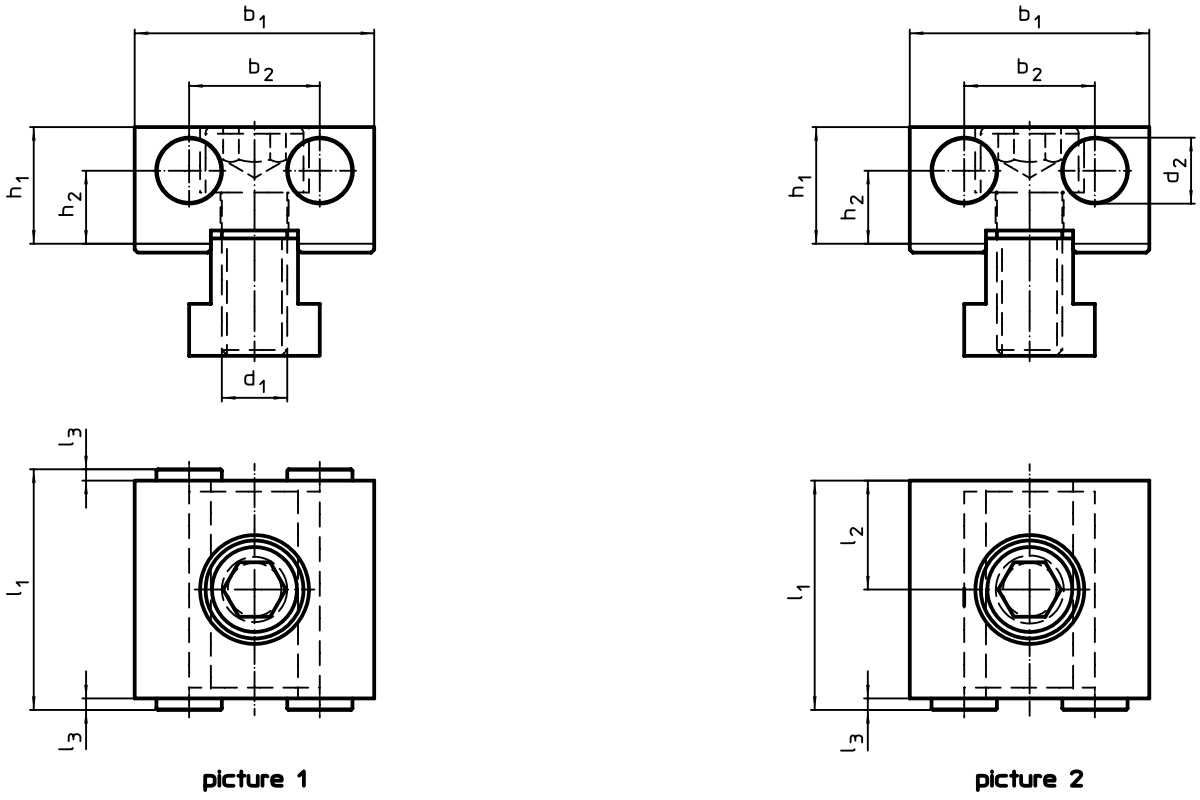
PRODUCT DESCRIPTION

Material

Pin
- Diamond coating

Body
- Tool steel, hardened

DRAWING



ORDER INFORMATION

Dimensions [mm]									[g]	Art. No.
d_1	d_2	l_1	l_2	l_3	b_1	b_2	h_1	h_2		
diamond coated, two-sided – picture 1										
M12	12	44	–	2	44	24	21,4	13,4	390	1586.010
diamond coated one-sided, flat – picture 2										
M12	12	42	20	2	44	24	21,4	13,4	390	1586.011

9

Stops • gripper studs

EH 1586.



PRODUCT DESCRIPTION

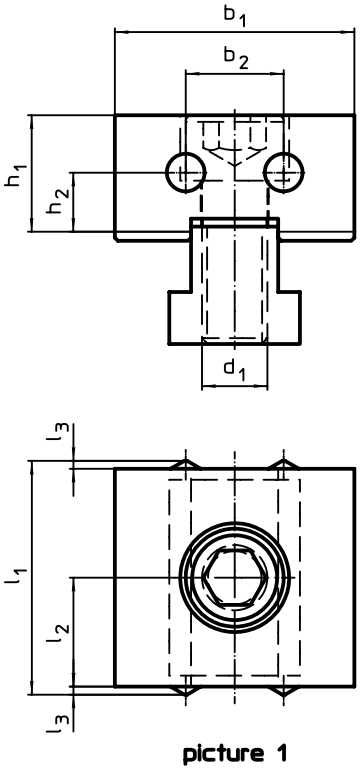
Gripper insert consists of two pins from HSS, when clamped they penetrate into the work-piece surface and may leave residual marks.

Material

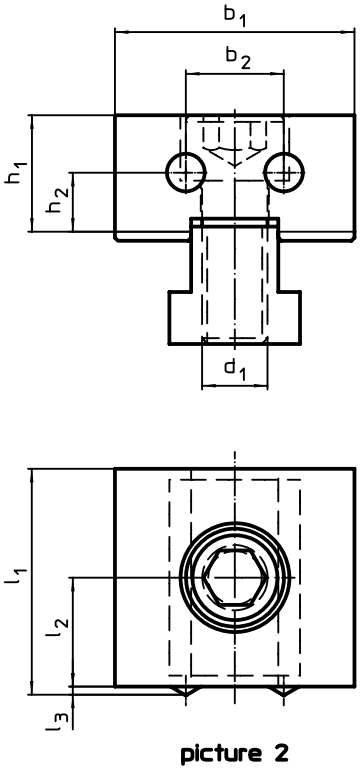
Inserts
- Hard metal, pointed

Body
- Tool steel, hardened

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions [mm]								[g]	Art. No.
d_1	l_1	l_2	l_3	b_1	b_2	h_1	h_2		
gripper studs, two-sided – picture 1									
M12	42	20	1	44	18	21,4	11	400	1586.020
gripper studs, plain – picture 2									
M12	41	20	1	44	18	21,4	11	390	1586.021

Stops • horizontal prisms

EH 1586.

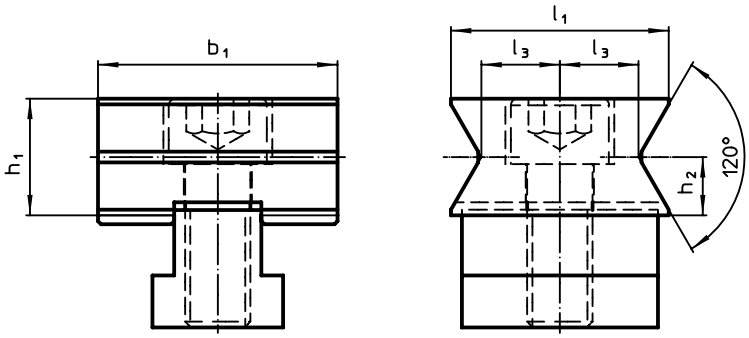


PRODUCT DESCRIPTION

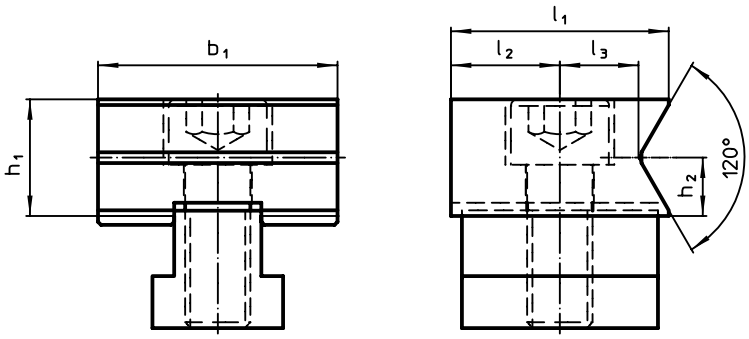
Material

- Tool steel, hardened

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions [mm]								[g]	Art. No.
d_1	d_2	l_1	l_2	l_3	b_1	h_1	h_2		
horizontal prisms on both sides – picture 1									
M12	8 – 20	40	–	14,4	44	21,4	10,7	390	1586.030
horizontal prism, plain – picture 2									
M12	8 – 20	40	20	14,4	44	21,4	10,7	450	1586.031

9

Stops • vertical prisms

EH 1586.

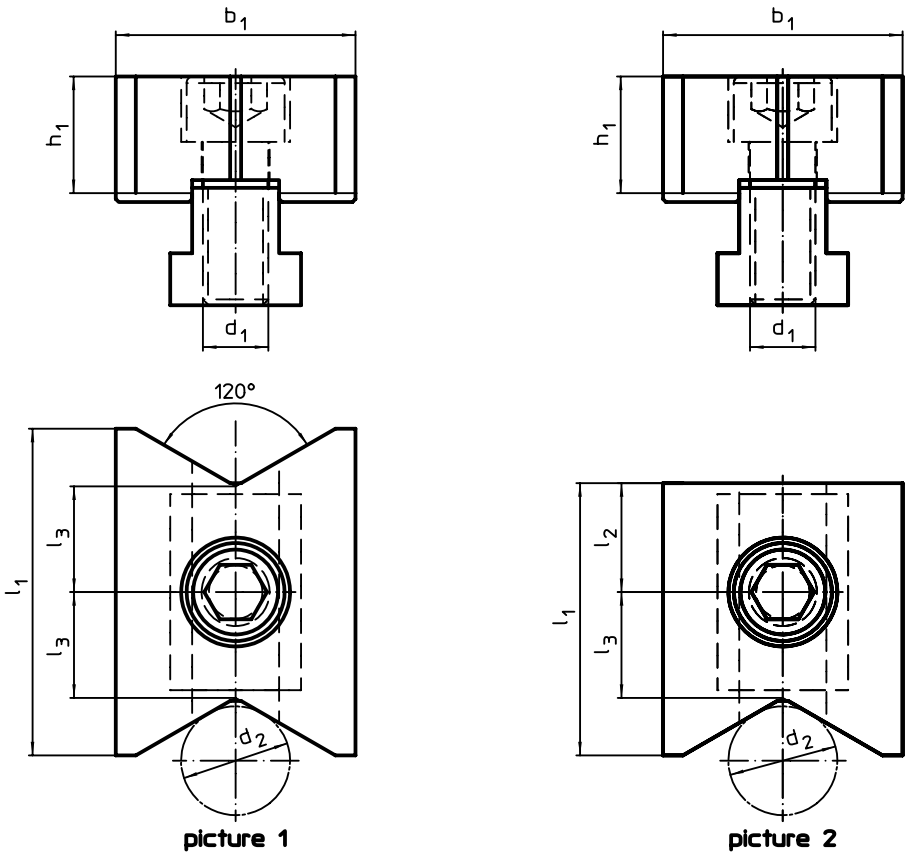


PRODUCT DESCRIPTION

Material

- Tool steel, hardened

DRAWING

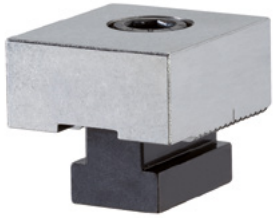


ORDER INFORMATION

Dimensions								Art. No.
d_1	d_2	l_1	l_2	l_3	b_1	h_1	[g]	
			[mm]					
vertical prisms on both sides – picture 1								
M12	10 – 70	60	–	19,4	44	21,4	490	1586.040
vertical prism, plain – picture 2								
M12	10 – 70	50	20	19,4	44	21,4	450	1586.041

Stops • soft

EH 1586.



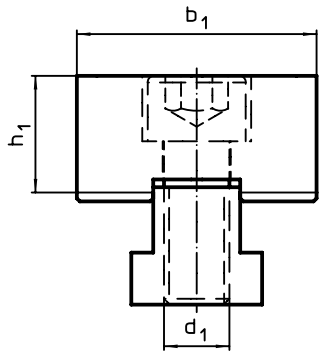
PRODUCT DESCRIPTION

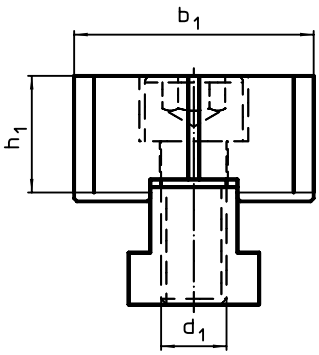
The chucks can be machined to the needed workpiece contour.

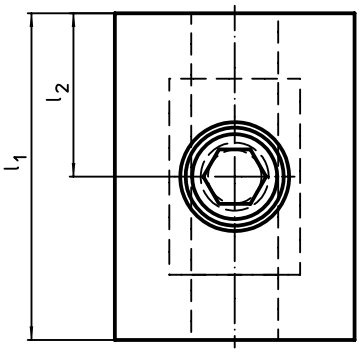
Material

- Tool steel

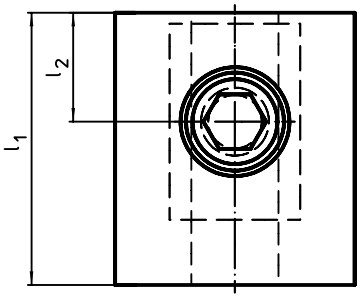
DRAWING







picture 1



picture 2

ORDER INFORMATION

Dimensions						Art. No.
d_1	l_1	l_2	b_1	h_1	[g]	
		[mm]				
soft, on both sides – picture 1						
M12	60	30	44	21,4	550	1586.050
soft, two-sided / one side short – picture 2						
M12	50	20	44	21,4	460	1586.051

9

Stops • ribbed

EH 1586.



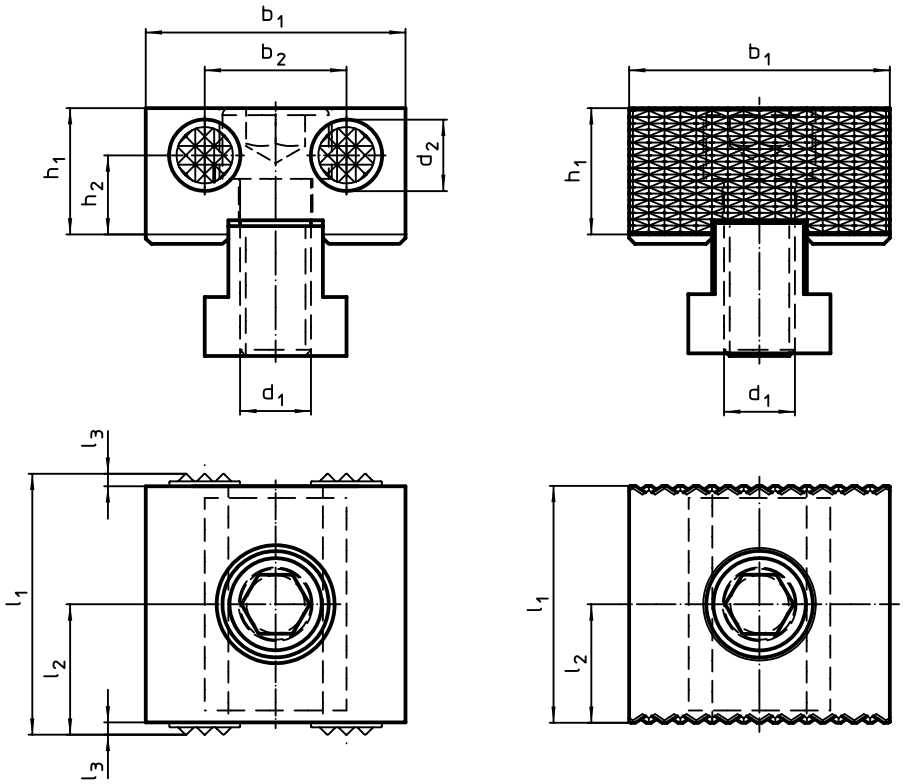
PRODUCT DESCRIPTION

Material

Inserts
- Hard metal

Body
- Tool steel, hardened

DRAWING



ORDER INFORMATION

Dimensions [mm]									[g]	Art. No.
d_1	d_2	l_1	l_2	l_3	b_1	b_2	h_1	h_2		
ribbed on both sides – picture 1										
M12	12	44	22	2	44	24	21,4	13,4	390	1586.060
ribbed over the entire surface, on both sides – picture 2										
M12	–	40	20	–	44	–	21,4	–	392	1586.062

Stops • plain

EH 1586.



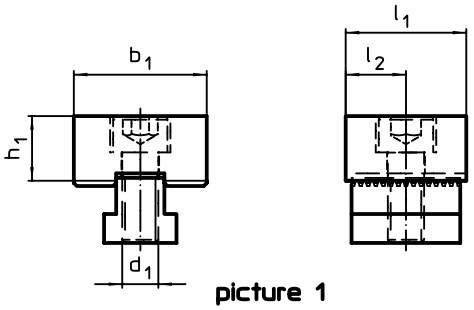
PRODUCT DESCRIPTION

Material

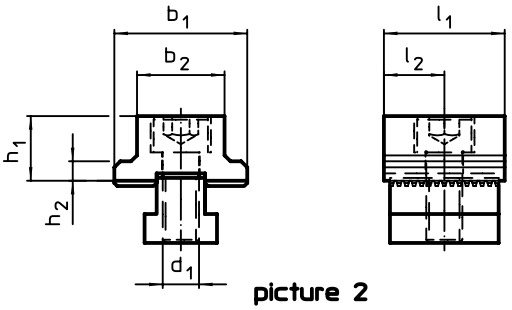
Inserts
- Hard metal

Body
- Tool steel, hardened

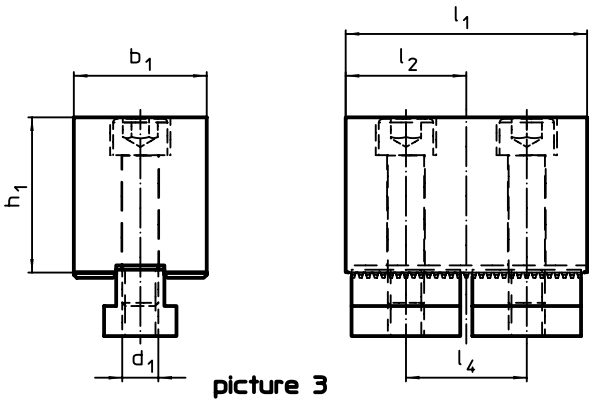
DRAWING



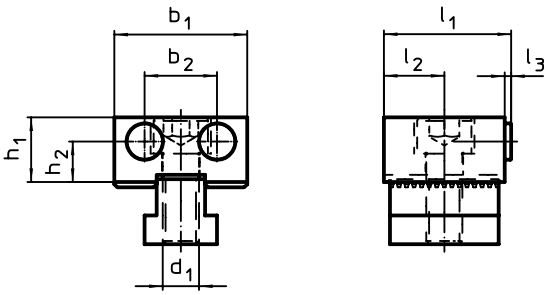
picture 1



picture 2



picture 3



picture 4

ORDER INFORMATION

Dimensions [mm]										[g]	Art. No.
d_1	d_2	l_1	l_2	l_3	l_4	b_1	b_2	h_1	h_2		
plain, on both sides – picture 1											
M12	–	40	20	–	–	44	–	21,4	–	400	1586.070
plain, two-sided / width shortened – picture 2											
M12	–	40	20	–	–	44	29	21,4	6,4	340	1586.071
plain, two-sided / high version – picture 3											
M12	–	80	40	–	40	44	–	51,4	–	1600	1586.072
ribbed and plain – picture 4											
M12	12	42	20	2	–	44	24	21,4	13,4	390	1586.073

Stops • with mounting thread

EH 1586.



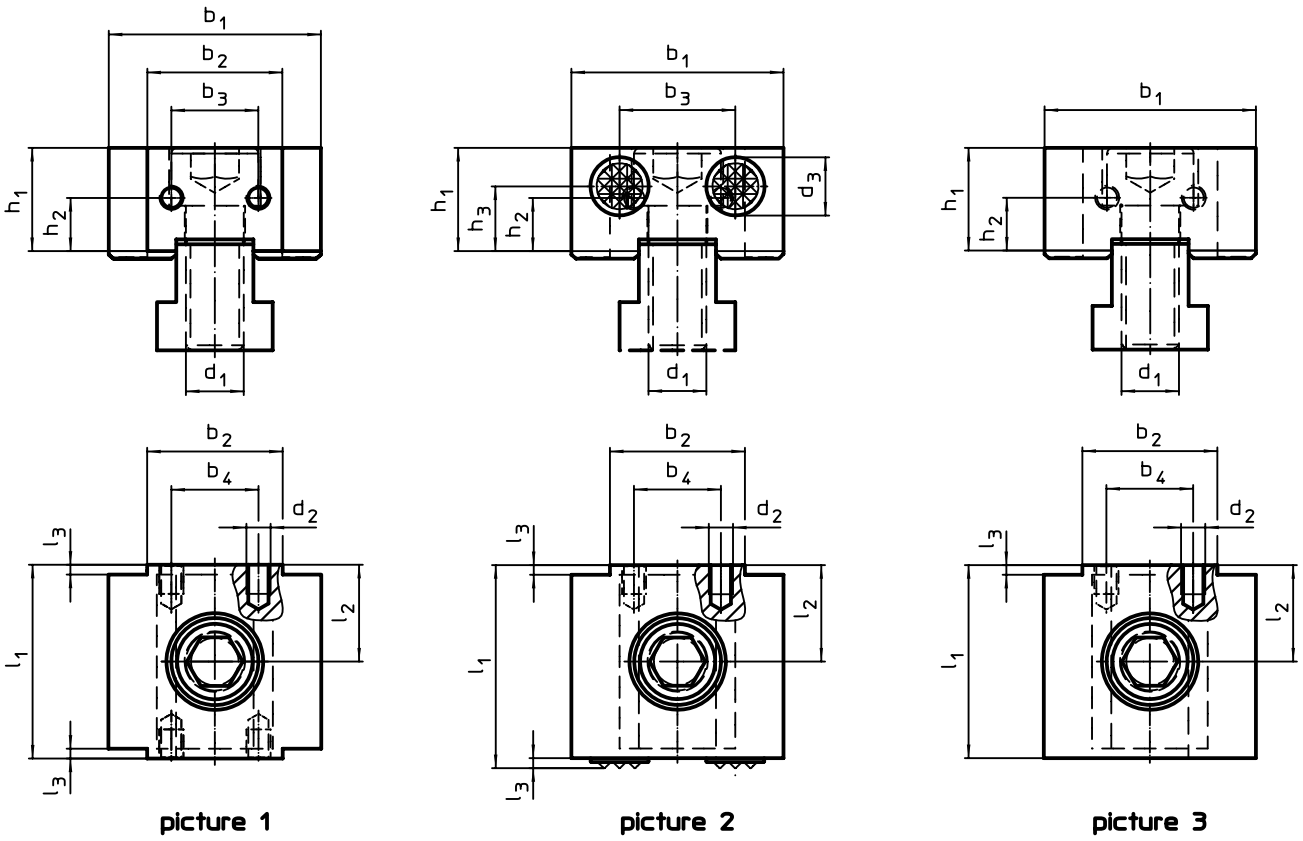
PRODUCT DESCRIPTION

Material

Inserts
- Hard metal

Body
- Tool steel, hardened

DRAWING



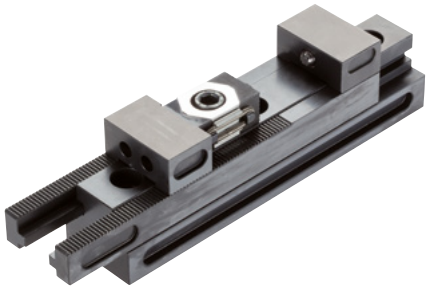
picture 1 picture 2 picture 3

ORDER INFORMATION

Dimensions [mm]													[g]	Art. No.
d_1	d_2	d_3	l_1	l_2	l_3	b_1	b_2	b_3	b_4	h_1	h_2	h_3		
mounting thread on both sides – picture 1														
M12	M5	–	40	20	2	44	28	18	18	21,4	11	11,0	400	1586.080
ribbed and mounting thread – picture 2														
M12	M5	12	42	20	2	44	28	24	18	21,4	11	13,4	400	1586.081
plain and mounting thread – picture 3														
M12	M5	–	40	20	2	44	28	–	18	21,4	11	–	400	1586.082

Combination Clamping Bars

EH 1586.



PRODUCT DESCRIPTION

The combination clamping bar offers 3 ways to clamp/support the workpiece:

- Floating mode

Floating mode is used to clamp and support additional clamping points on components.

- Centric mode

The jaws of the clamping bar move in sync. The centre axis of the workpiece remains unchanged even if the outer diameters are modified.

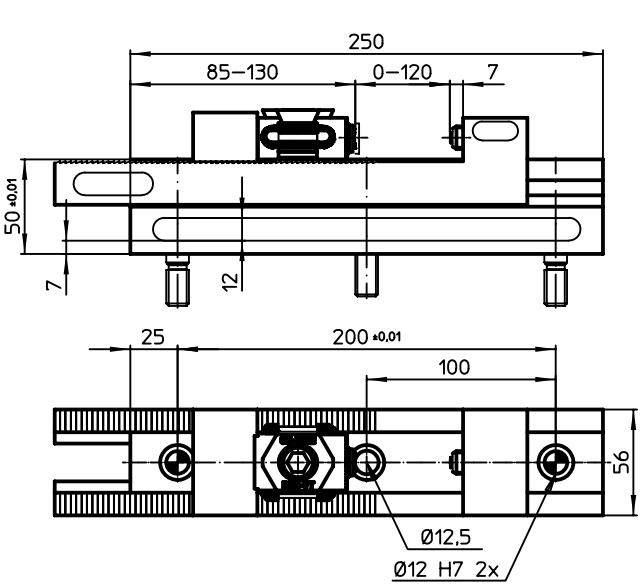
- Machine vice mode

When this mode is selected, one of the jaws is locked in place on the clamping bar. The second jaw remains movable.

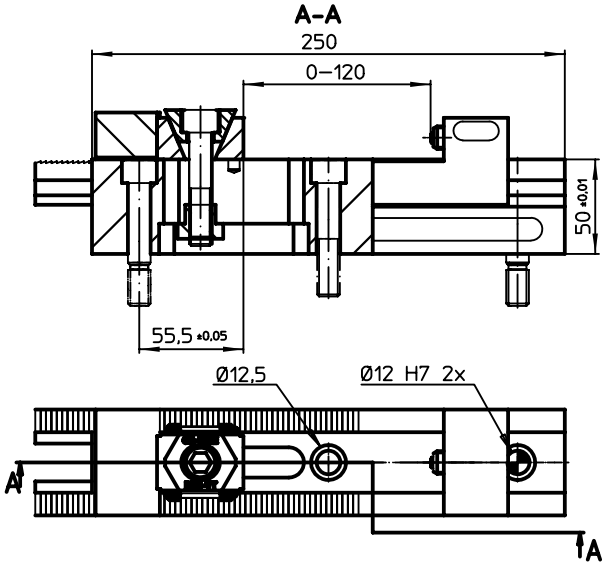
Material

- Tool steel, hardened

DRAWING



floating mode



machine vice mode

ORDER INFORMATION

[g]	Art. No.
5360	1586.400

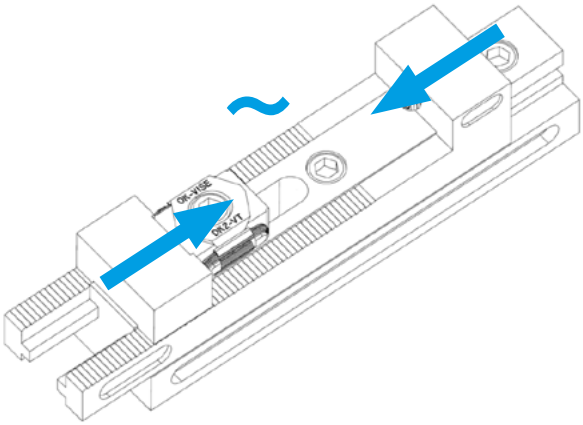
ACCESSORIES

	Number locating screws M12 x 45	Number cap screws M12 x 45	[g]	Art. No.
fixing screws for clamping bars				
	2	1	203	1586.401

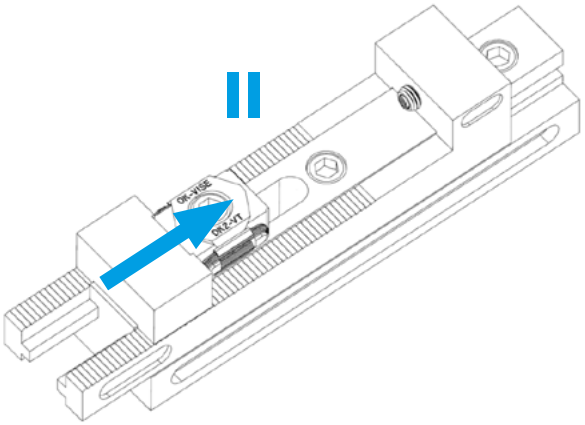
Combination Clamping Bars
1586.400

FUNCTIONS

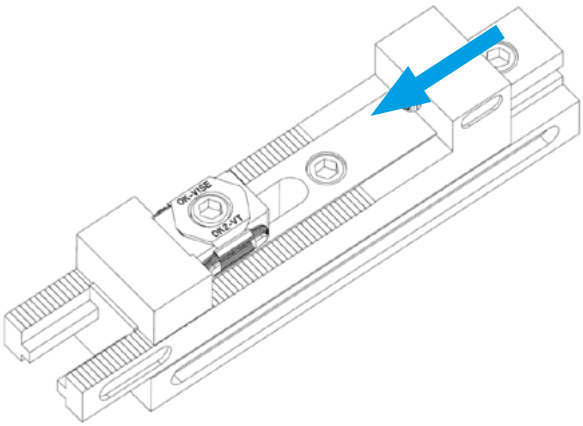
The combination clamping bar offers 3 different functions by means of which the workpiece can be clamped/supported.



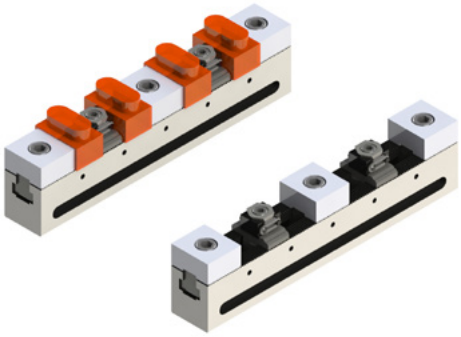
FLOATING MODE
- Floating mode is used to clamp and support additional clamping points on components.
- The fixture adapts to the position of the workpiece.



CENTRIC MODE
- The jaws of the clamping bar move in sync. The centre axis of the workpiece remains unchanged even if the outer diameters are modified.

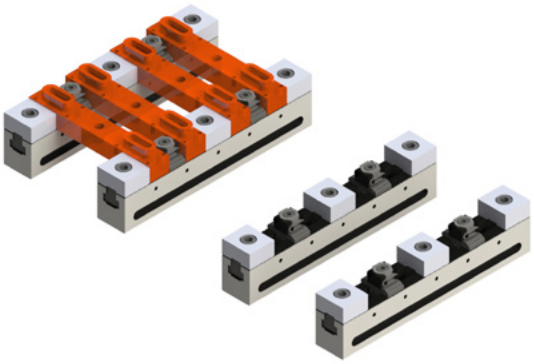


MACHINE VICE MODE
- When this mode is selected, one of the jaws is locked in place on the clamping bar. The second jaw remains movable.



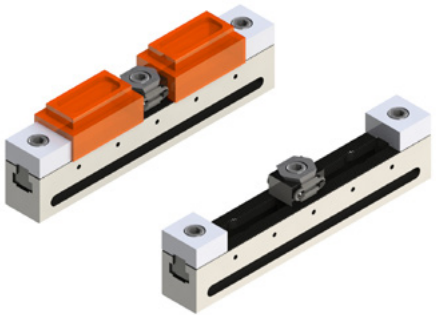
Flexible 3-sided machining.
You can machine up to 4 workpieces at once. Art. No. 1586.410

Units	Designation	Art. No.
1	Clamping bar	1585.300
1	Fixing screws	1585.301
3	Stop, flat, two-sided	1586.070
2	Taper clamping unit, M8 clamping jaw flat, two-sided	23250.0502



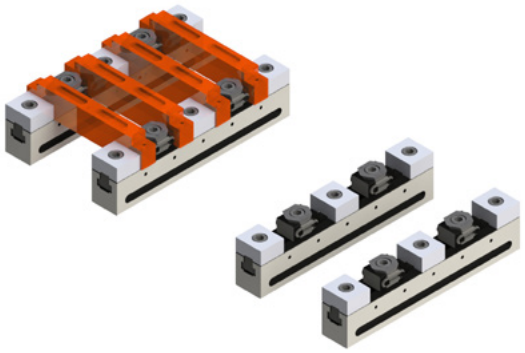
Two ranges of 1586.410. Particularly well suited for machining long workpieces. Art. No. 1586.411

Units	Designation	Art. No.
2	Clamping bar	1585.300
2	Fixing screws	1585.301
6	Stop, flat, two-sided	1586.070
4	Taper clamping unit, M8 clamping jaw flat, two-sided	23250.0502



Flexible 3-sided machining. 1-2 workpieces can be machined at the same time. Art. No. 1586.412

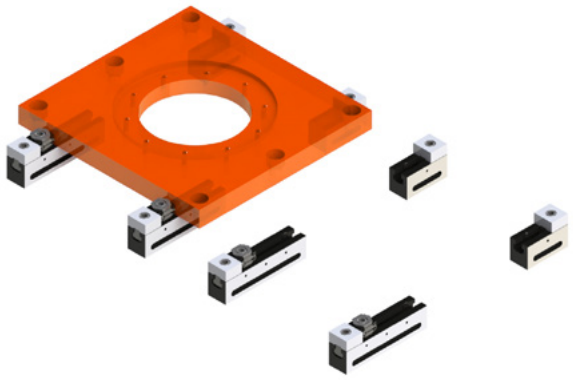
Units	Designation	Art. No.
1	Clamping bar	1585.300
1	Fixing screws	1585.301
2	Stop, flat, two-sided	1586.070
1	Taper clamping unit, M12 clamping jaw flat, two-sided	23250.0511



Flexible 3-sided machining. Particularly well suited for machining long workpieces. Art. No. 1586.413

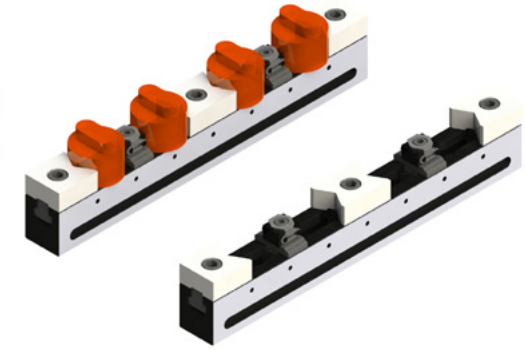
Units	Designation	Art. No.
2	Clamping bar	1585.300
2	Fixing screws	1585.301
6	Stop, flat, two-sided	1586.070
4	Taper clamping unit, M12 clamping jaw flat, two-sided	23250.0511

STANDARD RANGES



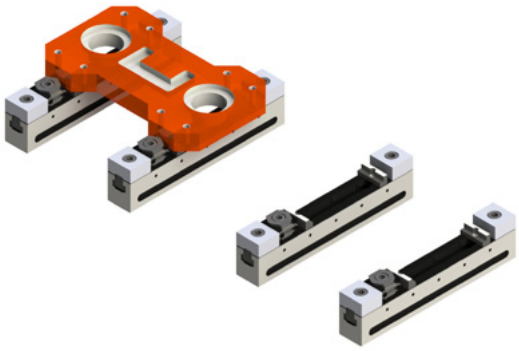
For machining large workpieces. Art. No. 1586.414

Units	Designation	Art. No.
2	Clamping bar	1585.100
2	Fixing screws	1585.101
2	Clamping bar	1585.200
2	Fixing screws	1585.201
4	Stop, flat, two-sided	1586.070
2	Taper clamping unit, M8 clamping jaw flat, two-sided	23250.0511



For machining cylindrical workpieces. 4 workpieces can be machined at the same time. Art. No. 1586.415

Units	Designation	Art. No.
1	Clamping bar	1585.400
1	Fixing screws	1585.401
1	Stop, V-blocks vertical, two-sided	1586.040
2	Stop, 1-sided, V-blocks vertical and flat	1586.041
2	Taper clamping unit, M8 clamping jaw flat, two-sided	23250.0502



For machining large workpieces. Including supports with a height of 15 mm. Art. No. 1586.416

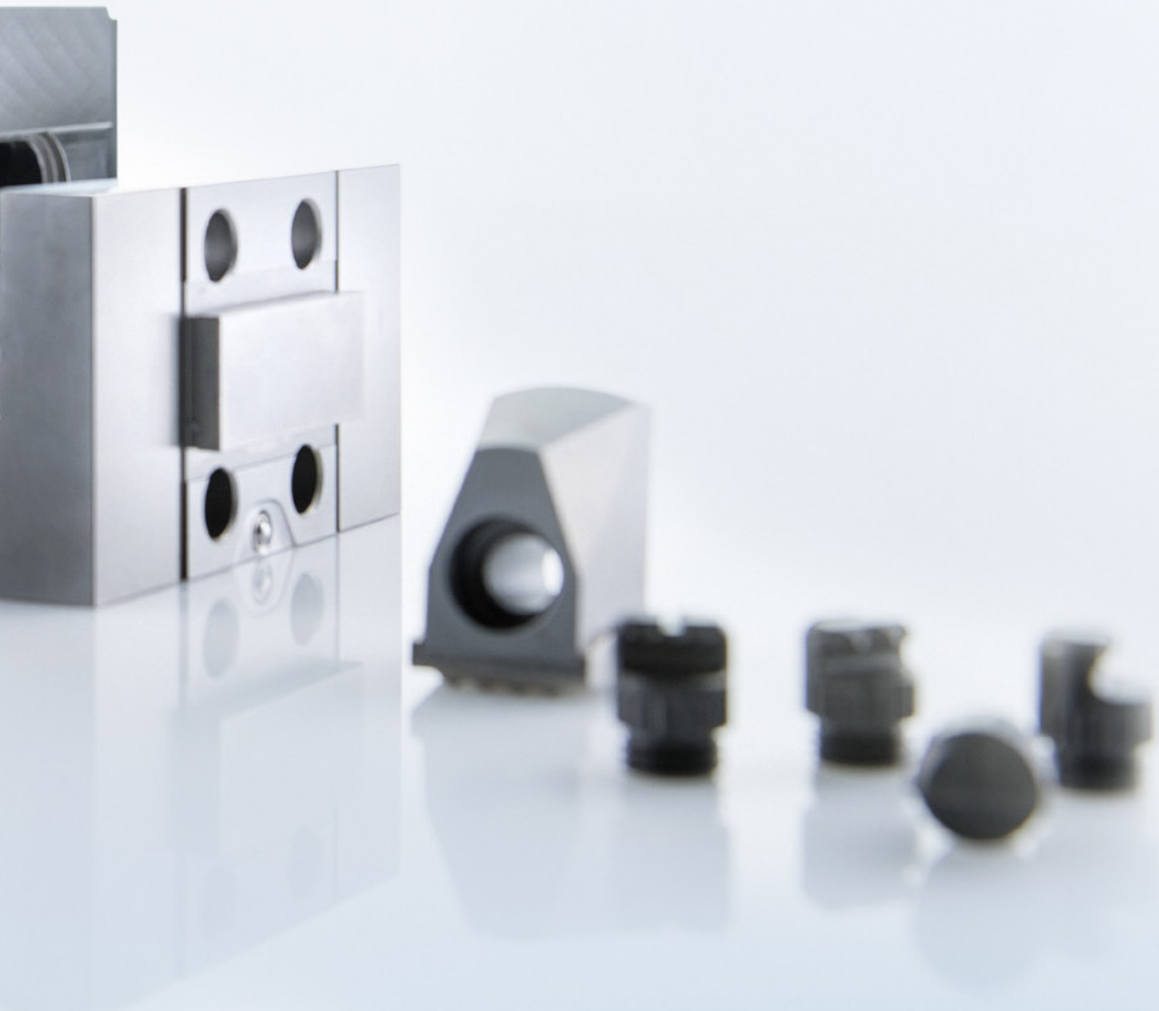
Units	Designation	Art. No.
2	Clamping bar	1585.300
2	Fixing screws	1585.301
4	Stop, flat, two-sided	1586.070
4	Support for clamping bar	1586.200
2	Taper clamping unit, M12 clamping jaw flat, two-sided	23250.0511

NOTES



10 MULTI-VICES

	Product group	Page
	Multi-Vices MS 125	884
	Conventional Clamping	885
	Gripp Clamping	886
	Pull-Down Clamping	888
	Five-Sided Machining	890



Multi-Vices MS 125

EH 1700.

MULTI-VICE – MECHANICAL VERSION MS 125-S/M/L

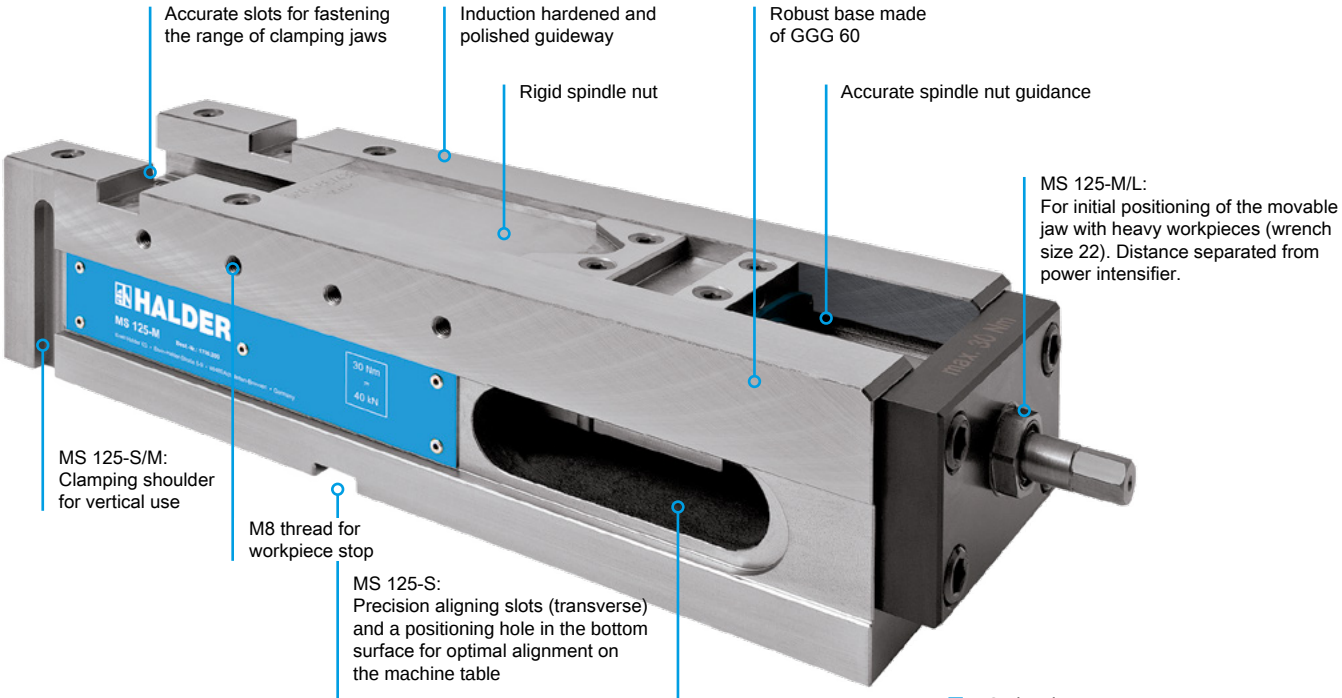
SCOPE OF APPLICATION

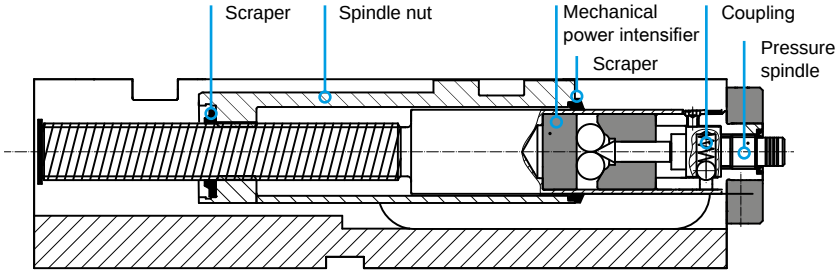
- Can be applied horizontally or vertically - therefore suitable for vertical and horizontal CNC milling machines
- Conventional clamping, gripper clamping or pull-down clamping are all possible
- MS 125-S – ideal for use on five-axis machining centres
- Clamping unmachined parts, saw-cut or flame-cut material by penetration of hardened, replaceable gripper elements into the workpiece
- With the support jaws, unmachined parts in highly varied materials, or with complex geometries, can be clamped securely and economically

PRODUCT FEATURES

- High versatility: the modular clamping system combines practically all the possibilities of our tried-and-tested models
- High-pressure spindle with power intensification - clamping force does not slacken
- Enlarged clamping span for secure clamping of unmachined parts
- Lost clamping margin 8 mm with pull-down clamping, 3 mm with gripp clamping
- Clamping with torque wrench (max. 30 Nm) - this makes it possible to work above the table with an unfavourable clamping arrangement on the tool







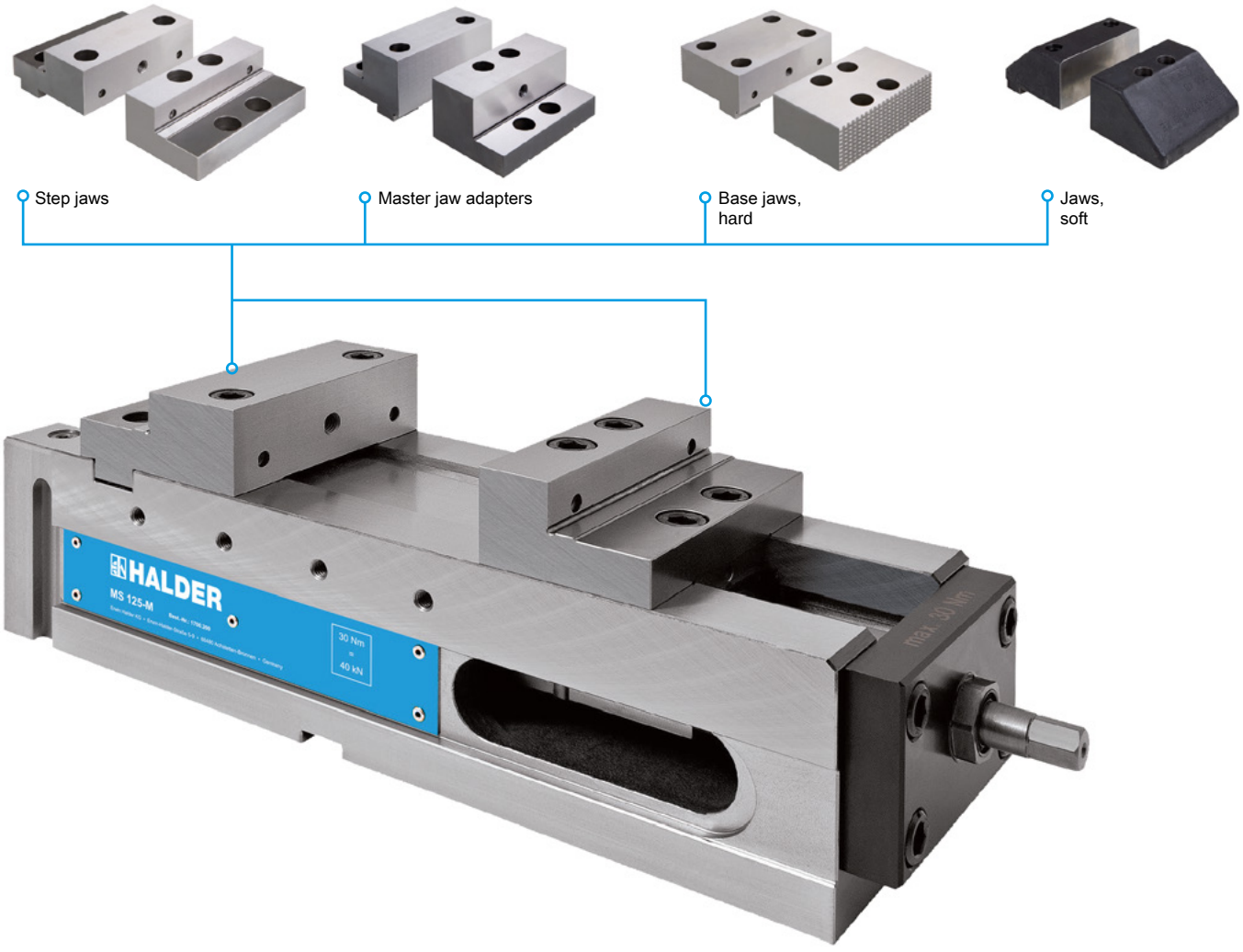
You will find details and your contact persons under:

www.halder.com/ Multi-Vices

MULTI-VICE CONVENTIONAL CLAMPING VERSION MS 125-S/M/L

FOR CONVENTIONAL CLAMPING OF WORKPIECES

On the following pages you will find a wide range of jaws suitable for clamping pre-machined workpieces.

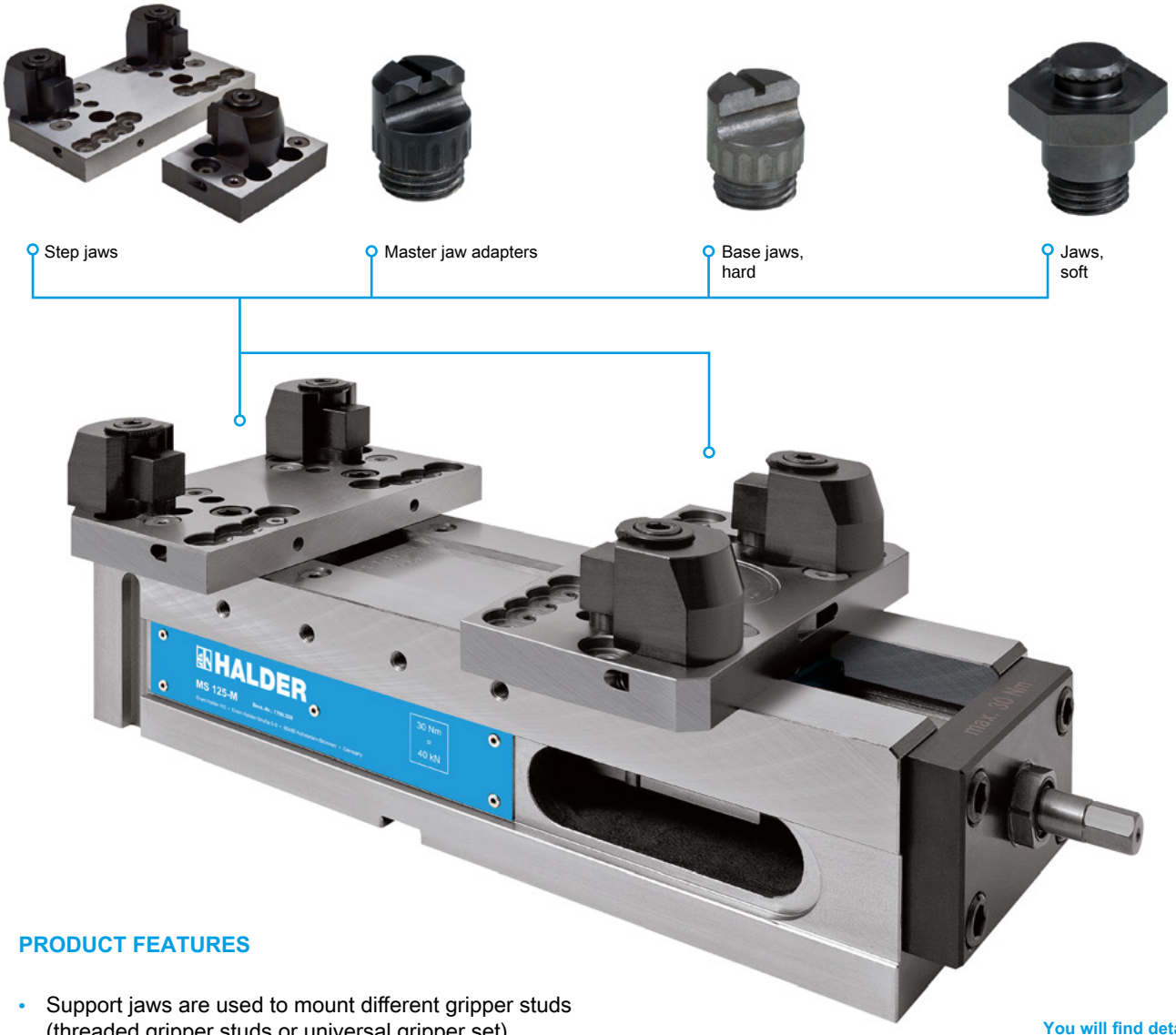


Gripp Clamping
EH 1702.

MULTI-VICE GRIPP CLAMPING VERSION MS 125-S/M/L

FOR CLAMPING COMPLEX UNMACHINED PARTS

The support jaws enable you to clamp different unmachined parts quickly and securely.
You will find products for gripp clamping on the following pages.



PRODUCT FEATURES

- Support jaws are used to mount different gripper studs (threaded gripper studs or universal gripper set)
- Gripper studs can be screwed in various positions on the grid plate in order to securely clamp various workpiece shapes.
- Additional pivot function of the support jaws compensates for non-parallel clamping surfaces and is required to clamp uneven workpieces
- Three-point clamping is possible due to the rigid support jaw

You will find details and your contact persons under:
www.halder.com/Multi-Vices

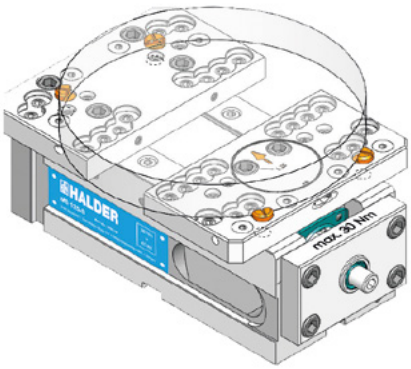
Gripp Clamping
EH 1702.

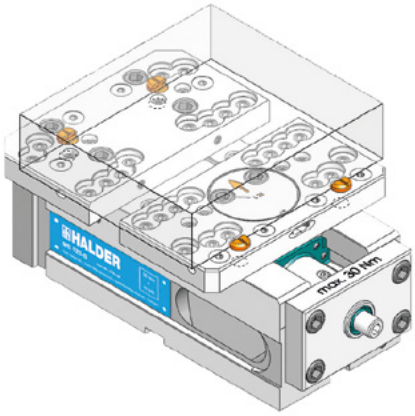
CLAMPING WIDTHS GRIPP CLAMPING

SUPPORT JAWS WITH GRIPPER STUDS



MS 125 - support jaws with gripper studs					
Dimensions	Rectangular workpiece			Round workpiece	
	Clamping range (mm)			Clamping range (mm)	
	min.	max.	min.	min.	max.
MS 125-S	28	202	70	Ø 70	Ø 240
MS 125-M	28	320	70	Ø 70	Ø 330
MS 125-L	28	452	70	Ø 70	Ø 330

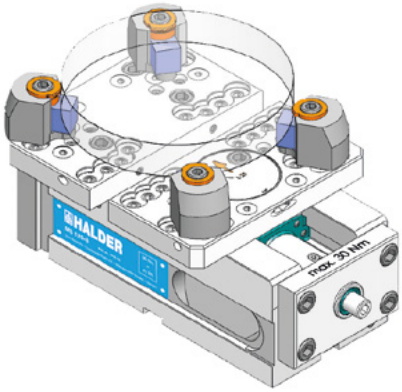


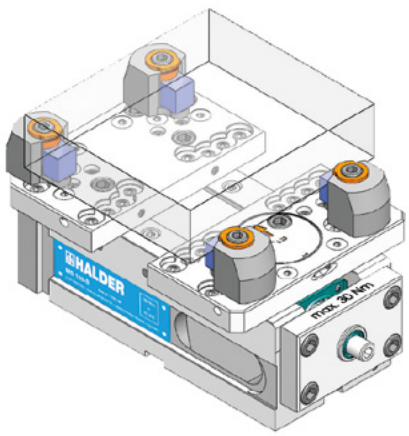


SUPPORT JAWS WITH UNIVERSAL GRIPPER SET



MS 125 - support jaws with universal gripper set					
Dimensions	Rectangular workpiece			Round workpiece	
	Clamping range (mm)			Clamping range (mm)	
	min.	max.	min.	min.	max.
MS 125-S	25	192	80	Ø 70	Ø 230
MS 125-M	25	310	80	Ø 70	Ø 330
MS 125-L	25	442	80	Ø 70	Ø 330





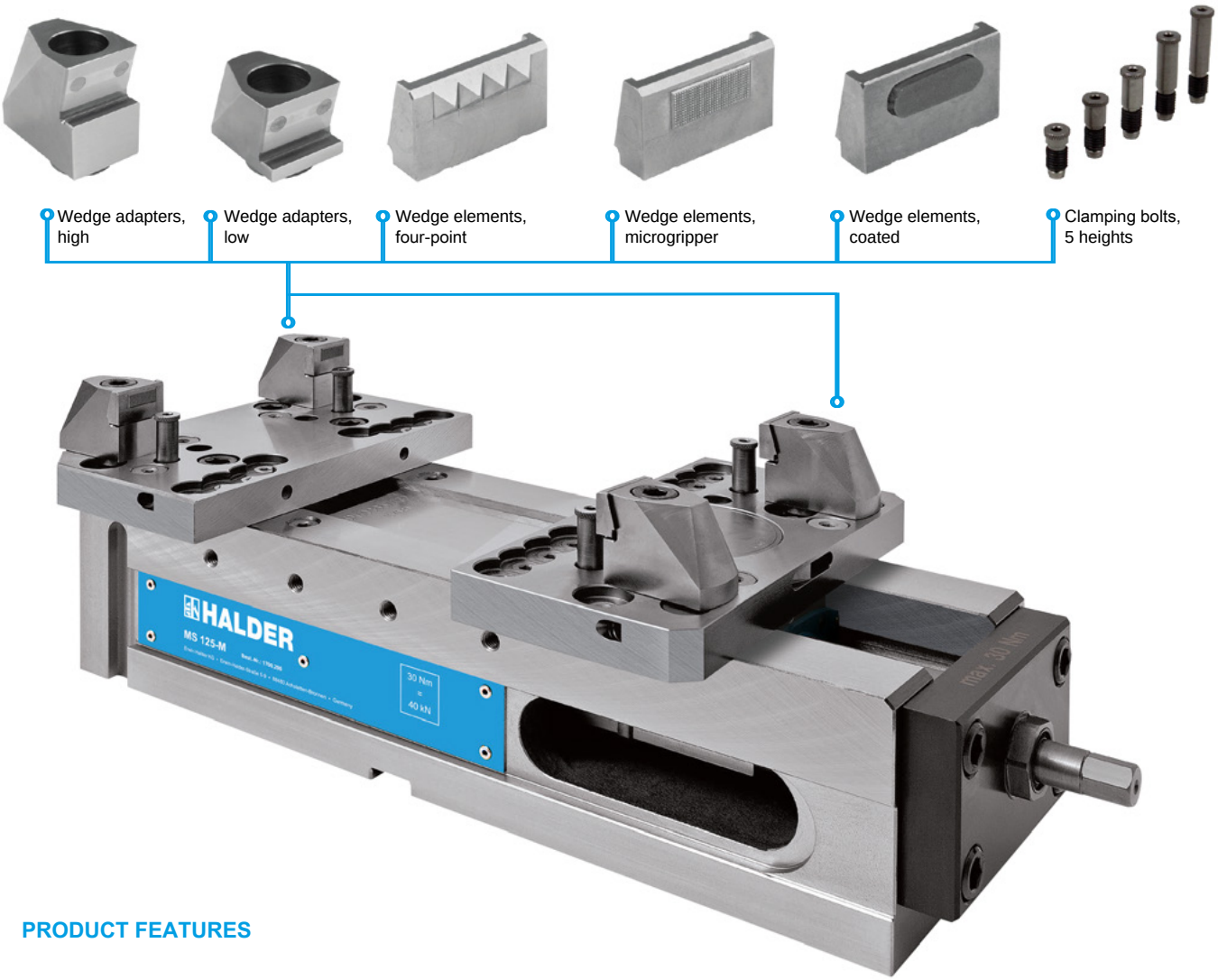
Pull-Down Clamping

EH 1703.

MULTI-VICE PULL-DOWN CLAMPING VERSION MS 125-S/M/L

ACCURACY THROUGH PULL-DOWN

The support jaws and the pull-down system ensure accurate, versatile and secure clamping of the unmachined parts. The workpiece is positioned on ground clamping bolts which make the connection to the guideway. In this way, the parallelism of the guideway or of the machine table is transferred to the workpiece, thus achieving even greater clamping accuracy. Vibrations in the workpiece during machining are to a large extent avoided.
The pull-down clamping products can be found on the following pages.



PRODUCT FEATURES

- Support jaws are used to mount various wedge adapters and clamping bolts
- Wedge adapters can be bolted in various positions on the grid plate
- The various wedge elements can be changed quickly on the wedge adapters
- Additional pivot function of the support jaws compensates for non-parallel clamping surfaces and is required to clamp uneven workpieces
- Accuracy through pull-down
- Clamping in the neutral filament can be optimised using the 5 different heights of the clamping bolts

You will find details and your contact persons under:

www.halder.com/Multi-Vices

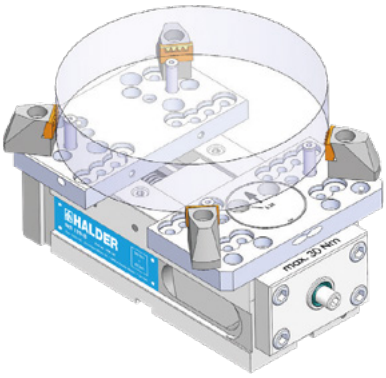
Pull-Down Clamping
EH 1703.

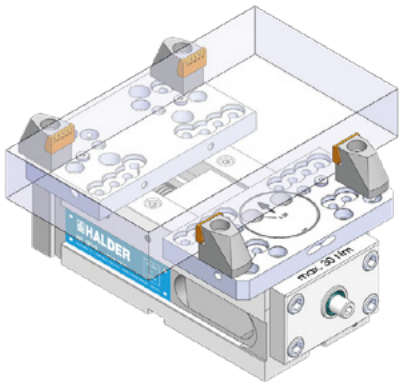
CLAMPING WIDTHS PULL-DOWN CLAMPING

SUPPORT JAWS WITH PULL-DOWN

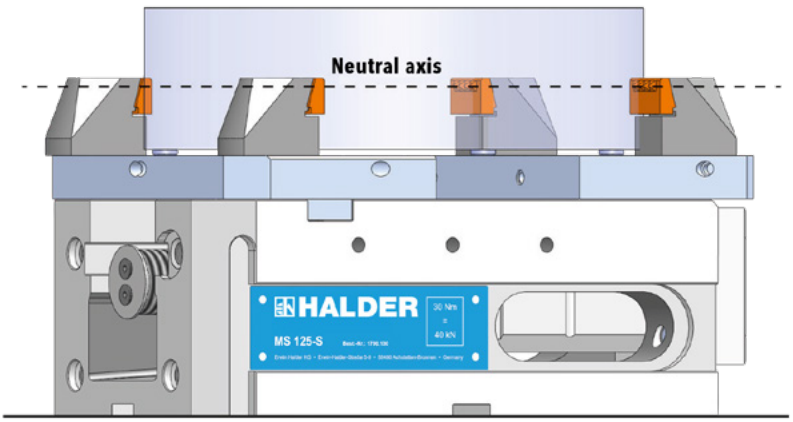


MS 125 - support jaws with pull-down				
Dimensions	**Square workpiece**		**Round workpiece**	
	min.	max.	min.	max.
MS 125-S	18	185	Ø 65	Ø 226
MS 125-M	18	305	Ø 65	Ø 330
MS 125-L	18	435	Ø 65	Ø 330





CLAMPING IN THE NEUTRAL AXIS



Five-Sided Machining

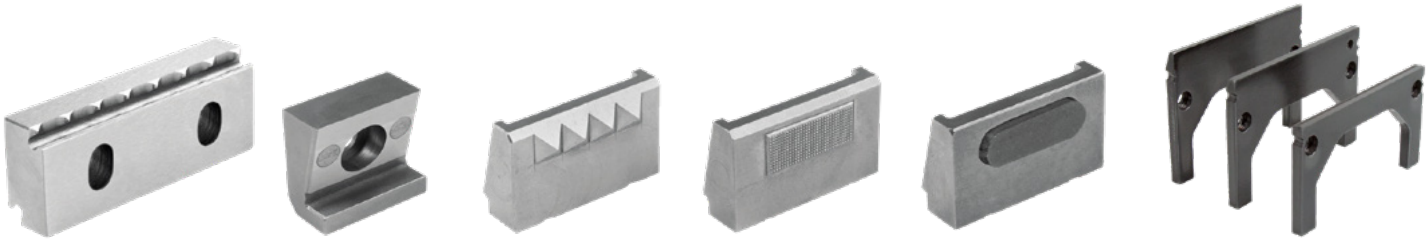
EH 1704.

MULTI-VICE FIVE-SIDED MACHINING VERSION MS 125-S/M/L

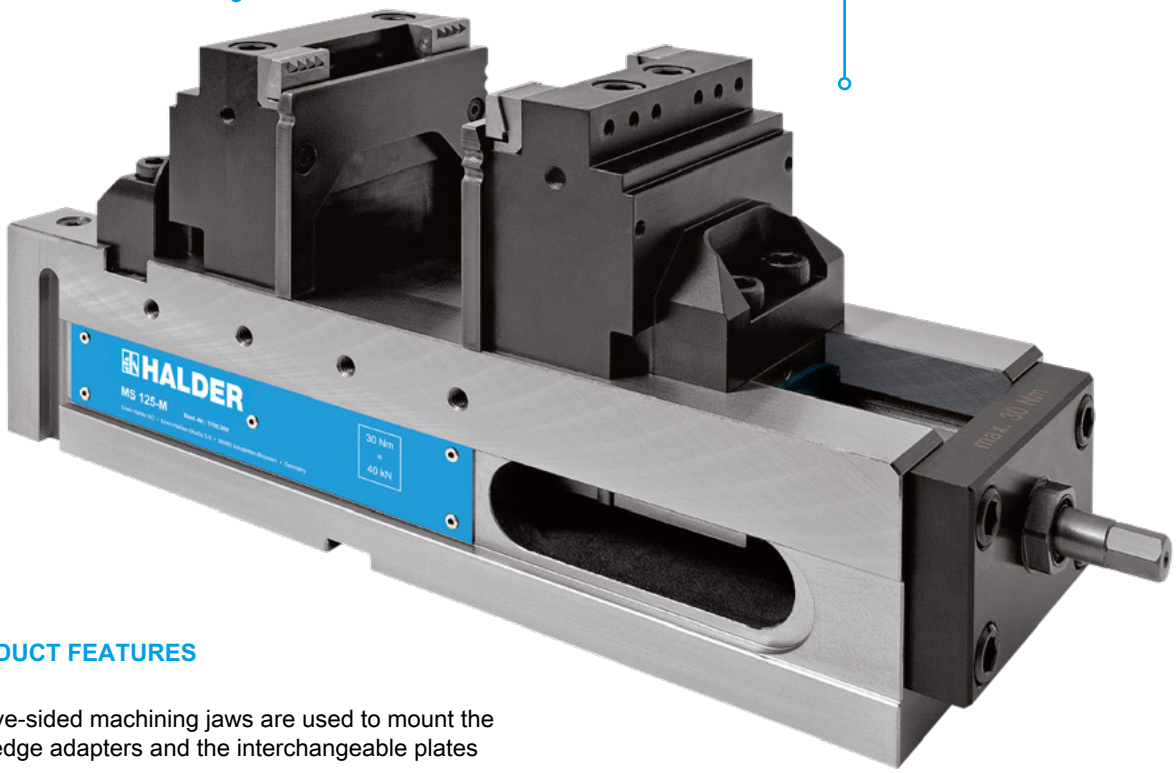
FIVE-SIDED MACHINING PLUS PULL-DOWN

The five-sided machining jaws with pull-down can clamp workpieces up to a height of 90 mm onto the guideway of the MS 125. The insertable plates are pressed onto the guideway using the pull-down effect, thus establishing an accurate parallel workpiece position.

This largely avoids any vibration of the workpiece during machining. Accessibility with short tools is a particular advantage of the five-sided machining jaws.
You will find products for five-sided machining on the following pages.



- Gripper strips, reversible
- Wedge adapters for jaw for five-sided machining
- Wedge elements, four-point
- Wedge elements, microgripper
- Wedge elements, coated
- Insertable plates in 3 heights



PRODUCT FEATURES

- Five-sided machining jaws are used to mount the wedge adapters and the interchangeable plates
- Wedge adapters can be bolted in various positions on the grid plate
- The various wedge elements can be quickly changed on the wedge adapters
- Suitable for five-sided machining with short tools
- Accuracy through pull-down
- Stability through form-locking
- Clamping in the neutral filament can be optimised using the three support heights of the interchangeable plates

You will find details and your contact persons under:

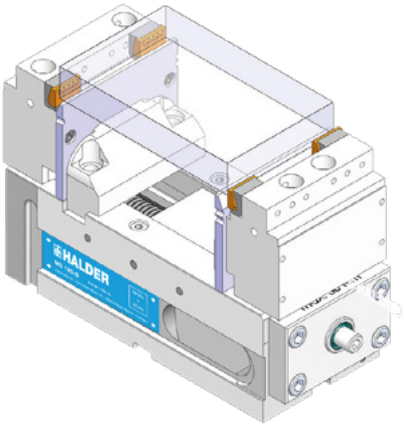
www.halder.com/Multi-Vices

Five-Sided Machining
EH 1704.

CLAMPING WIDTHS FIVE-SIDED MACHINING

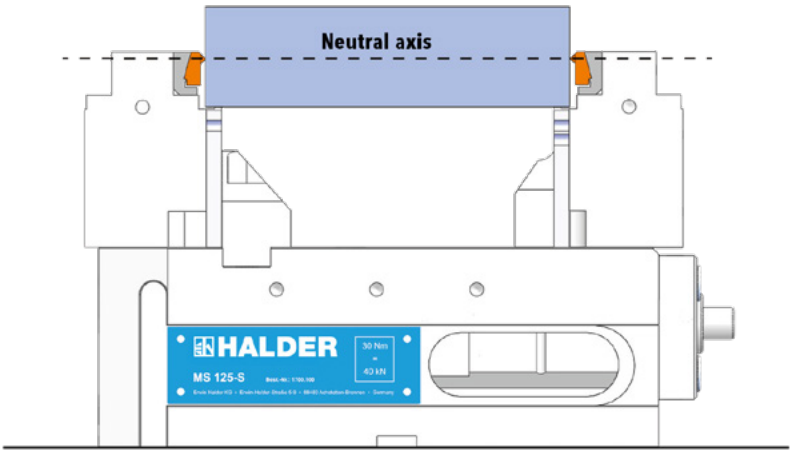
90-MM JAW FOR FIVE-SIDED MACHINING WITH PULL-DOWN





MS 125 - jaw for five-sided machining with pull-down		
Dimensions	**Square workpiece**	
	min.	max.
MS 125-S	18	180
MS 125-M	18	300
MS 125-L	18	430

CLAMPING IN THE NEUTRAL AXIS



10



11 BASIC ELEMENTS







Product group	Page
Clamping Angles	894
Clamping Cubes	898
Base Plates	900



Clamping Angles • semi-finished

EH 1906.



PRODUCT DESCRIPTION

Material

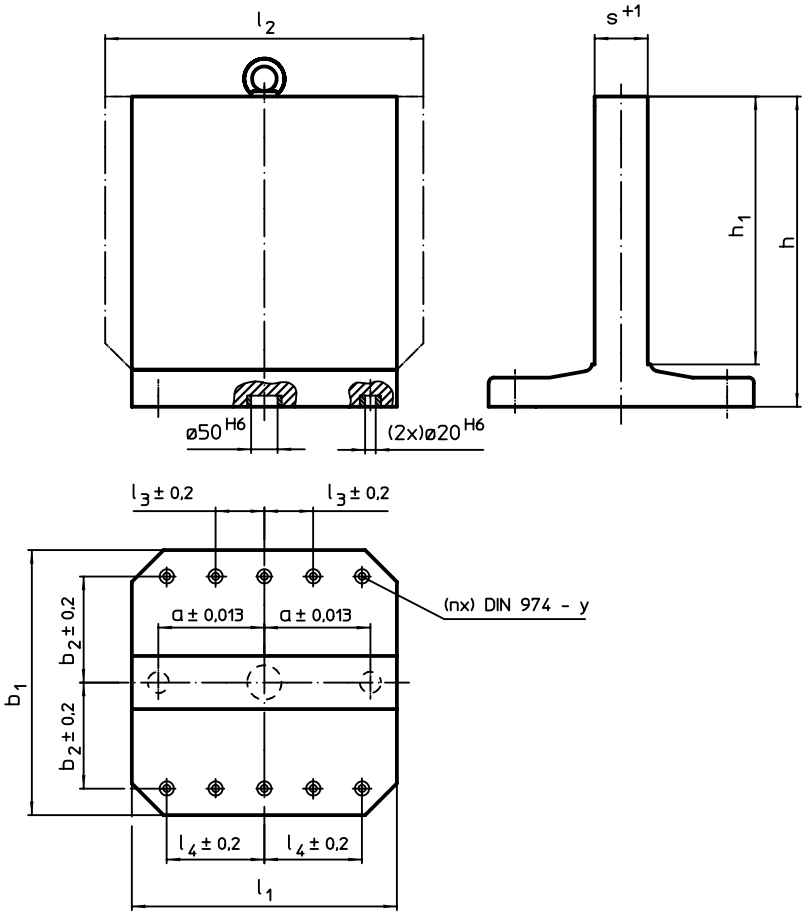
- Grey cast iron GG

MORE INFORMATION

Notes

Special plates on request.

DRAWING



ORDER INFORMATION

b_1 x l_1	l_2	h_1	h	a ±0,013	b_2 ±0,2	l_3 ±0,2	l_4 ±0,2	s +1	y	For screws	Number of fastening holes n		Art. No.
				[mm]					[mm]	[mm]		[kg]	
400 x 400	–	400	475	150	150	–	150	81	12	M12	4	150	1906.210
	500	400	475	150	150	–	150	81	12	M12	4	173	1906.310
500 x 500	–	500	595	200	200	–	200	101	12	M12	6	284	1906.410
	630	500	595	200	200	–	200	101	12	M12	6	334	1906.510
630 x 630	–	630	725	200	200	–	200	131	16	M16	6	470	1906.610
800 x 800	–	800	910	300	300	100	300	151	16	M16	8	745	1906.810

Clamping Angles

EH 1906.



PRODUCT DESCRIPTION

Material

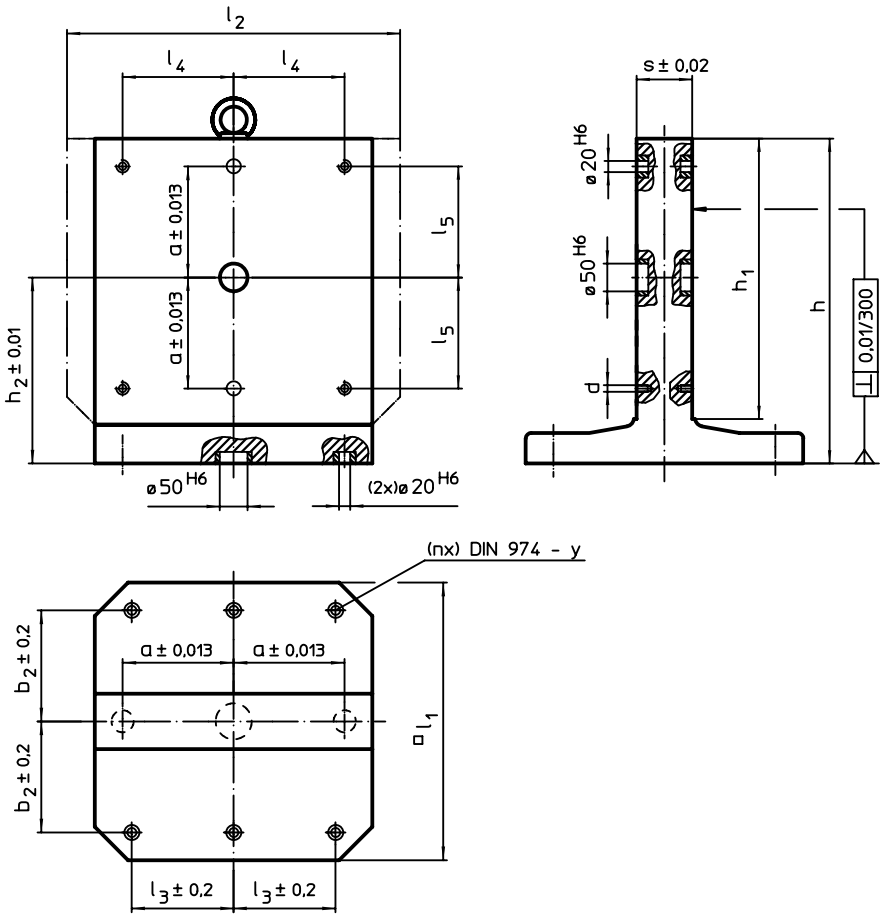
- Grey cast iron GG

MORE INFORMATION

Notes

Special plates on request.

DRAWING



ORDER INFORMATION

Dimensions [mm]												y [mm]	For screws [mm]	Number of fastening holes n	[kg]	Art. No.
l_1	l_2	h_1	h	a ±0,013	b_2 ±0,2	l_3 ±0,2	l_4	l_5	h_2 ±0,01	s ±0,02	d					
400	–	400	475	150	150	150	100	100	275	80	M12	12	M12	4	147	1906.240
	500	400	475	150	150	150	200	100	275	80	M12	12	M12	4	168	1906.340
500	–	500	595	200	200	200	200	200	345	100	M12	12	M12	6	295	1906.440
	630	500	595	200	200	200	200	200	345	100	M12	12	M12	6	326	1906.540
630	–	630	725	200	200	200	200	200	410	130	M16	16	M12	6	385	1906.640

Clamping Angles • welded, semi-finished

EH 1910.



PRODUCT DESCRIPTION

Material

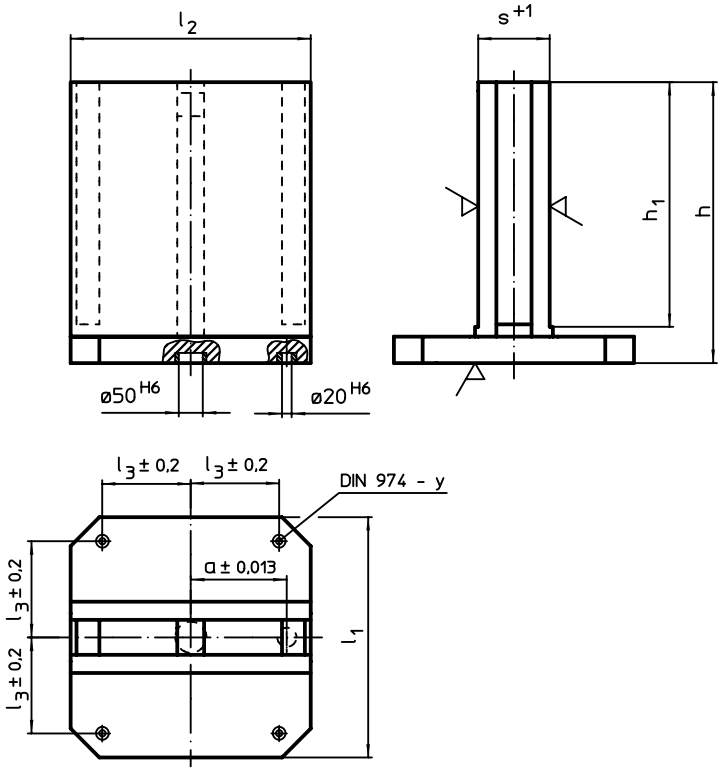
- Steel, welded

MORE INFORMATION

Notes

Special plates on request.

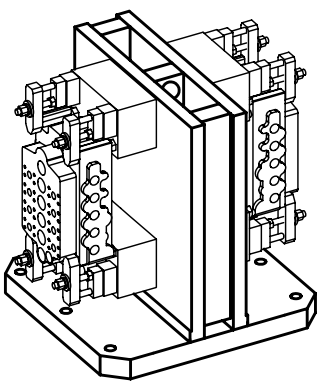
DRAWING



ORDER INFORMATION

Dimensions							y	For screws		Art. No.
l_1	l_2	l_3 ±0,2	h	h_1	s +1	a ±0,013				
[mm]							[mm]	[mm]	[kg]	
400	400	150	475	425	121	150	12	M12	148	1910.120
500	500	200	600	545	151	200	12	M12	274	1910.140
630	630	200	725	660	181	200	16	M16	395	1910.160

APPLICATION EXAMPLE



Clamping Angles • one-sided, welded, semi-finished

EH 1910.



PRODUCT DESCRIPTION

Material

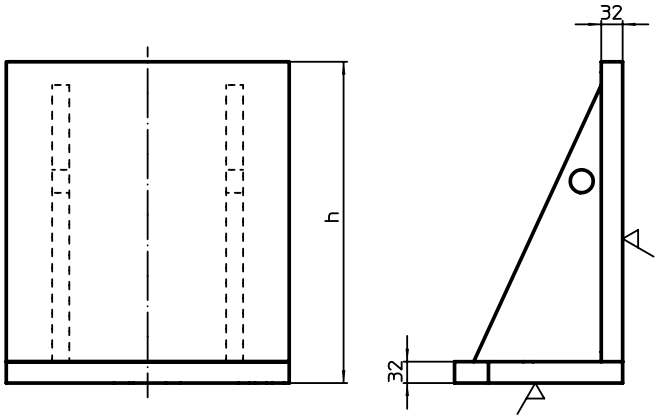
- Steel, welded

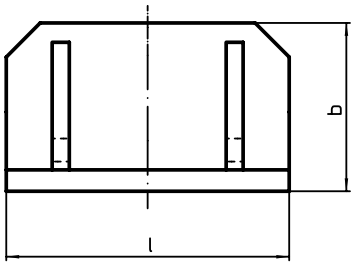
MORE INFORMATION

Notes

Special plates on request.

DRAWING

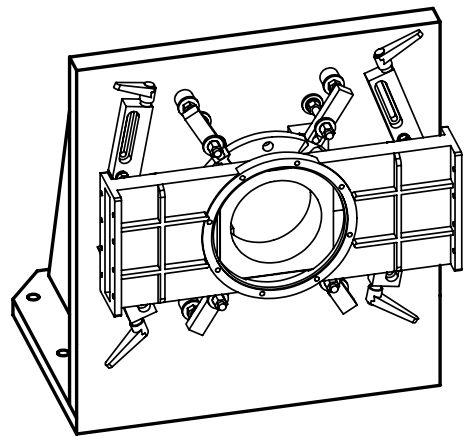




ORDER INFORMATION

Dimensions				Art. No.
l	b	h		
	[mm]		[kg]	
400	250	450	76	1910.020
500	330	550	125	1910.040
630	370	650	180	1910.060

APPLICATION EXAMPLE



Clamping Cubes • semi-finished

EH 1908.



PRODUCT DESCRIPTION

Material

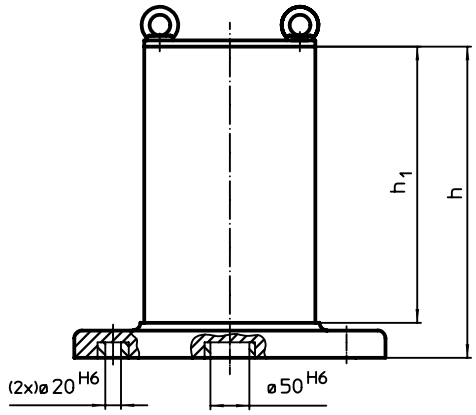
- Grey cast iron GG

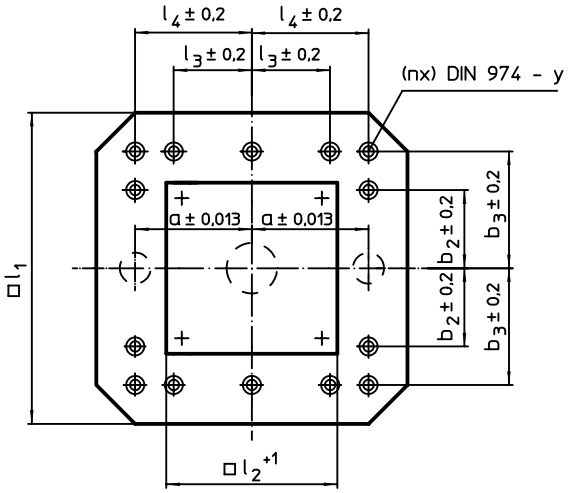
MORE INFORMATION

Notes

Special plates on request.

DRAWING





ORDER INFORMATION

Dimensions									y	For screws	Number of fastening holes n		Art. No.
l_1	l_2 +1	h_1	h	a ±0,013	b_2 ±0,2	b_3 ±0,2	l_3 ±0,2	l_4 ±0,2					
[mm]									[mm]	[mm]		[kg]	
400	231	358	408	150	–	150	–	150	12	M12	4	100	1908.210
500	331	510	565	200	–	200	–	200	12	M12	6	209	1908.410
630	451	640	700	200	200	300	200	300	16	M16	8	450	1908.610

Clamping Cubes • welded, semi-finished

EH 1910.



PRODUCT DESCRIPTION

Material

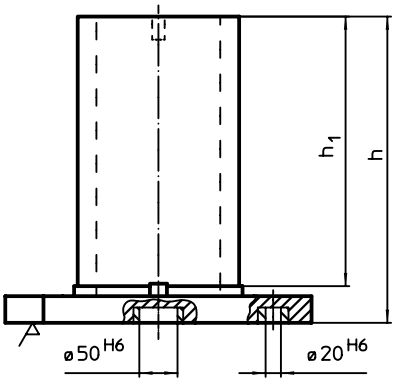
- Steel, welded

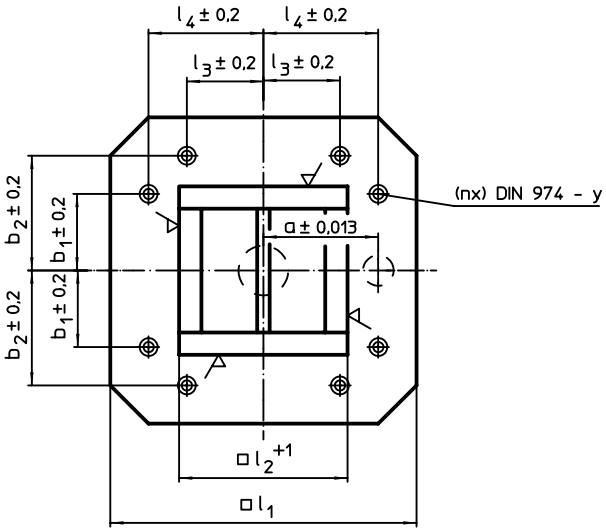
MORE INFORMATION

Notes

Special plates on request.

DRAWING





ORDER INFORMATION

Dimensions									y	For screws	Number of fastening holes n		Art. No.
l_1	l_2 +1	l_3 ±0,2	l_4 ±0,2	h	h_1	a ±0,013	b_1 ±0,2	b_2 ±0,2					
[mm]									[mm]	[mm]		[kg]	
400	231	–	150	500	450	150	150	–	12	M12	4	134	1910.220
500	331	–	200	650	595	200	200	–	12	M12	4	265	1910.240
630	451	200	300	800	740	200	200	300	16	M16	8	427	1910.260

Base Plates • semi-finished

EH 1912.



PRODUCT DESCRIPTION

Material

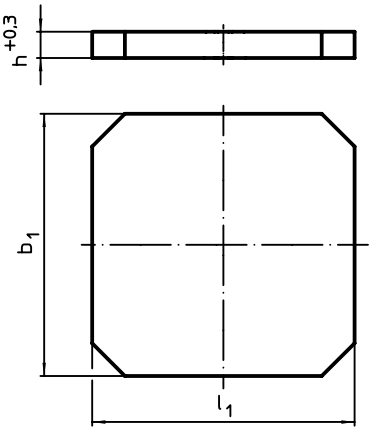
- Grey cast iron GG

MORE INFORMATION

Notes

Special plates on request.

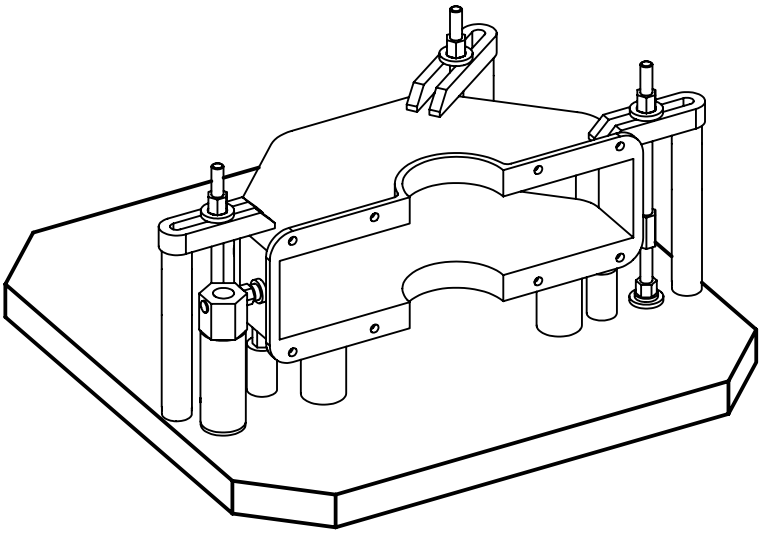
DRAWING



ORDER INFORMATION

Dimensions b_1 x l_1 [mm]	h +0,3 [mm]	[kg]	Art. No.
400 x 400	40,3	45	1912.210
400 x 500	40,3	57	1912.310
500 x 500	40,3	71	1912.410
500 x 630	50,3	112	1912.510
630 x 630	50,3	141	1912.610

APPLICATION EXAMPLE



Base Plates • with positioning holes

EH 1912.



PRODUCT DESCRIPTION

Material

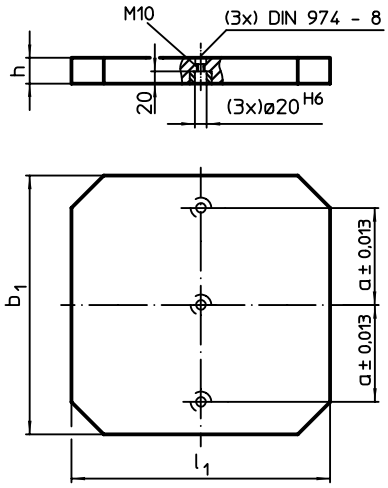
- Grey cast iron GG

MORE INFORMATION

Notes

Special plates on request.

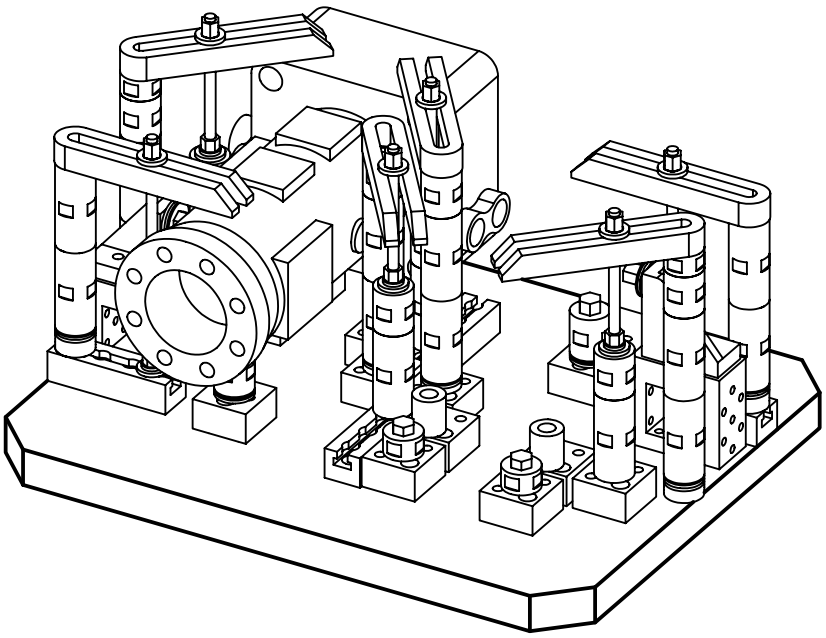
DRAWING



ORDER INFORMATION

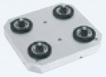
Dimensions				Art. No.
b_1 x l_1	h	a ±0,013		
	[mm]		[kg]	
400 x 400	40 ±0,02	150	45	1912.220
400 x 500	40 ±0,02	150	57	1912.320
500 x 500	40 ±0,02	200	71	1912.420
500 x 630	50 ±0,03	200	112	1912.520
630 x 630	50 ±0,03	200	141	1912.620

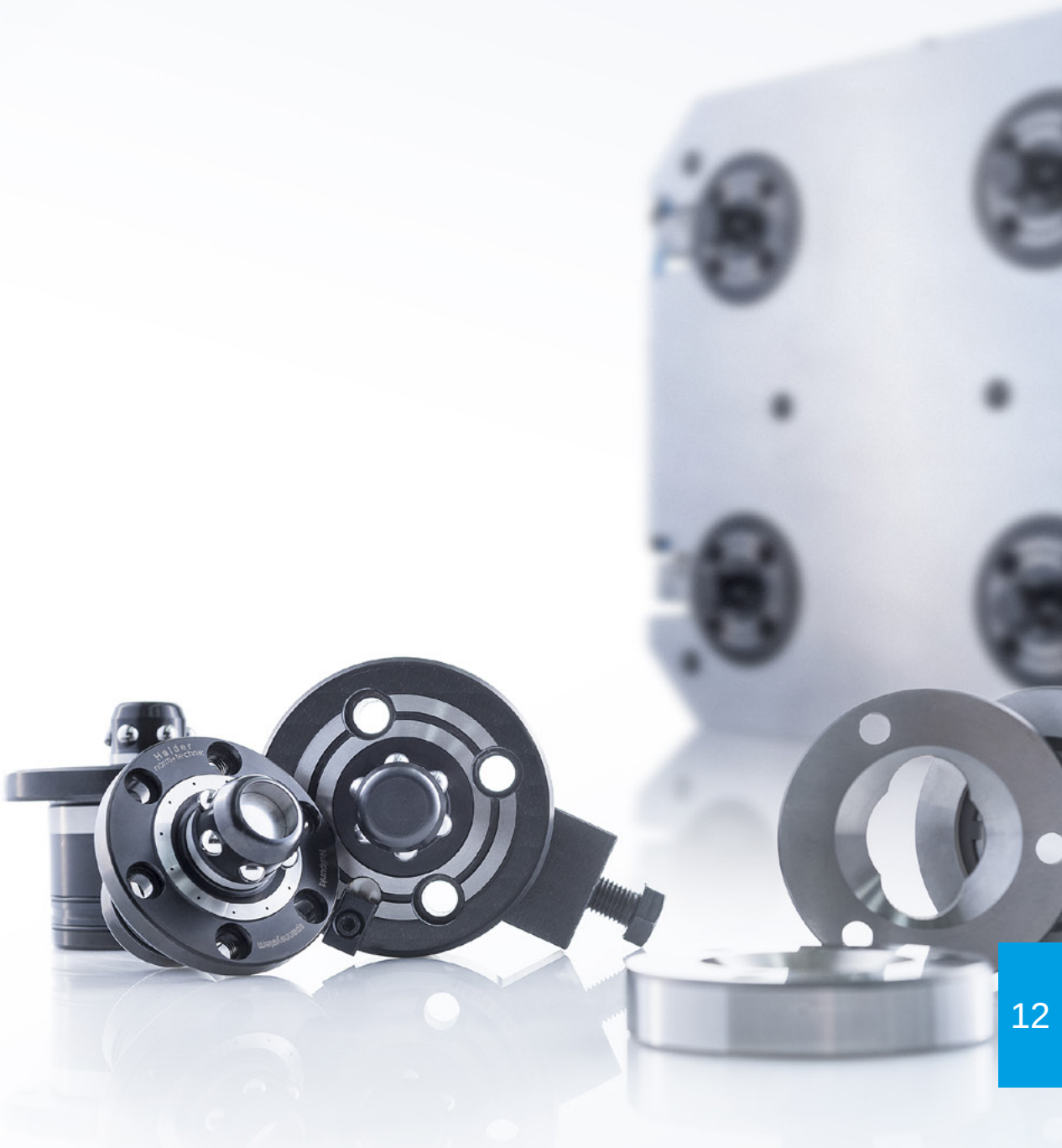
APPLICATION EXAMPLE





12 ZERO-POINT CLAMPING SYSTEMS

	Product group	Page
	Connecting Elements / Connecting Rings	904
	Base Plates and Supporting Plates	922
	Accessories for Zero-Point Clamping Systems	932



ZERO-POINT CLAMPING SYSTEMS

Coupling elements for clamping and at the same time centring jigs and fixtures, developed as a quick-change system for shortening set-up times.

- Referenced clamping of jigs and fixtures provided by repeatedly accurate placement at the „zero-point“.
- For machining workpieces in several working steps on different machines.

In addition to the maximum of flexibility zero-point clamping systems – be this hydraulic operation in a built-in version with integrated lifting of the jigs and fixtures or through a modular design – the way the system is designed (with the peg of the base element mounted pointing upwards and the connecting ring integrated on the jig) guarantees a high degree of production reliability, continuous accuracy, and soiling of the reference point is avoided.

FEATURES

- Holding force of up to 30 kN.
- Mechanical, pneumatic and hydraulic operation.
- Also with locking device against twisting when using individual elements.
- High efficiency, repeatedly accurate and cost-saving.
- Can be used on all machinery.
- Can also be integrated in Halder jig and fixture systems.







Built-in double acting connecting elements
Holding force of 30 kN



Built-in single acting connecting elements
Holding force of 20 kN

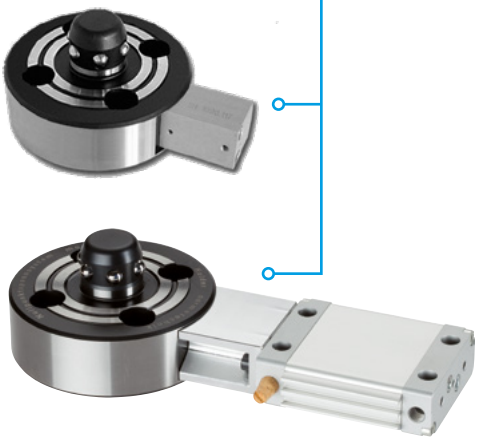


Connecting rings suited for all zero-point clamping systems



Modular connecting elements
Holding force up to 10 kN



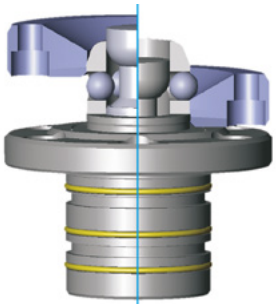


Control modules interchangeable

ZERO-POINT CLAMPING SYSTEMS

HYDRAULIC, DOUBLE ACTING, BUILT-IN CONNECTING ELEMENT HOLDING FORCE OF 30 kN

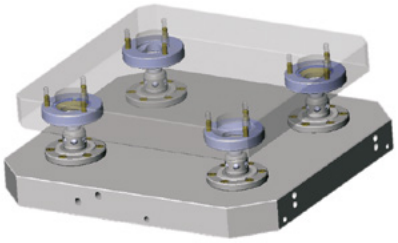
- Hydraulic clamping and centring.
- Releasing and lifting with integrated retraction cylinder, hydraulic.
- Suited for automation.
- Integrated pneumatic blow-out of the supporting surfaces.
- Pneumatic sensing check on the supporting surface during clamping.
- Can be integrated in base plates, angles, cubes, etc.



Functional Principle:
clamp and lift-off

HYDRAULIC, SINGLE-ACTING, BUILT-IN CONNECTING ELEMENT HOLDING FORCE OF 20 kN

- Clamping and centring by spring load.
- Releasing and lifting with integrated retraction cylinder, hydraulic.
- Suited for automation.
- Can be integrated in base plates, angles, cubes, etc.



Mounting principle

MODULAR CONNECTING ELEMENT HOLDING FORCE OF UP TO 10 kN

- Clamping and centring by spring load.
- Release: mechanical, pneumatic, hydraulic. (Control modules interchangeable).
- Can be integrated in base plates, angles, cubes, etc.
- Provided with screw thread for bolting to tables, plates, etc.



Machine table:
Base plate with 4
connecting elements

DESIGNS OF THE CONNECTING RINGS

The connecting rings are suited for all Halder zero-point clamping systems.
Can be bolted to and integrated on jigs and fixtures or directly on the workpiece.
The connecting rings are split into the following designs for positioning and simultaneous clamping of jigs and fixtures:

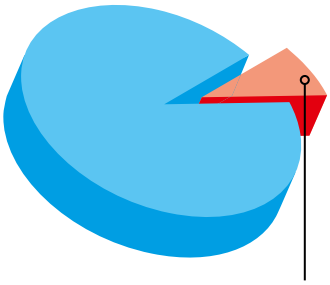
1. „Centrical“ connecting ring for aligning and clamping at the zero-point.
2. „Sword-shaped“ connecting ring for two-point placement for alignment in one axial direction.
3. „Floating“ connecting ring without centring function for over-determined additional clamping.

TIME IS MONEY

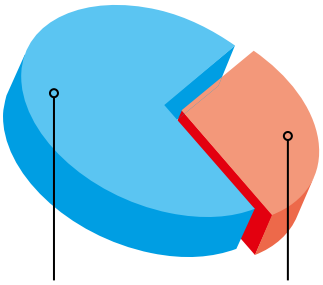
Halder zero-point clamping systems are a worthwhile investment that pay off within a very short period of time through simpler retooling procedures, less downtime for machinery and nearly unlimited flexibility. Make the comparison yourself as to the cost advantages obtained using Halder zero-point clamping systems.

COMPARE PRODUCTION TIME / SET-UP TIME

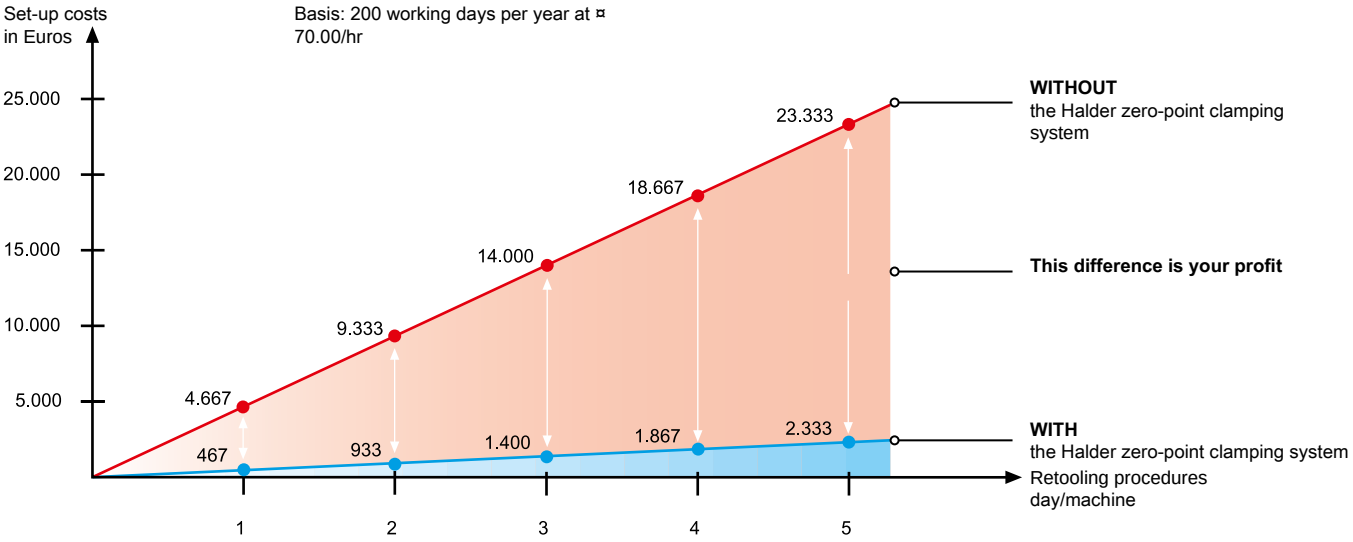
WITH the Halder zero-point clamping system



WITHOUT the Halder zero-point clamping system



COST COMPARISON OF SET-UP COSTS WITH AND WITHOUT THE HALDER ZERO-POINT CLAMPING SYSTEM



CALCULATION OF AMORTISATION TIME

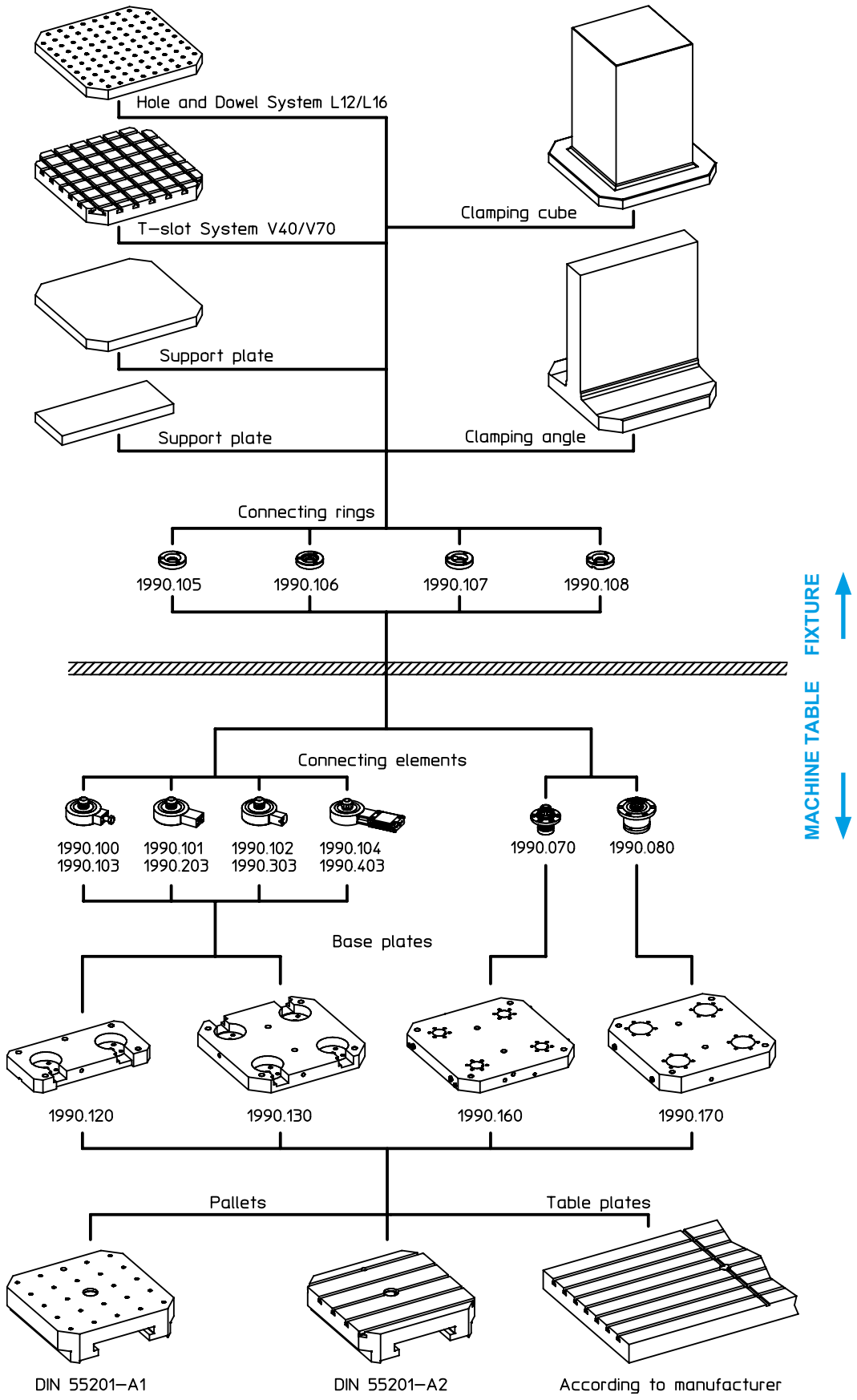
Example
With five retooling procedures/shift/machine

Without the Halder zero-point clamping system: 5 x ~20 Min. **= 100 Min.**
With the Halder zero-point clamping system: 5 x ~2 Min. = **10 Min.**

Saving/shift/net = **90 Min.**
Saving/year/200 working days = **300 h**

Cost advantage/year at € 70.00/hr **= € 21.000.-**

OVERVIEW


Hole and Dowel System L12/L16
T–slot System V40/V70
Support plate
Support plate
Clamping cube
Clamping angle
Connecting rings
1990.105
1990.106
1990.107
1990.108
FIXTURE
MACHINE TABLE
Connecting elements
1990.100
1990.103
1990.101
1990.203
1990.102
1990.303
1990.104
1990.403
1990.070
1990.080
Base plates
1990.120
1990.130
1990.160
1990.170
Pallets
Table plates
DIN 55201–A1
DIN 55201–A2
According to manufacturer

Connecting Elements • hydraulically operated, double acting, with lifting-off and blow-out

EH 1990.



PRODUCT DESCRIPTION

Material

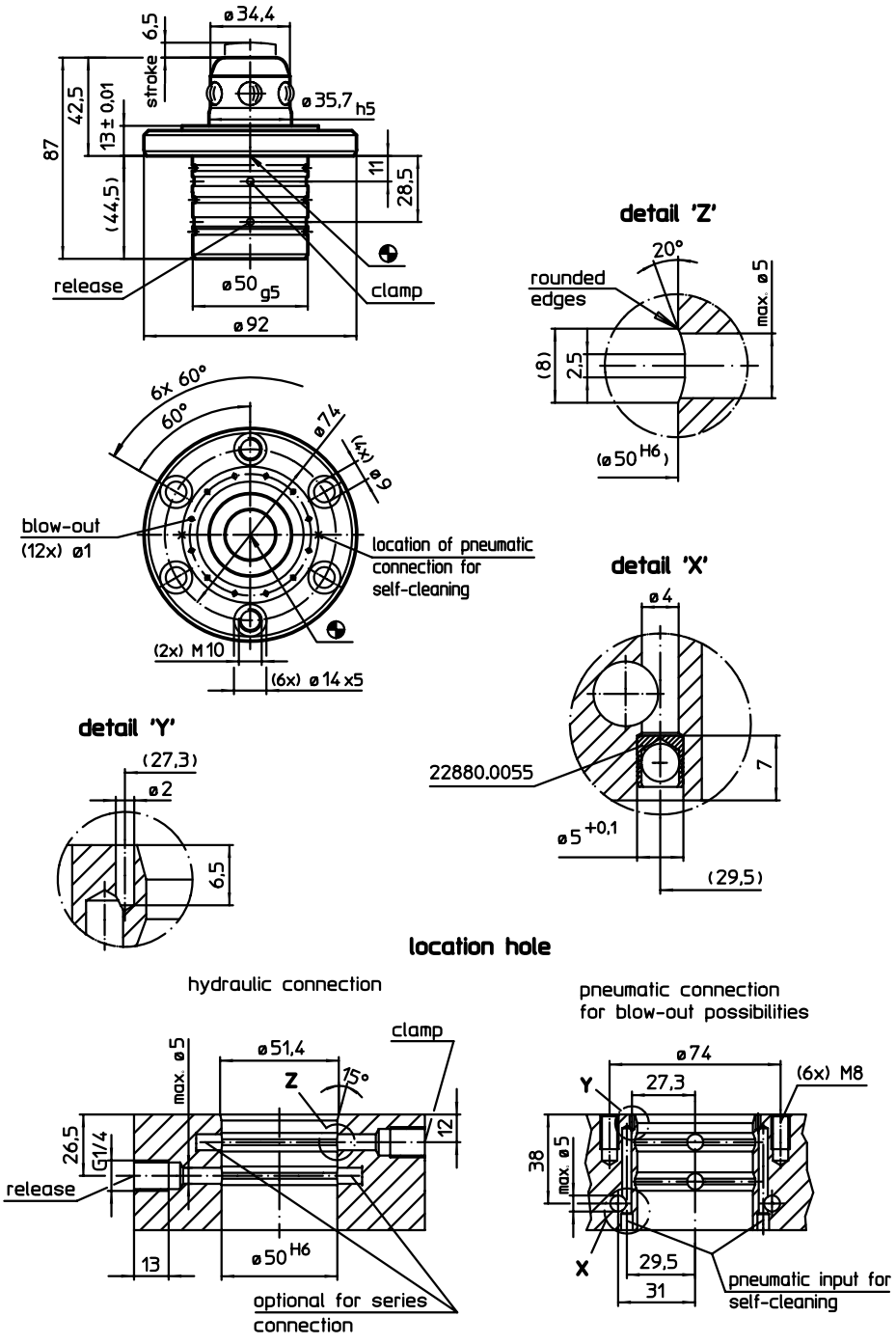
- Steel, case-hardened, ground

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

DRAWING



ORDER INFORMATION

Holding force [N]	Centering accuracy < [mm]	Release pressure max. [bar]	[g]	Art. No.
30000	0,01	60 – 80	1200	1990.070

Connecting Elements • hydraulically operated, single acting with lifting-off

EH 1990.



PRODUCT DESCRIPTION

Material

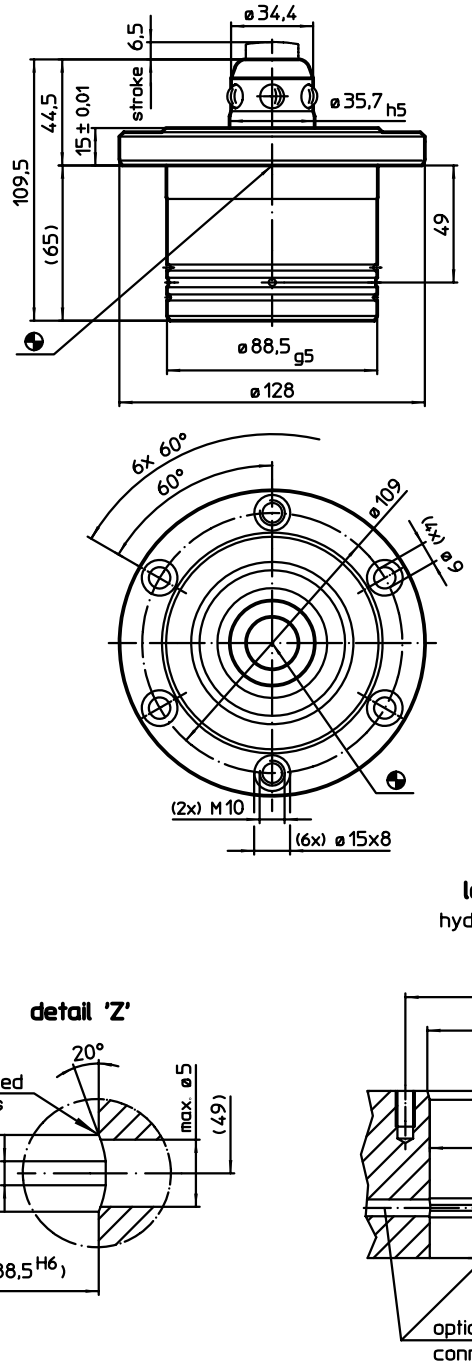
- Steel, case-hardened, ground

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

DRAWING



ORDER INFORMATION

Holding force [N]	Centering accuracy < [mm]	Release pressure max. [bar]	[g]	Art. No.
20000	0,01	60 – 80	3750	1990.080

Connecting Elements • modular, mechanically operated

EH 1990.



PRODUCT DESCRIPTION

Material

Body
- Steel, case-hardened, ground

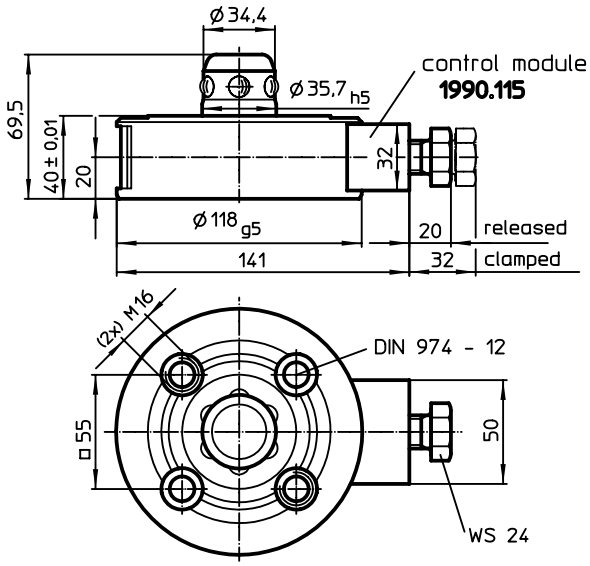
Control module
- Steel, blackened

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

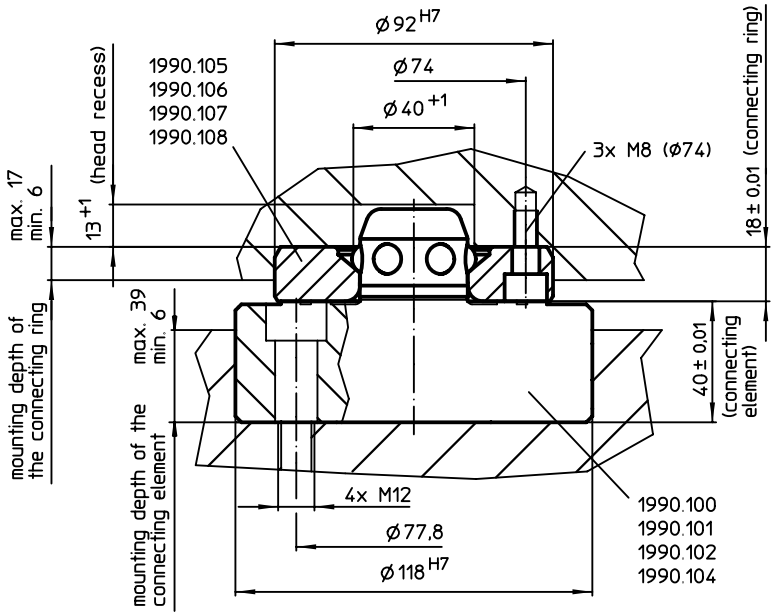
DRAWING



ORDER INFORMATION

Holding force [N]	Centering accuracy < [mm]	Release moment [Nm]	[g]	Art. No.
10000	0,01	10	3300	1990.100

APPLICATION EXAMPLE



Connecting Elements • modular, hydraulically operated

EH 1990.



PRODUCT DESCRIPTION

Material

Body
- Steel, case-hardened, ground

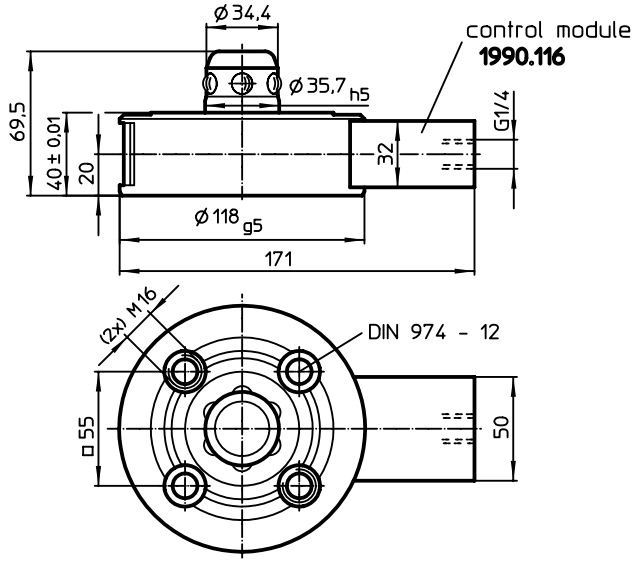
Control module
- Steel, blackened

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

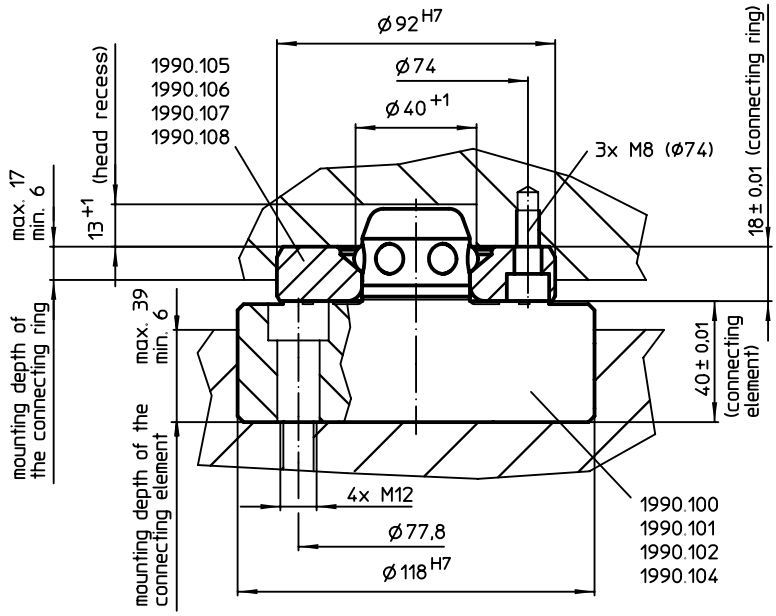
DRAWING



ORDER INFORMATION

Holding force [N]	Centering accuracy < [mm]	Release pressure [bar]	[g]	Art. No.
10000	0,01	80 – 120	3500	1990.101

APPLICATION EXAMPLE



Connecting Elements • modular, pneumatically operated

EH 1990.



PRODUCT DESCRIPTION

Material

Body
- Steel, case-hardened, ground

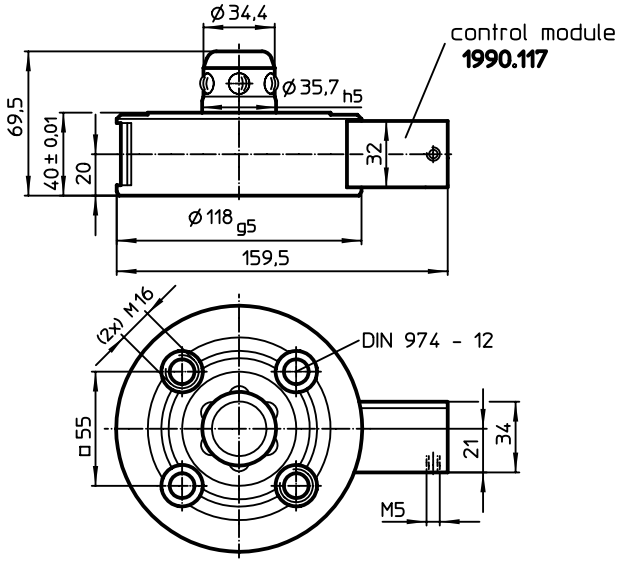
Control module
- Aluminium Al

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

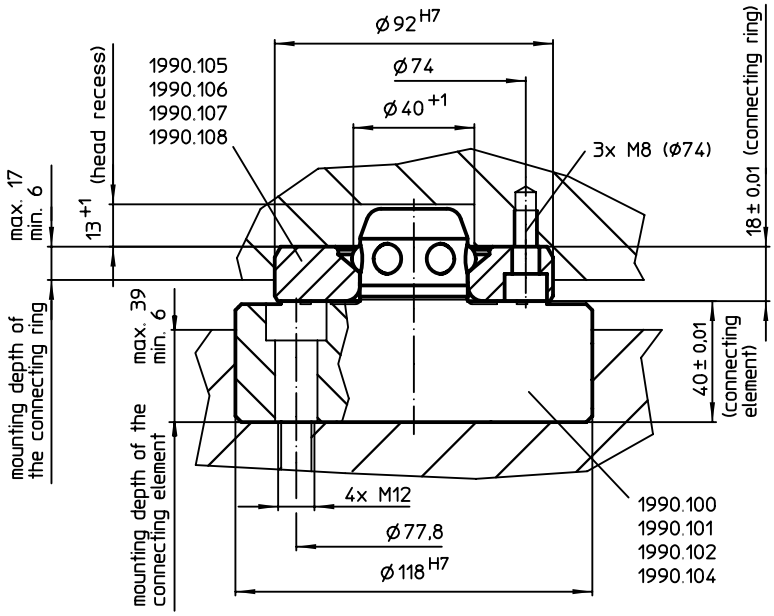
DRAWING



ORDER INFORMATION

Holding force [N]	Centering accuracy < [mm]	Release pressure [bar]	[g]	Art. No.
5000	0,01	6	3040	1990.102

APPLICATION EXAMPLE



Connecting Elements • modular, pneumatically operated, reinforced

EH 1990.



PRODUCT DESCRIPTION

Material

Body
- Steel, case-hardened, ground

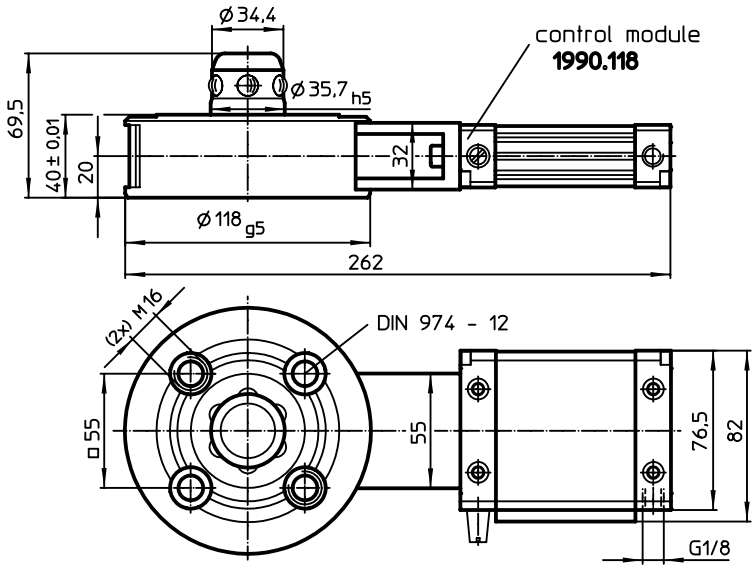
Control module
- Aluminium Al

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

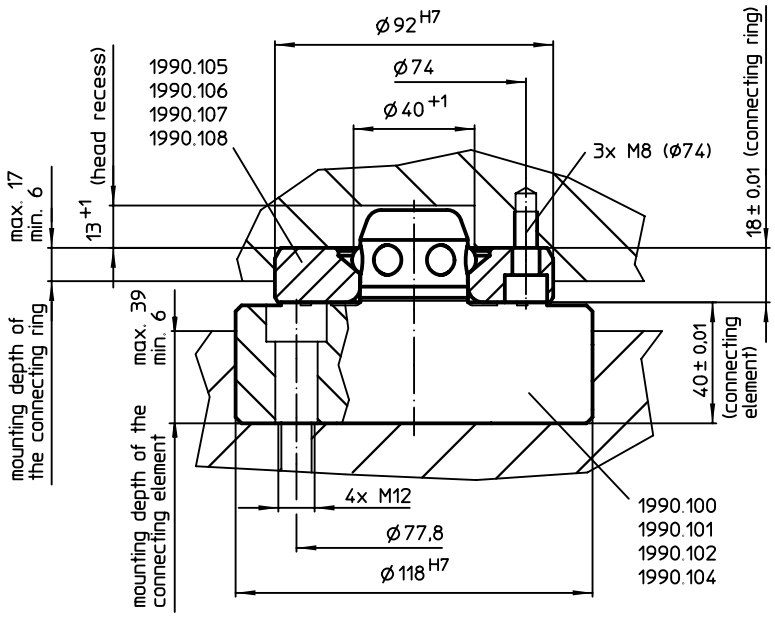
DRAWING



ORDER INFORMATION

Holding force [N]	Centering accuracy < [mm]	Release pressure [bar]	[g]	Art. No.
10000	0,01	6	3750	1990.104

APPLICATION EXAMPLE



12

Connecting Elements • modular, mechanically operated, protected against twisting

EH 1990.



PRODUCT DESCRIPTION

Material

Body
- Steel, case-hardened, ground

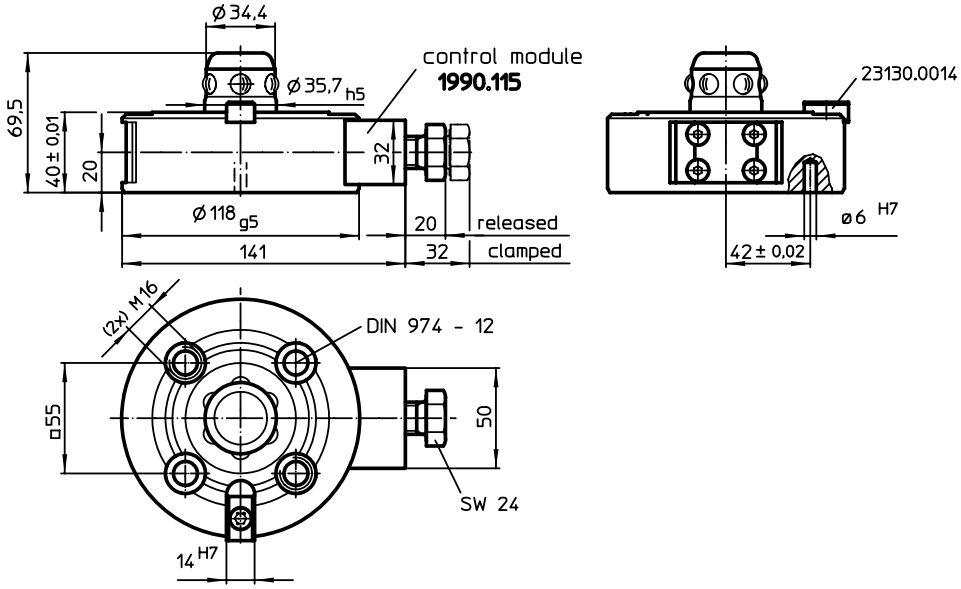
Control module
- Steel, blackened

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

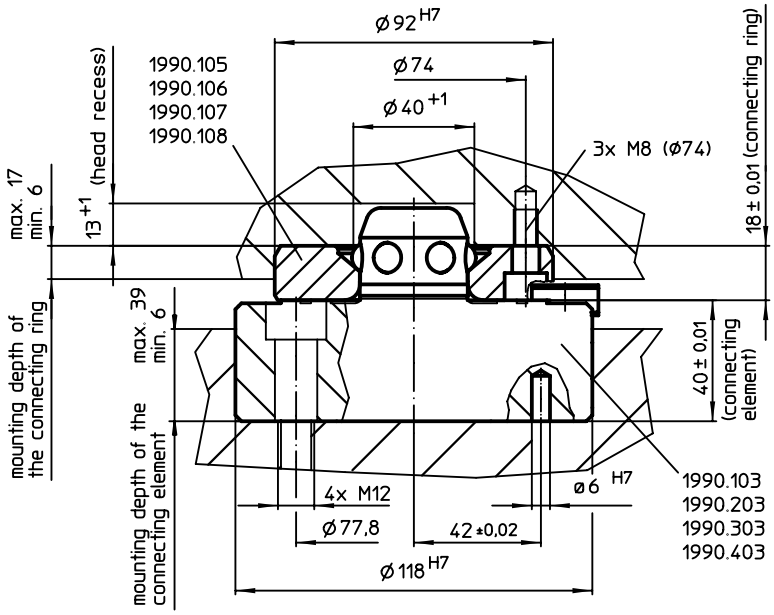
DRAWING



ORDER INFORMATION

Holding force [N]	Centering accuracy < [mm]	Release moment [Nm]	[g]	Art. No.
10000	0,01	10	3300	1990.103

APPLICATION EXAMPLE



Connecting Elements • modular, hydraulically operated, protected against twisting

EH 1990.



PRODUCT DESCRIPTION

Material

Body
- Steel, case-hardened, blackened, ground

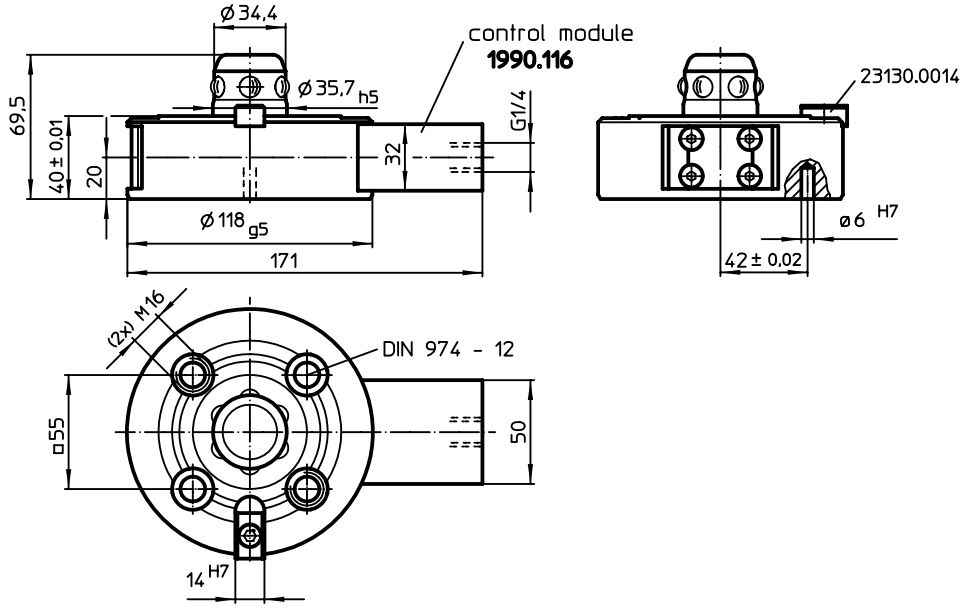
Control module
- Steel, blackened

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

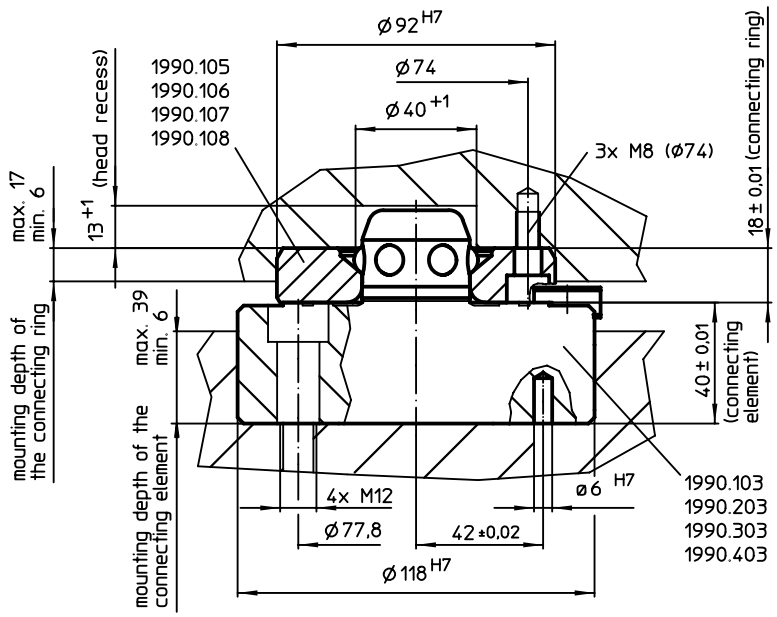
DRAWING



ORDER INFORMATION

Holding force [N]	Centering accuracy < [mm]	Release pressure [bar]	[g]	Art. No.
10000	0,01	80 – 120	3480	1990.203

APPLICATION EXAMPLE



Connecting Elements • modular, pneumatically operated, protected against twisting

EH 1990.



PRODUCT DESCRIPTION

Material

Body
- Steel, case-hardened, ground

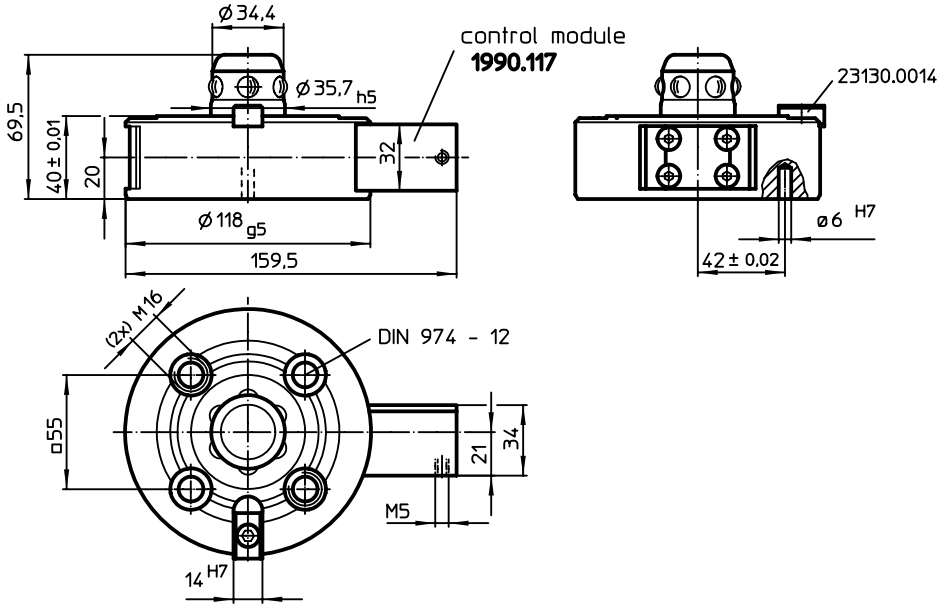
Control module
- Aluminium Al

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

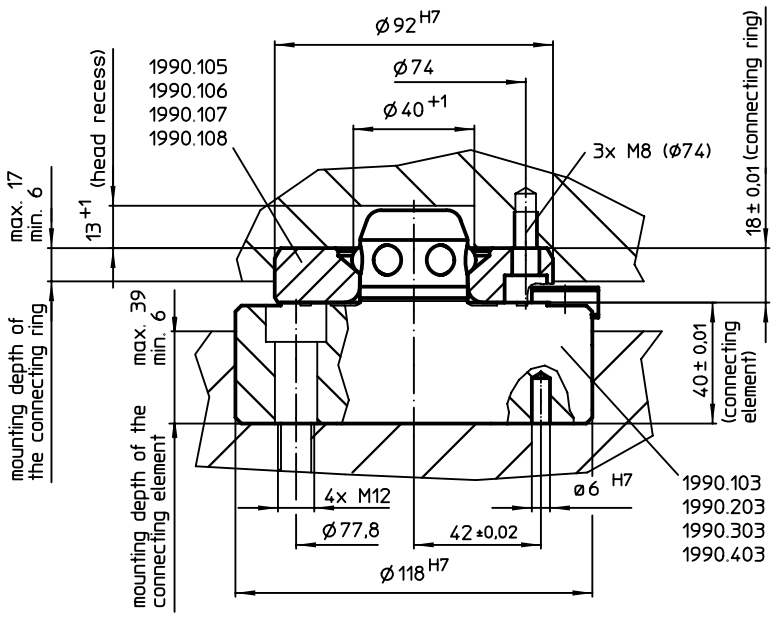
DRAWING



ORDER INFORMATION

Holding force [N]	Centering accuracy < [mm]	Release pressure [bar]	[g]	Art. No.
5000	0,01	6	3040	1990.303

APPLICATION EXAMPLE



Connecting Elements • modular, pneumatically operated, reinforced, protected against twisting

EH 1990.



PRODUCT DESCRIPTION

Material

Body
- Steel, case-hardened, ground

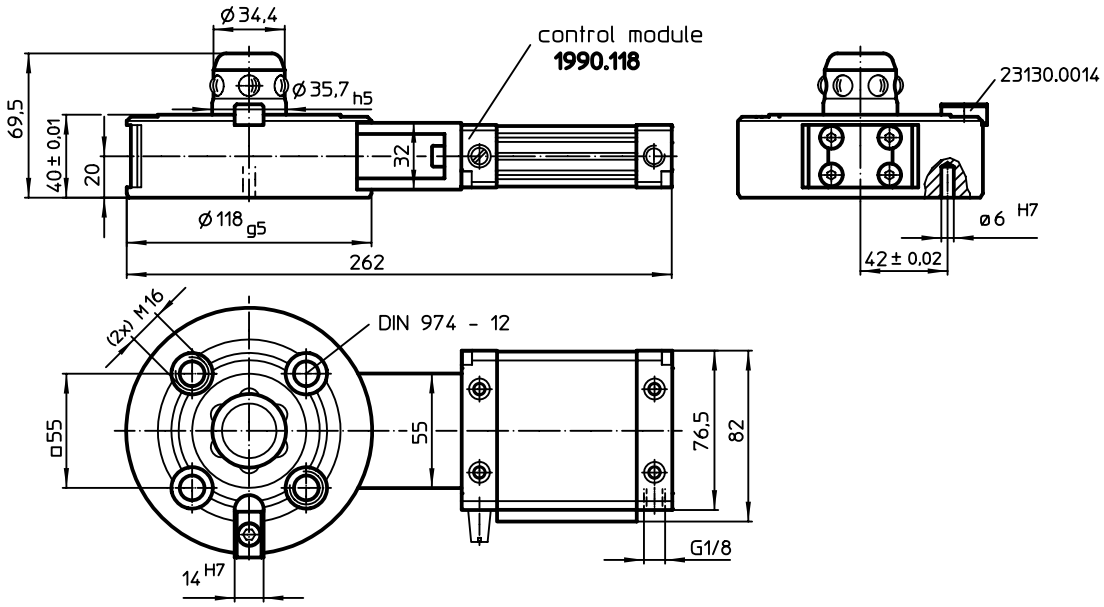
Control module
- Aluminium Al

MORE INFORMATION

Further products

Connecting Rings . . . . . → p. 919
Coverings, for connecting elements . . → p. 932

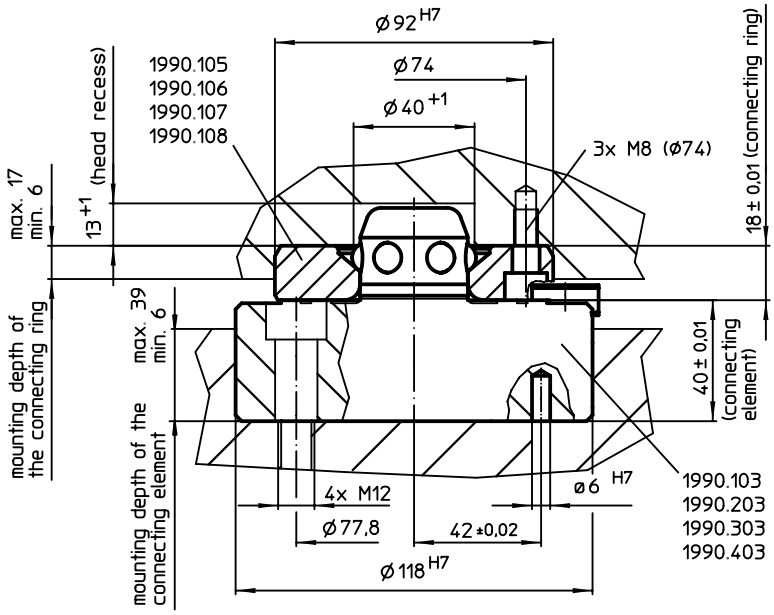
DRAWING



ORDER INFORMATION

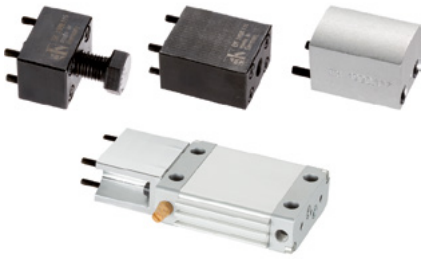
Holding force [N]	Centering accuracy < [mm]	Release pressure [bar]	[g]	Art. No.
10000	0,01	6	3750	1990.403

APPLICATION EXAMPLE



Control Modules

EH 1990.

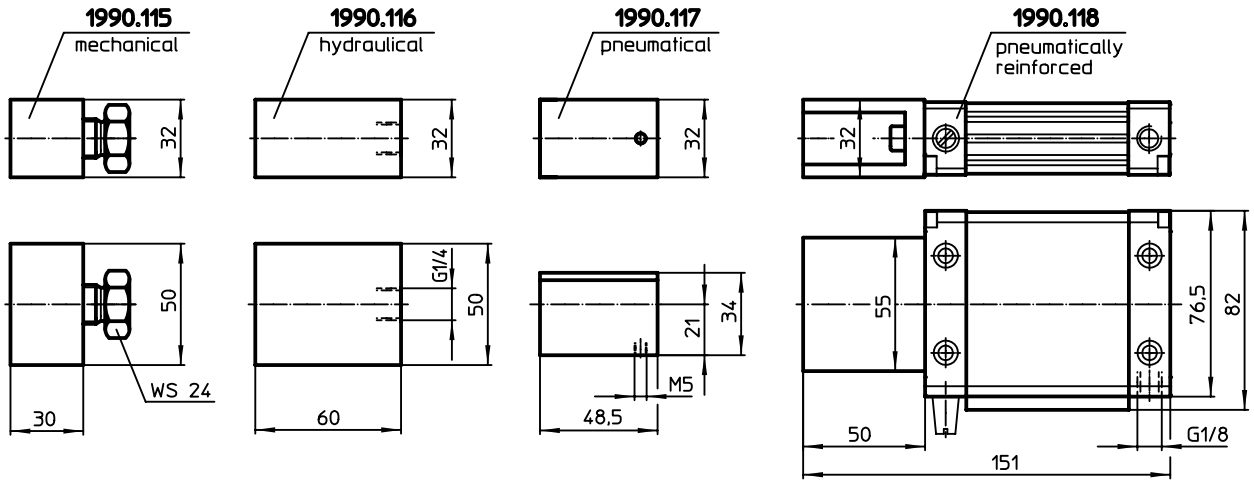


PRODUCT DESCRIPTION

Material

- Steel, blackened
- Aluminium Al

DRAWING



ORDER INFORMATION

[g]	Art. No.
mechanical	
387	1990.115
hydraulical	
617	1990.116
pneumatical	
165	1990.117
pneumatically, reinforced	
680	1990.118

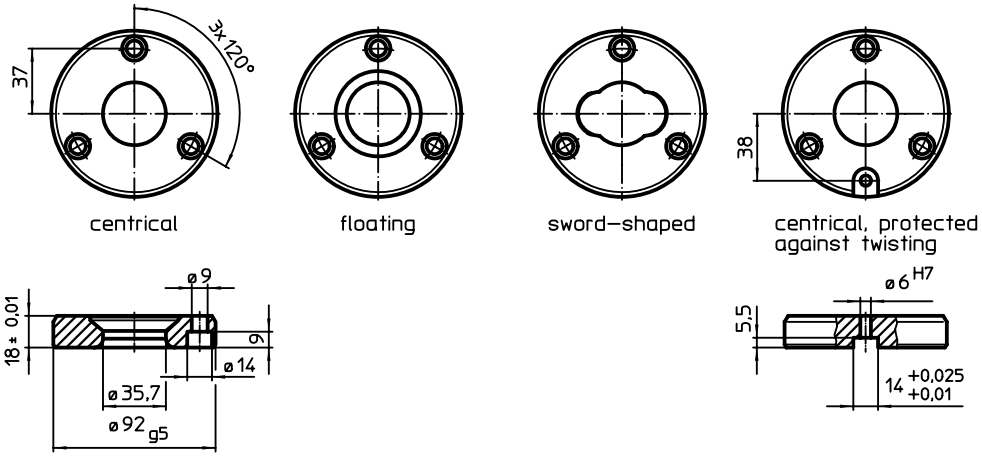
Connecting Rings
EH 1990.



PRODUCT DESCRIPTION

Material
- Steel, case-hardened, ground

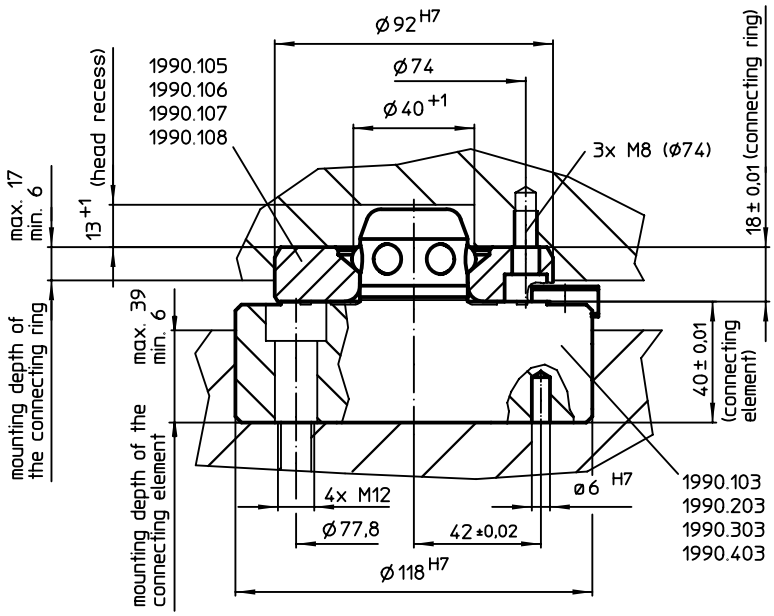
DRAWING

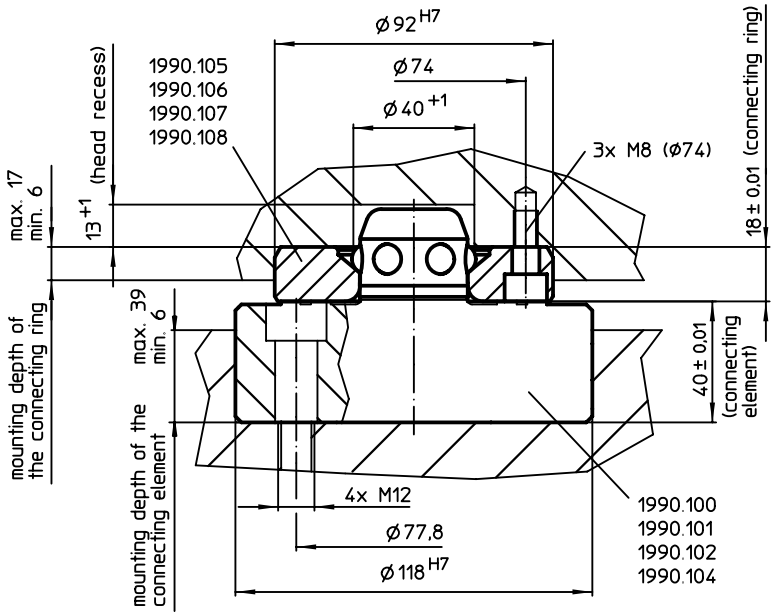


ORDER INFORMATION

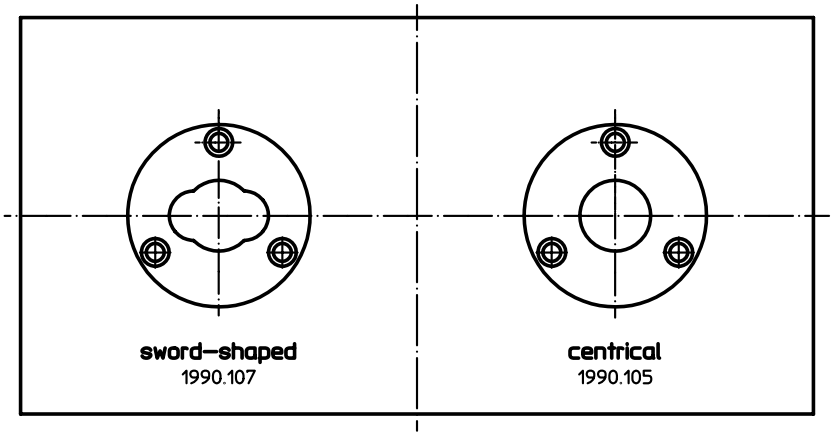
[g]	Art. No.
centrical	
680	1990.105
floating	
670	1990.106
sword-shaped	
670	1990.107
centrical, protected against twisting	
670	1990.108

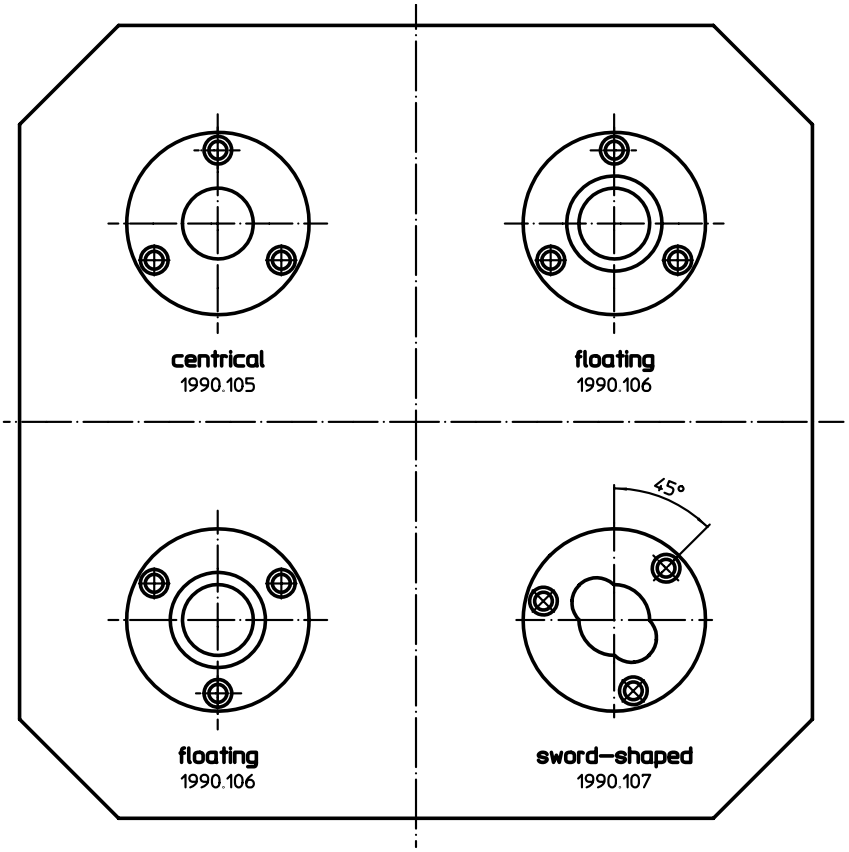
APPLICATION EXAMPLE





ASSEMBLY POSITION OF CONNECTING RINGS INDEPENDENT FROM DISTANCE





Base Plates • for 2 connecting elements

EH 1990.



PRODUCT DESCRIPTION

Material

- Aluminium Al

MORE INFORMATION

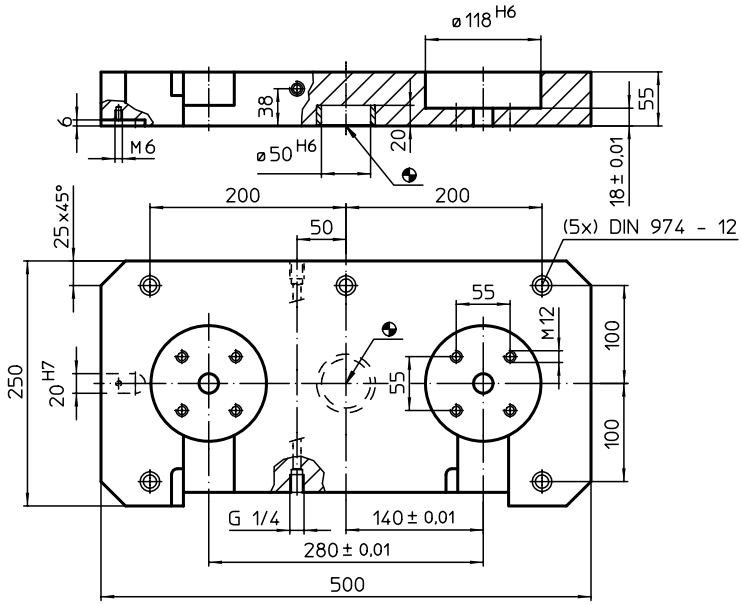
Notes

Special types on request.

Further products

Connecting Elements, modular, mechanically operated . . . . . → p. 910
Connecting Elements, modular, hydraulically operated . . . . . → p. 911
Connecting Elements, modular, pneumatically operated . . . . . → p. 912
Supporting Plates, with 2 connecting rings. . . . . → p. 930

DRAWING



ORDER INFORMATION

[kg]	Art. No.
14	1990.120

Base Plates • with 2 connecting elements

EH 1990.



PRODUCT DESCRIPTION

Material

Connecting element
- Refer to Art. No. 1990.100 -.102

Base plate
- Aluminium Al

MORE INFORMATION

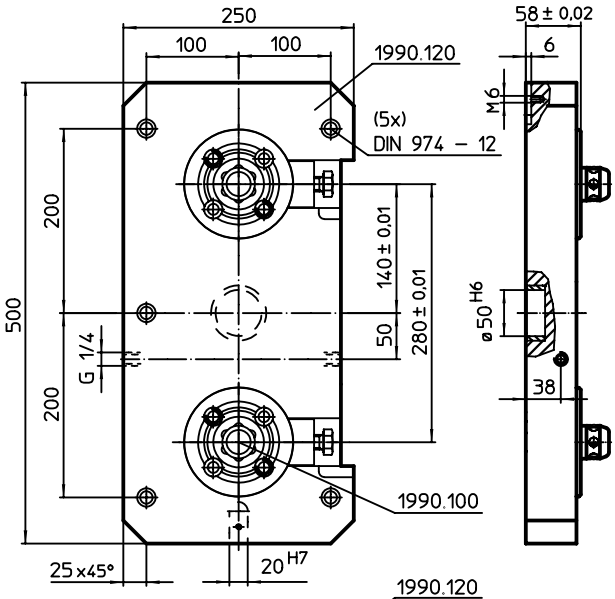
Notes
Special types on request.

Further products

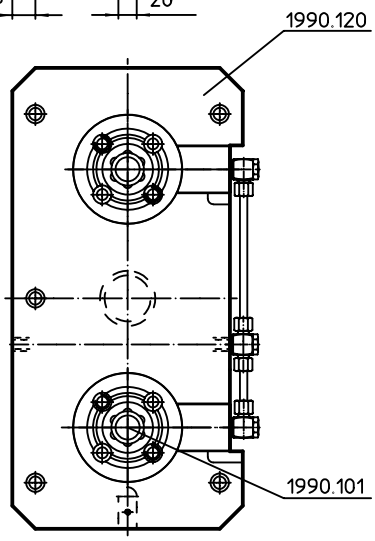
Connecting Elements, modular, mechanically operated . . . . . → p. 910
Connecting Elements, modular, hydraulically operated . . . . . → p. 911
Connecting Elements, modular, pneumatically operated . . . . . → p. 912
Supporting Plates, with 2 connecting rings. . . . . → p. 930

DRAWING

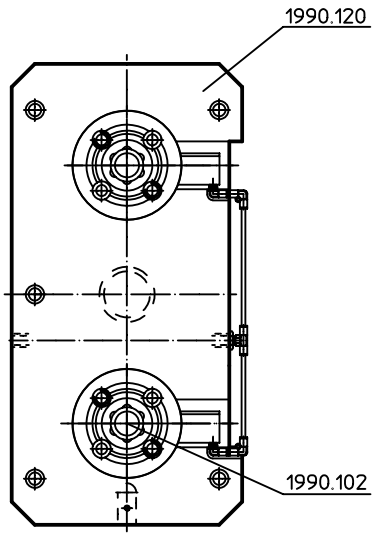
1990.125



1990.126



1990.127



ORDER INFORMATION

[kg]	Art. No.
mechanical	
16,5	1990.125
hydraulical	
17,0	1990.126
pneumatic	
16,0	1990.127

Base Plates • for 4 connecting elements

EH 1990.



PRODUCT DESCRIPTION

Material

- Aluminium Al

MORE INFORMATION

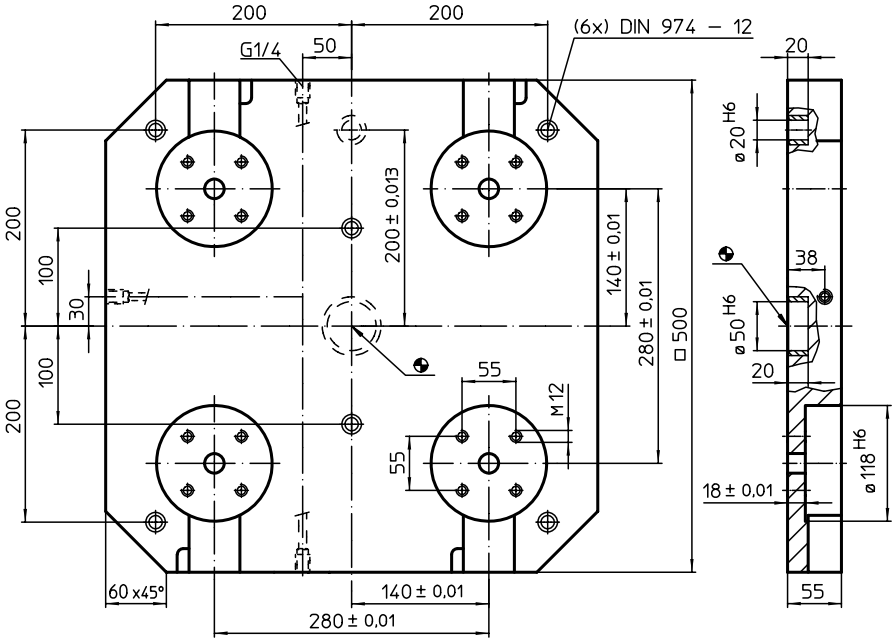
Notes

Special types on request.

Further products

Connecting Elements, modular, mechanically operated . . . . . → p. 910
Connecting Elements, modular, hydraulically operated . . . . . → p. 911
Connecting Elements, modular, pneumatically operated . . . . . → p. 912
Supporting Plates, with 4 connecting rings. . . . . → p. 931

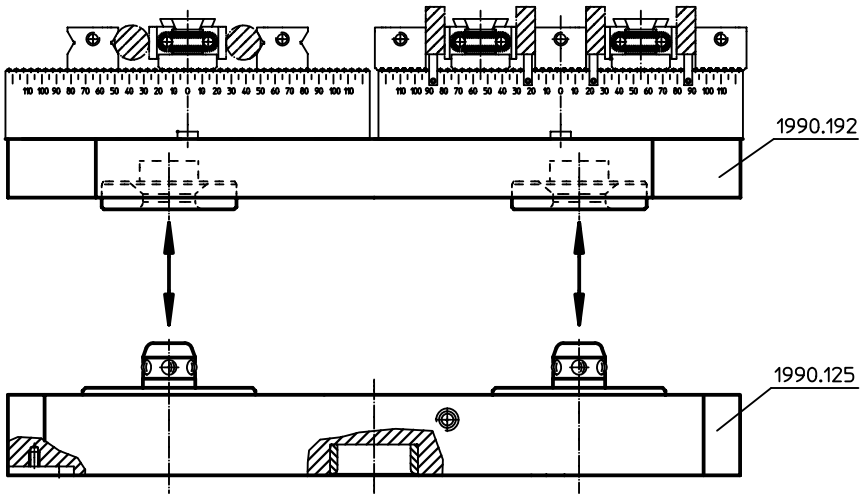
DRAWING



ORDER INFORMATION

[kg]	Art. No.
30	1990.130

APPLICATION EXAMPLE



Base Plates • with 4 connecting elements

EH 1990.



PRODUCT DESCRIPTION

Material

Connecting element
- Refer to Art. No. 1990.100- .102

Base plate
- Aluminium Al

MORE INFORMATION

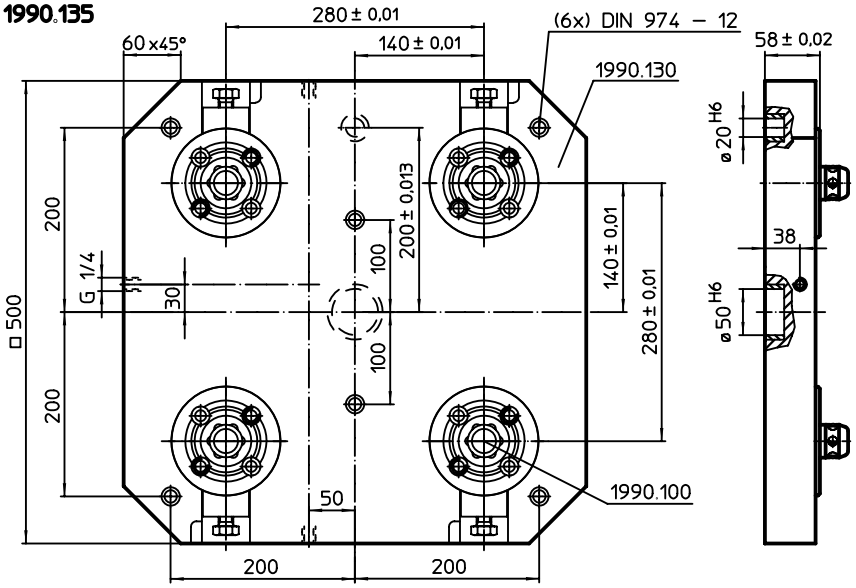
Notes
Special types on request.

Further products

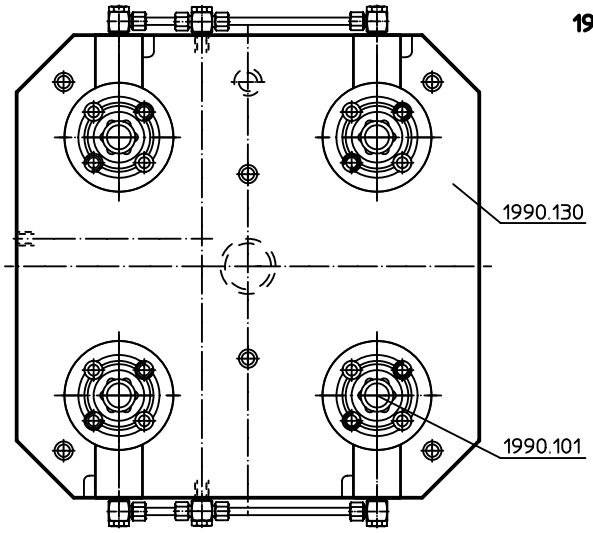
Connecting Elements, modular, mechanically operated . . . . . → p. 910
Connecting Elements, modular, hydraulically operated . . . . . → p. 911
Connecting Elements, modular, pneumatically operated . . . . . → p. 912
Supporting Plates, with 4 connecting rings. . . . . → p. 931

DRAWING

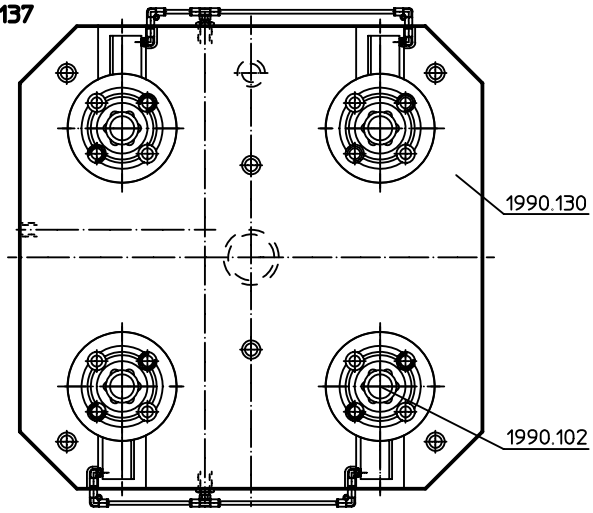
1990.135



1990.136



1990.137



ORDER INFORMATION

[kg]	Art. No.
mechanical	
43	1990.135
hydraulical	
44	1990.136
pneumatic	
42	1990.137

12

Base Plates • for 4 double acting connecting elements

EH 1990.



PRODUCT DESCRIPTION

Material

- Aluminium Al

MORE INFORMATION

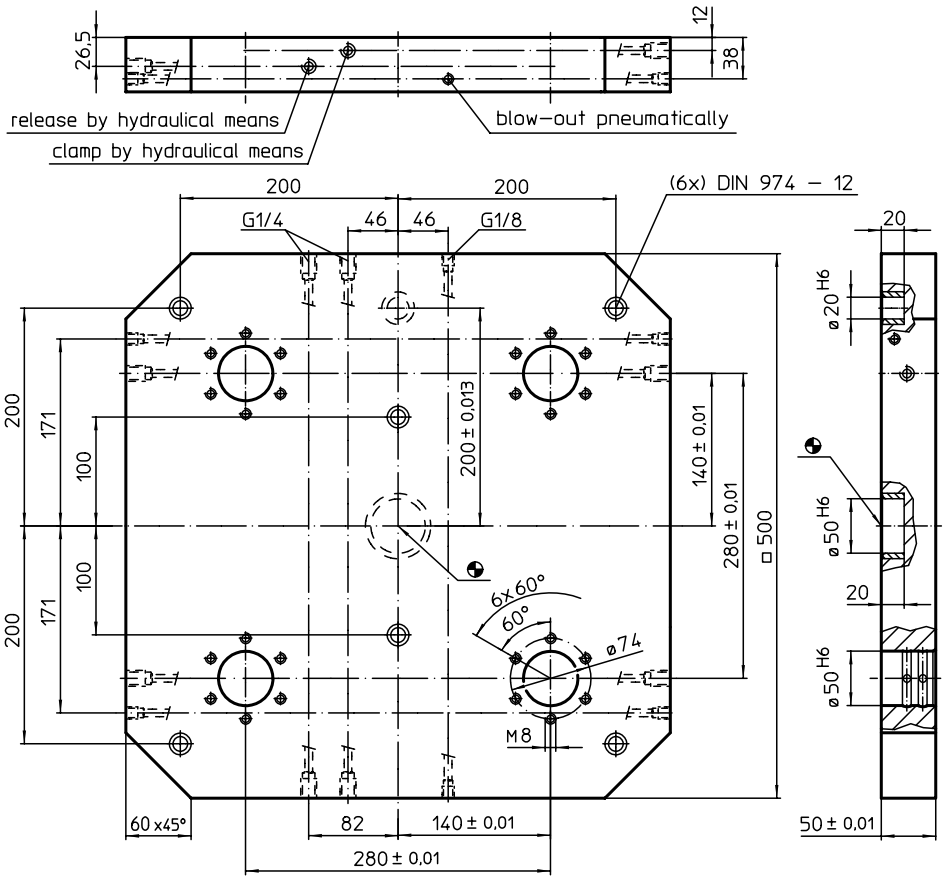
Notes

Special types on request.

Further products

Connecting Elements, hydraulically operated, double acting, with lifting-off and blow-out . . . . . → p. 904
Supporting Plates, with 4 connecting rings. . . . . → p. 931

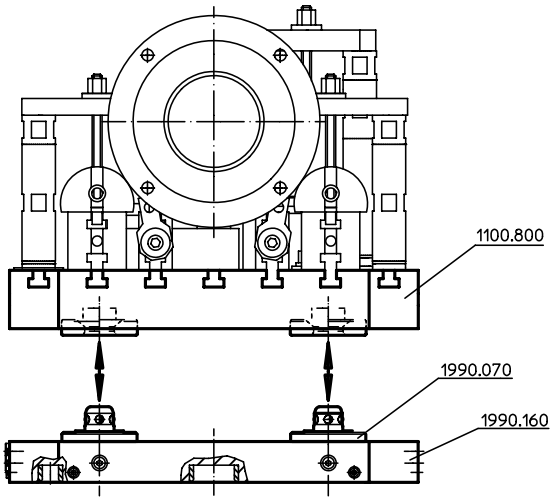
DRAWING



ORDER INFORMATION

[kg]	Art. No.
30	1990.160

APPLICATION EXAMPLE



Base Plates • with 4 double acting connecting elements

EH 1990.



PRODUCT DESCRIPTION

Material

Connecting element
- Steel, case-hardened, ground

Base plate
- Aluminium Al

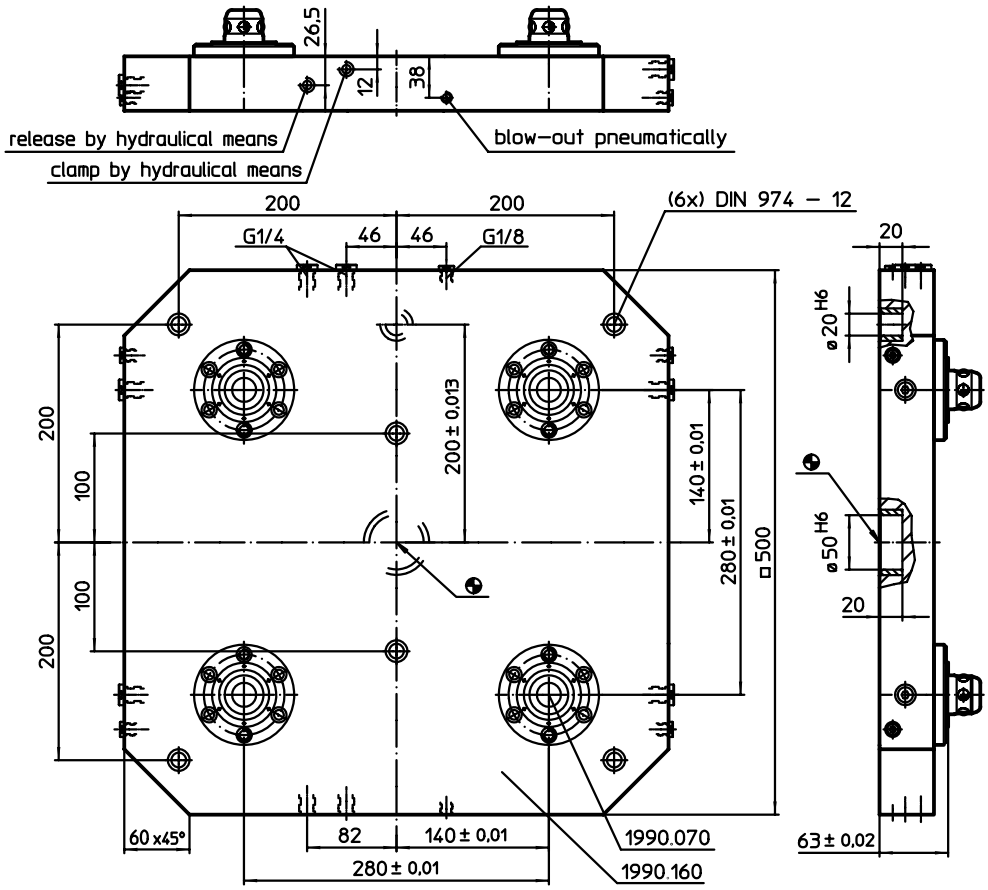
MORE INFORMATION

Notes
Special types on request.

Further products

Connecting Elements, hydraulically operated, double acting, with lifting-off and blow-out . . . . . → p. 904
Supporting Plates, with 4 connecting rings. . . . . → p. 931

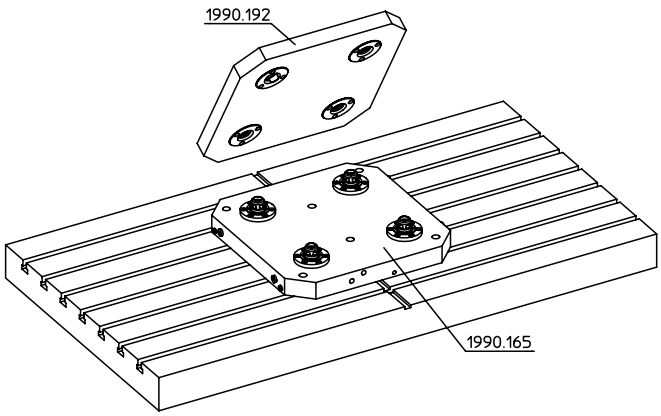
DRAWING



ORDER INFORMATION

[kg]	Art. No.
35	1990.165

APPLICATION EXAMPLE



Base Plates • for 4 single acting connecting elements

EH 1990.



PRODUCT DESCRIPTION

Material

- Aluminium Al

MORE INFORMATION

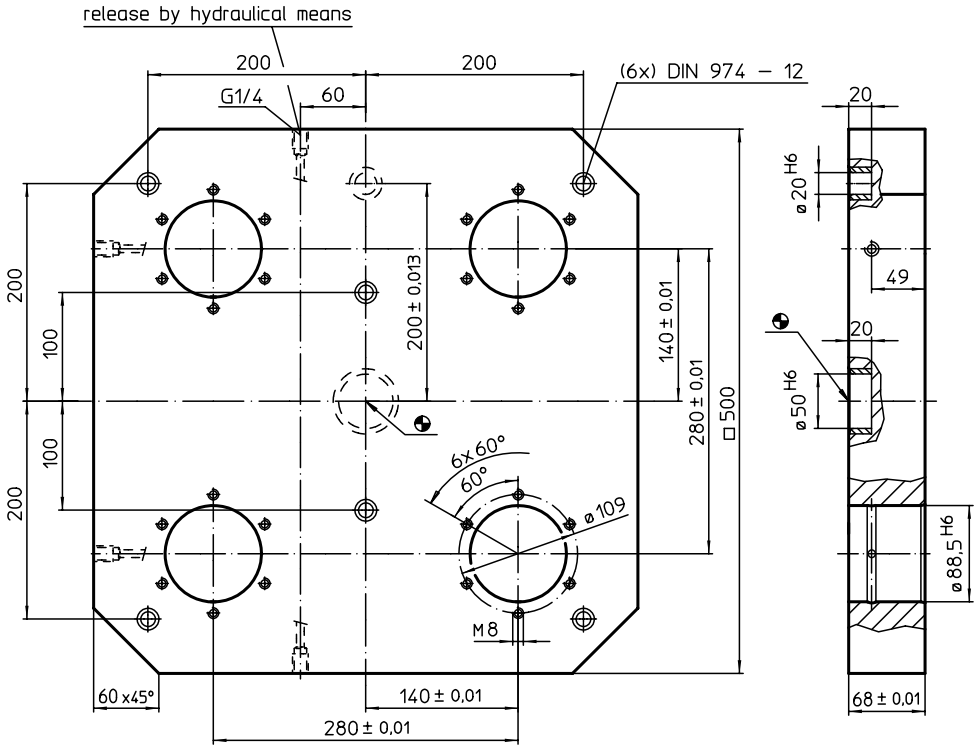
Notes

Special types on request.

Further products

Connecting Elements, hydraulically operated, single acting with lifting-off . → p. 909
Supporting Plates, with 4 connecting rings. . . . . → p. 931

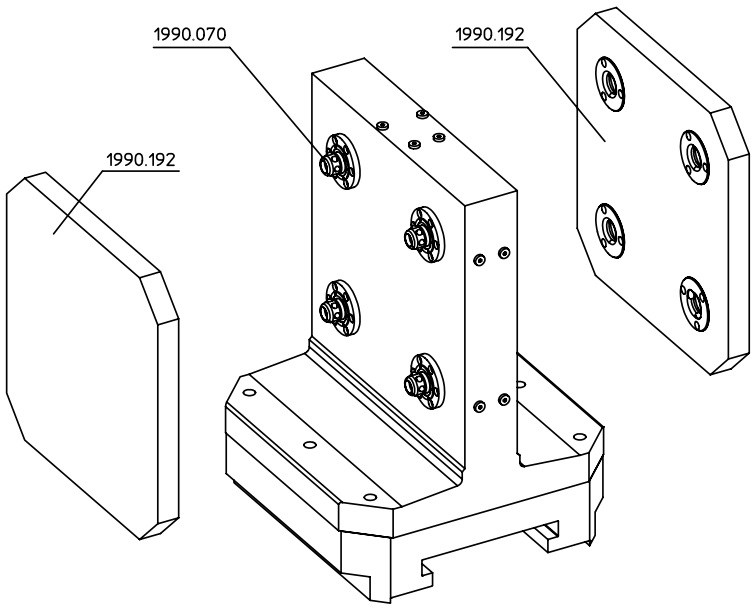
DRAWING



ORDER INFORMATION

[kg]	Art. No.
35	1990.170

APPLICATION EXAMPLE



Base Plates • with 4 single acting connecting elements

EH 1990.



PRODUCT DESCRIPTION

Material

Connecting element
- Steel, case-hardened, ground

Base plate
- Aluminium Al

MORE INFORMATION

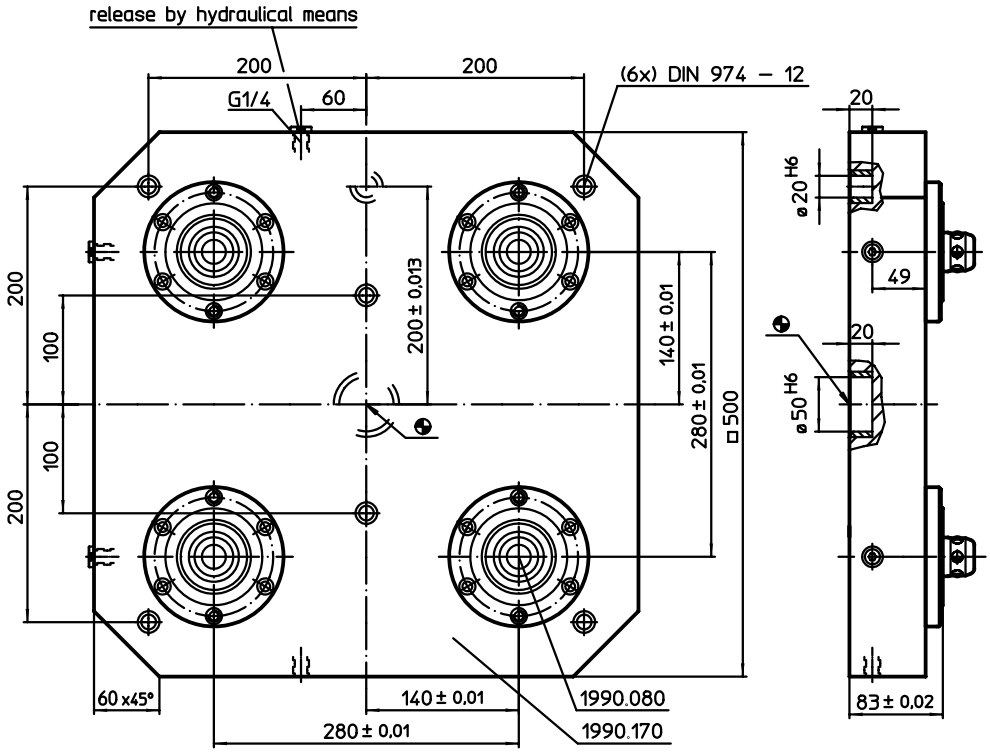
Notes

Special types on request.

Further products

Connecting Elements, hydraulically operated, single acting with lifting-off . → p. 909
Supporting Plates, with 4 connecting rings. . . . . → p. 931

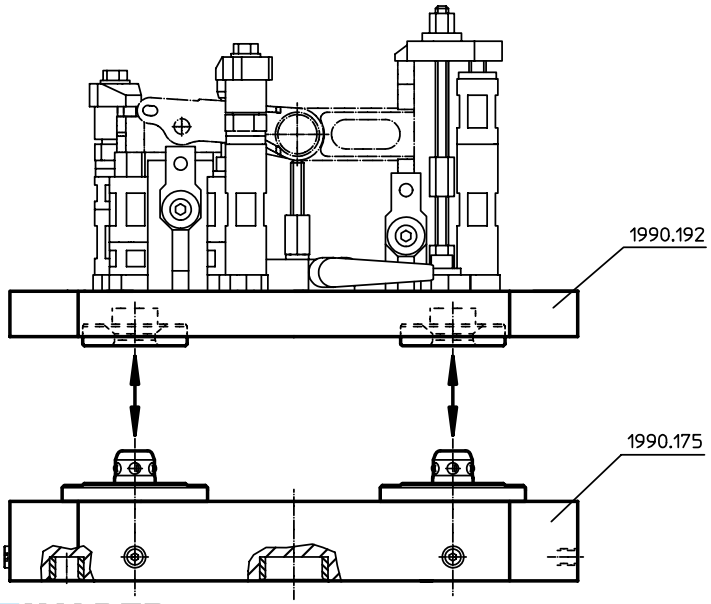
DRAWING



ORDER INFORMATION

[kg]	Art. No.
50	1990.175

APPLICATION EXAMPLE



Supporting Plates • with 2 connecting rings

EH 1990.



PRODUCT DESCRIPTION

Material

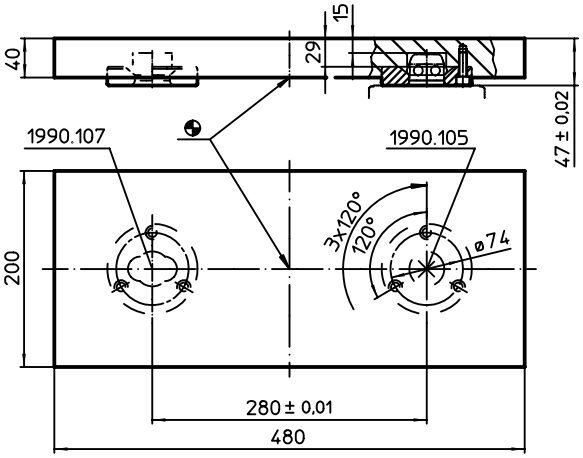
Connecting rings
- Steel, case-hardened, ground

Base plate
- Aluminium Al

MORE INFORMATION

Notes
Special types on request.

DRAWING

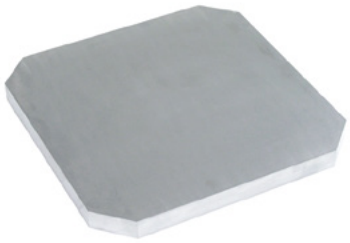


ORDER INFORMATION

[kg]	Art. No.
11	1990.190

Supporting Plates • with 4 connecting rings

EH 1990.



PRODUCT DESCRIPTION

Material

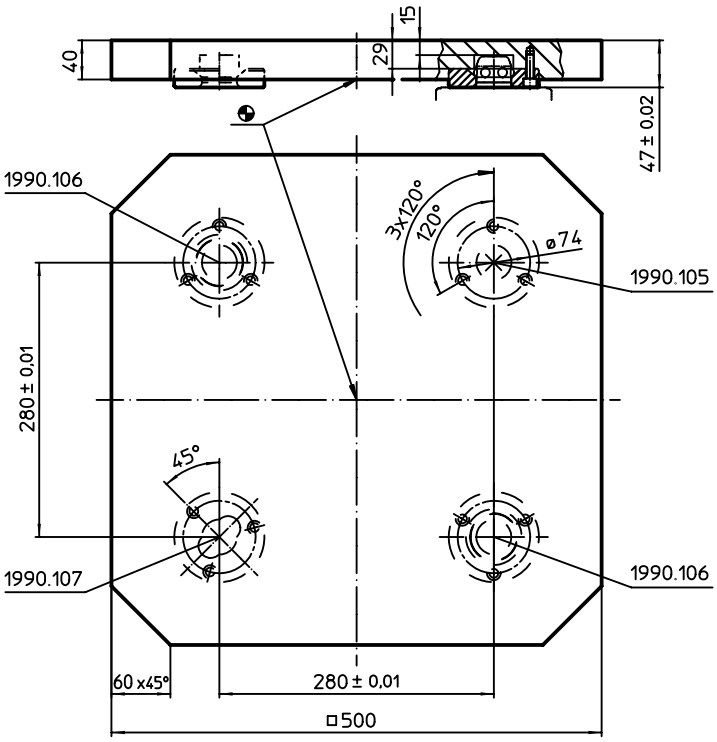
Connecting rings
- Steel, case-hardened, ground

Base plate
- Aluminium Al

MORE INFORMATION

Notes
Special types on request.

DRAWING



ORDER INFORMATION

[kg]	Art. No.
27	1990.192

Coverings • for connecting elements

EH 1990.

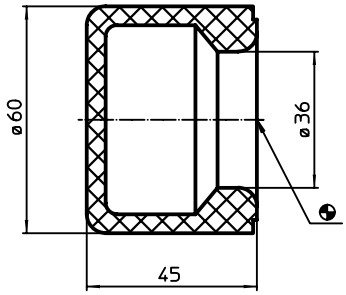


PRODUCT DESCRIPTION

Material

- Plastic

DRAWING



ORDER INFORMATION

[g]	Art. No.
70	1990.114

APPLICATION SAMPLE

EH 1990.080 CLAMPING ELEMENT, HYDRAULICALLY OPERATED, SINGLE ACTING WITH LIFT-OFF

This sample shows the application of a zero-point clamping system on a machine center.

PICTURE 1

The base plate with the clamped workpiece is being put onto the zero-point clamping system by means of a crane.

Example
Multifunctional base plate with 9 clamping elements for the use of different supporting plates, i.e. with 2, 3 or 4 clamping rings.

PICTURE 2

Easy insertion of the base plate due to:

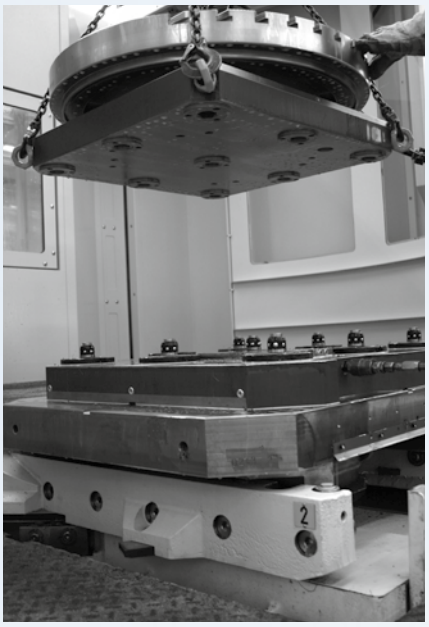
- Alignment by means of a critical taper on both the base plate and the counter piece, i.e. clamping ring.
- Base plate is supported by a retractable rest pad, plate is lowered 5 mm into position (when releasing, the base plate will be re-lifted by 5 mm).

Lowering, centering and clamping is achieved simultaneously by releasing the hydraulic pressure.

PICTURE 3

The workpiece is now ready for machining.

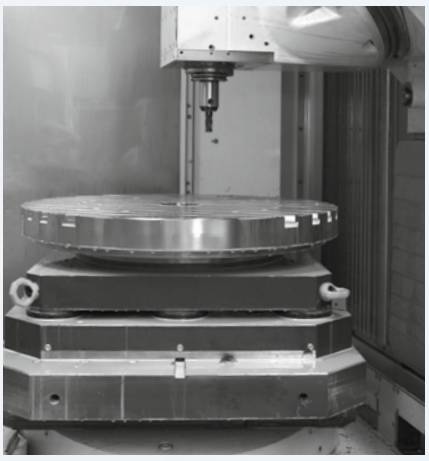
1.



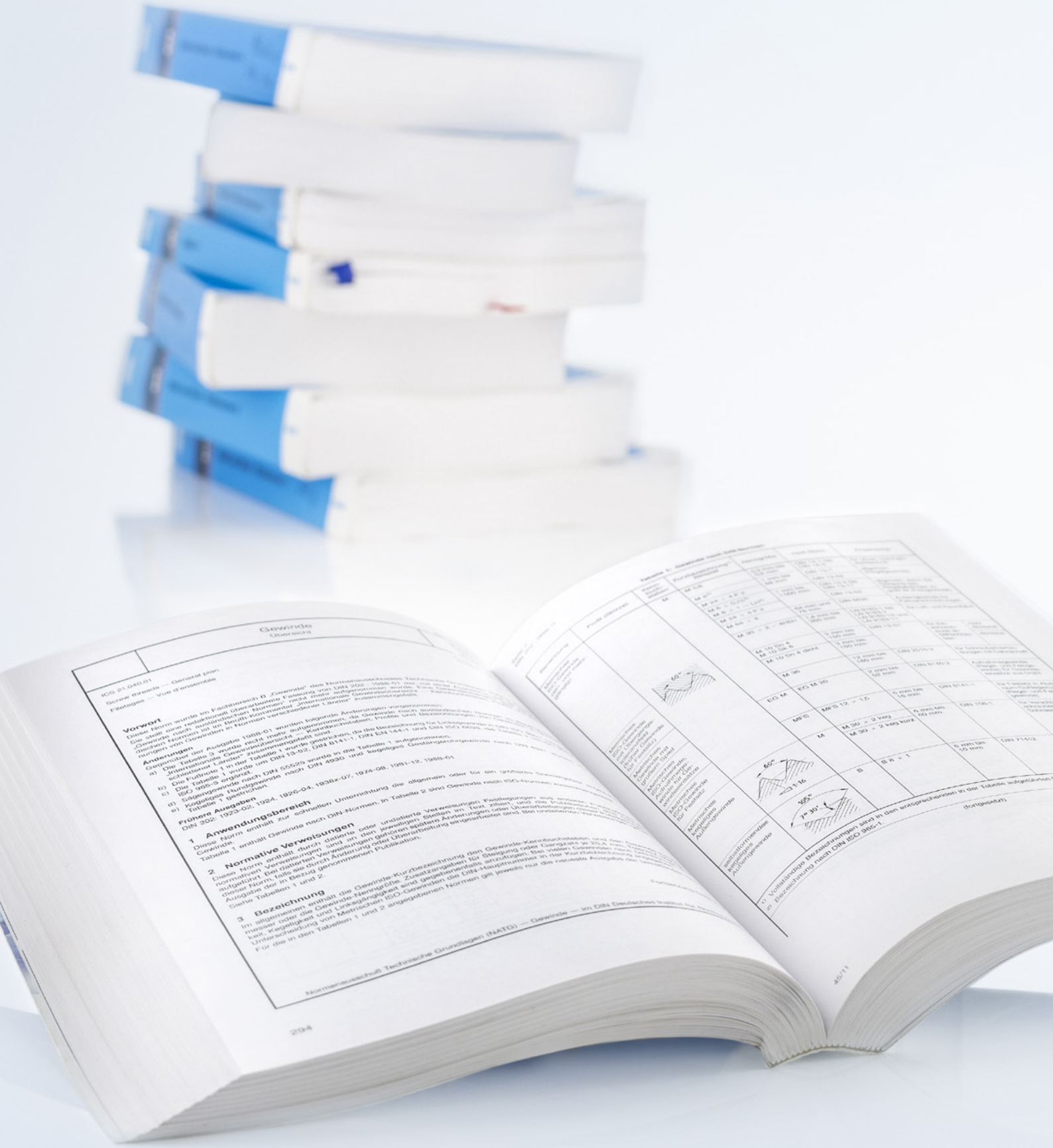
2.



3.







13 TECHNICAL APPENDIX

Produktgruppe	Seite
Units	936
ISO Fittings and Tolerances	937
Torques	939
Thread Lockings	941



UNITS

CONVERSION TABLE

Dimensions		
Inch (in)	in millimetres (mm)	in x 25,4 = mm
Millimetres (mm)	in inches (in)	mm x 0,03937 = in

Weight/force		
Ounces (oz)	in grammes (g)	oz x 28 = g
Grammes (g)	in ounces (oz)	g x 0,3527 = oz
Pounds (lbs)	in kilogrammes (kg)	lbs x 0,4536 = kg
Kilogrammes (kg)	in pounds (lbs)	kg x 2,205 = lbs
Kilogrammes (kg)	in Newton (N)	kg x 9,81 = N
Newton (N)	in kilogrammes (kg)	N / 9,81 = kg

Temperature		
Degree Fahrenheit (°F)	in degree Celsius (°C)	(°F – 32) x 5/9 = °C
Degree Celsius (°C)	in degree Fahrenheit (°F)	°C x 9/5 + 32 = °F

Torque		
Foot-pounds (ft-lbs)	in Newton metres (Nm)	ft/lbs x 1,35 = Nm
Newton metres (Nm)	in foot pounds (ft-lbs)	Nm x 0,74 = ft/lbs

ISO FITS

DIN 7154 AND DIN 7155

Values in µm

Range of nominal sizes in mm

Tolerance zone	H6	H7	H8	H9	H11	H12	H13	F7	F6	E9	D12	C13	JS12	h5	g5	g6	k6	n6	h6	f7	f8	h8	h9	h11	h13
from 1 to 3	+ 6 0	+10 0	+14 0	+25 0	+60 0	+100 0	+140 0	+16 +6	+12 +6	+39 14	+120 20	+200 +60	+50 -50	0 -4	-2 -6	-2 -8	+6 0	+10 +4	0 -6	-6 -16	-6 -20	0 -14	0 -25	0 -60	0 -140
over 3 to 6	+8 0	+12 0	+18 0	+30 0	+75 0	+120 0	+180 0	+22 +10	+18 +10	+50 +20	+150 +30	+250 +70	+60 -60	0 -5	-4 -9	-4 -12	+9 1	+16 +8	0 -8	-10 -22	-10 -28	0 -18	0 -30	0 -75	0 -180
over 6 to 10	+9 0	+15 0	+22 0	+36 0	+90 0	+150 0	+220 0	+28 +13	+22 +13	+61 +25	+190 +40	+300 +80	+75 -75	0 -6	-5 -11	-5 -14	+10 +1	+19 +10	0 -9	-13 -28	-13 -35	0 -22	0 -36	0 -90	0 -220
over 10 to 18	+11 0	+18 0	+27 0	+43 0	+110 0	+180 0	+270 0	+34 +16	+27 +16	+75 +32	+230 +50	+365 +95	+90 -90	0 -8	-6 -14	-6 -17	+12 +1	+23 +12	0 -11	-16 -34	-16 -43	0 -27	0 -43	0 -110	0 -270
over 18 to 30	+13 0	+21 0	+33 0	+52 0	+130 0	+210 0	+320 0	+41 +20	+33 +20	+92 +40	+275 +65	+440 +110	+105 -105	0 -9	-7 -16	-7 -20	+15 +2	+28 +15	0 -13	-20 -41	-20 -53	0 -33	0 -52	0 -130	0 -330
over 30 to 40	+16 0	+25 0	+39 0	+62 0	+160 0	+250 0	+390 0	+50 +25	+41 +25	+112 +50	+330 +80	+510 +120	+125 -125	0 -11	-9 -20	-9 -25	+18 +2	+33 +17	0 -16	-25 -50	-25 -64	0 -39	0 -62	0 -160	0 -390
over 40 to 50	+16 0	+25 0	+39 0	+62 0	+160 0	+250 0	+390 0	+50 +25	+49 +30	+112 +50	+330 +80	+520 +130	+125 -125	0 -11	-9 -20	-9 -25	+18 +2	+33 +17	0 -16	-25 -50	-25 -64	0 -39	0 -62	0 -160	0 -390
over 50 to 65	+19 0	+30 0	+46 0	+74 0	+190 0	+300 0	+460 0	+60 +30	+49 +30	+134 +60	+400 +100	+600 +140	+150 -150	0 -13	-10 -23	-10 -29	+21 +2	+39 +20	0 -19	-30 -60	-30 -76	0 -46	0 -74	0 -190	0 -460
over 65 to 80	+19 0	+30 0	+46 0	+74 0	+190 0	+300 0	+460 0	+60 +30	+58 +36	+134 +60	+400 +100	+690 +150	+150 -150	0 -13	-10 -23	-10 -29	+21 +2	+39 +20	0 -19	-30 -60	-30 -76	0 -46	0 -74	0 -190	0 -460
over 80 to 100	+22 0	+35 0	+54 0	+87 0	+220 0	+350 0	+540 0	+71 +36	+58 +36	+159 +72	+470 -120	+710 +170	+175 -175	0 -15	-12 -27	-12 -34	+25 +3	+45 +23	0 -22	-36 -71	-36 -90	0 -54	0 -87	0 -220	0 -540
over 100 to 120	+22 0	+35 0	+54 0	+87 0	+220 0	+350 0	+540 0	+71 +36	+58 +36	+159 +72	+470 -120	+720 +180	+175 -175	0 -15	-12 -27	-12 -34	+25 +3	+45 +23	0 -22	-36 -71	-36 -90	0 -54	0 -87	0 -220	0 -540

GENERAL TOLERANCES

DIN ISO 2768, PART 1

Table 1. Limit deviations for linear sizes with the exception of cut-off edges
(for radius of curvature and chamfer heights, please refer to table 2)

Values in mm

Tolerance class		Limit deviations for ranges of nominal sizes							
Symbol	Designation	von 0,5* to 3	over 3 to 6	over 6 to 30	over 30 to 120	over 120 to 400	over 400 to 1000	over 1000 to 2000	over 2000 to 4000
f	fine	± 0,05	± 0,05	± 0,1	± 0,15	± 0,2	± 0,3	± 0,5	–
m	medium	± 0,1	± 0,1	± 0,2	± 0,3	± 0,5	± 0,8	± 1,2	± 2
c	coarse	± 0,2	± 0,3	± 0,5	± 0,8	± 1,2	± 2	± 3	± 4
v	very coarse	–	± 0,5	± 1	± 1,5	± 2,5	± 4	± 6	± 8
*For nominal sizes below 0.5 mm, the limit deviations are to be indicated directly on the relevant nominal size(s).									

Table 2. Limit deviations for cut-off edges (radius of curvature and chamfer heights)

Values in mm

Tolerance class		Limit deviations for ranges of nominal sizes		
Symbol	Designation	over 0,5* to 3	over 3 to 6	over 6 to 30
f	fine	± 0,2	± 0,5	± 1
m	medium	± 0,2	± 0,5	± 1
c	coarse	± 0,4	± 1	± 2
v	very coarse	± 0,4	± 1	± 2
*For nominal sizes below 0.5 mm, the limit deviations are to be indicated directly on the relevant nominal size(s).				

Table 3. Limit deviations for angular dimensions

Values in mm

Tolerance class		Limit deviations for linear ranges, expressed in mm, for the shorter leg of relevant angle				
Symbol	Designation	to 10	over 10 to 50	over 50 to 120	over 120 to 400	over 400
f	fine	± 1°	± 0° 30´	± 0° 20´	± 0° 10´	± 0° 5´
m	medium	± 1°	± 0° 30´	± 0° 20´	± 0° 10´	± 0° 5´
c	coarse	± 1° 30´	± 1°	± 0° 30´	± 0° 15´	± 0° 10´
v	very coarse	± 3°	± 2°	± 1°	± 0° 30´	± 0° 20´

DIN ISO 2768, PART 2

Table 1. General tolerances for straightness and evenness Values in mm

Tolerance class	General tolerances for straightness and evenness for ranges of nominal sizes					
	to 10	over 10 to 30	over 30 to 100	over 100 to 300	over 300 to 1000	over 1000 to 3000
H	0,02	0,05	0,1	0,2	0,3	0,4
K	0,05	0,1	0,2	0,4	0,6	0,8
L	0,1	0,2	0,4	0,8	1,2	1,6

Table 2. General tolerances for perpendicularity Values in mm

Tolerance class	Perpendicularity tolerances for ranges of nominal sizes for the shorter leg of the angle			
	to 100	over 100 to 300	over 300 to 1000	over 1000 to 3000
H	0,2	0,3	0,4	0,5
K	0,4	0,6	0,8	1
L	0,6	1	1,5	2

Table 3. General tolerances for symmetry Values in mm

Tolerance class	Symmetry tolerances for ranges of nominal sizes			
	up to 100	over 100 to 300	over 300 to 1000	over 1000 to 3000
H	0,05	0,05	0,05	0,05
K	0,6	0,6	0,8	1
L	0,6	1	1,5	2

SHAPE AND POSITIONING TOLERANCE

for all Halder jig and fixture systems (except V70eco)

Positioning tolerance: 0 - 500 mm – 0,01
Parallelism: on 500 mm 0,015
Angle precision: on 200 mm 0,01

ARTICLE BASED TORQUES

(NOT VALID FOR STAINLESS STEEL)



EH 23070.
Fixture Nuts
DIN 6330
Quality 10



EH 23080.
Collar Nuts
with collar DIN 6331
Quality 10



EH 23080.
Collar Nuts
with ball seat



EH 23090.
Extension Nuts
Quality 10

Thread		M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M36	M42	M48
Pitch (**mm**)		1	1,25	1,50	1,75	2	2	2,50	2,50	2,50	3	3	3,50	4	4,50	5
Nuts	**Strength Class**															
Hardness **(HRC)** DIN 6330/6331	10	22–32														
Test force **(kN)** DIN EN 20898-2	10	20,9	38,1	60	88	121	165	203	260	321	374	486	595	866	–	–



EH 23030.
T-Bolts
DIN 787
Up to M12 Quality 10.9
From M14 Quality 8.8



EH 23040.
Studs for T-Nuts
DIN 6379
Up to M12 Quality10.9
From M14 Quality 8.8



EH 22980.
Swing Bolts
DIN 444
Quality 8.8

Thread		M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M36	M42	M48
Pitch (**mm**)		1	1,25	1,5	1,75	2	2	2,50	2,50	2,50	3	3	3,50	4	4,50	5
Nuts	**Strength Class**															
Permissible prestressing force with 90 % utilization yield point and friction μ = 0,14	8.8 10.9	9 13	17 25	26 38	38 55	53 77	73 107	91 130	117 167	146 208	168 240	221 315	269 284	394 561	542 773	714 1018
Required tightening moment of permissable prestressing force and friction μ = 0,14	8.8 10.9	10 14	25 36	46 67	82 120	130 191	206 302	284 405	407 580	542 772	698 994	1021 1455	1355 1930	2372 3378	3802 5415	5730 8162

GENERAL TORQUES
STRENGTHS FOR SCREWED CONNECTIONS

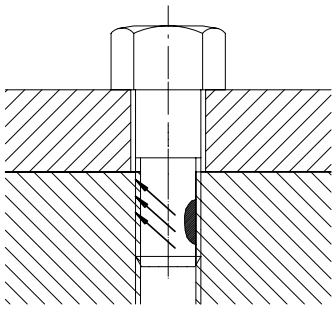
Thread		M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M36	M42	M48
Pitch **(mm)**		1	1,25	1,50	1,75	2	2	2,50	2,50	2,50	3	3	3,50	4	4,50	5
Nuts	**Strength Class**															
Hardness **(HRC)** DIN 6330/6331	10	22–32														
Test force **(kN)** (A_S x S_P) DIN EN 20898-2	10	20,9	38,1	60	88	121	165	203	260	321	374	486	595	866	–	–
Screws																
Hardness **(HRC)**	8.8	22–32							23–24							
	10.9	32–39														
	12.9	39–44														
Tightening values																
Specified failing load (A_S x R_m) **(kN)**	8.8 10.9 12.9	16 21 24	29 38 45	46 60 71	67 88 103	92 120 140	125 163 192	159 200 234	203 255 299	252 315 370	293 367 431	381 477 560	466 583 684	678 850 997	930 1165 1367	1222 1531 1797
Permissible load on screws max. 80 % of yield point	8.8 10.9 12.9	10 14 17	19 27 32	30 43 51	43 63 74	59 86 101	80 118 138	101 144 169	129 184 215	160 228 266	186 265 310	242 345 404	296 421 493	431 614 719	591 843 986	777 1107 1296
Test force (A_S x S_P) acc. to DIN ISO 898, part 1 **(kN)**	8.8 10.9 12.9	12 17 20	21 30 35	34 48 56	49 70 82	67 96 112	91 130 152	115 159 186	147 203 238	182 252 294	212 293 342	275 381 445	337 466 544	490 678 792	672 930 1087	882 1222 1428
Permissible prestressing force with 90 % utilization yield point and friction μ = 0,14 **(kN)**	8.8 10.9 12.9	9 13 15	17 25 29	26 38 44	38 55 65	53 77 91	73 107 125	91 130 152	117 167 196	146 208 243	168 240 281	221 315 369	269 384 449	394 561 657	542 773 904	714 1018 1191
Required tightening moment for permissible prestressing force and μ = 0,14 **(Nm)**	8.8 10.9 12.9	10 14 17	25 36 43	46 67 79	82 120 141	130 191 223	206 302 354	284 405 474	407 580 679	542 772 903	698 994 1163	1021 1455 1703	1355 1930 2258	2372 3378 3953	3802 5415 6337	5730 8162 9571
Required lever length to obtain the permissible prestressing force with normal manual force **(mm)**	8.8 10.9 12.9	30 42 51	65 90 110	125 175 210	215 300 360	330 450 550	490 700 830	650 920 1100	870 1200 1470	1100 1560 1860	1350 – –	– – –	– – –	– – –	– – –	– – –
Possible torque with normal ring spanner and torsional force. *Presstressing force resulting thereof **(Nm)**	–	60	80	90	100	110	125	140	150	170	185	225	240	300	330	410
Possible torque with normal ring spanner and torsional force. *Presstressing force resulting thereof **(kN)**	–	54	53	48	45	43	43	43	42	42	43	45	43	45	46	50
	8.8	breaking (B)			yielding hazard (F)		danger of a loosening of clamped parts on application of operational force									
* When applying this prestressing force, there exists a	10.9	(B)		(F)	danger of a loosening of clamped parts on application of operational force											
	12.9	(B)		(F)	danger of a loosening of clamped parts on application of operational force											

A_S = nominal load cross section in mm² / S_P = test load in N/mm² / R_m = minimum tensile strength N/mm² / μ = coefficient of friction

POLYAMIDE THREAD LOCKINGS

POLYAMIDE SPOT COATING AND ALL-AROUND COATING
IN COMPLIANCE WITH THE REQUIREMENTS OF DIN 267, PART 28

Description
Polyamide spot coating is a plastics material which is applied onto a part of a thread and which develops a clamping effect when screwed in. The axial play existing between the screw thread and the nut thread is filled up by the Polyamide material. Thus, a high surface pressure between the opposing uncoated flanks of the threads is achieved. This connection prevents a loosening of the threaded parts when subject to dynamic load.

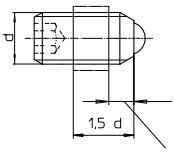


Polyamide spot coating is a favourably priced method of counteracting a self-loosening and self-releasing of screws and threaded parts.
By applying Polyamide spot coating, a connection is created which can be released at any time while maintaining its locking effect even after a repeated insertion or removal of the screw.

Field of application M 3 - M 16
Polyamide spot coating can be applied onto screws and threaded pins made of steel or stainless steel. This method is suitable for galvanic as well as organic/ anorganic surface treatments.

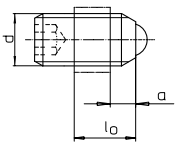
Dimensions and designation
Clamping thread lockings include all-around coatings, spot coatings and strip coatings.

Standard version - DIN 267, part 28
If not specified otherwise, the coating is located within a linear range of
1,5 x d ± 2 P for P < 1 and
1,5 x d ± P for P ≥ 1
measured from the tip of the screw.The first 2 or 3 threads remain uncoated in order to facilitate the screwing-in procedure.



2 to 3 thread turns almost free from coating
d = nominal diameter
P = thread lead

Versions with coating in special length or in special place
The measurements l_o and a must be stated in your order.



l_o = length of coating
a = position of coating from screw end
P = thread load

For l_o and a, the tolerances ± 2 P when P < 1 and ± P when P ≥ 1 apply.

Properties
- Reusable (up to 5 times).
- Temperature-resistant from - 50° C up to + 90° C, for short intervals up to + 120° C
- Unlimited shelf life
- The screw and the locking element form a unity
- Forgetting to apply the locking element does not happen any more
- Mounting aid (red or blue colour)
- Can be inserted immediately - no cure time
- Resistant against almost all aggressive substances (documentation can be made available on request)
- Polyamide spot coating can be adapted to suit specific requirements



In conformity with DIN 267, part 28

Thread	Test tightening moment M_A*		Screw-in torque	Clamping torque	
	Nm	Nm	Nm	Nm	Nm
*Determined on the basis of a total coefficient of friction f = 0,12 with a 90% utilization of the minimum values for the yield point or the tensile yield strength of the respective lowest strength class.	5.6 5.8 6.8	8.8 10.9 12.9	1. screw. in M_{in} max.	1. screw. out M_{out} min.	3. screw. out M_{out} min.
M3 M4 M5	0,6 1,4 2,6	1,2 2,8 5,5	0,43 0,90 1,60	0,10 0,12 0,18	0,08 0,10 0,15
M6 M8 - M8 x 1 M10 - M10 x 1,25	4,5 11,0 22,0	9,5 23,0 46,0	3,00 6,00 10,50	0,35 0,85 1,50	0,23 0,45 0,75
M12 - M12 x 1,25 M12 - M12 x 1,5 M14 - M14 x 1,5 M16 - M16 x 1,5	38,0 60,0 90,0	79,0 125,0 195,0	15,50 24,00 32,00	2,30 3,30 4,00	1,60 2,30 2,80

Requirements applicable to screwed joints with prestressing.

For spring plungers

Thread		Screwing-/clamping turning moment
Metric	Inch UNC/UNF	Nm M_{in} max. / M_{out} max.
M3	4-48 5-40 6-32 6-40	0,3
M4	8-32 8-36	0,5
M5	10-32	0,6
M6	1/4-20 1/4-28	1,2
M8	5/16-18	2
M10	3/8-16	3,5
M12	1/2-13	5
M16	5/8-11	7
M20	3/4-10	10
M24	1-8	12

MICRO-ENCAPSULATED THREAD LOCKINGS

MICRO-ENCAPSULATED ADHESIVES FOR LOCKING AND SEALING
IN COMPLIANCE WITH THE REQUIREMENTS OF DIN 267, PART 27

Micro-encapsulated systems maintain their strength for a period of approx. 4 years when stored under normal conditions in a dry climate at temperatures between 20 °C and 25 °C without major fluctuations.

PRECOTE® 80

Based on the system of Omni-Technik, preCOTE is a liquid plastics material including a hardening agent both of which are encapsulated into a thin polymer layer and embedded into a lacquer-type carrier system. PreCOTE is applied onto the Thread of screws yielding a dry and non-tacky safety coating which is ready for use at any time.

FUNCTION

On assembly of Threaded parts which are coated with preCOTE material, the micro capsules are ruptured by pressure and/or shearing force. During this, the liquid plastics material and the hardening agent are set free and mixed with each other thus initiating a chemical reaction (polymerization). Due to the curing of the adhesive, a locking effect as well as an additional sealing effect is created.

Product	OT preCOTE 80
Product colour	red
Temperature range	x_1 - 50 °C up to + 170 °C
Thread friction coefficient µ Thread	0,26 – 0,28
Function	high-strength universal screw locking

PROPERTIES

The cured preCOTE material serves as a locking element for joints even when subject to highest dynamic transverse stress. This means that a loss of prestressing exceeding the settling rate will not occur. The settling rate depends on the material to be clamped and its surface roughness. Besides, a corrosion within threaded assemblies is avoided. Mounting is performed according to almost the same procedures as with uncoated mating threads. Only the friction coefficient of the thread may be increased in some cases and therefore has to be compensated for by a correction of the tightening torque. Threaded joints which are locked and sealed with preCOTE material can be released without any damage being done to the threads using normal hand tools.

CURING

Curing will be initiated approx. 10 -15 minutes after mounting. Curing will be fully completed after 24 hours, however, it can be accelerated by temperature exposure.



Test without prestressing

Test torques at room temperature

Threads*		Torques in Nm		
		M_{in} max.	M_{out} min.	M_{out} max.
M 5		1	1	6,5
M 6		1,5	1,8	10
M 8	M 8 x 1	3	4	26
M 10	M 10 x 1,25	5,5	10	55
M 12	M 12 x 1,25 · M 12 x 1,5	7,5	16	95
M 14	M 14 x 1,5	11	22	160
M 16	M 16 x 1,5	14	35	250
M 18	M 18 x 1,5 · M 18 x 2	19	40	335
M 20	M 20 x 1,5 · M 20 x 2	22	45	500
M 22	M 22 x 1,5 · M 22 x 2	30	65	800
M 24	M 24 x 2	36	90	1050
M 27	M 27 x 2	42	120	1300
M 30	M 30 x 2	49	165	1700
M 33	M 33 x 2	55	210	2400
M 36	M 36 x 2	60	280	3000
M 39	M 39 x 2	70	330	4000

Requirements applicable to threaded joints without prestressing with test nut. Tolerance of thread 6 H.

*For nominal thread diameters < 5 mm and > 39 mm the testing torques have to be agreed upon between the supplier and the purchaser.

DIN parts	Description	Group	Page
DIN 39	Machine Handles, DIN 39	EH 24450.	**600**
DIN 98	Rotating Machine Handles, DIN 98	EH 24460.	**601**
DIN 99	Clamping Levers, DIN 99	EH 24470.	**597**
DIN 172	Positioning Bushings, with collar, DIN 172 A	EH 23112.	**401**
DIN 179	Positioning Bushings, without collar, DIN 179 A	EH 23112.	**404**
DIN 319	Ball Knobs, DIN 319	EH 24560.	**620**
DIN 319	Ball Knobs, metal types, similar to DIN 319	EH 24561.	**621**
DIN 444	Swing Bolts, DIN 444, form B	EH 22980.	**353**
DIN 444	Swing Bolts, DIN 444, form B, quality 8.8 high precision design	EH 22980.	**354**
DIN 464	High Knurled Thumb Screws, DIN 464	EH 24790.	**608**
DIN 466	High Knurled Nuts (with Collar), DIN 466	EH 24780.	**607**
DIN 467	Flat Knurled Nuts, DIN 467	EH 24760.	**605**
DIN 468	Crank Handles, DIN 468 goose-neck form with square end DIN 79	EH 24330.	**569**
DIN 469	Crank Handles, DIN 469 straight, with square end DIN 79	EH 24330.	**568**
DIN 508	Nuts for T-Slots, DIN 508	EH 23010.	**362**
DIN 508	Nuts for T-Slots, DIN 508, semi-finished	EH 23010.	**364**
DIN 508	Nuts for T-Slots, DIN 508 with slip protection	EH 23010.	**365**
DIN 508	Nuts for T-Slots, DIN 508	EH 23010.	**810**
DIN 653	Flat Knurled Thumb Screws, DIN 653	EH 24770.	**606**
DIN 787	T-Bolts, DIN 787	EH 23030.	**369**
DIN 950	Handwheels, DIN 950 cast iron	EH 24580.	**645**
DIN 950	Handwheels, DIN 950 light metal	EH 24590.	**648**
DIN 950	Handwheels, similar to DIN 950, stainless steel	EH 24591.	**651**
DIN 2079	Drive Blocks, DIN 2079	EH 23100.	**387**
DIN 3670	Disc-Type Handwheels, DIN 3670	EH 24570.	**643**
DIN 6303	Knurled Nuts, DIN 6303	EH 24480.	**604**
DIN 6304	Tommy Screws, DIN 6304 with fixed pin	EH 24490.	**612**
DIN 6305	Tommy Nuts, DIN 6305 with fixed pin	EH 24510.	**614**
DIN 6306	Tommy Screws, DIN 6306 with moveable pin	EH 24500.	**613**
DIN 6307	Tommy Nuts, DIN 6307 with moveable pin	EH 24510.	**615**
DIN 6310	Spring-Loaded Catches, DIN 6310 catches with spring	EH 22200.	**174**
DIN 6311	Thrust Pads, DIN 6311 and low model	EH 22560.	**257**
DIN 6314	Clamps, DIN 6314 flat	EH 23140.	**407**
DIN 6314	Clamps, with flat-faced ball, similar to DIN 6314	EH 23180.	**412**
DIN 6314	Clamps, with soft face, similar to DIN 6314	EH 23190.	**414**
DIN 6315 B	Clamps, DIN 6315 B forked	EH 23150.	**408**
DIN 6315 B	Clamps, DIN 6315 B forked	EH 23150.	**823**
DIN 6316	Clamps, DIN 6316 with goose-neck	EH 23160.	**409**
DIN 6319	Spherical Washers / Conical Seats, DIN 6319	EH 23050.	**375**
DIN 6319	Spherical Washers / Conical Seats, similar to DIN 6319, stainless steel	EH 23050.	**377**

DIN parts	Description	Group	Page
DIN 6319	Compact Spherical Washers / Conical Seats, similar to DIN 6319	EH 23050.	**379**
DIN 6319	Spherical Washers / Conical Seats, DIN 6319	EH 23050.	**813**
DIN 6320	Feet, DIN 6320 with threaded shank	EH 22640.	**351**
DIN 6321	Locating and Seating Pins, DIN 6321	EH 22630.	**278**
DIN 6321	Seating Pins, partially DIN 6321 (old norm)	EH 22630.	**280**
DIN 6321	Locating Pins, with bore hole similar to DIN 6321	EH 22630.	**281**
DIN 6323	Loose Slot Tenons, DIN 6323	EH 23120.	**392**
DIN 6323	Loose Slot Tenons, DIN 6323	EH 23120.	**822**
DIN 6330	Fixture Nuts, DIN 6330 (height 1,5 d)	EH 23070.	**383**
DIN 6330	Fixture Nuts, DIN 6330 (height 1,5 d)	EH 23070.	**815**
DIN 6331	Collar Nuts, DIN 6331 (height 1,5 d)	EH 23080.	**384**
DIN 6331	Collar Nuts, DIN 6331 (height 1,5 d)	EH 23080.	**816**
DIN 6332	Grub Screws, DIN 6332 with thrust point	EH 22540.	**255**
DIN 6332	Grub Screws, DIN 6332 with thrust point	EH 22540.	**800**
DIN 6335	Palm Grips, DIN 6335 cast iron	EH 24620.	**633**
DIN 6335	Palm Grips, DIN 6335 cast iron, plastic-coated	EH 24620.	**635**
DIN 6335	Palm Grips, DIN 6335 light metal	EH 24630.	**636**
DIN 6335	Palm Grips, DIN 6335 stainless steel die-cast	EH 24631.	**637**
DIN 6335	Palm Grips, DIN 6335 plastic	EH 24640.	**638**
DIN 6335	Grub Screws with Palm Grip, DIN 6335 plastic	EH 24730.	**640**
DIN 6336	Star Grips, DIN 6336 cast iron	EH 24650.	**622**
DIN 6336	Star Grips, DIN 6336 light metal	EH 24660.	**623**
DIN 6336	Star Grips, DIN 6336 stainless steel die-cast	EH 24661.	**624**
DIN 6336	Star Grips, DIN 6336 plastic	EH 24670.	**625**
DIN 6336	Grub Screws with Star Grip, DIN 6336 plastic	EH 24740.	**629**
DIN 6340	Shaft / Plain Washers, DIN 6340 heat-treated	EH 23060.	**380**
DIN 6340	Shaft / Plain Washers, DIN 6340 heat-treated	EH 23060.	**814**
DIN 6371	Captive C-Washers, DIN 6371 with countersunk screw DIN 923	EH 22280.	**179**
DIN 6372	C-Washers, DIN 6372	EH 22290.	**180**
DIN 6372	C-Washers, DIN 6372	EH 22290.	**800**
DIN 6379	Studs, DIN 6379 for T-nuts	EH 23040.	**371**
DIN 6379	Studs, DIN 6379 b_1 long for T-nuts	EH 23040.	**373**
DIN 6379	Studs, with internal hexagon, similar to DIN 6379, for T-nuts	EH 23040.	**374**
DIN 6379	Studs, DIN 6379 b_1 long for T-nuts	EH 23040.	**812**
DIN 12240	Rod Ends, DIN 12240-4, with male thread	EH 22982.	**355**
DIN 12240	Rod Ends, DIN 12240-4, with female thread	EH 22982.	**357**
NASM 17984	Ball Lock Pins, single acting - complies with NASM / MS17984	EH 4210.	**245**
NASM 17985	Ball Lock Pins, single acting - complies with NASM / MS17985	EH 4211.	**247**
NASM 17986	Ball Lock Pins, single acting - complies with NASM / MS17986	EH 4212.	**250**
NASM 17987	Ball Lock Pins, single acting - complies with NASM / MS17987	EH 4213.	**252**

Machine and Fixture Elements

Group	Description	Page
EH 22030.	Spring Plungers, with ball and internal hexagon	49
EH 22030.	Spring Plungers, with pin and internal hexagon	51
EH 22030.	Spring Plungers, headed, with ball and internal hexagon	53
EH 22031.	Spring Plungers, with moveable ball and internal hexagon	55
EH 22040.	Spring Plungers, plastic	57
EH 22050.	Spring Plungers, with ball and slot	58
EH 22050.	Spring Plungers, with ceramic ball and slot, stainless steel A4	60
EH 22050.	Spring Plungers, with pin and slot	61
EH 22050.	Spring Plungers, headed, with ball and slot	63
EH 22051.	Spring Plungers, with moveable ball and slot	65
EH 22060.	Spring Plungers, with internal hexagon	67
EH 22060.	Spring Plungers, with internal hexagon and seal	69
EH 22070.	Spring Plungers, smooth	71
EH 22070.	Spring Plungers, long	72
EH 22080.	Spring Plungers, smooth, with collar and ball	74
EH 22080.	Spring Plungers, smooth, long, with collar and ball	76
EH 22080.	Spring Plungers, smooth, with collar and ball, self-clamping	77
EH 22080.	Spring Plungers, smooth, with collar and pin	78
EH 22080.	Spring Plungers, smooth, without collar	79
EH 22081.	Spring Plungers, smooth, without collar, with moveable ball	80
EH 22082.	Holders, for spring plungers	81
EH 22090.	Spring Plungers, double-sided	82
EH 22100.	Spring Bodies	83
EH 22110.	Index Plungers Mini Indexes	96
EH 22110.	Index Plungers Mini Indexes, basic type	97
EH 22110.	Index Plungers Mini Indexes, stainless steel	99
EH 22110.	Index Plungers Compact, with hexagon collar	101
EH 22110.	Index Plungers Compact, with hexagon collar and locking	103
EH 22110.	Index Plungers Compact, with hexagon collar, with T-handle	105
EH 22110.	Index Plungers Compact, with hexagon collar and locking, with T-handle	106
EH 22110.	Index Plungers, with mounting flange, horizontal	108
EH 22110.	Mounting Blocks, for index bolts and index plungers, die-cast	109
EH 22110.	Locating Bushings, for index bolts and index plungers	111
EH 22110.	Positioning Bushings, for index bolts and index plungers	112
EH 22120.	Index Plungers, with hexagon collar	113
EH 22120.	Index Plungers, with hexagon collar, stainless steel	114
EH 22120.	Index Plungers, with hexagon collar and locking	115
EH 22120.	Index Plungers, with hexagon collar and locking, stainless steel	116
EH 22120.	Index Plungers, without hexagon collar	117
EH 22120.	Index Plungers, without hexagon collar, stainless steel	119
EH 22120.	Index Plungers, threadless, weldable	120
EH 22120.	Index Plungers, with hexagon collar, short	121
EH 22120.	Distance Collars, for index plungers	122
EH 22120.	Index Plungers, with mounting flange	124
EH 22120.	Index Plungers, simple finish	125
EH 22120.	Index Plungers, for thin-walled pieces	127
EH 22120.	Index Plungers, with pull-ring	128
EH 22120.	Index Bolts	132
EH 22120.	Mounting Blocks, for index bolts and index plungers	134
EH 22120.	Index Bolts, with mounting flange	135
EH 22120.	Index Bolts, with mounting flange, horizontal	136
EH 22121.	Index Bolts, simple finish	138
EH 22122.	Index Plungers, with release lock	130
EH 22122.	Index Plungers, with rapid locking head	131
EH 22130.	Precision Index Plungers, with cylindrical pin	139
EH 22130.	Precision Index Plungers, with tapered pin	141
EH 22140.	Lateral Spring Plungers	144
EH 22150.	Lateral Plungers, smooth, without seal	146
EH 22150.	Lateral Plungers, smooth, with seal	148
EH 22150.	Lateral Plungers, with plastic spring and pin	150
EH 22150.	Lateral Plungers, smooth, without seal, with female thread	152
EH 22150.	Lateral Plungers, smooth, with seal, with female thread	153
EH 22150.	Eccentric Mounting Bushings, for lateral plungers, smooth	154
EH 22150.	Lateral Plungers, with thread, without seal	155
EH 22150.	Lateral Plungers, with thread, with seal	157
EH 22150.	Lateral Plungers, with thread, without seal, with female thread	159
EH 22150.	Lateral Plungers, with thread, with seal, with female thread	161
EH 22160.	Lateral Spring Plungers, with spring steel sheet	163
EH 22200.	Spring-Loaded Catches, DIN 6310 catches with spring	174
EH 22260.	Door Catches	175
EH 22260.	Clamping Catches	176
EH 22270.	Shaft-End Washers	178
EH 22280.	Captive C-Washers, DIN 6371 with countersunk screw DIN 923	179
EH 22290.	C-Washers, DIN 6372	180
EH 22330.	Ball Lock Connectors, self-locking, with holder	181
EH 22330.	Ball Lock Connectors, self-locking, with holder, compact construction	183
EH 22340.	Ball Lock Connectors, self-locking, with holding rings	185
EH 22340. / EH 22350.	Ball Lock Pins, self-locking, with T-handle	202
EH 22340. / EH 22350.	Ball Lock Pins, self-locking, with L-handle	206
EH 22340. / EH 22350.	Ball Lock Pins, self-locking, with button handle	210
EH 22340. / EH 22350.	Ball Lock Pins, self-locking, with safety handle	214
EH 22350.	Lifting Pins, self-locking	187
EH 22350.	Lifting Pins, self-locking, stainless steel	189
EH 22350.	Locating Bushings, for lifting pins	191
EH 22350.	Locating Bushings, plain, for lifting pins	193
EH 22350.	Locating Bushings with Seal, plain, for lifting pins	195
EH 22351.	Lifting Pins, self-locking, with handle	197
EH 22352.	Threaded Lifting Pins, self-locking	199
EH 22360.	Clamping Pins, self-locking, with span compensation	217
EH 22370.	Ball Lock Pins, self-locking, with combination handle	225
EH 22370. / EH 22380.	Ball Lock Pins, self-locking, with standard handle	218
EH 22370. / EH 22380.	Ball Lock Pins, self-locking, with elastic grip	223
EH 22370. / EH 22380.	Ball Lock Pins, self-locking, with adjustable handle	231
EH 22380.	Ball Lock Pins, self-locking, with combination handle, precipitation-hardened	228
EH 22390.	Ball Lock Pins, self-locking, with standard handle, titanium	222
EH 22400.	Socket Pins, with spring-loaded balls	233
EH 22400.	Locating Bushings, for ball lock pins and socket pins	234
EH 22400.	Locating Bushings, with flange, for ball lock pins and socket pins	236
EH 22400.	Retaining Cables	237
EH 22410. / EH 22420.	Clamp Lock Pins, with button handle	241
EH 22540.	Grub Screws, DIN 6332 with thrust point	255
EH 22560.	Thrust Pads, DIN 6311 and low model	257
EH 22570.	Thrust Pads, plastic	258
EH 22570.	Grub Screws, ball-headed	259
EH 22590.	Mounting Pads	260
EH 22590.	Mounting Pads, protected against slipping	262
EH 22590.	Mounting Pads, with fastening holes	264
EH 22591.	Fulcrum Screws	265
EH 22593.	Support Legs	266
EH 22593.	Support Legs, with non-slip	269
EH 22594.	Support Legs, impact cushioning	272
EH 22600.	Seating Elements, with plastic contact surface, orienting	273
EH 22620.	Grippers round / square, with hard metal insert, ribbed	274
EH 22620.	Hard Metal Inserts, for locating hole	275
EH 22620.	Hard Metal Inserts, front mounting	276
EH 22620.	Hard Metal Inserts	277
EH 22630.	Locating and Seating Pins, DIN 6321	278
EH 22630.	Seating Pins, partially DIN 6321 (old norm)	280
EH 22630.	Locating Pins, with bore hole similar to DIN 6321	281
EH 22630.	Locating Pins, with ball end	283
EH 22640.	Feet, DIN 6320 with threaded shank	351
EH 22680.	Seating Pins, ribbed or pointed	286
EH 22680.	Seating Pins, pin shape	287
EH 22690.	Pins	288

Group	Description	Page
EH 22690.	Seating Pins, adjustable	291
EH 22691.	Pins, with plastic contact surface	292
EH 22700.	Ball-Ended Thrust Screws, headed, ball protected against rotating	295
EH 22700.	Ball-Ended Thrust Screws, headless, ball protected against rotating	297
EH 22710.	Ball-Ended Thrust Screws, headed, round ball	299
EH 22710.	Ball-Ended Thrust Screws, headed, flat-faced ball	300
EH 22720.	Ball-Ended Thrust Screws, headless, round ball	302
EH 22720.	Ball-Ended Thrust Screws, headless, flat-faced ball	304
EH 22720.	Ball-Ended Thrust Screws, headless, with fine-pitch thread	307
EH 22720.	Ball-Ended Thrust Screws, headless, short	308
EH 22720.	Ball-Ended Thrust Screws, headless, round ball and hexalobular socket	309
EH 22720.	Ball-Ended Thrust Screws, headless, flat-faced ball and hexalobular socket	310
EH 22730.	Self-Aligning Pads	315
EH 22730.	Self-Aligning Pads, with hard metal ball, ribbed	316
EH 22731.	Self-Aligning Pads, self-resetting	317
EH 22731.	Self-Aligning Pads, with hard metal ball, ribbed and self-resetting	319
EH 22740.	Self-Aligning Pads, adjustable	320
EH 22741.	Self-Aligning Pads, adjustable, self-resetting	321
EH 22750.	Ball Casters, with sheet steel housing	323
EH 22750.	Tolerance Rings	324
EH 22750.	Ball Casters, with mounting elements	325
EH 22751.	Ball Casters, plastic	326
EH 22752.	Ball Casters, screwable, plain bearing	327
EH 22753.	Ball Casters, plain bearing	328
EH 22760.	Thrust Screws, with brass pad	311
EH 22760.	Thrust Screws, with plastic pad	312
EH 22800.	Positioning Sensors, pneumatic	329
EH 22800.	Positioning Sensors, pneumatic	330
EH 22800.	Positioning Sensors, self-aligning, pneumatic	331
EH 22800.	Positioning Sensors, self-aligning, pneumatic	332
EH 22800.	Monitoring Units for Positioning Sensors, pneumatic	333
EH 22810.	Polling Units, with sensor	336
EH 22810.	Radio Transmitters, for polling unit	338
EH 22810.	Radio Receivers, for polling unit	339
EH 22860.	Oil-Sight Glasses	340
EH 22880.	Expander® Sealing Plugs, body from case-hardened steel	341
EH 22880.	Expander® Sealing Plugs, body from stainless steel	342
EH 22880.	Setting Dies, for Expander® sealing plug	343
EH 22880.	Expander® Sealing Plugs, with pull-anchor	345
EH 22880.	Expander® Sealing Plugs, with elongated pull-anchor	346
EH 22880.	Distance Bushings, for Expander® sealing plugs with elongated pull-anchor	347
EH 22880.	Assembly Tools, for Expander® sealing plugs with pull-anchor	348
EH 22980.	Swing Bolts, DIN 444, form B	353
EH 22980.	Swing Bolts, DIN 444, form B, quality 8.8 high precision design	354
EH 22982.	Rod Ends, DIN 12240-4, with male thread	355
EH 22982.	Rod Ends, DIN 12240-4, with female thread	357
EH 2B020.	Spring Plungers, with pin and slot - INCH	85
EH 2B030.	Spring Plungers, with pin and internal hexagon - INCH	88
EH 2B050.	Spring Plungers, with ball and slot - INCH	91
EH 2B080.	Spring Plungers, smooth, with collar and ball, self-clamping – INCH	94
EH 2B150.	Lateral Plungers, smooth, without seal - INCH	165
EH 2B150.	Lateral Plungers, smooth, with seal - INCH	167
EH 2B150.	Lateral Plungers, with plastic spring and pin - INCH	169
EH 2B150.	Lateral Plungers, smooth, without seal, with female thread - INCH	171
EH 2B150.	Lateral Plungers, smooth, with seal, with female thread - INCH	172
EH 2B150.	Eccentric Mounting Bushings, for lateral plungers, smooth - INCH	173
EH 4210.	Ball Lock Pins, single acting - complies with NASM / MS17984	245
EH 4211.	Ball Lock Pins, single acting - complies with NASM / MS17985	247
EH 4212.	Ball Lock Pins, single acting - complies with NASM / MS17986	250
EH 4213.	Ball Lock Pins, single acting - complies with NASM / MS17987	252

Clamping Elements

Group	Description	Page
EH 23010.	Nuts for T-Slots, DIN 508	362
EH 23010.	Nuts for T-Slots, DIN 508, semi-finished	364
EH 23010.	Nuts for T-Slots, DIN 508 with slip protection	365
EH 23020.	Nuts for T-Slots, extended	366
EH 23020.	Nuts for T-Slots, rhombus	367
EH 23020.	Nuts for T-Slots, rhombus, semi-finished	368
EH 23030.	T-Bolts, DIN 787	369
EH 23040.	Studs, DIN 6379 for T-nuts	371
EH 23040.	Studs, DIN 6379 b_1 long for T-nuts	373
EH 23040.	Studs, with internal hexagon, similar to DIN 6379, for T-nuts	374
EH 23050.	Spherical Washers / Conical Seats, DIN 6319	375
EH 23050.	Spherical Washers / Conical Seats, similar to DIN 6319, stainless steel	377
EH 23050.	Compact Spherical Washers / Conical Seats, similar to DIN 6319	379
EH 23060.	Shaft / Plain Washers, DIN 6340 heat-treated	380
EH 23060.	Washers, high precision design	381
EH 23061.	Shaft / Plain Washers	382
EH 23070.	Fixture Nuts, DIN 6330 (height 1,5 d)	383
EH 23080.	Collar Nuts, DIN 6331 (height 1,5 d)	384
EH 23080.	Collar Nuts with Conical Seat	385
EH 23090.	Extension Nuts (height 3 d)	386
EH 23100.	Drive Blocks, DIN 2079	387
EH 23110.	Fixed Slot Tenons	388
EH 23110.	Fixed Slot Tenons, with cylindrical fastening	389
EH 23110.	Centering Pins	390
EH 23110.	Centering Pins, stepped	391
EH 23111.	Positioning Clamping Pins	395
EH 23111.	Manual Handles, for positioning clamping pins	397
EH 23111.	Bushings, for positioning clamping pins	398
EH 23111.	Locating Bushings, for positioning clamping pins, for press fit	399
EH 23111.	Locating Bushings, for positioning clamping pins, for screw fit	400
EH 23112.	Positioning Bushings, with collar, DIN 172 A	401
EH 23112.	Positioning Bushings, without collar, DIN 179 A	404
EH 23120.	Loose Slot Tenons, DIN 6323	392
EH 23130.	Low Slot Tenons	393
EH 23140.	Clamps, DIN 6314 flat	407
EH 23150.	Clamps, DIN 6315 B forked	408
EH 23160.	Clamps, DIN 6316 with goose-neck	409
EH 23160.	Clamps, stepped	410
EH 23170.	Clamps, with nose, closed	411
EH 23180.	Clamps, with flat-faced ball, similar to DIN 6314	412
EH 23180.	Clamps, with nose	413
EH 23185.	Clamps, slotted, with adjustable counter piece	419
EH 23185.	Clamps, slotted, with adjustable counter piece, with T-bolt	420
EH 23185.	Clamps, slotted, with adjustable counter piece, with stud	421
EH 23185.	Clamps, slotted, with adjustable counter piece, with stud with internal hexagon	422
EH 23185.	Support Extensions, for straight clamps, slotted, with adjustable counter piece	423
EH 23190.	Clamps, with soft face, similar to DIN 6314	414
EH 23190.	Clamps, with exchangeable soft jaw	416
EH 23200.	Supporting Elements, for clamps	417
EH 23210.	Down-Hold Clamps, with cranked clamping lever	434
EH 23210.	Down-Hold Clamps, without clamping lever	435
EH 23210.	Down-Hold Clamps, without clamping lever, with support	436
EH 23210.	Holding Plates, for down-hold clamps	437
EH 23210.	Supporting Plates	456
EH 23211.	Sub-Part Clamps	438
EH 23220.	Bedding Supports	458
EH 23220.	Supporting Elements	460
EH 23229.	Push-Pull Clamps	440
EH 23230.	Push Plungers, with pin, protected against rotating	441
EH 23230.	Locating Clamps	442
EH 23231.	Clamping Vices	443
EH 23231.	Standard Jaws, for vices	445
EH 23231.	Interchangeable Jaws, for vices, with pull-down effect	446
EH 23240.	Stabilizing Clamping Jaws	447
EH 23250.	Taper Clamping Units	448

Group	Description	Page
EH 23250.	Coverings, for taper clamping units	450
EH 23251.	Double Edge Clamps	451
EH 23251.	Double Edge Clamps, machinable chucks	452
EH 23260.	Clamping Devices "actima"	478
EH 23270.	Eccentric Clamping Clamps	480
EH 23270.	Eccentric Clamping Washers	481
EH 23271.	Eccentric Clamps	482
EH 23280.	Stops, cylindrical	453
EH 23281.	Stops	457
EH 23290.	Pitbull® Clamps	454
EH 23290.	Clamping Claws	455
EH 23310.	Down-Thrust Clamps, swivelling, size 25	492
EH 23310.	Down-Thrust Clamps, swivelling, size 40	494
EH 23310.	Down-Thrust Clamps, swivelling, low construction, size 44	496
EH 23310.	Down-Thrust Clamps, swivelling, size 60	498
EH 23310.	Down-Thrust Clamps, swivelling, size 82.5	500
EH 23310.	Down-Thrust Clamps, moveable, size 40	502
EH 23310.	Positioning Rings, for down-thrust clamp	504
EH 23310.	Height Adjusting Cylinders	505
EH 23320.	Floating Clamps, compact construction, combined clamping and locking M 12	462
EH 23320.	Floating Clamps, compact construction, separate clamping and locking M 12	465
EH 23320.	Floating Clamps, combined clamping and locking M 12	467
EH 23320.	Floating Clamps, separate clamping and locking M 12	469
EH 23320.	Standard Clamping Jaws, for floating clamp M 12	471
EH 23320.	Clamping Jaws, for floating clamp M 12	472
EH 23320.	Floating Clamps, combined clamping and locking M 16	475
EH 23320.	Clamping Jaws, for floating clamp M 16	477
EH 23330.	Vertical Toggle Clamps, with horizontal base	508
EH 23330.	Vertical Toggle Clamps, with vertical base	510
EH 23330.	Vertical Toggle Clamps, with vertical base and solid support arm	512
EH 23330.	Vertical Toggle Clamps, with vertical base and safety lock	514
EH 23330.	Vertical Toggle Clamps, with angle base	515
EH 23330.	Vertical Toggle Clamps, with angle base and safety lock	516
EH 23330.	Vertical Toggle Clamps, with horizontal base and solid support arm	517
EH 23330.	Vertical Toggle Clamps, with horizontal base and safety lock	518
EH 23330.	Horizontal Toggle Clamps, with horizontal base	519
EH 23330.	Horizontal Toggle Clamps, with horizontal base / increased holding force	521
EH 23330.	Horizontal Toggle Clamps, with horizontal base and solid support arm	522
EH 23330.	Horizontal Toggle Clamps, with horizontal base and safety lock	523
EH 23330.	Horizontal Toggle Clamps, with vertical base	524
EH 23330.	Horizontal Toggle Clamps, with vertical base and safety lock	526
EH 23330.	Horizontal Toggle Clamps, with angle base	527
EH 23330.	Toggle Clamps Push-Pull Type, with angle base	528
EH 23330.	Toggle Clamps Push-Pull Type, with fastening thread	530
EH 23330.	Toggle Clamps Hook Type, with horizontal base	531
EH 23330.	Toggle Clamps Hook Type, vertical, with horizontal base	533
EH 23330.	Combination Clamps, with horizontal base	534
EH 23340.	Centering Clamping Elements, with clamping segments	540
EH 23340.	Centering Clamping Elements, with clamping balls	542
EH 23340.	Centering Clamping Elements, with clamping segments, operation from the bottom	544
EH 23340.	Centering Clamping Elements, with clamping balls, operation from the bottom	546
EH 23340.	Centering Clamping Mandrels	548
EH 23340.	Centering Clamping Mandrels, with lateral handling	549
EH 23341.	Shaft Clamps	550
EH 23370.	Clamping Claws	506
EH 23380.	Double Eccentric Levers, with fulcrum pin	483
EH 23390.	Eccentric Levers, with fulcrum pin	484
EH 23390.	Eccentric Quick Clamps, with female thread	485
EH 23390.	Eccentric Quick Clamps, with screw	486
EH 23400.	Fulcrum Pins	488
EH 23410.	Eccentric Clamps	489
EH 23410.	Eccentric Clamping Modules, with shaft location	490
EH 23470.	Screw Jacks	552
EH 23690.	Compact Clamps	536
EH 23690.	Height Adapters, for compact clamp	538
EH 23700.	Clamping Element Systems	424
EH 23700.	Straight Clamps, short	426
EH 23700.	Straight Clamps, long	427
EH 23700.	Intermediate Elements	428
EH 23700.	Intermediate Elements, with support	429
EH 23700.	Base Elements	430
EH 23700.	Base Elements, swivelling	431
EH 23700.	Base Elements, low	432
EH 23700.	Base Elements, for location hole	433

Operating Elements

EH 24100.	Retaining Catches, one-sided	556
EH 24100.	Retaining Catches, double-sided	557
EH 24101.	Retaining Catches, wing grip, one-sided	558
EH 24300.	U-Handles	559
EH 24300.	U-Handles, front mounting	561
EH 24310.	U-Handles, with support washer	562
EH 24310.	U-Handles	563
EH 24320.	U-Handles, plastic, front mounting	564
EH 24320.	U-Handles, plastic	565
EH 24321.	Tubular Handles	566
EH 24321.	Tubular Handles, front mounting	567
EH 24330.	Crank Handles, DIN 469 straight, with square end DIN 79	568
EH 24330.	Crank Handles, DIN 468 goose-neck form with square end DIN 79	569
EH 24330.	Crank Handles	570
EH 24330.	Crank Handles, stainless steel precision casting	571
EH 24331.	Crank Handles, with folding handle	572
EH 24331.	Crank Handles, with folding handle, stainless steel	573
EH 24350.	Gear Lever Handles	574
EH 24390.	Adjustable Clamping Levers, inner parts from stainless steel, with female thread	575
EH 24390.	Adjustable Clamping Levers, inner parts from stainless steel, with screw	576
EH 24400.	Adjustable Clamping Levers, with female thread	578
EH 24400.	Adjustable Clamping Levers, with screw	579
EH 24410.	Adjustable Clamping Levers, with clamping screw	581
EH 24420.	Adjustable Clamping Levers, with axial bearing, with female thread	584
EH 24420.	Adjustable Clamping Levers, with axial bearing, with screw	585
EH 24420.	Adjustable Clamping Levers, with axial bearing from stainless steel, with female thread	586
EH 24420.	Adjustable Clamping Levers, with axial bearing from stainless steel, with screw	587
EH 24430.	Clamping Levers	588
EH 24440.	Adjustable Clamping Levers	589
EH 24441.	Adjustable Flat Clamping Levers	591
EH 24441.	Adjustable Flat Clamping Levers, stainless steel	592
EH 24441.	Adjustable Flat Clamping Levers, with screw	593
EH 24441.	Adjustable Flat Clamping Levers, with screw, stainless steel	595
EH 24450.	Machine Handles, DIN 39	600
EH 24460.	Rotating Machine Handles, DIN 98	601
EH 24470.	Clamping Levers, DIN 99	597
EH 24470.	Clamping Nuts, welded	598
EH 24470.	Clamping Nuts, welded, double-sided	599
EH 24480.	Knurled Nuts, DIN 6303	604
EH 24490.	Tommy Screws, DIN 6304 with fixed pin	612
EH 24500.	Tommy Screws, DIN 6306 with moveable pin	613
EH 24510.	Tommy Nuts, DIN 6305 with fixed pin	614
EH 24510.	Tommy Nuts, DIN 6307 with moveable pin	615
EH 24512.	T-Handles	616
EH 24520.	Thumb Knobs	618
EH 24530.	Cylindrical Handles, rotating	602
EH 24532.	Folding Handles, rotating	603
EH 24540.	Mushroom-Type Knobs	617
EH 24550.	Conical Knobs	619
EH 24560.	Ball Knobs, DIN 319	620
EH 24561.	Ball Knobs, metal types, similar to DIN 319	621

Group	Description	Page
EH 24570.	Disc-Type Handwheels, DIN 3670	643
EH 24580.	Handwheels, DIN 950 cast iron	645
EH 24590.	Handwheels, DIN 950 light metal	648
EH 24591.	Handwheels, similar to DIN 950, stainless steel	651
EH 24600.	Disc-Type Handwheels, light metal	652
EH 24610.	Spoked Handwheels, light metal	654
EH 24620.	Palm Grips, DIN 6335 cast iron	633
EH 24620.	Palm Grips, DIN 6335 cast iron, plastic-coated	635
EH 24630.	Palm Grips, DIN 6335 light metal	636
EH 24631.	Palm Grips, DIN 6335 stainless steel die-cast	637
EH 24640.	Palm Grips, DIN 6335 plastic	638
EH 24650.	Star Grips, DIN 6336 cast iron	622
EH 24660.	Star Grips, DIN 6336 light metal	623
EH 24661.	Star Grips, DIN 6336 stainless steel die-cast	624
EH 24670.	Star Grips, DIN 6336 plastic	625
EH 24690.	Star Grips, stainless steel	626
EH 24690.	Grub Screws with Star Grip, stainless steel	627
EH 24690.	Star Grips, stainless steel, solid	628
EH 24700.	Palm Grips, with axial bearing	639
EH 24710.	Torque Handles	641
EH 24730.	Grub Screws with Palm Grip, DIN 6335 plastic	640
EH 24740.	Grub Screws with Star Grip, DIN 6336 plastic	629
EH 24750.	Star Grips, plastic	630
EH 24750.	Grub Screws with Star Grip, plastic	631
EH 24760.	Flat Knurled Nuts, DIN 467	605
EH 24770.	Flat Knurled Thumb Screws, DIN 653	606
EH 24780.	High Knurled Nuts (with Collar), DIN 466	607
EH 24790.	High Knurled Thumb Screws, DIN 464	608
EH 24820.	Knurled Nuts, plastic	610
EH 24830.	Knurled Thumb Screws, plastic	611

Machine Elements

EH 25010.	Sensing Elements, with sensor adapter	660
EH 25020.	Sensing Elements, with actuating bolt, protected against rotating	661
EH 25030.	Clamping Nuts, self-locking	677
EH 25050.	Tapered Shaft Hubs, no lock nut	663
EH 25050.	Tapered Shaft Hubs, without lock nut, stainless steel	665
EH 25050.	Tapered Shaft Hubs, with lock nut	666
EH 25050.	Tapered Shaft Hubs, with lock nut, stainless steel	668
EH 25069.	Set Collars	673
EH 25070.	Set Collars, with sensor adapter	675
EH 25071.	Set Collars, for quick setting	676
EH 25100.	Quick Plug Couplings, with radial offset compensation	679
EH 25100.	Quick Plug Couplings, with radial offset compensation and screwed flange	680
EH 25100.	Quick Plug Couplings, with angular and radial offset compensation	681
EH 25120.	Height Adjusting Elements	683
EH 25120.	Height Adjusting Elements, high	684
EH 25120.	Height Adjusting Elements, orienting	685
EH 25150.	Rubber Metal Buffers	686
EH 25150.	Rubber Endstop Buffers, cylindrical	688
EH 25150.	Rubber Endstop Buffers, parabolic	690
EH 25150.	Rubber Endstop Buffers, truncated cone form	691
EH 25150.	Rubber Endstop Buffers, low structure	693
EH 25150.	Rubber Endstop Buffers, cylindrical, front mounting	695
EH 25151.	Silicone Endstop Buffers, truncated cone form	692
EH 25160.	Hinges	696
EH 25160.	Hinges, with mounting thread	697
EH 25160.	Hinges, with adjustable friction resistance	698
EH 25160.	Spacer Plates, for hinges	699
EH 25160.	Threaded Plates, for hinges	700
EH 25160.	Stops, for hinges	701

T-Slot Systems

EH 1000.400 - EH 1000.500	Base Plates	710
EH 1000.800	Base Plates, overall dimensions same as pallets DIN 55 201	711
EH 1002.100	Base Plates	712
EH 1007.400 - EH 1108.300	Spacers	725
EH 1010.100 - EH 1110.100	Mounting Blocks	725
EH 1010.200 - EH 1110.300	Mounting Blocks	726
EH 1011.100 - EH 1111.100	Mounting Blocks	727
EH 1011.200 - EH 1111.300	Mounting Blocks	727
EH 1012.100 - EH 1112.400	Slotted Clamping Angles	732
EH 1013.600 - EH 1113.800	Clamping Bars	733
EH 1014.500 - EH 1114.500	Stops	735
EH 1020.300 - EH 1121.500	Thrust Angles	737
EH 1021.600 - EH 1021.700	Thrust Angles	738
EH 1029.600 - EH 1129.600	T-Slot Centering Blocks	740
EH 1030.000 - EH 1030.300	Nuts for T-Slots	740
EH 1031.100 - EH 1131.200	T-Clamping Blocks	742
EH 1032.100 - EH 1132.100	Wrenches	743
EH 1040.300 - EH 1040.700	Locating Pins	748
EH 1047.700 - EH 1147.700	Intermediate Plates	751
EH 1047.800 - EH 1147.800	Support Clamping Bars	752
EH 1047.900 - EH 1147.900	Supporting Plates	752
EH 1048.200 - EH 1148.300	V-Blocks	753
EH 1048.400 - EH 1148.400	Locating Segments	754
EH 1048.500 - EH 1148.500	V-Blocks	755
EH 1048.600 - EH 1148.600	Adjustable Rotating Elements	755
EH 1049.200 - EH 1149.200	Positioning Clamping Bars, two-sided	757
EH 1068.100 - EH 1068.300	Adapter Slot Clamping Elements, system V40/V70	759
EH 1068.600	Adapter Slot Centering Blocks, system V40/V70	760
EH 1068.800	Adapter Slot Blocks, system V40/V70	760
EH 1076.400	Clamping Angles	724
EH 1090	Standard Ranges V40	761
EH 1100.300 - EH 1100.500	Base Plates	713
EH 1100.700 - EH 1103.500	Base Plates, overall dimensions same as pallets DIN 55 201	715
EH 1101.300 - EH 1101.500	Connecting Elements	716
EH 1102.100 - EH 1102.200	Base Plates	717
EH 1104.300 - EH 1104.500	Supporting Plates, including accessories	719
EH 1104.700 - EH 1104.900	Clamping Angles, modular design	721
EH 1105.200	Clamping Angles	723
EH 1111.700 - EH 1111.800	Intermediate Plates	731
EH 1112.600 - EH 1112.800	Intermediate Elements	733
EH 1114.000 - EH 1114.100	Support Clamping Bars	734
EH 1115.100	Stops, cylindrical	735
EH 1116.000 - EH 1116.100	Stops	736
EH 1120.400 - EH 1122.300	Thrust Angles	739
EH 1130.400 - EH 1130.600	T-Blocks	741
EH 1131.500 - EH 1131.700	T-Clamping Blocks	743
EH 1132.500 - EH 1132.800	Butt Straps	744

Group	Description	Page
EH 1132.900	Clamping Heads	745
EH 1133.000 - EH 1133.200	Clamping Bars	745
EH 1137.300	Clamping Vices, moveable jaw	746
EH 1137.400	Clamping Vices, fixed jaw	746
EH 1138.100	Clamping Vices, replacement jaw, soft	747
EH 1138.400	Clamping Vices, replacement jaw, ribbed/flat	747
EH 1139.400 - EH 1139.500	Wrenches	748
EH 1140.300 - EH 1141.500	Locating Pins	749
EH 1141.600 - EH 1143.700	Locating Pins	750
EH 1149.000	Positioning Clamping Bars	756
EH 1162.000 - EH 1162.300	Fixed Drilling Supports	757
EH 1163.000 - EH 1163.300	Fixed Drilling Supports, adjustable	758
EH 1190	Standard Ranges V70	763
EH 1200.300 - EH 1200.500	Base Plates, V70eco	717
EH 1200.700 - EH 1203.500	Base Plates, V70eco, overall dimensions same as pallets DIN 55201	719
EH 1210.100	Mounting Blocks, V70eco	728
EH 1210.200 - EH 1210.300	Mounting Blocks, V70eco	729
EH 1211.100	Mounting Blocks, V70eco	729
EH 1211.200 - EH 1211.300	Mounting Blocks, V70eco	730

Hole and Dowel Systems

EH 1500.200 - EH 1600.900	Base Plates	769
EH 1501.300 - EH 1501.500	Base Plates	770
EH 1505.200 - EH 1605.400	Clamping Angles	773
EH 1506.200 - EH 1606.800	Clamping Angles	771
EH 1508.200 - EH 1608.600	Clamping Cubes	772
EH 1510.100 - EH 1610.100	Consoles	775
EH 1510.200 - EH 1610.200	Consoles	776
EH 1511.500 - EH 1611.500	Clamping Angles	777
EH 1512.000 - EH 1612.400	Mounting Elements	778
EH 1513.600 - EH 1613.800	Clamping Bars	778
EH 1514.700 - EH 1614.700	Clamping Heads	780
EH 1520.400 - EH 1621.700	Stop Angles	781
EH 1533.000 - EH 1633.200	Clamping Bars	782
EH 1547.900 - EH 1647.900	Supporting Plates	783
EH 1548.100 - EH 1648.100	V-Blocks	784
EH 1548.500 - EH 1648.500	V-Blocks	785
EH 1548.700 - EH 1648.800	V-Block Elements right/left	786
EH 1549.200 - EH 1649.200	Positioning Clamping Bars	787
EH 1550.000 - EH 1650.000	Supporting Bars	788
EH 1551.500 - EH 1651.700	Stops, cylindrical	788
EH 1553.500 - EH 1653.500	Positioning Clamping Cylinders	789
EH 1555.500 - EH 1655.500	Position Screws	790
EH 1557.000 - EH 1657.000	Screw Plugs	790
EH 1580.000	System Adapter Plates	791
EH 1581.000	System Adapter Plates	791
EH 1590	Standard Ranges L12	793
EH 1605.700	Clamping Angles	774
EH 1614.500	Stops	779
EH 1617.400 - EH 1617.900	Spacers	781
EH 1644.000	Thread Bolts	782
EH 1681.000	System Adapter Plates	792
EH 1690	Standard Ranges L16	795

Standard Parts for Fixture Systems

EH 22290.	C-Washers, DIN 6372	800
EH 22540.	Grub Screws, DIN 6332 with thrust point	800
EH 22680.	Seating Pins, ribbed or pointed	801
EH 22680.	Seating Pins, pin shape	802
EH 22690.	Pins	803
EH 22700.	Ball-Ended Thrust Screws, headless, ball protected against rotating	805
EH 22730.	Self-Aligning Pads	806
EH 22731.	Self-Aligning Pads, self-resetting	806
EH 22740.	Self-Aligning Pads, adjustable	808
EH 22741.	Self-Aligning Pads, adjustable with self-resetting	809
EH 23010.	Nuts for T-Slots, DIN 508	810
EH 23020.	Nuts for T-Slots, extended	810
EH 23020.	Nuts for T-Slots, rhombus	811
EH 23040.	Studs, DIN 6379 b_1 long for T-nuts	812
EH 23050.	Spherical Washers / Conical Seats, DIN 6319	813
EH 23060.	Shaft / Plain Washers, DIN 6340 heat-treated	814
EH 23070.	Fixture Nuts, DIN 6330 (height 1,5 d)	815
EH 23080.	Collar Nuts, DIN 6331 (height 1,5 d)	816
EH 23080.	Collar Nuts with Conical Seat	817
EH 23090.	Extension Nuts, (height 3 d)	818
EH 23110.	Fixed Slot Tenons, with cylindrical fastening	819
EH 23110.	Centering Pins	820
EH 23110.	Centering Pins, stepped	821
EH 23120.	Loose Slot Tenons, DIN 6323	822
EH 23150.	Clamps, DIN 6315 B forked	823
EH 23180.	Clamps, with nose	824
EH 23210.	Down-Hold Clamps, without clamping lever	829
EH 23220.	Bedding Supports	831
EH 23220.	Supporting Elements	832
EH 23280.	Stops, cylindrical	830
EH 23310.	Down-Thrust Clamps, swivelling, size 25	843
EH 23310.	Down-Thrust Clamps, swivelling, size 40	844
EH 23310.	Down-Thrust Clamps, moveable, size 40	845
EH 23310.	Positioning Rings, for down-thrust clamp	847
EH 23310.	Height Adjusting Cylinders	848
EH 23320.	Floating Clamps, compact construction, combined clamping and locking M 12	834
EH 23320.	Floating Clamps, compact construction, separate clamping and locking M 12	835
EH 23320.	Floating Clamps, combined clamping and locking M 12	836
EH 23320.	Floating Clamps, separate clamping and locking M 12	837
EH 23320.	Standard Clamping Jaws, for floating clamp M 12	839
EH 23320.	Clamping Jaws, for floating clamp M 12	840
EH 23690.	Compact Clamps	849
EH 23690.	Height Adapterubbrs, for compact clamp	851
EH 23700.	Clamping Element Systems	825
EH 23700.	Straight Clamps, long	826
EH 23700.	Intermediate Elements	827
EH 23700.	Base Elements	828

Multiple Clamping Systems

EH 1585.	Clamping Bars, length 100	855
EH 1585.	Clamping Bars, length 200	856
EH 1585.	Clamping Bars, length 300	857
EH 1585.	Clamping Bars, length 400 - 700	858
EH 1586	Standard Ranges EH 1586	879, 880
EH 1586.	Lateral Stops	865
EH 1586.	Insertion Tools	866
EH 1586.	Supports for Clamping Bar	867

Group	Description	Page
EH 1586.	Supports for Clamping Bar, with spring-loaded catch	**868**
EH 1586.	Supports for Clamping Bar, magnetic	**868**
EH 1586.	Stops, diamond coated	**869**
EH 1586.	Stops, gripper studs	**870**
EH 1586.	Stops, horizontal prisms	**871**
EH 1586.	Stops, vertical prisms	**872**
EH 1586.	Stops, soft	**873**
EH 1586.	Stops, ribbed	**874**
EH 1586.	Stops, plain	**875**
EH 1586.	Stops, with mounting thread	**876**
EH 1586.	Combination Clamping Bars	**877**
EH 23250.	Taper Clamping Units, plain / ribbed, M8	**859**
EH 23250.	Taper Clamping Units, plain / ribbed, M12	**860**
EH 23250.	Taper Clamping Units, with screw fastened thread, M12	**861**
EH 23250.	Adapter for Taper Clamping Units, for clamping bars	**862**
EH 23250.	Anti-Turn Locking Devices for Taper Clamping Units, for clamping bars	**863**
EH 23250.	Stop Plates for Taper Clamping Units, for clamping bars	**864**

Multi-Vices

EH 1700.	Multi-Vices, MS 125	**884**

You will find details and your contact persons under: www.halder.com/Multi-Vices

Basic Elements

EH 1906.	Clamping Angles	**895**
EH 1906.	Clamping Angles, semi-finished	**894**
EH 1908.	Clamping Cubes, semi-finished	**898**
EH 1910.	Clamping Angles, welded, semi-finished	**896**
EH 1910.	Clamping Angles, one-sided, welded, semi-finished	**897**
EH 1910.	Clamping Cubes, welded, semi-finished	**899**
EH 1912.	Base Plates, semi-finished	**900**
EH 1912.	Base Plates, with positioning holes	**901**

Zero-Point Clamping Systems

Group	Description	Page
EH 1990.	Connecting Elements, hydraulically operated, double acting, with lifting-off and blow-out	**908**
EH 1990.	Connecting Elements, hydraulically operated, single acting with lifting-off	**909**
EH 1990.	Connecting Elements, modular, mechanically operated	**910**
EH 1990.	Connecting Elements, modular, hydraulically operated	**911**
EH 1990.	Connecting Elements, modular, pneumatically operated	**912**
EH 1990.	Connecting Elements, modular, pneumatically operated, reinforced	**913**
EH 1990.	Connecting Elements, modular, mechanically operated, protected against twisting	**914**
EH 1990.	Connecting Elements, modular, hydraulically operated, protected against twisting	**915**
EH 1990.	Connecting Elements, modular, pneumatically operated, protected against twisting	**916**
EH 1990.	Connecting Elements, modular, pneumatically operated, reinforced, protected against twisting	**917**
EH 1990.	Control Modules	**918**
EH 1990.	Connecting Rings	**919**
EH 1990.	Base Plates, for 2 connecting elements	**922**
EH 1990.	Base Plates, with 2 connecting elements	**923**
EH 1990.	Base Plates, for 4 connecting elements	**924**
EH 1990.	Base Plates, with 4 connecting elements	**925**
EH 1990.	Base Plates, for 4 double acting connecting elements	**926**
EH 1990.	Base Plates, with 4 double acting connecting elements	**927**
EH 1990.	Base Plates, for 4 single acting connecting elements	**928**
EH 1990.	Base Plates, with 4 single acting connecting elements	**929**
EH 1990.	Supporting Plates, with 2 connecting rings	**930**
EH 1990.	Supporting Plates, with 4 connecting rings	**931**
EH 1990.	Coverings, for connecting elements	**932**

Description	Group	Page
A		
Adapter for Taper Clamping Units, for clamping bars	EH 23250.	**862**
Adapter Slot Blocks, system V40/V70	EH 1068.800	**760**
Adapter Slot Centering Blocks, system V40/V70	EH 1068.600	**760**
Adapter Slot Clamping Elements, system V40/V70	EH 1068.100 - EH 1068.300	**759**
Adjustable Clamping Levers	EH 24440.	**589**
Adjustable Clamping Levers, inner parts from stainless steel, with female thread	EH 24390.	**575**
Adjustable Clamping Levers, inner parts from stainless steel, with screw	EH 24390.	**576**
Adjustable Clamping Levers, with axial bearing from stainless steel, with female thread	EH 24420.	**586**
Adjustable Clamping Levers, with axial bearing from stainless steel, with screw	EH 24420.	**587**
Adjustable Clamping Levers, with axial bearing, with female thread	EH 24420.	**584**
Adjustable Clamping Levers, with axial bearing, with screw	EH 24420.	**585**
Adjustable Clamping Levers, with clamping screw	EH 24410.	**581**
Adjustable Clamping Levers, with female thread	EH 24400.	**578**
Adjustable Clamping Levers, with screw	EH 24400.	**579**
Adjustable Flat Clamping Levers	EH 24441.	**591**
Adjustable Flat Clamping Levers, stainless steel	EH 24441.	**592**
Adjustable Flat Clamping Levers, with screw	EH 24441.	**593**
Adjustable Flat Clamping Levers, with screw, stainless steel	EH 24441.	**595**
Adjustable Rotating Elements	EH 1048.600 - EH 1148.600	**755**
Anti-Turn Locking Devices for Taper Clamping Units, for clamping bars	EH 23250.	**863**
Assembly Tools, for Expander® sealing plugs with pull-anchor	EH 22880.	**348**
B		
Ball Casters, plain bearing	EH 22753.	**328**
Ball Casters, plastic	EH 22751.	**326**
Ball Casters, screwable, plain bearing	EH 22752.	**327**
Ball Casters, with mounting elements	EH 22750.	**325**
Ball Casters, with sheet steel housing	EH 22750.	**323**
Ball Knobs, DIN 319	EH 24560.	**620**
Ball Knobs, metal types, similar to DIN 319	EH 24561.	**621**
Ball Lock Connectors, self-locking, with holder	EH 22330.	**181**
Ball Lock Connectors, self-locking, with holder, compact construction	EH 22330.	**183**
Ball Lock Connectors, self-locking, with holding rings	EH 22340.	**185**
Ball Lock Pins, self-locking, with adjustable handle	EH 22370. /EH 22380.	**231**
Ball Lock Pins, self-locking, with button handle	EH 22340. /EH 22350.	**210**
Ball Lock Pins, self-locking, with combination handle	EH 22370.	**225**
Ball Lock Pins, self-locking, with combination handle, precipitation-hardened	EH 22380.	**228**
Ball Lock Pins, self-locking, with elastic grip	EH 22370. /EH 22380.	**223**
Ball Lock Pins, self-locking, with L-handle	EH 22340. /EH 22350.	**206**
Ball Lock Pins, self-locking, with safety handle	EH 22340. /EH 22350.	**214**
Ball Lock Pins, self-locking, with standard handle	EH 22370. /EH 22380.	**218**
Ball Lock Pins, self-locking, with standard handle, titanium	EH 22390.	**222**
Ball Lock Pins, self-locking, with T-handle	EH 22340. /EH 22350.	**202**
Ball Lock Pins, single acting - complies with NASM / MS17984	EH 4210.	**245**
Ball Lock Pins, single acting - complies with NASM / MS17985	EH 4211.	**247**
Ball Lock Pins, single acting - complies with NASM / MS17986	EH 4212.	**250**
Ball Lock Pins, single acting - complies with NASM / MS17987	EH 4213.	**252**
Ball-Ended Thrust Screws, headed, ball protected against rotating	EH 22700.	**295**
Ball-Ended Thrust Screws, headed, flat-faced ball	EH 22710.	**300**
Ball-Ended Thrust Screws, headed, round ball	EH 22710.	**299**
Ball-Ended Thrust Screws, headless, ball protected against rotating	EH 22700.	**297, 805**
Ball-Ended Thrust Screws, headless, flat-faced ball	EH 22720.	**304**
Ball-Ended Thrust Screws, headless, flat-faced ball and hexalobular socket	EH 22720.	**310**
Ball-Ended Thrust Screws, headless, round ball	EH 22720.	**302**
Ball-Ended Thrust Screws, headless, round ball and hexalobular socket	EH 22720.	**309**
Ball-Ended Thrust Screws, headless, short	EH 22720.	**308**
Ball-Ended Thrust Screws, headless, with fine-pitch thread	EH 22720.	**307**
Base Elements	EH 23700.	**430, 828**
Base Elements, for location hole	EH 23700.	**433**
Base Elements, low	EH 23700.	**432**
Base Elements, swivelling	EH 23700.	**431**
Base Plates	EH 1000.400 - EH 1000.500	**710**
	EH 1002.100	**712**
	EH 1100.300 - EH 1100.500	**713**
	EH 1102.100 - EH 1102.200	**717**
	EH 1500.200 - EH 1600.900	**769**
	EH 1501.300 - EH 1501.500	**770**
Base Plates, for 2 connecting elements	EH 1990.	**922**
Base Plates, for 4 connecting elements	EH 1990.	**924**
Base Plates, for 4 double acting connecting elements	EH 1990.	**926**
Base Plates, for 4 single acting connecting elements	EH 1990.	**928**
Base Plates, overall dimensions same as pallets DIN 55 201	EH 1000.800	**711**
	EH 1100.700 - EH 1103.500	**715**
Base Plates, semi-finished	EH 1912.	**900**
Base Plates, V70eco	EH 1200.300 - EH 1200.500	**717**
Base Plates, V70eco, overall dimensions same as pallets DIN 55201	EH 1200.700 - EH 1203.500	**719**
Base Plates, with 2 connecting elements	EH 1990.	**923**
Base Plates, with 4 connecting elements	EH 1990.	**925**
Base Plates, with 4 double acting connecting elements	EH 1990.	**927**
Base Plates, with 4 single acting connecting elements	EH 1990.	**929**
Base Plates, with positioning holes	EH 1912.	**901**
Bedding Supports	EH 23220.	**458, 831**
Bushings, for positioning clamping pins	EH 23111.	**398**
Butt Straps	EH 1132.500 - EH 1132.800	**744**
C		
C-Washers, DIN 6372	EH 22290.	**180, 800**
Captive C-Washers, DIN 6371 with countersunk screw DIN 923	EH 22280.	**179**
Centering Clamping Elements, with clamping balls	EH 23340.	**542**
Centering Clamping Elements, with clamping balls, operation from the bottom	EH 23340.	**546**
Centering Clamping Elements, with clamping segments	EH 23340.	**540**
Centering Clamping Elements, with clamping segments, operation from the bottom	EH 23340.	**544**
Centering Clamping Mandrels	EH 23340.	**548**
Centering Clamping Mandrels, with lateral handling	EH 23340.	**549**
Centering Pins	EH 23110.	**390, 820**
Centering Pins, stepped	EH 23110.	**391, 821**
Clamp Lock Pins, with button handle	EH 22410. / EH 22420.	**241**
Clamping Angles	EH 1105.200	**723**
	EH 1076.400	**724**
	EH 1506.200 - EH 1606.800	**771**
	EH 1505.200 - EH 1605.400	**773**
	EH 1605.700	**774**
	EH 1511.500 - EH 1611.500	**777**
	EH 1906.	**895**
Clamping Angles, modular design	EH 1104.700 - EH 1104.900	**721**
Clamping Angles, one-sided, welded, semi-finished	EH 1910.	**897**

Description	Group	Page
Clamping Angles, semi-finished	EH 1906. / EH 1907.	894
Clamping Angles, welded, semi-finished	EH 1910.	896
Clamping Bars	EH 1013.600 - EH 1113.800	733
	EH 1133.000 - EH 1133.200	745
	EH 1513.600 - EH 1613.800	778
	EH 1533.000 - EH 1633.200	782
Clamping Bars, length 100	EH 1585.	855
Clamping Bars, length 200	EH 1585.	856
Clamping Bars, length 300	EH 1585.	857
Clamping Bars, length 400 - 700	EH 1585.	858
Clamping Catches	EH 22260.	176
Clamping Claws	EH 23290.	455
	EH 23370.	506
Clamping Cubes	EH 1508.200 - EH 1608.600	772
Clamping Cubes, semi-finished	EH 1908.	898
Clamping Cubes, welded, semi-finished	EH 1910.	899
Clamping Devices "actima"	EH 23260.	478
Clamping Element Systems	EH 23700.	424, 825
Clamping Heads	EH 1132.900	745
	EH 1514.700 - EH 1614.700	780
Clamping Jaws, for floating clamp M 12	EH 23320.	472, 840
Clamping Jaws, for floating clamp M 16	EH 23320.	477
Clamping Levers	EH 24430.	588
Clamping Levers, DIN 99	EH 24470.	597
Clamping Nuts, self-locking	EH 25030.	677
Clamping Nuts, welded	EH 24470.	598
Clamping Nuts, welded, double-sided	EH 24470.	599
Clamping Pins, self-locking, with span compensation	EH 22360.	217
Clamping Vices	EH 23231.	443
Clamping Vices, fixed jaw	EH 1137.400	746
Clamping Vices, moveable jaw	EH 1137.300	746
Clamping Vices, replacement jaw, ribbed/flat	EH 1138.400	747
Clamping Vices, replacement jaw, soft	EH 1138.100	747
Clamps, DIN 6314 flat	EH 23140.	407
Clamps, DIN 6315 B forked	EH 23150.	408, 823
Clamps, DIN 6316 with goose-neck	EH 23160.	409
Clamps, slotted, with adjustable counter piece	EH 23185.	419
Clamps, slotted, with adjustable counter piece, with stud	EH 23185.	421
Clamps, slotted, with adjustable counter piece, with stud with internal hexagon	EH 23185.	422
Clamps, slotted, with adjustable counter piece, with T-bolt	EH 23185.	420
Clamps, stepped	EH 23160.	410
Clamps, with exchangeable soft jaw	EH 23190.	416
Clamps, with flat-faced ball, similar to DIN 6314	EH 23180.	412
Clamps, with nose	EH 23180.	413, 824
Clamps, with nose, closed	EH 23170.	411
Clamps, with soft face, similar to DIN 6314	EH 23190.	414
Collar Nuts with Conical Seat	EH 23080.	385, 817
Collar Nuts, DIN 6331 (height 1,5 d)	EH 23080.	384, 816
Combination Clamps, with horizontal base	EH 23330.	534
Combination Clamping Bars	EH 1586.	877
Compact Clamps	EH 23690.	536, 849
Compact Spherical Washers / Conical Seats, similar to DIN 6319	EH 23050.	379
Conical Knobs	EH 24550.	619
Connecting Elements	EH 1101.300 - EH 1101.500	716
Connecting Elements, hydraulically operated, double acting, with lifting-off and blow-out	EH 1990.	908
Connecting Elements, hydraulically operated, single acting with lifting-off	EH 1990.	909
Connecting Elements, modular, hydraulically operated	EH 1990.	911
Connecting Elements, modular, hydraulically operated, protected against twisting	EH 1990.	915
Connecting Elements, modular, mechanically operated	EH 1990.	910
Connecting Elements, modular, mechanically operated, protected against twisting	EH 1990.	914
Connecting Elements, modular, pneumatically operated	EH 1990.	912
Connecting Elements, modular, pneumatically operated, protected against twisting	EH 1990.	916
Connecting Elements, modular, pneumatically operated, reinforced	EH 1990.	913
Connecting Elements, modular, pneumatically operated, reinforced, protected against twisting	EH 1990.	917
Connecting Rings	EH 1990.	919
Consoles	EH 1510.100 - EH 1610.100	775
	EH 1510.200 - EH 1610.200	776
Control Modules	EH 1990.	918
Coverings, for connecting elements	EH 1990.	932
Coverings, for taper clamping units	EH 23250.	450
Crank Handles	EH 24330.	570
Crank Handles, DIN 468 goose-neck form with square end DIN 79	EH 24330.	569
Crank Handles, DIN 469 straight, with square end DIN 79	EH 24330.	568
Crank Handles, stainless steel precision casting	EH 24330.	571
Crank Handles, with folding handle	EH 24331.	572
Crank Handles, with folding handle, stainless steel	EH 24331.	573
Cylindrical Handles, rotating	EH 24530.	602

D

Disc-Type Handwheels, DIN 3670	EH 24570.	643
Disc-Type Handwheels, light metal	EH 24600.	652
Distance Bushings, for Expander® sealing plugs with elongated pull-anchor	EH 22880.	347
Distance Collars, for index plungers	EH 22120.	122
Door Catches	EH 22260.	175
Double Eccentric Levers, with fulcrum pin	EH 23380.	483
Double Edge Clamps	EH 23251.	451
Double Edge Clamps, machinable chucks	EH 23251.	452
Down-Hold Clamps, with cranked clamping lever	EH 23210.	434
Down-Hold Clamps, without clamping lever	EH 23210.	435, 829
Down-Hold Clamps, without clamping lever, with support	EH 23210.	436
Down-Thrust Clamps, moveable, size 40	EH 23310.	502, 845
Down-Thrust Clamps, swivelling, low construction, size 44	EH 23310.	496
Down-Thrust Clamps, swivelling, size 25	EH 23310.	492, 843
Down-Thrust Clamps, swivelling, size 40	EH 23310.	494, 844
Down-Thrust Clamps, swivelling, size 60	EH 23310.	498
Down-Thrust Clamps, swivelling, size 82.5	EH 23310.	500
Drive Blocks, DIN 2079	EH 23100.	387

E

Eccentric Clamping Clamps	EH 23270.	480
Eccentric Clamping Modules, with shaft location	EH 23410.	490
Eccentric Clamping Washers	EH 23270.	481
Eccentric Clamps	EH 23271.	482
	EH 23410.	489
Eccentric Levers, with fulcrum pin	EH 23390.	484
Eccentric Mounting Bushings, for lateral plungers, smooth	EH 22150.	154
Eccentric Mounting Bushings, for lateral plungers, smooth - INCH	EH 2B150.	173
Eccentric Quick Clamps, with female thread	EH 23390.	485
Eccentric Quick Clamps, with screw	EH 23390.	486
Expander® Sealing Plugs, body from case-hardened steel	EH 22880.	341
Expander® Sealing Plugs, body from stainless steel	EH 22880.	342
Expander® Sealing Plugs, with elongated pull-anchor	EH 22880.	346
Expander® Sealing Plugs, with pull-anchor	EH 22880.	345
Extension Nuts (height 3 d)	EH 23090.	386, 818

Description	Group	Page
F		
Feet, DIN 6320 with threaded shank	EH 22640.	**351**
Fixed Drilling Supports	EH 1162.000 - EH 1162.300	**757**
Fixed Drilling Supports, adjustable	EH 1163.000 - EH 1163.300	**758**
Fixed Slot Tenons	EH 23110.	**388**
Fixed Slot Tenons, with cylindrical fastening	EH 23110.	**389, 819**
Fixture Nuts, DIN 6330 (height 1,5 d)	EH 23070.	**383, 815**
Flat Knurled Nuts, DIN 467	EH 24760.	**605**
Flat Knurled Thumb Screws, DIN 653	EH 24770.	**606**
Floating Clamps, combined clamping and locking M 12	EH 23320.	**467, 836**
Floating Clamps, combined clamping and locking M 16	EH 23320.	**475**
Floating Clamps, compact construction, combined clamping and locking M 12	EH 23320.	**462, 834**
Floating Clamps, compact construction, separate clamping and locking M 12	EH 23320.	**465, 835**
Floating Clamps, separate clamping and locking M 12	EH 23320.	**469, 837**
Folding Handles, rotating	EH 24532.	**603**
Fulcrum Pins	EH 23400.	**488**
Fulcrum Screws	EH 22591.	**265**
G		
Gear Lever Handles	EH 24350.	**574**
Grippers round/square, with hard metal insert, ribbed	EH 22620.	**274**
Grub Screws with Palm Grip, DIN 6335 plastic	EH 24730.	**640**
Grub Screws with Star Grip, DIN 6336 plastic	EH 24740.	**629**
Grub Screws with Star Grip, plastic	EH 24750.	**631**
Grub Screws with Star Grip, stainless steel	EH 24690.	**627**
Grub Screws, ball-headed	EH 22570.	**259**
Grub Screws, DIN 6332 with thrust point	EH 22540.	**255, 800**
H		
Handwheels, DIN 950 cast iron	EH 24580.	**645**
Handwheels, DIN 950 light metal	EH 24590.	**648**
Handwheels, similar to DIN 950, stainless steel	EH 24591.	**651**
Hard Metal Inserts	EH 22620.	**277**
Hard Metal Inserts, for locating hole	EH 22620.	**275**
Hard Metal Inserts, front mounting	EH 22620.	**276**
Height Adapters, for compact clamp	EH 23690.	**538, 851**
Height Adjusting Cylinders	EH 23310.	**505, 848**
Height Adjusting Elements	EH 25120.	**683**
Height Adjusting Elements, high	EH 25120.	**684**
Height Adjusting Elements, orienting	EH 25120.	**685**
High Knurled Nuts (with Collar), DIN 466	EH 24780.	**607**
High Knurled Thumb Screws, DIN 464	EH 24790.	**608**
Hinges	EH 25160.	**696**
Hinges, with adjustable friction resistance	EH 25160.	**698**
Hinges, with mounting thread	EH 25160.	**697**
Holders, for spring plungers	EH 22082.	**81**
Holding Plates, for down-hold clamps	EH 23210.	**437**
Horizontal Toggle Clamps, with angle base	EH 23330.	**527**
Horizontal Toggle Clamps, with horizontal base	EH 23330.	**519**
Horizontal Toggle Clamps, with horizontal base / increased holding force	EH 23330.	**521**
Horizontal Toggle Clamps, with horizontal base and safety lock	EH 23330.	**523**
Horizontal Toggle Clamps, with horizontal base and solid support arm	EH 23330.	**522**
Horizontal Toggle Clamps, with vertical base	EH 23330.	**524**
Horizontal Toggle Clamps, with vertical base and safety lock	EH 23330.	**526**
I		
Index Bolts	EH 22120.	**132**
Index Bolts, simple finish	EH 22121.	**138**
Index Bolts, with mounting flange	EH 22120.	**135**
Index Bolts, with mounting flange, horizontal	EH 22120.	**136**
Index Plungers Compact, with hexagon collar	EH 22110.	**101**
Index Plungers Compact, with hexagon collar and locking	EH 22110.	**103**
Index Plungers Compact, with hexagon collar and locking, with T-handle	EH 22110.	**106**
Index Plungers Compact, with hexagon collar, with T-handle	EH 22110.	**105**
Index Plungers Mini Indexes	EH 22110.	**96**
Index Plungers Mini Indexes, basic type	EH 22110.	**97**
Index Plungers Mini Indexes, stainless steel	EH 22110.	**99**
Index Plungers, for thin-walled pieces	EH 22120.	**127**
Index Plungers, simple finish	EH 22120.	**125**
Index Plungers, threadless, weldable	EH 22120.	**120**
Index Plungers, with hexagon collar	EH 22120.	**113**
Index Plungers, with hexagon collar and locking	EH 22120.	**115**
Index Plungers, with hexagon collar and locking, stainless steel	EH 22120.	**116**
Index Plungers, with hexagon collar, short	EH 22120.	**121**
Index Plungers, with hexagon collar, stainless steel	EH 22120.	**114**
Index Plungers, with mounting flange	EH 22120.	**124**
Index Plungers, with mounting flange, horizontal	EH 22110.	**108**
Index Plungers, with pull-ring	EH 22120.	**128**
Index Plungers, with rapid locking head	EH 22122.	**131**
Index Plungers, with release lock	EH 22122.	**130**
Index Plungers, without hexagon collar	EH 22120.	**117**
Index Plungers, without hexagon collar, stainless steel	EH 22120.	**119**
Insertion Tools	EH 1586.	**866**
Interchangeable Jaws, for vices, with pull-down effect	EH 23231.	**446**
Intermediate Elements	EH 23700.	**428, 827**
	EH 1112.600 - EH 1112.800	**733**
Intermediate Elements, with support	EH 23700.	**429**
Intermediate Plates	EH 1111.700 - EH 1111.800	**731**
	EH 1047.700 - EH 1147.700	**751**
K		
Knurled Nuts, DIN 6303	EH 24480.	**604**
Knurled Nuts, plastic	EH 24820.	**610**
Knurled Thumb Screws, plastic	EH 24830.	**611**
L		
Lateral Plungers, smooth, with seal	EH 22150.	**148**
Lateral Plungers, smooth, with seal - INCH	EH 2B150.	**167**
Lateral Plungers, smooth, with seal, with female thread	EH 22150.	**153**
Lateral Plungers, smooth, with seal, with female thread - INCH	EH 2B150.	**172**
Lateral Plungers, smooth, without seal	EH 22150.	**146**
Lateral Plungers, smooth, without seal - INCH	EH 2B150.	**165**
Lateral Plungers, smooth, without seal, with female thread	EH 22150.	**152**
Lateral Plungers, smooth, without seal, with female thread - INCH	EH 2B150.	**171**
Lateral Plungers, with plastic spring and pin	EH 22150.	**150**
Lateral Plungers, with plastic spring and pin - INCH	EH 2B150.	**169**
Lateral Plungers, with thread, with seal	EH 22150.	**157**
Lateral Plungers, with thread, with seal, with female thread	EH 22150.	**161**
Lateral Plungers, with thread, without seal	EH 22150.	**155**
Lateral Plungers, with thread, without seal, with female thread	EH 22150.	**159**
Lateral Spring Plungers	EH 22140.	**144**
Lateral Spring Plungers, with spring steel sheet	EH 22160.	**163**
Lateral Stops	EH 1586.	**865**
Lifting Pins, self-locking	EH 22350.	**187**
Lifting Pins, self-locking, stainless steel	EH 22350.	**189**
Lifting Pins, self-locking, with handle	EH 22351.	**197**
Locating and Seating Pins, DIN 6321	EH 22630.	**278**
Locating Bushings with Seal, plain, for lifting pins	EH 22350.	**195**
Locating Bushings, for ball lock pins and socket pins	EH 22400.	**234**
Locating Bushings, for index bolts and index plungers	EH 22110.	**111**
Locating Bushings, for lifting pins	EH 22350.	**191**

Description	Group	Page
Locating Bushings, for positioning clamping pins, for press fit	EH 23111.	**399**
Locating Bushings, for positioning clamping pins, for screw fit	EH 23111.	**400**
Locating Bushings, plain, for lifting pins	EH 22350.	**193**
Locating Bushings, with flange, for ball lock pins and socket pins	EH 22400.	**236**
Locating Clamps	EH 23230.	**442**
Locating Pins	EH 1040.300 - EH 1040.700	**748**
	EH 1140.300 - EH 1141.500	**749**
	EH 1141.600 - EH 1143.700	**750**
Locating Pins, with ball end	EH 22630.	**283**
Locating Pins, with bore hole similar to DIN 6321	EH 22630.	**281**
Locating Segments	EH 1048.400 - EH 1148.400	**754**
Loose Slot Tenons, DIN 6323	EH 23120.	**392, 822**
Low Slot Tenons	EH 23130.	**393**

M

Machine Handles, DIN 39	EH 24450.	**600**
Manual Handles, for positioning clamping pins	EH 23111.	**397**
Monitoring Units for Positioning Sensors, pneumatic	EH 22800.	**333**
Mounting Blocks	EH 1010.100 - EH 1110.100	**725**
	EH 1010.200 - EH 1110.300	**726**
	EH 1011.100 - EH 1111.100	**727**
	EH 1011.200 - EH 1111.300	**727**
Mounting Blocks, for index bolts and index plungers	EH 22120.	**134**
Mounting Blocks, for index bolts and index plungers, die-cast	EH 22110.	**109**
Mounting Blocks, V70eco	EH 1210.100	**728**
	EH 1210.200 - EH 1210.300	**729**
	EH 1211.100	**729**
	EH 1211.200 - EH 1211.300	**730**
Mounting Elements	EH 1512.000 - EH 1612.400	**778**
Mounting Pads	EH 22590.	**260**
Mounting Pads, with fastening holes	EH 22590.	**264**
Mounting Pads, protected against slipping	EH 22590.	**262**
Multi-Vices, MS 125	EH 1700.	**884**
Mushroom-Type Knobs	EH 24540.	**617**

N

Nuts for T-Slots	EH 1030.000 - EH 1030.300	**740**
Nuts for T-Slots, DIN 508	EH 23010.	**362, 810**
Nuts for T-Slots, DIN 508 with slip protection	EH 23010.	**365**
Nuts for T-Slots, DIN 508, semi-finished	EH 23010.	**364**
Nuts for T-Slots, extended	EH 23020.	**366, 810**
Nuts for T-Slots, rhombus	EH 23020.	**367, 811**
Nuts for T-Slots, rhombus, semi-finished	EH 23020.	**368**

O

Oil-Sight Glasses	EH 22860.	**340**

P

Palm Grips, DIN 6335 cast iron	EH 24620.	**633**
Palm Grips, DIN 6335 cast iron, plastic-coated	EH 24620.	**635**
Palm Grips, DIN 6335 light metal	EH 24630.	**636**
Palm Grips, DIN 6335 plastic	EH 24640.	**638**
Palm Grips, DIN 6335 stainless steel die-cast	EH 24631.	**637**
Palm Grips, with axial bearing	EH 24700.	**639**
Pins	EH 22690.	**288, 803**
Pins, with plastic contact surface	EH 22691.	**292**
Pitbull® Clamps	EH 23290.	**454**
Polling Units, with sensor	EH 22810.	**336**
Position Screws	EH 1555.500 - EH 1655.500	**790**
Positioning Bushings, for index bolts and index plungers	EH 22110.	**112**
Positioning Bushings, with collar, DIN 172 A	EH 23112.	**401**
Positioning Bushings, without collar, DIN 179 A	EH 23112.	**404**
Positioning Clamping Bars	EH 1149.000	**756**
	EH 1549.200 - EH 1649.200	**787**
Positioning Clamping Bars, two-sided	EH 1049.200 - EH 1149.200	**757**
Positioning Clamping Cylinders	EH 1553.500 - EH 1653.500	**789**
Positioning Clamping Pins	EH 23111.	**395**
Positioning Rings, for down-thrust clamp	EH 23310.	**504, 847**
Positioning Sensors, pneumatic	EH 22800.	**329, 330**
Positioning Sensors, self-aligning, pneumatic	EH 22800.	**331, 332**
Precision Index Plungers, with cylindrical pin	EH 22130.	**139**
Precision Index Plungers, with tapered pin	EH 22130.	**141**
Push Plungers, with pin, protected against rotating	EH 23230.	**441**
Push-Pull Clamps	EH 23229.	**440**

Q

Quick Plug Couplings, with angular and radial offset compensation	EH 25100.	**681**
Quick Plug Couplings, with radial offset compensation	EH 25100.	**679**
Quick Plug Couplings, with radial offset compensation and screwed flange	EH 25100.	**680**

R

Radio Receivers, for polling unit	EH 22810.	**339**
Radio Transmitters, for polling unit	EH 22810.	**338**
Retaining Cables	EH 22400.	**237**
Retaining Catches, double-sided	EH 24100.	**557**
Retaining Catches, one-sided	EH 24100.	**556**
Retaining Catches, wing grip, one-sided	EH 24101.	**558**
Rod Ends, DIN 12240-4, with female thread	EH 22982.	**357**
Rod Ends, DIN 12240-4, with male thread	EH 22982.	**355**
Rotating Machine Handles, DIN 98	EH 24460.	**601**
Rubber Endstop Buffers, cylindrical	EH 25150.	**688**
Rubber Endstop Buffers, cylindrical, front mounting	EH 25150.	**695**
Rubber Endstop Buffers, low structure	EH 25150.	**693**
Rubber Endstop Buffers, parabolic	EH 25150.	**690**
Rubber Endstop Buffers, truncated cone form	EH 25150.	**691**
Rubber Metal Buffers	EH 25150.	**686**

S

Screw Jacks	EH 23470.	**552**
Screw Plugs	EH 1557.000 - EH 1657.000	**790**
Seating Elements, with plastic contact surface, orienting	EH 22600.	**273**
Seating Pins, adjustable	EH 22690.	**291**
Seating Pins, partially DIN 6321 (old norm)	EH 22630.	**280**
Seating Pins, pin shape	EH 22680.	**287, 802**
Seating Pins, ribbed or pointed	EH 22680.	**286, 801**
Self-Aligning Pads	EH 22730.	**315, 806**
Self-Aligning Pads, adjustable	EH 22740.	**320, 808**
Self-Aligning Pads, adjustable, self-resetting	EH 22741.	**321, 809**
Self-Aligning Pads, self-resetting	EH 22731.	**317, 806**
Self-Aligning Pads, with hard metal ball, ribbed	EH 22730.	**316**
Self-Aligning Pads, with hard metal ball, ribbed and self-resetting	EH 22731.	**319**
Sensing Elements, with actuating bolt, protected against rotating	EH 25020.	**661**

Description	Group	Page
Sensing Elements, with sensor adapter	EH 25010.	**660**
Set Collars	EH 25069.	**673**
Set Collars, for quick setting	EH 25071.	**676**
Set Collars, with sensor adapter	EH 25070.	**675**
Setting Dies, for Expander® sealing plug	EH 22880.	**343**
Shaft / Plain Washers	EH 23061.	**382**
Shaft / Plain Washers, DIN 6340 heat-treated	EH 23060.	**380, 814**
Shaft Clamps	EH 23341.	**550**
Shaft-End Washers	EH 22270.	**178**
Silicone Endstop Buffers, truncated cone form	EH 25151.	**692**
Slotted Clamping Angles	EH 1012.100 - EH 1112.400	**732**
Socket Pins, with spring-loaded balls	EH 22400.	**233**
Spacer Plates, for hinges	EH 25160.	**699**
Spacers	EH 1007.400 - EH 1108.300	**725**
	EH 1617.400 - EH 1617.900	**781**
Spherical Washers / Conical Seats, DIN 6319	EH 23050.	**375, 813**
Spherical Washers / Conical Seats, similar to DIN 6319, stainless steel	EH 23050.	**377**
Spoked Handwheels, light metal	EH 24610.	**654**
Spring Bodies	EH 22100.	**83**
Spring Plungers, double-sided	EH 22090.	**82**
Spring Plungers, headed, with ball and internal hexagon	EH 22030.	
Spring Plungers, headed, with ball and slot	EH 22050.	**63**
Spring Plungers, long	EH 22070.	**72**
Spring Plungers, plastic	EH 22040.	**57**
Spring Plungers, smooth	EH 22070.	**71**
Spring Plungers, smooth, long, with collar and ball	EH 22080.	**76**
Spring Plungers, smooth, with collar and ball	EH 22080.	**74**
Spring Plungers, smooth, with collar and ball, self-clamping	EH 22080.	**77**
Spring Plungers, smooth, with collar and ball, self-clamping – INCH	EH 2B080.	**94**
Spring Plungers, smooth, with collar and pin	EH 22080.	**78**
Spring Plungers, smooth, without collar	EH 22080.	**79**
Spring Plungers, smooth, without collar, with moveable ball	EH 22081.	**80**
Spring Plungers, with ball and internal hexagon	EH 22030.	**49, 53**
Spring Plungers, with ball and slot	EH 22050.	**58**
Spring Plungers, with ball and slot - INCH	EH 2B050.	**91**
Spring Plungers, with ceramic ball and slot, stainless steel A4	EH 22050.	**60**
Spring Plungers, with internal hexagon	EH 22060.	**67**
Spring Plungers, with internal hexagon and seal	EH 22060.	**69**
Spring Plungers, with moveable ball and internal hexagon	EH 22031.	**55**
Spring Plungers, with moveable ball and slot	EH 22051.	**65**
Spring Plungers, with pin and internal hexagon	EH 22030.	**51**
Spring Plungers, with pin and internal hexagon - INCH	EH 2B030.	**88**
Spring Plungers, with pin and slot	EH 22050.	**61**
Spring Plungers, with pin and slot - INCH	EH 2B020.	**85**
Spring-Loaded Catches, DIN 6310 catches with spring	EH 22200.	**174**
Stabilizing Clamping Jaws	EH 23240.	**447**
Standard Clamping Jaws, for floating clamp M 12	EH 23320.	**471, 839**
Standard Jaws, for vices	EH 23231.	**445**
Standard Ranges EH 1586	EH 1586	**879, 880**
Standard Ranges L12	EH 1590	**793**
Standard Ranges L16	EH 1690	**795**
Standard Ranges V40	EH 1090	**761**
Standard Ranges V70	EH 1190	**763**
Star Grips, DIN 6336 cast iron	EH 24650.	**622**
Star Grips, DIN 6336 light metal	EH 24660.	**623**
Star Grips, DIN 6336 plastic	EH 24670.	**625**
Star Grips, DIN 6336 stainless steel die-cast	EH 24661.	**624**
Star Grips, plastic	EH 24750.	**630**
Star Grips, stainless steel	EH 24690.	**626**
Star Grips, stainless steel, solid	EH 24690.	**628**
Stop Angles	EH 1520.400 - EH 1621.700	**781**
Stop Plates for Taper Clamping Units, for clamping bars	EH 23250.	**864**
Stops	EH 23281.	**457**
	EH 1014.500 - EH 1114.500	**735**
	EH 1116.000 - EH 1116.100	**736**
	EH 1614.500	**779**
Stops, cylindrical	EH 23280.	**453, 830**
	EH 1115.100	**735**
	EH 1551.500 - EH 1651.700	**788**
Stops, diamond coated	EH 1586.	**869**
Stops, for hinges	EH 25160.	**701**
Stops, gripper studs	EH 1586.	**870**
Stops, horizontal prisms	EH 1586.	**871**
Stops, plain	EH 1586.	**875**
Stops, ribbed	EH 1586.	**874**
Stops, soft	EH 1586.	**873**
Stops, vertical prisms	EH 1586.	**872**
Stops, with mounting thread	EH 1586.	**876**
Straight Clamps, long	EH 23700.	**427, 826**
Straight Clamps, short	EH 23700.	**426**
Studs, DIN 6379 b_1 long for T-nuts	EH 23040.	**373, 812**
Studs, DIN 6379 for T-nuts	EH 23040.	**371**
Studs, with internal hexagon, similar to DIN 6379, for T-nuts	EH 23040.	**374**
Sub-Part Clamps	EH 23211.	**438**
Support Clamping Bars	EH 1114.000 - EH 1114.100	**734**
	EH 1047.800 - EH 1147.800	**752**
Support Extensions, for straight clamps, slotted, with adjustable counter piece	EH 23185.	**423**
Support Legs	EH 22593.	**266**
Support Legs, impact cushioning	EH 22594.	**272**
Support Legs, protected against slipping	EH 22593.	**269**
Supporting Bars	EH 1550.000 - EH 1650.000	**788**
Supporting Elements	EH 23220.	**460, 832**
Supporting Elements, for clamps	EH 23200.	**417**
Supporting Plates	EH 23210.	**456**
	EH 1047.900 - EH 1147.900	**752**
	EH 1547.900 - EH 1647.900	**783**
Supporting Plates, including accessories	EH 1104.300 - EH 1104.500	**719**
Supporting Plates, with 2 connecting rings	EH 1990.	**930**
Supporting Plates, with 4 connecting rings	EH 1990.	**931**
Supports for Clamping Bar	EH 1586.	**867**
Supports for Clamping Bar, magnetic	EH 1586.	**868**
Supports for Clamping Bar, with spring-loaded catch	EH 1586.	**868**
Swing Bolts, DIN 444, form B	EH 22980.	**353**
Swing Bolts, DIN 444, form B, quality 8.8 high precision design	EH 22980.	**354**
System Adapter Plates	EH 1580.000	**791**
	EH 1581.000	**791**
	EH 1681.000	**792**

T

T-Blocks	EH 1130.400 - EH 1130.600	**741**
T-Bolts, DIN 787	EH 23030.	**369**
T-Clamping Blocks	EH 1031.100 - EH 1131.200	**742**
	EH 1131.500 - EH 1131.700	**743**
T-Handles	EH 24512.	**616**
T-Slot Centering Blocks	EH 1029.600 - EH 1129.600	**740**
Taper Clamping Units	EH 23250.	**448**
Taper Clamping Units, plain / ribbed, M12	EH 23250.	**860**
Taper Clamping Units, plain / ribbed, M8	EH 23250.	**859**

Description	Group	Page
Taper Clamping Units, with screw fastened thread, M12	EH 23250.	**861**
Tapered Shaft Hubs, no lock nut	EH 25050.	**663**
Tapered Shaft Hubs, with lock nut	EH 25050.	**666**
Tapered Shaft Hubs, with lock nut, stainless steel	EH 25050.	**668**
Tapered Shaft Hubs, without lock nut, stainless steel	EH 25050.	**665**
Thread Bolts	EH 1644.000	**782**
Threaded Lifting Pins, self-locking	EH 22352.	**199**
Threaded Plates, for hinges	EH 25160.	**700**
Thrust Angles	EH 1020.300 - EH 1121.500	**737**
	EH 1021.600 - EH 1021.700	**738**
	EH 1120.400 - EH 1122.300	**739**
Thrust Pads, DIN 6311 and low model	EH 22560.	**257**
Thrust Pads, plastic	EH 22570.	**258**
Thrust Screws, with brass pad	EH 22760.	**311**
Thrust Screws, with plastic pad	EH 22760.	**312**
Thumb Knobs	EH 24520.	**618**
Toggle Clamps Hook Type, vertical, with horizontal base	EH 23330.	**533**
Toggle Clamps Hook Type, with horizontal base	EH 23330.	**531**
Toggle Clamps Push-Pull Type, with angle base	EH 23330.	**528**
Toggle Clamps Push-Pull Type, with fastening thread	EH 23330.	**530**
Tolerance Rings	EH 22750.	**324**
Tommy Nuts, DIN 6305 with fixed pin	EH 24510.	**614**
Tommy Nuts, DIN 6307 with moveable pin	EH 24510.	**615**
Tommy Screws, DIN 6304 with fixed pin	EH 24490.	**612**
Tommy Screws, DIN 6306 with moveable pin	EH 24500.	**613**
Torque Handles	EH 24710.	**641**
Tubular Handles	EH 24321.	**566**
Tubular Handles, front mounting	EH 24321.	**567**

U

U-Handles	EH 24300.	**559**
	EH 24310.	**563**
U-Handles, front mounting	EH 24300.	**561**
U-Handles, plastic	EH 24320.	**565**
U-Handles, plastic, front mounting	EH 24320.	**564**
U-Handles, with support washer	EH 24310.	**562**

Description	Group	Page

V

V-Block Elements right/left	EH 1548.700 - EH 1648.800	**786**
V-Blocks	EH 1048.200 - EH 1148.300	**753**
	EH 1048.500 - EH 1148.500	**755**
	EH 1548.100 - EH 1648.100	**784**
	EH 1548.500 - EH 1648.500	**785**
Vertical Toggle Clamps, with angle base	EH 23330.	**515**
Vertical Toggle Clamps, with angle base and safety lock	EH 23330.	**516**
Vertical Toggle Clamps, with horizontal base	EH 23330.	**508**
Vertical Toggle Clamps, with horizontal base and safety lock	EH 23330.	**518**
Vertical Toggle Clamps, with horizontal base and solid support arm	EH 23330.	**517**
Vertical Toggle Clamps, with vertical base	EH 23330.	**510**
Vertical Toggle Clamps, with vertical base and safety lock	EH 23330.	**514**
Vertical Toggle Clamps, with vertical base and solid support arm	EH 23330.	**512**

W

Washers, high precision design	EH 23060.	**381**
Wrenches	EH 1032.100 - EH 1132.100	**743**
	EH 1139.400 - EH 1139.500	**748**

NOTES

NOTES

OUR PARTNERS WORLDWIDE

PARTNERS

Austria	**France**	Norway
Australia	Great Britain	Poland
Belgium	Hungary	Portugal
Bosnia-Herzegovina	Croatia	Romania
Bulgaria	Israel	**Serbia**
Brazil	India	Sweden
Canada	Italy	Singapore
Switzerland	**Japan**	**Slovenia**
China	**South Korea**	Slovak Republic
Czech Republic	Montenegro	Thailand
Denmark	Macedonia	Turkey
Spain	Mexico	Taiwan
Finland	Netherlands	**United States**

Please refer to **www.halder.com** for contact details of our agents ( ) and subsidiaries ( )

HALDER

Erwin Halder KG
Erwin-Halder-Straße 5-9
88480 Achstetten-Bronnen
Germany

T +49 7392 7009-0
F +49 7392 7009-160
info@halder.com
www.halder.com

MADE IN GERMANY.



102.295

15.500 / EN / 09.19