STANDARD PARTS

FOR FIXTURE SYSTEMS

We carry a comprehensive selection of clamping and fixture elements that complement our fixture systems.

8

C-Washers • DIN 6372

EH 22290.

PRODUCT DESCRIPTION

Material

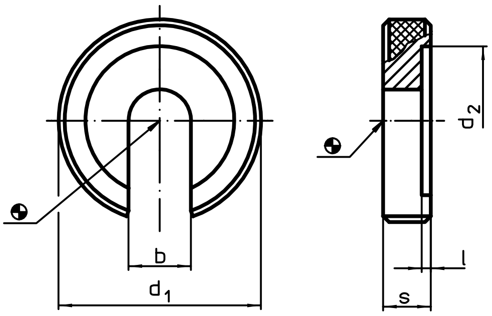
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . → p. 180

DRAWING



ORDER INFORMATION

System	Nominal size [mm]	Dimensions b [mm]	d1	d2	l	s	Weight [g]	Art. No.
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

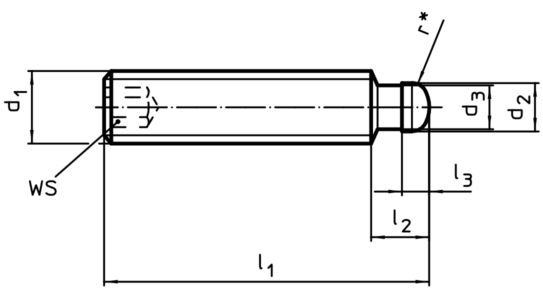
- Steel, blackened, quality 5.8, thrust point hardened

MORE INFORMATION

Further products

Complete Range . . . . → p. 255
Thrust Pads, DIN 6311 and low model → p. 257

DRAWING



picture 2

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

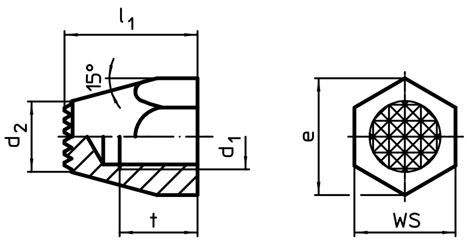
- Free cutting steel, case-hardened, blackened

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

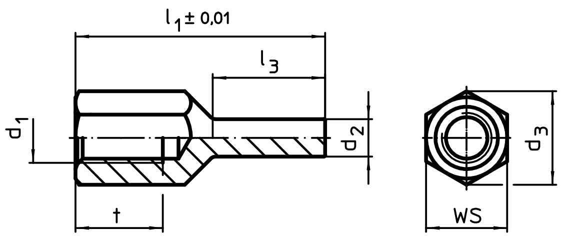
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . → p. 287

DRAWING

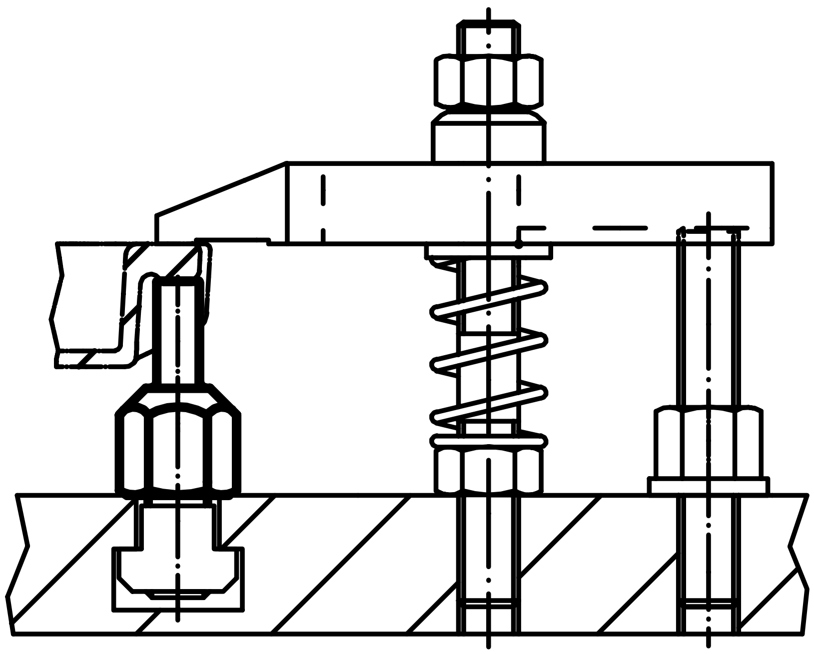


picture 2

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



8

HALDER

Pins

EH 22690.

PRODUCT DESCRIPTION

To be used as seats, stops and thrust pads.

Material

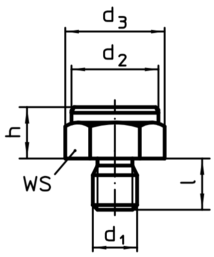
- Steel, case-hardened, blackened

MORE INFORMATION

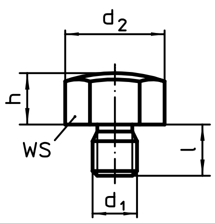
Further products

Complete Range . . . . → p. 288

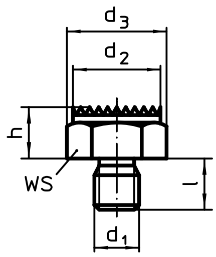
DRAWING



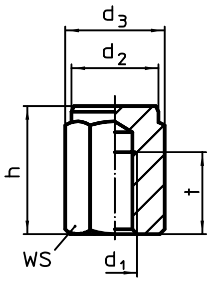
picture 1



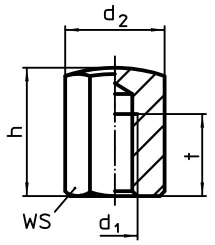
picture 2



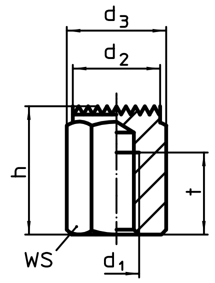
picture 3



picture 4



picture 5



picture 6

ORDER INFORMATION

System	Dimensions h	d_1	d_2	d_3	l	t	WS	Tightening torque max.	[g]	Art. No.
	[mm]						[mm]	[Nm]	[g]	
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.

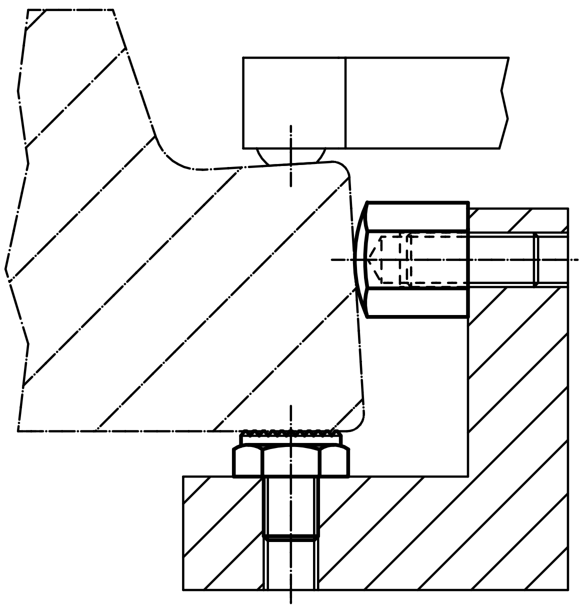
→

Standard Parts for Fixture Systems

System	Dimensions						WS	Tightening torque max.		Art. No.
	h	d_1	d_2	d_3	l	t				
	[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



8

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.

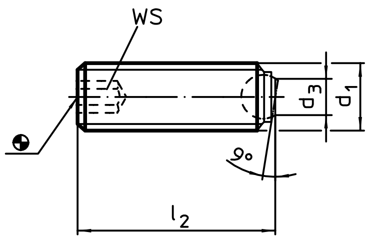
References

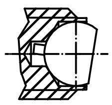
Thread lock on request, please refer to appendix - Technical Data -

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 d1	l2	d3	Ball	WS	Load capacity for static load¹⁾ max.		Art. No. 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

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.

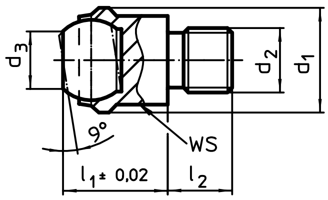
Material
Ball
- Ball-bearing steel, hardened, bright

Body
- Heat-treated steel, tempered, phosphated

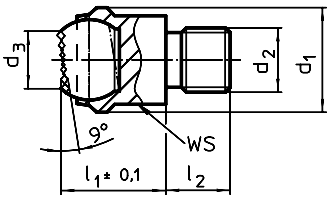
MORE INFORMATION
Notes
Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.

Further products
Complete Range . . . . → p. 315

DRAWING



picture 1



picture 2

ORDER INFORMATION

System	Dimensions d_1	d_2	d_3	l_1	l_2 -0,5	Ball	WS	Load capacity for static load max.	Tightening torque max.		Art. No. 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

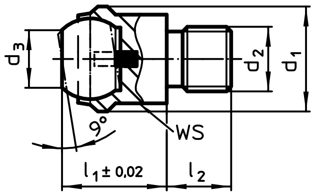
Ball
- Ball-bearing steel, hardened, bright

Body
- Heat-treated steel, tempered, phosphated

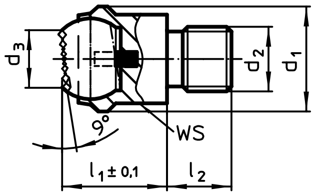
MORE INFORMATION
Notes
Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.

Further products
Complete Range . . . . → p. 317

DRAWING



picture 1

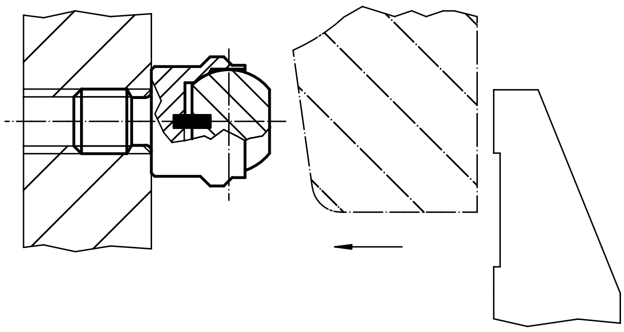


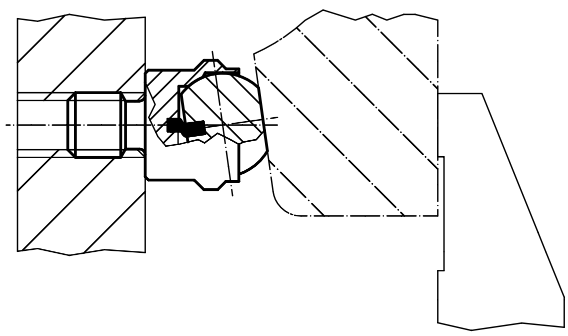
picture 2

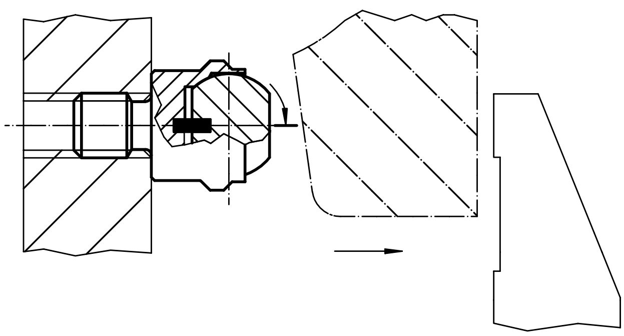
ORDER INFORMATION

System	Dimensions d1 [mm]	d2 [mm]	d3 [mm]	l1 [mm]	l2 -0,5 [mm]	Ball [mm]	WS [mm]	Load capacity for static load max. [kN]	Tightening torque max. [Nm]	[g]	Art. No. heat-treated steel
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







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

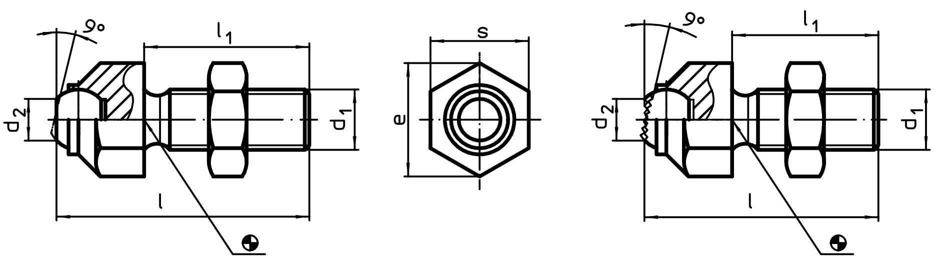
Notes

Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.
Special types on request.

Further products

Complete Range . . . . → p. 320

DRAWING

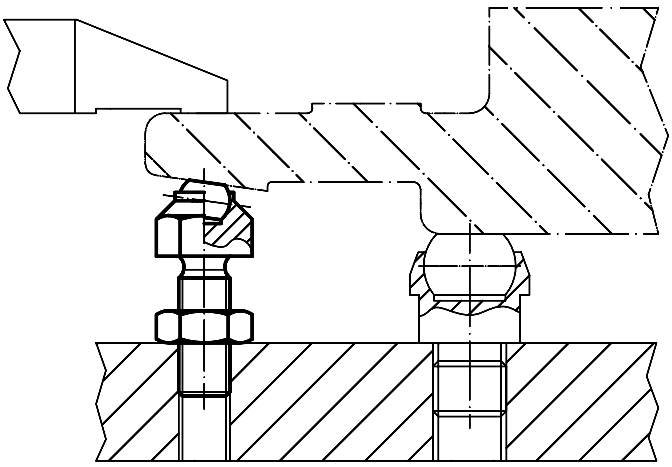


picture 1 picture 2

ORDER INFORMATION

System	Dimensions s	d_1	l	l_1	d_2	e	Ball	Load capacity for static load max. [kN]	Tightening torque max. [Nm]	[g]	Art. No. heat-treated steel
	[mm]										
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



8

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

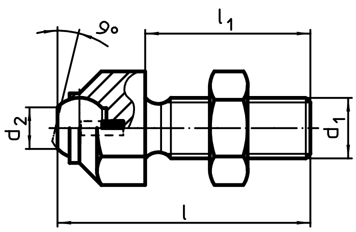
Notes

Ball protected against rotating.
Loading capacity valid for steel and stainless steel designs.
Special types on request.

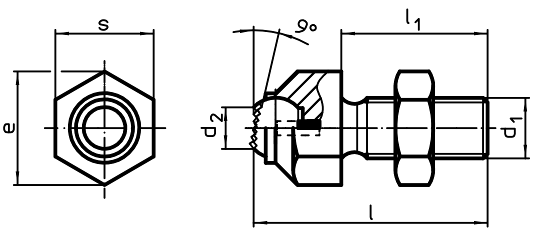
Further products

Complete Range . . . . → p. 321

DRAWING



picture 1



picture 2

ORDER INFORMATION

System	Dimensions s	d_1	l	l_1	d_2	e	Ball	Load capacity for static load max.	Tightening torque max.	Weight	Art. No. 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

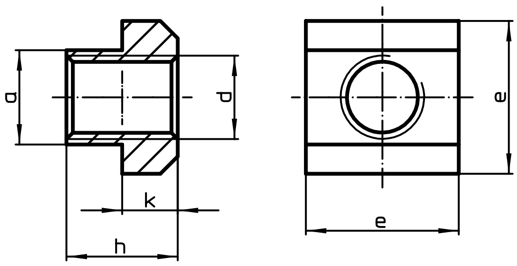
Notes

Special types on request.

Further products

Complete Range . . . . → p. 362

DRAWING



ORDER INFORMATION

System	T-slot size [mm]	d	a	e	h	k	For T-slots DIN 650 [mm]	Testing force to DIN 508 F min. [kN]	[g]	Art. No. heat-treated steel
		Dimensions [mm]								
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

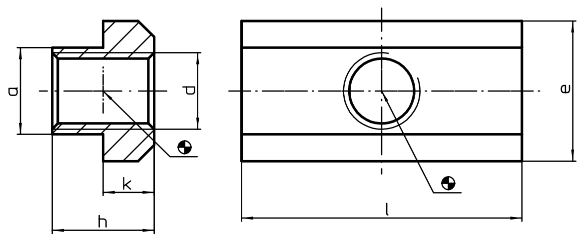
- Heat-treated steel, tempered, quality 10, blackened

MORE INFORMATION

Further products

Complete Range . . . . → p. 366

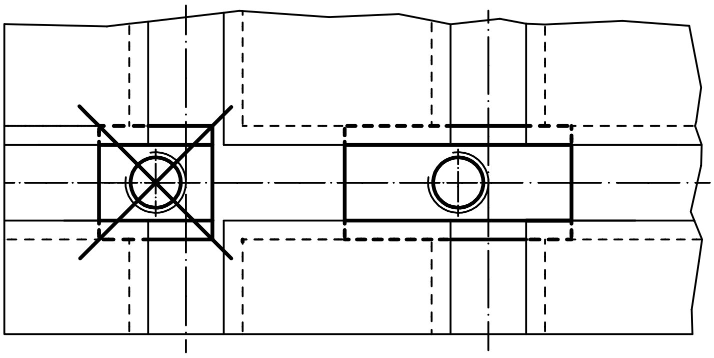
DRAWING



ORDER INFORMATION

System	T-slot size [mm]	d	a	e	l	h	k	[g]	Art. No.
		Dimensions [mm]							
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

APPLICATION EXAMPLE



Nuts for T-Slots • rhombus

EH 23020.

PRODUCT DESCRIPTION

Material

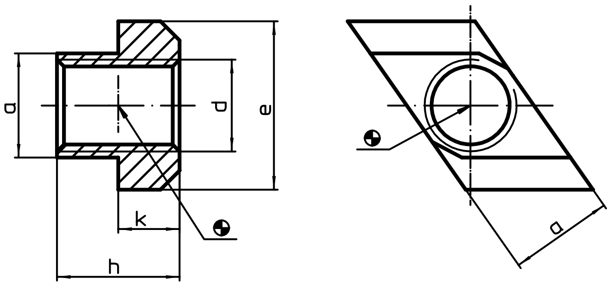
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . → p. 367

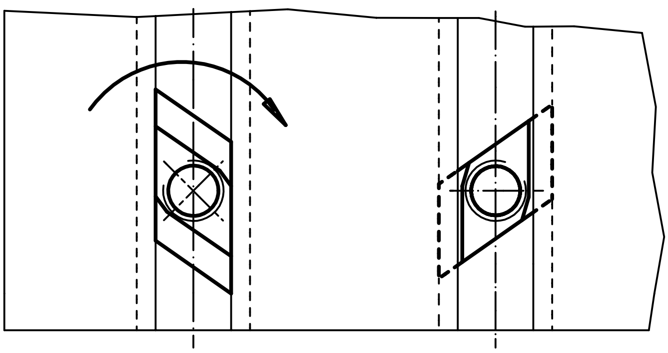
DRAWING



ORDER INFORMATION

System	T-slot size [mm]	d	a	e	h	k	[g]	Art. No.
		Dimensions [mm]						
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

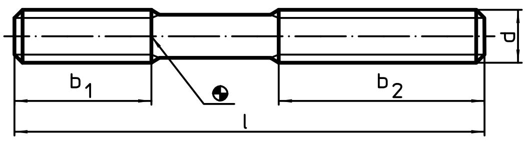
References

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

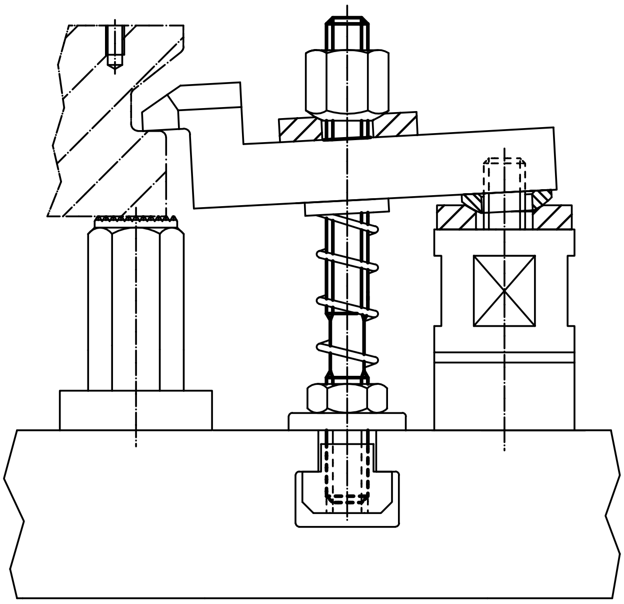


ORDER INFORMATION

System	Dimensions					Art. No.
	d	l	b_1	b_2		
	[mm]				[g]	
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

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

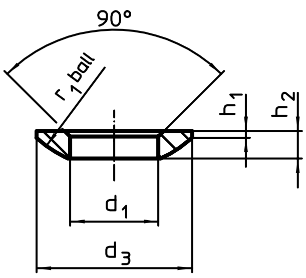
Conical seats form D are to be used only for plain, closed round areas.
For larger holes only use form G!

MORE INFORMATION

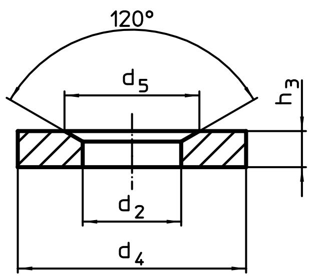
Further products

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

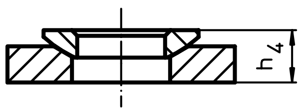
DRAWING

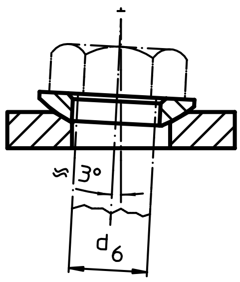


picture 1



picture 3





ORDER INFORMATION

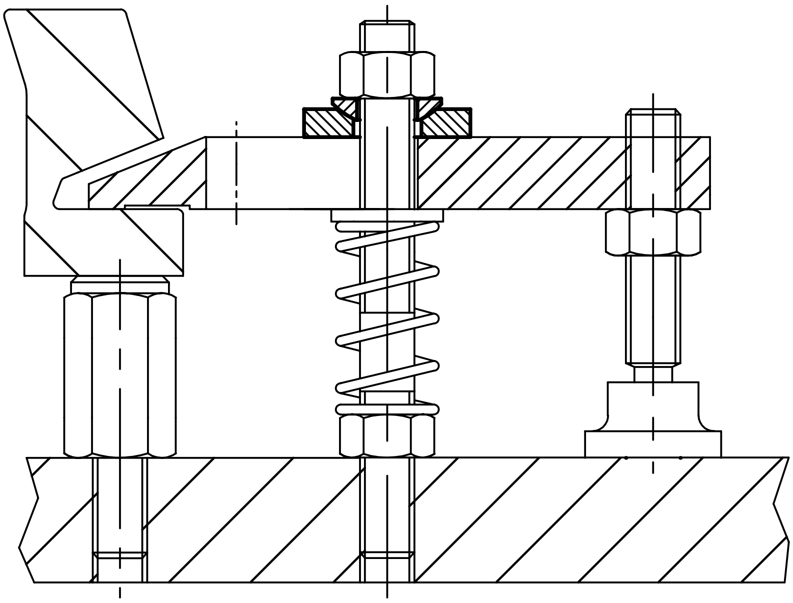
System	Dimensions										For pins	For screws	Load capacity for static load max.	Torque for screwed connections[1] max.	Weight	Art. No.
	d_1 H13	d_2 H13	d_3	d_4	d_5	h_1	h_2	h_3	h_4 with conical seat form G ~	r_1	d_6	d_6				
	[mm]										[mm]	[mm]	[kN]	[Nm]	[g]	
spherical washers from case-hardened 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.

System	Dimensions d1 H13	d2 H13	d3	d4	d5	h1	h2	h3	h4 with conical seat form G ~	r1	For pins d6	For screws d6	Load capacity for static load max.	Torque for screwed connec-tions[1] max.		Art. No.
	[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



8

Shaft / Plain Washers • DIN 6340 heat-treated

EH 23060.

PRODUCT DESCRIPTION

Material

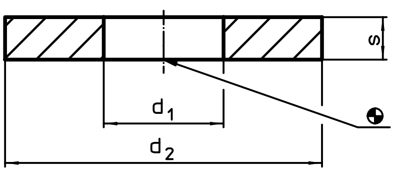
- Heat-treated steel, tempered, punched, mechanically trued, phosphatized

MORE INFORMATION

Further products

Complete Range . . . . → p. 380

DRAWING



ORDER INFORMATION

System	Dimensions d1	d2	s	For screws		Art. No.
		[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

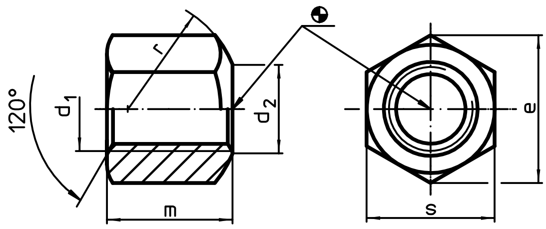
References

For torques and strengths please refer to appendix - Technical Data -

Further products

Complete Range . . . . → p. 383

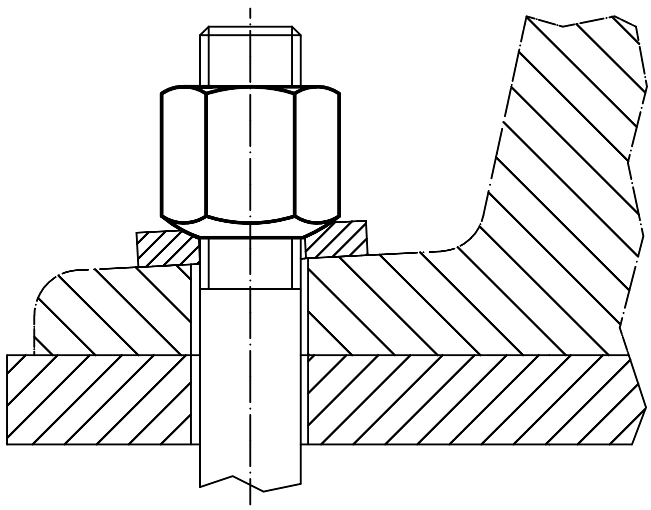
DRAWING



ORDER INFORMATION

System	Dimensions d_1	d_2	e	m	r	s	[g]	Art. No. heat-treated steel
	[mm]							
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



Collar Nuts • DIN 6331 (height 1,5 d)

EH 23080.

PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, quality 10, phosphated

MORE INFORMATION

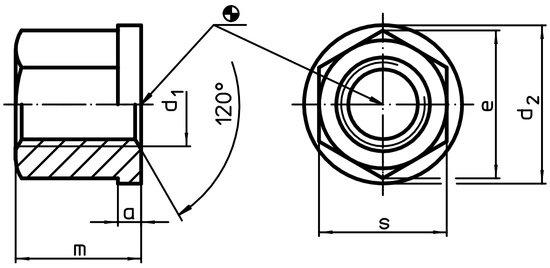
References

For torques and strengths please refer to appendix - Technical Data -

Further products

Complete Range . . . . → p. 384

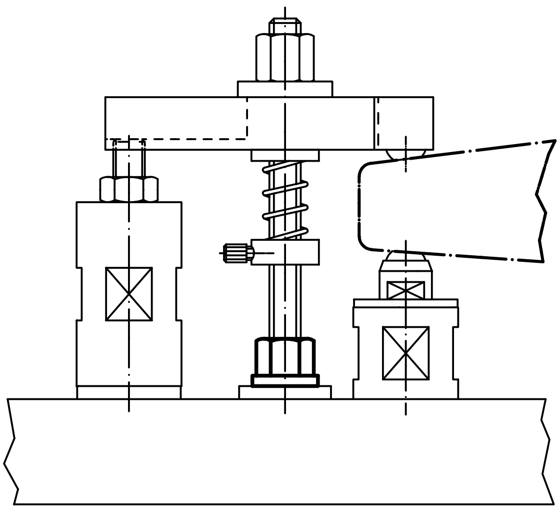
DRAWING

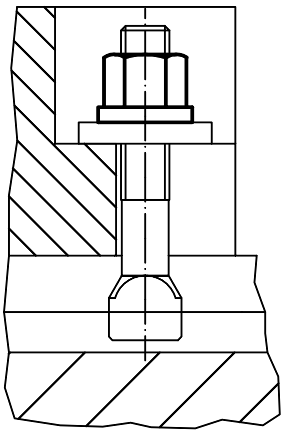


ORDER INFORMATION

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





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

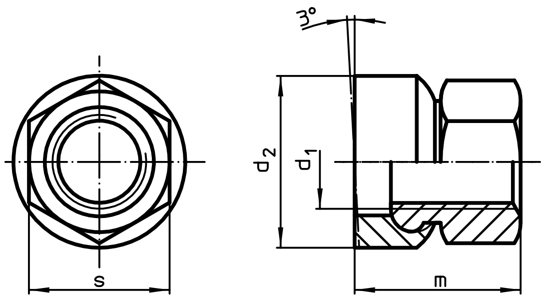
References

For torques and strengths please refer to appendix - Technical Data -

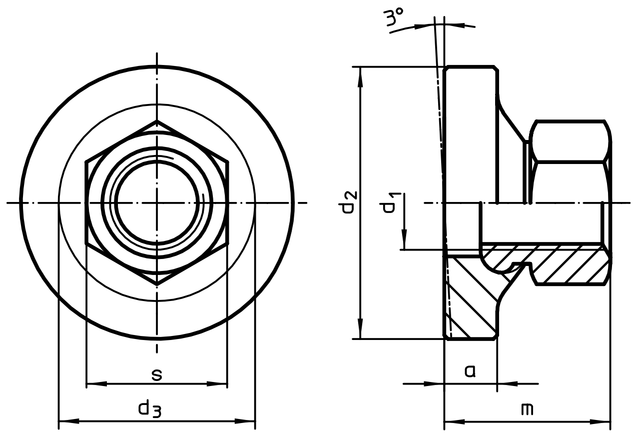
Further products

Complete Range . . . . → p. 385

DRAWING



picture 1

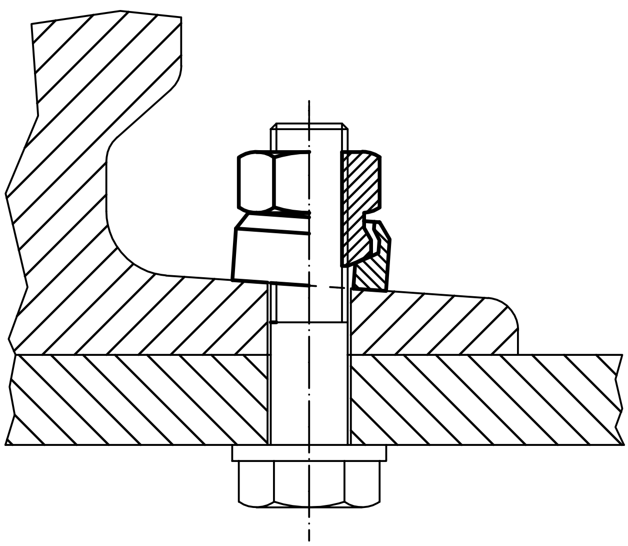


picture 2

ORDER INFORMATION

System	Dimensions d1	a	d2	d3	m ~	s	[g]	Art. No.
	[mm]					[mm]		
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



Extension Nuts • (height 3 d)

EH 23090.

PRODUCT DESCRIPTION

Material

- Heat-treated steel, tempered, quality 10, phosphated

MORE INFORMATION

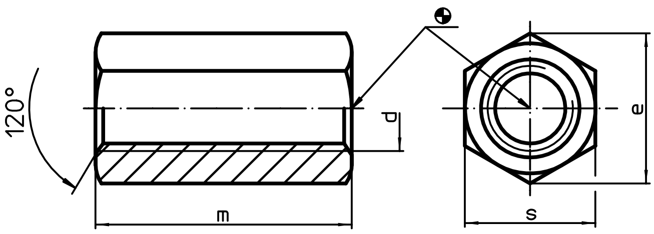
References

For torques and strengths please refer to appendix - Technical Data -

Further products

Complete Range . . . . → p. 386

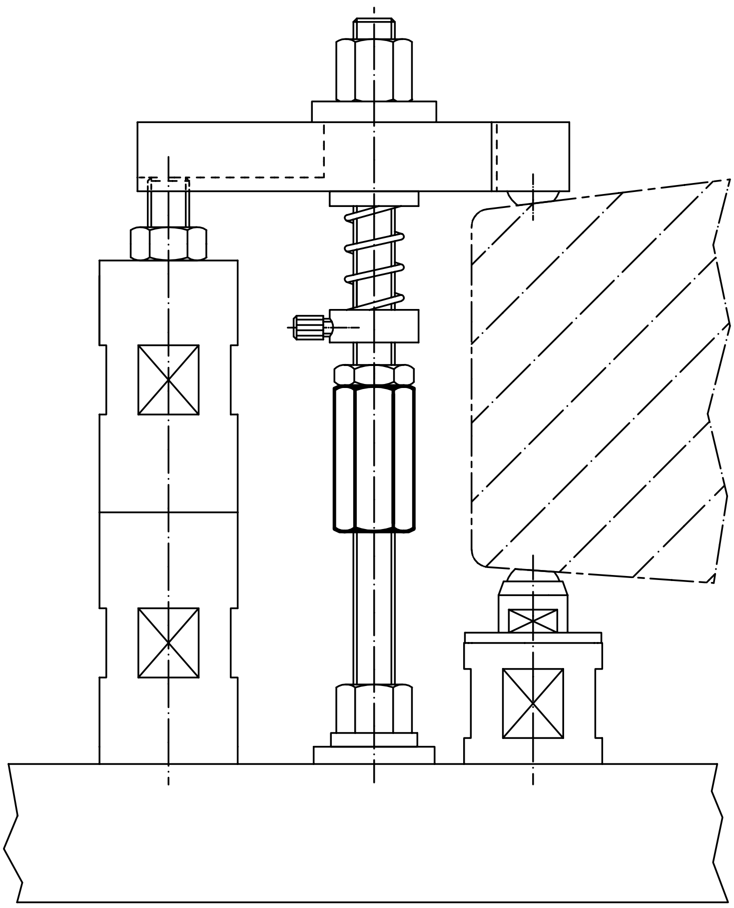
DRAWING



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



8

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

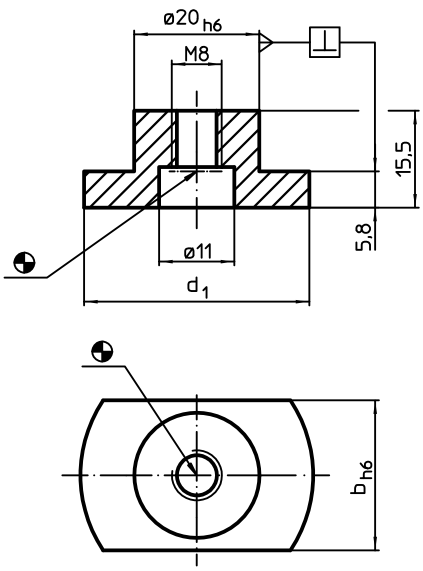
- Steel, case-hardened, blackened, ground

MORE INFORMATION

Further products

Complete Range . . . . → p. 389

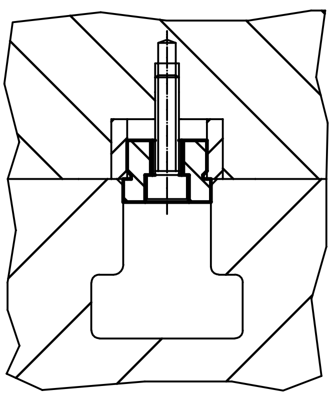
DRAWING



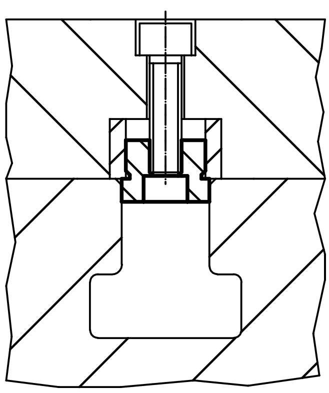
ORDER INFORMATION

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

Centering Pins

EH 23110.

PRODUCT DESCRIPTION

The centering pins are used for centering fixtures on pallets.

Material

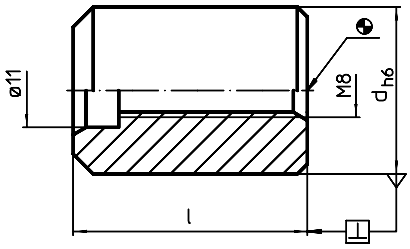
- Alloyed case-hardened steel, case hardened, ground

MORE INFORMATION

Further products

Complete Range . . . . → p. 390

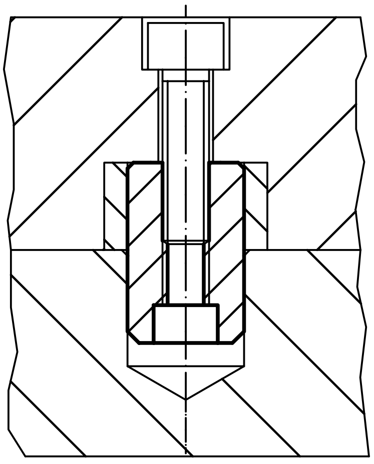
DRAWING

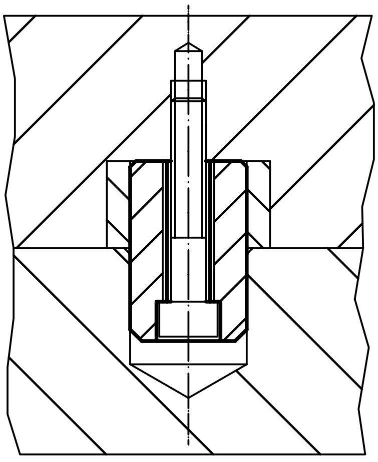


ORDER INFORMATION

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





8

Centering Pins • stepped

EH 23110.

PRODUCT DESCRIPTION

The stepped centering pins are used for centering fixtures on pallets.

Material

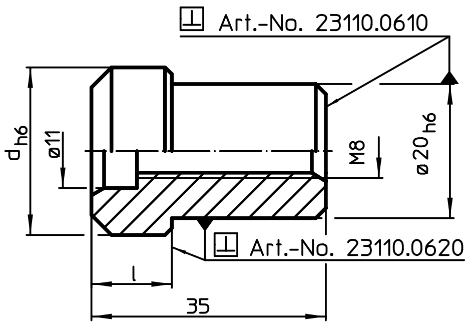
- Alloyed case-hardened steel, case hardened, ground

MORE INFORMATION

Further products

Complete Range . . . . → p. 391

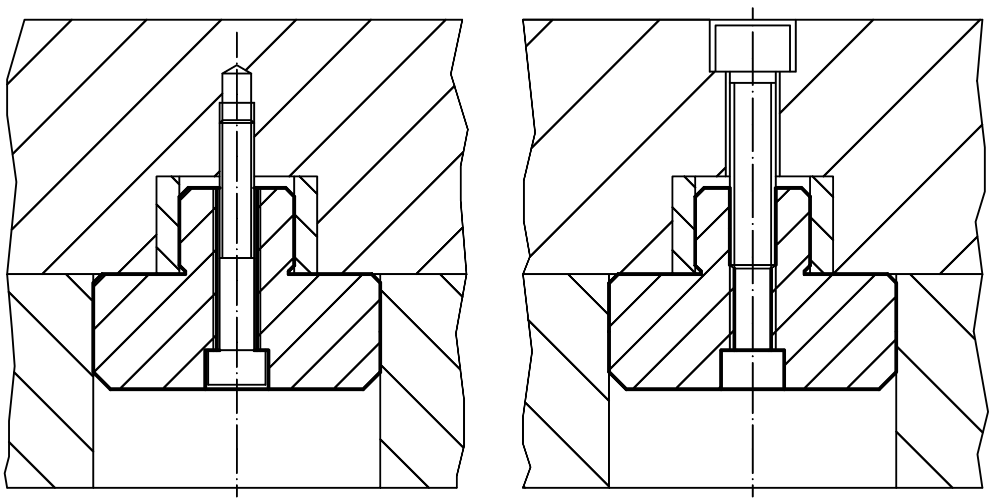
DRAWING



ORDER INFORMATION

System	Dimensions d h6	l	[g]	Art. No.
	[mm]			
V70/L12/L16	**25**	**12**	87	**23110.0610**
	50	**20**	330	**23110.0620**

APPLICATION EXAMPLE



8

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

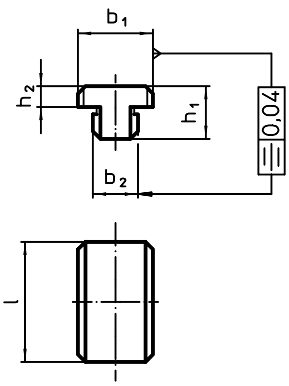
- Steel, case-hardened, blackened, ground

MORE INFORMATION

Further products

Complete Range . . . . → p. 392

DRAWING

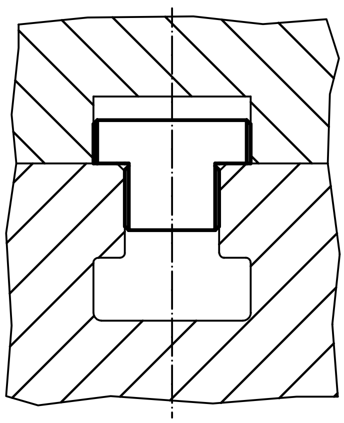


picture 1

ORDER INFORMATION

System	T-slot size fixture b_1 h6 [mm]	T-slot size machine b_2 h6 [mm]	Dimensions h_1	h_2 [mm]	l	[g]	Art. No.
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

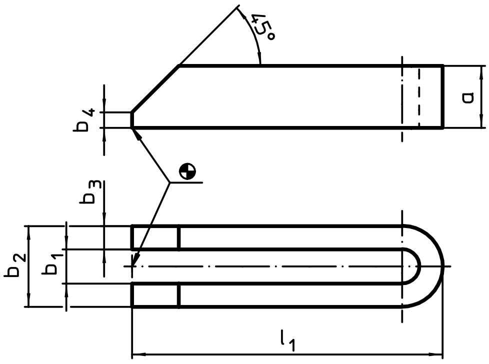
- Heat-treated steel, varnished

MORE INFORMATION

Further products

Complete Range . . . . → p. 408

DRAWING



ORDER INFORMATION

System	Nominal dimension b_1 [mm]	Dimensions l_1	a	b_2	b_3	b_4	For screws [mm]	[inch]	[g]	Art. No.
		[mm]								
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**

8

 Standard Parts for Fixture Systems

Clamps • with nose

EH 23180.

PRODUCT DESCRIPTION

Material

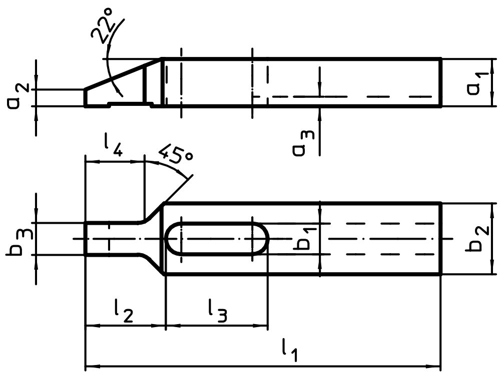
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . → p. 413

DRAWING

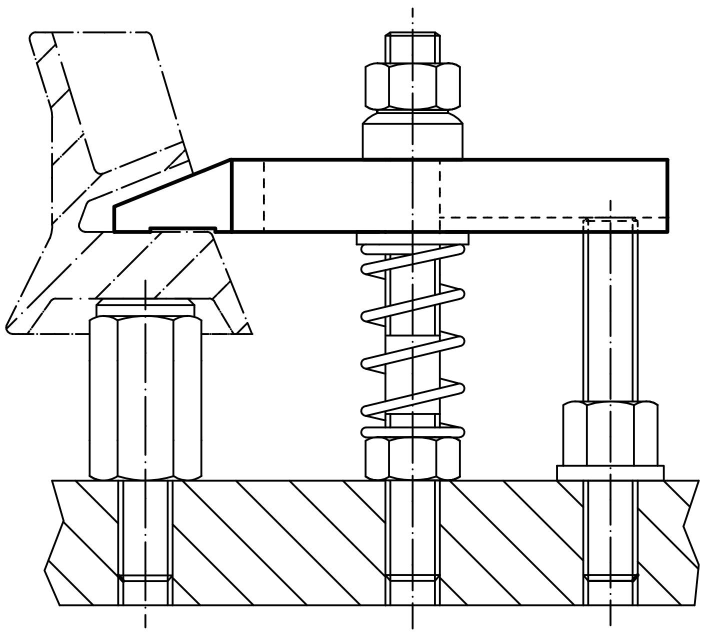


picture 2

ORDER INFORMATION

System	Nominal dimension b_1 [mm]	l_1	a_1	a_2	a_3	b_2	b_3	l_2	l_3	l_4	[g]	Art. No.
		Dimensions [mm]										
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

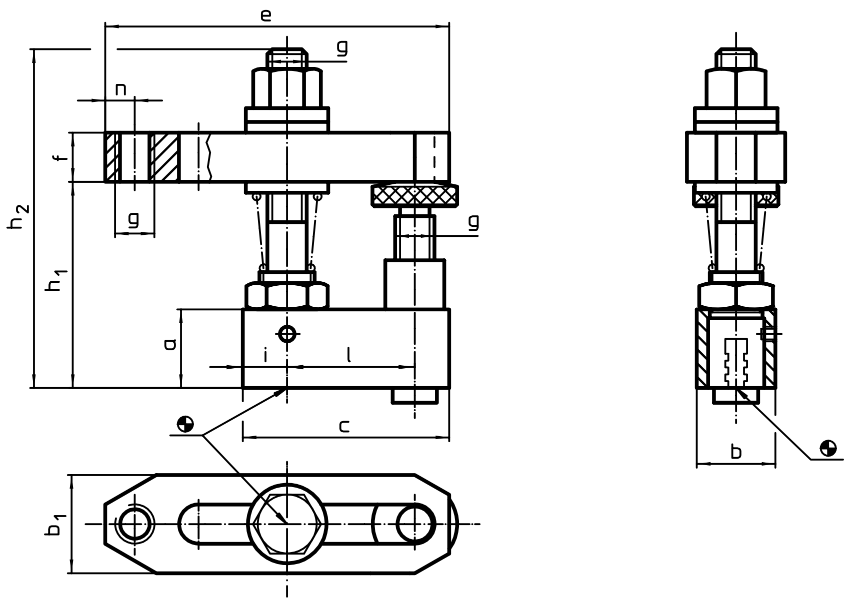
Pull-rod
- Special steel

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

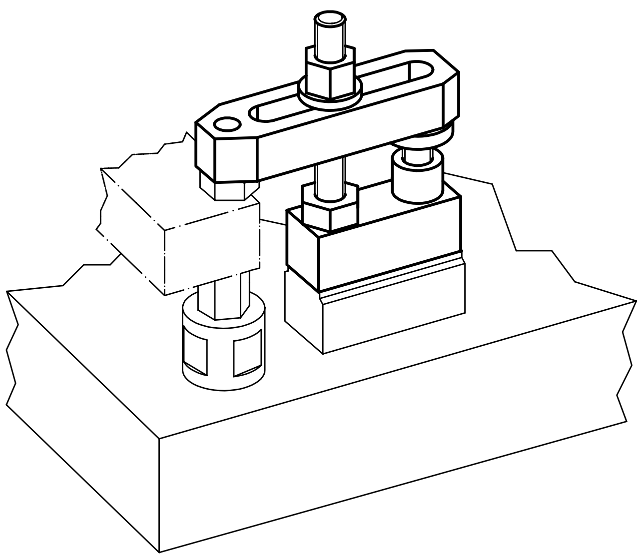
DRAWING



ORDER INFORMATION

System	a	b	c	b_1	e	f	g	h_1	h_2	i	l	n	[g]	Art. No.
	Dimensions [mm]													
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



Straight Clamps • long

EH 23700.

PRODUCT DESCRIPTION

Material

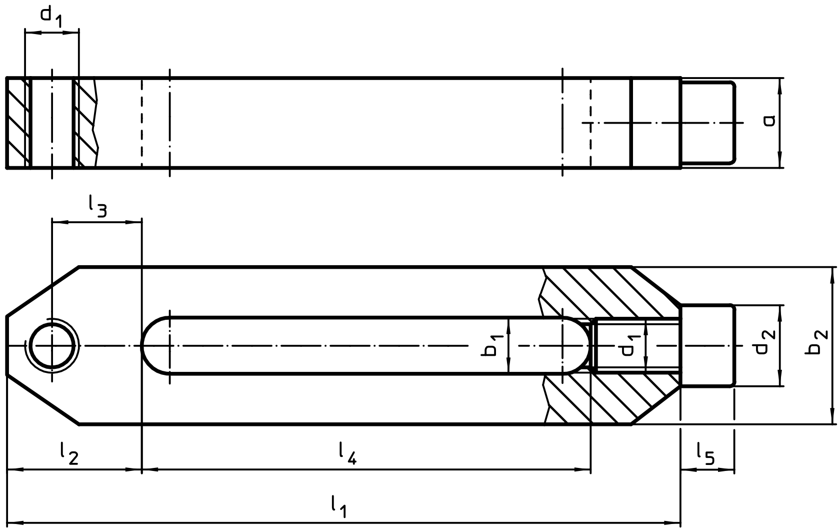
- Heat-treated steel, tempered, blackened

MORE INFORMATION

Further products

Complete Range . . . . → p. 427

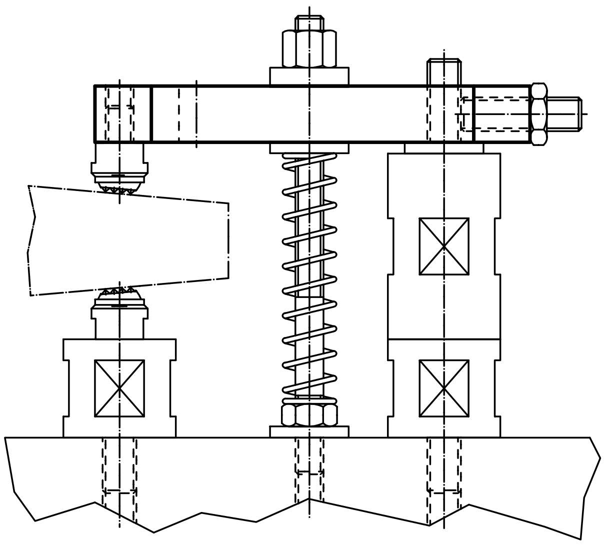
DRAWING

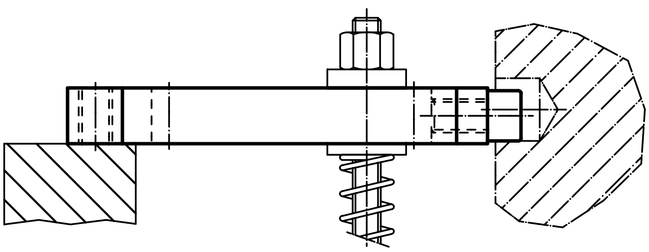


ORDER INFORMATION

System	Dimensions										[g]	Art. No.
	b_1	l_1	a	b_2	d_1	l_2	l_3	l_4	l_5	d_2		
	[mm]											
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





8

Intermediate Elements
EH 23700.

PRODUCT DESCRIPTION

Material

Body
- Steel, blackened

Wearing parts
- Heat-treated steel

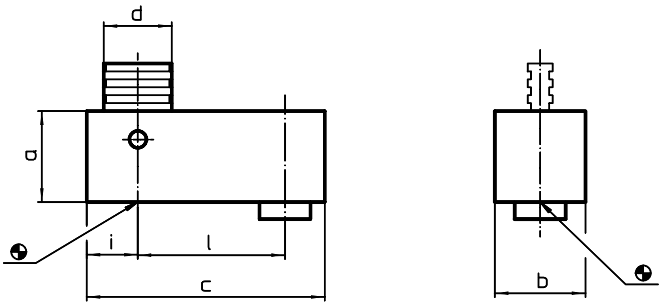
Pull-rod
- Special steel

MORE INFORMATION

Further products

Complete Range . . . . → p. 428

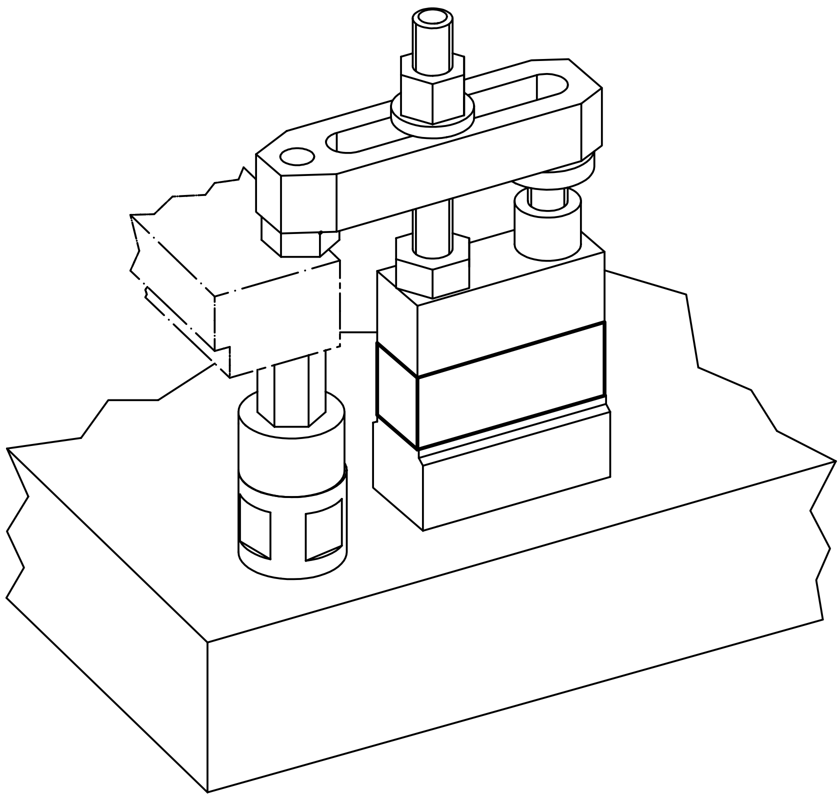
DRAWING



ORDER INFORMATION

System	Dimensions a	b	c	d	i	l	[g]	Art. No.
	[mm]							
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



Base Elements

EH 23700.

PRODUCT DESCRIPTION

Material

Body
- Steel, blackened

Wearing parts
- Heat-treated steel

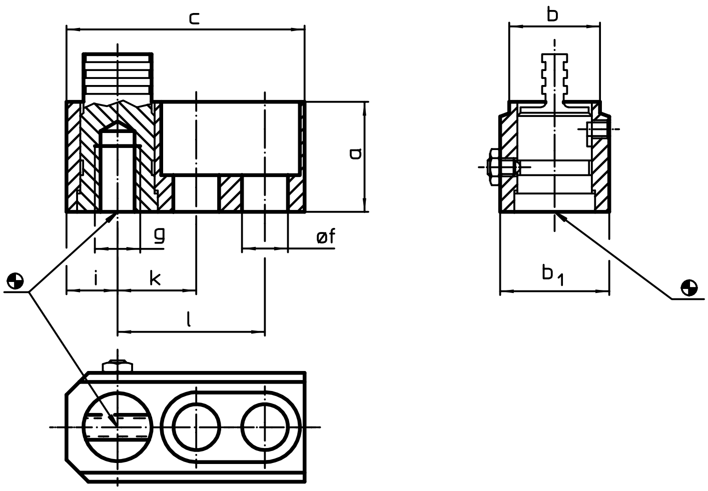
Pull-rod
- Special steel

MORE INFORMATION

Further products

Complete Range . . . . → p. 430

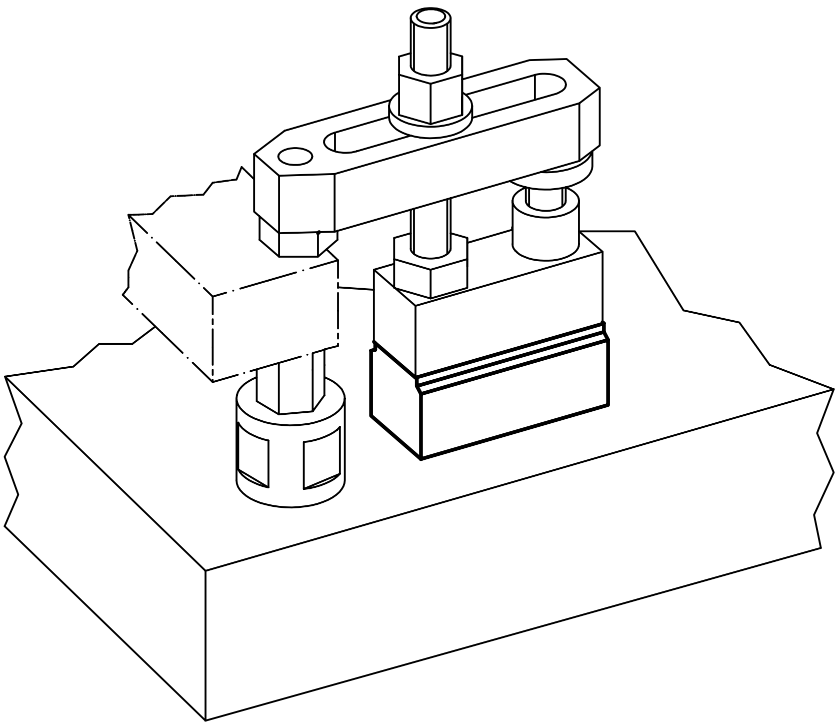
DRAWING



ORDER INFORMATION

System	a	b	c	b_1	f	g	i	k	l	[g]	Art. No.
	Dimensions [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



8

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

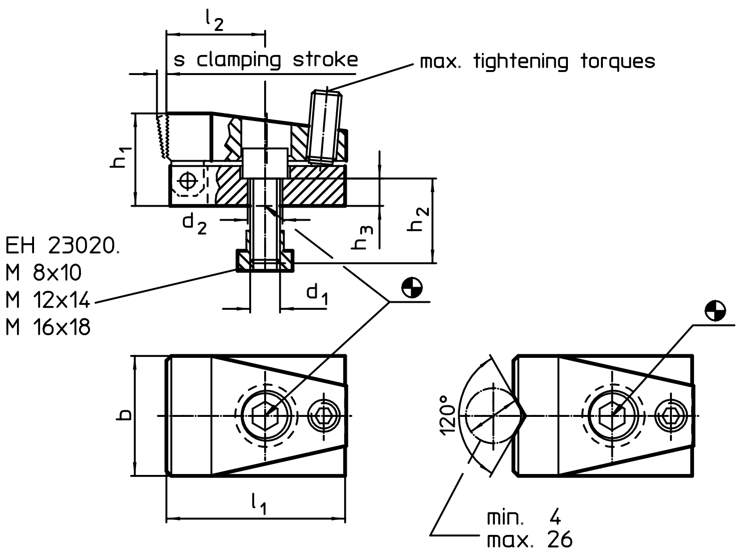
- Steel, case-hardened, blackened, ground

MORE INFORMATION

Further products

Complete Range . . . . → p. 435
Nuts for T-Slots, DIN 508 . . . . → p. 362
Nuts for T-Slots, extended. . . . . → p. 366

DRAWING

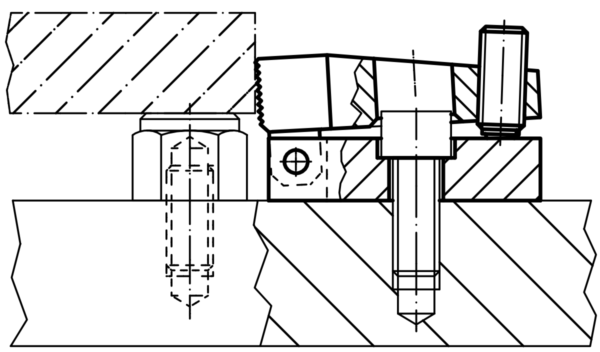


picture 1 picture 2

ORDER INFORMATION

System	T-slot size [mm]	d_1	d_2	b	h_1	h_2	h_3	l_1	l_2	s	Clamping force horizontal max. [kN]	Tightening torque max. [Nm]	[g]	Art. No.
		Dimensions [mm]												
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



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

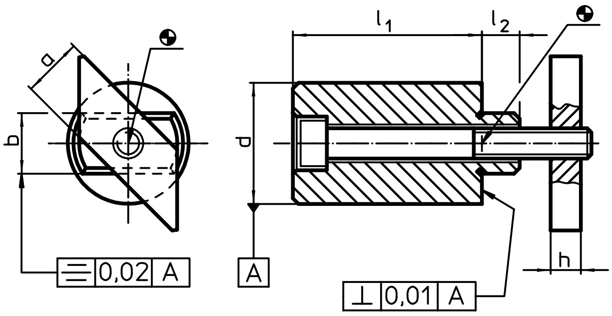
Screw
- Steel, quality 8.8 (ISO 4762)

MORE INFORMATION

Further products

Complete Range . . . . → p. 453

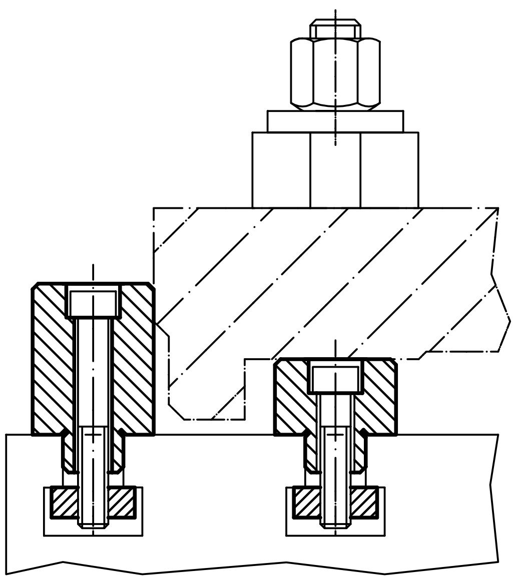
DRAWING



ORDER INFORMATION

System	T-slot size h6	Dimensions					Screw ISO 4762		Art. No.
		l_1	a -0,6	d ±0,01	h	l_2			
	[mm]	[mm]					[mm]	[g]	
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



8

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.

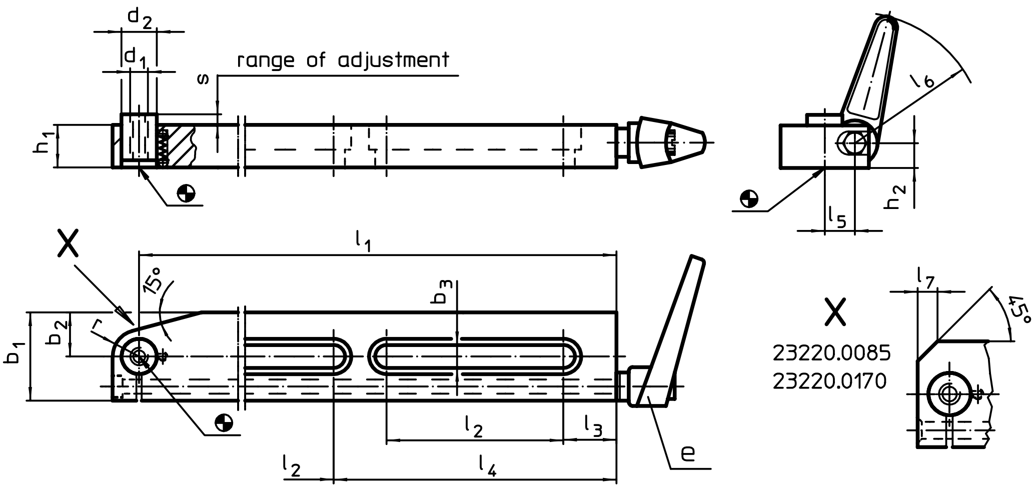
By screwing grub screws or supports into the support pin's female thread, the support height can be adjusted.

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 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	Stroke s	Load capacity max.	e	[g]	Art. No.
	[mm]															[mm]	[kN]			
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

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

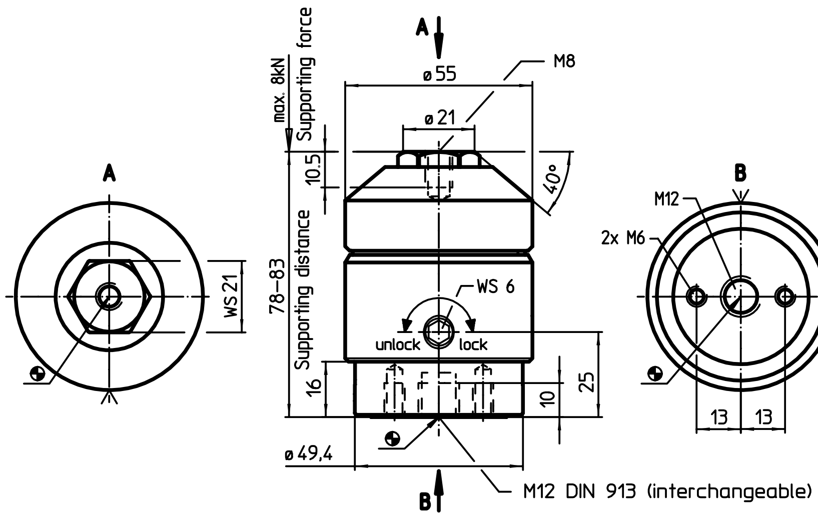
Additional flexible possibility of fitting with holding plate 23210.0740.
In the M 8 threaded pin on the support bolt various locating and seating pins (EH 22...) can be mounted. Custom-made extensions can also be fitted.
The clamping height can be increased using height adjusting cylinders EH 23310. 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

8

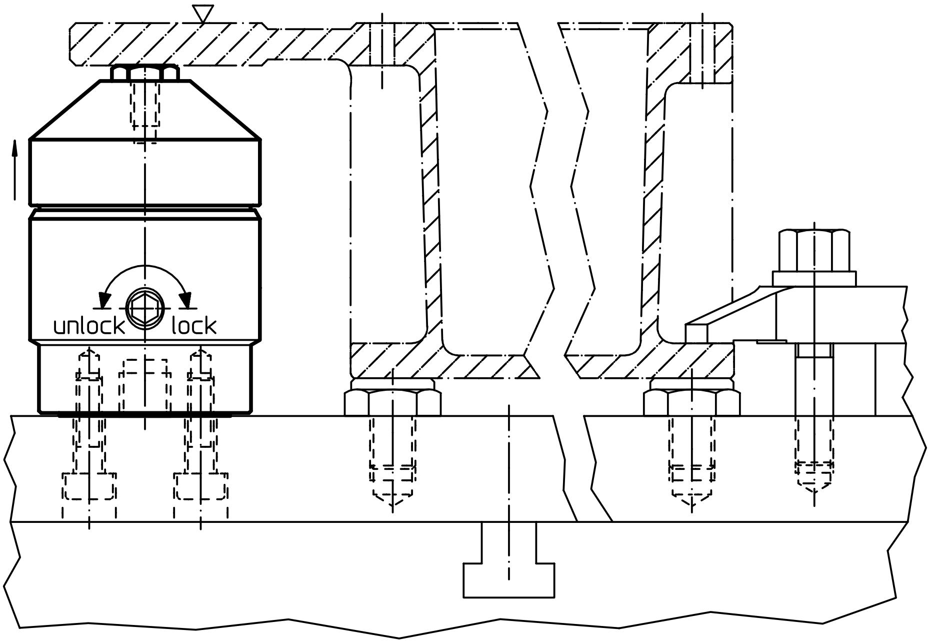
DRAWING

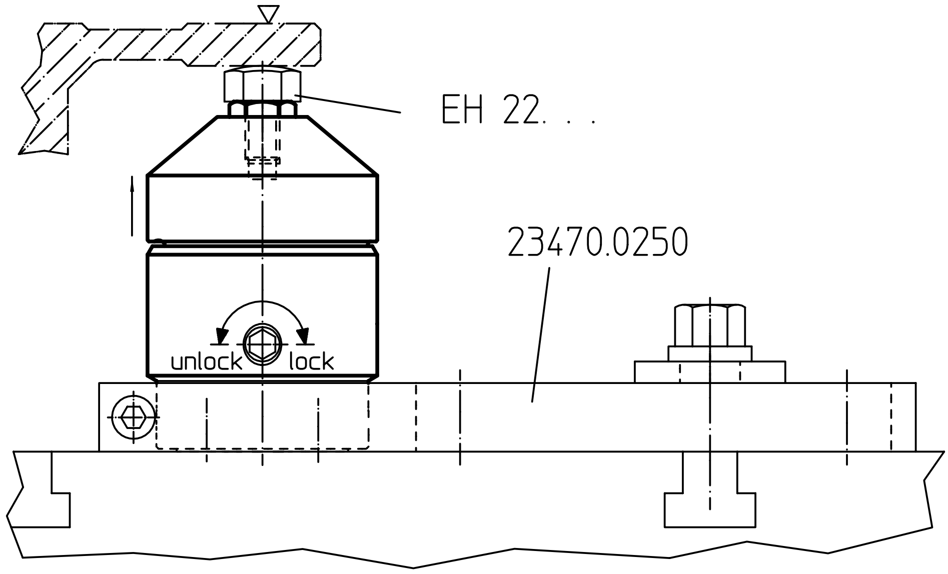


ORDER INFORMATION

System	[g]	Art. No.
V70/L12/L16	950	23220.0400

APPLICATION EXAMPLE





8

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

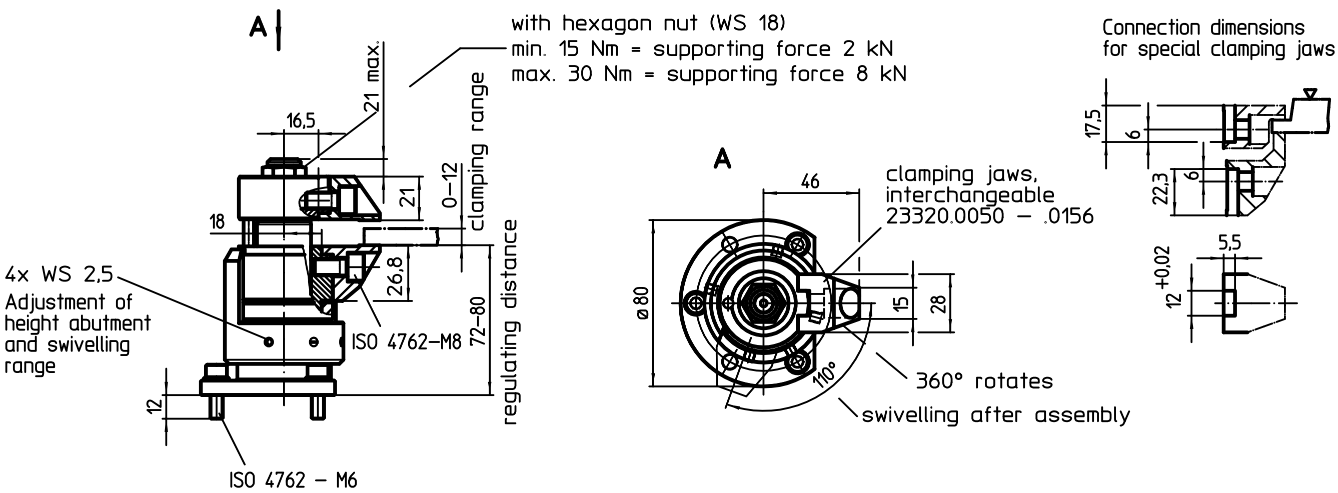
As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050-.0058, as well as pivot jaws, refer to 23320.0148-.0156.

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

8

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

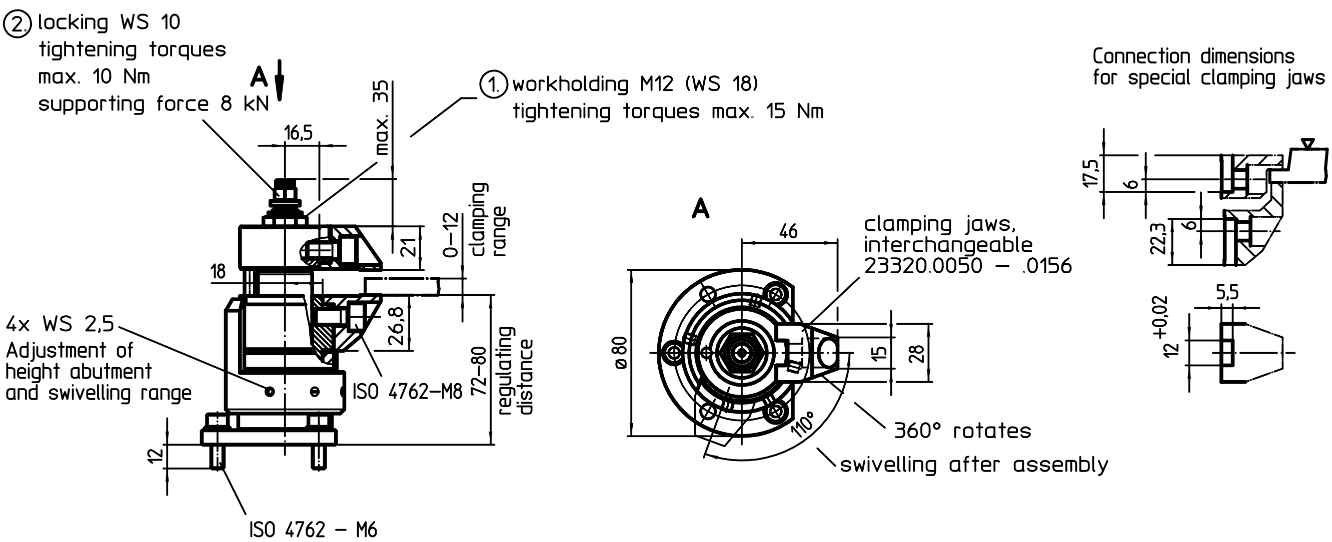
As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050-.0058, as well as pivot jaws, refer to 23320.0148-.0156.

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

8

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70/L12/L16	1650	23320.0010

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

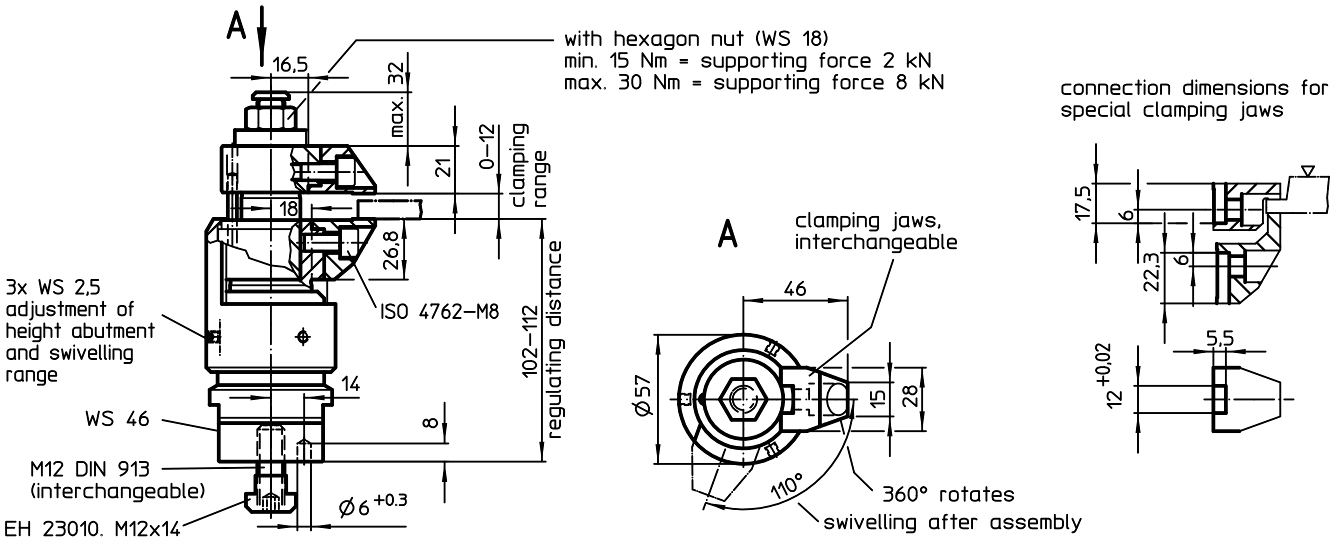
As an accessory, we offer clamping jaws with an increased clamping range, refer to 23320.0050-.0058, as well as pivot jaws, refer to 23320.0148-.0156.

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

8

DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70/L12/L16	2076	23320.0012

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.

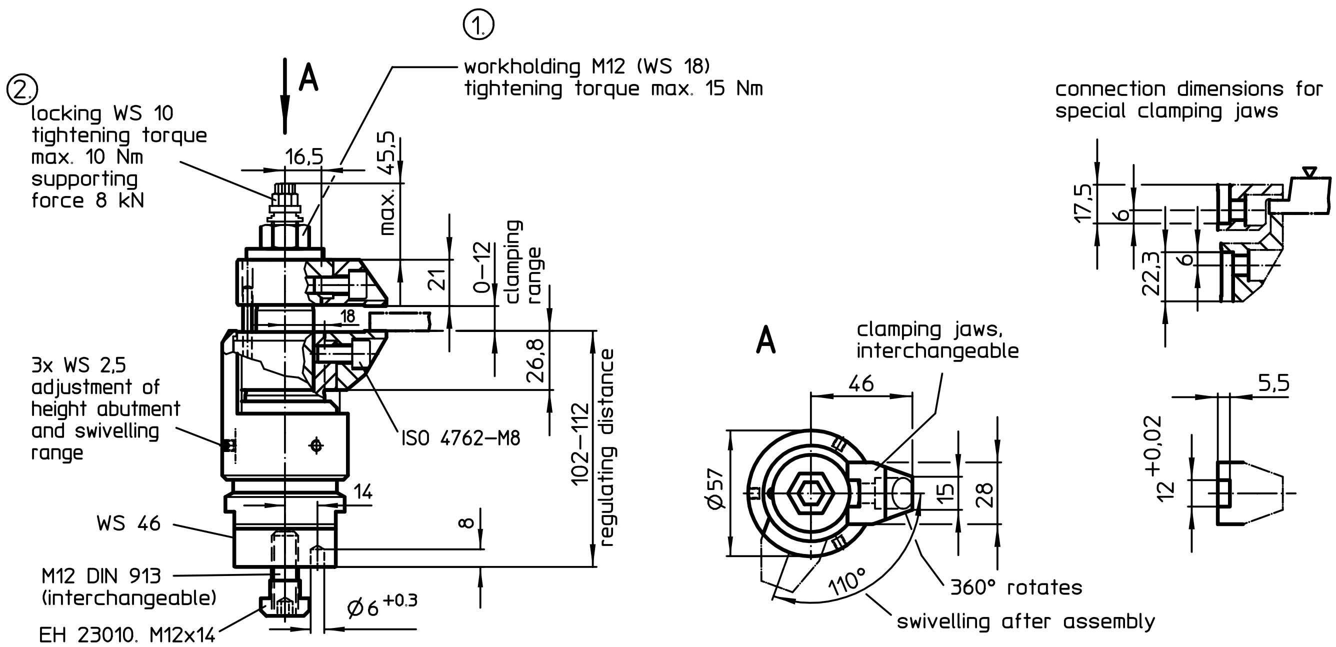
Accessories

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

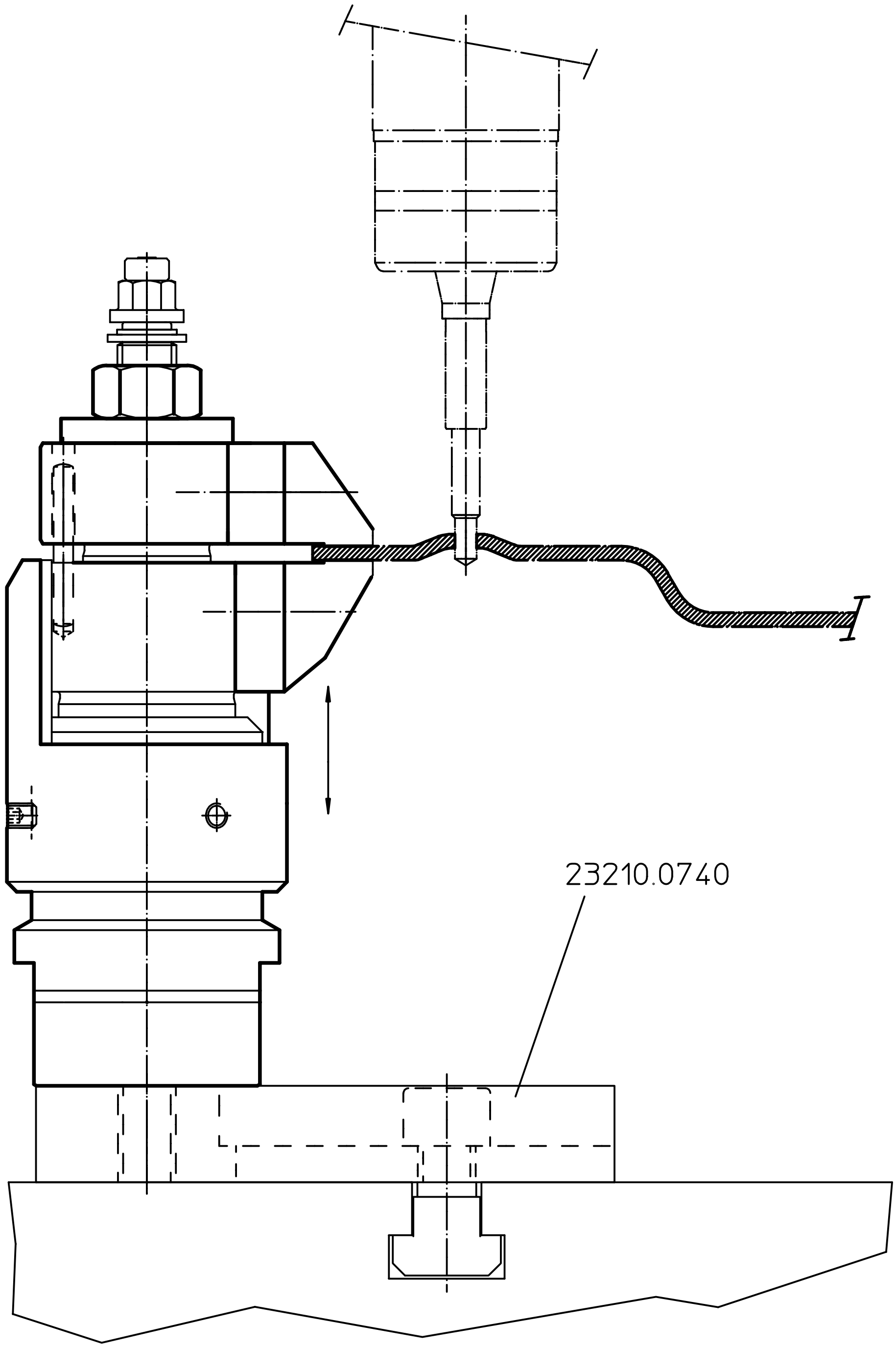
DRAWING



ORDER INFORMATION

System	[g]	Art. No.
V70/L12/L16	1890	23320.0014

APPLICATION EXAMPLE



8

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

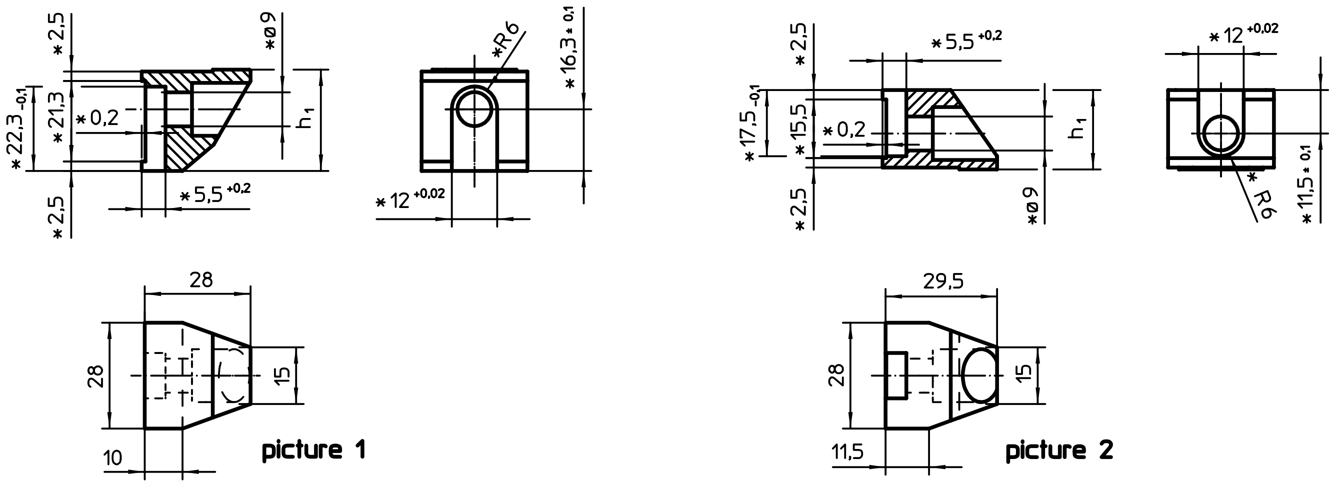
When using custom-made jaws, it is important to insert the tightening screw (M 8-12.9, 43 Nm) 10 mm deep into the clamp housing on the upper clamping jaw and 9 mm deep into the clamp housing on the lower clamping jaw.

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 h1 -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

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

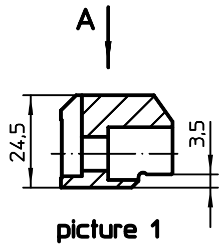
Notes

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.

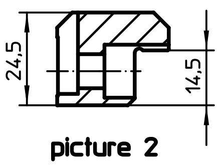
Further products

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

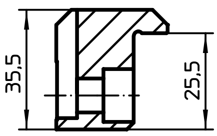
DRAWING



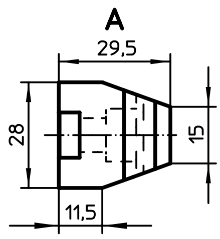
picture 1

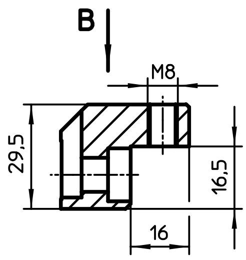


picture 2

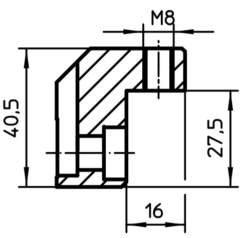


picture 3

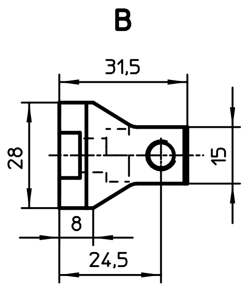


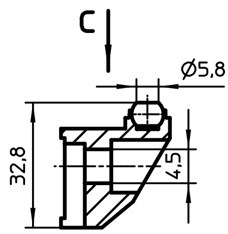


picture 4

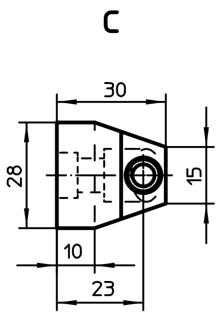


picture 5





picture 6

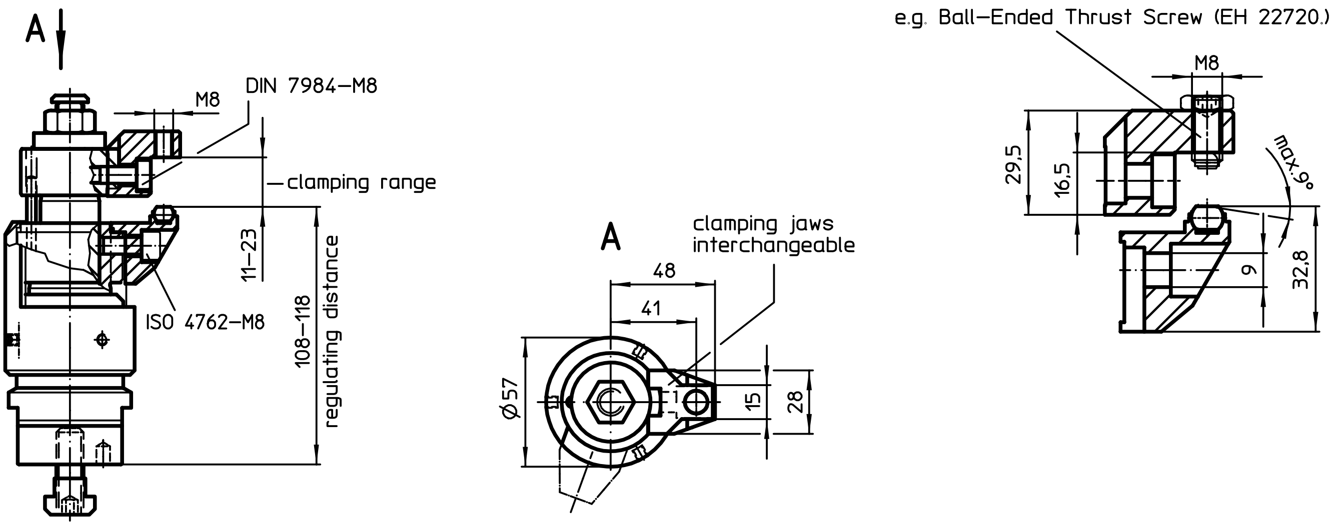


8

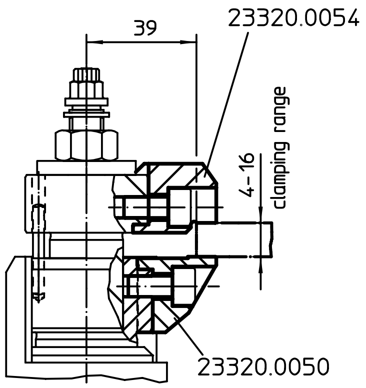
ORDER INFORMATION

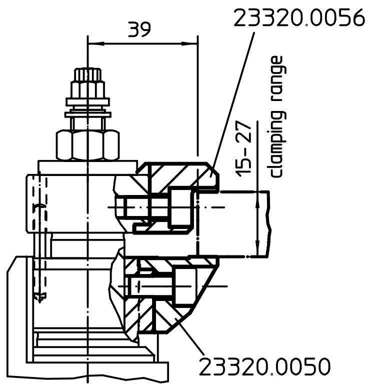
System	Clamping range max. in combination with 23320.0050 [mm]	Clamping range max. in combination with 23320.0148 [mm]	[g]	Art. No.
upper exchange clamping jaw – picture 1				
V70/L12/L16	**4 – 16**	–	91	23320.0054
upper exchange clamping jaw – picture 2				
V70/L12/L16	**15 – 27**	–	88	23320.0056
upper 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

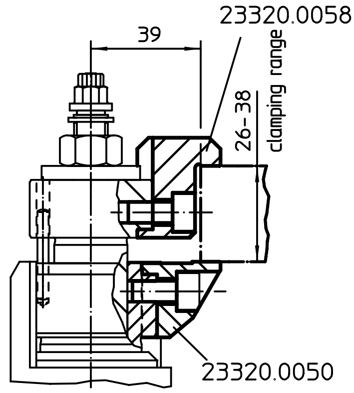
APPLICATION EXAMPLE

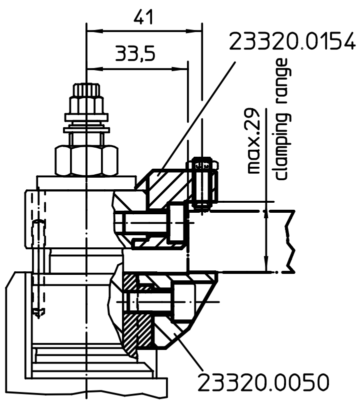


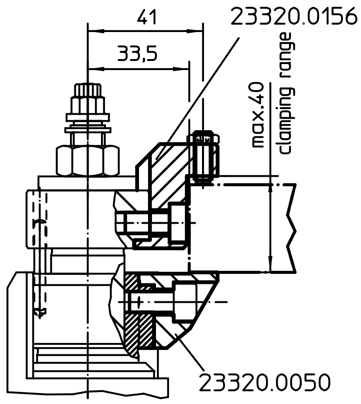
8

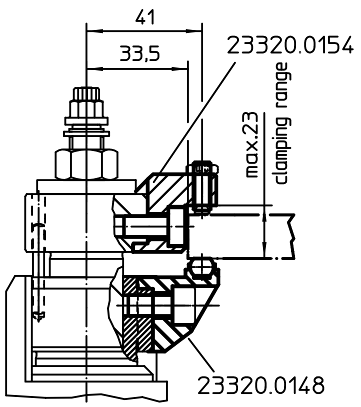

39
23320.0054
4-16
clamping range
23320.0050

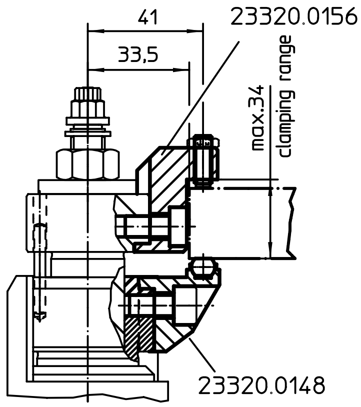

39
23320.0056
15-27
clamping range
23320.0050


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

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

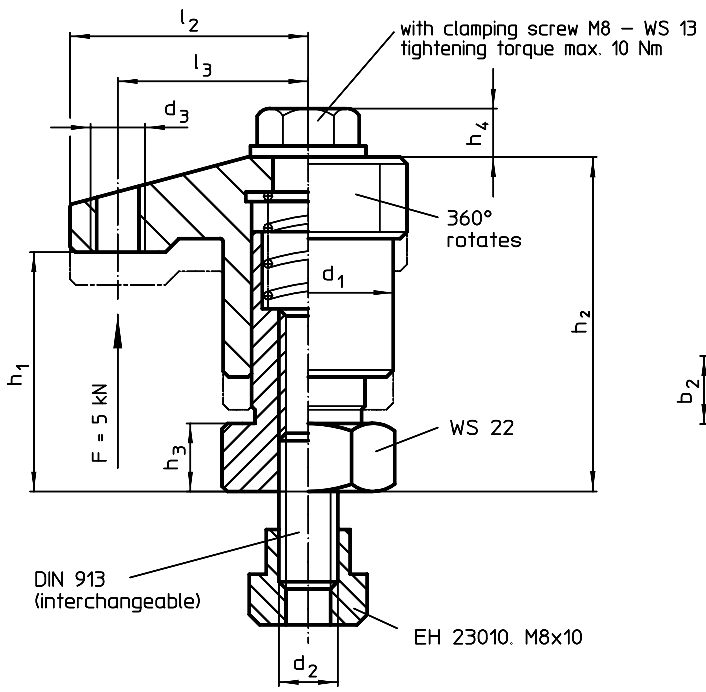
References

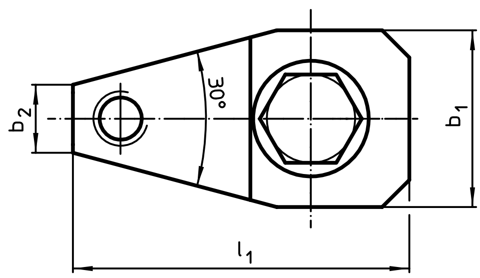
The clamping height can be increased with EH 23310. height adjusting cylinders and EH 1007. washers, and equally lowered by using clamping elements e.g. EH 22730.

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

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

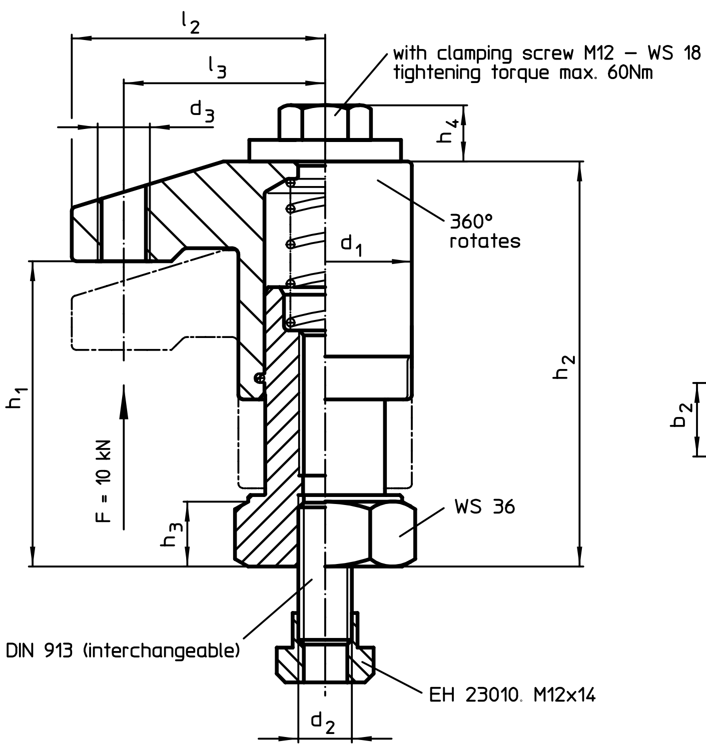
References

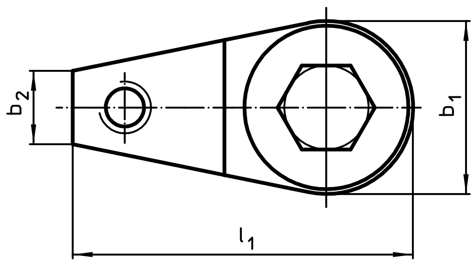
The clamping height can be increased by using height adjusting cylinders EH 23310. and disks EH 1107. and EH 1108. It can be reduced by employing clamping inserts, e.g. EH 22730.

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	d1	b1	b2	d2	d3	h1 min.	h1 max.	h2 min.	h2 max.	h3	h4	l1	l2	l3	Stroke [mm]	[g]	Art. No.
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

Dimensions in [mm].

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

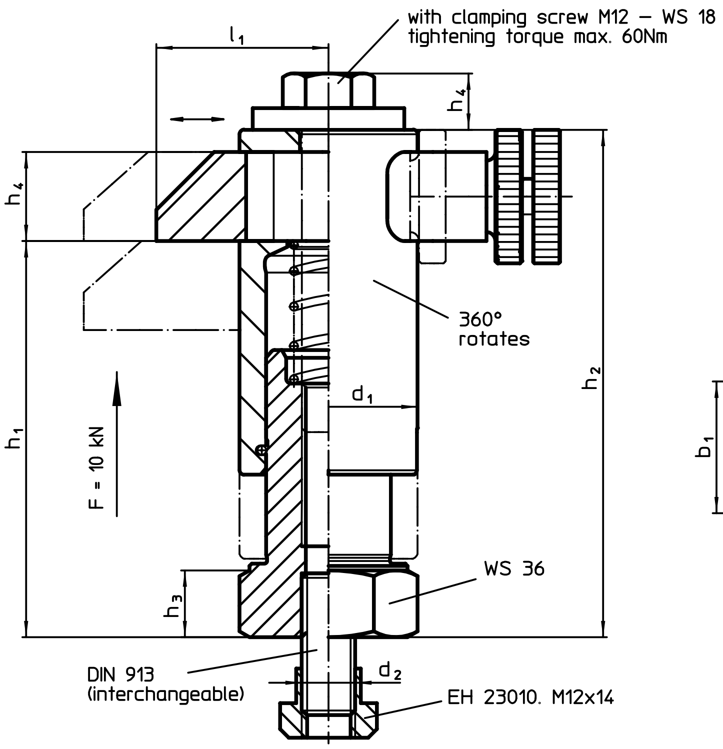
References

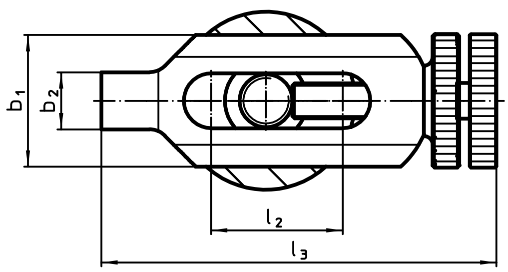
The clamping height can be increased by using height adjusting cylinders EH 23310. and disks EH 1107. and EH 1108. It can be reduced by employing clamping inserts, e.g. EH 22730.

Further products

Complete Range . . . . → p. 502
Positioning Rings, for down-thrust clamp. . . . . → p. 504

DRAWING





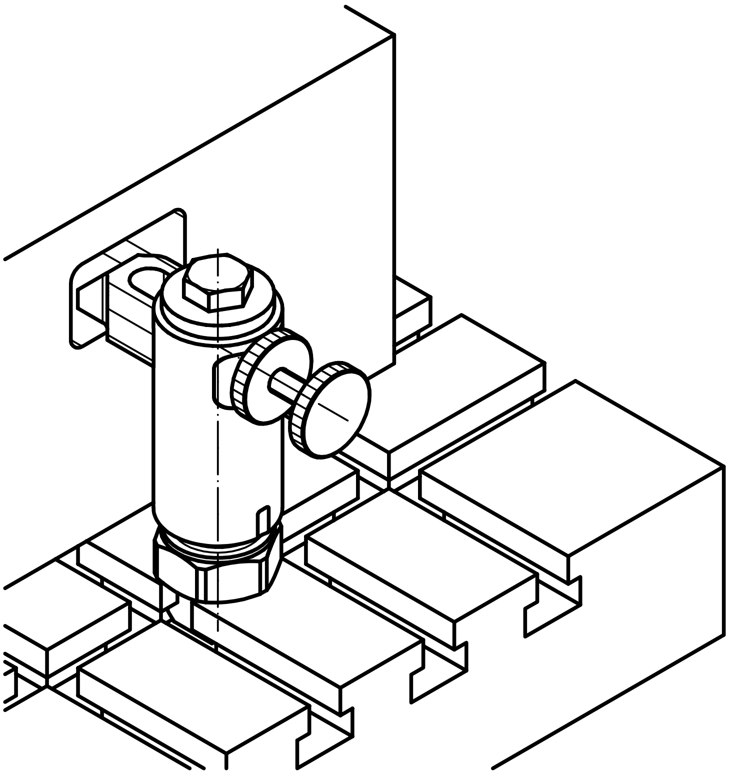
picture 2

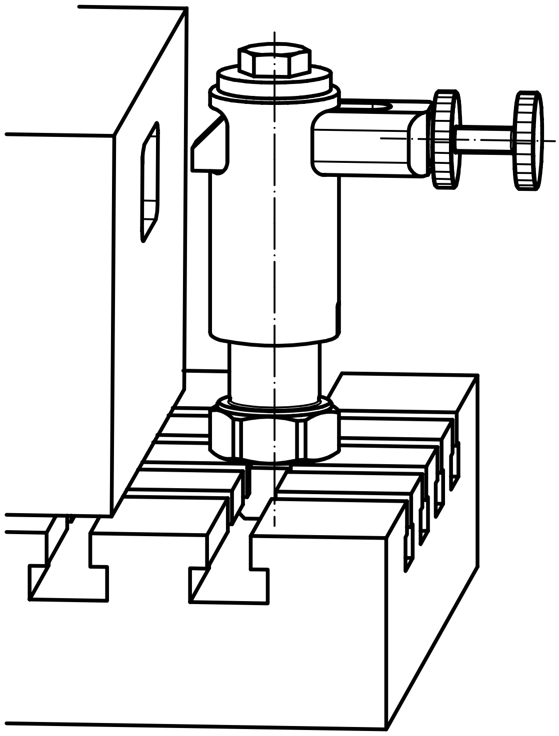
8

ORDER INFORMATION

System	Dimensions 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.	Stroke	Weight	Art. No.
	[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





8

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

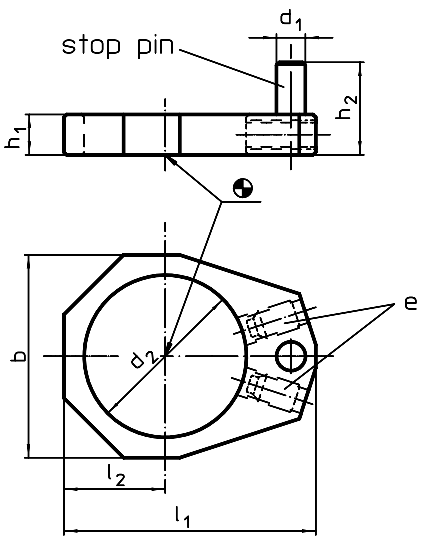
Before mounting the positioning ring, pull-off the clamping claw of down-thrust clamp.

MORE INFORMATION

Further products

Complete Range . . . . → p. 504

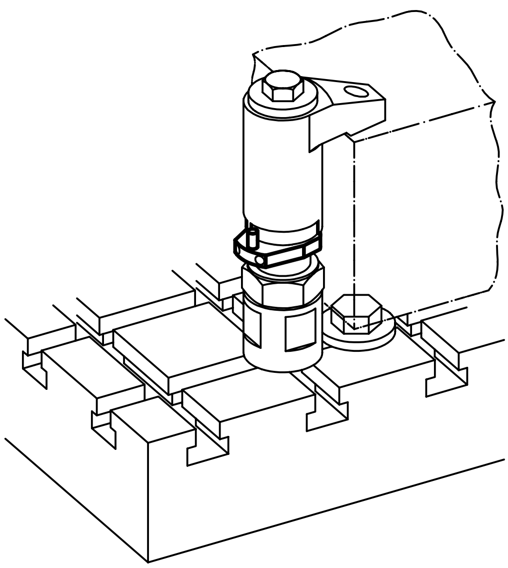
DRAWING



ORDER INFORMATION

System	Dimensions h_1	h_2	d_1	d_2 [mm]	l_1	l_2	b	e	For down-thrust clamp	[g]	Art. No.
V70/L12	**7**	16	5	28	43,5	17,5	35	22760.0052	23310.0050-.0058/23310.0083-.0088	32	23310.0350

APPLICATION EXAMPLE



8

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

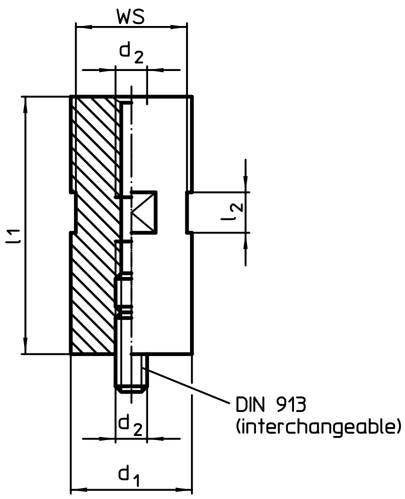
- Steel, case-hardened, blackened, ground

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 [mm]	l_1 ±0,01	d_2	l_2	WS [mm]	[g]	Art. No.
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:

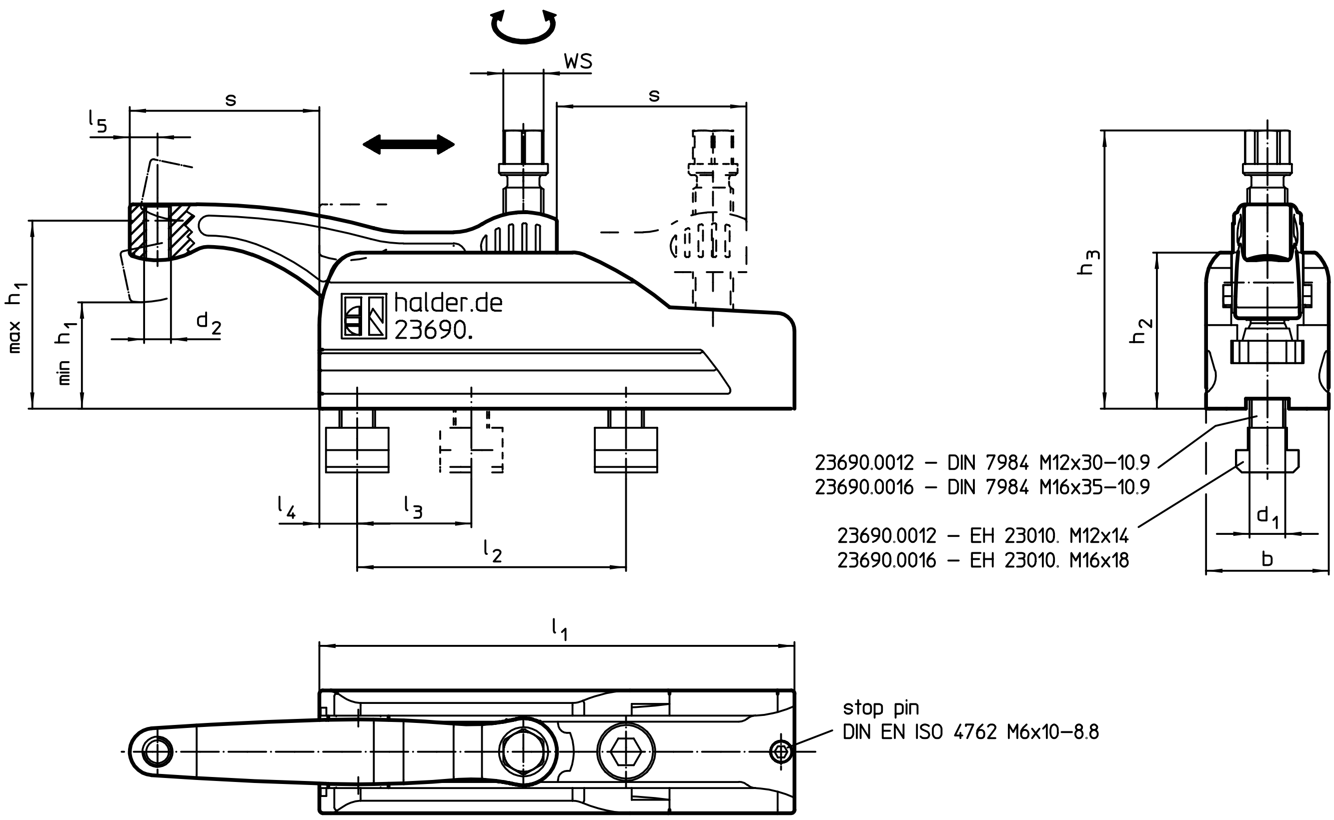
1. Slide clamping lever to clamping position.
2. Clamping is made via a hexagon collar screw.
3. Releasing is done in reverse order.

MORE INFORMATION

Further products

Complete Range . . . . → p. 536
Height Adapters, for compact clamp . . → p. 538

DRAWING



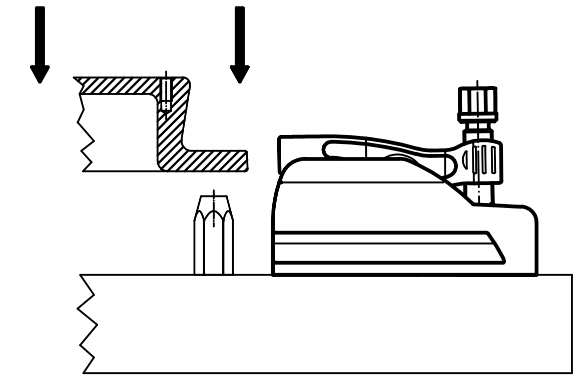
8

ORDER INFORMATION

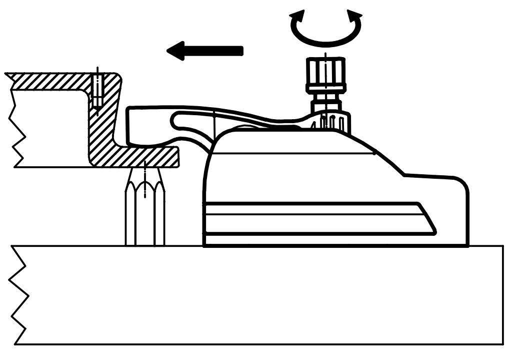
System	Dimensions													WS	Clamping force max.	Tightening torque max.	[g]	Art. No.
	d_1	d_2	h_1 min.	h_1 max.	h_2	h_3	s max.	l_1	l_2 +1	l_3	l_4	l_5	b					
	[mm]													[mm]	[kN]	[Nm]	[g]	
V70/L12	**M12**	M 8	40	60	59	95	43	134	70	50	13	10,0	45	16	15	45	1813	23690.0012
L16	**M16**	M12	47	85	70	126	85	213	120	50	17	12,5	55	18	25	75	4274	23690.0016

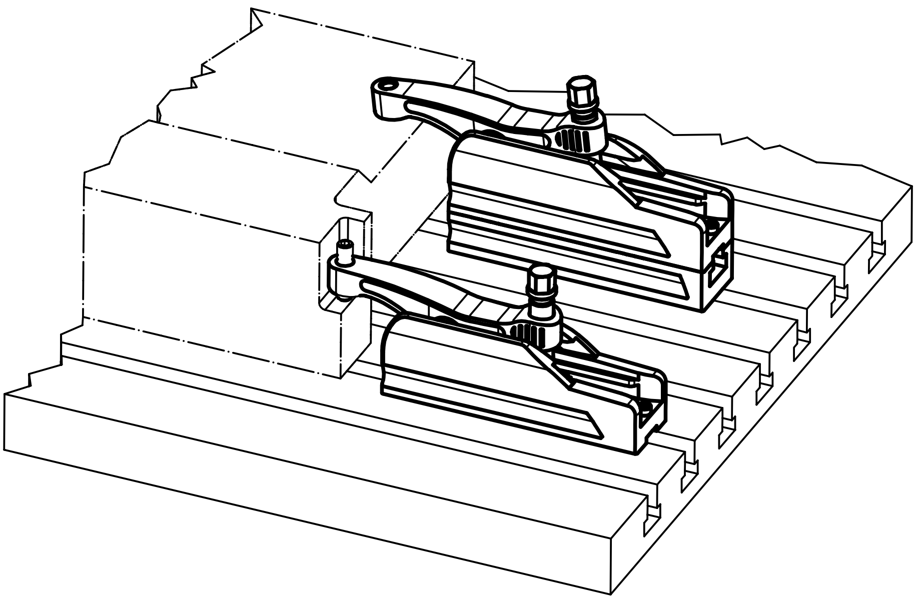
APPLICATION EXAMPLE

I



II





8

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

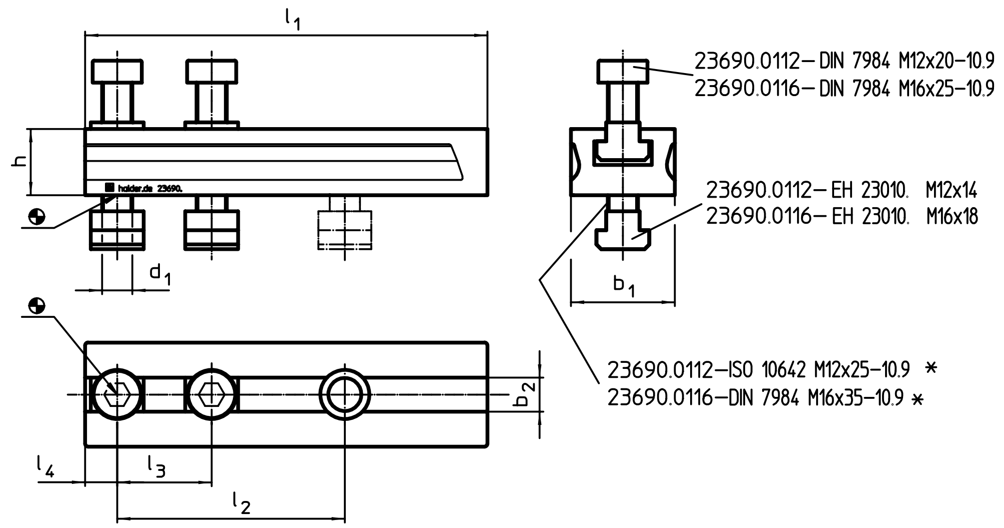
- Heat-treated steel, black coated

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								Weight	Art. No.
	d_1	l_1	l_2 +1	l_3	l_4	h	b_1	b_2 H12		
	[mm]								[g]	
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