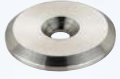


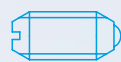
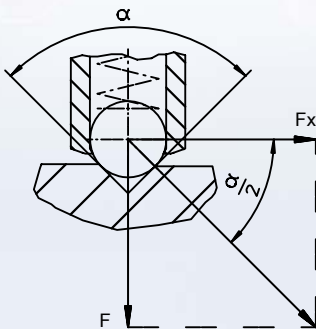
	Product group	Page
	Spring Plungers	50
	Index Plungers / Index Bolts	101
	Lateral Spring Plungers	152
	Locking Elements	183
	Shaft / C-Washers	187
	Ball Lock Connectors	190
	Lifting Pins	195
	Threaded Lifting Pins	206
	Ball Lock Pins	217
	Threaded Lock Pins	275
	Grub Screws / Thrust Pads	280
	Mounting Pads / Fulcrum Screws	285
	Support Legs	291
	Locating and Seating Elements	298
	Ball Elements / Push Elements	317
	Self-Aligning Pads	337
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	Retrieval Systems	352
	Expander® Sealing Plugs	363
	Swing Bolts	375
	Rod Ends	377

SPRING PLUNGERS

METRIC MODELS



CALCULATION OF THE INDEXING RESISTANCE



Standard spring load

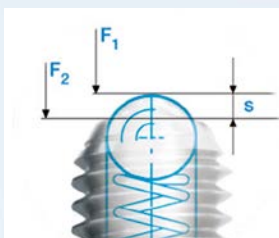


Heavy spring load

Sample calculation for:
 $\alpha = 60^\circ$, $F_x = 1,732 \times F$
 $\alpha = 90^\circ$, $F_x = F$
 $\alpha = 120^\circ$, $F_x = 0,577 \times F$



[www.halder.com/
SpringPlungers-Video](http://www.halder.com/SpringPlungers-Video)



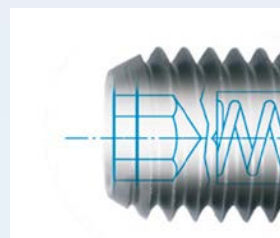
CERTIFIED

Certified spring load F_1 and F_2 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

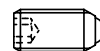
- Ball-bearing steel, hardened
- Stainless steel, hardened

Spring

- Stainless steel

Characteristic

Heavy spring load statt Reinforced spring load



Standard spring load



Heavy spring load

MORE INFORMATION

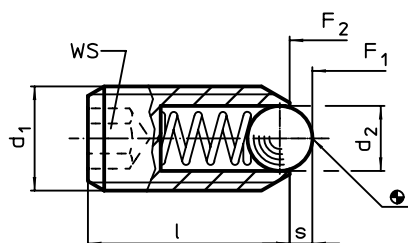
Notes

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, 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 3	1.5	8	1.5	0.4	3.0	4.5	250	0.2	22030.0003
M 4	2.5	12	2.0	0.8	8.5	14.0	250	0.6	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	1.7	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	8.0	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	67.0	22030.0020
M24	15.0	48	12.0	5.5	81.0	151.0	250	105.0	22030.0024
free cutting steel, heavy spring load									
M 3	1.5	8	1.5	0.4	5.0	9.0	250	0.3	22030.0043
M 4	2.5	12	2.0	0.8	12.0	18.0	250	0.6	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	1.7	22030.0046
M 8	4.5	18	4.0	1.5	36.0	62.0	250	4.0	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	67.0	22030.0060
M24	15.0	48	12.0	5.5	127.0	237.0	250	106.0	22030.0064

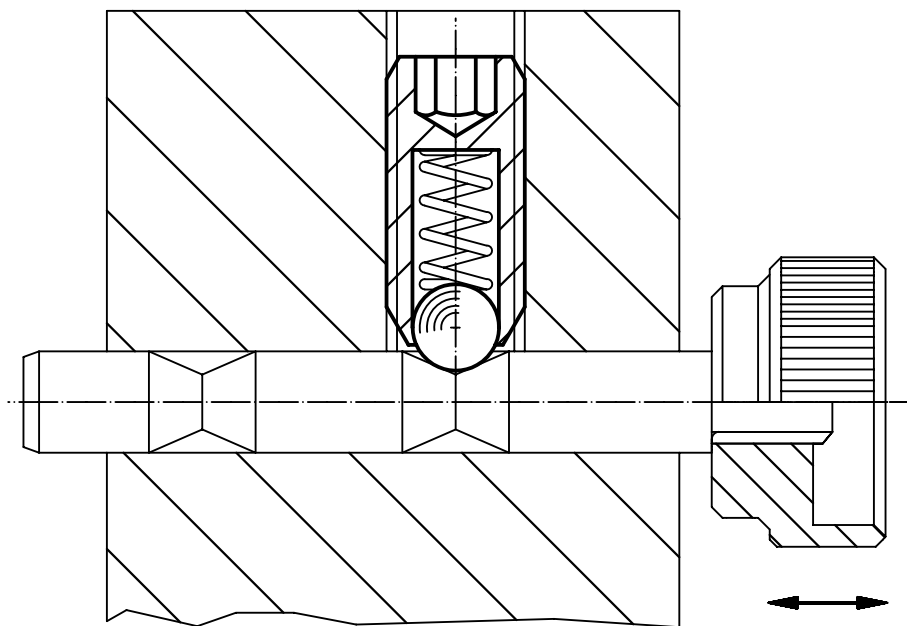
¹⁾ statistical average value



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	0.6	22030.0204
M 5	3.0	14	2.5	0.9	8.0	14.0	250	1.2	22030.0205
M 6	3.5	15	3.0	1.0	11.0	18.0	250	1.7	22030.0206
M 8	4.5	18	4.0	1.5	18.0	31.0	250	4.0	22030.0208
M10	6.0	23	5.0	2.0	24.0	45.0	250	8.0	22030.0210
M12	8.0	26	6.0	2.5	26.0	49.0	250	12.0	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	106.0	22030.0224
stainless steel, heavy spring load									
M 3	1.5	8	1.5	0.4	5.0	9.0	250	0.3	22030.0243
M 4	2.5	12	2.0	0.8	12.0	18.0	250	0.6	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	1.8	22030.0246
M 8	4.5	18	4.0	1.5	36.0	62.0	250	4.0	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	32.0	22030.0256
M20	12.0	43	10.0	4.5	84.0	166.0	250	67.0	22030.0260
M24	15.0	48	12.0	5.5	127.0	237.0	250	106.0	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, nitrided

Body

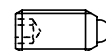
- Free cutting steel, blackened
- Stainless steel 1.4305

Spring

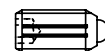
- Stainless steel

Characteristic

Heavy spring load statt Reinforced spring load



Standard spring load



Heavy spring load

MORE INFORMATION

Notes

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

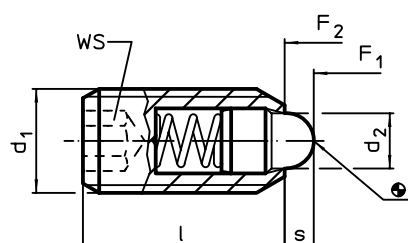
References

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

Further products

Spring Plungers, with pin and internal hexagon - INCH. → p. 93

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	1.2	22030.0105
M 6	2.7	15	3.0	2.0	6.0	17.0	250	1.8	22030.0106
M 8	3.8	18	4.0	2.0	16.0	33.0	250	4.1	22030.0108
M10	4.5	23	5.0	2.5	19.0	42.0	250	8.4	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	68.0	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	1.9	22030.0146
M 8	3.8	18	4.0	2.0	23.0	59.0	250	4.1	22030.0148
M10	4.5	23	5.0	2.5	20.0	54.0	250	8.4	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	68.0	22030.0160
M24	13.0	48	12.0	8.0	91.0	223.0	250	106.0	22030.0164

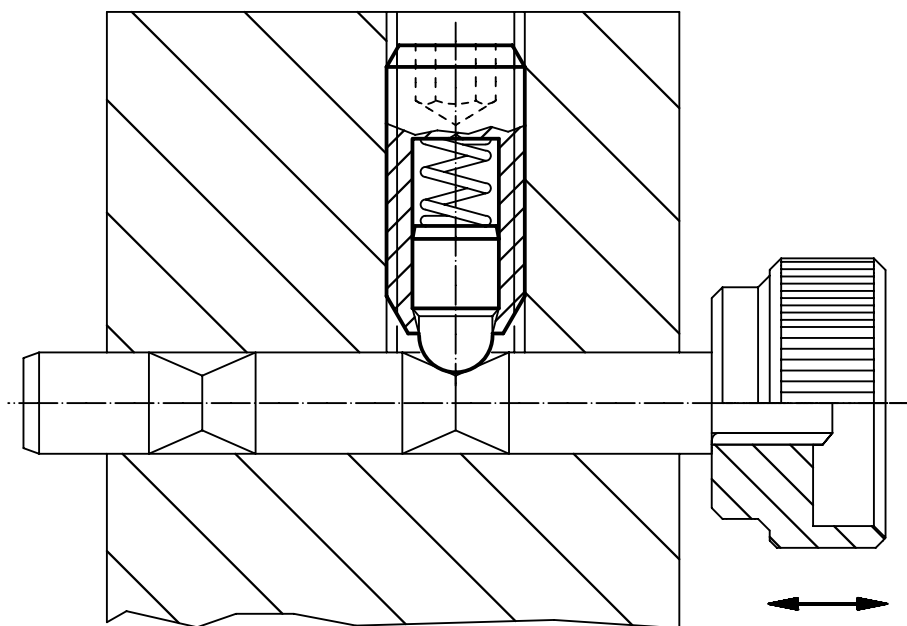
¹⁾ statistical average value



Dimensions			WS	Stroke s	Spring load ¹⁾		max.		Art. No.
d ₁	d ₂	l	[mm]	[mm]	F ₁ ~	F ₂ ~	[°C]	[g]	
stainless steel, standard spring load									
M 4	1.8	12	2.0	1.5	4.5	12.5	250	0.6	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	1.9	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	8.4	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	68.0	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	4.2	22030.0348
M10	4.5	23	5.0	2.5	20.0	54.0	250	8.4	22030.0350
M12	6.2	26	6.0	3.5	38.0	96.0	250	13.0	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	108.0	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

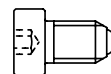
- Stainless steel

Assembly

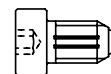
Respect dimension l_3 for M 4 / M 5.

Characteristic

Heavy spring load statt Reinforced spring load



Standard spring load



Heavy spring load

MORE INFORMATION

Notes

Special types on request.

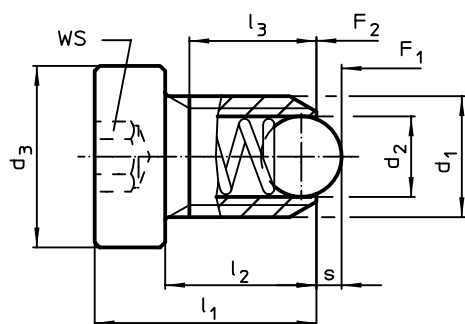
Spring plungers are specially tested for spring range and forces.

References

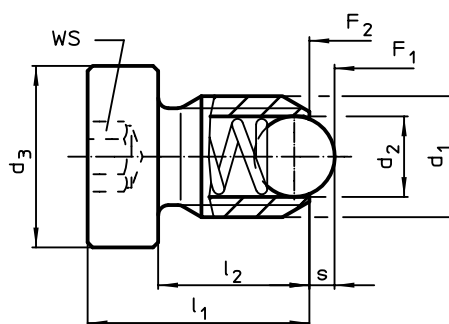
Thread lock on request, please refer to appendix - Technical Data -

Calculation of indexing resistance, please refer to appendix - Technical Data -

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 min.			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	7.8	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	1.1	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	7.8	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

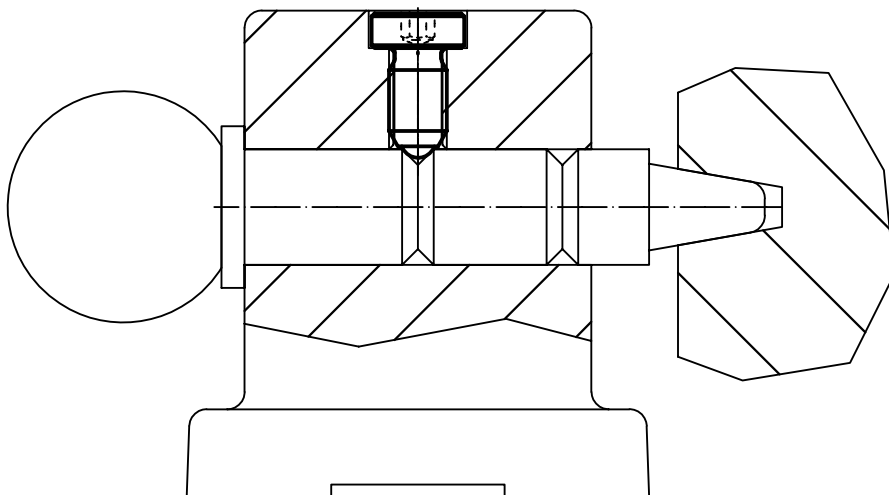
¹⁾ statistical average value



Dimensions						WS	Stroke s	Spring load ¹⁾		 max.		Art. No.
d ₁	d ₂	d ₃	l ₁	l ₂	l ₃ min.	[mm]	[mm]	F ₁ ~	F ₂ ~	[°C]	[g]	
[mm]												
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	0.9	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	7.9	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	22.0	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.

Another advantage of the plastic ball is the electric insulation.

Material

Body

- Free cutting steel, blackened
- Stainless steel 1.4305

Bearing

- Plastic

Ball

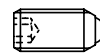
- Ball-bearing steel, hardened
- Stainless steel, hardened

Spring

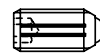
- Stainless steel

Characteristic

Heavy spring load statt Reinforced spring load



Standard spring load



Heavy spring load

MORE INFORMATION

Notes

Special types on request.

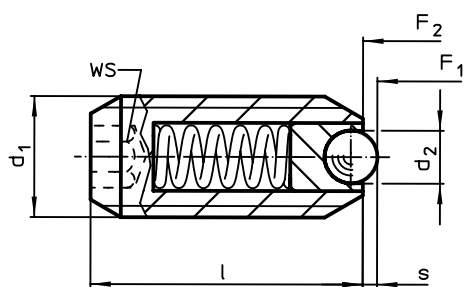
Spring plungers are specially tested for spring range and forces.

References

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

Calculation of indexing resistance, 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 ~	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	1.0	22031.0005
M 6	2.5	15	3.0	0.70	6.3	10.0	-30	90	1.6	22031.0006
M 8	3.5	18	4.0	0.95	16.0	24.0	-30	90	3.7	22031.0008
M10	4.5	23	5.0	1.40	18.8	31.7	-30	90	7.4	22031.0010
M12	6.5	26	6.0	2.50	24.0	49.0	-30	90	11.0	22031.0012
M16	8.5	33	8.0	3.10	38.0	68.0	-30	90	30.0	22031.0016
free cutting steel, heavy spring load										
M 5	2.0	14	2.5	0.50	10.0	14.0	-30	90	1.1	22031.0045
M 6	2.5	15	3.0	0.70	11.0	16.0	-30	90	1.6	22031.0046
M 8	3.5	18	4.0	0.95	23.0	40.0	-30	90	3.7	22031.0048
M10	4.5	23	5.0	1.40	28.0	54.3	-30	90	7.4	22031.0050
M12	6.5	26	6.0	2.50	36.5	77.3	-30	90	12.0	22031.0052
M16	8.5	33	8.0	3.10	50.0	88.7	-30	90	30.0	22031.0056

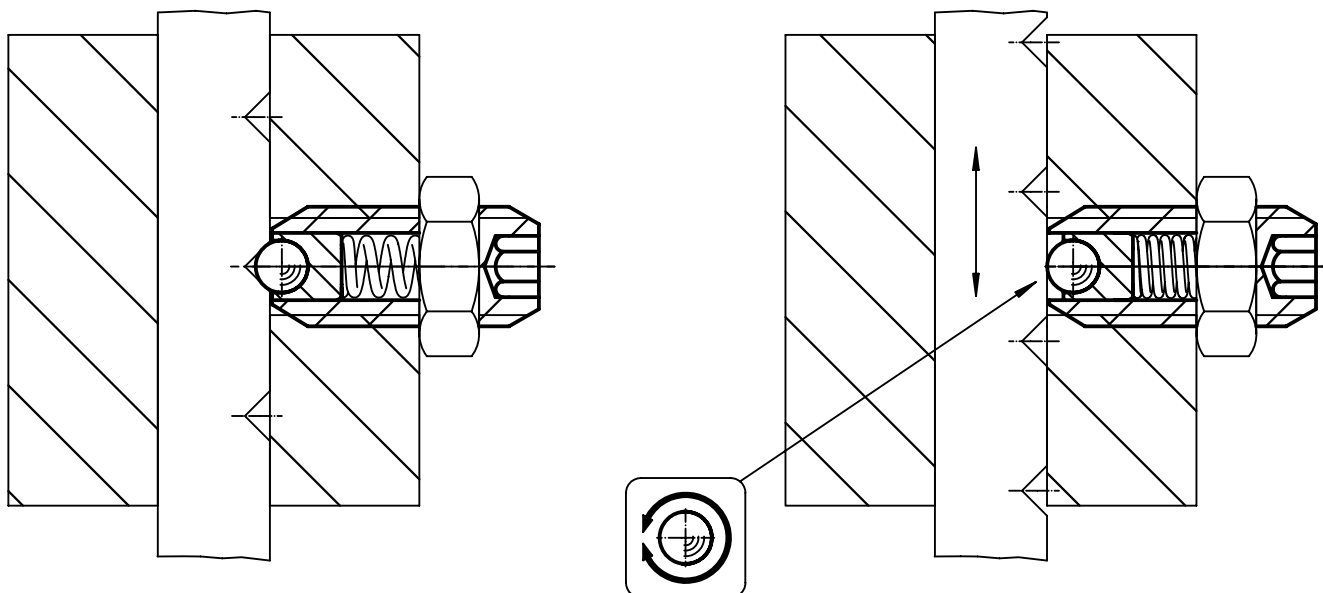
¹⁾ statistical average value



Dimensions			WS	Stroke s	Spring load ¹⁾		 min. max.	 [g]	Art. No.	
d ₁	d ₂	l			F ₁ ~	F ₂ ~				
[mm]			[mm]	[mm]	[N]		[°C]			
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	1.6	22031.0206
M 8	3.5	18	4.0	0.95	16.0	24.0	-30	90	3.7	22031.0208
M10	4.5	23	5.0	1.40	18.8	31.7	-30	90	7.5	22031.0210
M12	6.5	26	6.0	2.50	24.0	49.0	-30	90	11.0	22031.0212
M16	8.5	33	8.0	3.10	38.0	68.0	-30	90	30.0	22031.0216
stainless steel, heavy spring load										
M 5	2.0	14	2.5	0.50	10.0	14.0	-30	90	1.1	22031.0245
M 6	2.5	15	3.0	0.70	11.0	16.0	-30	90	1.6	22031.0246
M 8	3.5	18	4.0	0.95	23.0	40.0	-30	90	3.7	22031.0248
M10	4.5	23	5.0	1.40	28.0	54.3	-30	90	7.4	22031.0250
M12	6.5	26	6.0	2.50	36.5	77.3	-30	90	11.0	22031.0252
M16	8.5	33	8.0	3.10	50.0	88.7	-30	90	31.0	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

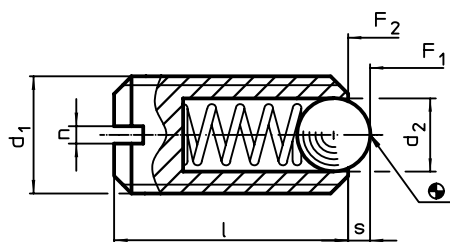
Special types on request.

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, please refer to appendix - Technical Data -

DRAWING

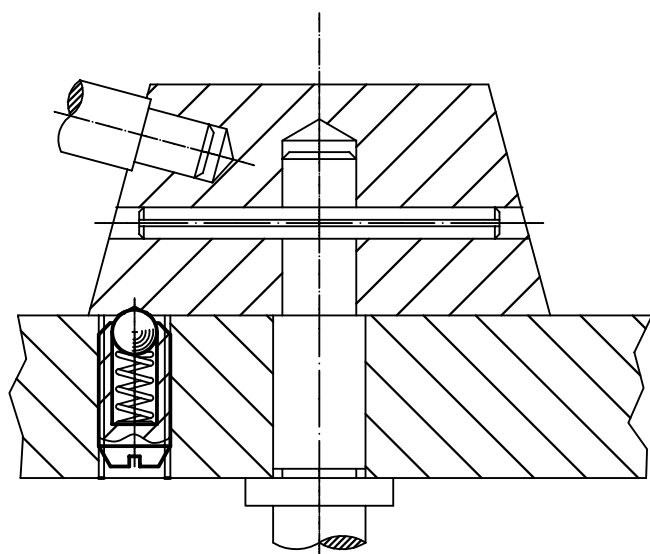


ORDER INFORMATION

Dimensions				Stroke s	Spring load ¹⁾		 min. max.		 [g]	Art. No.
d ₁	d ₂	l	n		F ₁ ~	F ₂ ~	[°C]			
[mm]				[mm]	[N]					
ball from stainless steel										
M 6	3.5	14	1.0	0.9	12	17	-30	50	0.5	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	2.5	22040.0010
ball from thermoplastic										
M 6	3.5	14	1.0	0.9	12	17	-30	50	0.4	22040.0406
M 8	5.0	16	1.2	1.5	20	35	-30	50	0.9	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.



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

MORE INFORMATION

Notes

Special types on request.

Spring plungers are specially tested for spring range and forces.

References

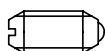
Thread lock on request, please refer to appendix - Technical Data -

Calculation of indexing resistance, please refer to appendix - Technical Data -

Further products

Spring Plungers, with ball and slot -

INCH → p. 96

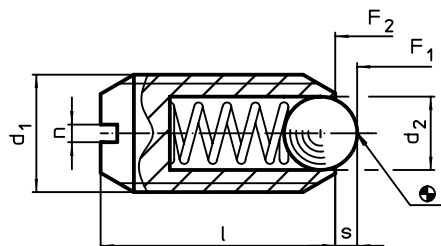


Standard spring load



Heavy spring load

DRAWING



ORDER INFORMATION

Dimensions				Stroke s	Spring load ¹⁾				Art. No.
d ₁	d ₂	l	n		F ₁ ~	F ₂ ~	max.		
[mm]				[mm]	[N]		[°C]	[g]	
free cutting steel, standard spring load									
M 2	1.0	4	0.25	0.3	0.8	1.5	250	0.1	22050.0002
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	6.5	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	22.0	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 2	1.0	4	0.25	0.3	1.6	2.0	250	0.1	22050.0202
M 3	1.5	7	0.40	0.4	6.4	9.5	250	0.3	22050.0203
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	6.7	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	45.0	22050.0220
M24	15.0	34	3.00	5.5	127.0	237.0	250	72.0	22050.0224

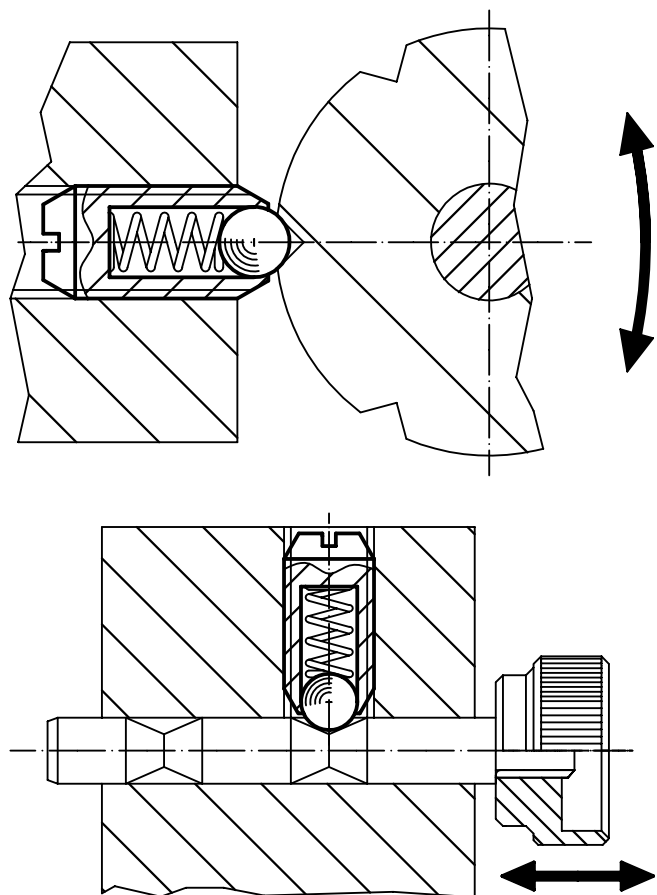
¹⁾ statistical average value



Dimensions				Stroke s	Spring load ¹⁾		 max. [°C]	 [g]	Art. No.
d ₁	d ₂	l	n		F ₁ ~	F ₂ ~			
[mm]				[mm]	[N]				
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	0.5	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	3.6	22050.0408
M10	6.0	19	1.50	2.0	24.0	45.0	250	6.6	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	22.0	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	73.0	22050.0424
stainless steel, heavy spring load									
M 2	1.0	4	0.25	0.3	1.6	2.0	250	0.1	22050.0602
M 3	1.5	7	0.40	0.4	6.4	9.5	250	0.3	22050.0603
M 4	2.5	9	0.60	0.8	12.0	18.0	250	0.5	22050.0604
M 5	3.0	12	0.80	0.9	15.0	22.0	250	1.0	22050.0605
M 6	3.5	14	1.00	1.0	19.0	28.0	250	1.7	22050.0606
M 8	4.5	16	1.20	1.5	36.0	62.0	250	3.7	22050.0608
M10	6.0	19	1.50	2.0	57.0	104.0	250	6.8	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	73.0	22050.0624

¹⁾ statistical average value

APPLICATION EXAMPLE



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

EH 22050.



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

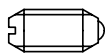
Spring

- 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.

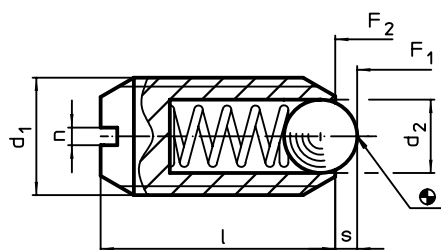
References

Thread lock on request, please refer to appendix - Technical Data -
Calculation of indexing resistance, please refer to appendix - Technical Data -

Further products

Spring Plungers, with moveable ceramic ball and slot, stainless steel A4 → p. 69

DRAWING



ORDER INFORMATION

Dimensions				Stroke s	Spring load ¹⁾				Art. No.
d ₁	d ₂	l	n		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	3.4	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	9.6	22050.1412
M16	10.0	24	2.0	3.5	41.0	86	250	21.0	22050.1416
stainless steel A4, heavy spring load									
M 4	2.5	9	0.6	0.8	12.0	18	250	0.4	22050.1604
M 5	3.0	12	0.8	0.9	15.0	22	250	1.0	22050.1605
M 6	3.5	14	1.0	1.0	19.0	28	250	1.6	22050.1606
M 8	4.5	16	1.2	1.5	36.0	62	250	3.5	22050.1608
M10	6.0	19	1.5	2.0	57.0	104	250	6.3	22050.1610
M12	8.0	22	2.0	2.5	61.0	110	250	9.6	22050.1612
M16	10.0	24	2.0	3.5	68.0	142	250	21.0	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, nitrided

Body

- Free cutting steel, blackened
- Stainless steel 1.4305

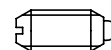
Spring

- 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

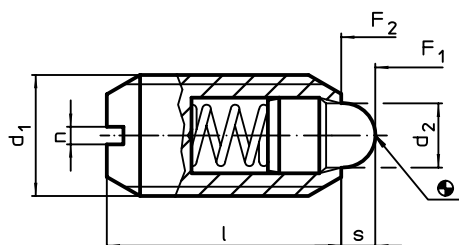
Thread lock on request, please refer to appendix - Technical Data -

Further products

Spring Plungers, with pin and slot -

INCH → p. 90

DRAWING



ORDER INFORMATION

Dimensions				Stroke s	Spring load ¹⁾				Art. No.
d ₁	d ₂	l	n		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	7.0	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	22.0	22050.0116
M20	10.0	30	2.5	6.5	39.0	81.0	250	45.0	22050.0120
M24	13.0	34	3.0	8.0	72.0	155.0	250	72.0	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	22.0	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	73.0	22050.0324

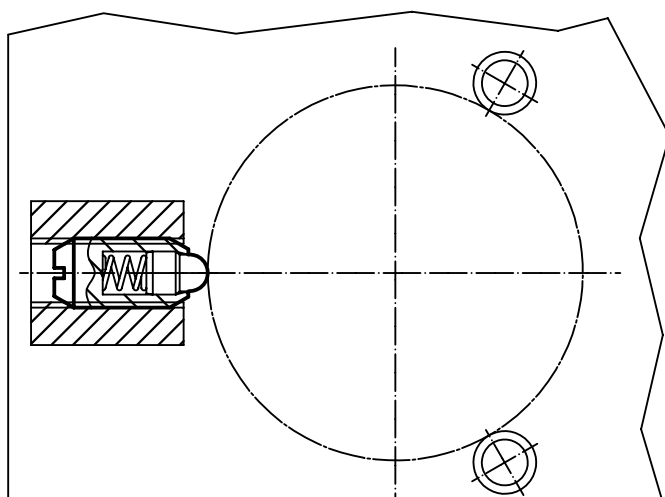
¹⁾ statistical average value



Dimensions				Stroke s	Spring load ¹⁾		 max. [°C]	 [g]	Art. No.
d ₁	d ₂	l	n		F ₁ ~	F ₂ ~			
[mm]				[mm]	[N]				
stainless steel, standard spring load									
M 4	1.8	9	0.6	1.5	4.5	12.5	250	0.4	22050.0504
M 5	2.4	12	0.8	2.0	5.0	13.0	250	1.1	22050.0505
M 6	2.7	14	1.0	2.0	6.0	17.0	250	1.8	22050.0506
M 8	3.8	16	1.2	2.0	16.0	33.0	250	3.8	22050.0508
M10	4.5	19	1.5	2.5	19.0	42.0	250	7.0	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	22.0	22050.0516
M20	10.0	30	2.5	6.5	39.0	81.0	250	46.0	22050.0520
M24	13.0	34	3.0	8.0	72.0	155.0	250	73.0	22050.0524
stainless steel, heavy spring load									
M 6	2.7	14	1.0	2.0	11.0	25.0	250	1.8	22050.0706
M 8	3.8	16	1.2	2.0	23.0	59.0	250	3.8	22050.0708
M10	4.5	19	1.5	2.5	20.0	54.0	250	7.0	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	46.0	22050.0720
M24	13.0	34	3.0	8.0	91.0	223.0	250	74.0	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

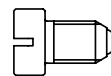
- Stainless steel

Assembly

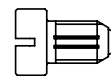
Respect dimension l_3 for M 4 / M 5.

Characteristic

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



Standard spring load



Heavy spring load

MORE INFORMATION

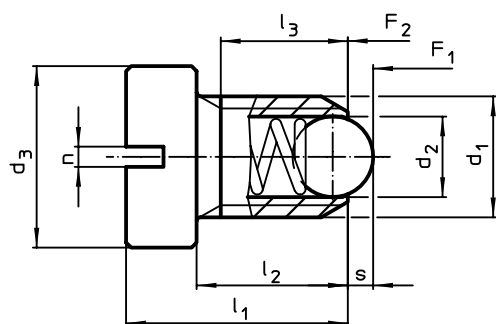
Notes

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

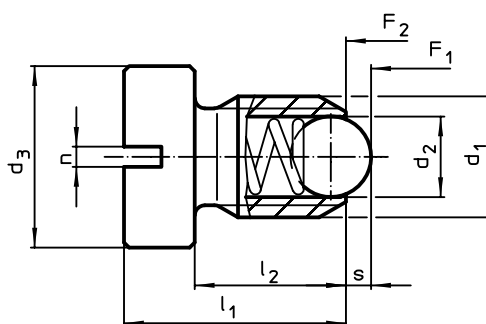
References

Thread lock on request, please refer to appendix - Technical Data -
Calculation of indexing resistance, please refer to appendix - Technical Data -

DRAWING



Size M4+M5



Size M6-M12

ORDER INFORMATION

Dimensions							Stroke s [mm]	Spring load ¹⁾		max. [°C]	[g]	Art. No.
d_1	d_2	d_3	l_1	l_2	l_3 min.	n		F_1 ~ [N]	F_2 ~ [N]			
[mm]												
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	1.0	22050.0930
M 5	3.0	8	12.5	8.5	6.7	0.8	0.9	8.0	14.0	250	2.2	22050.0931
M 6	3.5	10	14.0	9.0	–	1.0	1.0	11.0	18.0	250	3.7	22050.0932
M 8	4.5	13	16.5	11.0	–	1.2	1.5	18.0	31.0	250	7.4	22050.0933
M10	6.0	16	20.0	14.0	–	1.5	2.0	24.0	45.0	250	13.0	22050.0934
M12	8.0	18	22.0	15.0	–	2.0	2.5	26.0	49.0	250	19.0	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	0.9	22050.1040
M 5	3.0	8	12.5	8.5	6.7	0.8	0.9	15.0	22.0	250	2.2	22050.1050
M 6	3.5	10	14.0	9.0	–	1.0	1.0	19.3	26.6	250	3.8	22050.1060
M 8	4.5	13	16.5	11.0	–	1.2	1.5	36.0	60.5	250	7.5	22050.1080
M10	6.0	16	20.0	14.0	–	1.5	2.0	57.0	103.5	250	13.0	22050.1100
M12	8.0	18	22.0	15.0	–	2.0	2.5	61.0	110.0	250	19.0	22050.1120

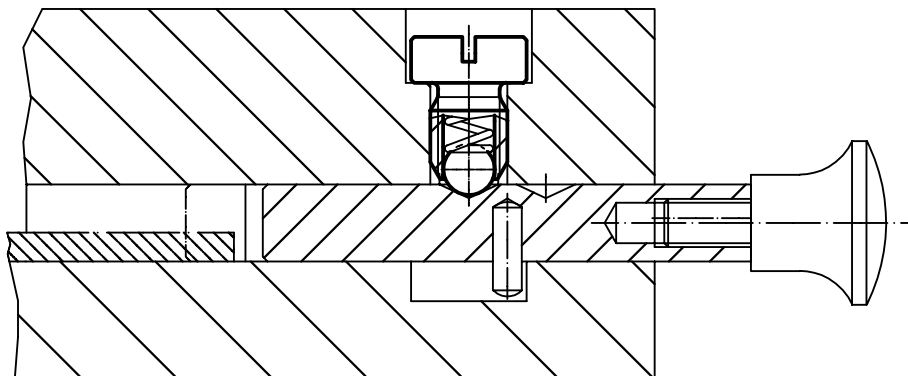
¹⁾ statistical average value



Dimensions							Stroke s	Spring load ¹⁾		 max. [°C]	 [g]	Art. No.
d ₁	d ₂	d ₃	l ₁	l ₂	l ₃ min.	n		F ₁ ~	F ₂ ~			
[mm]								[mm]	[N]			
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	1.0	22050.0940
M 5	3.0	8	12.5	8.5	6.7	0.8	0.9	8.0	14.0	250	2.2	22050.0941
M 6	3.5	10	14.0	9.0	–	1.0	1.0	11.0	18.0	250	3.8	22050.0942
M 8	4.5	13	16.5	11.0	–	1.2	1.5	18.0	31.0	250	7.5	22050.0943
M10	6.0	16	20.0	14.0	–	1.5	2.0	24.0	45.0	250	13.0	22050.0944
M12	8.0	18	22.0	15.0	–	2.0	2.5	26.0	49.0	250	19.0	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	1.0	22050.1240
M 5	3.0	8	12.5	8.5	6.7	0.8	0.9	15.0	22.0	250	2.2	22050.1250
M 6	3.5	10	14.0	9.0	–	1.0	1.0	19.3	26.6	250	3.8	22050.1260
M 8	4.5	13	16.5	11.0	–	1.2	1.5	36.0	60.5	250	7.6	22050.1280
M10	6.0	16	20.0	14.0	–	1.5	2.0	57.0	103.5	250	13.0	22050.1300
M12	8.0	18	22.0	15.0	–	2.0	2.5	61.0	110.0	250	19.0	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.

Another advantage of the plastic ball is the electric insulation.

Material

Body

- Free cutting steel, blackened
- Stainless steel 1.4305

Bearing

- Plastic

Ball

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

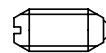
Spring

- 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.

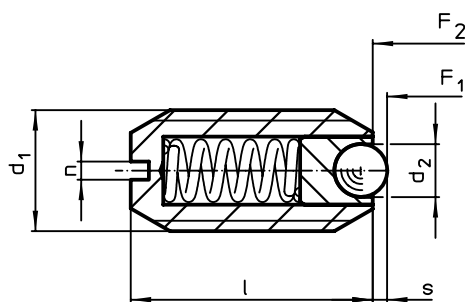
Spring plungers are specially tested for spring range and forces.

References

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

Calculation of indexing resistance, please refer to appendix - Technical Data -

DRAWING



ORDER INFORMATION

Dimensions				Stroke s	Spring load ¹⁾					Art. No.
d ₁	d ₂	l	n		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	0.8	22051.0005
M 6	2.5	14	1.0	0.70	6.3	10.0	-30	90	1.5	22051.0006
M 8	3.5	16	1.2	0.95	16.0	24.0	-30	90	3.3	22051.0008
M10	4.5	19	1.5	1.40	18.8	31.7	-30	90	5.9	22051.0010
M12	6.5	22	2.0	2.50	24.0	49.0	-30	90	9.3	22051.0012
M16	8.5	24	2.0	3.10	38.0	68.0	-30	90	20.0	22051.0016
free cutting steel, heavy spring load										
M 5	2.0	12	0.8	0.50	10.0	14.0	-30	90	0.9	22051.0205
M 6	2.5	14	1.0	0.70	11.0	16.0	-30	90	1.5	22051.0206
M 8	3.5	16	1.2	0.95	23.0	40.0	-30	90	3.3	22051.0208
M10	4.5	19	1.5	1.40	28.0	54.3	-30	90	6.0	22051.0210
M12	6.5	22	2.0	2.50	36.5	77.3	-30	90	9.4	22051.0212
M16	8.5	24	2.0	3.10	50.0	88.7	-30	90	20.0	22051.0216

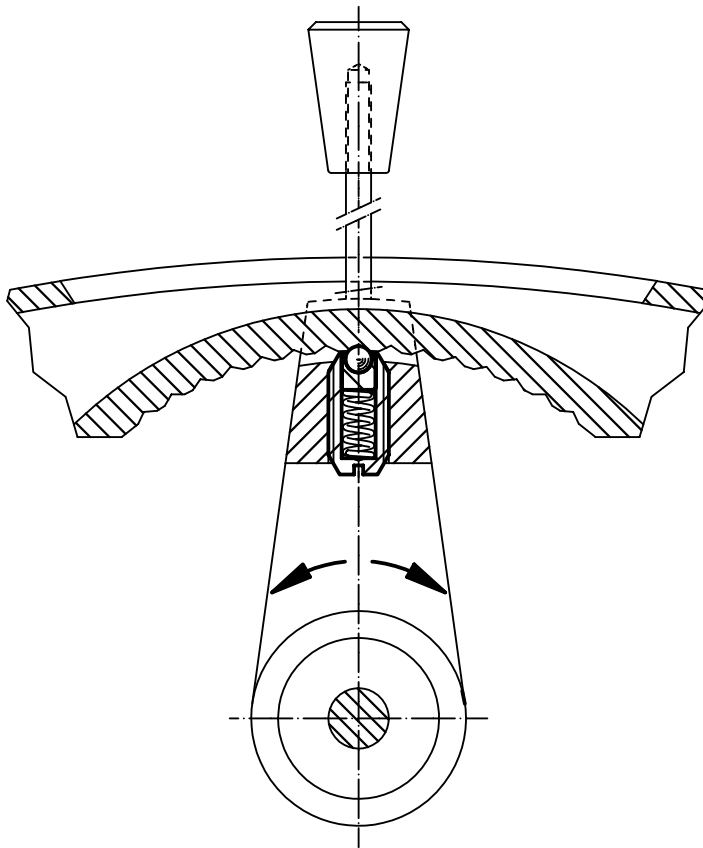
¹⁾ statistical average value



Dimensions				Stroke s	Spring load ¹⁾		 min. max. [°C]	 [g]	Art. No.	
d ₁	d ₂	l	n		F ₁ ~	F ₂ ~				
[mm]					[N]					
stainless steel, standard spring load										
M 5	2.0	12	0.8	0.50	4.8	6.8	-30	90	0.9	22051.0405
M 6	2.5	14	1.0	0.70	6.3	10.0	-30	90	1.5	22051.0406
M 8	3.5	16	1.2	0.95	16.0	24.0	-30	90	3.3	22051.0408
M10	4.5	19	1.5	1.40	18.8	31.7	-30	90	5.9	22051.0410
M12	6.5	22	2.0	2.50	24.0	49.0	-30	90	9.4	22051.0412
M16	8.2	24	2.0	3.10	38.0	68.0	-30	90	20.0	22051.0416
stainless steel, heavy spring load										
M 5	2.0	12	0.8	0.50	10.0	14.0	-30	90	0.9	22051.0605
M 6	2.5	14	1.0	0.70	11.0	16.0	-30	90	1.5	22051.0606
M 8	3.5	16	1.2	0.95	23.0	40.0	-30	90	3.4	22051.0608
M10	4.5	19	1.5	1.40	28.0	54.3	-30	90	6.0	22051.0610
M12	6.5	22	2.0	2.50	36.5	77.3	-30	90	9.5	22051.0612
M16	8.5	24	2.0	3.10	50.0	88.7	-30	90	20.0	22051.0616

¹⁾ statistical average value

APPLICATION EXAMPLE



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

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.

Another advantage of the moveable ceramic ball is the electric insulation.

Characteristics of the ceramic ball:

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

The stainless steel A4 version ensures maximum corrosion resistance.

Material

Body

- Stainless steel A4

Bearing

- Plastic

Ball

- Ceramic

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

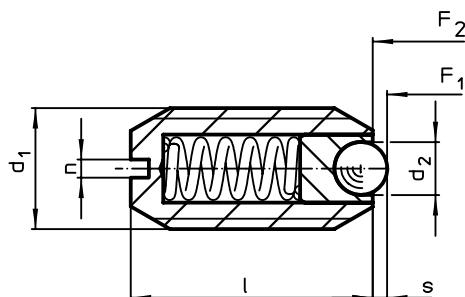
Thread lock on request, please refer to appendix - Technical Data -

Calculation of indexing resistance, please refer to appendix - Technical Data -

Further products

Spring Plungers, with ceramic ball and slot, stainless steel A4. → p. 62

DRAWING



ORDER INFORMATION

Dimensions				Stroke s	Spring load ¹⁾		 min. max.		 [g]	Art. No.
d ₁	d ₂	l	n		F ₁	F ₂	[°C]			
[mm]				[mm]	[N]					
standard spring load										
M 5	2.0	12	0.8	0.50	4.8	6.8	-30	90	0.9	22051.0505
M 6	2.5	14	1.0	0.70	6.3	10.0	-30	90	1.5	22051.0506
M 8	3.5	16	1.2	0.95	16.1	24.0	-30	90	3.2	22051.0508
M10	4.5	19	1.5	1.40	18.8	31.7	-30	90	5.8	22051.0510
M12	6.5	22	2.0	2.50	24.0	49.0	-30	90	8.9	22051.0512
M16	8.5	24	2.0	3.10	38.0	68.0	-30	90	19.0	22051.0516
heavy spring load										
M 5	2.0	12	0.8	0.50	10.0	14.0	-30	90	0.9	22051.0705
M 6	2.5	14	1.0	0.70	11.0	16.0	-30	90	1.5	22051.0706
M 8	3.5	16	1.2	0.95	22.9	40.0	-30	90	3.3	22051.0708
M10	4.5	19	1.5	1.40	28.1	54.3	-30	90	5.8	22051.0710
M12	6.5	22	2.0	2.50	36.5	77.3	-30	90	9.0	22051.0712
M16	8.5	24	2.0	3.10	50.0	88.7	-30	90	19.0	22051.0716

¹⁾ statistical average value

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, nitrided

Body

- Free cutting steel, blackened
- Stainless steel 1.4305

Spring

- Stainless steel

Assembly

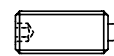
Spring plungers can be mounted and removed by means of the slot or internal hexagon.

Please use a special assembly tool for mounting with a slot (pin side).

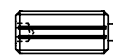
Characteristic

Standard spring load: no marking

Reinforced spring load: marked with two lines



Standard spring load



Heavy spring load

MORE INFORMATION

Notes

Special types on request.

Spring plungers are specially tested for spring range and forces.

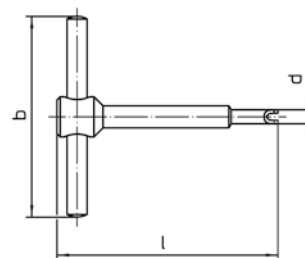
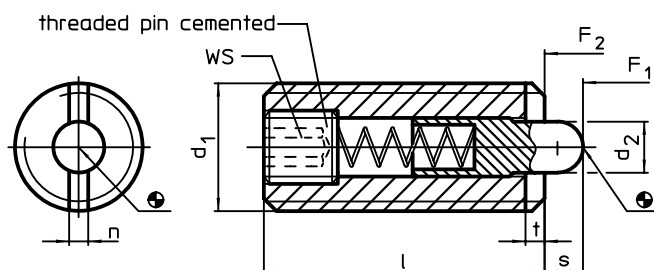
References

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

Further products

Spring Plungers, with internal hexagon and seal. → p. 72

DRAWING



ORDER INFORMATION

Dimensions					WS	Stroke s	Spring load ¹⁾		 min. max.	 [g]	Art. No.	
d ₁	d ₂	l	n	t			F ₁ ~	F ₂ ~				
[mm]					[mm]	[mm]	[N]		[°C]			
free cutting steel, standard spring load												
M 3	1.0	12	0.4	0.5	0.7	1.0	2.0	4	–	250	0.4	22060.0003
M 4	1.5	15	0.6	0.6	1.3	1.5	4.5	16	–	250	0.9	22060.0004
M 5	2.4	18	1.2	0.8	1.5	2.3	6.0	19	–	250	1.7	22060.0005
M 6	2.7	20	1.3	0.9	2.0	2.5	6.0	19	–	250	2.8	22060.0006
M 8	3.5	22	1.5	1.4	2.5	3.0	10.0	39	–	250	5.7	22060.0008
M10	4.0	22	1.5	1.4	3.0	3.0	10.0	39	–	250	9.2	22060.0010
M12	6.0	28	2.7	2.0	4.0	4.0	12.0	53	–	250	16.0	22060.0012
M16	7.5	32	3.2	2.5	5.0	5.0	45.0	100	–	250	35.0	22060.0016
M20	10.0	40	3.7	3.0	6.0	7.0	52.0	125	–	250	67.0	22060.0020
M24	12.0	52	3.7	3.0	8.0	10.0	70.0	170	–	250	129.0	22060.0024
free cutting steel, heavy spring load												
M 5	2.4	18	1.2	0.8	1.5	2.3	11.0	40	–	250	1.6	22060.0105
M 6	2.7	20	1.3	0.9	2.0	2.5	15.0	43	–	250	2.8	22060.0106
M 8	3.5	22	1.5	1.4	2.5	3.0	20.0	75	–	250	5.7	22060.0108
M10	4.0	22	1.5	1.4	3.0	3.0	20.0	75	–	250	9.1	22060.0110
M12	6.0	28	2.7	2.0	4.0	4.0	45.0	120	–	250	16.0	22060.0112
M16	7.5	32	3.2	2.5	5.0	5.0	64.0	160	–	250	26.0	22060.0116
M20	10.0	40	3.7	3.0	6.0	7.0	75.0	195	–	250	67.0	22060.0120
M24	12.0	52	3.7	3.0	8.0	10.0	75.0	245	–	250	129.0	22060.0124

¹⁾ statistical average value



Dimensions					WS	Stroke s	Spring load ¹⁾				Art. No.	
d ₁	d ₂	l	n	t	[mm]	[mm]	F ₁ ~	F ₂ ~	min.	max.		[g]
[mm]							[N]		[°C]			
free cutting steel, pin from thermoplastic, standard spring load												
M 4	1.5	15	0.6	0.6	1.3	1.5	4.5	16	-30	50	0.9	22060.0204
M 5	2.4	18	1.2	0.8	1.5	2.3	6.0	19	-30	50	1.5	22060.0205
M 6	2.7	20	1.3	0.9	2.0	2.5	6.0	19	-30	50	2.3	22060.0206
M 8	3.5	22	1.5	1.4	2.5	3.0	10.0	39	-30	50	5.0	22060.0208
M10	4.0	22	1.5	1.4	3.0	3.0	10.0	39	-30	50	8.1	22060.0210
M12	6.0	28	2.7	2.0	4.0	4.0	12.0	53	-30	50	14.0	22060.0212
M16	7.5	32	3.2	2.5	5.0	5.0	45.0	100	-30	50	31.0	22060.0216
stainless steel, standard spring load												
M 3	1.0	12	0.4	0.5	0.7	1.0	2.0	4	–	250	0.9	22060.0403
M 4	1.5	15	0.6	0.6	1.3	1.5	4.5	16	–	250	0.9	22060.0404
M 5	2.4	18	1.2	0.8	1.5	2.3	6.0	19	–	250	1.7	22060.0405
M 6	2.7	20	1.3	0.9	2.0	2.5	6.0	19	–	250	2.8	22060.0406
M 8	3.5	22	1.5	1.4	2.5	3.0	10.0	39	–	250	4.6	22060.0408
M10	4.0	22	1.5	1.4	3.0	3.0	10.0	39	–	250	9.5	22060.0410
M12	6.0	28	2.7	2.0	4.0	4.0	12.0	53	–	250	16.0	22060.0412
M16	7.5	32	3.2	2.5	5.0	5.0	45.0	100	–	250	34.0	22060.0416
M20	10.0	40	3.7	3.0	6.0	7.0	52.0	125	–	250	67.0	22060.0420
stainless steel, heavy spring load												
M 5	2.4	18	1.2	0.8	1.5	2.3	15.0	44	–	250	2.2	22060.0505
M 6	2.7	20	1.3	0.9	2.0	2.5	20.0	50	–	250	4.1	22060.0506
M 8	3.5	22	1.5	1.4	2.5	3.0	26.0	70	–	250	7.4	22060.0508
M10	4.0	22	1.5	1.4	3.0	3.0	26.0	70	–	250	12.4	22060.0510
M12	6.0	28	2.7	2.0	4.0	4.0	51.0	122	–	250	22.2	22060.0512
M16	7.5	32	3.2	2.5	5.0	5.0	72.0	164	–	250	46.1	22060.0516
M20	10.0	40	3.7	3.0	7.0	7.0	93.0	211	–	250	86.5	22060.0520
M24	12.0	52	3.7	3.0	10.0	10.0	86.0	247	–	250	167.0	22060.0524
stainless steel, pin from thermoplastic, standard spring load												
M 4	1.5	15	0.6	0.6	1.3	1.5	4.5	16	-30	50	0.9	22060.0604
M 5	2.4	18	1.2	0.8	1.5	2.3	6.0	19	-30	50	1.6	22060.0605
M 6	2.7	20	1.3	0.9	2.0	2.5	6.0	19	-30	50	2.5	22060.0606
M 8	3.5	22	1.5	1.4	2.5	3.0	10.0	39	-30	50	5.1	22060.0608
M10	4.0	22	1.5	1.4	3.0	3.0	10.0	39	-30	50	8.5	22060.0610
M12	6.0	28	2.7	2.0	4.0	4.0	12.0	53	-30	50	14.0	22060.0612
M16	7.5	32	3.2	2.5	5.0	5.0	45.0	100	-30	50	31.0	22060.0616
stainless steel, pin from thermoplastic, heavy spring load												
M 5	2.4	18	1.2	0.8	1.5	2.3	15.0	44	-30	50	1.9	22060.0705
M 6	2.7	20	1.3	0.9	2.0	2.5	20.0	50	-30	50	3.6	22060.0706
M 8	3.5	22	1.5	1.4	2.5	3.0	26.0	70	-30	50	6.6	22060.0708
M10	4.0	22	1.5	1.4	3.0	3.0	26.0	70	-30	50	11.4	22060.0710
M12	6.0	28	2.7	2.0	4.0	4.0	51.0	122	-30	50	20.0	22060.0712
M16	7.5	32	3.2	2.5	5.0	5.0	72.0	164	-30	50	42.7	22060.0716

¹⁾ statistical average value

ACCESSORIES

	Dimensions					Art. No.
	d ₁	b	d	l		
	[mm]					
assembly tool for mounting via slot (pin sided)						
	M 3	50	2.35	55	17	22060.0903
	M 4	50	3.00	55	18	22060.0904
	M 5	50	4.00	60	21	22060.0905
	M 6	60	4.70	60	30	22060.0906
	M 8	60	6.45	70	39	22060.0908
	M10	80	8.00	80	66	22060.0910
	M12	80	9.80	80	72	22060.0912
	M16	100	13.50	105	144	22060.0916
	M20	100	17.00	115	162	22060.0920
	M24	100	19.90	100	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

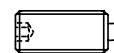
Spring plungers can be mounted and removed by means of the slot or internal hexagon.

Please use a special assembly tool for mounting with a slot (pin side).

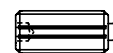
Characteristic

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

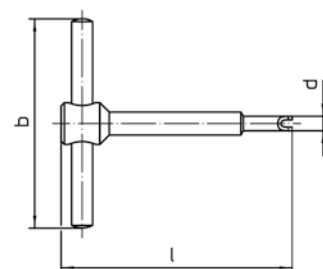
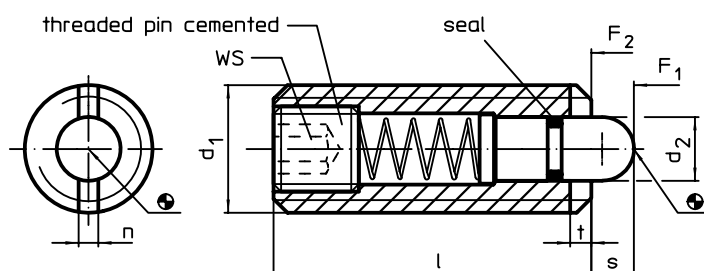
Compared to EH 22060., i.e. "no seal", there are deviations in dimension l, spring load and temperature range.

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

Further products

Spring Plungers, with internal hexagon. → p. 70

DRAWING



ORDER INFORMATION

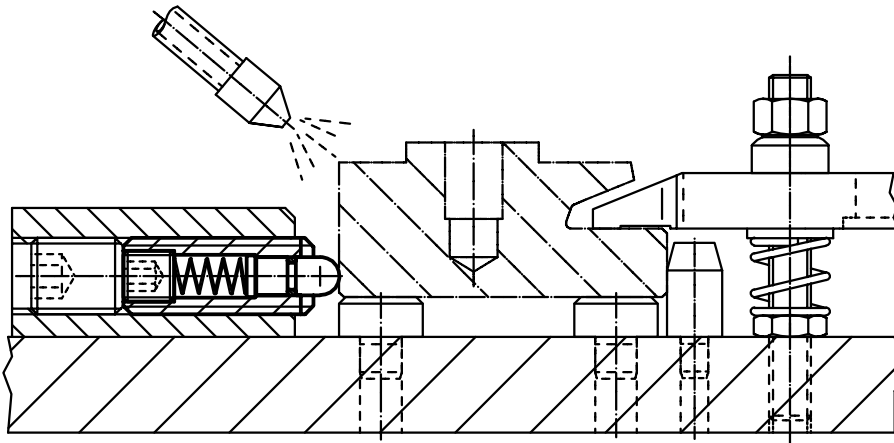
Dimensions					WS	Stroke s	Spring load ¹⁾		 min. max.	 [g]	Art. No.	
d ₁	d ₂	l	n	t			F ₁ ~	F ₂ ~				[°C]
[mm]					[mm]	[mm]	[N]					
free cutting steel, standard spring load												
M 8	3.8	26	1.5	1.4	2.5	3.0	9	24	-30	80	6.7	22060.0048
M10	4.0	28	1.5	1.4	3.0	3.5	15	30	-30	80	12.0	22060.0050
M12	6.0	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	6.7	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	44.0	22060.0156
stainless steel, standard spring load												
M 8	3.8	26	1.5	1.4	2.5	3.0	9	24	-30	80	6.8	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	43.0	22060.0456

¹⁾ statistical average value

ACCESSORIES

	Dimensions				 [g]	Art. No.
	d _i	b	d	l		
	[mm]					
assembly tool for mounting via slot (pin sided)						
	M 8	60	6.45	70	39	22060.0908
	M10	80	8.00	80	66	22060.0910
	M12	80	9.80	80	72	22060.0912
	M16	100	13.50	105	144	22060.0916

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, nitrided

Body

- Free cutting steel, blackened
- Stainless steel 1.4305

Spring

- Stainless steel

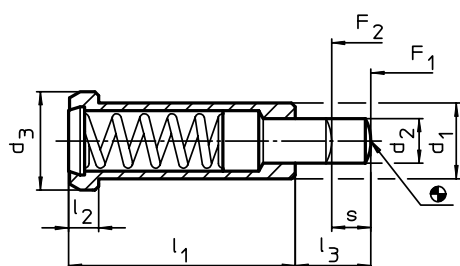
MORE INFORMATION

Notes

Special types on request.

Spring plungers are specially tested for spring range and forces.

DRAWING

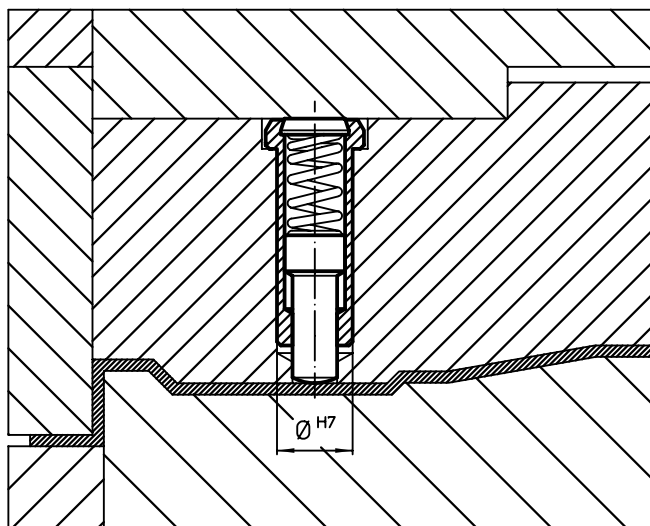


ORDER INFORMATION

Dimensions						Stroke s	Spring load ¹⁾		 max.	Location hole H7		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	4.0	22070.0006
8	3.9	10	24	3.2	8	4.5	30	88	250	8	7.4	22070.0008
10	5.9	13	30	4.0	10	5.5	42	110	250	10	15.0	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	4.0	22070.0106
8	3.9	10	24	3.2	8	4.5	30	88	250	8	7.5	22070.0108
10	5.9	13	30	4.0	10	5.5	42	110	250	10	15.0	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



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, black
- Stainless Steel 1.4305, nitrided

Body

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

Spring

- Stainless steel

Assembly

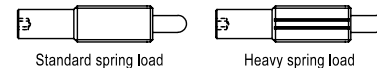
Spring plungers can be mounted and removed by means of the slot or internal hexagon.

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

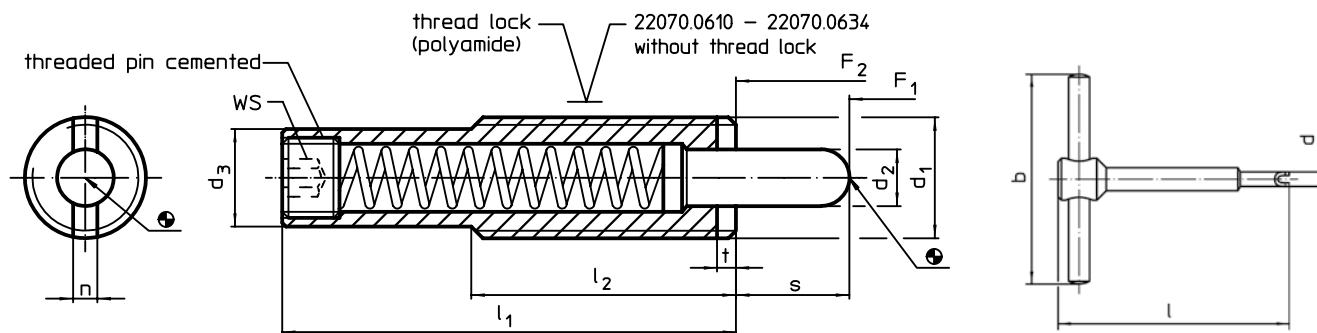
Special types on request.

Spring plungers are specially tested for spring range and forces.

References

Thread lock: polyamide all-around coating (for details please refer to the technical appendix).

DRAWING



ORDER INFORMATION

Dimensions							Stroke s	WS	Spring load ¹⁾		 min. max.		 [g]	Art. No.
d ₁	d ₂	d ₃	l ₁	l ₂	n	t			F ₁ ~	F ₂ ~	[°C]			
[mm]							[mm]	[mm]	[N]					
body from free cutting steel, standard spring load, with thread lock														
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	53	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	69	22070.0442
							25	6	13	41	-30	90	81	22070.0444
							30	6	13	47	-30	90	83	22070.0450
			98	35	3.2	3.0	30	6	24	110	-30	90	97	22070.0452
							40	6	13	63	-30	90	117	22070.0455
							50	6	7	43	-30	90	119	22070.0460
M24	10.0	19.6	60	45	3.7	3.0	15	8	14	87	-30	90	132	22070.0480

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]	
stainless steel, standard spring load, with thread lock														
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	23	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	82	22070.0244
							30	6	13	47	-30	90	84	22070.0250
			148	35	3.2	3.0	40	6	13	63	-30	90	118	22070.0255
							50	6	7	43	-30	90	119	22070.0260
			M24	10.0	19.6	60	45	3.7	3.0	15	8	14	87	-30
body from free cutting steel, heavy spring load, with thread lock														
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	56	22070.0540
							20	6	18	72	-30	90	71	22070.0542
			98	35	3.2	3.0	25	6	20	70	-30	90	81	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	40	192	-30
stainless steel, heavy spring load, with thread lock														
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	23	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	55	22070.0336
							20	6	8	33	-30	90	55	22070.0340
			98	35	3.2	3.0	25	6	20	70	-30	90	82	22070.0344
							30	6	20	80	-30	90	83	22070.0350
			148	35	3.2	3.0	40	6	21	113	-30	90	122	22070.0355
							50	6	13	75	-30	90	122	22070.0360
			M24	10.0	19.6	60	45	3.7	3.0	15	8	40	192	-30
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				 [g]	Art. No.
	d ₁	b	d	l		
	[mm]					
assembly tool for mounting via slot (pin sided)						
	M10	80	7.8	70	87	22070.0830
	M12	80	9.5	75	88	22070.0832
	M16	80	13.4	95	110	22070.0834
	M22	100	19.0	100	245	22070.0836
	M24	100	19.9	100	258	22070.0838

Spring Plungers • with collar and ball, front slot

EH 22075.



PRODUCT DESCRIPTION

Spring plungers can be used for locating or for applying pressure, as a detent or for ejection. This spring plunger is characterised by the collar with front slot. This makes it suitable for applications that require a flat surface when screwed in.

Material

Body

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

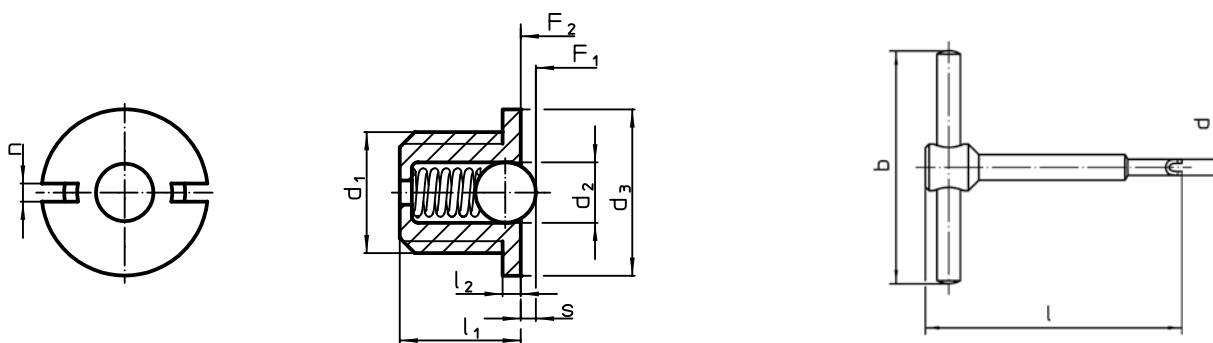
References

Thread lock on request, please refer to appendix - Technical Data -
Calculation of indexing resistance, please refer to appendix - Technical Data -

Further products

Spring Plungers, smooth, with collar and ball → p. 79

DRAWING



ORDER INFORMATION

Dimensions						Stroke s +0.1 -0.1	Spring load ¹⁾		 min. max.		Art. No.	
d ₁	d ₂	d ₃ -0.1	l ₁	l ₂ -0.1	n		F ₁ ~	F ₂ ~				
[mm]						[mm]	[N]		[°C]		[g]	
body from free cutting steel, ball from stainless steel, standard spring load												
M 4	2.00	5.5	4.0	0.6	0.6	0.6	1.7	3.9	–	250	0.3	22075.0004
M 5	3.00	7.0	5.0	0.8	1.2	0.8	2.9	4.5	–	250	0.5	22075.0005
M 6	3.50	8.0	6.0	1.0	1.3	1.0	3.6	8.7	–	250	0.8	22075.0006
M 8	5.00	10.0	7.0	1.5	1.5	1.6	5.4	10.2	–	250	1.9	22075.0008
M10	6.35	12.0	9.0	1.5	1.5	1.9	7.4	17.5	–	250	3.6	22075.0010
M12	8.00	14.0	11.5	1.5	2.7	2.4	10.8	22.3	–	250	6.0	22075.0012
body and ball from stainless steel, standard spring load												
M 4	2.00	5.5	4.0	0.6	0.6	0.6	1.7	3.9	–	250	0.3	22075.0404
M 5	3.00	7.0	5.0	0.8	1.2	0.8	2.9	4.5	–	250	0.5	22075.0405
M 6	3.50	8.0	6.0	1.0	1.3	1.0	3.6	8.7	–	250	0.9	22075.0406
M 8	5.00	10.0	7.0	1.5	1.5	1.6	5.4	10.2	–	250	1.9	22075.0408
M10	6.35	12.0	9.0	1.5	1.5	1.9	7.4	17.5	–	250	3.7	22075.0410
M12	8.00	14.0	11.5	1.5	2.7	2.4	10.8	22.3	–	250	6.1	22075.0412
body from thermoplastic, ball from stainless steel, standard spring load												
M 4	2.00	5.5	4.0	0.6	0.6	0.6	2.1	3.9	-30	50	0.1	22075.0604
M 5	3.00	7.0	5.0	0.8	1.2	0.8	3.2	4.5	-30	50	0.2	22075.0605
M 6	3.50	8.0	6.0	1.0	1.3	1.0	4.1	8.7	-30	50	0.4	22075.0606
M 8	5.00	10.0	7.0	1.5	1.5	1.6	5.7	10.2	-30	50	0.9	22075.0608
M10	6.50	12.0	9.0	1.5	1.5	1.9	9.2	17.2	-30	50	1.8	22075.0610
M12	8.00	14.0	11.5	1.5	2.7	2.4	11.2	22.3	-30	50	3.2	22075.0612

¹⁾ statistical average value



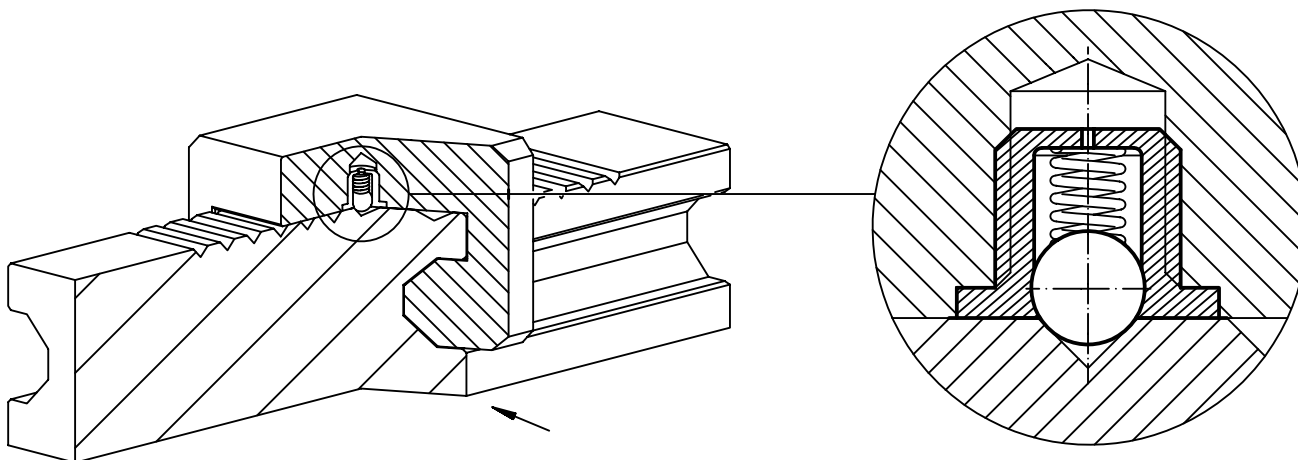
Dimensions						Stroke s +0.1 -0.1 [mm]	Spring load ¹⁾		 min. max. [°C]		 [g]	Art. No.
d ₁	d ₂	d ₃ -0.1 [mm]	l ₁	l ₂ -0.1 [mm]	n		F ₁ ~ [N]	F ₂ ~ [N]				
body and ball from thermoplastic, standard spring load												
M 4	2.00	5.5	4.0	0.6	0.6	0.6	2.1	3.9	-30	50	0.1	22075.0804
M 5	3.00	7.0	5.0	0.8	1.2	0.8	3.2	4.5	-30	50	0.2	22075.0805
M 6	3.50	8.0	6.0	1.0	1.3	1.0	4.1	8.7	-30	50	0.4	22075.0806
M 8	5.00	10.0	7.0	1.5	1.5	1.6	5.7	10.2	-30	50	0.9	22075.0808
M10	6.50	12.0	9.0	1.5	1.5	1.9	9.2	17.2	-30	50	1.8	22075.0810
M12	8.00	14.0	11.5	1.5	2.7	2.4	11.2	22.3	-30	50	3.2	22075.0812

¹⁾ statistical average value

ACCESSORIES

	Dimensions					Art. No.
	d ₁	b	d	l		
	[mm]					
assembly tool						
	M 4	50	5.2	55	20	22075.0904
	M 5	50	6.7	55	24	22075.0905
	M 6	50	7.7	60	30	22075.0906
	M 8	60	9.7	60	47	22075.0908
	M10	60	11.7	70	72	22075.0910
	M12	80	13.7	80	127	22075.0912

APPLICATION EXAMPLE



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, please refer to appendix - Technical Data - Version with higher spring forces see "EH 22080. Spring Plungers, smooth, long, with collar and ball".

Further products

Spring Plungers, with collar and ball, front slot. → p. 77
 Spring Plungers, smooth, long, with collar and ball → p. 81
 Spring Plungers, smooth, with collar and ball, self-clamping. → p. 82
 Holders, for spring plungers → p. 86



Light spring load

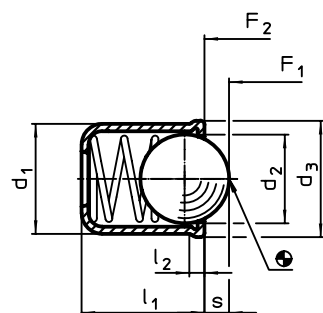


Standard spring load

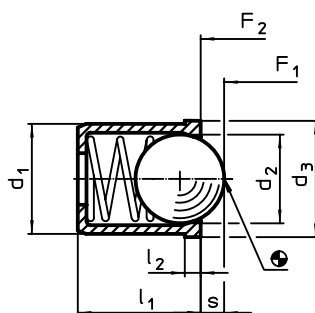


Heavy spring load

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions					Stroke s	Spring load ¹⁾		 min. max. [°C]	Location hole H7 [mm]	 [g]	Art. No.	
d ₁ +0.1	d ₂	d ₃	l ₁	l ₂ ~		F ₁ ~	F ₂ ~					
[mm]					[mm]	[N]						
body and ball from stainless steel, light spring load – picture 1												
3	2.38	3.5	4.0	0.6	0.70	0.4	1.3	–	250	3	0.1	22080.1003
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	2.0	22080.1008
10	8.50	11.0	13.0	1.5	3.30	3.9	10.0	–	250	10	4.0	22080.1010
12	10.00	13.0	16.0	2.3	4.00	6.2	14.6	–	250	12	7.0	22080.1012

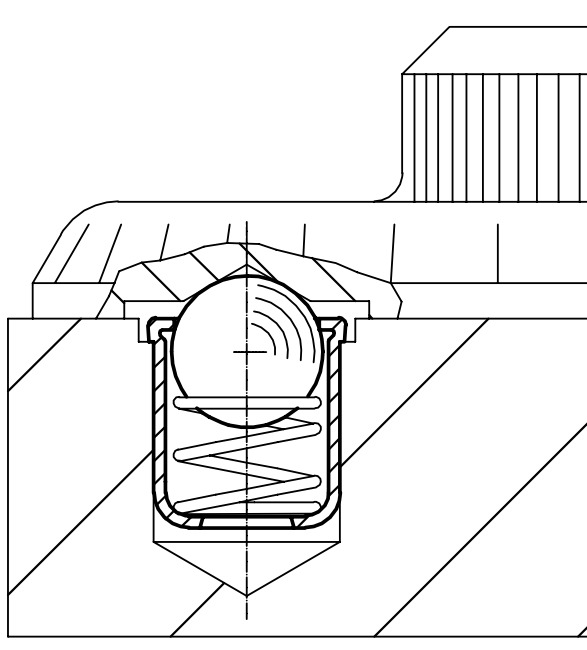
¹⁾ statistical average value



Dimensions					Stroke s	Spring load ¹⁾		 min. max.		Location hole H7		Art. No.
d ₁ +0.1	d ₂	d ₃	l ₁	l ₂ ~		F ₁ ~	F ₂ ~	[°C]		[mm]	[g]	
[mm]					[mm]	[N]						
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	0.1	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	4.5	22080.0010
12	10.00	13.0	16.0	2.3	4.00	12.0	26.5	–	250	12	7.2	22080.0012
body and ball from stainless steel, heavy spring load – picture 1												
3	2.38	3.5	4.0	0.6	0.70	2.4	5.5	–	250	3	0.1	22080.2003
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	2.2	22080.2008
10	8.50	11.0	13.0	1.5	3.30	17.0	37.0	–	250	10	4.6	22080.2010
12	10.00	13.0	16.0	2.3	4.00	28.0	57.0	–	250	12	7.4	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	0.4	22080.0204
5	4.00	5.5	6.0	1.0	1.00	4.0	6.5	–	250	5	0.7	22080.0205
6	5.00	6.5	7.0	1.0	1.60	6.0	11.5	–	250	6	1.2	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	3.1	22080.0410
12	10.00	13.0	16.0	1.5	3.30	14.0	25.0	-30	50	12	5.7	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	1.4	22080.0610
12	10.00	13.0	16.0	1.5	3.30	14.0	25.0	-30	50	12	2.4	22080.0612

¹⁾ statistical average value

APPLICATION EXAMPLE



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

Spring plungers are specially tested for spring range and forces.

References

Calculation of indexing resistance, please refer to appendix - Technical Data -

Further products

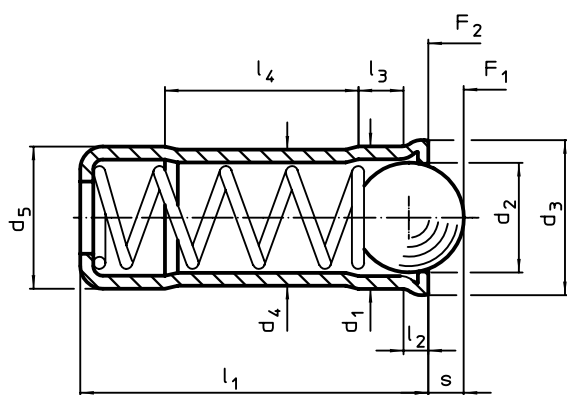
Spring Plungers, smooth, with collar and ball → p. 79

MORE INFORMATION

Notes

Special types on request.

DRAWING

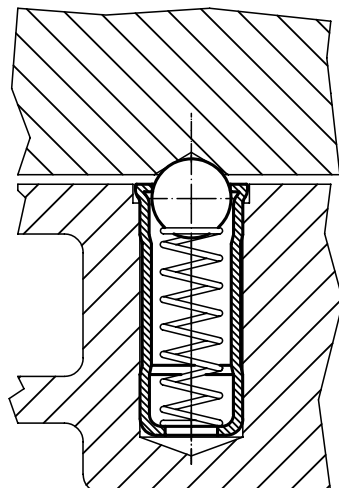


ORDER INFORMATION

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 ~	[mm]	F ₁ ~	F ₂ ~	[°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	1.7	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	3.6	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	7.6	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

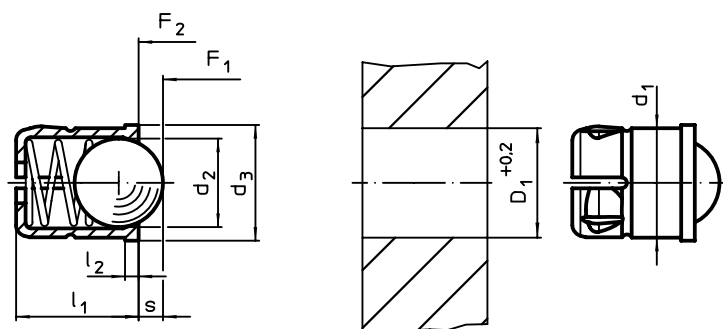
Calculation of indexing resistance, please refer to appendix - Technical Data -

Further products

Spring Plungers, smooth, with collar and ball → p. 79

Spring Plungers, smooth, with collar and ball, self-clamping – INCH → p. 99

DRAWING

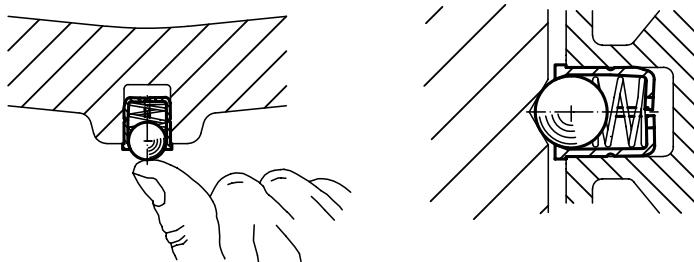


ORDER INFORMATION

Dimensions					Stroke s	Spring load ¹⁾		 min. max.	Location hole D ₁ +0.2		Art. No.	
d ₁ +0.1	d ₂	d ₃	l ₁ ±0.2	l ₂ ~		F ₁ ~	F 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	0.2	22080.0704
5	4.0	5.6	6.0	1.0	1.0	6.0	9.4	-30	50	5	0.4	22080.0705
6	5.0	6.5	7.0	1.0	1.6	6.2	12.6	-30	50	6	0.7	22080.0706
8	6.5	8.5	9.0	1.0	1.9	10.0	20.4	-30	50	8	1.5	22080.0708
10	8.0	11.0	13.5	1.5	2.4	11.9	22.3	-30	50	10	3.1	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	0.1	22080.0804
5	4.0	5.6	6.0	1.0	1.0	6.0	9.4	-30	50	5	0.1	22080.0805
6	5.0	6.5	7.0	1.0	1.6	6.2	12.6	-30	50	6	0.2	22080.0806
8	6.5	8.5	9.0	1.0	1.9	10.0	20.4	-30	50	8	0.5	22080.0808
10	8.0	11.0	13.5	1.5	2.4	11.9	22.3	-30	50	10	1.4	22080.0810

¹⁾ statistical average value

APPLICATION EXAMPLE



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 .

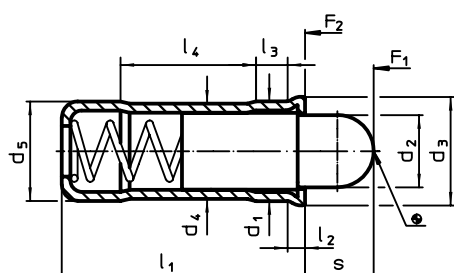
MORE INFORMATION

Notes

Special types on request.

Spring plungers are specially tested for spring range and forces.

DRAWING

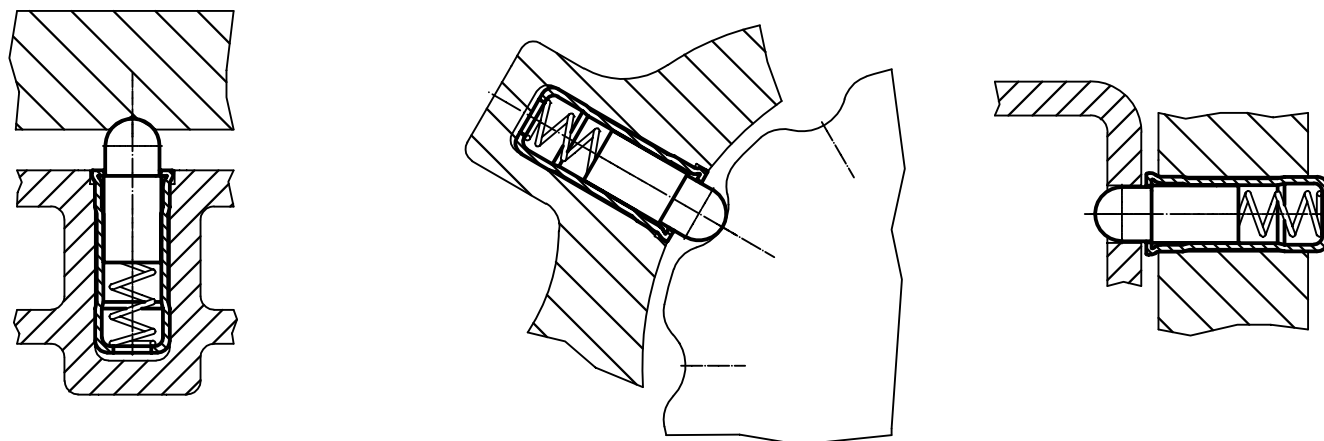


ORDER INFORMATION

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	1.1	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	2.0	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	4.0	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	0.7	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	1.2	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	2.3	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	4.8	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

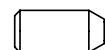
Assembly

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.

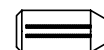
Characteristic

Standard spring load: no marking

Reinforced spring load: marked with two lines



Standard spring load



Heavy spring load

MORE INFORMATION

Notes

Special types on request.

Spring plungers are specially tested for spring range and forces.

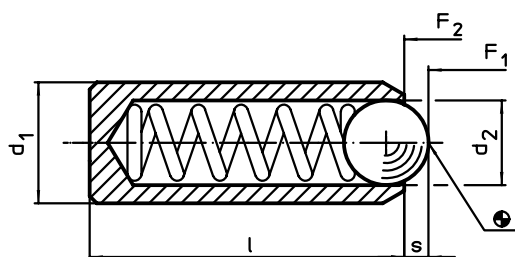
References

Calculation of indexing resistance, please refer to appendix - Technical Data -

Further products

Spring Plungers, smooth, without collar, with moveable ball → p. 85

DRAWING



ORDER INFORMATION

Dimensions			Stroke s	Spring load ¹⁾		max. [°C]	Location hole joint connection F8 / press fit H9	[g]	Art. No.
d ₁ ±0.04	d ₂	l		F ₁ ~	F ₂ ~				
[mm]	[mm]	[mm]	[mm]	[N]	[N]		[mm]		
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	0.1	22080.0308
3.0	2.0	7.0	0.65	4.5	7.5	250	3.0	0.3	22080.0310
3.5	2.5	9.0	0.80	8.5	14.0	250	3.5	0.5	22080.0312
4.0	3.0	11.0	0.90	8.0	14.0	250	4.0	0.7	22080.0315
4.5	3.2	12.0	0.95	9.5	16.5	250	4.5	1.0	22080.0317
5.0	3.5	13.0	1.00	11.0	18.0	250	5.0	1.4	22080.0320
5.5	4.0	14.0	1.20	15.5	25.0	250	5.5	1.8	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	8.4	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	0.1	22080.0358
3.0	2.0	7.0	0.65	7.8	11.6	250	3.0	0.3	22080.0360
3.5	2.5	9.0	0.80	12.0	18.0	250	3.5	0.5	22080.0362
4.0	3.0	11.0	0.90	15.0	22.0	250	4.0	0.7	22080.0365
4.5	3.2	12.0	0.95	18.7	25.1	250	4.5	1.0	22080.0367
5.0	3.5	13.0	1.00	19.3	26.6	250	5.0	1.4	22080.0370
5.5	4.0	14.0	1.20	25.1	39.2	250	5.5	1.8	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	5.1	22080.0377
10.0	8.0	20.0	2.50	61.0	110.0	250	10.0	8.5	22080.0380
12.0	10.0	22.0	3.50	68.0	143.0	250	12.0	13.0	22080.0382

¹⁾ statistical average value

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. Another advantage of the plastic ball is the electric insulation.

Material

Body

- Stainless steel 1.4305

Ball

- Stainless steel, hardened

Bearing

- Plastic

Spring

- Stainless steel

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, please refer to appendix - Technical Data -

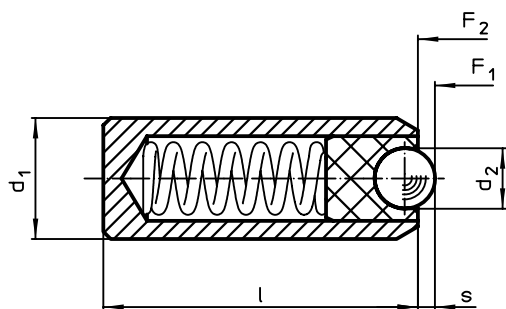
Assembly

The locating hole has to be adapted to each individual application case. We recommend

Further products

Spring Plungers, smooth, without collar → p. 84

DRAWING



ORDER INFORMATION

Dimensions			Stroke s	Spring load ¹⁾		 min. max.		Location hole joint connection F8 / press fit H9		Art. No.
d ₁ ±0.04	d ₂	l		F ₁ ~	F ₂ ~	[°C]				
[mm]			[mm]	[N]				[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	1.3	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	4.4	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

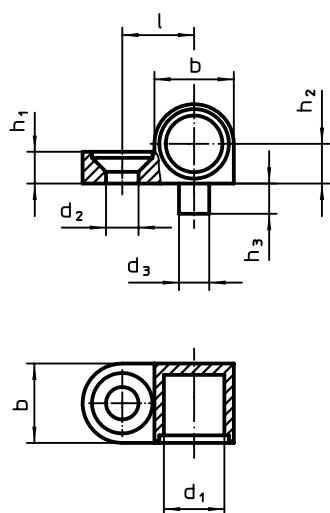
Assembly

The left and right hand versions (picture 1 / picture 3) are attached using only one

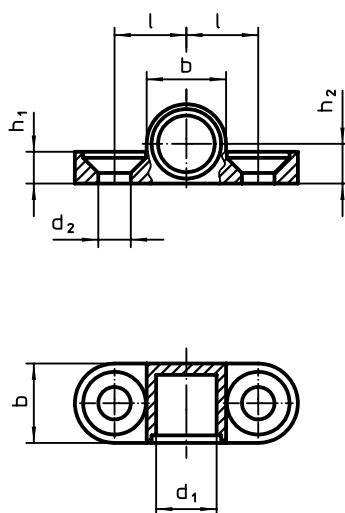
screw, and are also provided with an anti-turn locking device.

MORE INFORMATION**References**

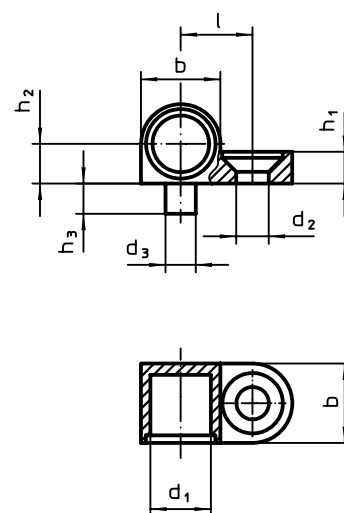
Suitable for spring plungers, smooth, with collar and ball (EH 22080.)

DRAWING

picture 1



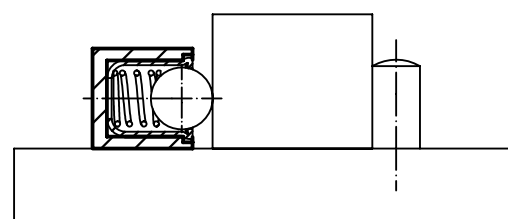
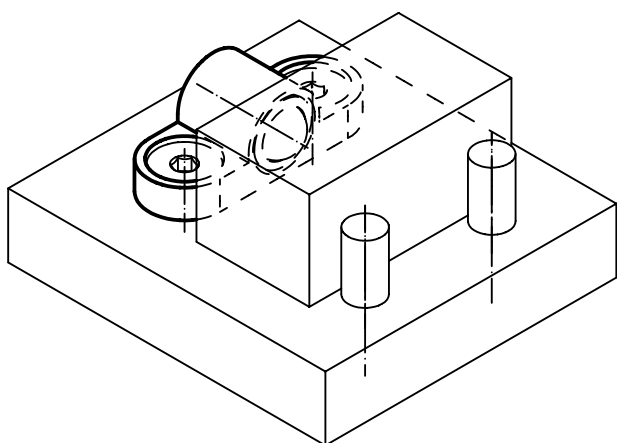
picture 2



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	2.9	22082.0006
8	4.3	4	10.5	4.2	5.25	4	9.5	M4	5.3	22082.0008
two-sided – picture 2										
6	3.2	–	8.5	3.2	4.25	–	7.5	M3	3.5	22082.0106
8	4.3	–	10.5	4.2	5.25	–	9.5	M4	6.5	22082.0108
right – picture 3										
6	3.2	3	8.5	3.2	4.25	3	7.5	M3	2.8	22082.0206
8	4.3	4	10.5	4.2	5.25	4	9.5	M4	5.2	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

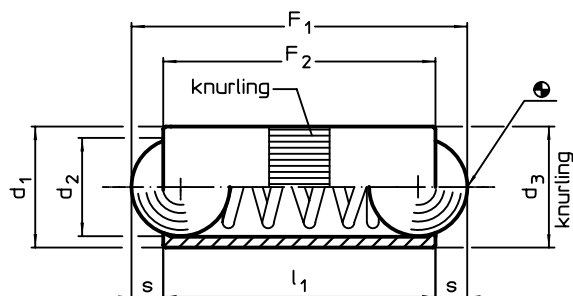
Notes

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

References

Calculation of indexing resistance, please refer to appendix - Technical Data -

DRAWING

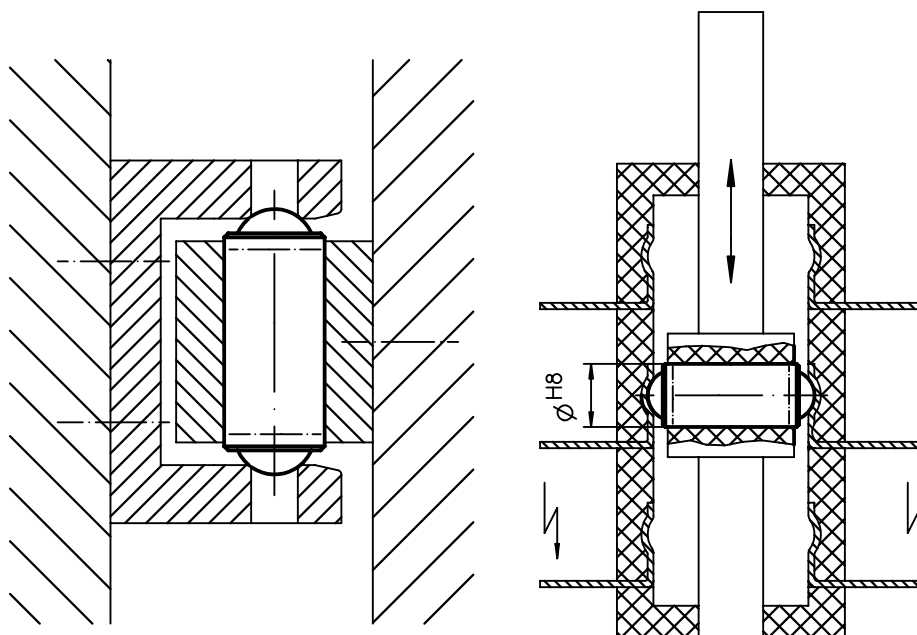


ORDER INFORMATION

Dimensions				Stroke s	Spring load ¹⁾		max. [°C]	Location hole H8	[g]	Art. No.
d ₁	d ₂	d ₃	l ₁		F ₁ ~	F ₂ ~				
[mm]				[mm]	[N]			[mm]		
2.5	2.0	2.52	5.3	0.65	1.3	2.5	250	2.5	0.1	22090.0025
3.0	2.5	3.02	7.3	0.80	2.0	4.5	250	3.0	0.3	22090.0030
4.0	3.0	4.03	9.0	0.90	2.5	7.5	250	4.0	0.6	22090.0040
5.0	4.0	5.03	10.8	1.20	3.5	8.0	250	5.0	1.2	22090.0050
6.0	5.0	6.03	12.6	1.60	3.5	10.5	250	6.0	1.9	22090.0060
7.0	6.0	7.03	14.0	2.00	4.0	12.0	250	7.0	3.0	22090.0070
8.0	6.5	8.03	18.0	2.10	6.0	15.0	250	8.0	5.1	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

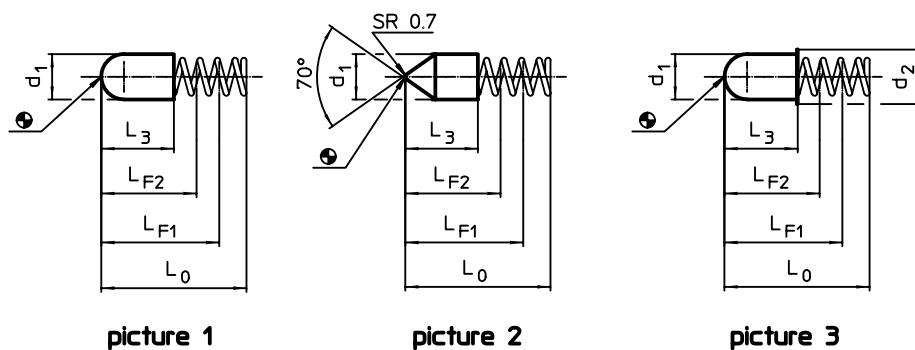
- Stainless steel 1.4310

MORE INFORMATION

Notes

Special springs on request.

DRAWING



picture 1

picture 2

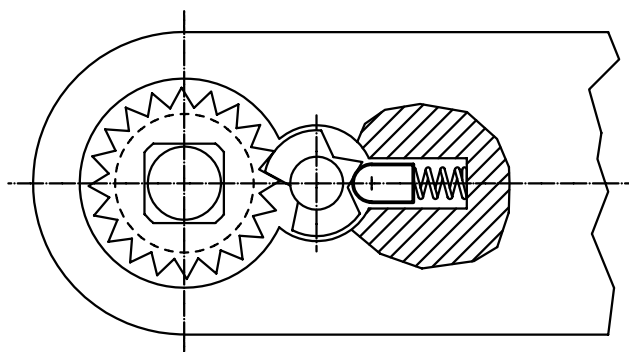
picture 3

ORDER INFORMATION

Dimensions						Stroke s	Spring load ¹⁾		Spring rate	 max.	 [g]	Art. No.
d ₁ ±0.05	L ₀	d ₂	L for F ₁	L for F ₂	L ₃		F ₁ ~	F ₂ ~				
[mm]						[mm]	[N]		[N/mm]	[°C]		
body from steel, round – picture 1												
2.2	16	–	12.0	10.5	7.8	1.5	2.2	3.0	0.53	250	0.1	22100.0012
2.6	8	–	6.5	5.2	3.8	1.3	1.1	2.0	0.70	250	0.1	22100.0016
3.0	12	–	9.0	8.7	6.0	0.3	6.2	6.8	2.00	250	0.2	22100.0022
	16	–	13.0	10.7	8.5	2.3	4.8	8.4	1.60	250	0.3	22100.0024
3.4	12	–	9.0	7.8	6.0	1.2	5.0	7.0	1.69	250	0.2	22100.0034
	15	–	12.0	8.2	7.3	3.8	5.9	13.3	1.95	250	0.2	22100.0036
4.0	14	–	12.0	9.0	8.0	3.0	5.0	12.3	2.45	250	0.4	22100.0042
5.0	16	–	13.0	10.4	8.0	2.6	8.0	15.0	2.70	250	0.6	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	0.2	22100.0124
3.6	18	–	15.0	11.5	9.0	1.5	6.7	14.5	2.24	250	0.4	22100.0137
4.0	16	–	13.0	11.4	7.5	1.6	8.0	12.3	2.70	250	0.4	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	0.2	22100.0212
3.0	11	–	9.0	6.7	5.0	2.3	1.6	3.4	0.78	250	0.1	22100.0222
	16	–	13.0	10.7	8.5	2.3	4.8	8.4	1.60	250	0.2	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	0.2	22100.0373

¹⁾ statistical average value

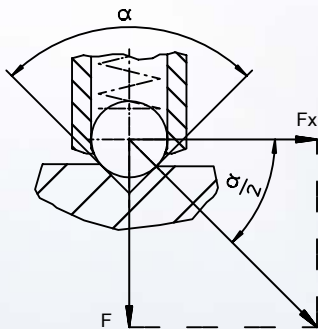
APPLICATION EXAMPLE



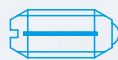
SPRING PLUNGERS

INCH MODELS

CALCULATION OF INDEXING RESISTANCE



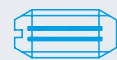
Example of calculation for:
 $\alpha = 60^\circ$, $F_x = 1,732 \times F$
 $\alpha = 90^\circ$, $F_x = F$
 $\alpha = 120^\circ$, $F_x = 0,577 \times F$



Light spring load



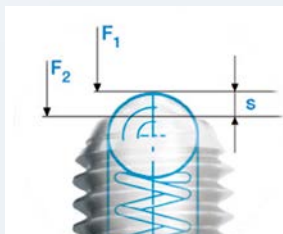
Standard spring load



Heavy spring load



[www.halder.com/
SpringPlungers-Video](http://www.halder.com/SpringPlungers-Video)



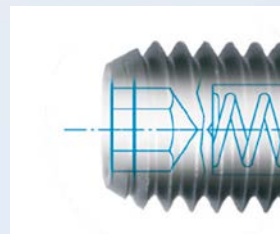
CERTIFIED

Certified spring load F_1 and F_2 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), nitrided

Body

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

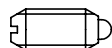
Spring

- Stainless steel

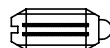
Characteristic

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

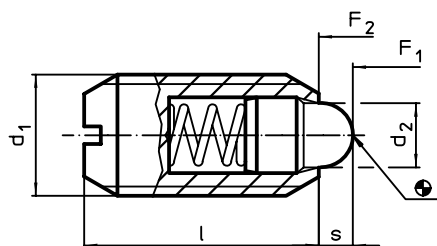
A conversion table can be found in the technical data following these product information pages.

Thread lock: polyamide spot coating (for details please refer to the technical appendix).

Further products

Spring Plungers, with pin and slot... → p. 63

DRAWING



ORDER INFORMATION

Dimensions					Stroke s	Spring load ¹⁾		min.	max.	[oz]	Art. No.	
d ₁	Thread	d ₂	l			F ₁ ~	F ₂ ~				Without thread lock	With thread lock
[in]		[in]			[in]	[lb]		[°F]				
free cutting steel, standard spring load												
#6-32	0.138	2A-UNC	0.046	3/8	0.063	0.5	1.5	-22	482	0.013	2B020.0033	—
									194	0.013	—	2B020.0233
#8-32	0.164	2A-UNC	0.070	7/16	0.052	0.8	1.5	-22	482	0.023	2B020.0036	—
									194	0.023	—	2B020.0236
#8-36	0.164	2A-UNF	0.070	7/16	0.052	0.8	1.5	-22	482	0.024	2B020.0038	—
									194	0.032	—	2B020.0238
#10-32	0.190	2A-UNF	0.093	15/32	0.065	1.0	2.5	-22	482	0.036	2B020.0040	—
									194	0.042	—	2B020.0240
1/4-20	0.250	2A-UNC	0.119	17/32	0.078	1.1	3.5	-22	482	0.062	2B020.0042	—
									194	0.064	—	2B020.0242
5/16-18	0.313	2A-UNC	0.135	37/64	0.084	1.0	4.0	-22	482	0.123	2B020.0046	—
									194	0.115	—	2B020.0246
3/8-16	0.375	2A-UNC	0.186	5/8	0.110	1.5	4.5	-22	482	0.187	2B020.0048	—
									194	0.190	—	2B020.0248
1/2-13	0.500	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	0.625	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

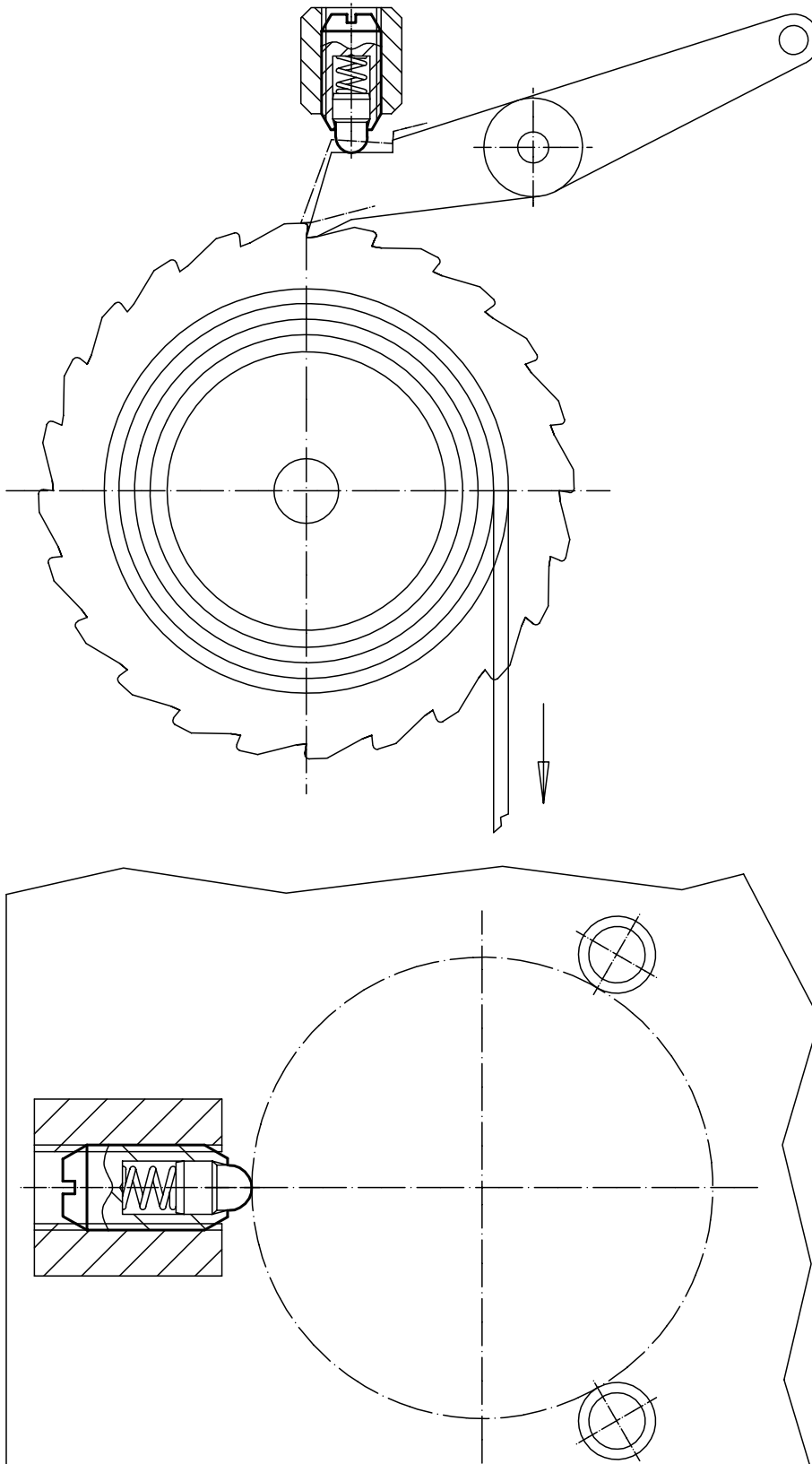


Dimensions					Stroke s	Spring load ¹⁾					Art. No.	
d ₁	Thread	d ₂	l	F ₁ ~		F ₂ ~	min.	max.	Without thread lock		With thread lock	
[in]		[in]		[in]		[lb]		[°F]				[oz]
free cutting steel, heavy spring load												
#6-32	0.138	2A-UNC	0.046	3/8	0.063	0.5	2.5	-22	482	0.022	2B020.0063	–
									194	0.021	–	2B020.0263
#8-32	0.164	2A-UNC	0.070	7/16	0.052	1.8	4.6	-22	482	0.023	2B020.0066	–
									194	0.023	–	2B020.0266
#8-36	0.164	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	0.190	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	0.250	2A-UNC	0.119	17/32	0.078	3.0	9.7	-22	482	0.065	2B020.0072	–
									194	0.074	–	2B020.0272
5/16-18	0.313	2A-UNC	0.135	37/64	0.084	3.8	13.0	-22	482	0.116	2B020.0076	–
									194	0.123	–	2B020.0276
3/8-16	0.375	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	0.500	2A-UNC	0.248	3/4	0.151	5.0	22.4	-22	482	0.384	2B020.0080	–
									194	0.388	–	2B020.0280
5/8-11	0.625	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	0.138	2A-UNC	0.046	3/8	0.063	0.5	1.5	-22	482	0.013	2B020.0133	–
									194	0.013	–	2B020.0333
#8-32	0.164	2A-UNC	0.070	7/16	0.052	0.8	1.5	-22	482	0.023	2B020.0136	–
									194	0.023	–	2B020.0336
#8-36	0.164	2A-UNF	0.070	7/16	0.052	0.8	1.5	-22	482	0.024	2B020.0138	–
									194	0.024	–	2B020.0338
#10-32	0.190	2A-UNF	0.093	15/32	0.065	1.0	2.5	-22	482	0.042	2B020.0140	–
									194	0.035	–	2B020.0340
1/4-20	0.250	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	0.313	2A-UNC	0.135	37/64	0.084	1.0	4.0	-22	482	0.123	2B020.0146	–
									194	0.115	–	2B020.0346
3/8-16	0.375	2A-UNC	0.186	5/8	0.110	1.5	4.5	-22	482	0.180	2B020.0148	–
									194	0.190	–	2B020.0348
1/2-13	0.500	2A-UNC	0.248	3/4	0.151	1.8	5.5	-22	482	0.388	2B020.0150	–
									194	0.377	–	2B020.0350
5/8-11	0.625	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	0.138	2A-UNC	0.046	3/8	0.063	0.5	2.5	-22	482	0.014	2B020.0163	–
									194	0.017	–	2B020.0363
#8-32	0.164	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	0.164	2A-UNF	0.070	7/16	0.052	1.8	4.6	-22	482	0.025	2B020.0168	–
									194	0.025	–	2B020.0368
#10-32	0.190	2A-UNF	0.093	15/32	0.065	2.6	6.3	-22	482	0.036	2B020.0170	–
									194	0.042	–	2B020.0370
1/4-20	0.250	2A-UNC	0.119	17/32	0.078	3.0	9.7	-22	482	0.071	2B020.0172	–
									194	0.074	–	2B020.0372
5/16-18	0.313	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	0.375	2A-UNC	0.186	5/8	0.110	4.5	16.0	-22	482	0.183	2B020.0178	–
									194	0.185	–	2B020.0378
1/2-13	0.500	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	0.625	2A-UNC	0.310	1 1/16	0.215	7.0	43.5	-22	482	0.914	2B020.0182	–
									194	0.910	–	2B020.0382

¹⁾ statistical average value

APPLICATION EXAMPLE

2



Spring Plungers • with pin and internal hexagon - INCH

EH 2B030.



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), nitrided

Body

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

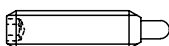
Spring

- Stainless steel

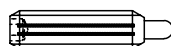
Characteristic

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

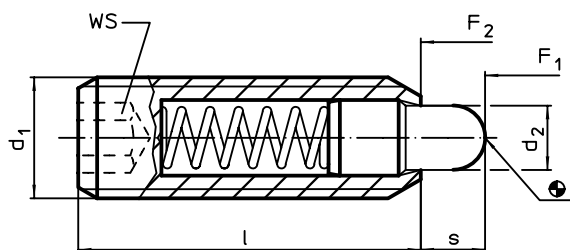
A conversion table can be found in the technical data following these product information pages.

Thread lock: polyamide spot coating (for details please refer to the technical appendix).

Further products

Spring Plungers, with pin and internal hexagon..... → p. 53

DRAWING



ORDER INFORMATION

Dimensions					WS	Stroke s	Spring load ¹⁾		min.	max.	[°F]	[oz]	Art. No.	
d ₁	Thread	d ₂	l				F ₁ ~	F ₂ ~					Without thread lock	With thread lock
[in]		[in]			[in]	[in]	[lb]							
free cutting steel, standard spring load														
#6-32	0.138	2A-UNC	0.046	17/32	1/16	0.063	0.5	1.5	-22	482	0.025	2B030.0033	—	—
										194	0.028	—	2B030.0233	—
#8-32	0.164	2A-UNC	0.070	5/8	5/64	0.094	0.8	2.3	-22	482	0.042	2B030.0036	—	—
										194	0.033	—	2B030.0236	—
#10-32	0.190	2A-UNF	0.093	3/4	3/32	0.125	1.4	2.7	-22	482	0.057	2B030.0040	—	—
										194	0.057	—	2B030.0240	—
1/4-20	0.250	2A-UNC	0.119	1	1/8	0.188	1.0	4.0	-22	482	0.121	2B030.0042	—	—
										194	0.120	—	2B030.0242	—
1/4-28	0.250	2A-UNF	0.119	1	1/8	0.188	1.0	4.0	-22	482	0.134	2B030.0044	—	—
										194	0.145	—	2B030.0244	—
5/16-18	0.313	2A-UNC	0.135	1	5/32	0.188	1.5	4.5	-22	482	0.205	2B030.0046	—	—
										194	0.196	—	2B030.0246	—
3/8-16	0.375	2A-UNC	0.186	1 1/8	3/16	0.188	2.7	7.2	-22	482	0.331	2B030.0048	—	—
										194	0.331	—	2B030.0248	—
1/2-13	0.500	2A-UNC	0.248	1 1/4	1/4	0.250	2.7	9.3	-22	482	0.649	2B030.0050	—	—
										194	0.649	—	2B030.0250	—
5/8-11	0.625	2A-UNC	0.310	1 1/2	5/16	0.313	3.5	10.6	-22	482	1.242	2B030.0052	—	—
										194	1.249	—	2B030.0252	—
3/4-10	0.750	2A-UNC	0.374	1 3/4	3/8	0.313	5.5	14.5	-22	482	2.172	2B030.0053	—	—
										194	2.174	—	2B030.0253	—
1-8	0.125	2A-UNC	0.499	2 13/32	3/8	0.500	4.0	31.0	-22	482	5.443	2B030.0054	—	—
										194	7.668	—	2B030.0254	—

¹⁾ statistical average value



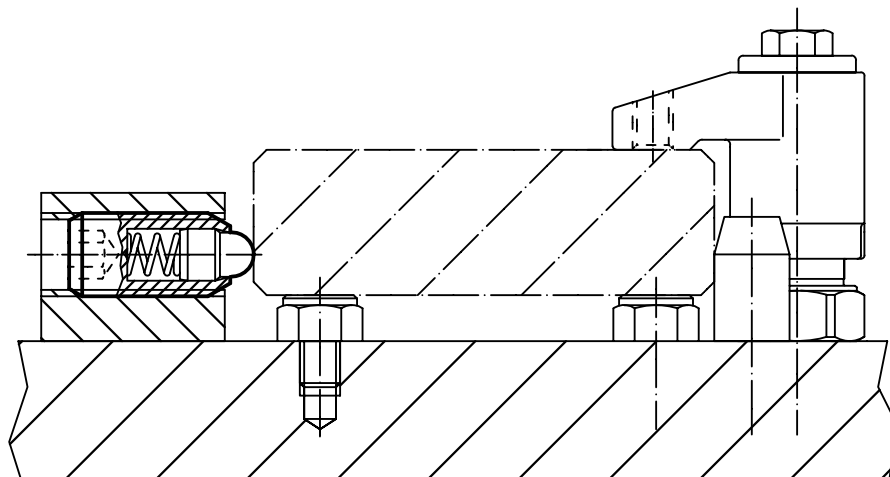
Dimensions					WS	Stroke s	Spring load ¹⁾					Art. No.	
d ₁	Thread	d ₂	l				F ₁ ~	F ₂ ~	min.	max.		Without thread lock	With thread lock
[in]			[in]		[in]	[in]	[lb]			[°F]	[oz]		
free cutting steel, heavy spring load													
#6-32	0.138	2A-UNC	0.046	17/32	1/16	0.063	1.5	3.4	-22	482	0.019	2B030.0063	—
										194	0.019	—	2B030.0263
#8-32	0.164	2A-UNC	0.070	5/8	5/64	0.094	2.6	6.6	-22	482	0.033	2B030.0066	—
										194	0.033	—	2B030.0266
#10-32	0.190	2A-UNF	0.093	3/4	3/32	0.125	3.2	9.0	-22	482	0.058	2B030.0070	—
										194	0.067	—	2B030.0270
1/4-20	0.250	2A-UNC	0.119	1	1/8	0.188	3.1	10.1	-22	482	0.122	2B030.0072	—
										194	0.099	—	2B030.0272
1/4-28	0.250	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	0.313	2A-UNC	0.135	1	5/32	0.188	3.0	15.0	-22	482	0.208	2B030.0076	—
										194	0.199	—	2B030.0276
3/8-16	0.375	2A-UNC	0.186	1 1/8	3/16	0.188	5.5	12.7	-22	482	0.335	2B030.0078	—
										194	0.328	—	2B030.0278
1/2-13	0.500	2A-UNC	0.248	1 1/4	1/4	0.250	6.6	16.0	-22	482	0.649	2B030.0080	—
										194	0.650	—	2B030.0280
5/8-11	0.625	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	0.750	2A-UNC	0.374	1 3/4	3/8	0.313	6.7	33.0	-22	482	2.174	2B030.0083	—
										194	2.176	—	2B030.0283
1-8	0.125	2A-UNC	0.499	2 13/32	3/8	0.500	16.0	60.0	-22	482	5.538	2B030.0084	—
										194	5.496	—	2B030.0284
stainless steel, standard spring load													
#6-32	0.138	2A-UNC	0.046	17/32	1/16	0.063	0.5	1.5	-22	482	0.018	2B030.0133	—
										194	0.019	—	2B030.0333
#8-32	0.164	2A-UNC	0.070	5/8	5/64	0.094	0.8	2.3	-22	482	0.033	2B030.0136	—
										194	0.039	—	2B030.0336
#10-32	0.190	2A-UNF	0.093	3/4	3/32	0.125	1.4	2.7	-22	482	0.057	2B030.0140	—
										194	0.063	—	2B030.0340
1/4-20	0.250	2A-UNC	0.119	1	1/8	0.188	1.0	4.0	-22	482	0.120	2B030.0142	—
										194	0.121	—	2B030.0342
1/4-28	0.250	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	0.313	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	0.375	2A-UNC	0.186	1 1/8	3/16	0.188	2.7	7.2	-22	482	0.330	2B030.0148	—
										194	0.339	—	2B030.0348
1/2-13	0.500	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	0.625	2A-UNC	0.310	1 1/2	5/16	0.313	3.5	10.6	-22	482	1.249	2B030.0152	—
										194	1.249	—	2B030.0352
3/4-10	0.750	2A-UNC	0.374	1 3/4	3/8	0.313	5.5	14.5	-22	482	2.180	2B030.0153	—
										194	2.187	—	2B030.0353
1-8	0.125	2A-UNC	0.499	2 13/32	3/8	0.500	4.0	31.0	-22	482	5.475	2B030.0154	—
										194	5.464	—	2B030.0354

¹⁾ statistical average value

Dimensions					WS	Stroke s	Spring load ¹⁾		min.	max.	[oz]	Art. No.	
d ₁	Thread	d ₂	l				F ₁ ~	F ₂ ~				Without thread lock	With thread lock
[in]		[in]			[in]	[in]	[lb]		[°F]				
stainless steel, heavy spring load													
#6-32	0.138	2A-UNC	0.046	17/32	1/16	0.063	1.5	3.4	-22	482	0.019	2B030.0163	–
										194	0.019	–	2B030.0363
#8-32	0.164	2A-UNC	0.070	5/8	5/64	0.094	2.6	6.6	-22	482	0.034	2B030.0166	–
										194	0.034	–	2B030.0366
#10-32	0.190	2A-UNF	0.093	3/4	3/32	0.125	3.2	9.0	-22	482	0.063	2B030.0170	–
										194	0.057	–	2B030.0370
1/4-20	0.250	2A-UNC	0.119	1	1/8	0.188	3.1	10.1	-22	482	0.122	2B030.0172	–
										194	0.131	–	2B030.0372
1/4-28	0.250	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	0.313	2A-UNC	0.135	1	5/32	0.188	3.0	15.0	-22	482	0.168	2B030.0176	–
										194	0.212	–	2B030.0376
3/8-16	0.375	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	0.500	2A-UNC	0.248	1 1/4	1/4	0.250	6.6	16.0	-22	482	0.653	2B030.0180	–
										194	0.638	–	2B030.0380
5/8-11	0.625	2A-UNC	0.310	1 1/2	5/16	0.313	10.5	22.2	-22	482	1.252	2B030.0182	–
										194	1.256	–	2B030.0382
3/4-10	0.750	2A-UNC	0.374	1 3/4	3/8	0.313	6.7	33.0	-22	482	2.188	2B030.0183	–
										194	2.191	–	2B030.0383
1-8	0.125	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



Light spring load



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.

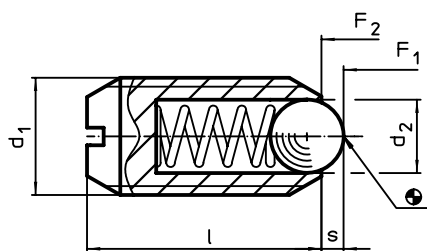
Thread lock: polyamide spot coating (for details please refer to the technical appendix).

Calculation of indexing resistance, please refer to appendix - Technical Data -

Further products

Spring Plungers, with ball and slot ... → p. 60

DRAWING



ORDER INFORMATION

Dimensions					Stroke s	Spring load ¹⁾		 min. max. [°F]	 [oz]	Art. No.		
d ₁	Thread	d ₂	l	F ₁ ~		F ₂ ~	Without thread lock			With thread lock		
[in]			[in]		[in]	[lb]						
free cutting steel, light spring load												
#10-32	0.190	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	0.250	2A-UNC	1/8	17/32	0.035	2.1	4.0	-22	482	0.074	2B050.0012	—
									194	0.073	—	2B050.0212
5/16-18	0.313	2A-UNC	5/32	37/64	0.040	2.0	4.6	-22	482	0.114	2B050.0016	—
									194	0.123	—	2B050.0216
3/8-16	0.375	2A-UNC	3/16	5/8	0.048	2.5	5.0	-22	482	0.193	2B050.0018	—
									194	0.194	—	2B050.0218
1/2-13	0.500	2A-UNC	9/32	3/4	0.072	3.0	6.0	-22	482	0.397	2B050.0020	—
									194	0.399	—	2B050.0220
5/8-11	0.625	2A-UNC	3/8	63/64	0.096	4.5	9.0	-22	482	0.787	2B050.0022	—
									194	0.790	—	2B050.0222

¹⁾ statistical average value



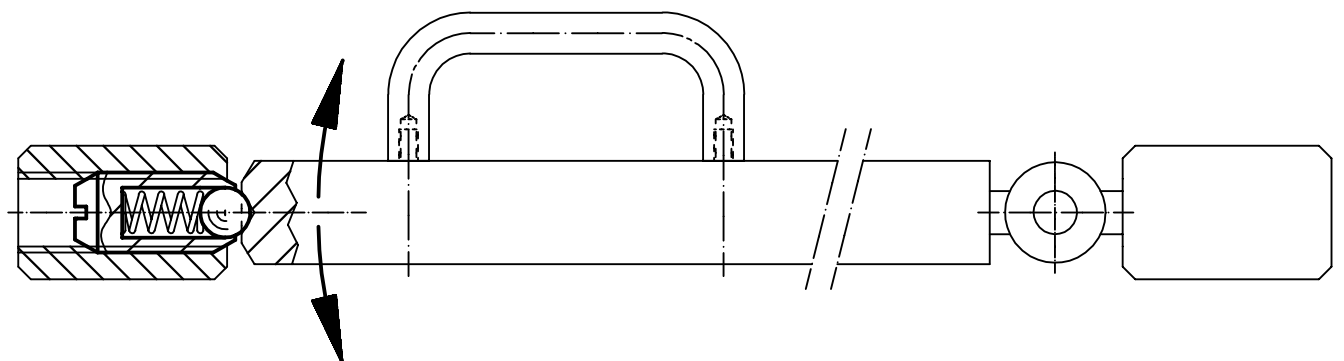
Dimensions					Stroke s	Spring load ¹⁾		 min. max. [°F]	 [oz]	Art. No.		
d ₁	Thread	d ₂	l	F ₁ ~		F ₂ ~	Without thread lock			With thread lock		
[in]		[in]		[in]		[lb]						
free cutting steel, standard spring load												
#4-48	0.112	2A-UNF	1/16	3/16	0.020	0.1	0.5	-22	482	0.004	2B050.0031	–
									194	0.005	–	2B050.0231
#5-40	0.125	2A-UNC	1/16	1/4	0.020	0.3	0.8	-22	482	0.008	2B050.0032	–
									194	0.007	–	2B050.0232
#6-32	0.138	2A-UNC	5/64	5/16	0.023	0.5	1.0	-22	482	0.011	2B050.0033	–
									194	0.011	–	2B050.0233
#6-40	0.138	2A-UNF	5/64	5/16	0.023	0.5	1.0	-22	482	0.012	2B050.0035	–
									194	0.020	–	2B050.0235
#8-32	0.164	2A-UNC	3/32	11/32	0.025	0.8	1.3	-22	482	0.018	2B050.0036	–
									194	0.026	–	2B050.0236
#8-36	0.164	2A-UNF	3/32	11/32	0.025	0.8	1.3	-22	482	0.026	2B050.0038	–
									194	0.027	–	2B050.0238
#10-32	0.190	2A-UNF	3/32	33/64	0.025	2.0	3.1	-22	482	0.049	2B050.0040	–
									194	0.050	–	2B050.0240
1/4-20	0.250	2A-UNC	1/8	17/32	0.035	3.8	6.8	-22	482	0.065	2B050.0042	–
									194	0.074	–	2B050.0242
5/16-18	0.313	2A-UNC	5/32	37/64	0.040	4.0	8.4	-22	482	0.123	2B050.0046	–
									194	0.115	–	2B050.0246
3/8-16	0.375	2A-UNC	3/16	5/8	0.048	5.0	10.3	-22	482	0.198	2B050.0048	–
									194	0.189	–	2B050.0248
1/2-13	0.500	2A-UNC	9/32	3/4	0.072	6.0	12.0	-22	482	0.389	2B050.0050	–
									194	0.378	–	2B050.0250
5/8-11	0.625	2A-UNC	3/8	63/64	0.096	9.0	18.0	-22	482	0.811	2B050.0052	–
									194	0.797	–	2B050.0252
free cutting steel, heavy spring load												
#10-32	0.190	2A-UNF	3/32	33/64	0.025	3.3	4.8	-22	482	0.049	2B050.0070	–
									194	0.041	–	2B050.0270
1/4-20	0.250	2A-UNC	1/8	17/32	0.035	5.6	8.6	-22	482	0.064	2B050.0072	–
									194	0.065	–	2B050.0272
5/16-18	0.313	2A-UNC	5/32	37/64	0.040	6.0	11.1	-22	482	0.113	2B050.0076	–
									194	0.113	–	2B050.0276
3/8-16	0.375	2A-UNC	3/16	5/8	0.048	7.5	15.1	-22	482	0.196	2B050.0078	–
									194	0.198	–	2B050.0278
1/2-13	0.500	2A-UNC	9/32	3/4	0.072	6.0	24.0	-22	482	0.408	2B050.0080	–
									194	0.398	–	2B050.0280
5/8-11	0.625	2A-UNC	3/8	63/64	0.096	7.0	40.0	-22	482	0.825	2B050.0082	–
									194	0.819	–	2B050.0282
stainless steel, light spring load												
#10-32	0.190	2A-UNF	3/32	33/64	0.025	0.9	1.5	-22	482	0.041	2B050.0110	–
									194	0.048	–	2B050.0310
1/4-20	0.250	2A-UNC	1/8	17/32	0.035	2.1	4.0	-22	482	0.052	2B050.0112	–
									194	0.074	–	2B050.0312
5/16-18	0.313	2A-UNC	5/32	37/64	0.040	2.0	4.6	-22	482	0.117	2B050.0116	–
									194	0.123	–	2B050.0316
3/8-16	0.375	2A-UNC	3/16	5/8	0.048	2.5	5.0	-22	482	0.190	2B050.0118	–
									194	0.188	–	2B050.0318
1/2-13	0.500	2A-UNC	9/32	3/4	0.072	3.0	6.0	-22	482	0.397	2B050.0120	–
									194	0.399	–	2B050.0320
5/8-11	0.625	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⁾		 min. max.		 [oz]	Art. No.	
d ₁	Thread	d ₂	l	F ₁		F ₂	°F	Without thread lock	With thread lock			
[in]		[in]		[in]		[lb]						
stainless steel, standard spring load												
#4-48	0.112	2A-UNF	1/16	3/16	0.020	0.1	0.5	-22	482	0.004	2B050.0131	—
									194	0.005	—	2B050.0331
#5-40	0.125	2A-UNC	1/16	1/4	0.020	0.3	0.8	-22	482	0.007	2B050.0132	—
									194	0.015	—	2B050.0332
#6-32	0.138	2A-UNC	5/64	5/16	0.023	0.5	1.0	-22	482	0.011	2B050.0133	—
									194	0.185	—	2B050.0333
#6-40	0.138	2A-UNF	5/64	5/16	0.023	0.5	1.0	-22	482	0.012	2B050.0135	—
									194	0.020	—	2B050.0335
#8-32	0.164	2A-UNC	3/32	11/32	0.025	0.8	1.3	-22	482	0.018	2B050.0136	—
									194	0.018	—	2B050.0336
#8-36	0.164	2A-UNF	3/32	11/32	0.025	0.8	1.3	-22	482	0.019	2B050.0138	—
									194	0.026	—	2B050.0338
#10-32	0.190	2A-UNF	3/32	33/64	0.025	2.0	3.1	-22	482	0.041	2B050.0140	—
									194	0.041	—	2B050.0340
1/4-20	0.250	2A-UNC	1/8	17/32	0.035	3.8	6.8	-22	482	0.065	2B050.0142	—
									194	0.073	—	2B050.0342
5/16-18	0.313	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	0.375	2A-UNC	3/16	5/8	0.048	5.0	10.3	-22	482	0.198	2B050.0148	—
									194	0.191	—	2B050.0348
1/2-13	0.500	2A-UNC	9/32	3/4	0.072	6.0	12.0	-22	482	0.383	2B050.0150	—
									194	0.406	—	2B050.0350
5/8-11	0.625	2A-UNC	3/8	63/64	0.096	9.0	18.0	-22	482	0.813	2B050.0152	—
									194	0.815	—	2B050.0352
stainless steel, heavy spring load												
#10-32	0.190	2A-UNF	3/32	33/64	0.025	3.3	4.8	-22	482	0.046	2B050.0170	—
									194	0.049	—	2B050.0370
1/4-20	0.250	2A-UNC	1/8	17/32	0.035	5.6	8.6	-22	482	0.074	2B050.0172	—
									194	0.071	—	2B050.0372
5/16-18	0.313	2A-UNC	5/32	37/64	0.040	6.0	11.1	-22	482	0.123	2B050.0176	—
									194	0.115	—	2B050.0376
3/8-16	0.375	2A-UNC	3/16	5/8	0.048	7.5	15.1	-22	482	0.197	2B050.0178	—
									194	0.198	—	2B050.0378
1/2-13	0.500	2A-UNC	9/32	3/4	0.072	6.0	24.0	-22	482	0.395	2B050.0180	—
									194	0.409	—	2B050.0380
5/8-11	0.625	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



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.

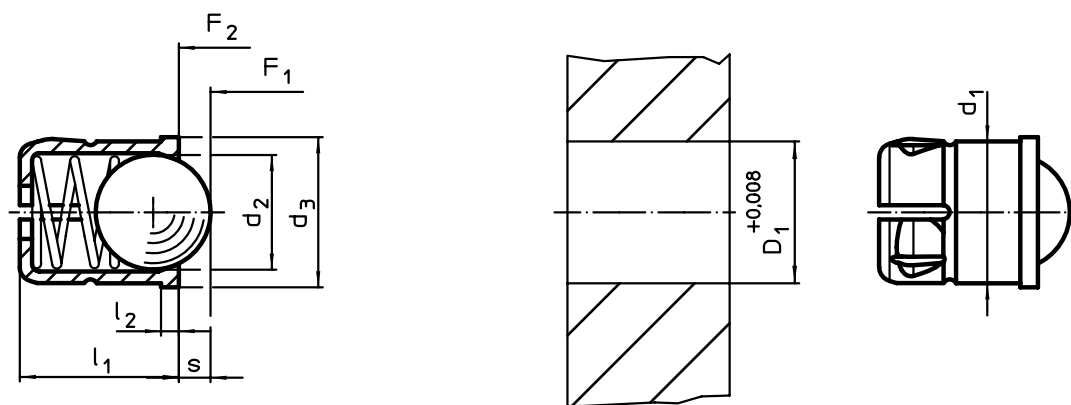
References

Calculation of indexing resistance, please refer to appendix - Technical Data -

Further products

Spring Plungers, smooth, with collar and ball, self-clamping. → p. 82

DRAWING



ORDER INFORMATION

Dimensions					Stroke s	Spring load ¹⁾		 min. max. [°F]		Location hole D_1 $+0.008$	 [oz]	Art. No.
d_1 $+0.004$	d_2	d_3	l_1 ± 0.01	l_2		F_1 $\sim$	F_2 $\sim$					
			[in]		[in]	[lb]				[in]		
3/16	0.157	0.220	0.236	0.039	0.039	1.3	2.1	-22	122	3/16	0.012	2B080.0050
1/4	0.197	0.276	0.276	0.039	0.059	1.4	2.8	-22	122	1/4	0.024	2B080.0060
5/16	0.256	0.335	0.354	0.039	0.075	1.9	4.5	-22	122	5/16	0.051	2B080.0080
3/8	0.315	0.433	0.531	0.059	0.091	2.7	5.0	-22	122	3/8	0.103	2B080.0090
1/2	0.394	0.551	0.630	0.059	0.126	3.1	5.6	-22	122	1/2	0.208	2B080.0120

¹⁾ statistical average value

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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
- Thermoplast PA 6, red, 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

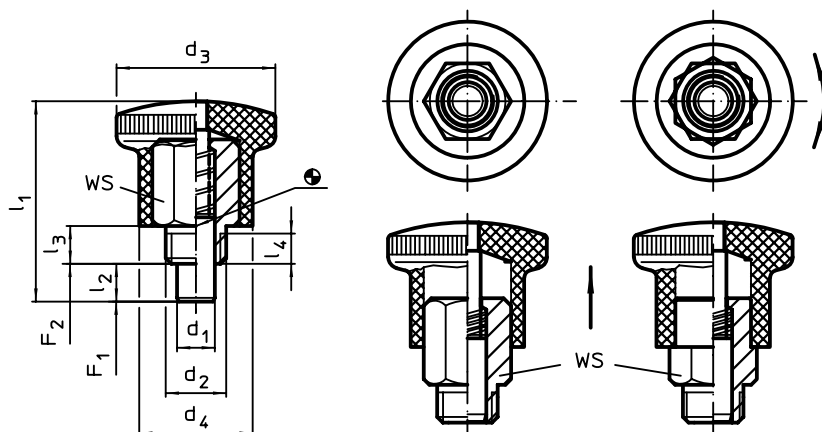
Notes

Knob not removable.

Further products

Distance Collars, for index plungers . . → p. 129

DRAWING



picture 1

picture 2

ORDER INFORMATION

Dimensions								WS	Spring load ¹⁾		min. max.			Art. No.	
d ₀	d ₂	d ₃	d ₄	l ₁	l ₂ min.	l ₃	l ₄ min.		F ₁ ~	F ₂ ~				Steel	Stainless steel
-0.06															
[mm]															
without locking, knob black – 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
without locking, knob red – picture 1															
4	M 8 x 0,75	21	15	26.5	5	5	3.5	10	4.5	12	-30	80	14	22110.2024	22110.2044
5	M 8 x 0,75	21	15	26.5	5	5	3.5	10	4.5	12	-30	80	14	22110.2026	22110.2046
6	M10 x 1	25	18	34.0	7	7	4.5	12	5.0	18	-30	80	25	22110.2028	22110.2048
7	M10 x 1	25	18	34.0	7	7	4.5	12	5.0	18	-30	80	25	22110.2030	22110.2050
with locking, knob black – 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
with locking, knob red – picture 2															
4	M 8 x 0,75	21	15	26.5	5	5	3.5	10	4.5	12	-30	80	13	22110.2034	22110.2054
5	M 8 x 0,75	21	15	26.5	5	5	3.5	10	4.5	12	-30	80	14	22110.2036	22110.2056
6	M10 x 1	25	18	34.0	7	7	4.5	12	5.0	18	-30	80	24	22110.2038	22110.2058
7	M10 x 1	25	18	34.0	7	7	4.5	12	5.0	18	-30	80	25	22110.2040	22110.2060

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.
Due to a thread recess the index plungers can be completely screwed in.

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

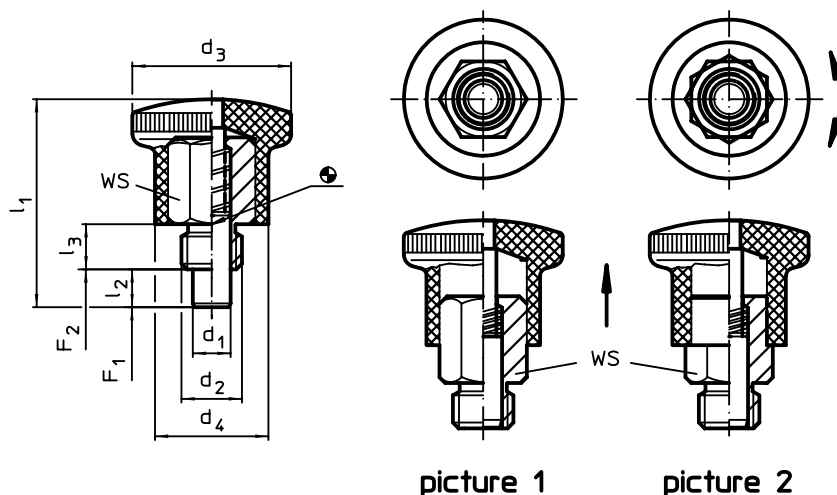
Notes

Knob not removable.

Further products

Distance Collars, for index plungers . . → p. 129

DRAWING



picture 1

picture 2

ORDER INFORMATION

Dimensions							WS	Spring load ¹⁾		Temperature		Weight	Art. No.	
d ₁ h9	d ₂	d ₃	d ₄	l ₁	l ₂ min.	l ₃	[mm]	F ₁ ~	F ₂ ~	min.	max.	[g]	Steel	Stainless steel
[mm]														
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	24	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	40	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

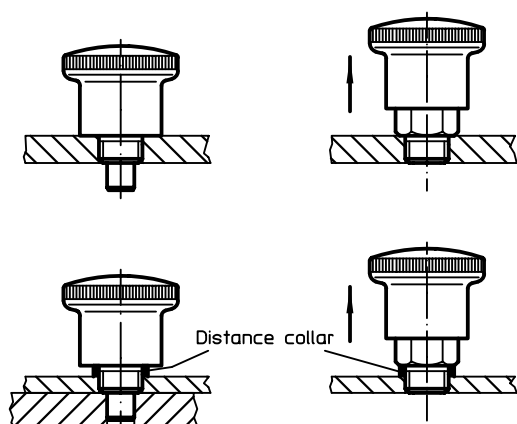
¹⁾ statistical average value



d ₁ h9	Dimensions						WS [mm]	Spring load ¹⁾		min. max. [°C]		[g]	Art. No.	
	d ₂	d ₃	d ₄	l ₁	l ₂ min.	l ₃		F ₁ ~ [N]	F ₂ ~ [N]				Steel	Stainless steel
with locking – picture 2														
4	M 8	21	15	27.5	5	6	10	4	12	-30	80	14	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
7	M12 x 1,5	28	20	40.5	7	10	14	10	23	-30	80	39	22110.0644	22110.0744
	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.
Due to a thread recess the index plungers can be completely screwed in.

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

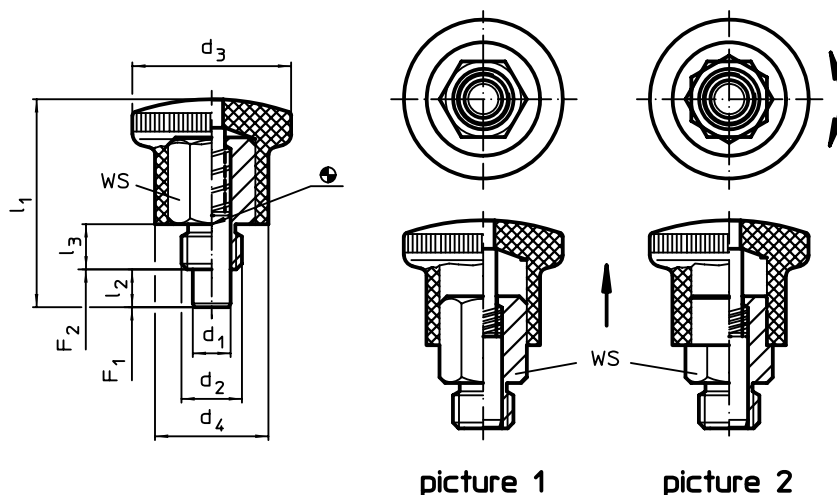
Notes

Knob not removable.

Further products

Distance Collars, for index plungers . . . → p. 129

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 ~	max.		
[mm]							[mm]	[N]		[°C]	[g]	
without locking – picture 1												
4	M 8	21	15	27.5	5	6	10	4	12	250	27	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

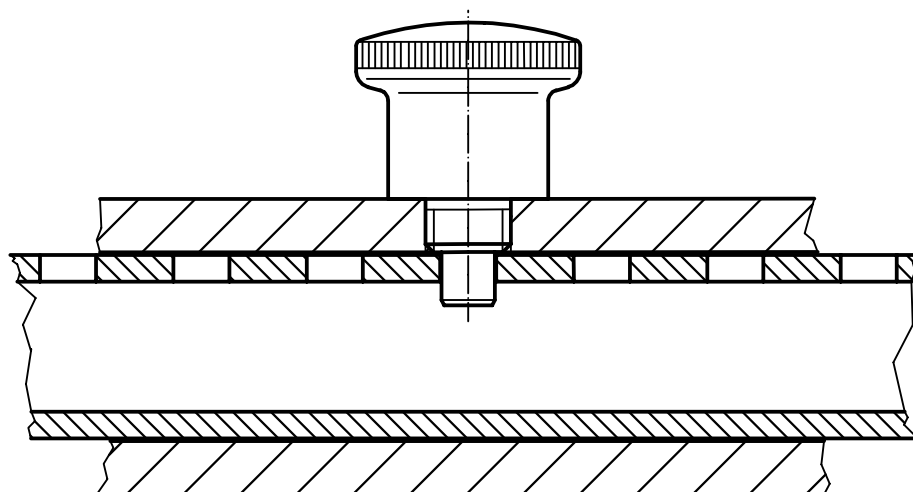
¹⁾ statistical average value



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	50	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
- Thermoplast PA 6, red, dull

Assembly

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

MORE INFORMATION

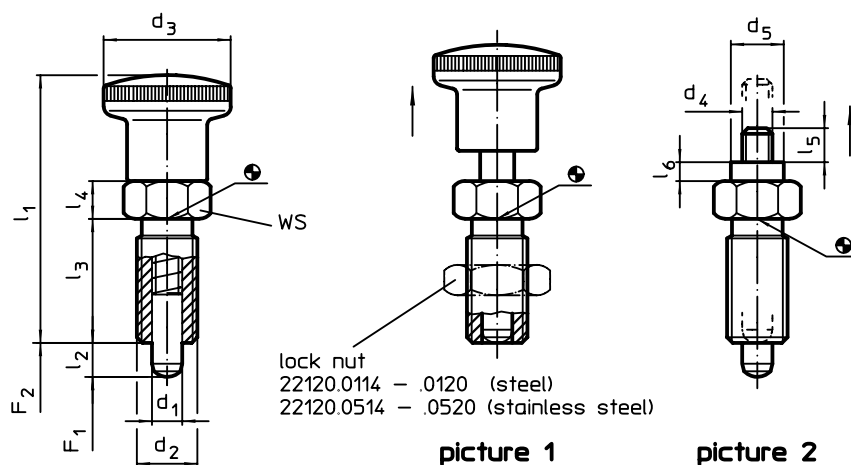
Notes

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

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. → p. 115
Locating Bushings, for index bolts and index plungers → p. 116
Distance Collars, for index plungers → p. 129

DRAWING



picture 1

picture 2

ORDER INFORMATION

Dimensions											WS	Spring load ¹⁾		Temperature		Weight	Art. No.	
d ₁	d ₂	I ₂ min.	d ₃	d ₄	d ₅	I ₁	I ₃	I ₄	I ₅	I ₆	[mm]	F ₁	F ₂	min.	max.	[g]	Steel	Stainless steel
-0.02 -0.05																		
[mm]																		
[N]																		
[°C]																		
with knob, black – picture 1																		
4	M 8 x 1	4	16	–	–	35.0	16	5	–	–	10	4.5	12.0	-30	80	10	22110.0103	22110.0203
		6	16	–	–	35.0	16	5	–	–	10	4.0	12.5	-30	80	10	22110.0104	22110.0204
5	M10 x 1	5	19	–	–	40.0	18	6	–	–	12	5.0	15.0	-30	80	18	22110.0106	22110.0206
		8	19	–	–	40.0	18	6	–	–	12	5.0	18.0	-30	80	18	22110.0107	22110.0207
6	M12 x 1,5	6	23	–	–	48.0	22	6	–	–	14	6.5	19.0	-30	80	29	22110.0109	22110.0209
		9	23	–	–	48.0	22	6	–	–	14	6.0	25.0	-30	80	29	22110.0110	22110.0210
8	M16 x 1,5	8	28	–	–	58.0	26	8	–	–	17	8.5	26.0	-30	80	62	22110.0112	22110.0212
		12	28	–	–	58.0	26	8	–	–	17	8.5	28.0	-30	80	62	22110.0113	22110.0213
10	M16 x 1,5	12	28	–	–	58.0	26	8	–	–	17	9.5	38.0	-30	80	63	22110.0115	22110.0215
12	M20 x 1,5	15	33	–	–	67.0	33	10	–	–	22	11.5	40.0	-30	80	128	22110.0116	22110.0216
16	M24 x 2	20	33	–	–	78.5	38	12	–	–	27	13.0	54.0	-30	80	203	22110.0117	22110.0217

¹⁾ statistical average value



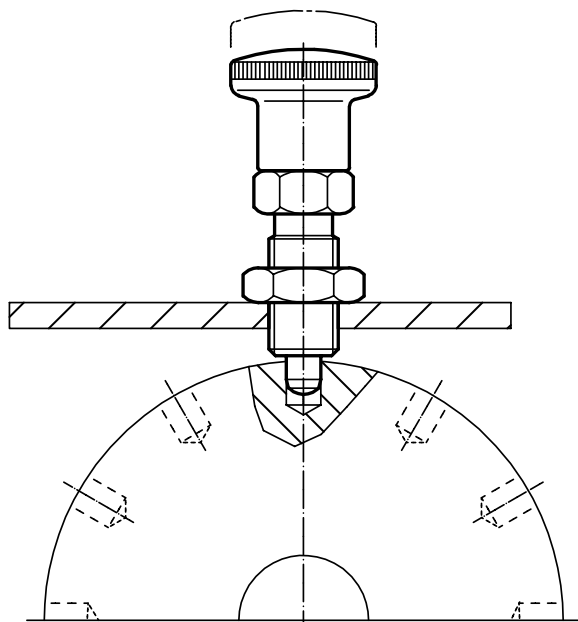
Dimensions											WS	Spring load ¹⁾					Art. No.	
d ₁ -0.02 -0.05	d ₂	I ₂ min.	d ₃	d ₄	d ₅	I ₁	I ₃	I ₄	I ₅	I ₆		F ₁ ~	F ₂ ~	min.	max.		Steel	Stainless steel
[mm]											[mm]	[N]		[°C]		[g]		
with knob, red – picture 1																		
4	M 8 x 1	4	16	–	–	35.0	16	5	–	–	10	4.5	12.0	-30	80	10	22110.2103	22110.2203
		6	16	–	–	35.0	16	5	–	–	10	4.0	12.5	-30	80	11	22110.2104	22110.2204
5	M10 x 1	5	19	–	–	40.0	18	6	–	–	12	5.0	15.0	-30	80	18	22110.2106	22110.2206
		8	19	–	–	40.0	18	6	–	–	12	5.0	18.0	-30	80	18	22110.2107	22110.2207
6	M12 x 1,5	6	23	–	–	48.0	22	6	–	–	14	6.5	19.0	-30	80	30	22110.2109	22110.2209
		9	23	–	–	48.0	22	6	–	–	14	6.0	25.0	-30	80	29	22110.2110	22110.2210
8	M16 x 1,5	8	28	–	–	58.0	26	8	–	–	17	8.5	26.0	-30	80	62	22110.2112	22110.2212
		12	28	–	–	58.0	26	8	–	–	17	8.5	28.0	-30	80	64	22110.2113	22110.2213
10	M16 x 1,5	12	28	–	–	58.0	26	8	–	–	17	9.5	38.0	-30	80	65	22110.2115	22110.2215
12	M20 x 1,5	15	33	–	–	71.5	33	10	–	–	22	11.5	40.0	-30	80	117	22110.2116	22110.2216
16	M24 x 2	20	33	–	–	78.5	38	12	–	–	27	13.0	54.0	-30	80	202	22110.2117	22110.2217
without knob – picture 2																		
4	M 8 x 1	4	–	M3	7	–	16	5	4.5	2.5	10	4.5	12.0	–	250	9	22110.0143	22110.0243
		6	–	M3	7	–	16	5	4.5	2.5	10	4.0	12.5	–	250	9	22110.0144	22110.0244
5	M10 x 1	5	–	M4	8	–	18	6	5.5	3.0	12	5.0	15.0	–	250	16	22110.0146	22110.0246
		8	–	M4	8	–	18	6	5.5	3.0	12	5.0	18.0	–	250	17	22110.0147	22110.0247
6	M12 x 1,5	6	–	M5	9	–	22	6	7.0	3.5	14	6.5	19.0	–	250	25	22110.0149	22110.0249
		9	–	M5	9	–	22	6	7.0	3.5	14	6.0	25.0	–	250	26	22110.0150	22110.0250
8	M16 x 1,5	8	–	M6	10	–	26	8	8.5	4.0	17	8.5	26.0	–	250	54	22110.0152	22110.0252
		12	–	M6	10	–	26	8	8.5	4.0	17	8.5	28.0	–	250	55	22110.0153	22110.0253
10	M16 x 1,5	12	–	M6	10	–	26	8	8.5	4.0	17	9.5	38.0	–	250	56	22110.0155	22110.0255
12	M20 x 1,5	15	–	M6	12	–	33	10	8.5	4.0	22	11.5	40.0	–	250	111	22110.0156	22110.0256
16	M24 x 2	20	–	M8	15	–	38	12	11.5	5.0	27	13.0	54.0	–	250	193	22110.0157	22110.0257

¹⁾ statistical average value

ACCESSORIES

Dimensions		Wrench size		Art. No.	
d ₂				Steel	Stainless steel
[mm]		[mm]	[g]		
lock nuts ISO 8675 (DIN 439)					
	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	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	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
- Thermoplast PA 6, red, 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

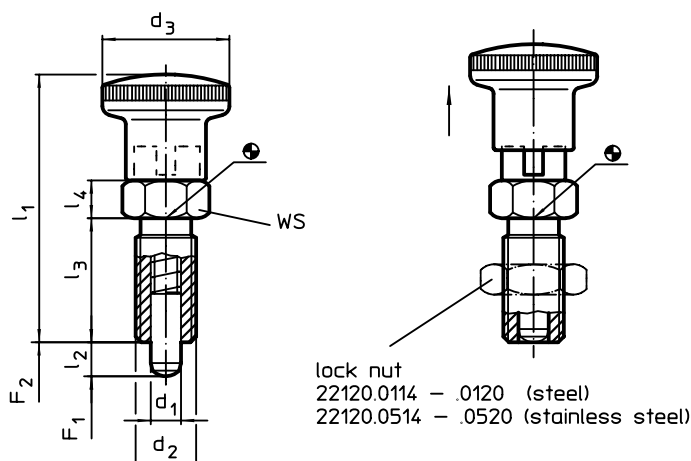
Notes

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

Further products

Mounting Blocks, for index bolts and
index plungers, die-cast. → p. 115
Locating Bushings, for index bolts and
index plungers → p. 116
Distance Collars, for index plungers . . . → p. 129

DRAWING



ORDER INFORMATION

Dimensions							WS	Spring load ¹⁾				Art. No.		
d ₁ -0.02 -0.05	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]		
with knob, black														
4	M 8 x 1	4	16	35.0	16	5	10	4.5	12.0	-30	80	12	22110.0123	22110.0223
		6	16	35.0	16	5	10	4.0	12.5	-30	80	12	22110.0124	22110.0224
5	M10 x 1	5	19	40.0	18	6	12	5.0	15.0	-30	80	20	22110.0126	22110.0226
		8	19	40.0	18	6	12	5.0	18.0	-30	80	20	22110.0127	22110.0227
6	M12 x 1,5	6	23	48.0	22	6	14	6.5	19.0	-30	80	31	22110.0129	22110.0229
		9	23	48.0	22	6	14	6.0	25.0	-30	80	33	22110.0130	22110.0230
8	M16 x 1,5	8	28	58.0	26	8	17	8.5	26.0	-30	80	65	22110.0132	22110.0232
		12	28	58.0	26	8	17	8.5	28.0	-30	80	68	22110.0133	22110.0233
10	M16 x 1,5	12	28	58.0	26	8	17	9.5	38.0	-30	80	69	22110.0135	22110.0235
12	M20 x 1,5	15	33	67.0	33	10	22	11.5	40.0	-30	80	125	22110.0136	22110.0236
16	M24 x 2	20	33	78.5	38	12	27	13.0	54.0	-30	80	219	22110.0137	22110.0237

¹⁾ statistical average value



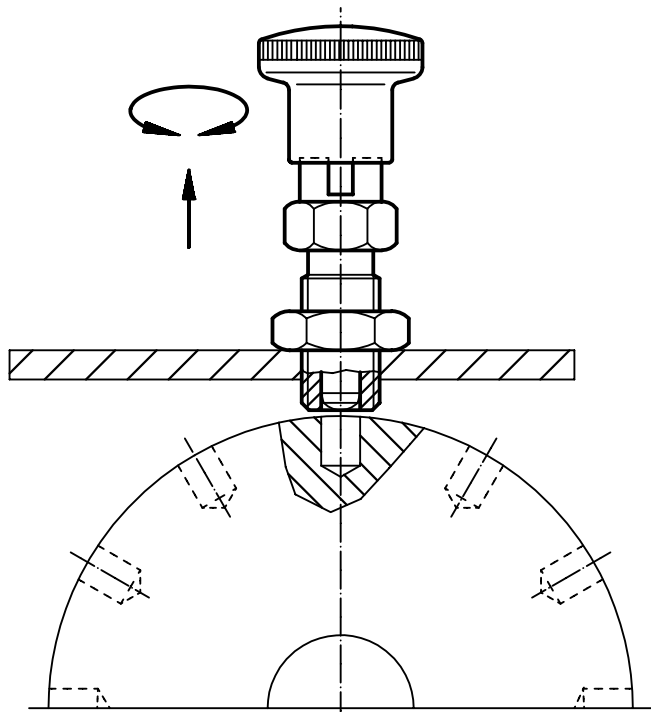
Dimensions							WS	Spring load ¹⁾				Art. No.		
d ₁ -0.02 -0.05	d ₂	l ₂ min.	d ₃	l ₁	l ₃	l ₄		F ₁ ~	F ₂ ~	min.	max.		Steel	Stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
with knob, red														
4	M 8 x 1	4	16	35.0	16	5	10	4.5	12.0	-30	80	11	22110.2123	22110.2223
		6	16	35.0	16	5	10	4.0	12.5	-30	80	13	22110.2124	22110.2224
5	M10 x 1	5	19	40.0	18	6	12	5.0	15.0	-30	80	21	22110.2126	22110.2226
		8	19	40.0	18	6	12	5.0	18.0	-30	80	21	22110.2127	22110.2227
6	M12 x 1,5	6	23	48.0	22	6	14	6.5	19.0	-30	80	33	22110.2129	22110.2229
		9	23	48.0	22	6	14	6.0	25.0	-30	80	32	22110.2130	22110.2230
8	M16 x 1,5	8	28	58.0	26	8	17	8.5	26.0	-30	80	65	22110.2132	22110.2232
		12	28	58.0	26	8	17	8.5	28.0	-30	80	69	22110.2133	22110.2233
10	M16 x 1,5	12	28	58.0	26	8	17	9.5	38.0	-30	80	70	22110.2135	22110.2235
12	M20 x 1,5	15	33	71.5	33	10	22	11.5	40.0	-30	80	127	22110.2136	22110.2236
16	M24 x 2	20	33	78.5	38	12	27	13.0	54.0	-30	80	200	22110.2137	22110.2237

¹⁾ statistical average value

ACCESSORIES

Dimensions		Wrench size		Art. No.	
d_2				Steel	Stainless steel
[mm]		[mm]	[g]		
lock nuts ISO 8675 (DIN 439)					
	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	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	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

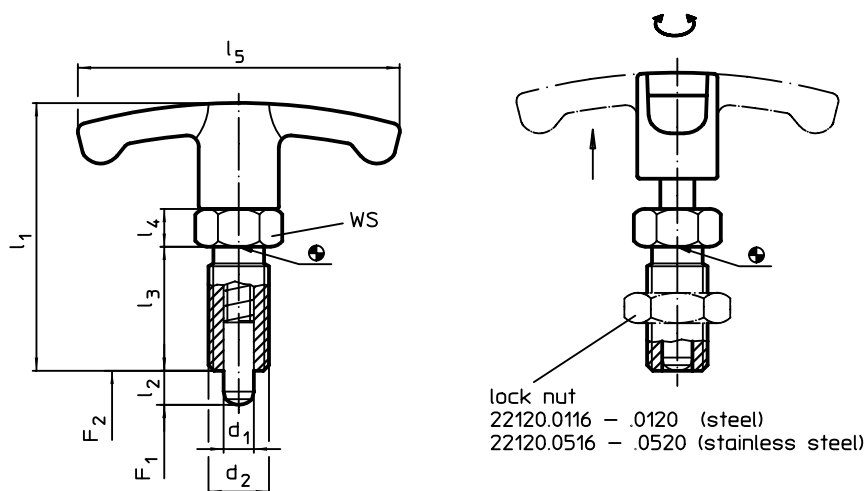
Notes

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

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. → p. 115
Locating Bushings, for index bolts and index plungers. → p. 116
Distance Collars, for index plungers . . . → p. 129

DRAWING



ORDER INFORMATION

Dimensions							WS	Spring load ¹⁾		min. max.			Art. No.	
d ₁ -0.02 -0.05	l ₂	d ₂	l ₁	l ₃	l ₄	l ₅		F ₁ ~	F ₂ ~				Steel	Stainless steel
							[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	31	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		Wrench size		Art. No.	
d ₂				Steel	Stainless steel
	[mm]	[mm]	[g]		
lock nuts ISO 8675 (DIN 439)					
	M12 x 1,5	18	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	22120.0118	22120.0518
	M20 x 1,5	30	32.0	22120.0120	22120.0520

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

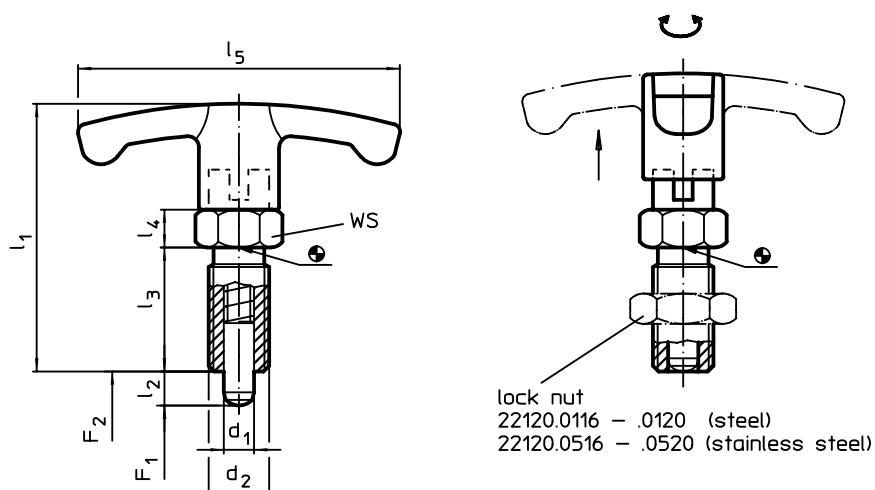
Notes

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

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. → p. 115
Locating Bushings, for index bolts and index plungers → p. 116
Distance Collars, for index plungers . . . → p. 129

DRAWING



ORDER INFORMATION

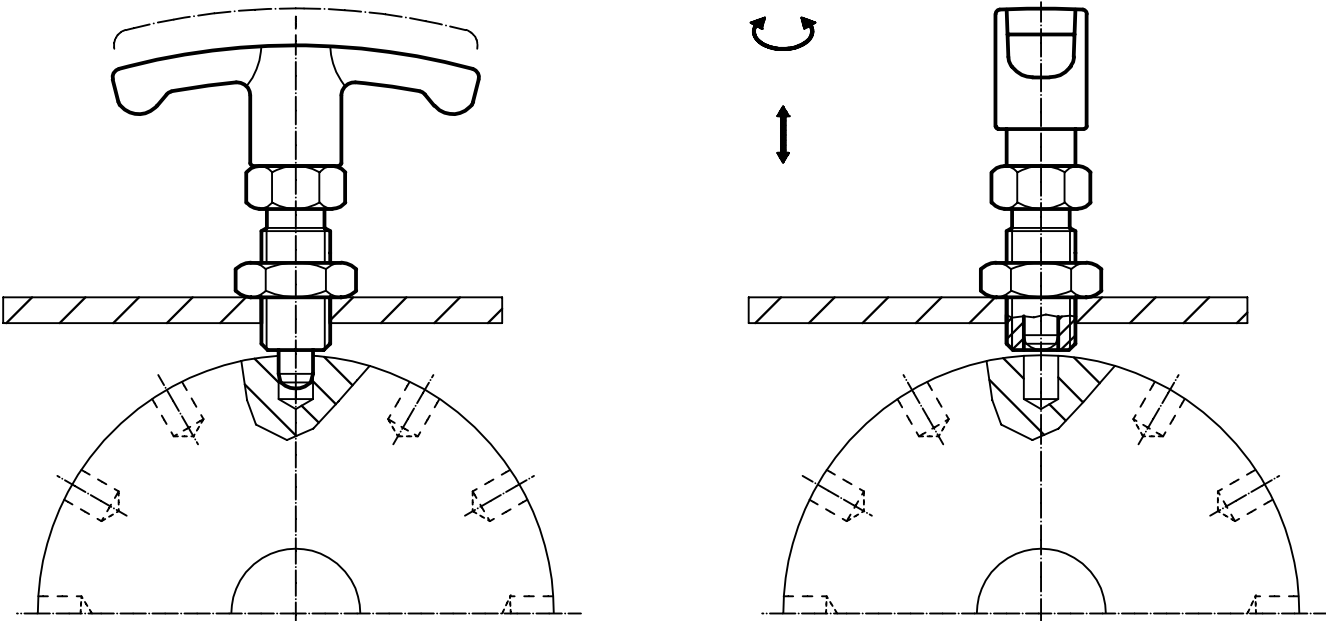
Dimensions							WS	Spring load ¹⁾					Art. No.	
d ₁ -0.02 -0.05	l ₂	d ₂	l ₁	l ₃	l ₄	l ₅	F ₁ ~	F ₂ ~	min.	max.			Steel	Stainless steel
[mm]							[mm]	[N]		[°C]		[g]		
6	6	M12 x 1,5	48	22	6	54	14	6.5	19	-30	80	33	22110.0832	22110.0932
	9	M12 x 1,5	48	22	6	54	14	6.0	25	-30	80	34	22110.0834	22110.0934
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	Wrench size		Art. No.	
	d ₂			Steel	Stainless steel
	[mm]	[mm]	[g]		
lock nuts ISO 8675 (DIN 439)					
	M12 x 1,5	18	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	22120.0118	22120.0518
	M20 x 1,5	30	32.0	22120.0120	22120.0520

APPLICATION EXAMPLE



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

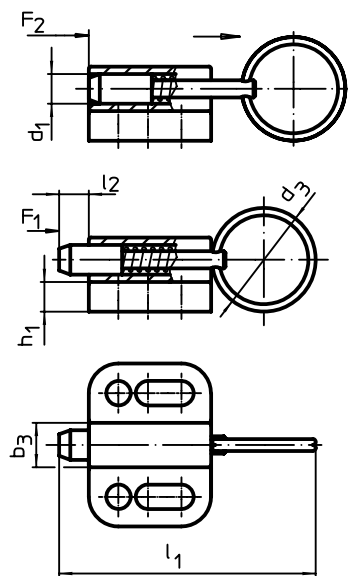
When using locking index plungers, the knob is pulled-out, turned 90° and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

Notes

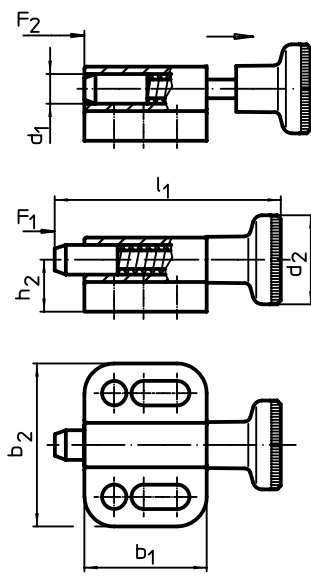
Knob not removable.

DRAWING



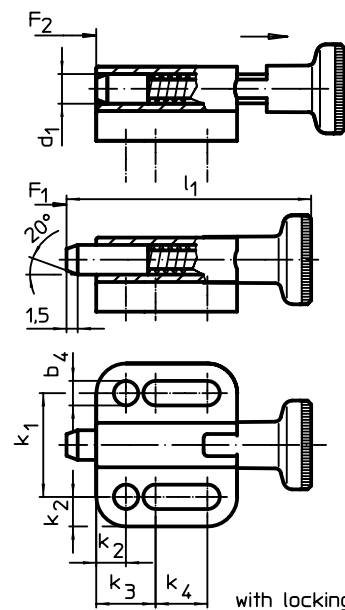
without locking

picture 1



without locking

picture 2



with locking

picture 3

ORDER INFORMATION

Dimensions															Spring load ¹⁾					Art. No.
d ₁ h11	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	11	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	21	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	12	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

Index Plungers • with mounting flange, horizontal, stainless steel

EH 22110.

2



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

Material

Housing

- Stainless steel 1.4308, precision casting, bright, matt blasted

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

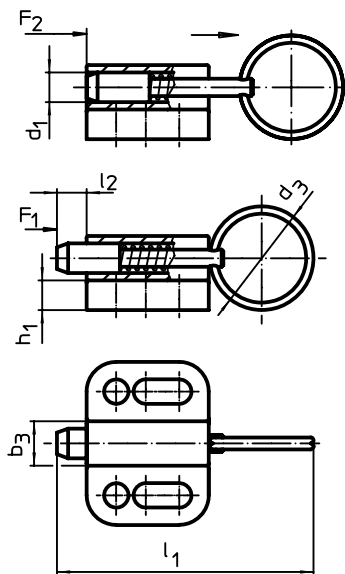
When using locking index plungers, the knob is pulled-out, turned 90° and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

Notes

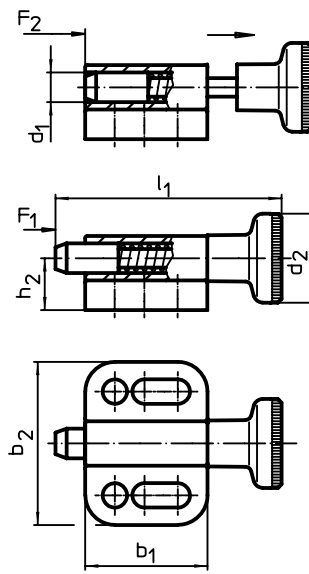
Knob not removable.

DRAWING



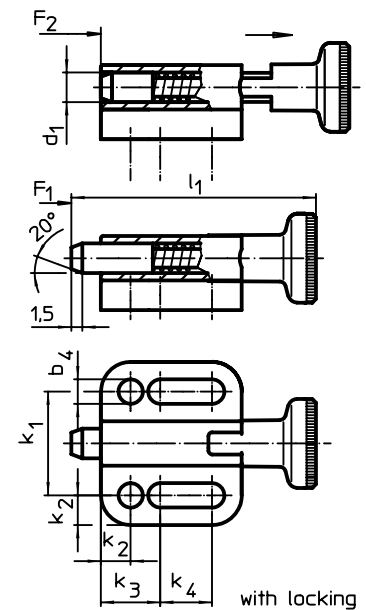
without locking

picture 1



without locking

picture 2



with locking

picture 3

ORDER INFORMATION

Dimensions															Spring load ¹⁾					Art. No.
d ₁ h11	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	12	22110.2304
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	24	22110.2305
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	42	22110.2306
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	67	22110.2308
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	93	22110.2310
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	14	22110.2324
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	26	22110.2325
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	44	22110.2326
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	67	22110.2328
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	99	22110.2330
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	15	22110.2344
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	30	22110.2345
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	48	22110.2346
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	68	22110.2348
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	109	22110.2350

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

Grub Screw

- Steel, blackened, with brass pad

Body

- Zinc die-cast, plastic coated, black

Assembly

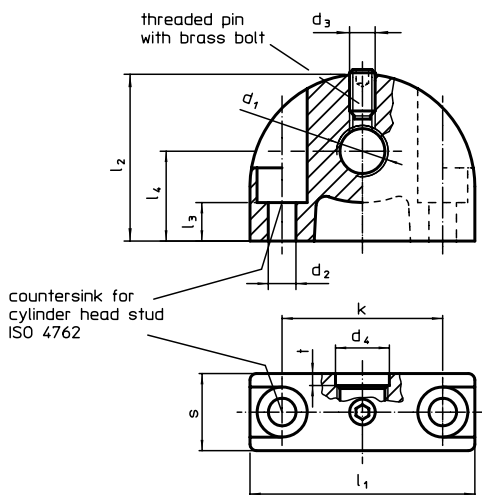
Index plunger must be assembled in hole d_1 on countersink side.

MORE INFORMATION

Further products

Positioning Bushings, for index bolts and index plungers → p. 117

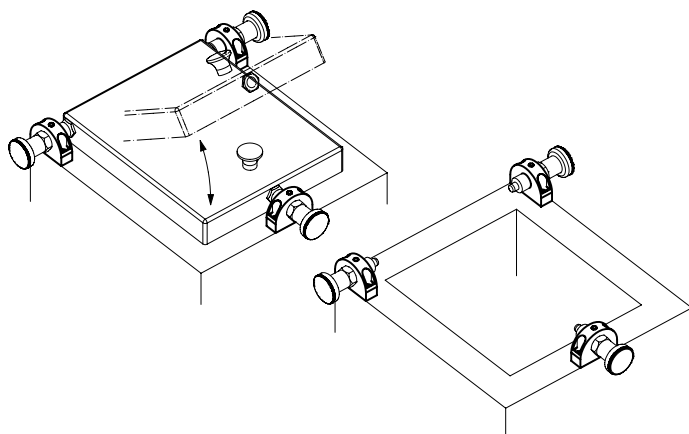
DRAWING



ORDER INFORMATION

Dimensions											max. [°C]	[g]	Art. No.
d_1	d_2	d_3	d_4	k	l_1	l_2	l_3	l_4	s	t			
[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	36	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	78	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

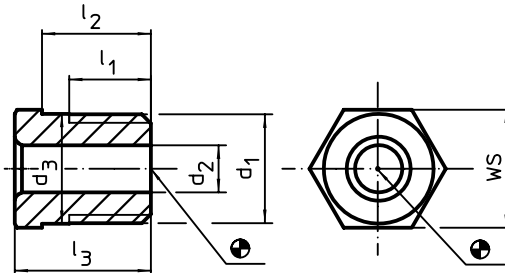
- Steel, nitrided

MORE INFORMATION

Further products

Mounting Blocks, for index bolts and index plungers, die-cast. → p. 115

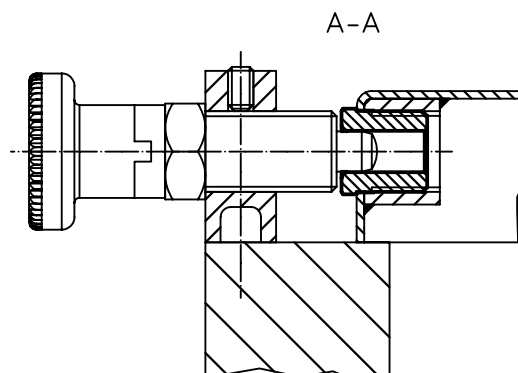
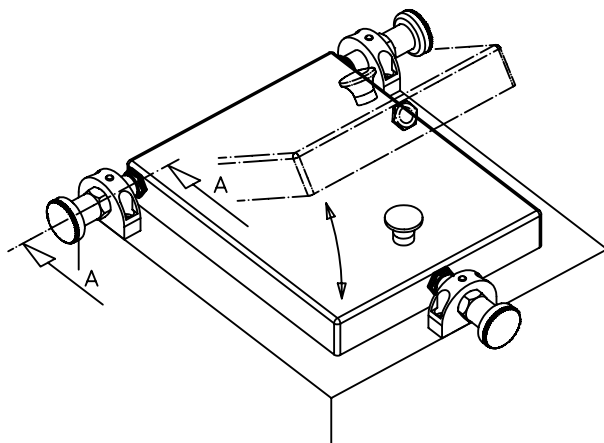
DRAWING



ORDER INFORMATION

Dimensions						For pin	WS			Art. No.
d_1	d_2 +0.1	d_3 ±0.3	l_1 min.	l_2 -0.3	l_3			max.		
			[mm]			[mm]	[mm]	[°C]	[g]	
M12 x 1,5	4.2	12.1	9	10	13	4	13	250	10.0	22110.0454
	5.2	12.1	9	10	13	5	13	250	9.6	22110.0455
	6.2	12.1	9	10	13	6	13	250	8.5	22110.0456
M16 x 1,5	8.2	16.1	11	12	15	8	17	250	18.0	22110.0458
	10.2	16.1	11	12	15	10	17	250	14.0	22110.0460
	12.2	16.1	11	12	15	12	17	250	9.1	22110.0462

APPLICATION EXAMPLE



Positioning Bushings • for index bolts and index plungers

EH 22110.



PRODUCT DESCRIPTION

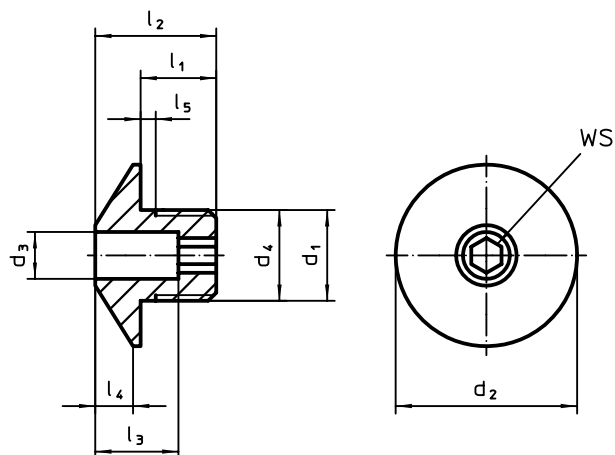
Positioning bushings are suitable for index plungers and index bolts.
Low wear thanks to hardened running ball.

Material

▪ Steel, hardened, blackened

▪ Stainless steel, hardened

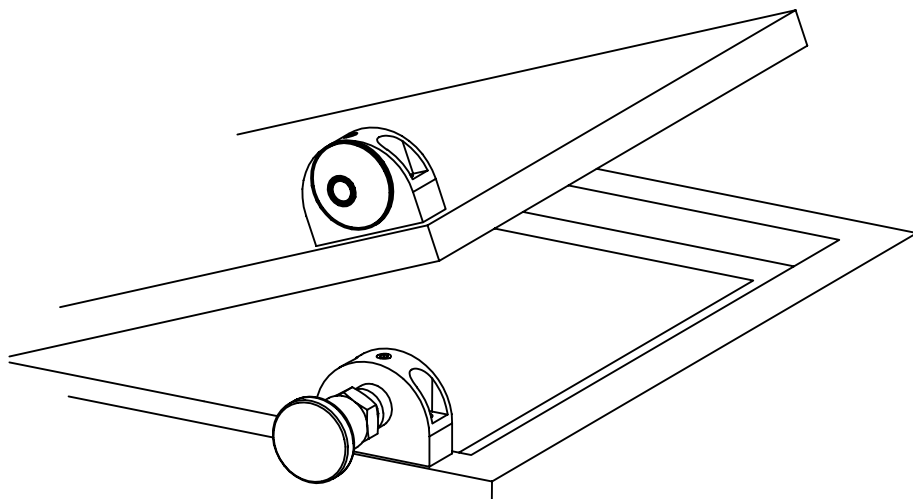
DRAWING



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	17	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	34	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.

2



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.

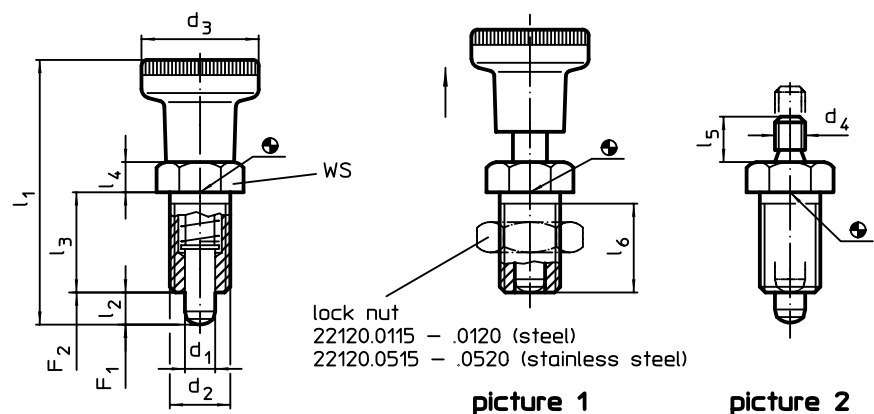
Further products

Mounting Blocks, for index bolts and index plungers, die-cast. → p. 115

Locating Bushings, for index bolts and index plungers. → p. 116

Distance Collars, for index plungers . . . → p. 129

DRAWING



ORDER INFORMATION

Dimensions										WS	Spring load ¹⁾		Temperature		Weight	Art. No.	
d ₁	d ₂	d ₃	d ₄	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	[mm]	F ₁	F ₂	min.	max.	[g]	Free cutting steel	Stainless steel
-0.02 -0.05				~	min.				min.		[N]		[°C]				
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	6.5	19	-30	80	29	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	119	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	6.5	19	–	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	97	22120.0030	22120.0430

¹⁾ statistical average value

ACCESSORIES

	Dimensions	Wrench size	Weight	Art. No.	
	d ₂			Steel	Stainless steel
	[mm]	[mm]	[g]		
lock nuts ISO 8675 (DIN 439)					
	M10 x 1	16	5.2	22120.0115	22120.0515
	M12 x 1,5	18	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	22120.0118	22120.0518
	M20 x 1,5	30	32.0	22120.0120	22120.0520

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.

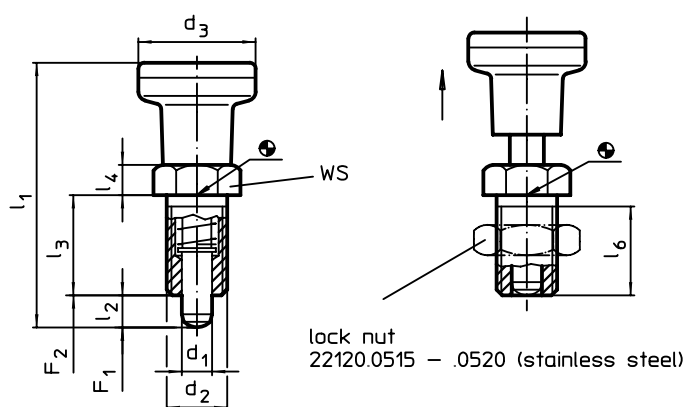
Further products

Mounting Blocks, for index bolts and

index plungers, die-cast. → p. 115

Distance Collars, for index plungers . . . → p. 129

DRAWING



ORDER INFORMATION

Dimensions								WS	Spring load ¹⁾		max.		Art. No.
d ₁ -0.02 -0.05	d ₂	d ₃	l ₁ ~	l ₂ min.	l ₃	l ₄	l ₆ min.		F ₁ ~	F ₂ ~			Stainless steel
[mm]								[mm]	[N]		[°C]	[g]	
5	M10 x 1	21	45.0	5	17	5	15	12	6.0	14	250	43	22120.0485
6	M12 x 1,5	25	54.5	6	20	6	17	14	6.5	19	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	179	22120.0490

¹⁾ statistical average value

ACCESSORIES

Dimensions		Wrench size		Art. No.
d ₂				Stainless steel
[mm]		[mm]	[g]	
lock nuts ISO 8675 (DIN 439)				
	M10 x 1	16	5.2	22120.0515
	M12 x 1,5	18	7.5	22120.0516
	M16 x 1,5	24	15.0	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.

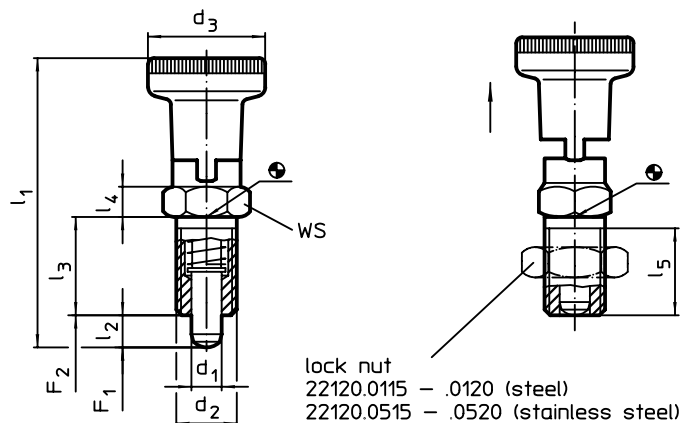
Further products

Mounting Blocks, for index bolts and index plungers, die-cast. → p. 115

Locating Bushings, for index bolts and index plungers. → p. 116

Distance Collars, for index plungers . . . → p. 129

DRAWING



ORDER INFORMATION

Dimensions								WS	Spring load ¹⁾					Art. No.	
d ₁ -0.02 -0.05	d ₂	d ₃	l ₁ ~	l ₂ min.	l ₃	l ₄	l ₅ min.		F ₁ ~	F ₂ ~	min.	max.		Free cutting 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	21	22120.0205	22120.0605
6	M12 x 1,5	25	61.0	6	20	6	17	14	6.5	19	-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	Wrench size		Art. No.	
	d ₂			Steel	Stainless steel
	[mm]	[mm]	[g]		
lock nuts ISO 8675 (DIN 439)					
	M10 x 1	16	5.2	22120.0115	22120.0515
	M12 x 1,5	18	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	22120.0118	22120.0518
	M20 x 1.5	30	32.0	22120.0120	22120.0520

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.

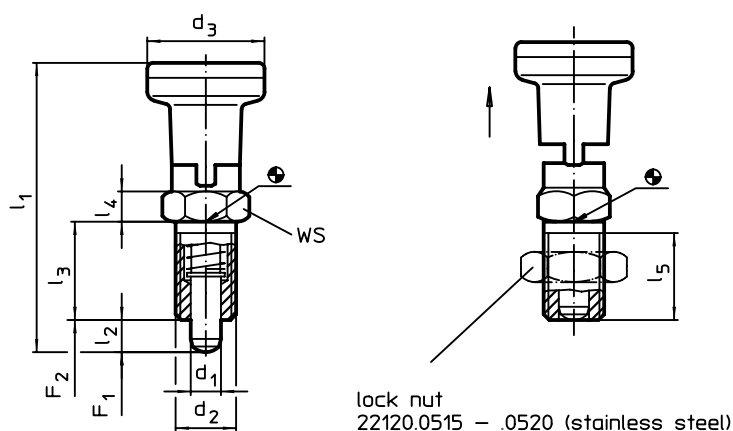
Further products

Mounting Blocks, for index bolts and

index plungers, die-cast. → p. 115

Distance Collars, for index plungers . . . → p. 129

DRAWING



ORDER INFORMATION

Dimensions								WS	Spring load ¹⁾		max.		Art. No.
d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l ₅		F ₁	F ₂			Stainless steel
-0.02 -0.05			~	min.			min.		~	~	max.	[g]	
			[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	6.5	19	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	203	22120.0620

¹⁾ statistical average value

ACCESSORIES

Dimensions		Wrench size		Art. No.
d ₂				Stainless steel
[mm]		[mm]	[g]	
lock nuts ISO 8675 (DIN 439)				
	M10 x 1	16	5.2	22120.0515
	M12 x 1,5	18	7.5	22120.0516
	M16 x 1,5	24	15.0	22120.0518
	M20 x 1,5	30	32.0	22120.0520

Index Plungers • with hexagon collar, stainless steel A4

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

The stainless steel A4 version ensures maximum corrosion resistance.

Material

Body

- Stainless steel 1.4401

Locking pin

- Stainless steel 1.4401 nickel-plated

Knob

- Thermoplastic PA 6, black-grey, matt

- Stainless steel 1.4401

Lock nut

- Stainless steel 1.4401

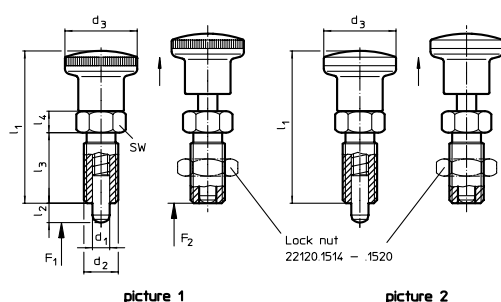
MORE INFORMATION

Notes

Knob not removable.

Lock nuts have to be purchased separately.

DRAWING



ORDER INFORMATION

Dimensions							Spring load ¹⁾				Art. No.	
d ₁ -0.02 -0.05	d ₂	l ₂ min.	d ₃	l ₁	l ₃	l ₄	F ₁ ~	F ₂ ~	min.	max.		
[mm]							[N]		[°C]		[g]	
with knob of thermoplastic – picture 1												
4	M 8 x 1	4	16	35.0	16	5	3.5	11	-30	80	10	22120.1044
		6	16	35.0	16	5	3.0	11	-30	80	11	22120.1064
5	M10 x 1	5	19	40.0	18	6	3.0	12	-30	80	18	22120.1045
		8	19	40.0	18	6	3.0	14	-30	80	18	22120.1065
6	M12 x 1,5	6	23	48.0	22	6	4.5	16	-30	80	30	22120.1046
		9	23	48.0	22	6	4.0	20	-30	80	30	22120.1066
8	M16 x 1,5	8	28	58.0	26	8	6.0	23	-30	80	66	22120.1068
		12	28	58.0	26	8	7.0	26	-30	80	63	22120.1048
10	M16 x 1,5	12	28	58.0	26	8	7.5	32	-30	80	64	22120.1080
12	M20 x 1,5	15	33	71.5	33	10	9.0	32	-30	80	129	22120.1082
with knob from stainless steel – picture 2												
4	M 8 x 1	8	16	35.0	16	5	3.5	11	–	100	20	22120.1054
		6	16	35.0	16	5	3.0	11	–	100	20	22120.1074
5	M10 x 1	5	18	40.0	18	6	3.0	12	–	100	32	22120.1055
		8	18	40.0	18	6	3.0	14	–	100	32	22120.1075
6	M12 x 1,5	6	22	48.0	22	6	4.5	16	–	100	63	22120.1056
		9	22	48.0	22	6	4.0	20	–	100	56	22120.1076
8	M16 x 1,5	8	27	58.0	26	8	6.0	20	–	100	107	22120.1078
		12	27	58.0	26	8	7.0	26	–	100	109	22120.1058
10	M16 x 1,5	12	27	58.0	26	8	7.5	32	–	100	111	22120.1090
12	M20 x 1,5	15	32	71.5	33	10	9.0	32	–	100	203	22120.1092

¹⁾ statistical average value

ACCESSORIES

	Dimensions	Wrench size		Art. No.
	d ₂ [mm]	[mm]	[g]	Stainless steel 1.4401
lock nuts ISO 8675 (DIN 439)				
	M 8 x 1	13	2.8	22120.1514
	M10 x 1	16	5.4	22120.1515
	M12 x 1,5	18	7.6	22120.1516
	M16 x 1,5	24	18.0	22120.1518
	M20 x 1.5	30	33.0	22120.1520

Index Plungers • with hexagon collar and locking, stainless steel A4

EH 22120.



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

The stainless steel A4 version ensures maximum corrosion resistance.

Material

Body

- Stainless steel 1.4401

Locking pin

- Stainless steel 1.4401 nickel-plated

Knob

- Thermoplastic PA 6, black-grey, matt

- Stainless steel 1.4401

Lock nut

- Stainless steel 1.4401

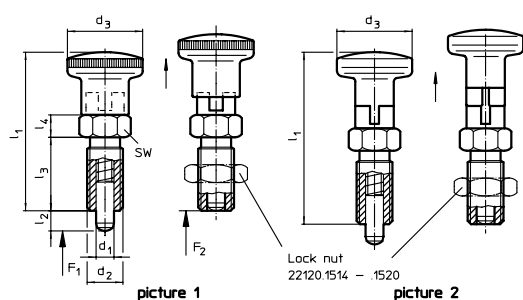
MORE INFORMATION

Notes

Knob not removable.

Lock nuts have to be purchased separately.

DRAWING



ORDER INFORMATION

Dimensions							Spring load ¹⁾				Art. No.	
d ₁ -0.02 -0.05	d ₂	l ₂ min.	d ₃	l ₁	l ₃	l ₄	F ₁ ~	F ₂ ~	min.	max.		
[mm]							[N]		[°C]		[g]	
with knob of thermoplastic – picture 1												
4	M 8 x 1	4	16	35.0	16	5	3.5	11	-30	80	12	22120.1144
		6	16	35.0	22	6	4.5	16	-30	80	11	22120.1164
5	M10 x 1	5	19	35.0	16	5	3.0	11	-30	80	20	22120.1145
		8	19	48.0	22	6	4.0	20	-30	80	18	22120.1165
6	M12 x 1,5	6	23	40.0	18	6	3.0	12	-30	80	33	22120.1146
		9	23	58.0	26	8	6.0	23	-30	80	33	22120.1166
8	M16 x 1,5	8	28	58.0	26	8	7.0	26	-30	80	67	22120.1168
		12	28	40.0	18	6	3.0	14	-30	80	70	22120.1148
10	M16 x 1,5	12	28	58.0	26	8	7.5	32	-30	80	70	22120.1180
12	M20 x 1,5	15	33	71.5	33	10	9.0	32	-30	80	141	22120.1182
with knob from stainless steel – picture 2												
4	M 8 x 1	4	16	35.0	16	5	3.5	11	–	100	21	22120.1154
		6	16	35.0	16	5	3.0	11	–	100	22	22120.1174
5	M10 x 1	5	18	40.0	18	6	3.0	12	–	100	36	22120.1155
		8	18	40.0	18	6	3.0	14	–	100	37	22120.1175
6	M12 x 1,5	6	22	48.0	22	6	4.5	16	–	100	60	22120.1156
		9	22	48.0	22	6	4.0	20	–	100	63	22120.1176
8	M16 x 1,5	8	27	58.0	26	8	6.0	23	–	100	117	22120.1178
		12	27	58.0	26	8	7.0	26	–	100	118	22120.1158
10	M16 x 1,5	12	27	58.0	26	8	7.5	32	–	100	135	22120.1190
12	M20 x 1,5	15	32	71.5	33	10	9.0	32	–	100	229	22120.1192

¹⁾ statistical average value

ACCESSORIES

	Dimensions d ₂ [mm]	Wrench size [mm]		Art. No. Stainless steel 1.4401
			[g]	
lock nuts ISO 8675 (DIN 439)				
	M 8 x 1	13	2.8	22120.1514
	M12 x 1,5	18	7.6	22120.1516
	M10 x 1	16	5.4	22120.1515
	M16 x 1,5	24	18.0	22120.1518
	M20 x 1,5	30	33.0	22120.1520

Index Plungers • without hexagon collar

EH 22120.

2



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.

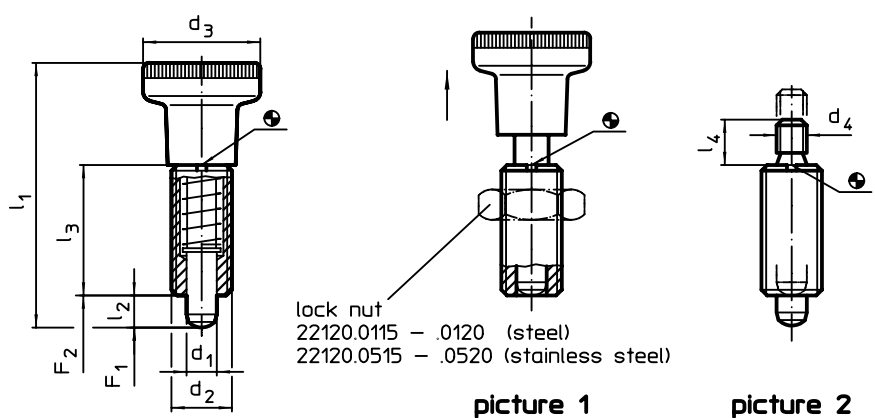
Further products

Mounting Blocks, for index bolts and index plungers, die-cast. → p. 115

Locating Bushings, for index bolts and index plungers. → p. 116

Distance Collars, for index plungers .. → p. 129

DRAWING



picture 1

picture 2

ORDER INFORMATION

Dimensions								Spring load ¹⁾					Art. No.	
d ₁ -0.02 -0.05	d ₂	d ₃	d ₄	l ₁ ~	l ₂ min.	l ₃	l ₄	F ₁ ~	F ₂ ~	min.	max.		Free cutting 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	–	6.5	19	-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	6.5	19	–	250	19	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

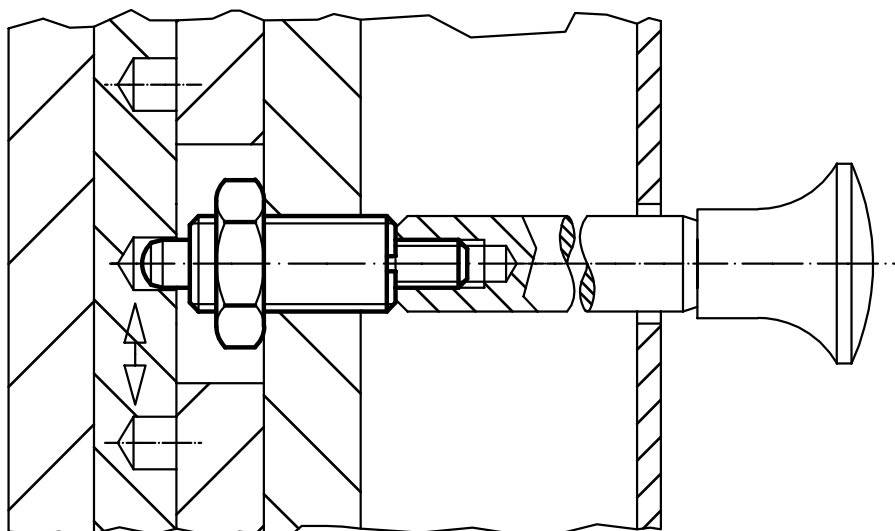
¹⁾ statistical average value

ACCESSORIES

	Dimensions	Wrench size		Art. No.	
	d ₂			Steel	Stainless steel
	[mm]	[mm]	[g]		
lock nuts ISO 8675 (DIN 439)					
	M10 x 1	16	5.2	22120.0115	22120.0515
	M12 x 1,5	18	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	22120.0118	22120.0518
	M20 x 1,5	30	32.0	22120.0120	22120.0520

	Dimensions	Wrench size		Art. No.	
	d ₂			Steel	Stainless steel
	[mm]	[mm]	[g]		
assembly tool					
	M10 x 1	–	9.3	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.

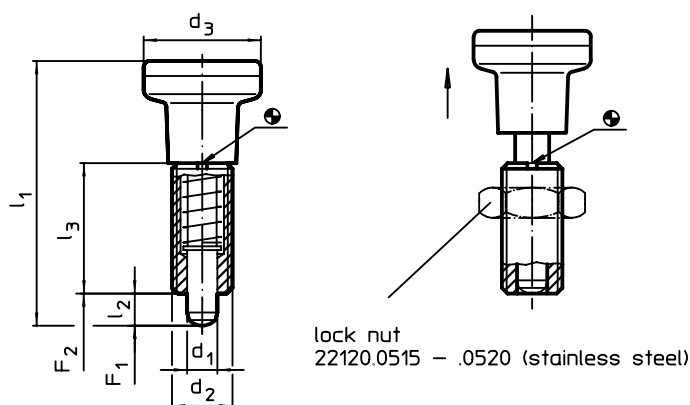
Further products

Mounting Blocks, for index bolts and

index plungers, die-cast. → p. 115

Distance Collars, for index plungers . . . → p. 129

DRAWING



ORDER INFORMATION

Dimensions						Spring load ¹⁾				Art. No.
d ₁ -0.02 -0.05	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	36	22120.0475
6	M12 x 1,5	25	54.5	6	26	6.5	19	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	Wrench size		Art. No.	
	d ₂			Stainless steel	Steel
	[mm]	[mm]		[g]	
lock nuts ISO 8675 (DIN 439)					
	M10 x 1	16	5.2	22120.0515	–
	M12 x 1,5	18	7.5	22120.0516	–
	M16 x 1,5	24	15.0	22120.0518	–
	M20 x 1,5	30	32.0	22120.0520	–
assembly tool					
	M10 x 1	–	9.3	–	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

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

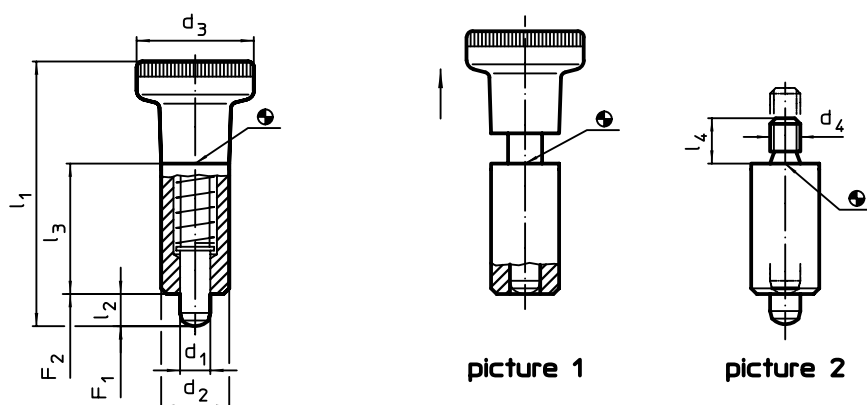
Notes

Knob not removable.

Further products

Locating Bushings, for index bolts and index plungers → p. 116

DRAWING

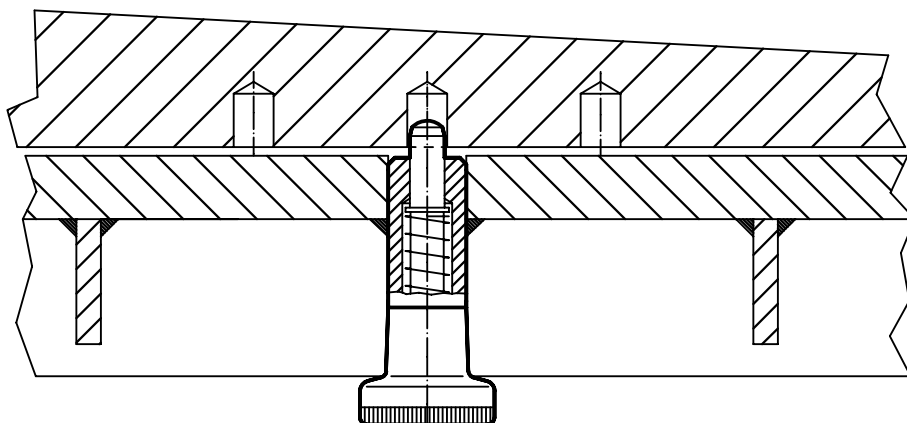


ORDER INFORMATION

Dimensions								Spring load ¹⁾		Temperature		Weight	Art. No.
d ₁	d ₂	d ₃	d ₄	l ₁	l ₂	l ₃	l ₄	F ₁	F ₂	min.	max.	[g]	
-0.02 -0.05	h9			~	min.			~	~				
[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

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.

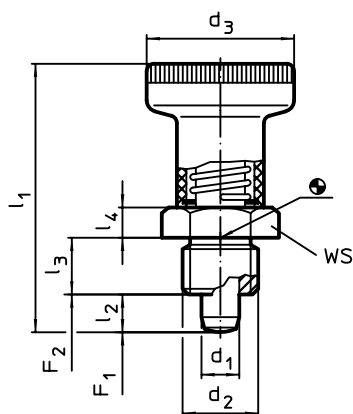
Further products

Locating Bushings, for index bolts and index plungers ... → p. 116
Distance Collars, for index plungers ... → p. 129

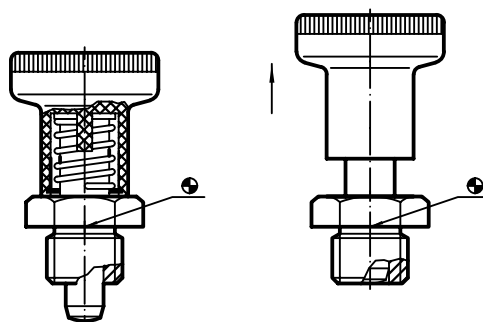
Assembly

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

DRAWING



picture 1



picture 2 with locking

ORDER INFORMATION

Dimensions							WS	Spring load ¹⁾		min.	max.	[g]	Art. No.	
d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄		F ₁	F ₂				Free cutting steel	Stainless steel
-0.02 -0.05			~	min.	-0.15		[mm]	~	~	[°C]				
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	60	22120.0238	22120.0258

¹⁾ statistical average value

ACCESSORIES

	Dimensions	Wrench size	[g]	Art. No.	
	d ₂	[mm]		Steel	Stainless steel
	[mm]				
lock nuts ISO 8675 (DIN 439)					
	M12 x 1,5	18	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	22120.0118	22120.0518

Distance Collars • for index plungers

EH 22120.



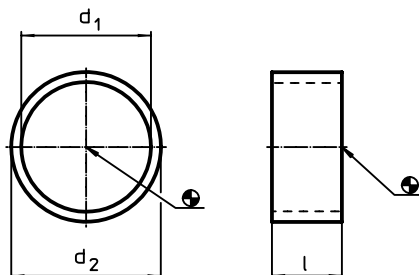
PRODUCT DESCRIPTION

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

Material

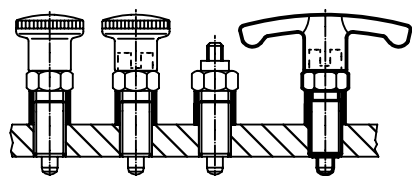
- Stainless steel 1.4305

DRAWING

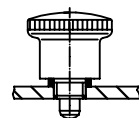


EH 22110.

mini indexes



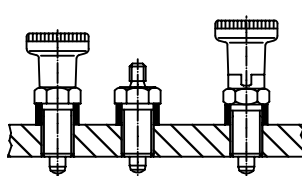
picture 1



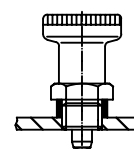
picture 2

EH 22120.

index plunger short



picture 3



picture 4

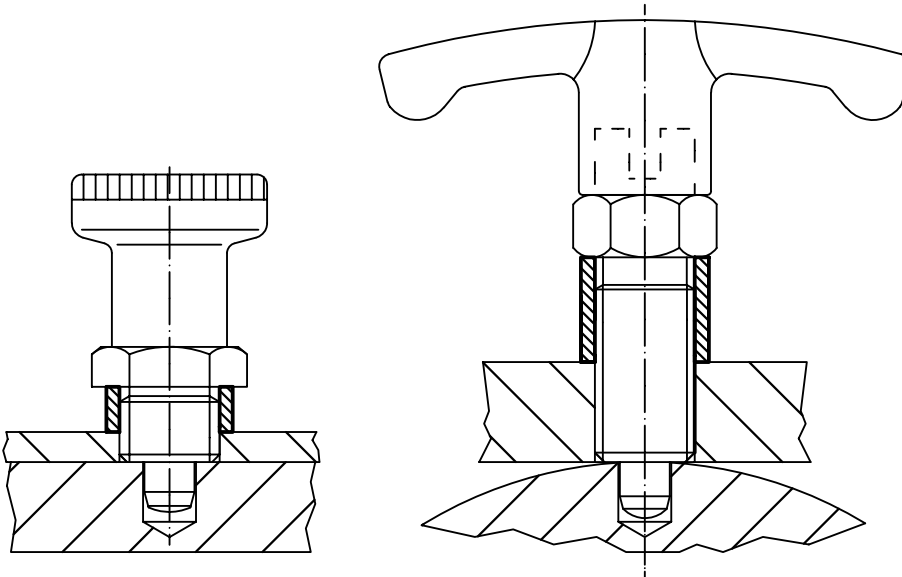
ORDER INFORMATION

Dimensions			For index plungers size	For finish picture	max.	[g]	Art. No.
d_1 H12	l ± 0.1 [mm]	d_2 -0.1	[mm]		[°C]		
8	2	10	M 8	1/2	250	0.4	22120.0632
	3	10	M 8	1	250	0.8	22120.0633
	4	10	M 8	1	250	0.9	22120.0634
	6	10	M 8	1	250	1.2	22120.0636
	8	10	M 8	1	250	2.0	22120.0638
	10	10	M 8	1	250	2.0	22120.0640
10	2	12	M10	1/2/3	250	0.6	22120.0642
	4	12	M10	1/2/3	250	1.1	22120.0644
	6	12	M10	1/3	250	1.6	22120.0646
	8	12	M10	1/3	250	2.1	22120.0648
	10	12	M10	1/3	250	2.7	22120.0650
12	12	12	M10	1/3	250	3.0	22120.0652
	2	14	M12	1	250	0.6	22120.0662
	4	14	M12	1	250	2.5	22120.0664
	6	14	M12	1	250	1.9	22120.0666
	8	14	M12	1	250	2.4	22120.0668
	2	17	M12	3/4	250	2.0	22120.0672
	4	17	M12	3/4	250	3.4	22120.0674
	5	17	M12	3/4	250	4.4	22120.0675

→

d_1 H12	Dimensions		For index plungers size [mm]	For finish picture	 max. [°C]	 [g]	Art. No.
	l ± 0.1 [mm]	d_2 -0.1					
16	4	17	M16	1	250	0.9	22120.0676
	6	17	M16	1	250	1.2	22120.0677
	8	17	M16	1	250	1.4	22120.0678
	10	17	M16	1	250	2.0	22120.0679
	12	17	M16	1	250	2.1	22120.0680
	2	19	M16	3/4	250	1.3	22120.0682
	4	19	M16	3/4	250	2.8	22120.0684
	6	19	M16	3/4	250	3.8	22120.0686
	8	19	M16	3/4	250	4.8	22120.0688
	10	19	M16	3	250	6.1	22120.0690
20	12	19	M16	3	250	7.3	22120.0692
	6	22	M20	1/3	250	3.0	22120.0693
	8	22	M20	1/3	250	4.0	22120.0694
	10	22	M20	1/3	250	4.9	22120.0695
	12	22	M20	1/3	250	5.9	22120.0696
	14	22	M20	1/3	250	6.9	22120.0697
	16	22	M20	1/3	250	9.3	22120.0698
	18	22	M20	1/3	250	9.0	22120.0699

APPLICATION EXAMPLE



Index Plungers • with mounting flange

EH 22120.

2



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

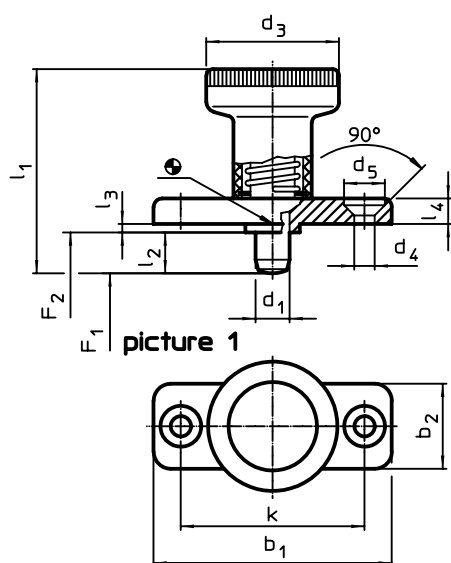
Notes

Knob not removable.

Further products

Locating Bushings, for index bolts and index plungers → p. 116

DRAWING



Index Plungers • simple finish

EH 22120.

2



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

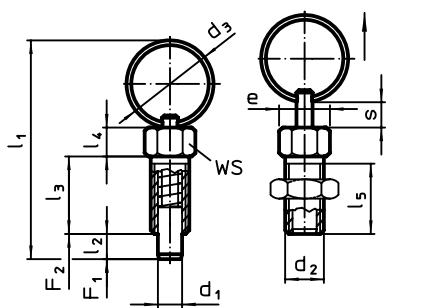
Notes

Lock nuts have to be purchased separately.

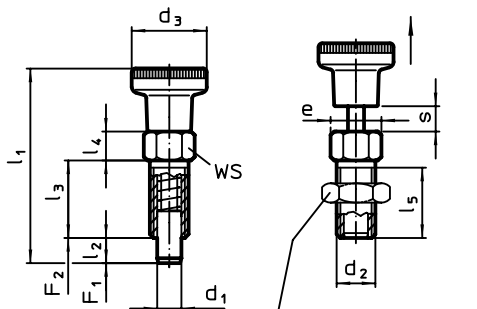
Further products

Locating Bushings, for index bolts and index plungers → p. 116

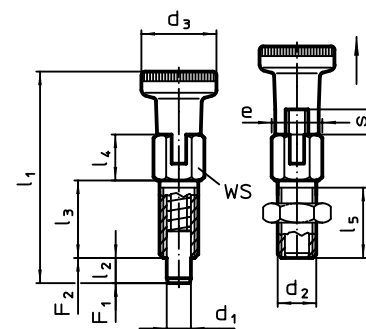
DRAWING



picture 1



picture 2



picture 3

lock nut
22120.0704 – .0708 (Steel)
22120.0714 – .0718 (Stainless steel)

ORDER INFORMATION

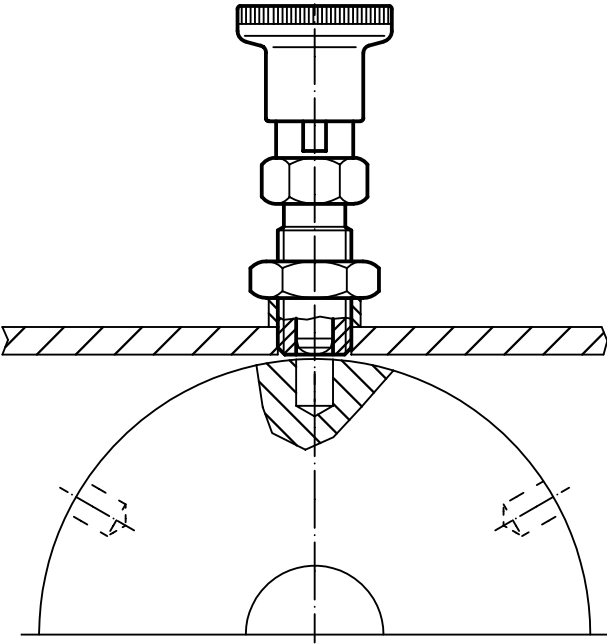
Dimensions										WS	Tight- ening torque max.	Spring load ¹⁾					Art. No.	
d ₁ -0.05	d ₂	d ₃	e	l ₁	l ₂ min.	l ₃	l ₄	l ₅	s min.			F ₁ ~	F ₂ ~	min.	max.		Steel	Stainless steel
[mm]										[mm]	[Nm]	[N]		[°C]		[g]		
with pull-ring, without locking – picture 1																		
3	M 6	14	6.9	34.0	3.5	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	3.8	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

ACCESSORIES

	Dimensions	Wrench size	 [g]	Art. No.	
	d ₂ [mm]	[mm]		Steel	Stainless steel
	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

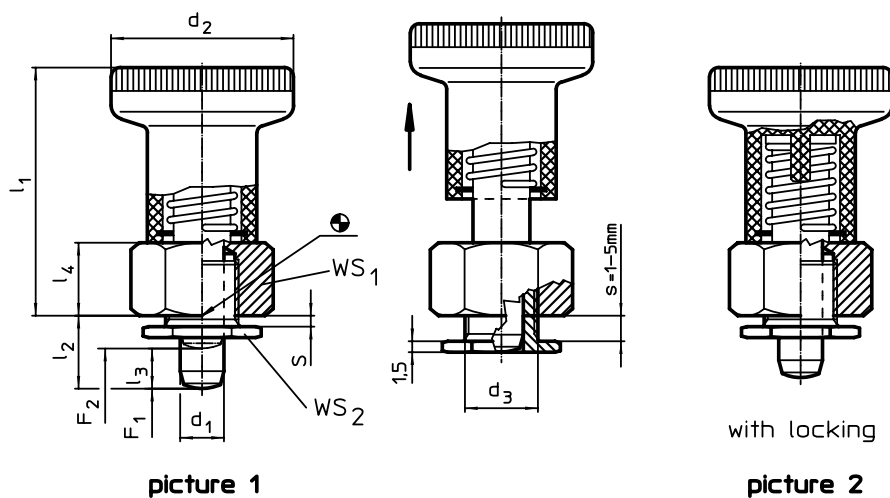
Notes

Knob not removable.

Further products

Locating Bushings, for index bolts and index plungers → p. 116

DRAWING



ORDER INFORMATION

Dimensions								WS ₁	WS ₂	Spring load ¹⁾		min. max.			Art. No.
d ₁	l ₂	d ₂	d ₃	l ₁	l ₃	l ₄	s			F ₁	F ₂				
-0.02 -0.05								[mm]	[mm]	[N]	[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

		Art. No.
		
ring spanner, flat	26	22120.0299

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

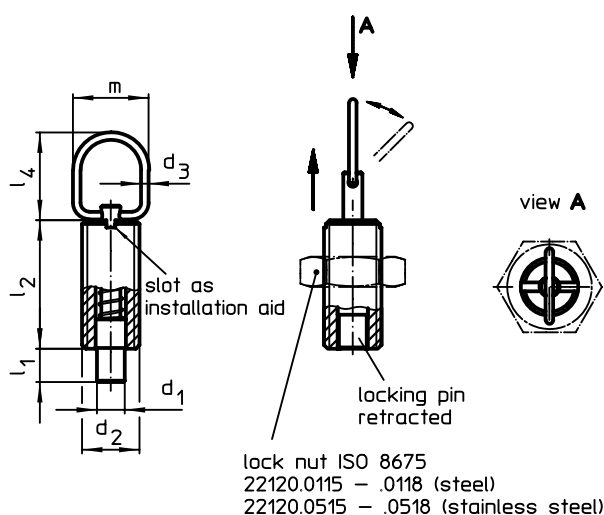
Mounting Blocks, for index bolts and index plungers, die-cast. → p. 115

Locating Bushings, for index bolts and index plungers. → p. 116

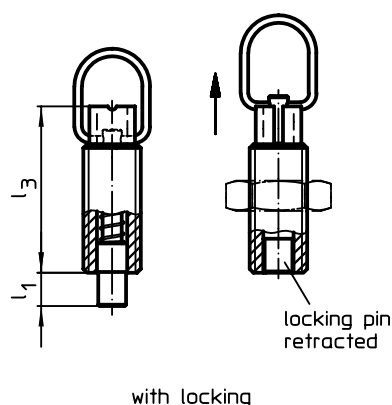
Distance Collars, for index plungers. → p. 129

Mounting Blocks, for index bolts and index plungers. → p. 143

DRAWING



picture 1



picture 2

ORDER INFORMATION

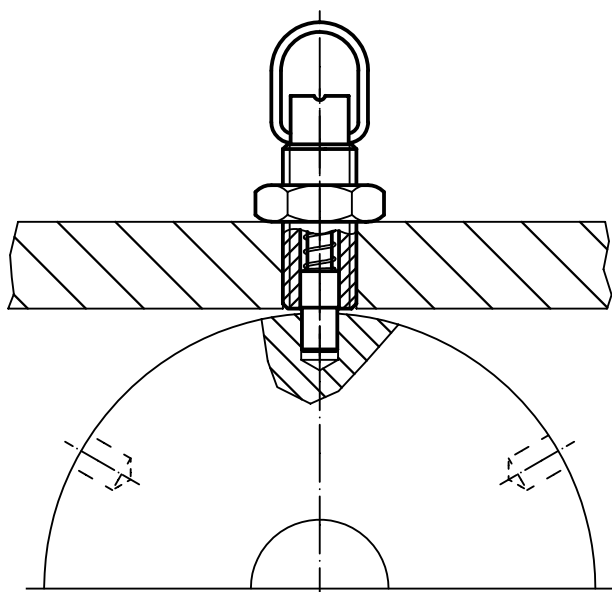
Dimensions								Stroke s	Spring load ¹⁾		 max.	 [g]	Art. No.	
d ₁ -0.05 -0.1	d ₂	d ₃	l ₁ min.	l ₂	l ₃	l ₄	m		F ₁ ~	F ₂ ~			Steel	Stainless steel
[mm]								[mm]	[N]		[°C]			
without locking – picture 1														
5	M10	1.5	5	22	28	23	18	5	5	15	250	11	22120.1310	22120.1410
	M10 x 1	1.5	5	22	28	23	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
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	Wrench size		Art. No.	
	d ₂			Steel	Stainless steel
	[mm]	[mm]	[g]		
lock nuts ISO 4035					
	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)					
	M10 x 1	16	5.2	22120.0115	22120.0515
	M12 x 1,5	18	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	22120.0118	22120.0518

APPLICATION EXAMPLE



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.

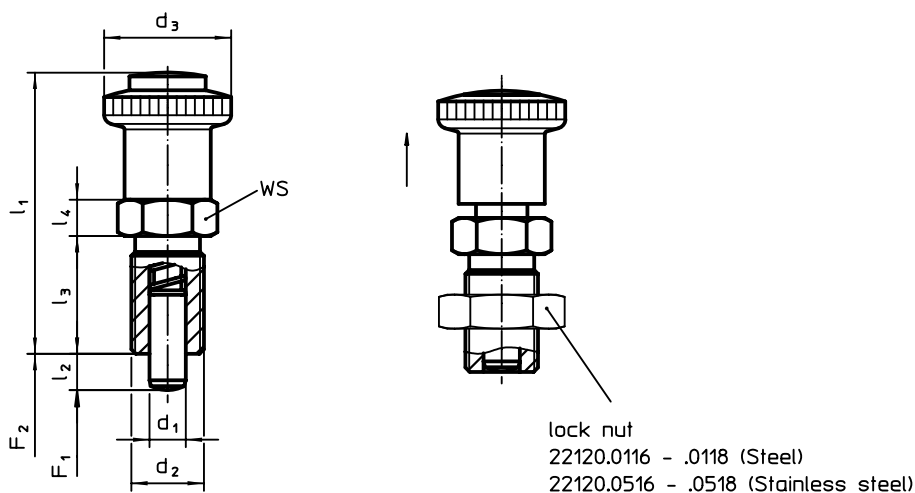
Further products

Locating Bushings, for index bolts and index plungers → p. 116

Distance Collars, for index plungers → p. 129

Mounting Blocks, for index bolts and index plungers → p. 143

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	28	56	22	6	19	6.5	19	-30	80	45	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	73	22122.0015	22122.0115
		12	28	62	26	8	19	8.5	28	-30	80	74	22122.0020	22122.0120
10	M16 x 1,5	12	28	62	26	8	19	9.5	38	-30	80	75	22122.0025	22122.0125

¹⁾ statistical average value

ACCESSORIES

	Dimensions	Wrench size	[g]	Art. No.	
	d ₂ [mm]	[mm]		Steel	Stainless steel
	M12 x 1,5	18	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	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

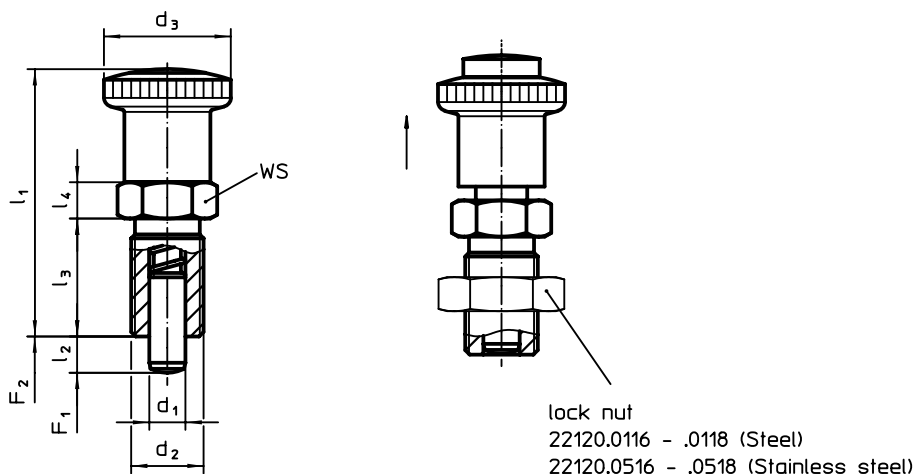
Knob not removable.

Lock nuts have to be purchased separately.

Further products

Locating Bushings, for index bolts and index plungers → p. 116
Distance Collars, for index plungers → p. 129
Mounting Blocks, for index bolts and index plungers → p. 143

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	49	22122.0205	22122.0305
		9	30	53.5	22	6	19	6.0	25	-30	80	49	22122.0210	22122.0310
8	M16 x 1,5	8	30	59.5	26	8	19	8.5	26	-30	80	75	22122.0215	22122.0315
		12	30	59.5	26	8	19	8.5	28	-30	80	78	22122.0220	22122.0320
10	M16 x 1,5	12	30	59.5	26	8	19	9.5	38	-30	80	79	22122.0225	22122.0325

¹⁾ statistical average value

ACCESSORIES

	Dimensions	Wrench size	[g]	Art. No.	
	d ₂	[mm]		Steel	Stainless steel
	[mm]	[mm]			
	M12 x 1,5	18		22120.0116	22120.0516
	M16 x 1,5	24	15.0	22120.0118	22120.0518

Index Plungers • with sensor

EH 22123.

2



PRODUCT DESCRIPTION

Index plungers are used for indexing bores.

The index plunger with sensor makes it possible to monitor the indexing position of the indexing plunger. When it engages, the sensor already switches after 2/3 of the indexing distance l_2 . In addition to the electronic signal, the switching status is indicated directly on the sensor via an LED.

Material

Body

- Stainless steel 1.4305

Locking pin

- Stainless steel 1.4305, nickel-plated

Knob

- Thermoplastic PA 6, black, dull

Cable

- Thermoplastic PUR, black

Magnet

- Permanent magnet

Sensor

- Thermoplastic PA 6, black, dull

Lock nut

- Stainless steel A2 (ISO 8675)

Assembly

The enclosed separate sensor and sensor clip can be mounted with the enclosed Allen key. The derivation direction of the sensor cable can be determined individually.

- Push the sensor into the side of the

sensor clip.

- Tighten the internal hexagon screw of the sensor with light hand force (max. 0.1 Nm).
- Clip the sensor clip into the annular groove of the index plunger in any position.
- By turning the sensor clip, the sensor cable's derivation direction can be adjusted.

Note:

To avoid interferences, no magnetic fields should act on the index plunger.

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

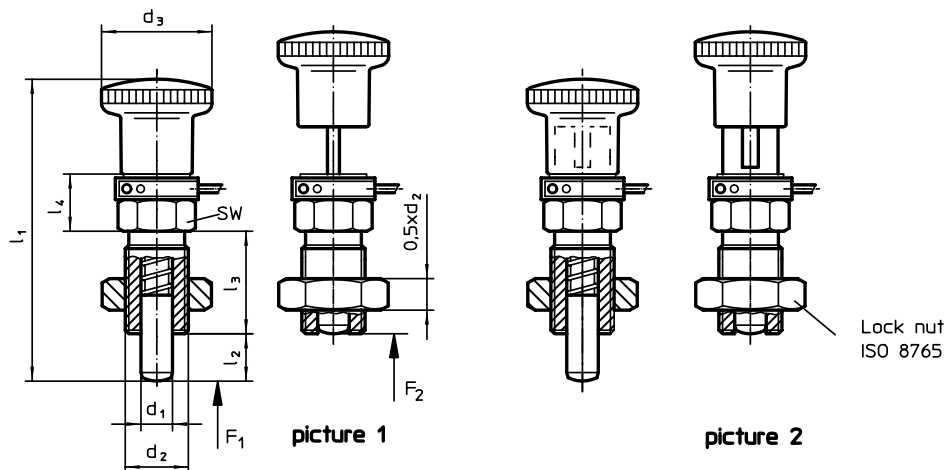
Knob not removable.

Lock nuts have to be purchased separately.

Further products

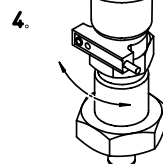
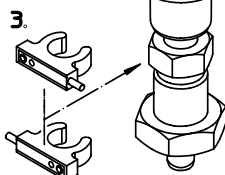
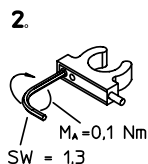
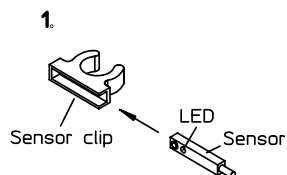
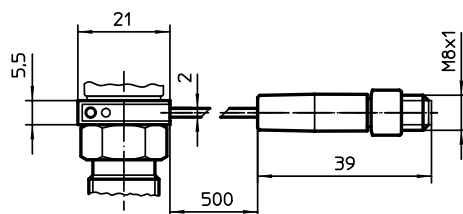
Retrieval Units, with sensor. → p. 359

DRAWING



picture 1

picture 2

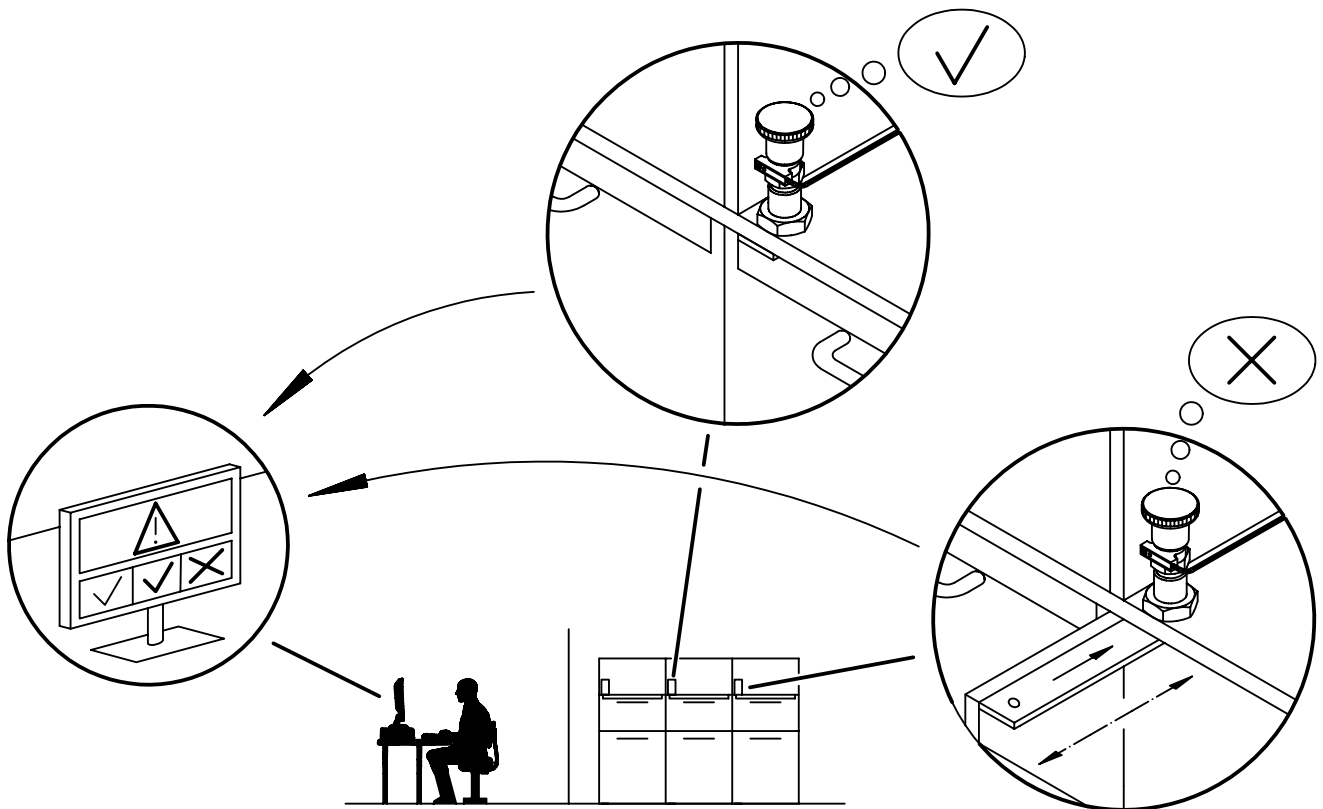


ORDER INFORMATION

Dimensions							WS	Spring load ¹⁾				Art. No.		
d ₁ -0.02 -0.05	d ₂	l ₂ min.	d ₃	l ₁	l ₃	l ₄		F ₁	F ₂	min.	max.			
[mm]								[mm]	[N]		[°C]		[g]	
with knob, without locking – picture 1														
4	M 8 x 1	6	16	41.5	16	11.5	10	4.0	12.5	-25	75	34	22123.0004	
5	M10 x 1	8	19	46.5	18	12.5	12	5.0	18.0	-25	75	46	22123.0005	
6	M12 x 1,5	9	23	54.5	22	12.5	14	6.0	25.0	-25	75	62	22123.0006	
8	M16 x 1,5	12	28	64.5	26	14.5	17	8.5	28.0	-25	75	105	22123.0008	
10	M16 x 1,5	12	28	64.5	26	14.5	17	9.5	38.0	-25	75	106	22123.0010	
12	M20 x 1,5	15	33	78.0	33	16.5	22	11.5	40.0	-25	75	200	22123.0012	
16	M24 x 2	20	33	85.0	38	18.5	27	13.0	54.0	-25	75	296	22123.0016	
with knob and locking – picture 2														
4	M 8 x 1	6	16	41.5	16	11.5	10	4.0	12.5	-25	75	34	22123.0104	
5	M10 x 1	8	19	46.5	18	12.5	12	5.0	18.0	-25	75	49	22123.0105	
6	M12 x 1,5	9	23	54.5	22	12.5	14	6.0	25.0	-25	75	66	22123.0106	
8	M16 x 1,5	12	28	64.5	26	14.5	17	8.5	28.0	-25	75	112	22123.0108	
10	M16 x 1,5	12	28	64.5	26	14.5	17	9.5	38.0	-25	75	117	22123.0110	
12	M20 x 1,5	15	33	78.0	33	16.5	22	11.5	40.0	-25	75	206	22123.0112	
16	M24 x 2	20	33	85.0	38	18.5	27	13.0	54.0	-25	75	313	22123.0116	

¹⁾ statistical average value

APPLICATION EXAMPLE



Index Bolts

EH 22120.

2



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.

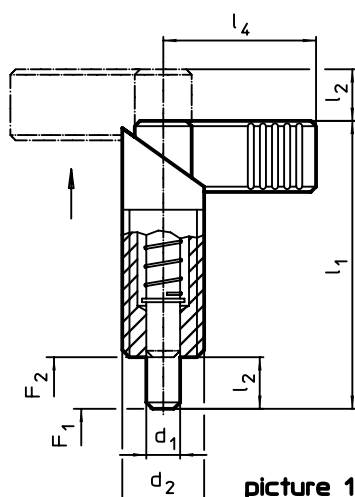
Further products

Mounting Blocks, for index bolts and index plungers, die-cast. → p. 115

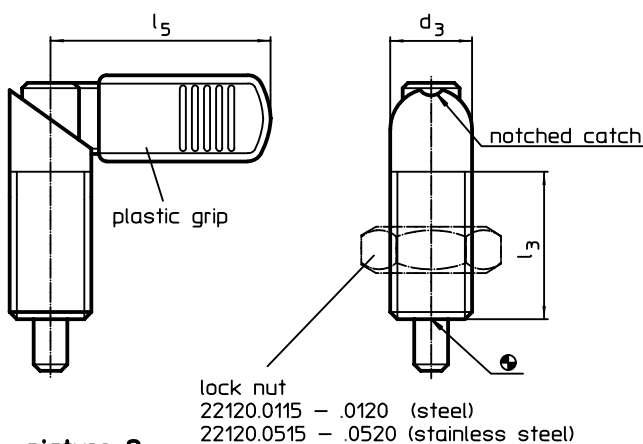
Locating Bushings, for index bolts and index plungers. → p. 116

Mounting Blocks, for index bolts and index plungers. → p. 143

DRAWING



picture 1



picture 2

lock nut
22120.0115 – .0120 (steel)
22120.0515 – .0520 (stainless steel)

ORDER INFORMATION

Dimensions								Spring load ¹⁾		min. max.		[g]	Art. No.	
d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l ₅	F ₁	F ₂				Free cutting steel	Stainless steel
-0.02 -0.04														
[mm]														
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	75	22120.0316	22120.0326
	M12 x 1,5	12	47.0	8	26	26	–	8.5	19.5	–	250	30	22120.0315	22120.0325
8	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	128	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



d ₁ -0.02 -0.04	Dimensions							Spring load ¹⁾		min. max.			Art. No.	
	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l ₅	F ₁ ~	F ₂ ~				Free cutting 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	Wrench size		Art. No.	
	d ₂			Steel	Stainless steel
	[mm]	[mm]	[g]		
lock nuts ISO 8675 (DIN 439)					
	M10 x 1	16	5.2	22120.0115	22120.0515
	M12 x 1,5	18	7.5	22120.0116	22120.0516
	M16 x 1,5	24	15.0	22120.0118	22120.0518
	M20 x 1,5	30	32.0	22120.0120	22120.0520

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

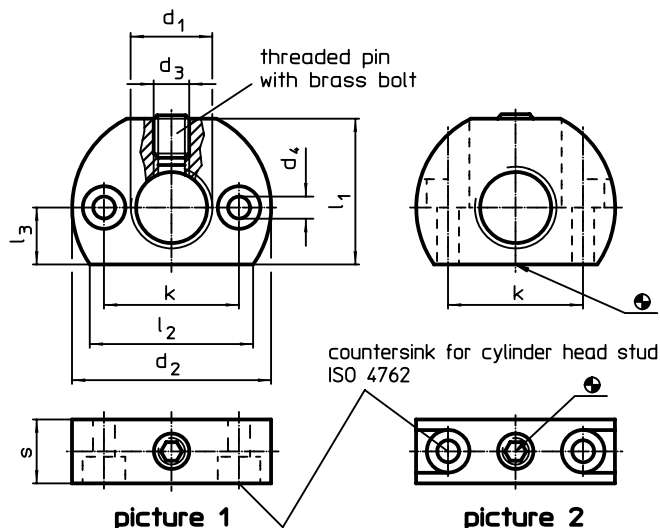
Grub Screw

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

Body

- Steel, blackened
- Stainless steel 1.4305

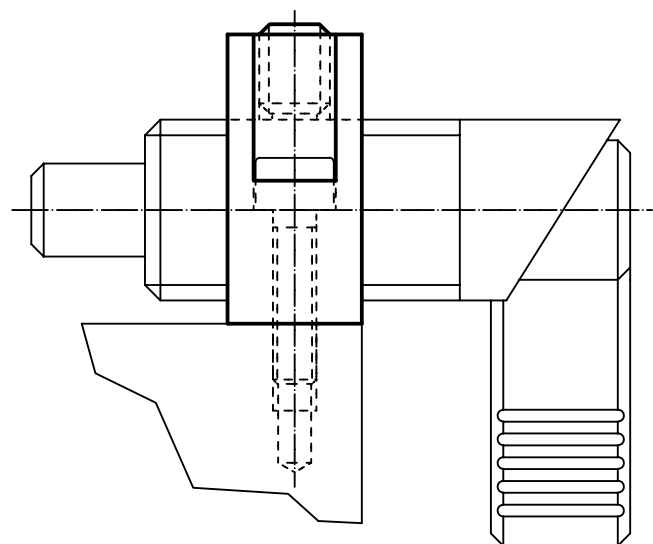
DRAWING



ORDER INFORMATION

Dimensions											Art. No.	
d ₁	d ₂	d ₃	d ₄	k ±0.1	l ₁	l ₂ ~	l ₃	s	max.		Steel	Stainless steel
[mm]									[°C]	[g]		
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

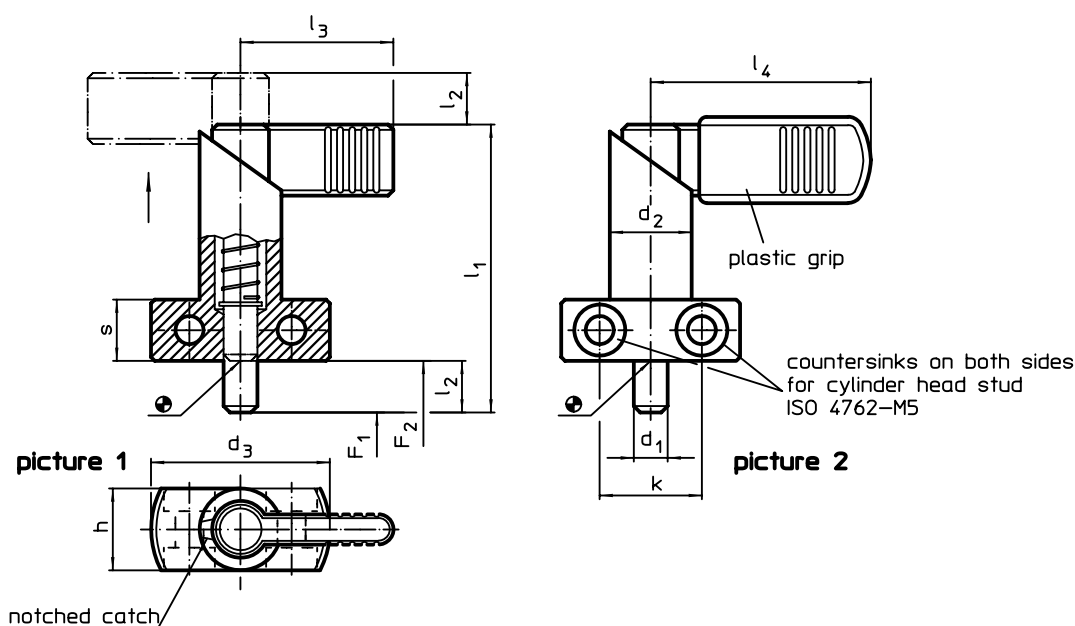
By turning the index bolt 180° the locking pin will be pulled-in and secured by a notched catch (when locking pin should not overhang).

MORE INFORMATION

Further products

Locating Bushings, for index bolts and index plungers → p. 116

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	171	22120.0382
12	12	20	40	20	22	69	37	–	15	21	58	–	250	174	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

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

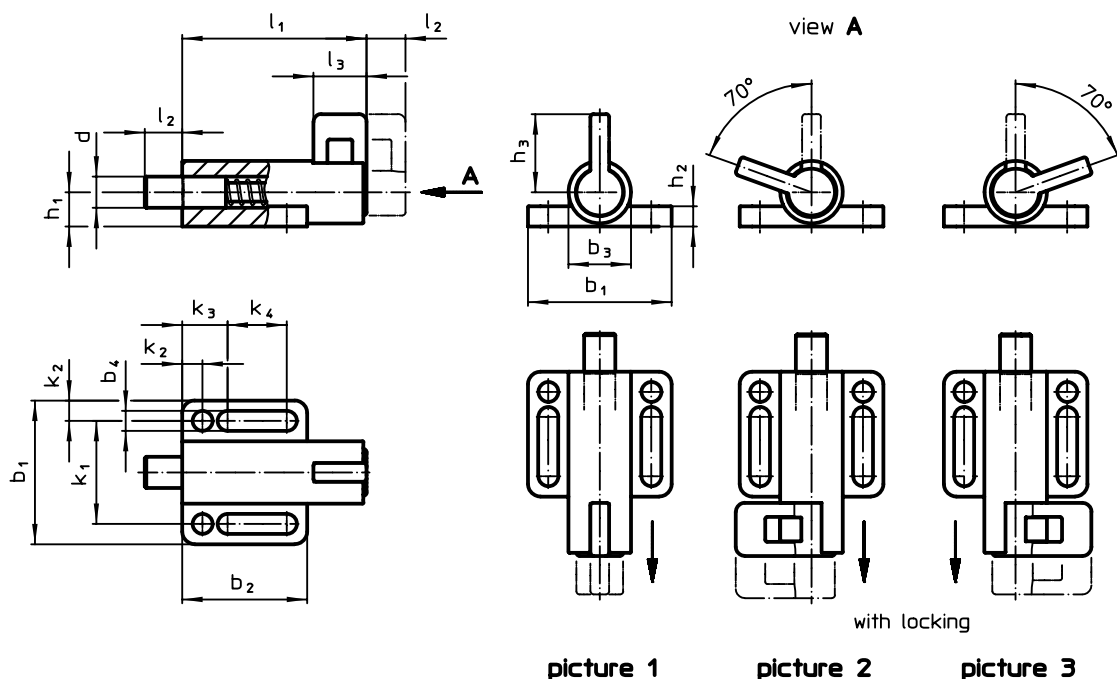
Assembly

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

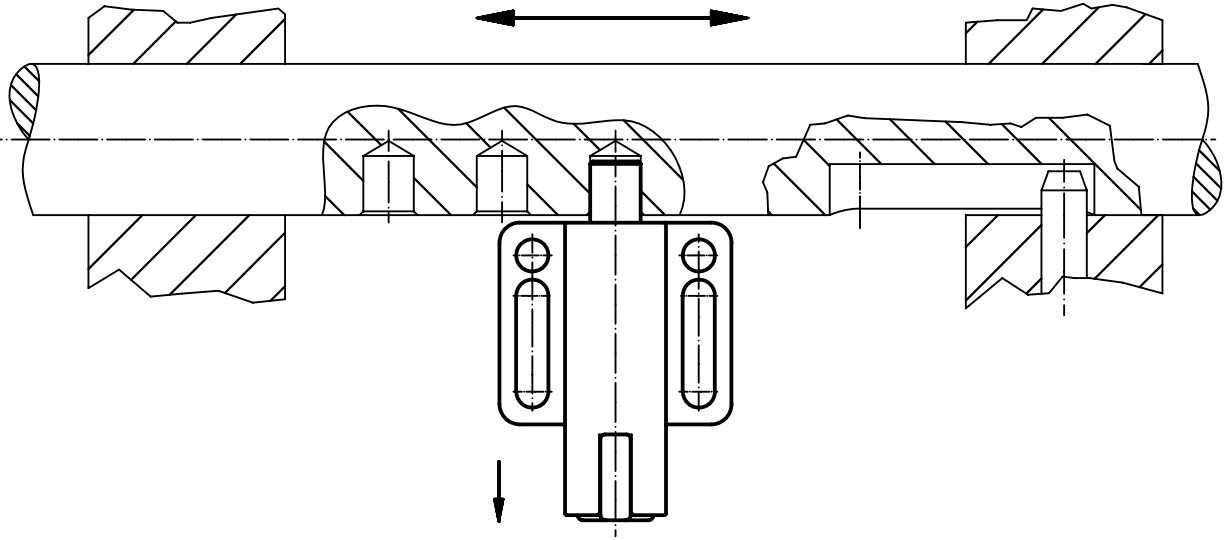


ORDER INFORMATION

Dimensions															Spring load ¹⁾					Art. No.
d	l ₂	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.		
-0.05	min.																			
[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
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



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

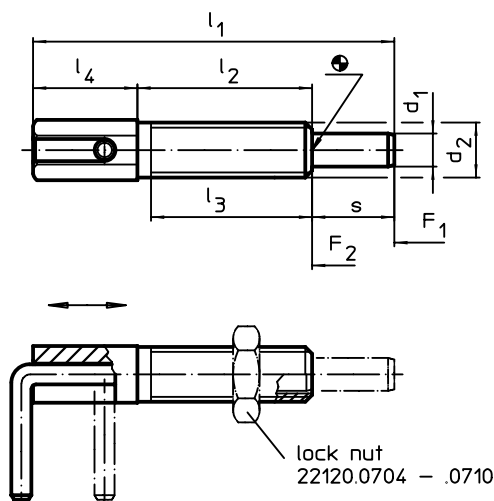
Notes

Lock nuts have to be purchased separately.

Further products

Locating Bushings, for index bolts and index plungers → p. 116

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	[mm]	F ₁ ~	F ₂ ~	[Nm]	[°C]	[g]	
[mm]										[N]					
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	5.9	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	14.0	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	26.0	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	43.0	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	104.0	22121.0125

¹⁾ statistical average value

ACCESSORIES

	Dimensions	Wrench size		Art. No.
	d ₂ [mm]	[mm]	[g]	Steel
	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

For precise adjustment, the grip ball and plunger should be glued grease-free after assembly. Detailed assembly instructions can be downloaded as a PDF file under "Documents".

Operation

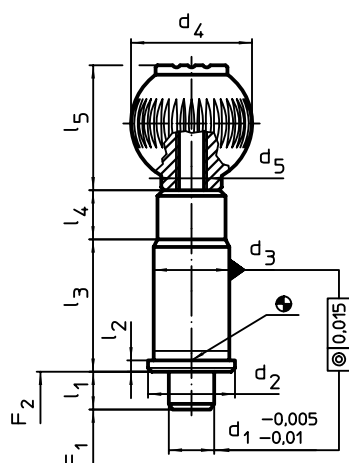
When using locking index plungers the knob is pulled out and turned 90°.

MORE INFORMATION

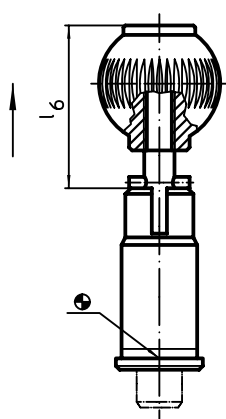
Notes

Bushings must be ordered separately.

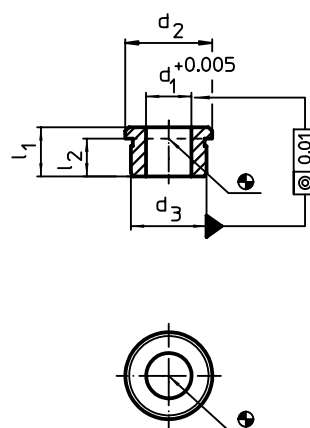
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

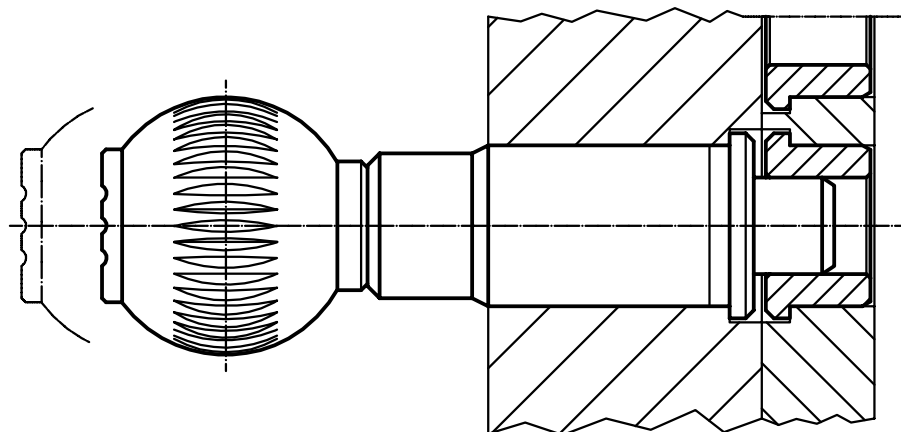
Dimensions											Spring load ¹⁾			Art. No.
d ₁ -0.005 -0.01	d ₂	d ₃ n6	d ₄	d ₅	l ₁ min.	l ₂	l ₃	l ₄	l ₅	l ₆	F ₁ ~	F ₂ ~		
[mm]											[N]			
without locking – picture 1														
10	19	16	25	M 6	10	2.5	31	13	25.0	–	15	30	79	22130.0010
12	23	20	32	M 8	10	3.0	35	13	33.0	–	15	35	138	22130.0012
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	349	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

ACCESSORIES

	Dimensions					 [g]	Art. No.
	d ₁ +0.005	d ₂	d ₃ n6	l ₁ min.	l ₂		
	[mm]						
socket for precision index plungers, cylindrical – 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

For precise adjustment, the grip ball and plunger should be glued grease-free after assembly. Detailed assembly instructions can be downloaded as a PDF file under "Documents".

Operation

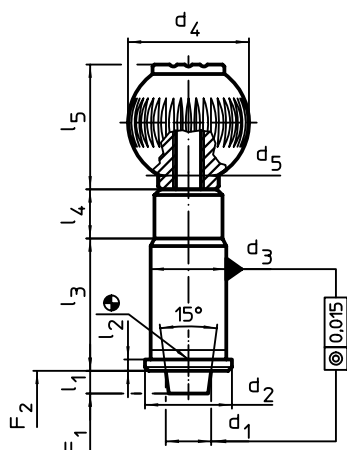
When using locking index plungers the knob is pulled out and turned 90°.

MORE INFORMATION

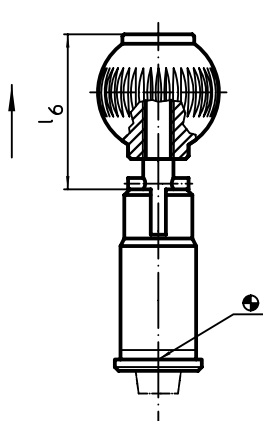
Notes

Bushings must be ordered separately.

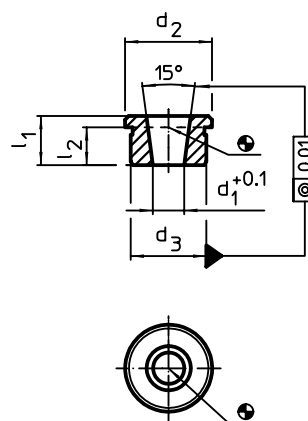
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

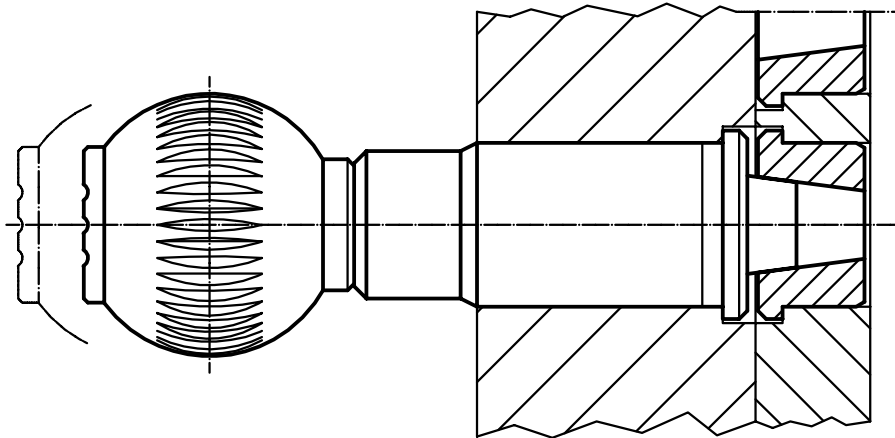
Nominal diameter	Dimensions											Spring load ¹⁾			Art. No.
	d ₁	d ₂	d ₃ n6	d ₄	d ₅	l ₁ min.	l ₂	l ₃	l ₄	l ₅	l ₆	F ₁ ~	F ₂ ~		
	[mm]											[N]			
without locking – picture 1															
10	10	19	16	25	M 6	6	2.5	31	13	25.0	–	19	29	78	22130.0110
12	12	23	20	32	M 8	6	3.0	35	13	33.0	–	22	35	135	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	95	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

ACCESSORIES

	Nominal diam- eter	Dimensions						Art. No.
	d ₁ +0.1	d ₂	d ₃ n6	l ₁ min.	l ₂			
	[mm]	[mm]						
socket for precision index plungers, tapered – 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



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.



Lateral Spring Plungers

EH 22140.

2



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

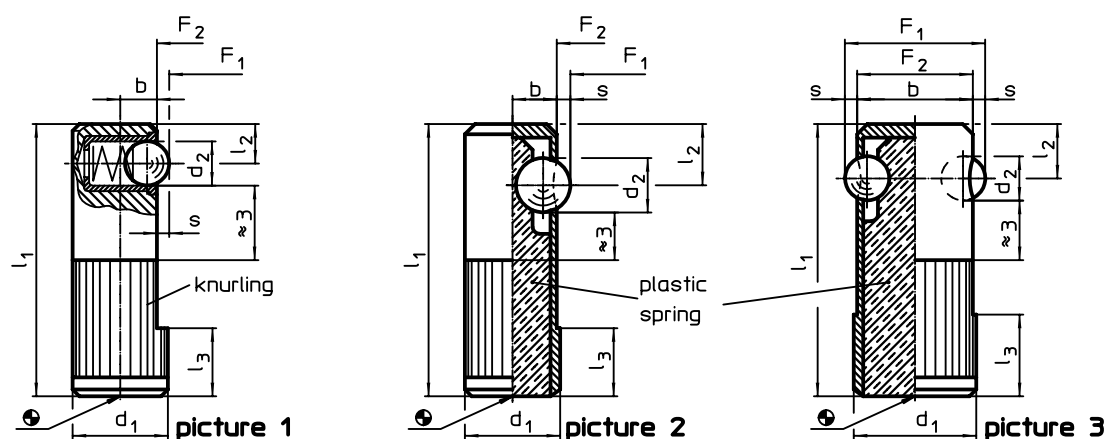
Insertion bore l_3 to be considered.

MORE INFORMATION

Notes

Special types on request.

DRAWING



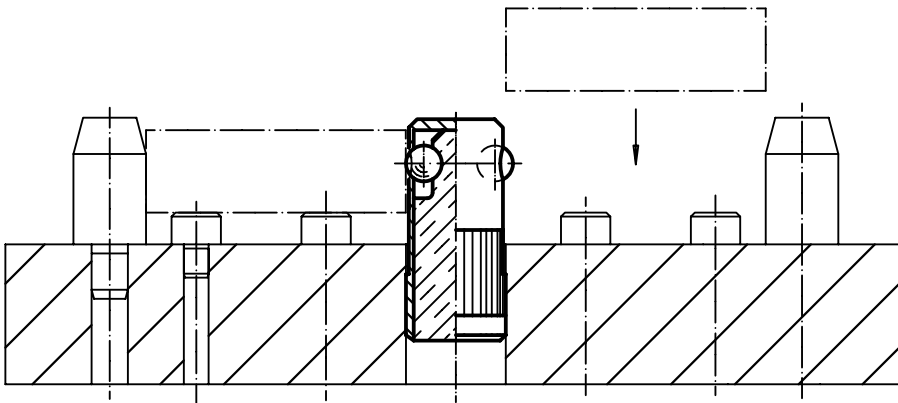
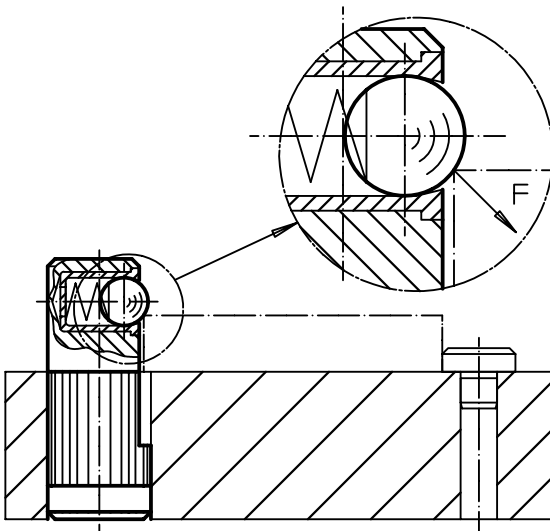
ORDER INFORMATION

Dimensions						Location hole H8	Stroke s	Spring load ¹⁾		 min. max.		 [g]	Art. No.
d ₁ +0.1	d ₂	l ₁	l ₂	l ₃	b			F ₁ ~	F ₂ ~	[N]			
[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	8.9	22140.0008
10	4.0	30	4.2	7	4.0	10	1.0	4.5	9.0	-30	50	16.0	22140.0010
12	5.0	35	4.8	9	5.0	12	1.6	6.5	13.0	-30	50	28.0	22140.0012
14	6.5	40	5.8	10	5.4	14	1.9	8.0	18.0	-30	50	43.0	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	8.8	22140.0108
10	4.0	30	4.2	7	4.0	10	1.0	4.5	9.0	-30	50	16.0	22140.0110
12	5.0	35	4.8	9	5.0	12	1.6	6.5	13.0	-30	50	28.0	22140.0112
14	6.5	40	5.8	10	5.4	14	1.9	8.0	18.0	-30	50	42.0	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	8.6	22140.0410
12	6.5	35	8.0	9	5.5	12	1.5	80.0	260.0	-40	80	14.0	22140.0412
14	8.0	40	9.0	10	6.5	14	2.0	120.0	480.0	-40	80	20.0	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	20.0	22140.0616
18	6.5	40	8.0	12	17.0	18	1.8	120.0	330.0	-40	80	29.0	22140.0618
22	8.0	45	9.0	15	21.0	22	2.5	130.0	540.0	-40	80	43.0	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

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

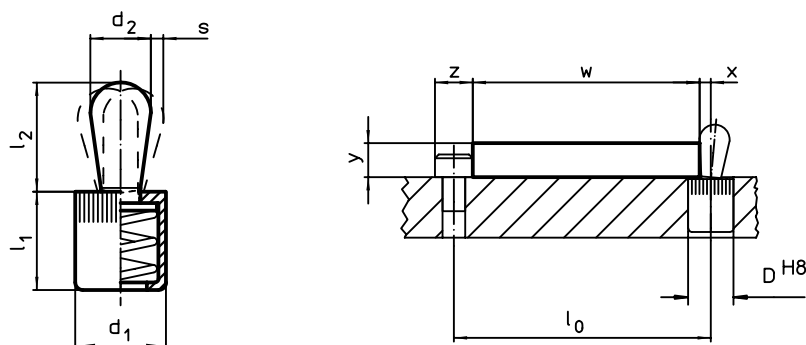
Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth → p. 163

DRAWING



ORDER INFORMATION

Dimensions		Spring load F max. ¹⁾ ~	Dimensions		Stroke s	Location hole D H8	 max.		Art. No.
d ₁	d ₂		l ₁ -1	l ₂ ±0.5					
[mm]		[N]	[mm]		[mm]	[mm]	[°C]	[g]	
pin: steel/pin from steel, light spring load									
6	3	10	7.0	4.0	1.0	6	250	0.6	22150.0010
10	5	20	11.0	6.7	1.6	10	250	2.6	22150.0020
	6	40	11.0	10.7	2.0	10	250	3.4	22150.0025
12	8	50	13.5	13.6	2.6	12	250	6.8	22150.0030
16	10	100	18.0	16.7	3.2	16	250	14.0	22150.0040
pin: steel/pin from steel, standard spring load									
6	3	20	7.0	4.0	1.0	6	250	0.6	22150.0011
10	5	50	11.0	6.7	1.6	10	250	2.8	22150.0021
	6	75	11.0	10.7	2.0	10	250	3.6	22150.0026
12	8	100	13.5	13.6	2.6	12	250	7.3	22150.0031
16	10	150	18.0	16.7	3.2	16	250	15.0	22150.0041
pin: steel/pin from steel, heavy spring load									
6	3	40	7.0	4.0	1.0	6	250	0.7	22150.0012
10	5	100	11.0	6.7	1.6	10	250	3.0	22150.0022
	6	100	11.0	10.7	2.0	10	250	3.9	22150.0027
12	8	150	13.5	13.6	2.6	12	250	7.8	22150.0032
16	10	200	18.0	16.7	3.2	16	250	15.0	22150.0042

¹⁾ statistical average value



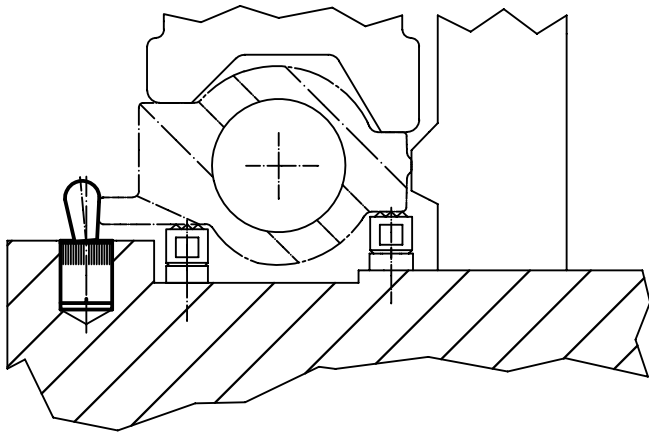
Dimensions		Spring load $F_{\text{max.}}^{1)}$ ~ [N]	Dimensions		Stroke s [mm]	Location hole D_{H8} [mm]	max. [°C]	[g]	Art. No.
d_1	d_2		l_1 -1	l_2 ± 0.5					
[mm]	[mm]		[mm]	[mm]					
pin: thermoplastic/pin from thermoplastic, light spring load									
6	3	10	7.0	4.0	1.0	6	80	0.3	22150.0050
10	5	20	11.0	6.7	1.6	10	80	1.3	22150.0060
	6	40	11.0	10.7	2.0	10	80	1.5	22150.0062
12	8	50	13.5	13.9	2.6	12	80	2.9	22150.0070
16	10	100	18.0	16.7	3.2	16	80	6.6	22150.0080

¹⁾ statistical average value

ACCESSORIES

	Dimensions		[g]	Art. No.
	d_1			
	[mm]			
assembly tool				
	6		19	22150.0830
	10		49	22150.0831
	12		86	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

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

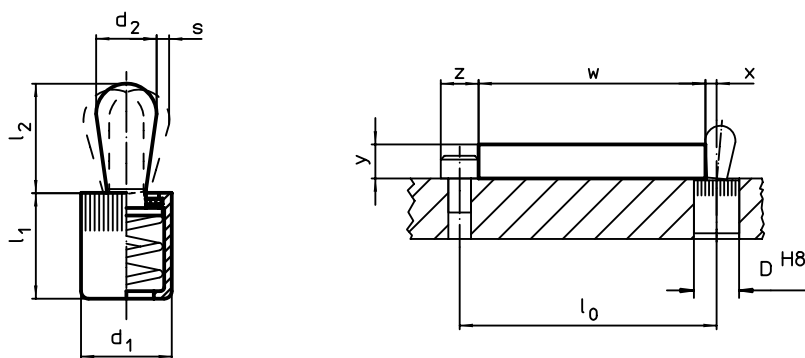
Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth → p. 163

DRAWING



ORDER INFORMATION

Dimensions d ₁ d ₂		Spring load F max. ¹⁾ ~	Dimensions l ₁ -2 l ₂ ±0.5		Stroke s	Location hole D H8	 max.		Art. No.
[mm]		[N]	[mm]		[mm]	[mm]	[°C]	[g]	
pin: steel/pin from steel, light spring load									
6	3	10	7.5	4.0	1.0	6	110	0.6	22150.0110
10	5	20	12.0	6.3	1.6	10	110	2.6	22150.0120
	6	40	12.0	10.3	2.0	10	110	3.5	22150.0125
12	8	50	14.5	13.2	2.6	12	110	6.9	22150.0130
16	10	100	18.5	16.4	3.2	16	110	15.0	22150.0140
pin: steel/pin from steel, standard spring load									
6	3	20	7.5	4.0	1.0	6	110	0.6	22150.0111
10	5	50	12.0	6.3	1.6	10	110	2.9	22150.0121
	6	75	12.0	10.3	2.0	10	110	3.6	22150.0126
12	8	100	14.5	13.2	2.6	12	110	7.5	22150.0131
16	10	150	18.5	16.4	3.2	16	110	15.0	22150.0141
pin: steel/pin from steel, heavy spring load									
6	3	40	7.5	4.0	1.0	6	110	0.7	22150.0112
10	5	100	12.0	6.3	1.6	10	110	3.0	22150.0122
	6	100	12.0	10.3	2.0	10	110	3.9	22150.0127
12	8	150	14.5	13.2	2.6	12	110	7.9	22150.0132
16	10	200	18.5	16.4	3.2	16	110	16.0	22150.0142

¹⁾ statistical average value



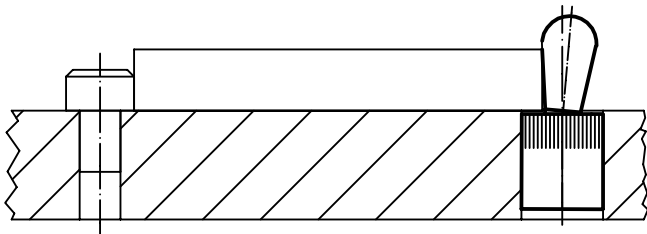
Dimensions		Spring load F max. ¹⁾ ~	Dimensions		Stroke s	Location hole D H8	 max.		Art. No.
d ₁	d ₂		l ₁ -2	l ₂ ±0.5					
[mm]		[N]	[mm]		[mm]	[mm]	[°C]	[g]	
pin: thermoplastic/pin from thermoplastic, light spring load									
6	3	10	7.5	4.0	1.0	6	80	0.4	22150.0150
10	5	20	12.0	6.3	1.6	10	80	1.4	22150.0160
	6	40	12.0	10.3	2.0	10	80	1.6	22150.0165
12	8	50	14.5	13.5	2.6	12	80	2.9	22150.0170
16	10	100	18.5	16.4	3.2	16	80	7.3	22150.0180

¹⁾ statistical average value

ACCESSORIES

	Dimensions		Art. No.
	d ₁ [mm]	[g]	
assembly tool			
	6	19	22150.0830
	10	49	22150.0831
	12	86	22150.0832
	16	105	22150.0833

APPLICATION EXAMPLE



Lateral Plungers • with plastic spring and pin

EH 22150.

2



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 $x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0,123]$

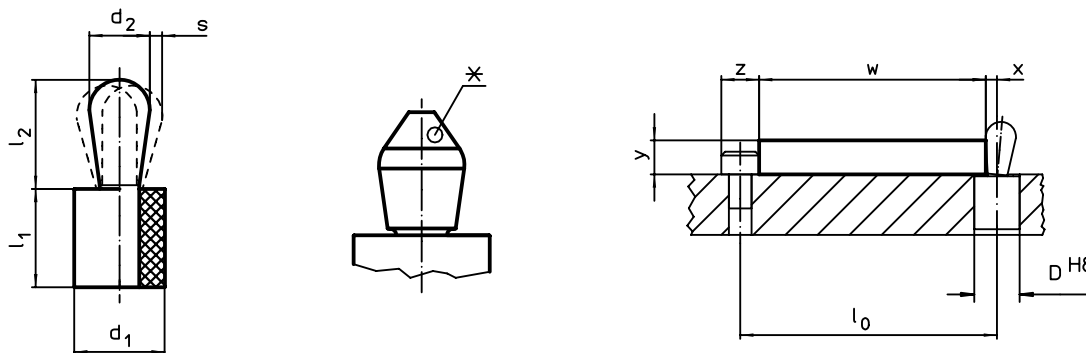
Characteristic

Version light spring load = blue spring

Version standard spring load = red spring

Version heavy spring load = green spring

DRAWING



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

ORDER INFORMATION

Dimensions		Spring load F max. ¹⁾ ~	Dimensions		Stroke s	Location hole D H8	 max.		Art. No.
d ₁	d ₂		l ₁ -1	l ₂ ±0.5					
[mm]		[N]	[mm]		[mm]	[mm]	[°C]	[g]	
pin: steel/pin from steel, light spring load									
6	3	10	7	3.7	0.4	5.9	100	0.5	22150.0200²⁾
8	4	15	9	5.2	0.6	7.9	100	1.2	22150.0202
10	5	30	9	7.3	0.8	9.9	100	2.1	22150.0204
	6	20	9	10.3	1.0	9.9	100	2.9	22150.0207
pin: steel/pin from steel, standard spring load									
6	3	20	7	3.7	0.4	5.9	100	0.5	22150.0201²⁾
8	4	30	9	5.2	0.6	7.9	100	1.2	22150.0203
10	5	60	9	7.3	0.8	9.9	100	2.1	22150.0205
	6	30	9	10.3	1.0	9.9	100	2.9	22150.0208
12	8	50	13	13.3	1.2	11.9	100	6.8	22150.0211
16	10	80	16	16.9	1.6	15.9	100	14.0	22150.0213
pin: steel/pin from steel, heavy spring load									
10	5	90	9	7.3	0.8	9.9	100	2.1	22150.0206
	6	60	9	10.3	1.0	9.9	100	2.9	22150.0209
12	8	100	13	13.3	1.2	11.9	100	6.8	22150.0212
16	10	160	16	16.9	1.6	15.9	100	15.0	22150.0214

¹⁾ statistical average value

²⁾ deviating pin shape (see drawing)



Dimensions d ₁ d ₂ [mm]		Spring load F max. ¹⁾ [N]	Dimensions l ₁ -1 l ₂ ±0.5 [mm]		Stroke s [mm]	Location hole D H8 [mm]	 max. [°C]	 [g]	Art. No.
pin: stainless steel/pin from stainless steel, light spring load									
6	3	10	7	3.7	0.4	5.9	100	0.5	22150.0215²⁾
8	4	15	9	5.2	0.6	7.9	100	1.2	22150.0217
10	5	30	9	7.3	0.8	9.9	100	2.1	22150.0219
	6	20	9	10.3	1.0	9.9	100	2.9	22150.0222
pin: stainless steel/pin from stainless steel, standard spring load									
6	3	20	7	3.7	0.4	5.9	100	0.5	22150.0216²⁾
8	4	30	9	5.2	0.6	7.9	100	1.2	22150.0218
10	5	60	9	7.3	0.8	9.9	100	2.1	22150.0220
	6	30	9	10.3	1.0	9.9	100	2.9	22150.0223
12	8	50	13	13.3	1.2	11.9	100	6.8	22150.0226
16	10	80	16	16.9	1.6	15.9	100	15.0	22150.0228
pin: stainless steel/pin from stainless steel, heavy spring load									
10	5	90	9	7.3	0.8	9.9	100	2.1	22150.0221
	6	60	9	10.3	1.0	9.9	100	2.9	22150.0224
12	8	100	13	13.2	1.2	11.9	100	6.8	22150.0227
16	10	160	16	16.6	1.6	15.9	100	15.0	22150.0229
pin: thermoplastic/pin from thermoplastic, light spring load									
6	3	10	7	3.7	0.4	5.9	80	0.3	22150.0230²⁾
8	4	15	9	5.2	0.6	7.9	80	0.6	22150.0232
10	5	30	9	7.3	0.8	9.9	80	1.0	22150.0234
	6	20	9	10.3	1.0	9.9	80	1.1	22150.0237
pin: thermoplastic/pin from thermoplastic, standard spring load									
6	3	20	7	3.7	0.4	5.9	80	0.3	22150.0231²⁾
8	4	30	9	5.2	0.6	7.9	80	0.6	22150.0233
10	5	60	9	7.3	0.8	9.9	80	1.0	22150.0235
	6	30	9	10.3	1.0	9.9	80	1.1	22150.0238
12	8	50	13	13.3	1.2	11.9	80	2.3	22150.0240
16	10	80	16	16.9	1.6	15.9	80	4.9	22150.0242
pin: thermoplastic/pin from thermoplastic, heavy spring load									
10	5	90	9	7.3	0.8	9.9	80	1.0	22150.0236
	6	60	9	10.3	1.0	9.9	80	1.1	22150.0239
12	8	100	13	13.3	1.2	11.9	80	2.3	22150.0241
16	10	160	16	16.9	1.6	15.9	80	5.1	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	96	22150.0843
	16	145	22150.0844

Lateral Plungers • smooth, 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

- 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:

$$x = d_z/2 - s$$

Installation by pressing in.

Characteristic

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

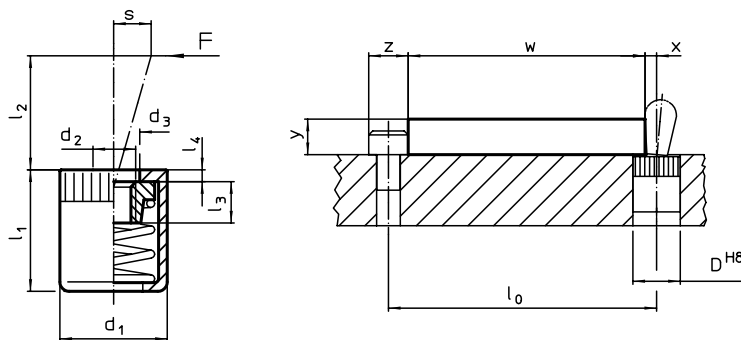
Notes

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

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth → p. 163

DRAWING



ORDER INFORMATION

Dimensions		Spring load $F_{\max.}^{1)}$ [N]	d_3	Dimensions				Stroke s [mm]	Location hole D_{H8} [mm]	max. [°C]	[g]	Art. No.
d_1	d_2			l_1	l_2	l_3	l_4					
[mm]	[mm]				[mm]							
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	18	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	18	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
					7.5	4.5	1.2	2.0	10	250	2.5	22150.1027
16	M6	200	10.2	18	11.5	7.5	1.7	3.2	16	250	9.3	22150.1042

¹⁾ statistical average value

ACCESSORIES

	Dimensions		Art. No.
	d_1	[g]	
	[mm]		
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

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

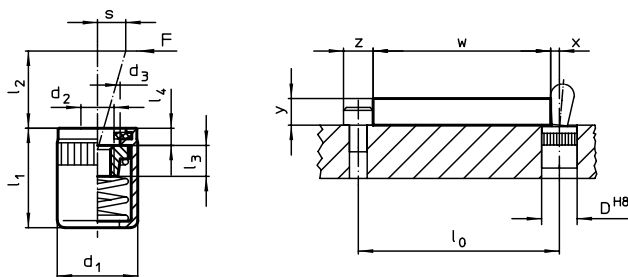
Notes

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

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth → p. 163

DRAWING



ORDER INFORMATION

Dimensions		Spring load F max. ¹⁾ ~ [N]	Dimensions					Stroke s [mm]	Location hole D H8 [mm]	max. [°C]	[g]	Art. No.
d ₁	d ₂		d ₃	l ₁₋₂	l ₂	l ₃	l ₄					
[mm]	[mm]				[mm]							
light spring load												
10	M4	20	6.3	12.0	2.5	4.5	1.8	1.6	10	110	1.9	22150.1120
		40	6.3	12.0	7.5	4.5	1.8	2.0	10	110	2.0	22150.1125
16	M6	100	10.2	18.5	11.5	7.5	2.0	3.2	16	110	9.6	22150.1140
standard spring load												
10	M4	50	6.3	12.0	2.5	4.5	1.8	1.6	10	110	2.2	22150.1121
		75	6.3	12.0	7.5	4.5	1.8	2.0	10	110	2.2	22150.1126
16	M6	150	10.2	18.5	11.5	7.5	2.0	3.2	16	110	9.5	22150.1141
heavy spring load												
10	M4	100	6.3	12.0	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	18.5	11.5	7.5	2.0	3.2	16	110	10.0	22150.1142

¹⁾ statistical average value

ACCESSORIES

Dimensions		Art. No.
d ₁	[mm]	
assembly tool		
	10	22150.0831
	16	22150.0833

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

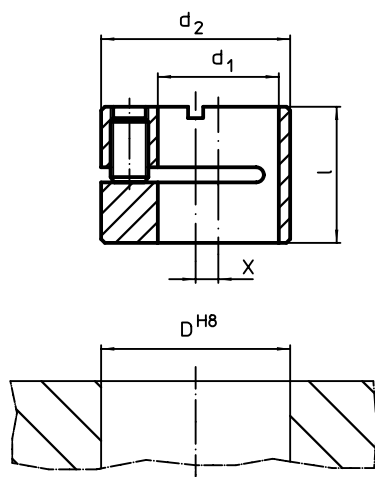
Body

- Steel, blackened

Assembly

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

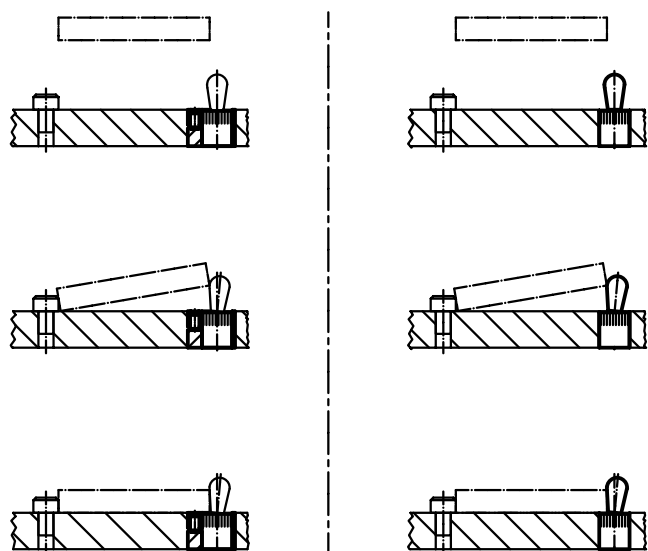
DRAWING



ORDER INFORMATION

d ₁ H8	Dimensions			Location hole D H8		Art. No.
	d ₂ h9	l	x			
		[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:

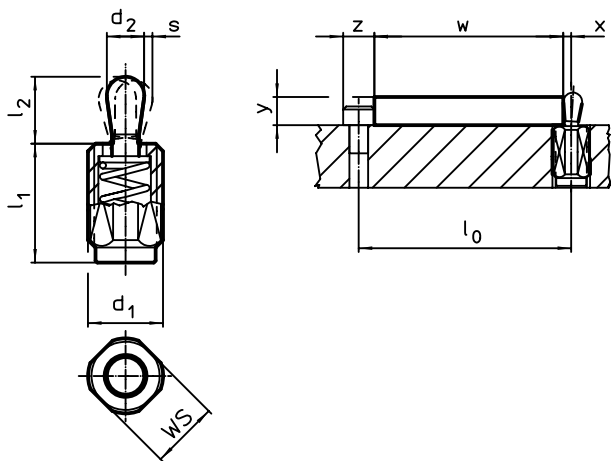
$$l_0 = z/2 + w + x,$$

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

Version light spring load = spring from stainless steel
 Version standard spring load = spring from steel, blackened
 Version heavy spring load = spring from steel, zinc-plated by galvanization

DRAWING



ORDER INFORMATION

d_1	l_1 -2	Dimensions Spring load $F_{\max.}^{1)}$ ~	d_2	l_2	Stroke s	WS	max. [°C]	[g]	Art. No.
[mm]		[N]	[mm]		[mm]	[mm]			
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



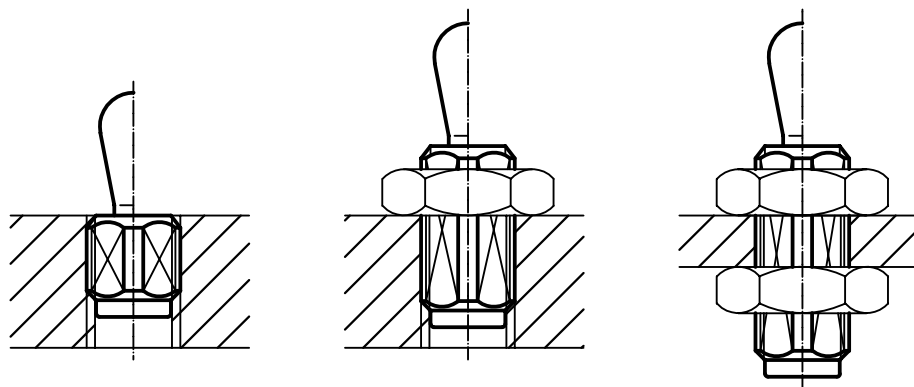
d ₁	l ₁₋₂	Dimensions		d ₂	l ₂	Stroke s	WS	max. 		Art. No.
		Spring load F max. ¹⁾ ~								
[mm]		[N]		[mm]		[mm]	[mm]	[°C]	[g]	
pin: steel/standard spring load										
M12	11.5	50		5	6.4	1.6	10	250	4.1	22150.0311
	19.0	50		5	6.4	1.6	10	250	6.4	22150.0315
	26.5	50		5	6.4	1.6	10	250	8.3	22150.0319
	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			Art. No.
	d ₁			
	[mm]		[g]	
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 $x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0,123]$

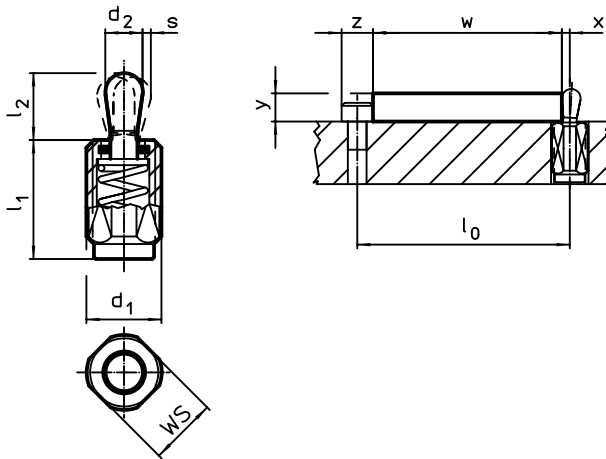
Characteristic

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

Version heavy spring load = spring from steel, zinc-plated by galvanization

DRAWING



ORDER INFORMATION

d_1	l_{1-2}	Dimensions		d_2	l_2	Stroke s	WS	max. [°C]	[g]	Art. No.
		Spring load F max. ¹⁾								
[mm]		[N]		[mm]		[mm]	[mm]			
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



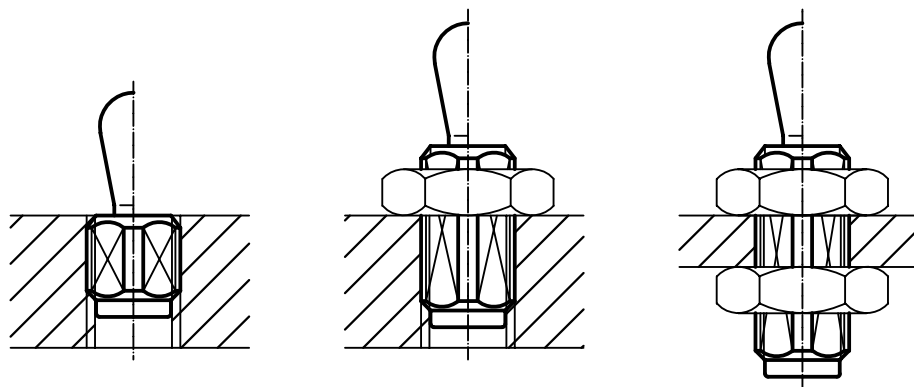
d ₁	l ₁₋₂	Dimensions			Stroke s	WS	max.		Art. No.
		Spring load F max. ¹⁾	d ₂	l ₂					
[mm]		[N]	[mm]		[mm]	[mm]	[°C]	[g]	
pin: steel/standard spring load									
M12	11.5	50	5	6	0.8	10	110	4.1	22150.0411
	19.0	50	5	6	0.8	10	110	6.3	22150.0415
	26.5	50	5	6	0.8	10	110	8.1	22150.0419
	11.5	75	6	10	1.0	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		Art. No.
	d ₁	[g]	
	[mm]		
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

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

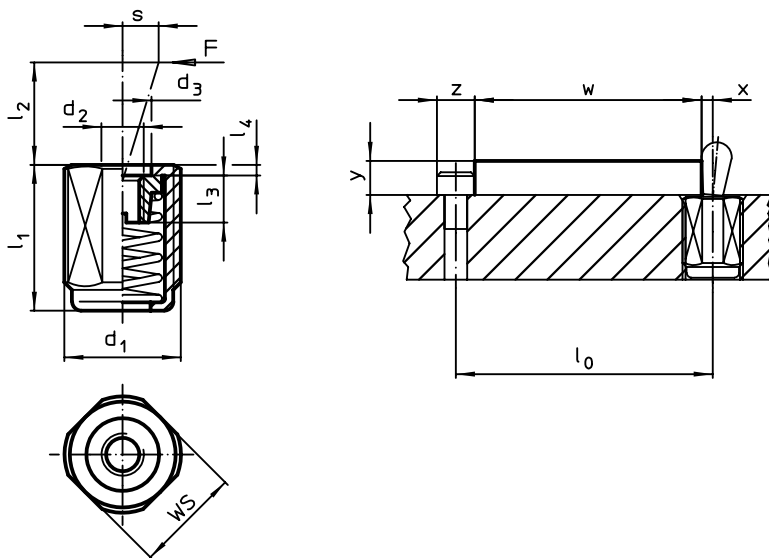
Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Notes

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

DRAWING



ORDER INFORMATION

Dimensions		Spring load F max. ¹⁾ ~ [N]	Dimensions					Stroke s [mm]	WS [mm]	max. [°C]	[g]	Art. No.
d ₁	l ₁ -2		d ₂	d ₃	l ₂	l ₃	l ₄					
[mm]	[mm]				[mm]							
light spring load												
M12	11.5	20	M4	6.1	4.0	4.5	1.5	1.6	10	250	3.2	22150.1310
	19.0	20	M4	6.1	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
M18 x 1,5	26.5	40	M4	6.1	7.5	4.5	1.5	2.0	10	250	6.9	22150.1338
	18.0	100	M6	10.1	11.5	7.5	1.5	3.2	16	250	15.0	22150.1350
	31.5	100	M6	10.1	11.5	7.5	1.5	3.2	16	250	23.0	22150.1354
	45.0	100	M6	10.1	11.5	7.5	1.5	3.2	16	250	32.0	22150.1358

¹⁾ statistical average value



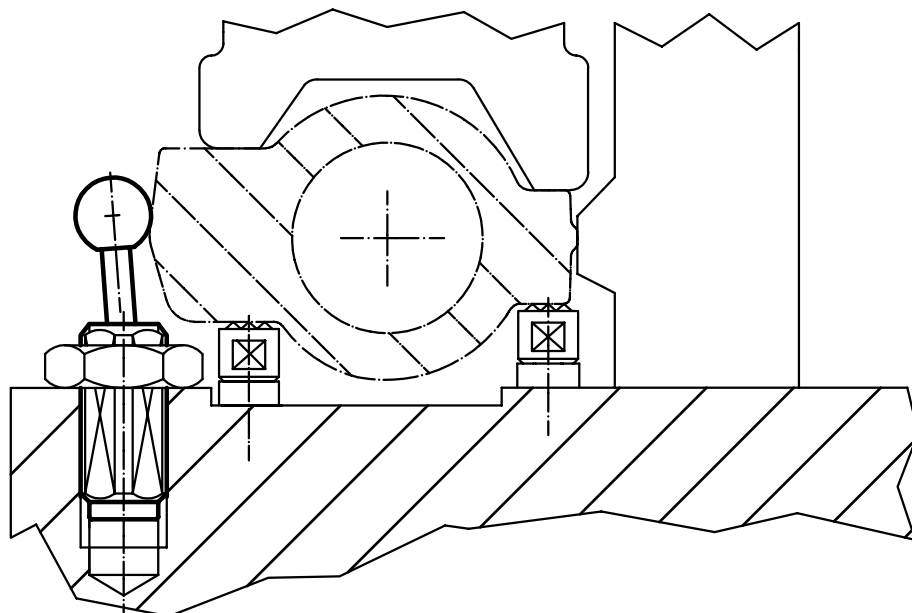
Dimensions		Spring load F max. ¹⁾ ~	Dimensions					Stroke s	WS	max. [°C]	[g]	Art. No.
d ₁	l ₁₋₂		d ₂	d ₃	l ₂	l ₃	l ₄					
[mm]		[N]			[mm]			[mm]	[mm]	[°C]	[g]	
standard spring load												
M12	11.5	50	M4	6.1	4.0	4.5	1.5	1.6	10	250	3.5	22150.1311
	19.0	50	M4	6.1	4.0	4.5	1.5	1.6	10	250	5.6	22150.1315
	26.5	50	M4	6.1	4.0	4.5	1.5	1.6	10	250	7.5	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	10.1	11.5	7.5	1.5	3.2	16	250	15.0	22150.1351
	31.5	150	M6	10.1	11.5	7.5	1.5	3.2	16	250	23.0	22150.1355
	45.0	150	M6	10.1	11.5	7.5	1.5	3.2	16	250	32.0	22150.1359
heavy spring load												
M12	11.5	100	M4	6.1	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	10.1	11.5	7.5	1.5	3.2	16	250	14.0	22150.1352
	31.5	200	M6	10.1	11.5	7.5	1.5	3.2	16	250	24.0	22150.1356
	45.0	200	M6	10.1	11.5	7.5	1.5	3.2	16	250	34.0	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

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

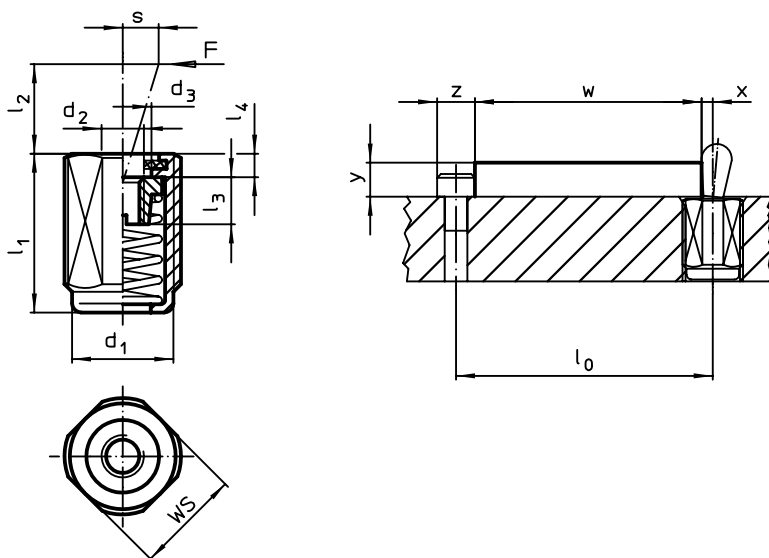
Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Notes

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

DRAWING



ORDER INFORMATION

Dimensions		Spring load F max. ¹⁾ ~	d ₂	d ₃	Dimensions			Stroke s	WS	max. [°C]	[g]	Art. No.
d ₁	l ₁₋₂				l ₂	l ₃	l ₄					
[mm]	[mm]	[N]			[mm]			[mm]	[mm]			
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	15.0	22150.1450
	31.5	100	M6	10.1	11.5	7.5	2.3	3.2	16	110	23.0	22150.1454
	45.0	100	M6	10.1	11.5	7.5	2.3	3.2	16	110	32.0	22150.1458

¹⁾ statistical average value



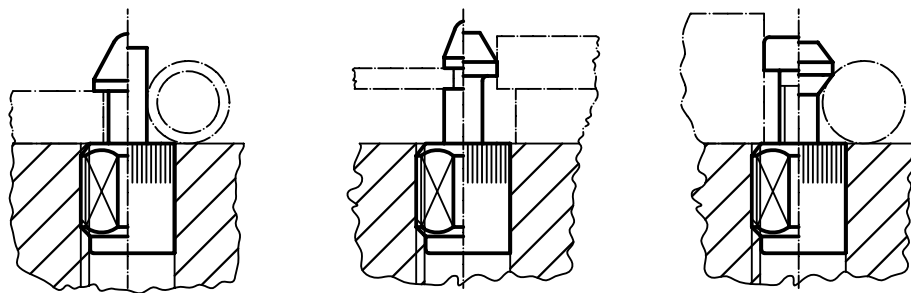
Dimensions		Spring load F max. ¹⁾ ~ [N]	Dimensions					Stroke s [mm]	WS [mm]	 max. [°C]	 [g]	Art. No.
d ₁	l ₁₋₂		d ₂	d ₃	l ₂	l ₃	l ₄					
[mm]					[mm]							
standard spring load												
M12	11.5	50	M4	6.1	4.0	4.5	2.0	1.6	10	110	3.3	22150.1411
	19.0	50	M4	6.1	4.0	4.5	2.0	1.6	10	110	5.4	22150.1415
	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
M18 x 1,5	26.5	75	M4	6.1	7.5	4.5	2.0	2.0	10	110	7.4	22150.1439
	18.0	150	M6	10.1	11.5	7.5	2.3	3.2	16	110	14.0	22150.1451
	31.5	150	M6	10.1	11.5	7.5	2.3	3.2	16	110	23.0	22150.1455
	45.0	150	M6	10.1	11.5	7.5	2.3	3.2	16	110	32.0	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	3.5	22150.1432
	19.0	100	M4	6.1	7.5	4.5	2.0	2.0	10	110	6.2	22150.1436
M18 x 1,5	26.5	100	M4	6.1	7.5	4.5	2.0	2.0	10	110	8.6	22150.1440
	18.0	200	M6	10.1	11.5	7.5	2.3	3.2	16	110	15.0	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.

2



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

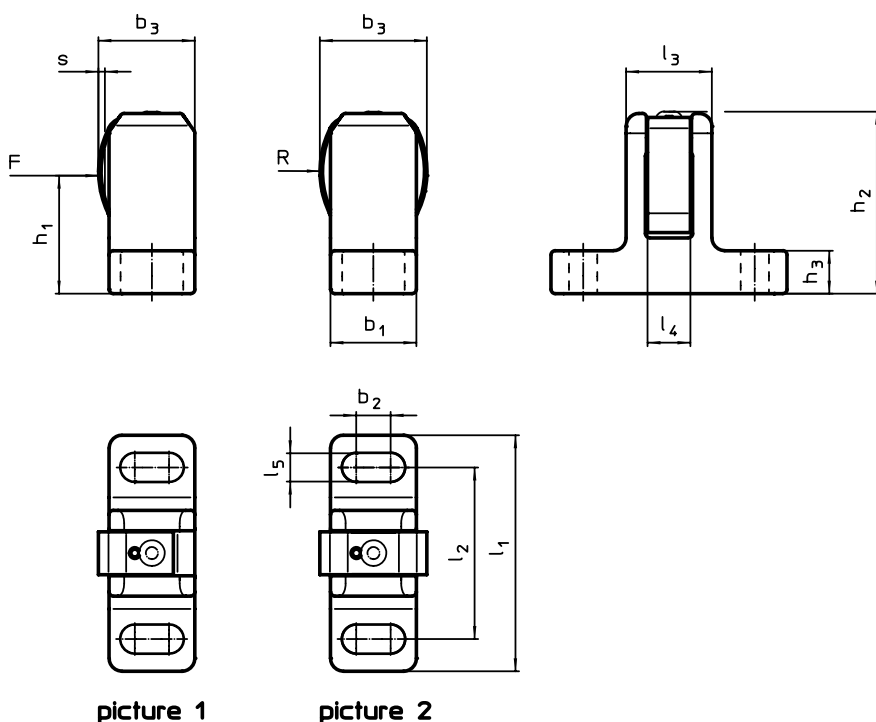
Spring element

- Stainless steel

Body

- Steel, black

DRAWING



picture 1

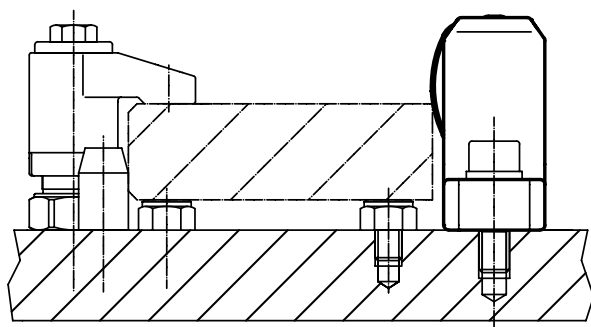
picture 2

ORDER INFORMATION

Dimensions												Stroke	For screw	Spring load	max.		Art. No.
l_1 ± 1	l_2	l_3	l_4	l_5	b_1 ± 0.5	b_2	b_3 $\sim$	h_1	h_2 ± 1	h_3	R	s		F max. ¹⁾	°C	g	
[mm]												[mm]	[mm]	[N]			
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	127	22160.0006
72	50	23	12	13.5	25	6	29.0	40.5	61.5	15	32.8	1.5	M12	170	250	251	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	128	22160.0206
72	50	23	12	13.5	25	6	33.5	40.5	61.5	15	32.8	1.5	M12	170	250	256	22160.0212

¹⁾ statistical average value

APPLICATION EXAMPLE



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

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

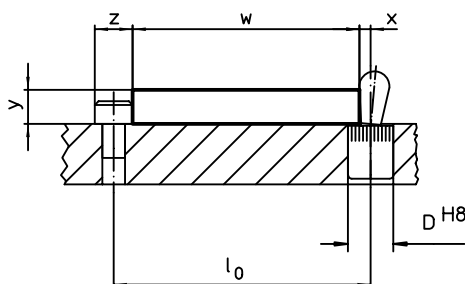
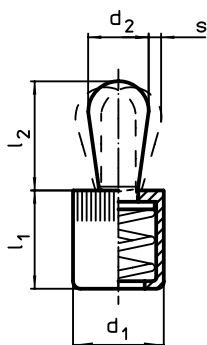
Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth - INCH. → p. 182

DRAWING



ORDER INFORMATION

Dimensions		Spring load F max. ¹⁾ ~	Dimensions		Stroke s	Location hole D H8	 max.		Art. No.
d ₁	d ₂		l ₁ -0.08	l ₂					
[in]		[lb]	[in]		[in]	[in]	[°F]	[oz]	
pin: steel/light spring load									
1/4	0.118	2.2	0.275	0.157	0.04	1/4	482	0.024	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	0.137	2B150.0025
1/2	0.315	11.2	0.525	0.535	0.09	1/2	482	0.261	2B150.0030
5/8	0.393	22.5	0.669	0.657	0.12	5/8	482	0.527	2B150.0040
pin: steel/standard spring load									
1/4	0.118	4.5	0.275	0.157	0.04	1/4	482	0.024	2B150.0011
7/16	0.197	11.2	0.433	0.263	0.06	7/16	482	0.115	2B150.0021
	0.236	16.9	0.433	0.421	0.08	7/16	482	0.143	2B150.0026
1/2	0.315	22.5	0.525	0.535	0.09	1/2	482	0.277	2B150.0031
5/8	0.393	34.0	0.669	0.657	0.12	5/8	482	0.526	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	0.123	2B150.0022
	0.236	22.5	0.433	0.421	0.08	7/16	482	0.156	2B150.0027
1/2	0.315	34.0	0.525	0.535	0.09	1/2	482	0.292	2B150.0032
5/8	0.393	45.0	0.669	0.657	0.12	5/8	482	0.549	2B150.0042

¹⁾ statistical average value



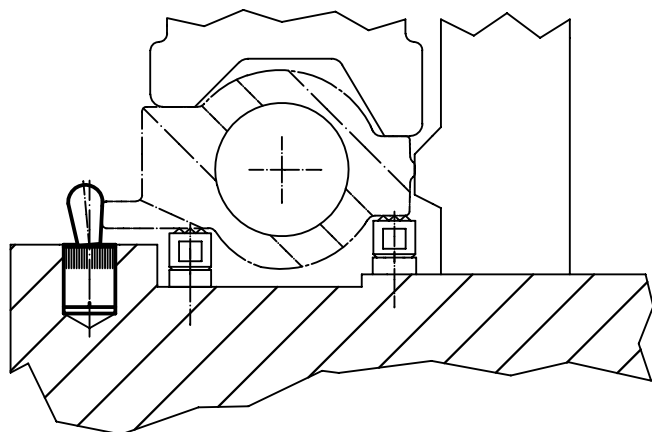
Dimensions		Spring load F max. ¹⁾ ~ [lb]	Dimensions		Stroke s [in]	Location hole D H8 [in]	max. [°F]	 [oz]	Art. No.
d ₁	d ₂		l ₁ -0.08	l ₂					
[in]	[in]		[in]	[in]					
pin: thermoplastic/light spring load									
1/4	0.118	2.2	0.275	0.157	0.04	1/4	176	0.014	2B150.0050
7/16	0.197	4.5	0.433	0.263	0.06	7/16	176	0.062	2B150.0060
	0.236	9.0	0.433	0.421	0.08	7/16	176	0.070	2B150.0065
1/2	0.315	11.2	0.525	0.547	0.09	1/2	176	0.118	2B150.0070
5/8	0.393	22.5	0.669	0.657	0.12	5/8	176	0.250	2B150.0080

¹⁾ statistical average value

ACCESSORIES

	Dimensions d ₁ [in]	 [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

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

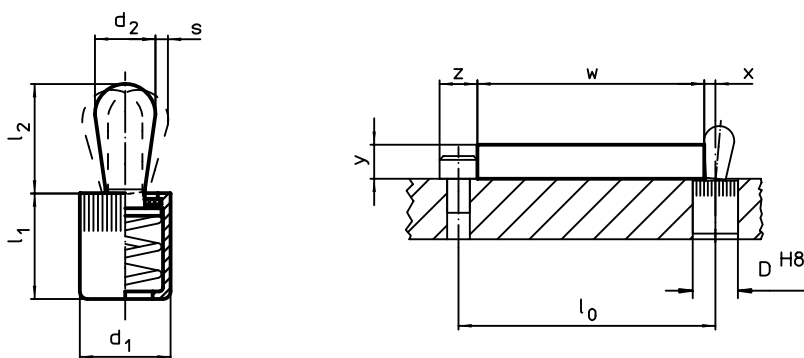
Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth - INCH..... → p. 182

DRAWING



ORDER INFORMATION

Dimensions		Spring load	Dimensions		Stroke	Location			Art. No.
d ₁	d ₂	F max. ¹⁾	l ₁ -0.08	l ₂	s	hole D H8	max.		
[in]		[lb]	[in]		[in]	[in]	[°F]	[oz]	
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	0.109	2B150.0120
	0.236	9.0	0.430	0.393	0.08	7/16	230	0.138	2B150.0125
1/2	0.315	11.2	0.551	0.511	0.09	1/2	230	0.256	2B150.0130
5/8	0.393	22.5	0.708	0.646	0.12	5/8	230	0.574	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	0.146	2B150.0126
1/2	0.315	22.5	0.551	0.511	0.09	1/2	230	0.275	2B150.0131
5/8	0.393	34.0	0.708	0.646	0.12	5/8	230	0.518	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	0.123	2B150.0122
	0.236	22.5	0.430	0.393	0.08	7/16	230	0.159	2B150.0127
1/2	0.315	34.0	0.551	0.511	0.09	1/2	230	0.288	2B150.0132
5/8	0.393	45.0	0.708	0.646	0.12	5/8	230	0.542	2B150.0142

¹⁾ statistical average value



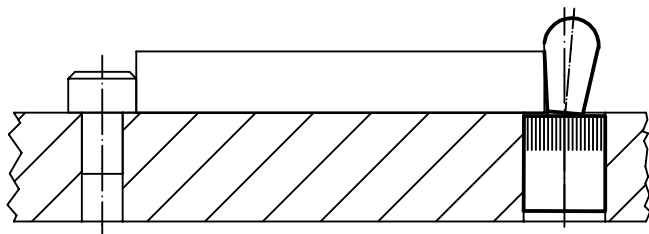
Dimensions		Spring load F max. ¹⁾ ~ [lb]	Dimensions		Stroke s [in]	Location hole D H8 [in]	max. [°F]	 [oz]	Art. No.
d ₁	d ₂		l ₁ -0.08	l ₂					
[in]	[in]		[in]	[in]					
pin: thermoplastic/light spring load									
1/4	0.118	2.2	0.275	0.157	0.04	1/4	176	0.014	2B150.0150
7/16	0.197	4.5	0.430	0.236	0.06	7/16	176	0.064	2B150.0160
	0.236	9.0	0.393	0.472	0.08	7/16	176	0.072	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	0.296	2B150.0180

¹⁾ statistical average value

ACCESSORIES

	Dimensions		Art. No.
	d ₁ [in]	[oz]	
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.

2



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 $x = d_2/2 - s - [(l_2 - d_2/2 - y) * 0,123]$

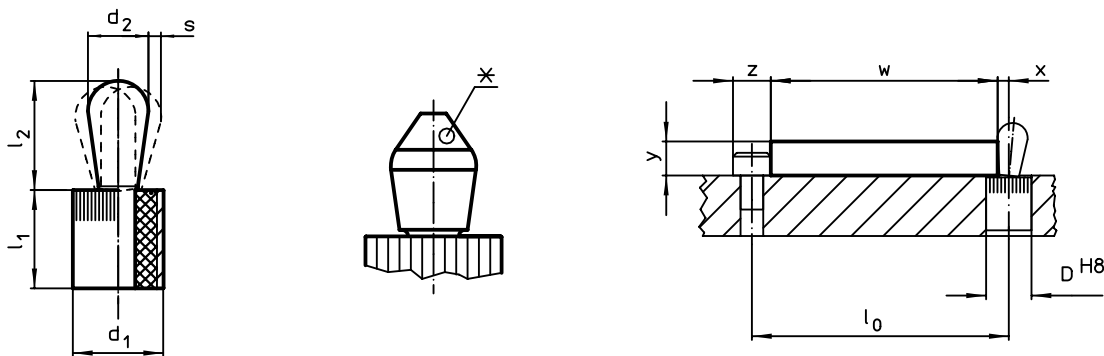
Characteristic

Version light spring load = blue spring

Version standard spring load = red spring

Version heavy spring load = green spring

DRAWING



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

ORDER INFORMATION

Dimensions		Spring load F max. ¹⁾ ~	Dimensions		Stroke s	Location hole D H8	 max.		Art. No.
d ₁	d ₂		l ₁ -0.03	l ₂ ±0.02					
[in]		[lb]	[in]		[in]	[in]	[°F]	[oz]	
pin: steel/light spring load									
1/4	0.118	2.2	0.295	0.145	0.016	0.250	212	0.020	2B150.0210 ²⁾
7/16	0.197	6.7	0.374	0.287	0.032	0.438	212	0.092	2B150.0220
	0.236	4.4	0.374	0.406	0.040	0.438	212	0.120	2B150.0225
pin: steel/standard spring load									
1/4	0.118	4.4	0.295	0.145	0.016	0.250	212	0.020	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	0.120	2B150.0226
1/2	0.315	11.1	0.553	0.515	0.048	0.500	212	0.260	2B150.0230
5/8	0.394	18.0	0.675	0.678	0.062	0.625	212	0.534	2B150.0240
pin: steel/heavy spring load									
7/16	0.197	20.0	0.374	0.287	0.032	0.438	212	0.092	2B150.0222
	0.236	13.5	0.374	0.406	0.040	0.438	212	0.121	2B150.0227
1/2	0.315	22.2	0.553	0.515	0.048	0.500	212	0.262	2B150.0231
5/8	0.394	36.0	0.675	0.678	0.062	0.625	212	0.540	2B150.0241

¹⁾ statistical average value

²⁾ deviating pin shape (see drawing)



Dimensions		Spring load F max. ¹⁾ ~ [lb]	Dimensions		Stroke s [in]	Location hole D H8 [in]	max. [°F]	 [oz]	Art. No.
d ₁	d ₂		l ₁ -0.03	l ₂ ±0.02					
[in]	[in]		[in]	[in]					
pin: stainless steel/light spring load									
1/4	0.118	2.2	0.295	0.145	0.016	0.250	212	0.022	2B150.0310²⁾
7/16	0.197	6.7	0.374	0.287	0.032	0.438	212	0.093	2B150.0320
	0.236	4.4	0.374	0.406	0.040	0.438	212	0.121	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	2B150.0311²⁾
7/16	0.197	13.5	0.374	0.287	0.032	0.438	212	0.093	2B150.0321
	0.236	6.7	0.374	0.406	0.040	0.438	212	0.121	2B150.0326
1/2	0.315	11.1	0.553	0.515	0.048	0.500	212	0.247	2B150.0330
5/8	0.394	18.0	0.675	0.678	0.062	0.625	212	0.543	2B150.0340
pin: stainless steel/heavy spring load									
7/16	0.197	20.0	0.374	0.287	0.032	0.438	212	0.095	2B150.0322
	0.236	13.5	0.374	0.406	0.040	0.438	212	0.122	2B150.0327
1/2	0.315	22.2	0.553	0.515	0.048	0.500	212	0.263	2B150.0331
5/8	0.394	36.0	0.675	0.678	0.062	0.625	212	0.546	2B150.0341
pin: thermoplastic/light spring load									
1/4	0.118	2.2	0.295	0.145	0.016	0.250	176	0.013	2B150.0410²⁾
7/16	0.197	6.7	0.374	0.287	0.032	0.438	176	0.054	2B150.0420
	0.236	4.4	0.374	0.406	0.040	0.438	176	0.058	2B150.0425
pin: thermoplastic/standard spring load									
1/4	0.118	4.4	0.295	0.145	0.016	0.250	176	0.012	2B150.0411²⁾
7/16	0.197	13.5	0.374	0.287	0.032	0.438	176	0.052	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	0.104	2B150.0430
5/8	0.394	18.0	0.675	0.678	0.062	0.625	176	0.196	2B150.0440
pin: thermoplastic/heavy spring load									
7/16	0.197	20.0	0.374	0.287	0.032	0.438	176	0.054	2B150.0422
	0.236	13.5	0.374	0.406	0.040	0.438	176	0.058	2B150.0427
1/2	0.315	22.2	0.553	0.515	0.048	0.500	176	0.106	2B150.0431
5/8	0.394	36.0	0.675	0.678	0.062	0.625	176	0.200	2B150.0441

¹⁾ statistical average value

²⁾ deviating pin shape (see drawing)

ACCESSORIES

	Dimensions		Art. No.
	d ₁ [in]	[oz]	
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:

$$x = d_z/2 - s$$

Installation by pressing in.

Characteristic

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

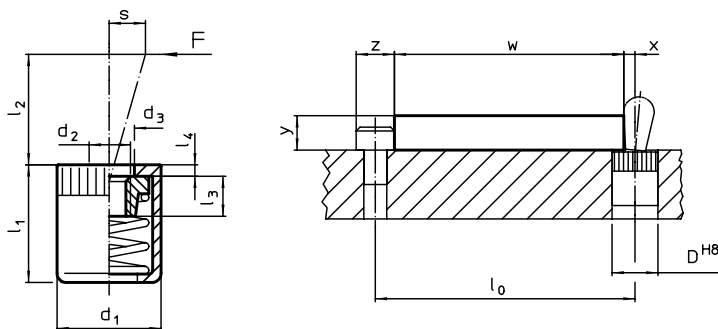
Notes

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

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth - INCH → p. 182

DRAWING



ORDER INFORMATION

Dimensions		Spring load $F_{\max.}^{1)}$ [lb]	Dimensions					Stroke s [in]	Location hole D_{H8} [in]	max. [°F]	[oz]	Art. No.
d_1	d_2		d_3 +0.008	l_1 -0.08	l_2	l_3	l_4					
[in]	[in]				[in]							
light spring load												
7/16	#8-32	4.5	0.248	0.433	0.1000	0.177	0.047	0.063	7/16	482	0.081	2B150.1020
		9.0	0.248	0.433	0.2950	0.177	0.047	0.079	7/16	482	0.081	2B150.1025
5/8	1/4-20	22.5	0.409	0.669	0.4530	0.295	0.067	0.126	5/8	482	0.369	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	0.088	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	0.319	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	0.095	2B150.1022
		34.0	0.248	0.433	0.2950	0.177	0.047	0.079	7/16	482	0.100	2B150.1027
5/8	1/4-20	45.0	0.409	0.669	0.4563	0.295	0.067	0.126	5/8	482	0.342	2B150.1042

¹⁾ statistical average value

ACCESSORIES

Dimensions		Art. No.
d_1	[oz]	
[in]		
assembly tool		
	7/16	22150.0831
	5/8	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

Version light spring load = spring from stainless steel

Version standard spring load = spring from steel, blackened

Version heavy spring load = spring from steel, zinc-plated by galvanization

MORE INFORMATION

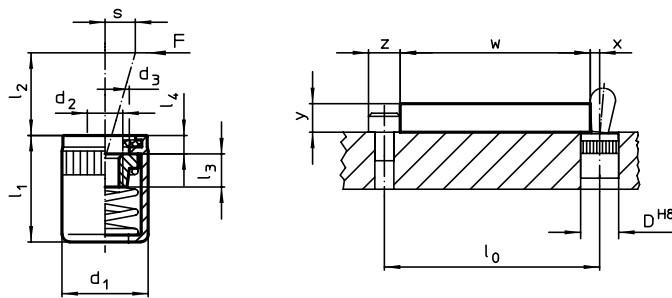
Notes

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

Further products

Eccentric Mounting Bushings, for lateral plungers, smooth - INCH. → p. 182

DRAWING



ORDER INFORMATION

Dimensions		Spring load F max. ¹⁾ ~	d ₃ +0.008 -0.08	Dimensions				Stroke s	Location hole D H8	max. °F	oz	Art. No.
d ₁	d ₂			l ₁	l ₂	l ₃	l ₄					
[in]		[lb]	[mm]		[in]			[in]	[in]	[°F]	[oz]	
light spring load												
7/16	#8-32	4.5	0.248	0.430	0.100	0.177	0.063	0.063	7/16	230	0.083	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	0.368	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	0.090	2B150.1121
		16.9	0.248	0.430	0.295	0.177	0.063	0.079	7/16	230	0.094	2B150.1126
5/8	1/4-20	34.0	0.401	0.709	0.453	0.295	0.079	0.126	5/8	230	0.312	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	0.334	2B150.1142

¹⁾ statistical average value

ACCESSORIES

Dimensions		Art. No.
d ₁	[oz]	
[in]		
assembly tool		
	7/16	22150.0831
	5/8	22150.0833

Eccentric Mounting Bushings • for lateral plungers, smooth - INCH

EH 2B150.



PRODUCT DESCRIPTION

The eccentric is used in conjunction with smooth lateral plungers EH 2B150. for positioning or clamping workpieces with large tolerances.

Material

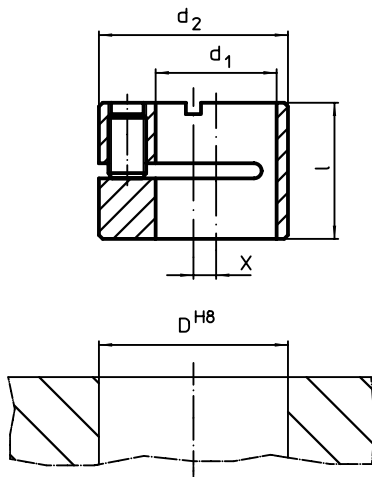
Body

- Steel, blackened

Assembly

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

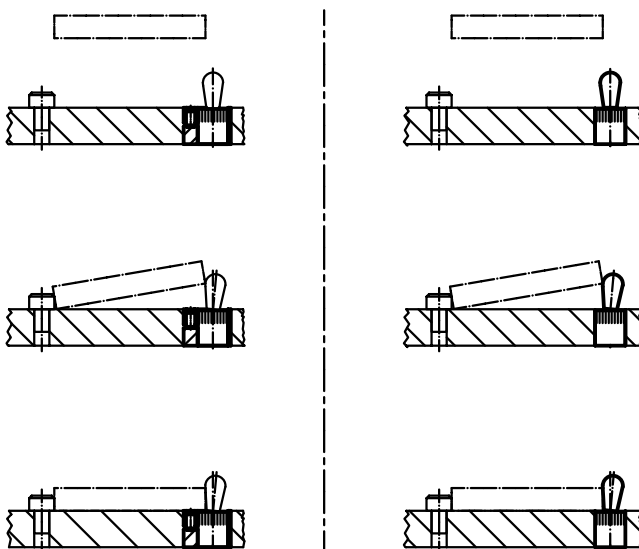
DRAWING



ORDER INFORMATION

d ₁ H8	Dimensions			Location hole D H8		Art. No.
	d ₂ h9	l	x			
		[in]		[in]	[oz]	
1/4	1/2	0.390	0.079	1/2	0.211	2B150.0806
7/16	11/16	0.469	0.079	11/16	0.378	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

APPLICATION EXAMPLE



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



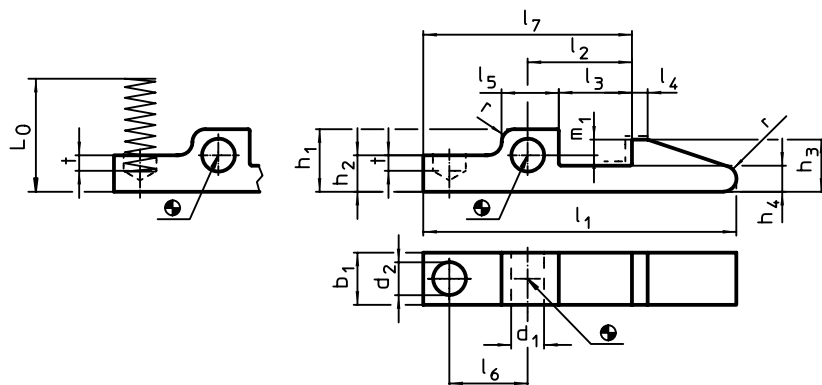
PRODUCT DESCRIPTION

The catches with spring, manufactured according to DIN 6310, are used as locking elements, for example.

Material

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

DRAWING

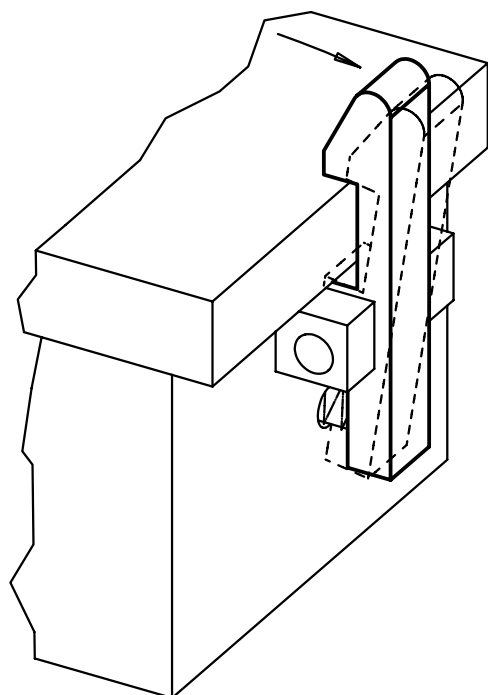


Hardened where shown by ___ line.

ORDER INFORMATION

I ₁	b ₁ -0.2	d ₁ E9	d ₂	h ₁	h ₂	h ₃	h ₄	Dimensions										Spring rate R ~ [N/mm]		Art. No.
								I ₂ ±0.1	I ₃	I ₄	I ₅	I ₆	I ₇	m ₁	t	r	L ₀ ~			
								[mm]												
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	35	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.

2

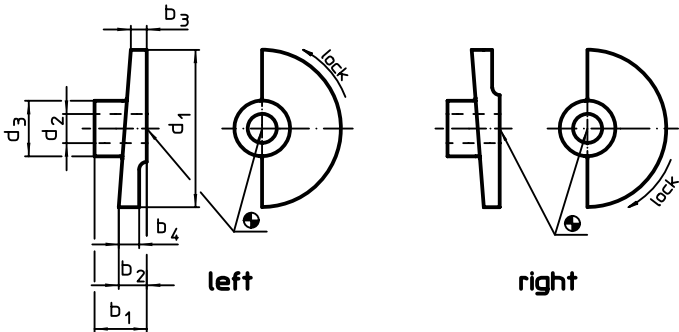


PRODUCT DESCRIPTION

Material
■ Sintered steel

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

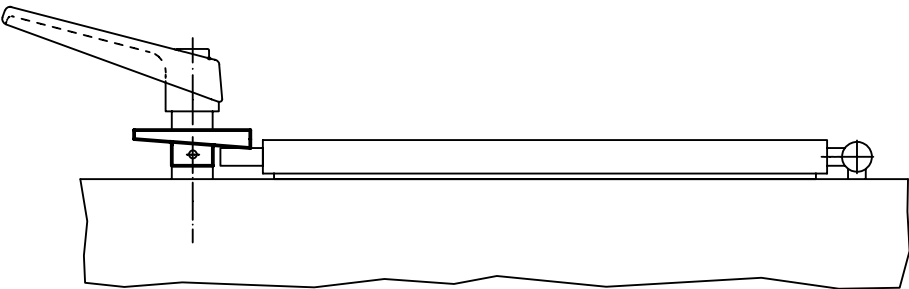
DRAWING



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



Clamping Catches

EH 22260.

2



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

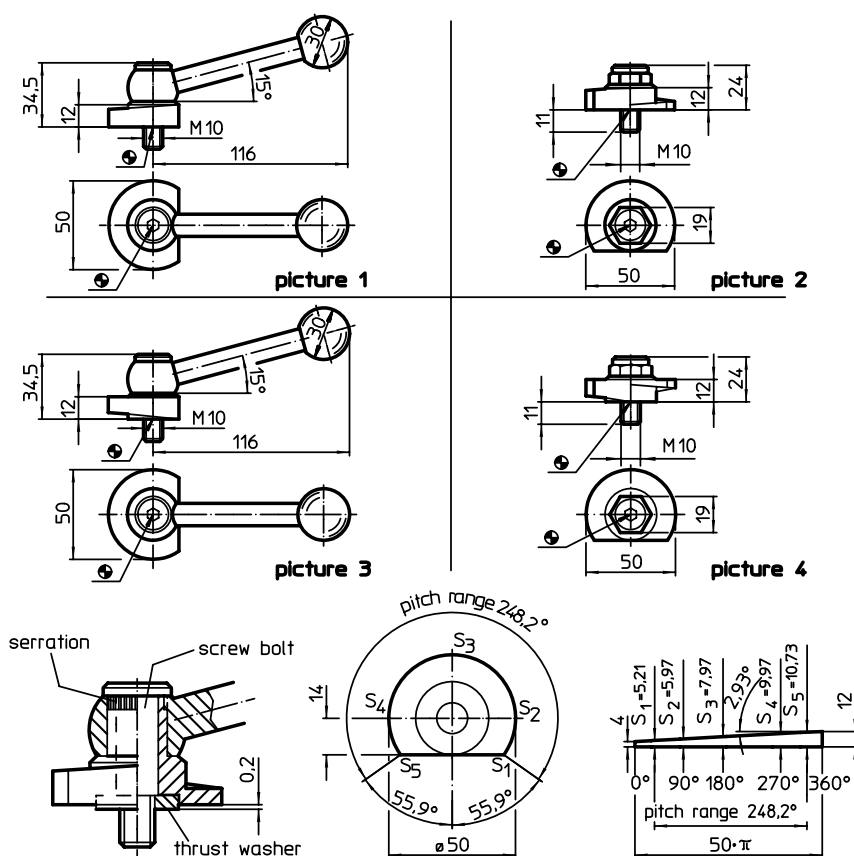
The screw bolt and the washer are adjustable. Once screwed in, the clamping catch can easily be turned to the desired position. For Art. No. 22260.0250 / .0251 and 22260.0450 / .0451, the serration helps to put the tension lever to the preferred position.

MORE INFORMATION

Notes

Left turn type can be supplied on request.

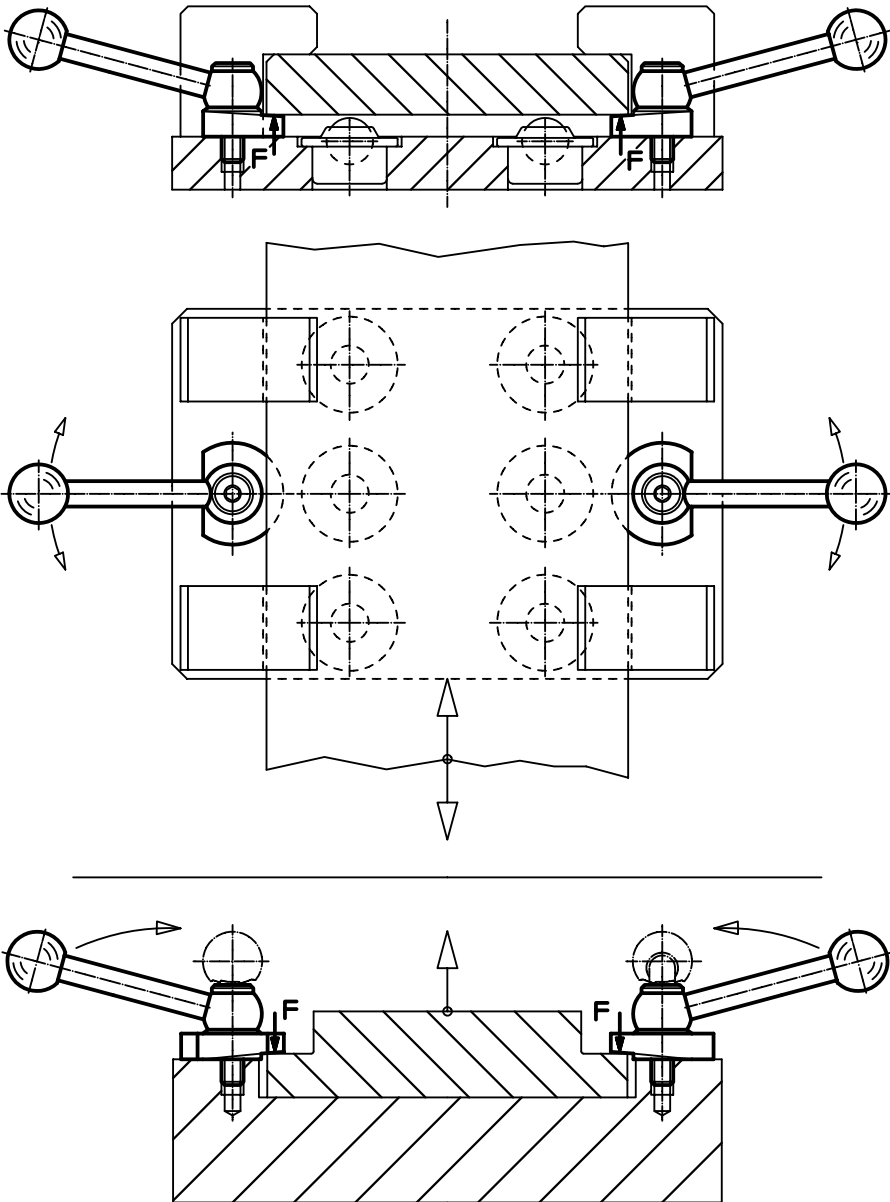
DRAWING



ORDER INFORMATION

Tightening torque max. [Nm]	 [g]	Art. No.	
		Steel	Stainless steel
with adjustable tension 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
with adjustable tension lever, pitch on bearing surface – picture 3			
40	312	22260.0450	22260.0451
with clamping screw, pitch on bearing surface – picture 4			
40	154	22260.0550	22260.0551

APPLICATION EXAMPLE



Shaft-End Washers

EH 22270.



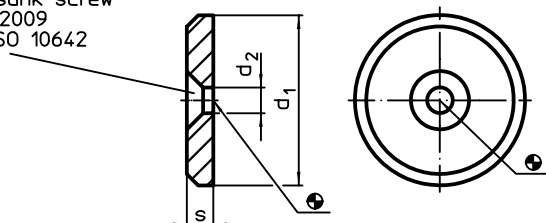
PRODUCT DESCRIPTION

Material

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

DRAWING

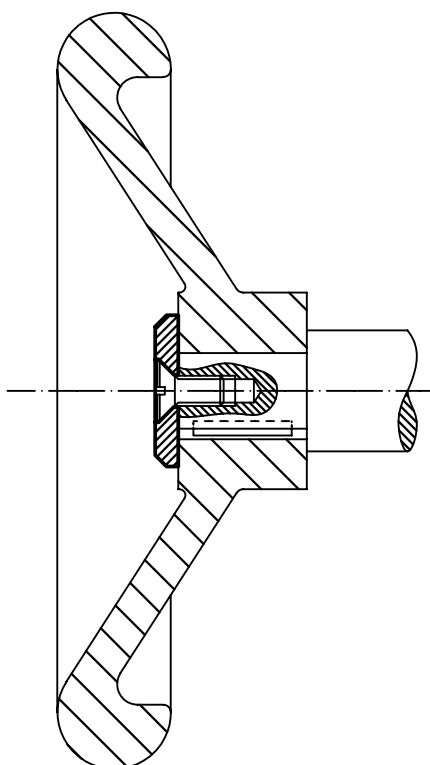
for countersunk screw
DIN EN ISO 2009
or DIN EN ISO 10642



ORDER INFORMATION

d ₁	Dimensions			Art. No.	
	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	66.0	22270.0045	22270.0145
52	6.6	6.0	91.0	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

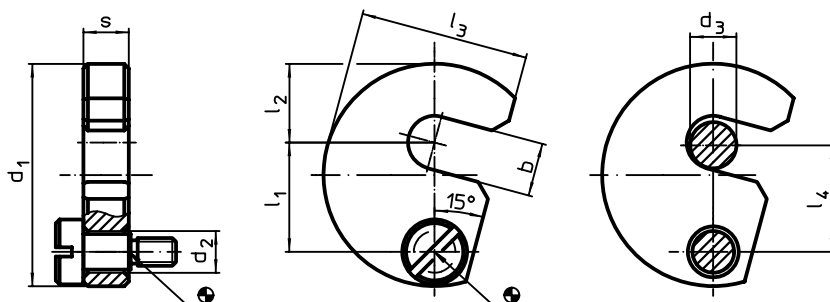
Captive C-Washer

- 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.

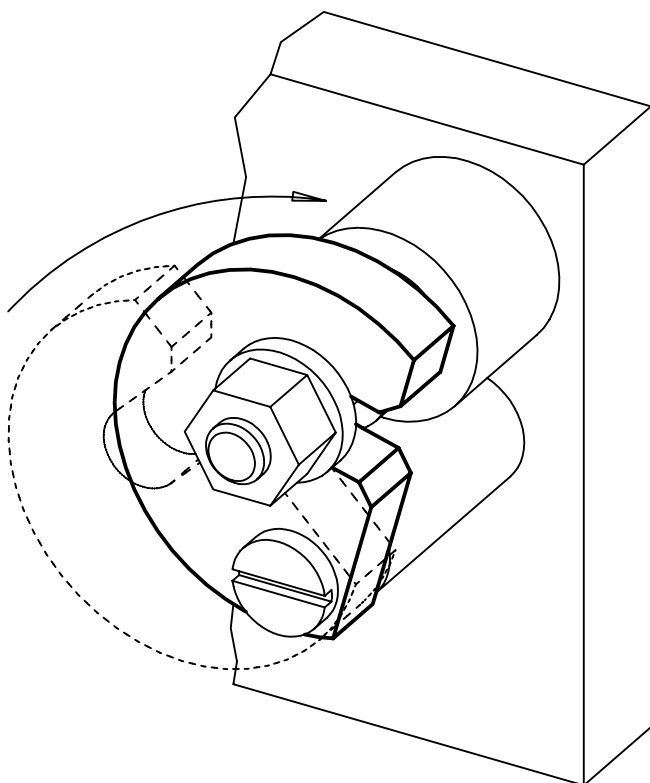
DRAWING



ORDER INFORMATION

Nominal size d_3 [mm]	b	d_1	d_2	Dimensions					Suitable screw [mm]	 [g]	Art. No.
				l_1	l_2	l_3	l_4	s -0.2			
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	192	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



C-Washers • DIN 6372
EH 22290.



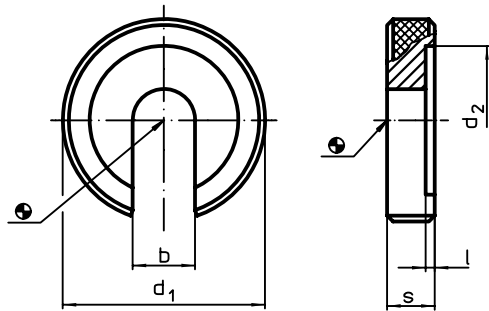
PRODUCT DESCRIPTION

The c-washers (slotted washers) are manufactured according to DIN 6372. For better handling, the c-washers have a knurling all around.

Material

- Heat-treated steel, tempered, blackened

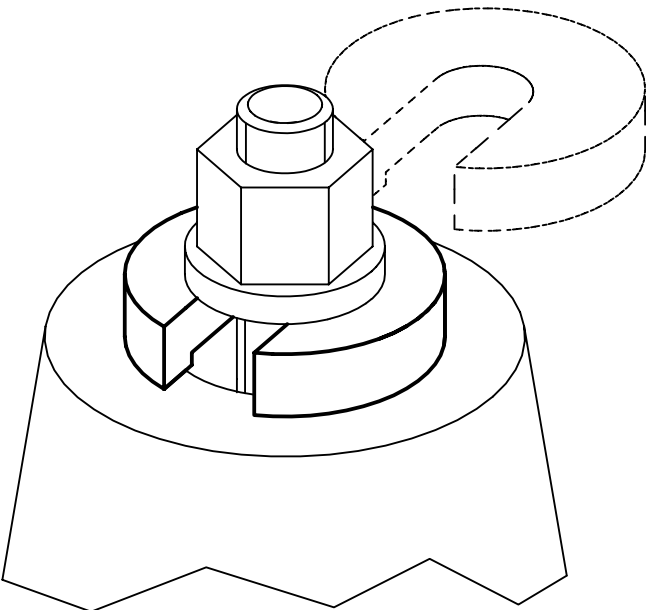
DRAWING



ORDER INFORMATION

Nominal size	Dimensions						Art. No.
	b	d ₁	d ₂	l	s		
[mm]			[mm]			[g]	
6	6.4	22	16	0.8	6	13	22290.0006
8	8.4	28	21	1.0	7	24	22290.0008
10	10.5	34	25	1.2	8	38	22290.0010
12	13.0	40	30	1.8	9	57	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 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 button.

MORE INFORMATION

Notes

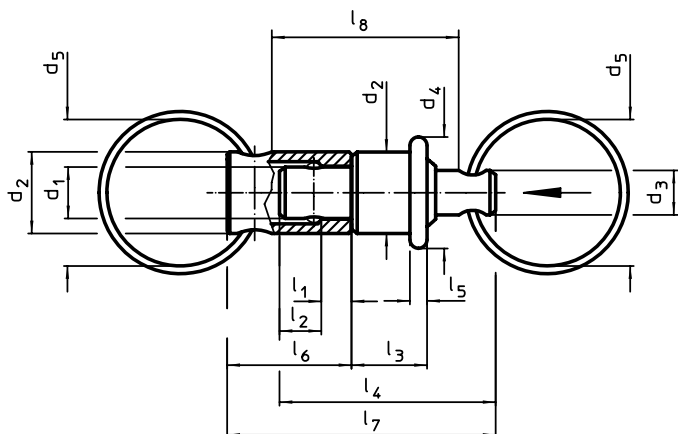
Pin and bushing separately on request.

Further products

Ball Lock Connectors, self-locking, with holder. → p. 191

Ball Lock Connectors, self-locking, with holder, compact construction. → p. 193

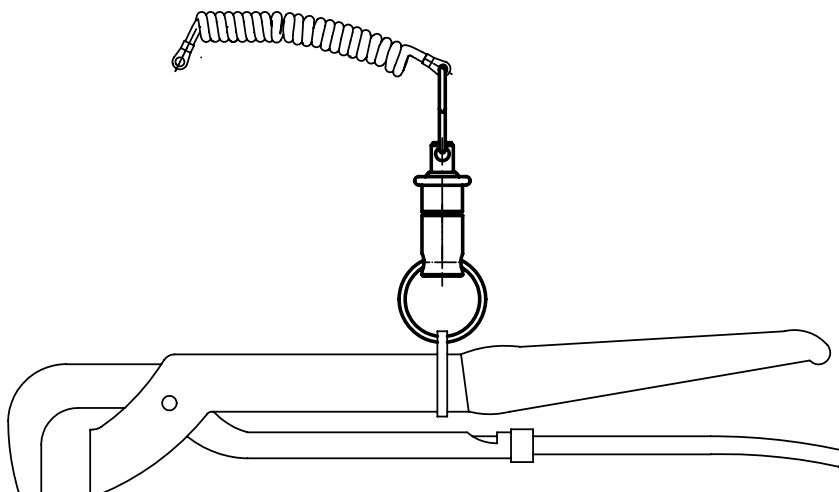
DRAWING



ORDER INFORMATION

Dimensions													Load capacity max.	max.		Art. No.
d_1	d_2	d_3	d_4	d_5	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	[N]	[°C]	[g]	
-0.03 -0.06				~	+0.6	± 1		~			~	~	30	250	14	22340.0905
6	9.5	6.2	13	20	3.2	4.8	8.8	25.2	2.4	14.5	31.5	26.2				

APPLICATION EXAMPLE



Ball Lock Connectors • self-locking, with holder

EH 22330.

2



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 three versions available - mounting in wood (picture 2 and picture 4), one version that can be mounted in plastic (picture 3) and with holding (picture 5 and picture 6). In the bushings (picture 2, picture 3 and picture 5) the ball lock connector is lockable (4x90°). In the bushings (picture 4 and picture 6) the ball lock connector is rotatable.

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

Holder

- Stainless steel

Bushing

- 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 to instructions
 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 button.

Characteristic

Marking groove if dimension = 1,5 mm for l_1 (bushings - pictures 2, 3 and 4) or l_2 (ball lock connector - picture 1).

MORE INFORMATION

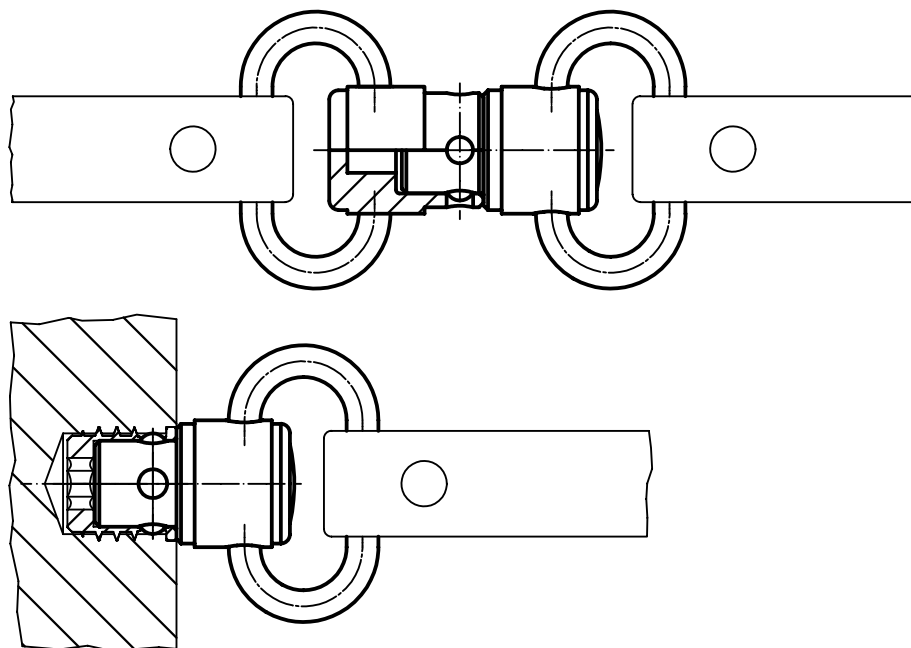
Notes

Special types on request.

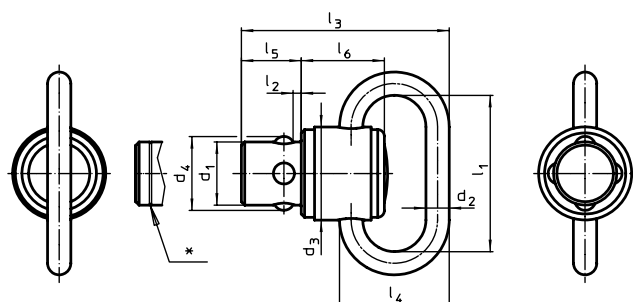
Further products

Ball Lock Connectors, self-locking, with holding rings → p. 190
 Ball Lock Connectors, self-locking, with holder, compact construction. → p. 193

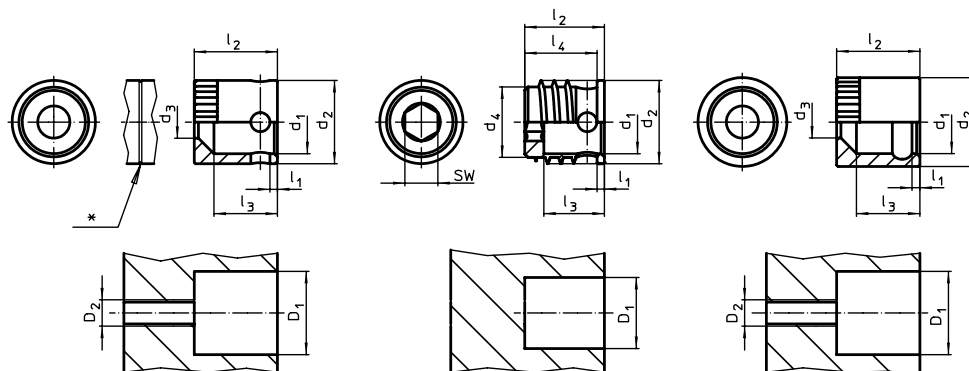
APPLICATION EXAMPLE



DRAWING



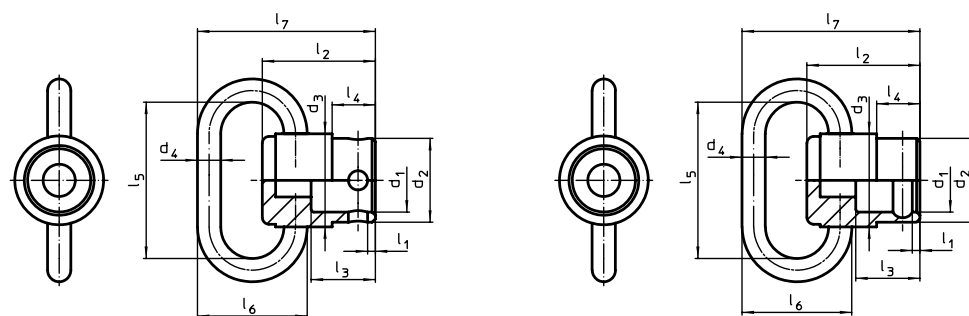
picture 1



picture 2

picture 3

picture 4



picture 5

picture 6

* Marking if dimension = 1,5 mm for l_1 (pictures 2,3 and 4) or l_2 (picture 1).

ORDER INFORMATION

Nominal diameter d ₁	Dimensions										WS	Load capac- ity max.	Location hole D ₁				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]
ball lock connectors – picture 1																		
9.5	23.0	1.00	3.50	14.0	11.1	31.30	16.5	9	12.5	–	–	1.2	–	-50	150	22.0	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	30.0	22330.0120	
		1.50	4.50	14.0	11.1	36.60	23.0	9	12.5	–	–	2.0	–	-50	150	28.0	22330.0121	
bushing, mounting in wood, lockable – picture 2																		
9.6	1.0	12.65	12.65	4.9	–	9.65	–	–	–	–	–	–	12.7	-50	150	5.8	22330.0305	
	1.5	12.65	12.65	4.9	–	9.65	–	–	–	–	–	–	12.7	-50	150	5.5	22330.0306	
bushing, mounting in plastic, lockable – picture 3																		
9.6	1.0	12.10	12.65	–	10.7	9.20	11.0	–	–	–	5	–	11.1 ¹⁾	-50	150	3.3	22330.0310	
	1.5	12.10	12.65	–	10.7	9.20	11.0	–	–	–	5	–	11.1 ¹⁾	-50	150	3.0	22330.0311	
bushing, mounting in wood, rotatable – picture 4																		
9.6	1.0	12.65	13.50	4.9	–	9.65	–	–	–	–	–	–	13.5	-50	150	7.3	22330.0315	
	1.5	12.65	13.50	4.9	–	9.65	–	–	–	–	–	–	13.5	-50	150	8.5	22330.0316	
flexible mount, lockable – picture 5																		
9.6	1.0	17.00	12.60	14.0	3.5	9.60	6.5	23	16.5	26.8	–	1.2	–	-50	150	16.0	22330.1215	
flexible mount, rotatable – picture 6																		
9.6	1.0	17.00	12.60	14.0	3.5	9.60	6.5	23	16.5	26.8	–	1.2	–	-50	150	15.0	22330.1315	

¹⁾ depending on the hardness of the plastic

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

EH 22330.

2



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 three versions available - mounting in wood (picture 2 and picture 4), one version that can be mounted in plastic (picture 3) and with holding (picture 5 and picture 6). In the bushings (picture 2, picture 3 and picture 5) the ball lock connector is lockable (4x90°). In the bushings (picture 4 and picture 6) the ball lock connector is rotatable.

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

Holder

- Stainless steel

Bushing

- 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 to instructions
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 button.

MORE INFORMATION

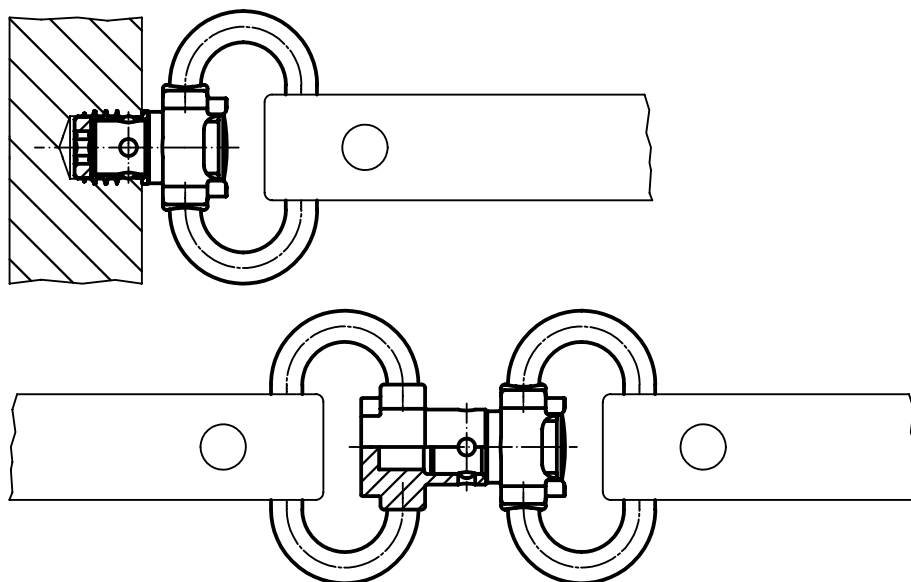
Notes

Special types on request.

Further products

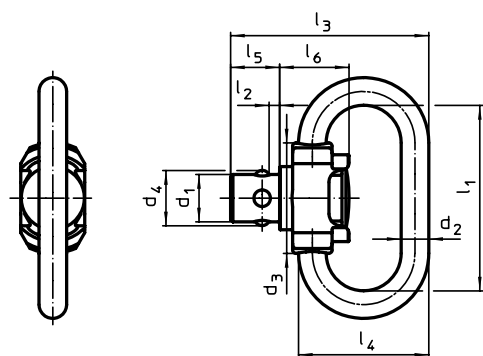
Ball Lock Connectors, self-locking, with holding rings → p. 190
 Ball Lock Connectors, self-locking, with holder. → p. 191

APPLICATION EXAMPLE

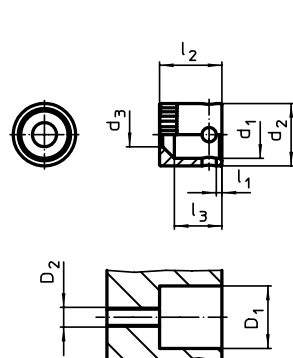


DRAWING

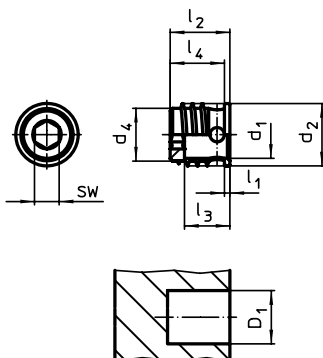
2



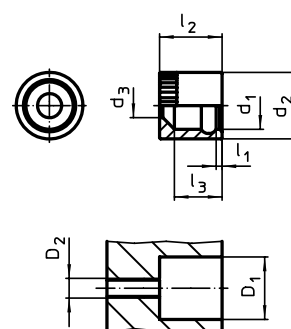
picture 1



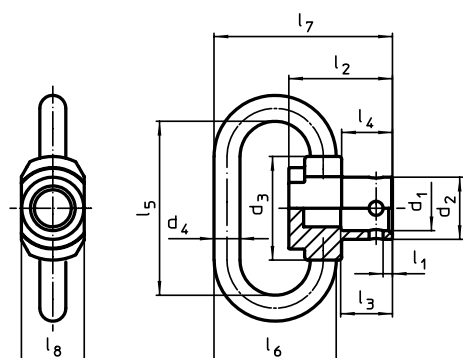
picture 2



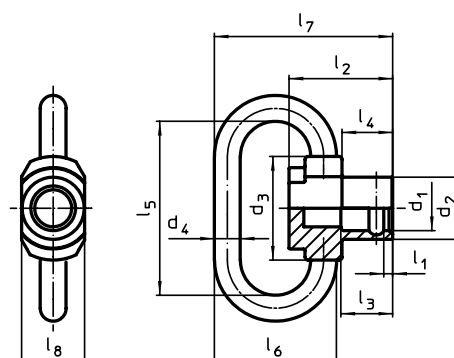
picture 3



picture 4



picture 5



picture 6

ORDER INFORMATION

Nominal diameter d ₁	Dimensions												WS	Load capac- ity max.	Location hole D ₁				Art. No.
	l ₁	l ₂	d ₂	d ₃	d ₄	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	min.				max.			
																	[mm]		
ball lock connectors – picture 1																			
6.0	23	1	3.50	14.0	6.9	25.1	16.5	6.2	8.8	8.1	–	–	1.5	–	-50	150	9.8	22330.0402	
bushing, mounting in wood, lockable – picture 2																			
6.1	1	9	8.15	3.1	–	7.0	–	–	–	–	–	–	–	8.3	-50	150	1.6	22330.0405	
bushing, mounting in plastic, lockable – picture 3																			
6.1	1	9	10.00	–	8.2	6.5	8.2	–	–	–	–	4	–	8.3 ¹⁾	-50	150	3.6	22330.0407	
bushing, mounting in wood, rotatable – picture 4																			
6.1	1	9	9.15	3.1	–	7.0	–	–	–	–	–	–	–	9.1	-50	150	2.4	22330.0409	
flexible mount, lockable – picture 5																			
6.1	1	14	8.40	14.0	3.5	7.0	6.8	23.0	16.5	24.1	8.5	–	1.5	–	-50	150	13.0	22330.1405	
flexible mount, rotatable – picture 6																			
6.1	1	14	8.40	14.0	3.5	7.0	6.8	23.0	16.5	24.1	8.5	–	1.5	–	-50	150	10.0	22330.1409	

¹⁾ depending on the hardness of the plastic

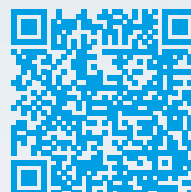
SELF-LOCKING LIFTING PINS

READY TO SUPPORT ANY LOAD

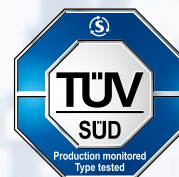
LIFTING CAPACITY OF UP TO 1,000 KG

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/
LiftingDevices](http://www.halder.com/LiftingDevices)



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.

Mounting:

- Press in the button and hold it down
- Insert the lifting pin
- Release the button (The button must be back in its original position)

Dismantling:

- Press in the button and hold it down.
- Remove the lifting pin.
- Release the button.

Operation

Each lifting pin contains an instruction manual with an EC Declaration of Conformity.

MORE INFORMATION

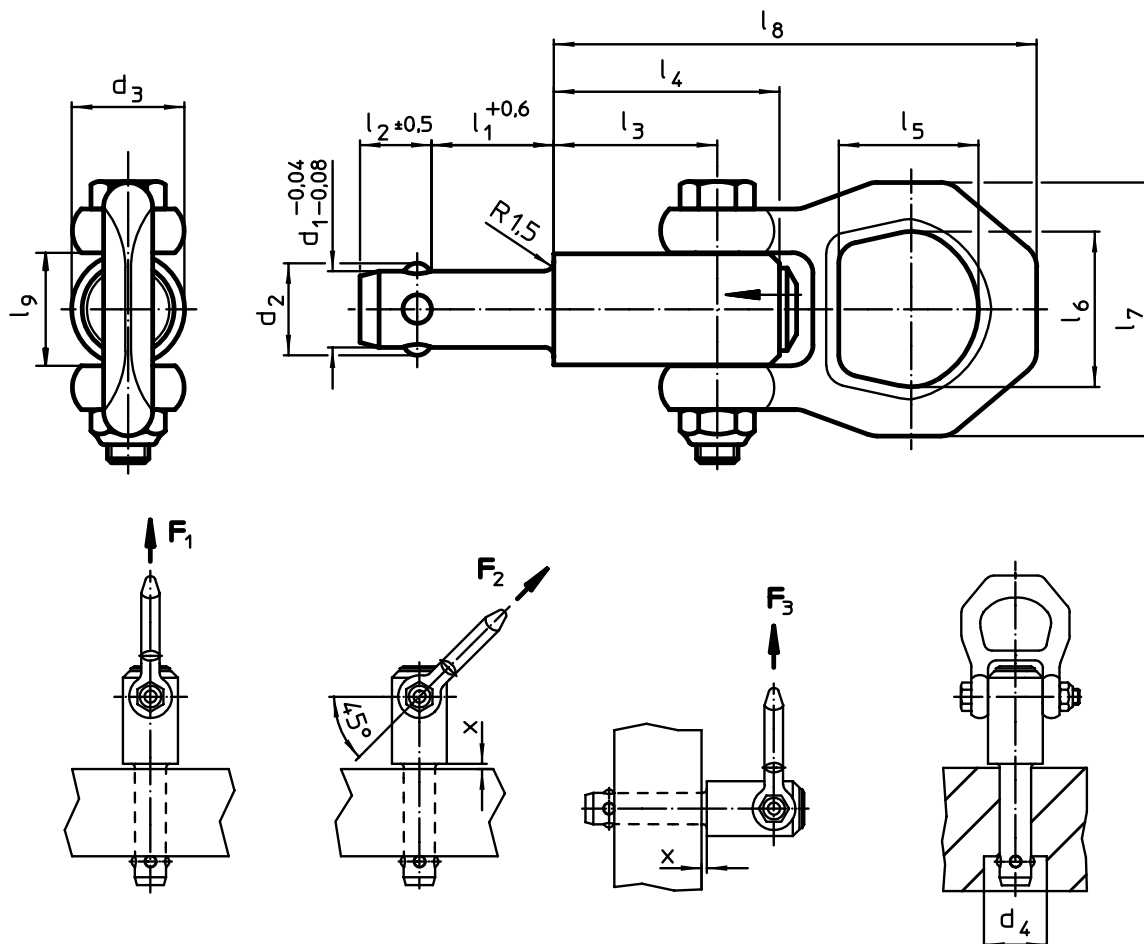
Accessories

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. 198
Locating Bushings, for lifting pins	→ p. 200
Locating Bushings, plain, for lifting pins	→ p. 201
Locating Bushings with Seal, plain, for lifting pins	→ p. 203
Threaded Lifting Pins, self-locking	→ p. 207
Threaded Lifting Pins, self-locking, for centre holes according to DIN 332	→ p. 209
Threaded Lifting Pins, self-locking, with rotatable shackle	→ p. 211
Threaded Lifting Pins, self-locking - INCH	→ p. 213
Threaded Lifting Pins, self-locking, with rotatable shackle - INCH	→ p. 215

DRAWING

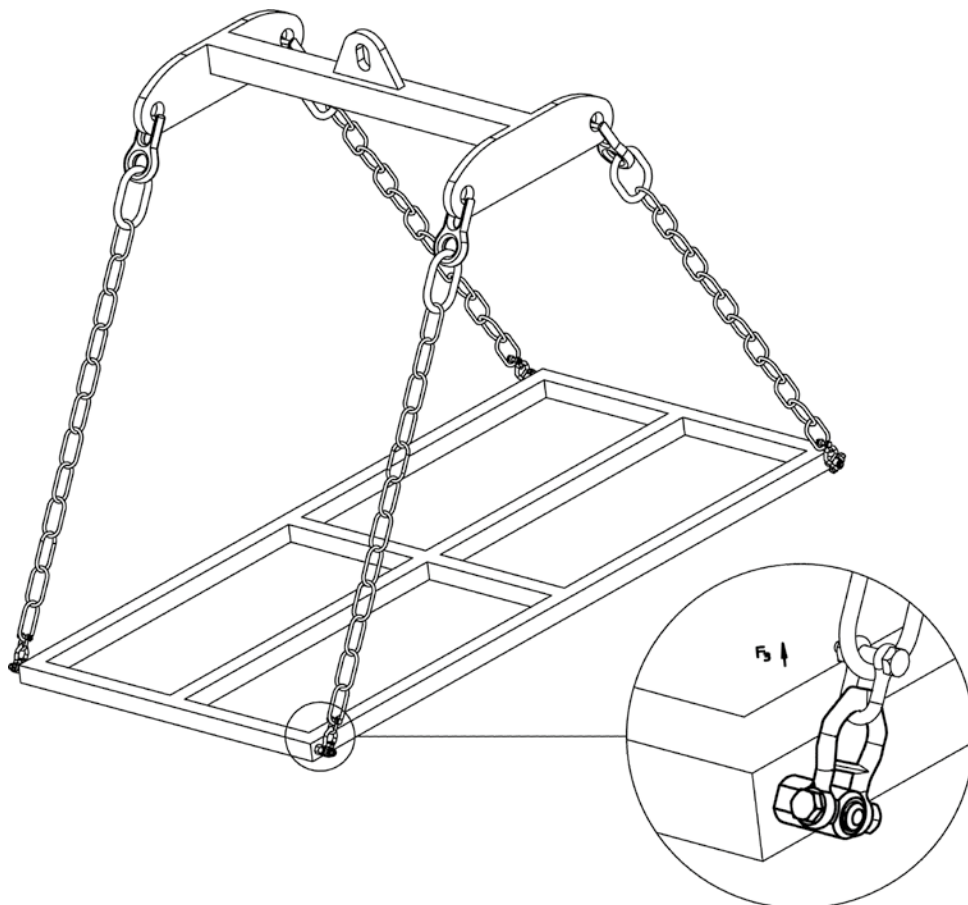


ORDER INFORMATION

d ₁ -0.04 -0.08	l ₁ +0.6	Dimensions											Load capacity ¹⁾			x		Location hole H11	 max.		Art. No.
		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]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kN]	[kN]	[kN]	[mm]	[mm]				
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	266	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	269	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	270	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	278	22350.0606
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	266	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	266	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	273	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	235	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	277	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	277	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	299	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	291	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	282	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	289	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	299	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	309	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	302	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	360	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	391	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	385	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	424	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	467	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	709	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	776	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.

Mounting:

- Press in the button and hold it down
- Insert the lifting pin
- Release the button (The button must be back in its original position)

Dismantling:

- Press in the button and hold it down.
- Remove the lifting pin.
- Release the button.

Operation

Each lifting pin contains an instruction manual with an EC Declaration of Conformity.

MORE INFORMATION

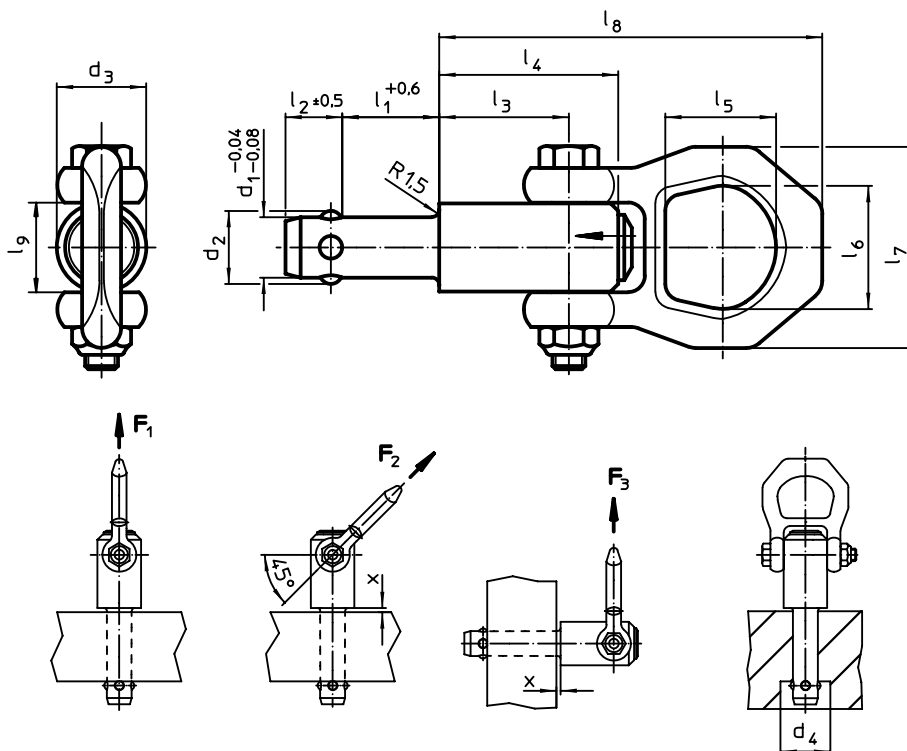
Accessories

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

Further products

- Lifting Pins, self-locking. → p. 196
- Locating Bushings, for lifting pins → p. 200
- Locating Bushings, plain, for lifting pins → p. 201
- Locating Bushings with Seal, plain, for lifting pins. → p. 203
- Threaded Lifting Pins, self-locking. → p. 207
- Threaded Lifting Pins, self-locking, for centre holes according to DIN 332 → p. 209
- Threaded Lifting Pins, self-locking, with rotatable shackle. → p. 211
- Threaded Lifting Pins, self-locking - INCH → p. 213
- Threaded Lifting Pins, self-locking, with rotatable shackle - INCH → p. 215

DRAWING

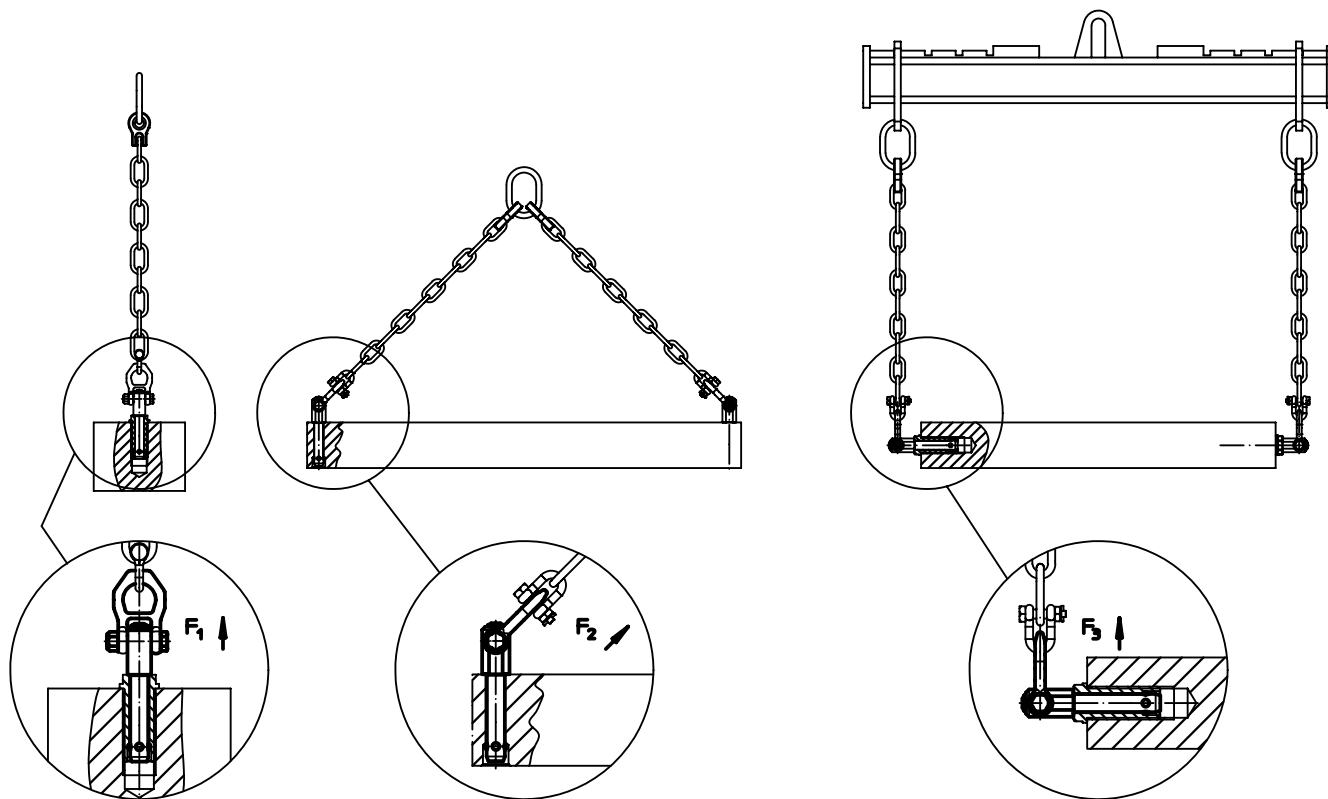


ORDER INFORMATION

Dimensions													Load capacity ¹⁾			x		Location hole H11			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.		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	270	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	273	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	275	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	280	22350.0706
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	228	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	229	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	233	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	238	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	277	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	281	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	292	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	298	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	285	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	292	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	304	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	316	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	260	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	290	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	323	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	395	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	430	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	465	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	729	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	693	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

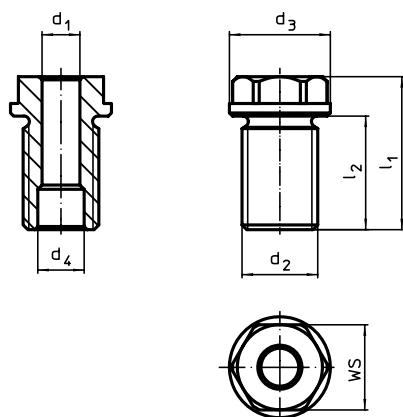
Can be mounted in blind holes.

For thin-walled parts, lock nuts are used for assembly.

Assembly

Safe tolerances and consistent function.

DRAWING

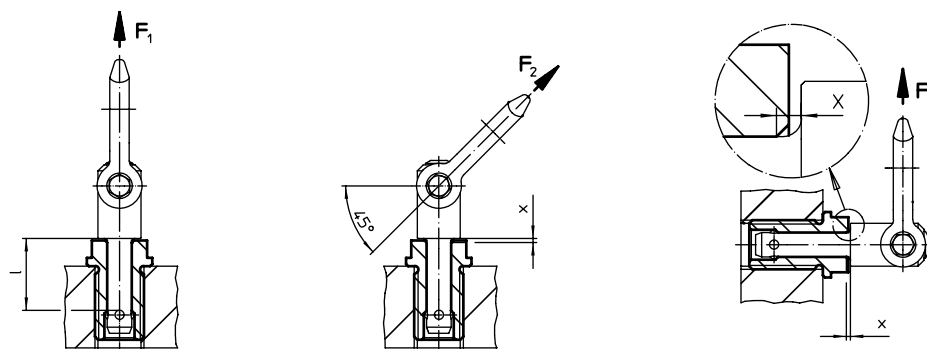


ORDER INFORMATION

d ₁ H11	Dimensions	For nominal length	Dimensions				WS	Tightening torque max.	x ¹⁾	Load capacity ¹⁾			For lifting pin		Art. No.
	d ₂		d ₃ -0.2	d ₄ +0.3	l ₁	l ₂				F ₁	F ₂	F ₃			
	[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	34	22350.0900
		15	24	9.8	27.5	20	19	90	1.5	1.5	1.2	0.5	22350.0602 / .0702	34	22350.0902
	M16	25	24	9.8	37.5	25	19	75	1.5	1.5	1.2	0.5	22350.0604 / .0704	47	22350.0904
		35	24	9.8	47.5	35	19	75	1.5	1.5	1.2	0.5	22350.0606 / .0706	57	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	71	22350.0910
		25	28	12.2	35.5	24	24	145	1.5	2.7	2.4	2.1	22350.0623 / .0723	74	22350.0912
	M20	35	28	12.2	46.0	29	24	130	1.5	2.7	2.4	2.1	22350.0625 / .0725	94	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	95	22350.0920
		25	32	14.7	36.5	24	27	220	1.5	3.5	3.2	2.8	22350.0633 / .0733	103	22350.0922
	M24	35	32	14.7	48.5	36	27	200	1.5	3.5	3.2	2.8	22350.0635 / .0735	120	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	164	22350.0930
		50	39	19.2	66.0	44	30	400	1.5	4.8	4.5	4.1	22350.0643 / .0743	238	22350.0934
	M30	75	39	19.2	96.0	74	30	400	1.5	4.8	4.5	4.1	22350.0645 / .0745	325	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	353	22350.0954
		75	43	26.0	95.0	80	36	440	1.5	10.0	8.5	6.5	22350.0675 / .0775	470	22350.0956

¹⁾ for a 5-fold safety against breakage

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

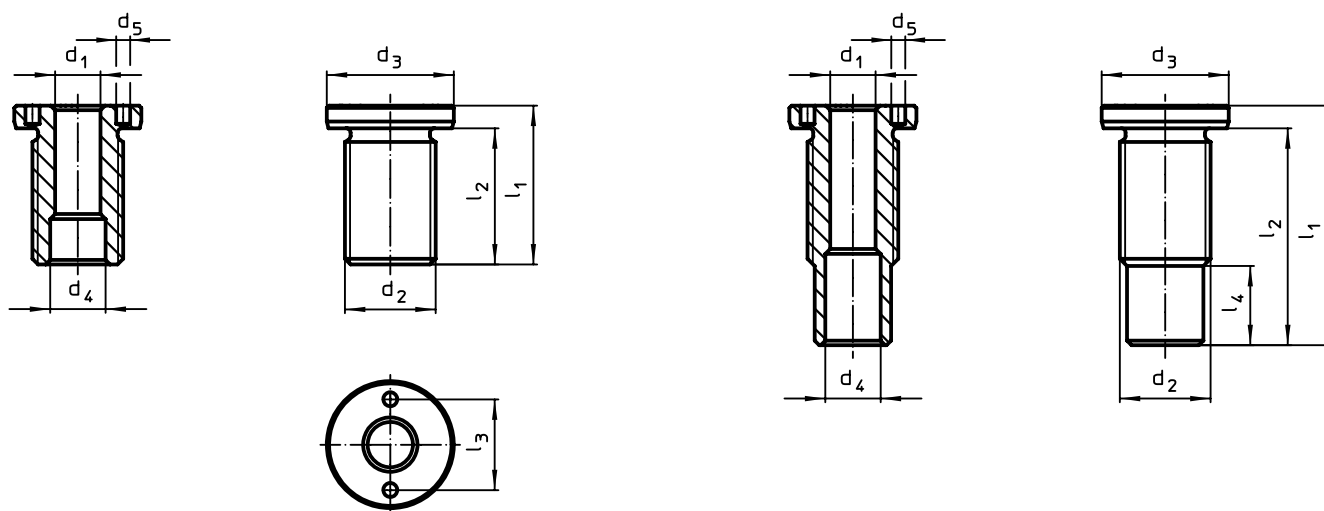
Safe tolerances and consistent function.

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

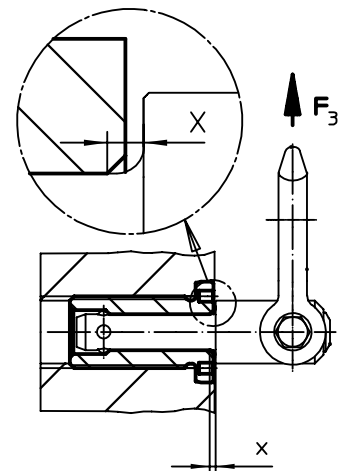
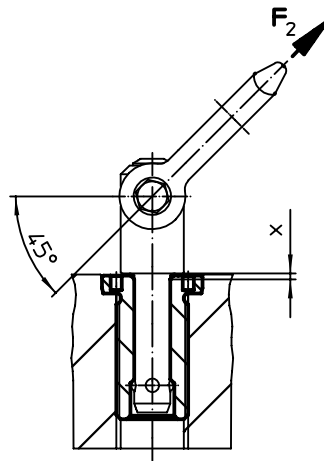
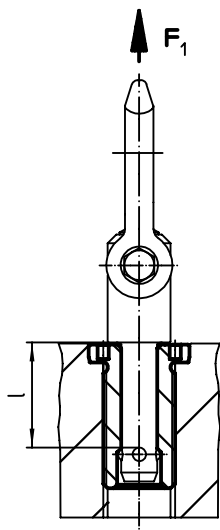
d ₁ H11	Dimensions	For nominal length	Dimensions								Tight- ening torque max.	x ¹⁾	Load capacity ¹⁾			For lifting pin		Art. No.
	d ₂		d ₃ -0.2	d ₄ +0.3	d ₅ +0.1	l ₁	l ₂	l ₃	l ₄	F ₁			F ₂	F ₃				
	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kN]			[kN]	[kN]	[g]			
8	M16 x 1,5	10	24	9.8	3.1	25	20	16	–	75	1.5	1.5	1.2	0.5	22350.0601 / .0701	31	22350.1900	
		15	24	9.8	3.1	25	20	16	–	75	1.5	1.5	1.2	0.5	22350.0602 / .0702	32	22350.1902	
	M16	25	24	9.8	3.1	35	30	16	–	75	1.5	1.5	1.2	0.5	22350.0604 / .0704	41	22350.1904	
		35	24	9.8	3.1	45	40	16	–	75	1.5	1.5	1.2	0.5	22350.0606 / .0706	49	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	55	22350.1910	
		25	28	12.2	5.1	35	29	20	–	100	1.5	2.7	2.4	2.1	22350.0623 / .0723	64	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	93	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	80	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	116	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	130	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	201	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	248	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	341	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	413	22350.1956	

¹⁾ for a 5-fold safety against breakage

ACCESSORIES

	Suitable for size d_1 [mm]	Pin spacing ± 0.1 [mm]	Pin diameter -0.1 [mm]	Square drive [in]	 [g]	Art. No.
adjustable face wrench, offset						
	8	–	3		121	22350.1990
	10/12/16/20/25	–	5		309	22350.1991
face and socket wrench						
	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

Bushings

- Stainless steel 1.4542, precipitation-hardened

O-ring

- NBR

Spring

- Stainless steel

Assembly

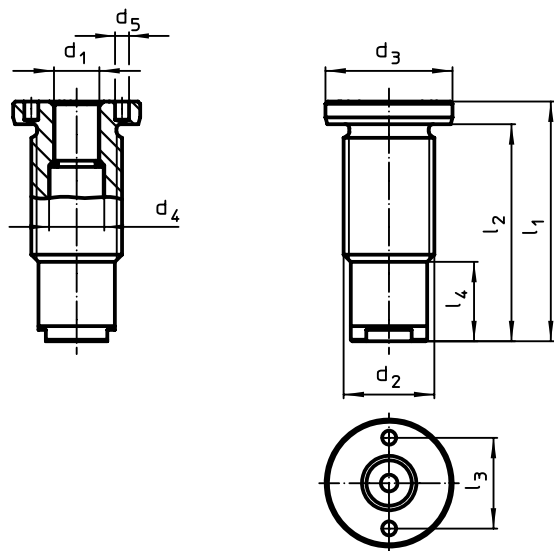
Safe tolerances and consistent function.

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

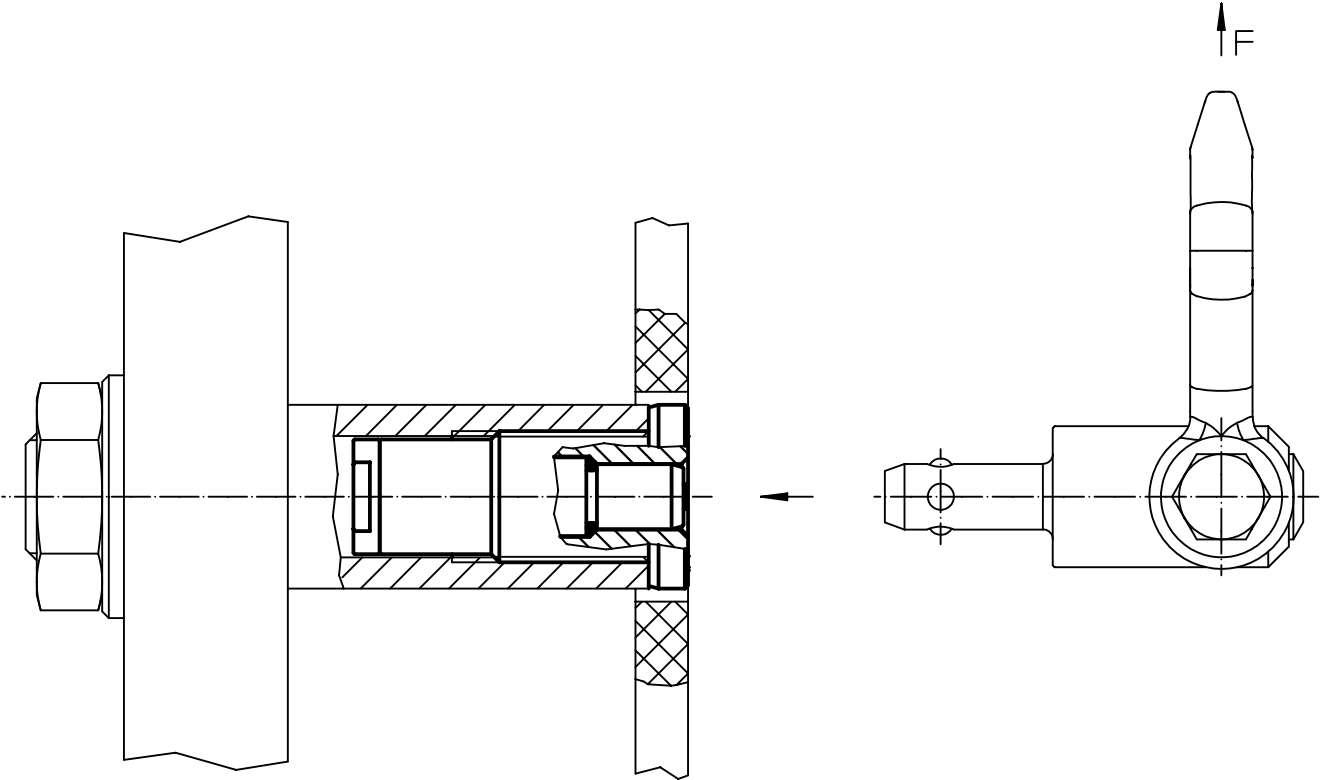
d ₁ H11	Dimensions	For nominal length	Dimensions								Tight- ening torque max.	x ¹⁾	Load capacity ¹⁾				For lifting pin		Art. No.
	d ₂		d ₃ -0.2	d ₄ +0.3	d ₅ +0.1	l ₁	l ₂	l ₃	l ₄	F ₁			F ₂	F ₃					
	[mm]		[mm]										[Nm]	[mm]	[kN]				
8	M16 x 1,5	10	24	9.9	3.1	37.5	32.5	16	12.5	75	1.5	1.5	1.2	0.5	22350.0601 / .0701	47	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	92	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	3.2	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

ACCESSORIES

	Suitable for size d ₁ [mm]	Pin spacing ±0.1 [mm]	Pin diameter -0.1 [mm]	Square drive [in]	 [g]	Art. No.
adjustable face wrench, offset						
	8	–	3		121	22350.1990
	10/12/16/20/25	–	5		309	22350.1991
face and socket wrench						
	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.

Mounting:

- Press in the button and hold it down
- Insert the lifting pin
- Release the button (The button must be back in its original position)

Dismantling:

- Press in the button and hold it down.
- Remove the lifting pin.
- Release the button.

Operation

Each lifting pin contains an instruction manual with an EC Declaration of Conformity.

MORE INFORMATION

Accessories

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

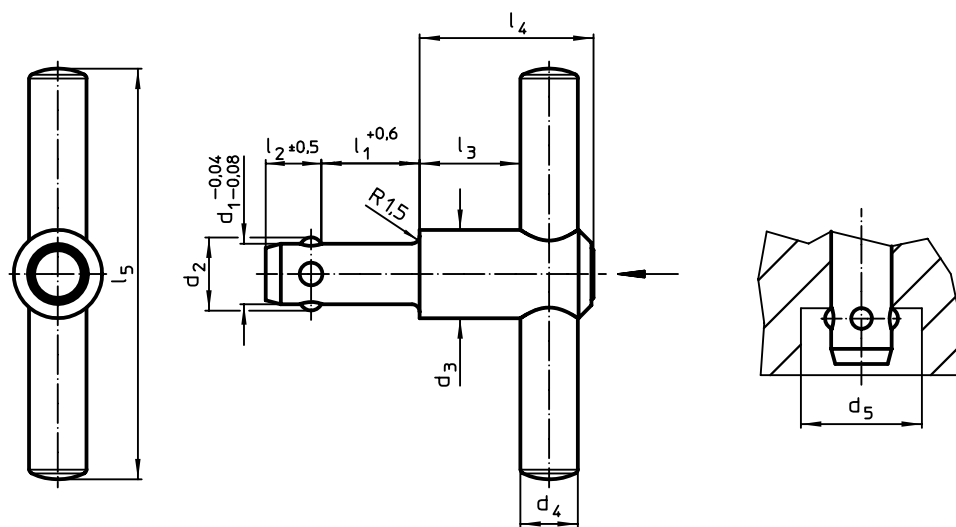
Further products

Locating Bushings, for lifting pins → p. 200

Locating Bushings, plain, for lifting pins → p. 201

Locating Bushings with Seal, plain, for lifting pins. → p. 203

DRAWING



ORDER INFORMATION

Dimensions										Load capacity	Location hole H11	🌡️	🏠	Art. No.
d_1	l_1	d_2	d_3	d_4	d_5 min.	l_2	l_3	l_4	l_5	F_1		max.		
-0.04 -0.08	+0.6									[N]	[mm]	[°C]	[g]	
[mm]														
8.0	35	9.35	21.5	14	9.85	8.75	18.7	36.0	100	500	8.0	250	136	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	154	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

ORANGE IS THE NEW THREAD TIME IS MONEY

Eye bolts and other lifting elements have to be screwed in laboriously. In contrast, threaded lifting pins can be pushed into existing threads just by pushing a button. They thus save a great deal of time when handling very varied loads. A selection of different versions provides the right solution for every purpose.



[www.halder.com/
LiftingDevices](http://www.halder.com/LiftingDevices)



Threaded Lifting Pins • self-locking

EH 22352.

2



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 of 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

Threaded lifting pins can be mounted into a thread that is true to gauge.

Mounting:

- Press in the button and hold it down.
- Insert the threaded lifting pin.
- Release the button (The button must be back in its original position.).
- Tighten the threaded lifting pin by hand,

until it bears completely on the bearing surface.

- It must be ensured that the threaded segments are engaged in the mounting thread.

Dismantling:

- Unscrew the threaded lifting pin approx. a quarter of a turn anticlockwise.
- Press in the button and hold it down.
- Remove the threaded lifting pin.
- Release the button.

Operation

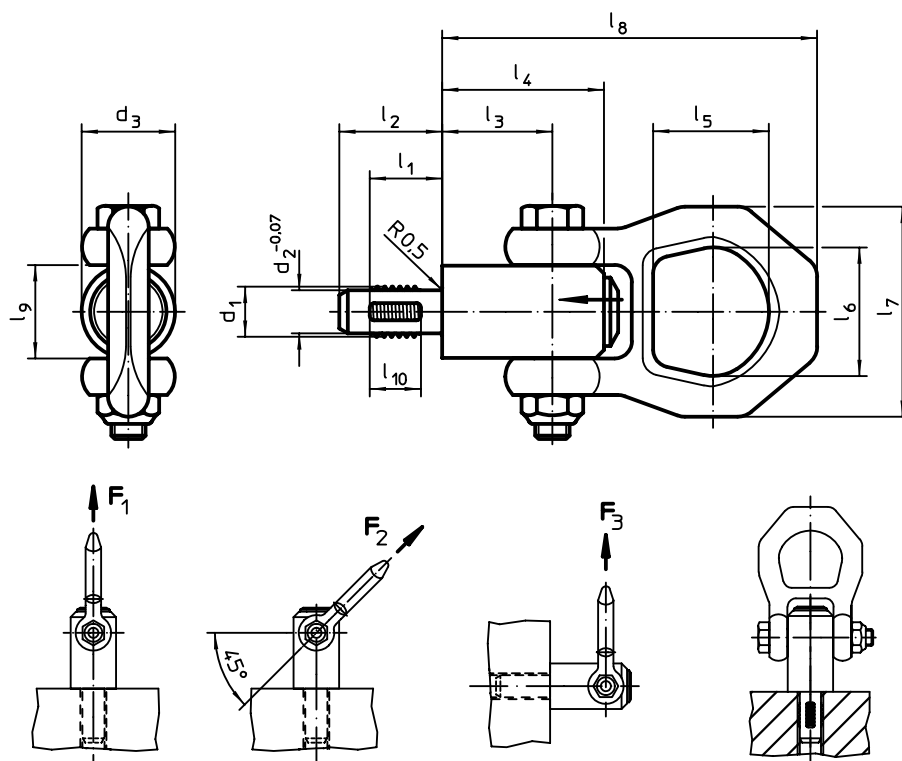
Each threaded lifting pin contains an instruction manual with an EC Declaration of Conformity.

MORE INFORMATION

Further products

- Lifting Pins, self-locking. → p. 196
- Lifting Pins, self-locking, stainless steel. → p. 198
- Threaded Lifting Pins, self-locking, for centre holes according to DIN 332 . . . → p. 209
- Threaded Lifting Pins, self-locking, with rotatable shackle → p. 211
- Threaded Lifting Pins, self-locking - INCH → p. 213
- Threaded Lifting Pins, self-locking, with rotatable shackle - INCH → p. 215

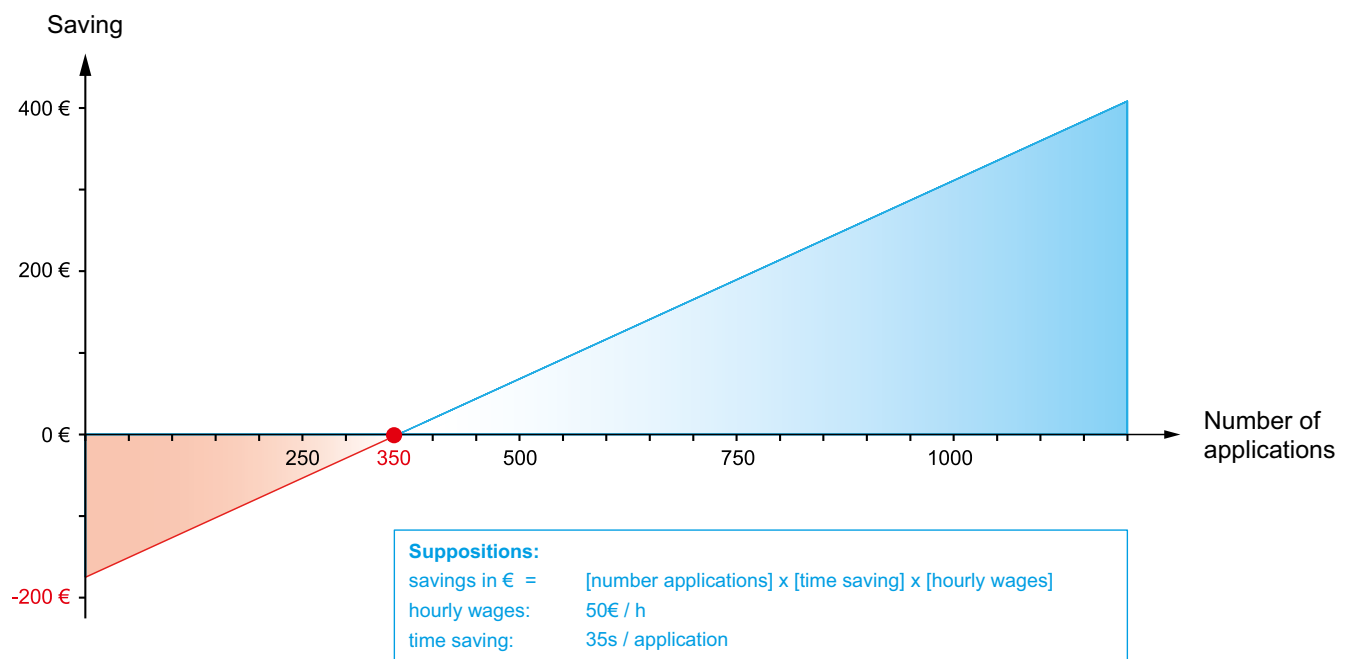
DRAWING



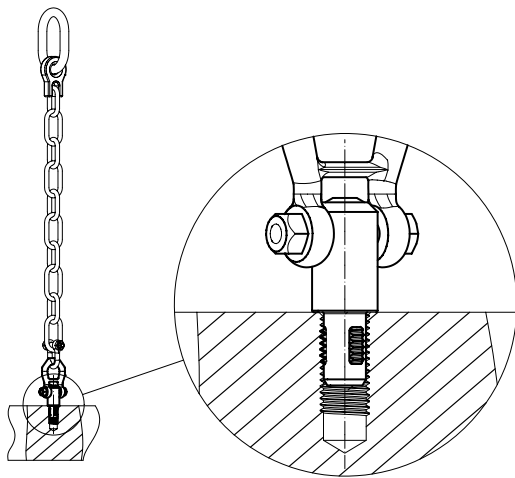
ORDER INFORMATION

Dimensions													Load capacity ¹⁾			Locating 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	F ₂	F ₃		max.		Heat-treated steel	Stainless steel
[mm]													[kN]			[mm]	[°C]	[g]		
M 8	12	6.62	21.5	17.8	25.7	36	27.0	30.0	49	87.5	21.5	8	2.1	0.9	0.8	M 8	250	274	22352.0008	22352.1008
M10	14	8.35	21.5	20.0	25.7	36	27.0	30.0	49	87.5	21.5	10	3.9	1.5	1.5	M10	250	268	22352.0010	22352.1010
M12	17	10.07	21.5	24.0	25.7	36	27.0	30.0	49	87.5	21.5	12	6.2	2.5	2.3	M12	250	273	22352.0012	22352.1012
M14	17	11.80	21.5	24.0	25.7	36	27.0	30.0	49	87.5	21.5	12	7.8	4.2	2.9	M14	250	279	22352.0014	—
M16	17	13.80	21.5	24.0	25.7	36	27.0	30.0	49	87.5	21.5	12	8.4	4.5	4.2	M16	250	284	22352.0016	22352.1016
M20	22	17.25	30.0	30.0	36.5	52	32.6	36.0	56	114.0	26.0	17	16.6	7.7	5.8	M20	250	586	22352.0020	—
													10.0	7.7	5.8	M20	250	519	—	22352.1020
M24	27	20.70	36.0	36.0	42.0	60	50.6	49.8	82	152.0	36.0	22	23.0	11.1	8.6	M24	250	1187	22352.0024	22352.1024
M27	31	23.67	45.0	40.0	42.0	60	50.6	49.8	82	152.0	36.0	26	33.8	15.7	13.7	M27	250	1546	22352.0027	—
M30	35	26.10	45.0	45.0	42.0	60	50.6	49.8	82	152.0	36.0	30	42.3	21.5	15.5	M30	250	1596	22352.0030	—

¹⁾ for a 5-fold safety against breakage



APPLICATION EXAMPLE



Threaded Lifting Pins • self-locking, for centre holes according to DIN 332

EH 22352.



PRODUCT DESCRIPTION

This threaded lifting pin is used when there is a threaded hole with a counterbore according to DIN 332.

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 of 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

Threaded lifting pins can be mounted into a thread that is true to gauge.

Mounting:

1. Press in the button and hold it down.
2. Insert the threaded lifting pin.
3. Release the button (The button must be back in its original position.).
4. Tighten the threaded lifting pin by hand,

until it bears completely on the bearing surface.

5. It must be ensured that the threaded segments are engaged in the mounting thread.

Dismantling:

1. Unscrew the threaded lifting pin approx. a quarter of a turn anticlockwise.
2. Press in the button and hold it down.
3. Remove the threaded lifting pin.
4. Release the button.

Operation

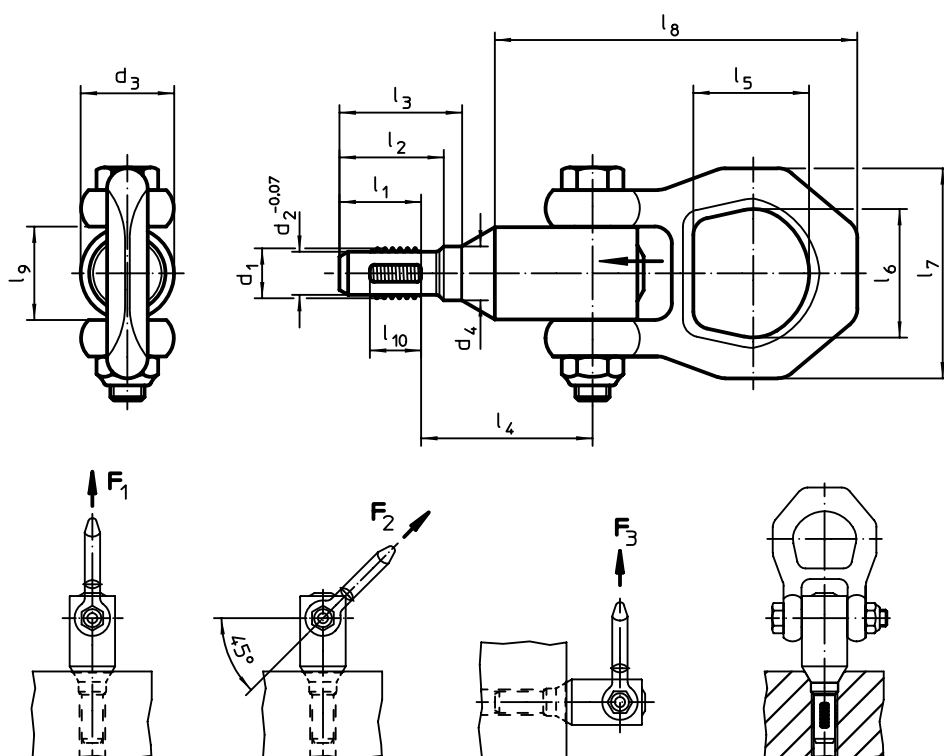
Each threaded lifting pin contains an instruction manual with an EC Declaration of Conformity.

MORE INFORMATION

Further products

- Lifting Pins, self-locking. → p. 196
- Lifting Pins, self-locking, stainless steel. → p. 198
- Threaded Lifting Pins, self-locking. → p. 207
- Threaded Lifting Pins, self-locking, with rotatable shackle. → p. 211
- Threaded Lifting Pins, self-locking - INCH → p. 213
- Threaded Lifting Pins, self-locking, with rotatable shackle - INCH → p. 215

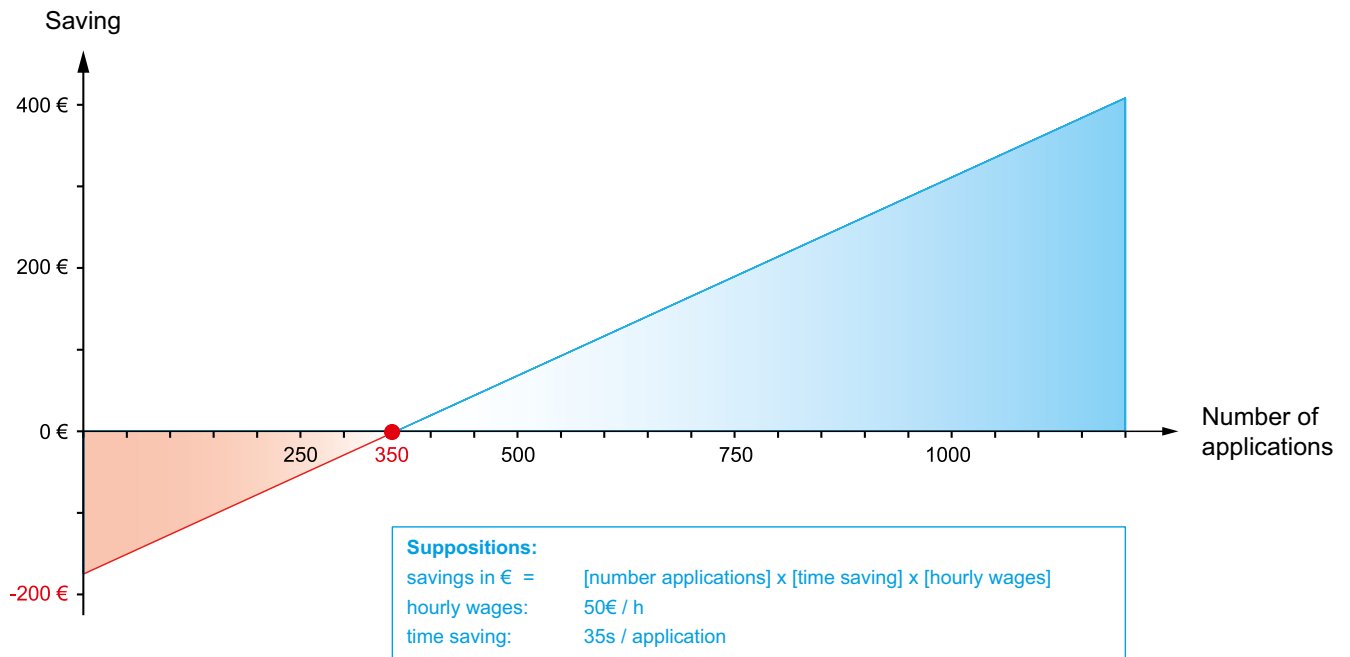
DRAWING



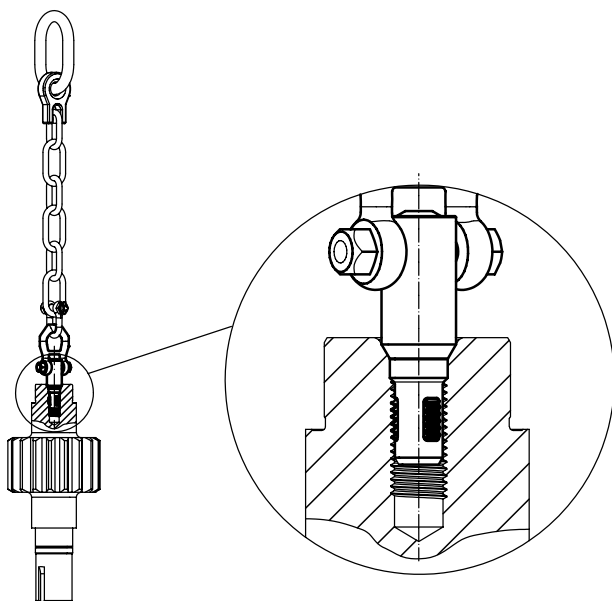
ORDER INFORMATION

Dimensions														Load capacity ¹⁾			Locating thread			Art. No.	
d ₁	l ₁	d ₂ -0.07	d ₃	d ₄	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	l ₉	l ₁₀	F ₁	F ₂	F ₃				max.	Heat-treated steel
[mm]														[kN]			[mm]	[°C]	[g]		
M 8	13.9	6.62	21.5	8.1	17.6	19.5	34.6	27.0	30.0	49	82.3	21.5	8	2.1	0.9	0.8	M 8	250	227	22352.2008	22352.3008
M10	16.0	8.35	21.5	10.2	20.0	22.9	36.4	27.0	30.0	49	83.6	21.5	10	3.9	1.5	1.5	M10	250	274	22352.2010	22352.3010
M12	19.0	10.07	21.5	12.7	24.0	28.1	39.1	27.0	30.0	49	84.3	21.5	12	6.2	2.5	2.3	M12	250	249	22352.2012	22352.3012
M16	19.0	13.80	21.5	16.7	25.0	30.5	42.3	27.0	30.0	49	88.5	21.5	12	8.4	4.5	4.2	M16	250	271	22352.2016	22352.3016
M20	25.0	17.75	30.0	20.7	31.8	39.1	53.7	32.6	36.0	56	109.2	30.0	17	16.6	7.7	5.8	M20	250	554	22352.2020	—
														10.0	7.7	5.8	M20	250	555	—	22352.3020
M24	31.0	20.70	36.0	24.7	38.9	47.3	61.4	50.6	49.8	82	145.4	36.0	22	23.0	11.1	8.6	M24	250	1234	22352.2024	22352.3024

¹⁾ for a 5-fold safety against breakage



APPLICATION EXAMPLE



Threaded Lifting Pins • self-locking, with rotatable shackle

EH 22353.

2



PRODUCT DESCRIPTION

Heavy-duty lifting element for quick and easy use, with moveable, rotatable 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. The rotatable shackle will always align with the tensile direction of pull without the pin rotating. This prevents the lifting device from being turned out of the thread and the component can be lifted safely.

All versions are corrosion-protected. The version made of 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

Threaded lifting pins can be mounted into a thread that is true to gauge.

Mounting:

- Press in the button and hold it down.
- Insert the threaded lifting pin.
- Release the button (The button must be back in its original position.).
- Tighten the threaded lifting pin by hand,

until it bears completely on the bearing surface.

- It must be ensured that the threaded segments are engaged in the mounting thread.

Dismantling:

- Unscrew the threaded lifting pin approx. a quarter of a turn anticlockwise.
- Press in the button and hold it down.
- Remove the threaded lifting pin.
- Release the button.

Operation

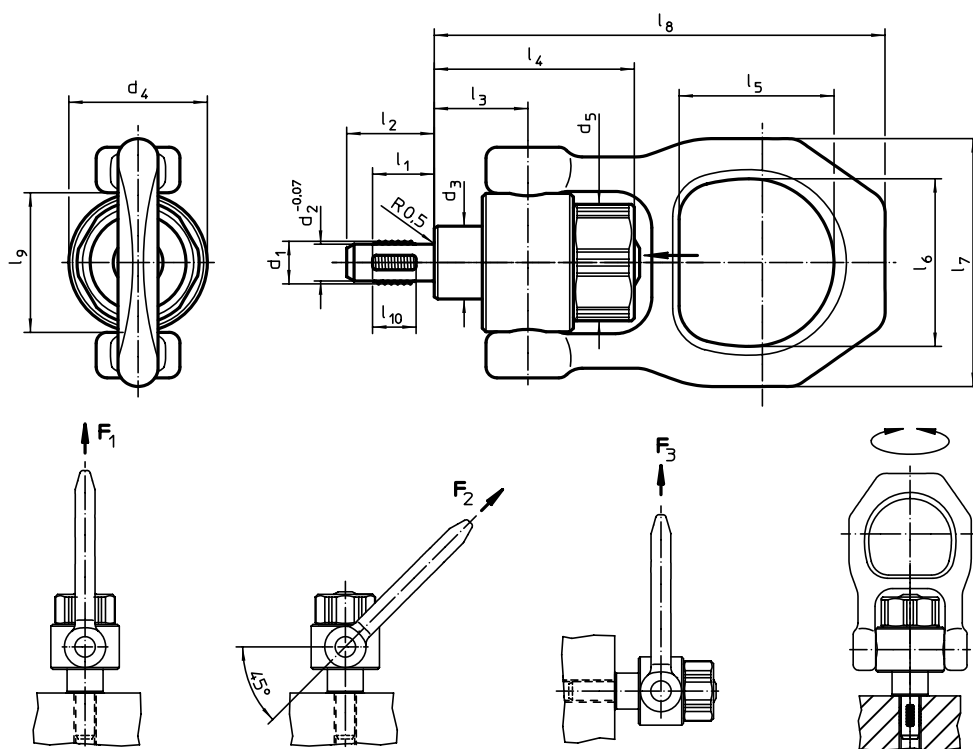
Each threaded lifting pin contains an instruction manual with an EC Declaration of Conformity.

MORE INFORMATION

Further products

- Lifting Pins, self-locking. → p. 196
- Lifting Pins, self-locking, stainless steel. → p. 198
- Threaded Lifting Pins, self-locking. . . → p. 207
- Threaded Lifting Pins, self-locking, for centre holes according to DIN 332 . . . → p. 209
- Threaded Lifting Pins, self-locking - INCH → p. 213
- Threaded Lifting Pins, self-locking, with rotatable shackle - INCH → p. 215

DRAWING

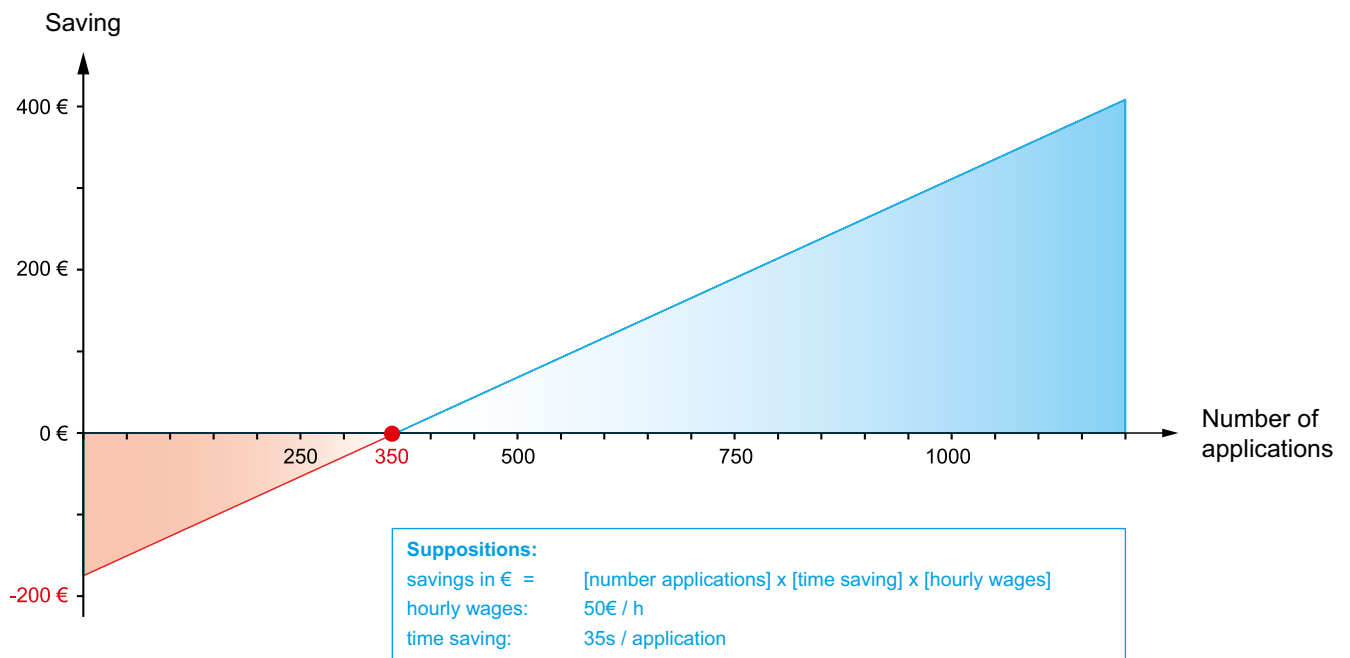


ORDER INFORMATION

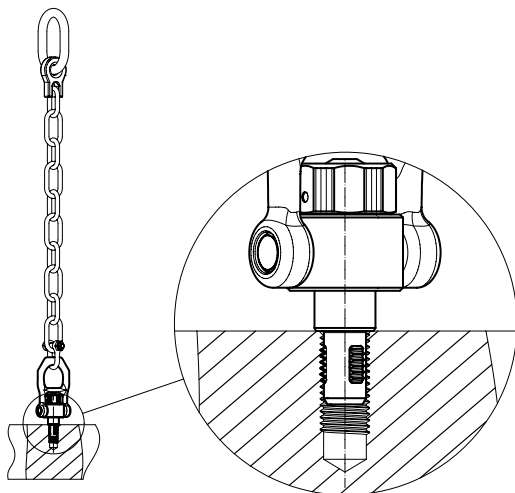
Dimensions															Load capacity ¹⁾			Locating thread	 max.	Tightening torque max.	 [g]	Art. No.	
d ₁	l ₁	d ₂ -0.07	d ₃	d ₄	d ₅	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	l ₉	l ₁₀	F ₁	F ₂	F ₃	[mm]	[°C]	[Nm]		Heat-treated steel	Stainless steel
[mm]															[kN]								
M 8	12	6.62	20	38	33.5	17.8	25.7	54.9	42.5	46	68	123.7	38	8	2.1	0.9	0.8	M 8	250	2	677	22353.0008	22353.1008
M10	14	8.35	20	38	33.5	20.0	25.7	54.9	42.5	46	68	123.7	38	10	3.9	1.5	1.5	M10	250	2	691	22353.0010	22353.1010
M12	17	10.07	20	38	33.5	24.0	25.7	54.9	42.5	46	68	123.7	38	12	6.2	2.5	2.3	M12	250	2	694	22353.0012	22353.1012
M16	17	13.80	20	38	33.5	24.0	25.7	54.9	42.5	46	68	123.7	38	12	8.4	4.5	4.2	M16	250	2	698	22353.0016	22353.1016
M20	22	17.25	35	59	50.0	30.0	36.5	73.7	55.6	70	102	167.5	59	17	16.6	7.7	5.0	M20	250	3	1964	22353.0020	22353.1020
M24	27	20.70	35	59	50.0	36.0	42.0	79.2	55.6	70	102	173.0	59	22	18.5	11.1	8.6	M24	250	3	1860	22353.0024 ²⁾	—
															18.0	11.1	8.6	M24	250	3	1984	—	22353.1024 ²⁾

¹⁾ for a 5-fold safety against breakage

²⁾ from 150°C linear decrease of the load capacity by 23%



APPLICATION EXAMPLE



Threaded Lifting Pins • self-locking - INCH

EH 2B352.

2



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 of 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

Threaded lifting pins can be mounted into a thread that is true to gauge.

Mounting:

- Press in the button and hold it down.
- Insert the threaded lifting pin.
- Release the button (The button must be back in its original position.).
- Tighten the threaded lifting pin by hand, until it bears completely on the bearing surface.

- It must be ensured that the threaded segments are engaged in the mounting thread.

Dismantling:

- Unscrew the threaded lifting pin approx. a quarter of a turn anticlockwise.
- Press in the button and hold it down.
- Remove the threaded lifting pin.
- Release the button.

Operation

Each threaded lifting pin contains an instruction manual with an EC Declaration of Conformity.

MORE INFORMATION

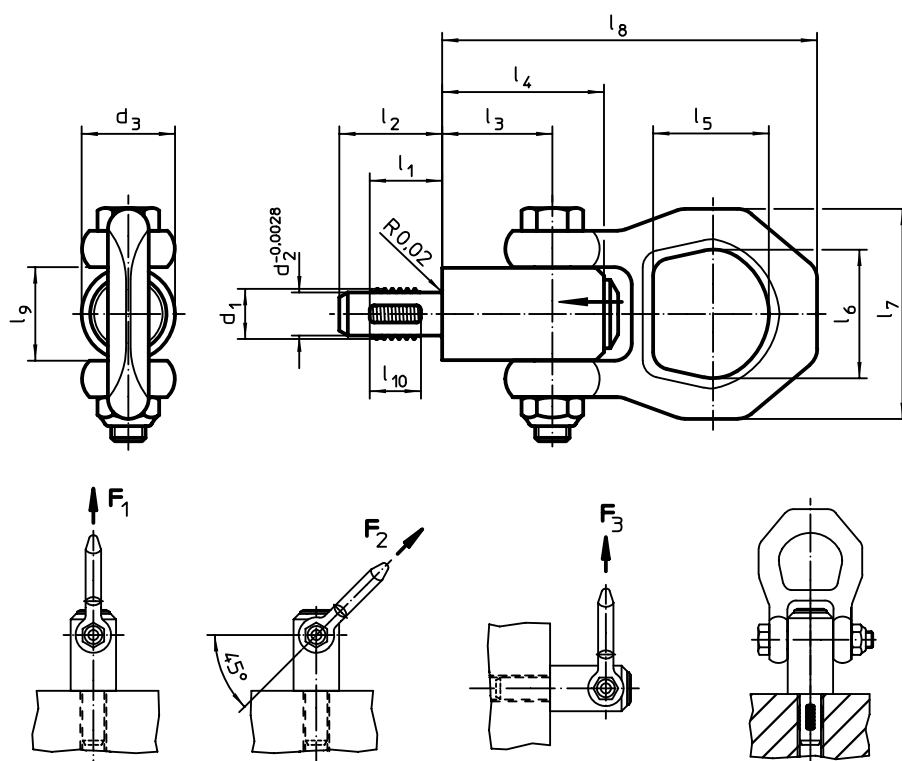
Notes

- This product is manufactured in INCH dimensions.

Further products

- Lifting Pins, self-locking. → p. 196
- Lifting Pins, self-locking, stainless steel. → p. 198
- Threaded Lifting Pins, self-locking. . . → p. 207
- Threaded Lifting Pins, self-locking, for centre holes according to DIN 332 . . . → p. 209
- Threaded Lifting Pins, self-locking, with rotatable shackle → p. 211
- Threaded Lifting Pins, self-locking, with rotatable shackle - INCH → p. 215

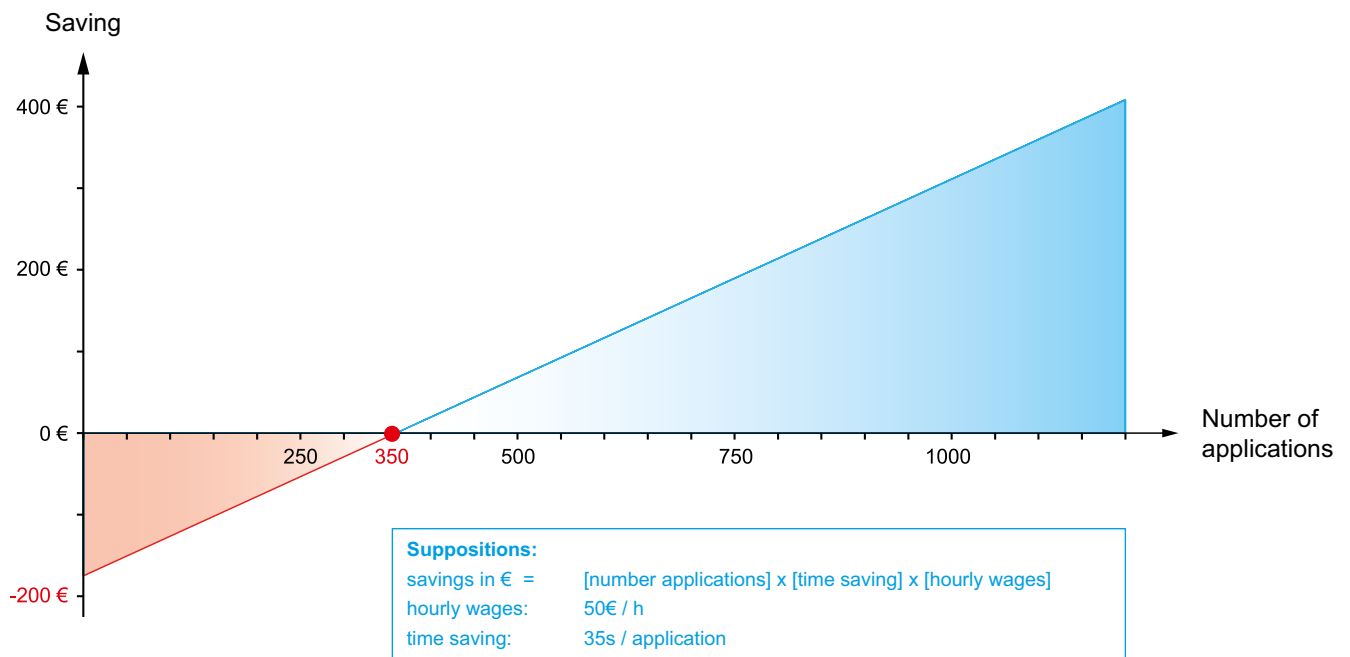
DRAWING



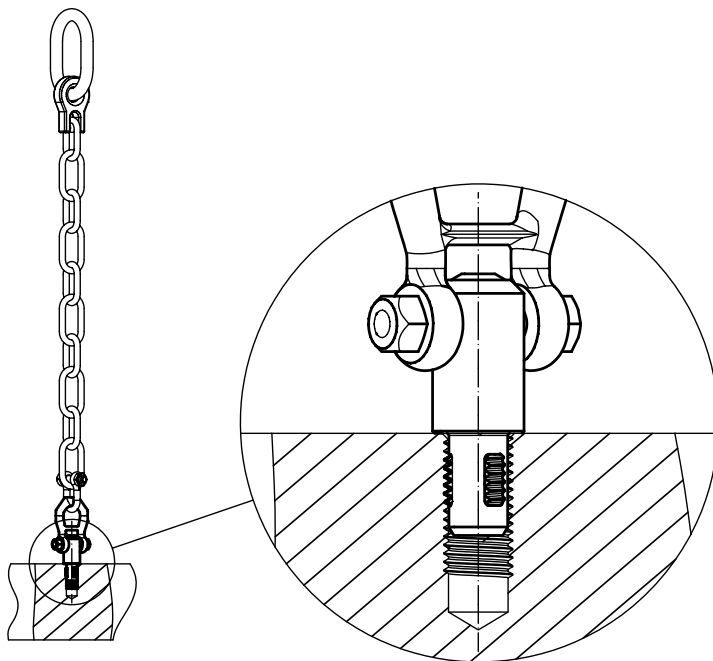
ORDER INFORMATION

d ₁	l ₁	Dimensions											Load capacity ¹⁾			Locating thread	max. [°F]	[oz]	Art. No.	
		d ₂ -0.0028	d ₃	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	l ₉	l ₁₀	F ₁	F ₂	F ₃				Heat-treated steel	Stainless steel
		[in]											[lbf]							
1/2-13	0.669	0.416	0.846	0.945	1.012	1.417	1.063	1.181	1.929	3.445	0.846	0.472	1528	764	607	1/2-13	482	9.830	2B352.0012	2B352.1012
3/4-10	0.866	0.640	1.181	1.181	1.437	2.047	1.283	1.417	2.205	4.488	1.181	0.669	3619	1731	1281	3/4-10	482	18.080	2B352.0020	—
													2248	1731	1281	3/4-10	482	18.080	—	2B352.1020
1-8	1.063	0.863	1.417	1.417	1.654	2.362	1.992	1.961	3.228	5.984	1.417	0.866	6766	3147	2225	1-8	482	42.153	2B352.0024	2B352.1024

¹⁾ for a 5-fold safety against breakage



APPLICATION EXAMPLE



Threaded Lifting Pins • self-locking, with rotatable shackle - INCH

EH 2B353.



PRODUCT DESCRIPTION

Heavy-duty lifting element for quick and easy use, with moveable, rotatable 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. The rotatable shackle will always align with the tensile direction of pull without the pin rotating. This prevents the lifting device from being turned out of the thread and the component can be lifted safely.

All versions are corrosion-protected. The version made of 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

Threaded lifting pins can be mounted into a thread that is true to gauge.

Mounting:

- Press in the button and hold it down.
- Insert the threaded lifting pin.
- Release the button (The button must be back in its original position.).
- Tighten the threaded lifting pin by hand, until it bears completely on the bearing surface.

- It must be ensured that the threaded segments are engaged in the mounting thread.

Dismantling:

- Unscrew the threaded lifting pin approx. a quarter of a turn anticlockwise.
- Press in the button and hold it down.
- Remove the threaded lifting pin.
- Release the button.

Operation

Each threaded lifting pin contains an instruction manual with an EC Declaration of Conformity.

MORE INFORMATION

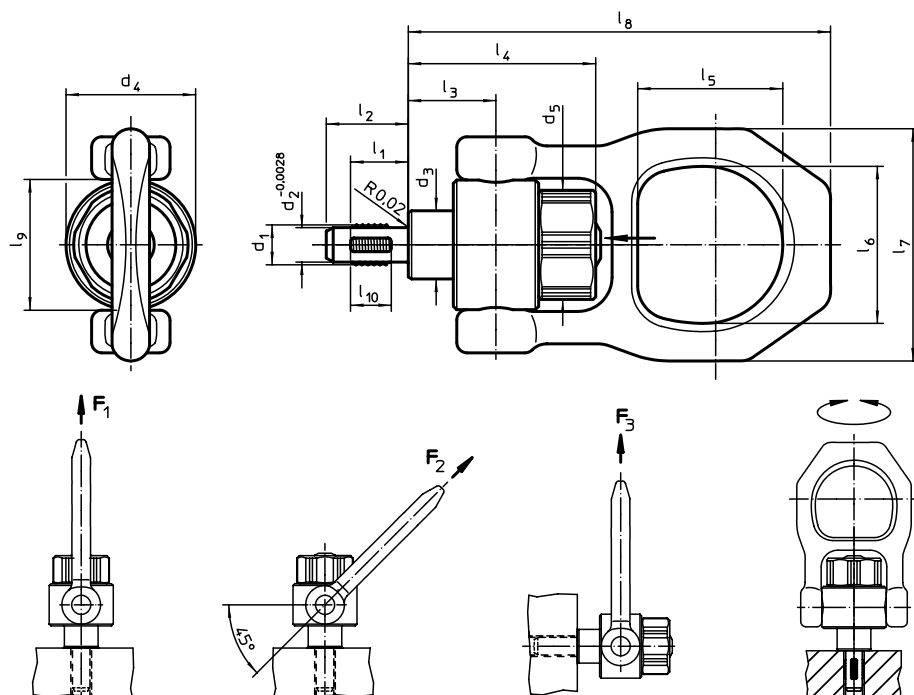
Notes

- This product is manufactured in INCH dimensions.

Further products

- Lifting Pins, self-locking. → p. 196
- Lifting Pins, self-locking, stainless steel. → p. 198
- Threaded Lifting Pins, self-locking. → p. 207
- Threaded Lifting Pins, self-locking, for centre holes according to DIN 332 → p. 209
- Threaded Lifting Pins, self-locking, with rotatable shackle → p. 211
- Threaded Lifting Pins, self-locking - INCH → p. 213

DRAWING

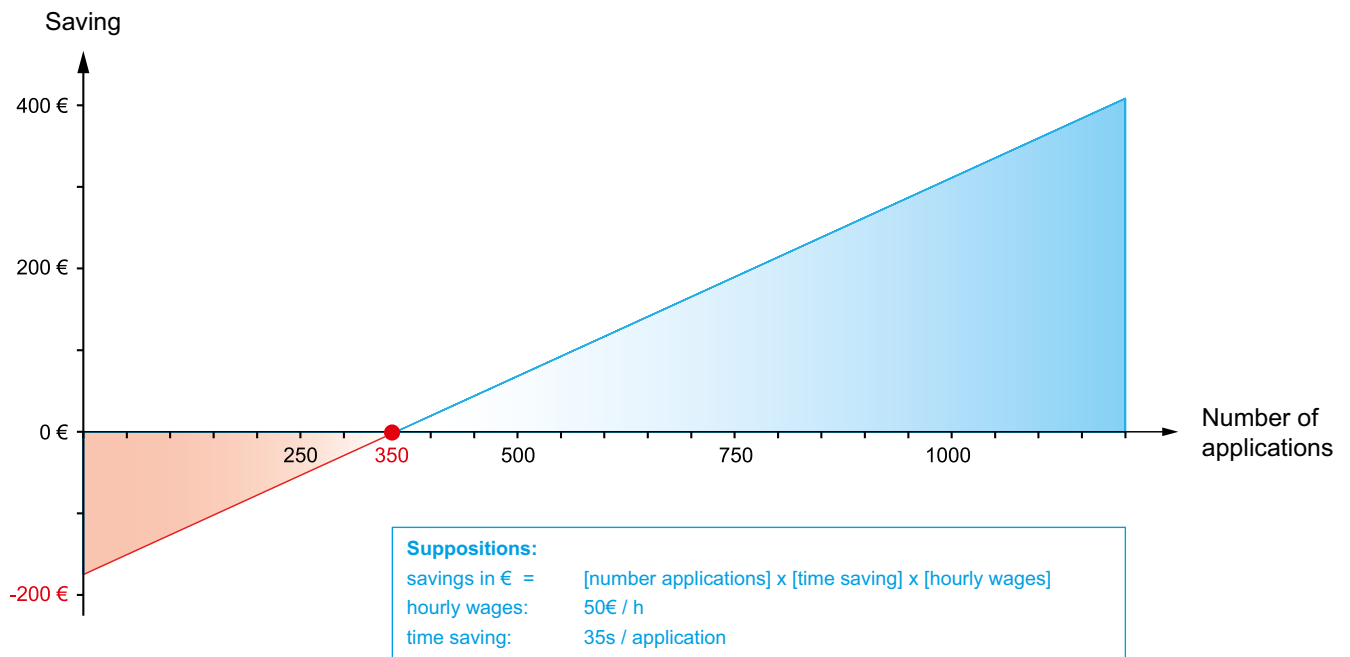


ORDER INFORMATION

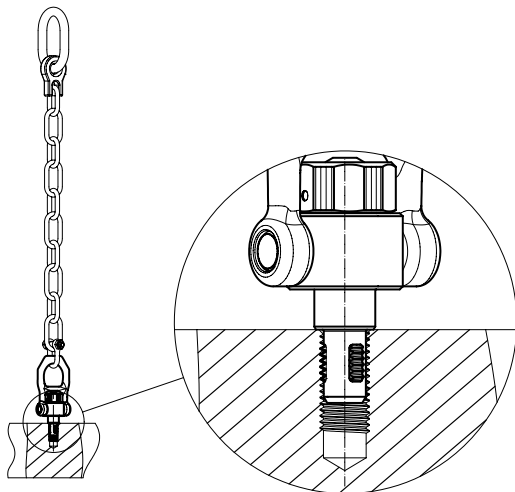
Dimensions															Load capacity ¹⁾			Lo- cating thread	" " "	Tight- ening torque max.		Art. No.	
d ₁	l ₁	d ₂ +0.0028	d ₃	d ₄	d ₅	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	l ₉	l ₁₀	F ₁	F ₂	F ₃		" " "			Heat-trea- ted steel	Stainless steel
[in]															[lbf]				[°F]	[lbf ft]	[oz]		
1/2-13	0.669	0.416	0.787	1.496	1.319	0.945	1.012	2.161	1.673	1.811	2.677	4.870	1.496	0.472	1528	764	607	1/2-13	482	1.48	24.601	2B353.0012	2B353.1012
3/4-10	0.866	0.640	1.378	2.323	1.969	1.181	1.437	2.902	2.189	2.756	4.016	6.594	2.323	0.669	3619	1731	1124	3/4-10	482	2.21	64.973	2B353.0020	2B353.1020
1-8	1.063	0.863	1.378	2.323	1.969	1.417	1.654	3.118	2.189	2.756	4.016	6.811	2.323	0.866	4159	3147	2225	1-8	482 ²⁾	2.21	67.529	2B353.0024 ²⁾	—
															4046	3147	2225	1-8	482 ²⁾	2.21	67.529	—	2B353.1024 ²⁾

¹⁾ for a 5-fold safety against breakage

²⁾ from 302°F linear decrease of the load capacity by 23%



APPLICATION EXAMPLE



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](http://www.halder.com/BallLockPins-Video)



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

EH 22340. /EH 22350.



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 button.

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. 246

Locating Bushings, with flange, for ball lock pins and socket pins. → p. 248

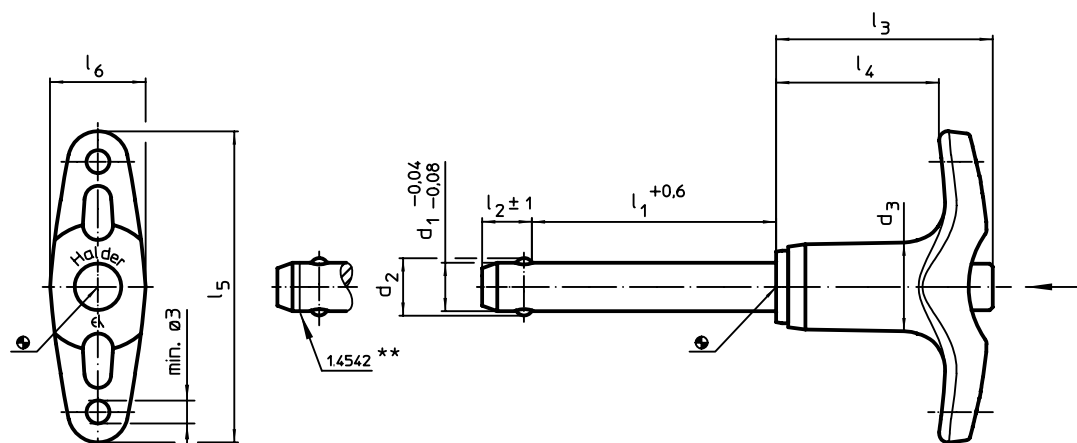
Retaining Cables → p. 249

Positioning Bushings, with collar, DIN 172 A → p. 424

Positioning Bushings, without collar, DIN 179 A → p. 427

Ball Lock Pins with T-Handle, single acting - comply with NAS / MS17985 . → p. 261

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions									Location hole H11	 min. max.		 [g]	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					Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
[mm]									[mm]	[°C]			[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	21	14	22340.0014	24	22350.0014
	25	5.5	11.8	6.0	31.6	24.1	45.2	12.7	5	-30	150	22	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	23	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	24	14	22340.0007	24	22350.0007
	50	5.5	11.8	6.0	31.6	24.1	45.2	12.7	5	-30	150	25	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	28	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



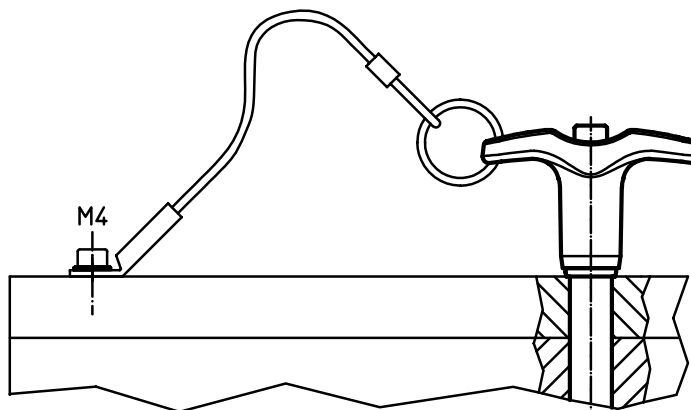
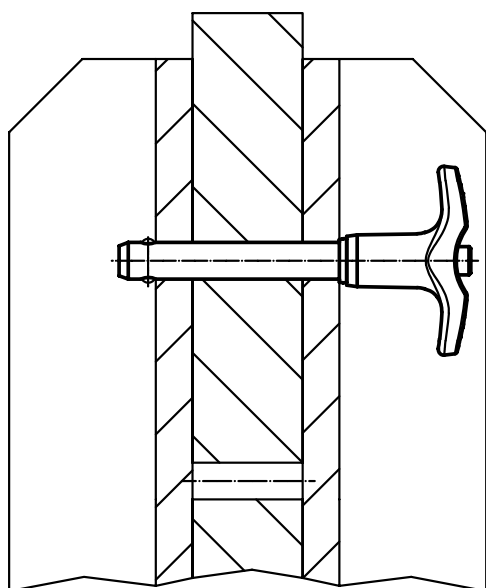
Dimensions									Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d ₁ -0.04 -0.08	l ₁ +0.6	d ₂	d ₃	l ₂ ±1	l ₃	l ₄	l ₅	l ₆		min.	max.		Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
[mm]										[mm]	[°C]		[g]	[kN]		[kN]
6	10	7.0	11.8	7.0	31.6	24.1	45.2	12.7	6	-30	150	21	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	23	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	26	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	29	21	22340.0030	35	22350.0030
	60	7.0	11.8	7.0	31.6	24.1	45.2	12.7	6	-30	150	30	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	34	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	34	38	22340.0032	63	22350.0032
	15	9.5	14.7	8.2	35.8	26.9	51.5	15.8	8	-30	150	36	38	22340.0033	63	22350.0033
	20	9.5	14.7	8.2	35.8	26.9	51.5	15.8	8	-30	150	38	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	45	38	22340.0038	63	22350.0038
	45	9.5	14.7	8.2	35.8	26.9	51.5	15.8	8	-30	150	47	38	22340.0039	63	22350.0039
	50	9.5	14.7	8.2	35.8	26.9	51.5	15.8	8	-30	150	49	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
10	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
	15	12.0	14.7	9.6	35.8	26.9	51.5	15.8	10	-30	150	41	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	50	60	22340.0046	100	22350.0046
	35	12.0	14.7	9.6	35.8	26.9	51.5	15.8	10	-30	150	53	60	22340.0047	100	22350.0047
	40	12.0	14.7	9.6	35.8	26.9	51.5	15.8	10	-30	150	56	60	22340.0048	100	22350.0048
	45	12.0	14.7	9.6	35.8	26.9	51.5	15.8	10	-30	150	59	60	22340.0049	100	22350.0049
	50	12.0	14.7	9.6	35.8	26.9	51.5	15.8	10	-30	150	62	60	22340.0050	100	22350.0050
12	60	12.0	14.7	9.6	35.8	26.9	51.5	15.8	10	-30	150	68	60	22340.0052	100	22350.0052
	70	12.0	14.7	9.6	35.8	26.9	51.5	15.8	10	-30	150	74	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
	20	14.5	18.2	10.6	35.1	25.3	59.1	20.2	12	-30	150	69	87	22340.0064	144	22350.0064
	25	14.5	18.2	10.6	35.1	25.3	59.1	20.2	12	-30	150	72	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	85	87	22340.0068	144	22350.0068	
45	14.5	18.2	10.6	35.1	25.3	59.1	20.2	12	-30	150	89	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	102	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	146	87	22340.0062	144	22350.0062	
120	14.5	18.2	10.6	35.1	25.3	59.1	20.2	12	-30	150	154	87	22340.0063	144	22350.0063	

¹⁾ Shearing resistance similar to DIN 50141

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	l_2 ± 1	l_3	l_4	l_5	l_6		min.	max.		Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
[mm]									[mm]	[°C]		[g]	[kN]		[kN]	
16	30	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	153	155	22340.0071	257	22350.0071
	35	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	161	155	22340.0073	257	22350.0073
	40	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	168	155	22340.0075	257	22350.0075
	45	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	172	155	22340.0077	257	22350.0077
	50	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	184	155	22340.0078	257	22350.0078
	60	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	200	155	22340.0079	257	22350.0079
	70	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	214	155	22340.0080	257	22350.0080
	80	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	231	155	22340.0081	257	22350.0081
	90	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	245	155	22340.0082	257	22350.0082
	100	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	260	155	22340.0083	257	22350.0083
	110	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	277	155	22340.0084	257	22350.0084
	120	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	293	155	22340.0085	257	22350.0085
	130	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	309	155	22340.0086	257	22350.0086
	140	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	324	155	22340.0087	257	22350.0087
	150	19.0	23.4	14.0	42.2	29.8	74.8	24.7	16	-30	150	339	155	22340.0088	257	22350.0088
20	50	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	245	244	22340.0089	403	22350.0089
	60	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	269	244	22340.0090	403	22350.0090
	70	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	293	244	22340.0091	403	22350.0091
	80	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	315	244	22340.0092	403	22350.0092
	90	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	340	244	22340.0093	403	22350.0093
	100	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	364	244	22340.0094	403	22350.0094
	110	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	390	244	22340.0095	403	22350.0095
	120	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	413	244	22340.0096	403	22350.0096
	130	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	436	244	22340.0097	403	22350.0097
	140	24.8	23.4	17.0	43.1	29.8	74.8	24.7	20	-30	150	462	244	22340.0098	403	22350.0098
25	50	31.0	30.4	22.0	54.8	37.5	88.7	33.2	25	-30	150	449	386	22340.0100	631	22350.0100
	60	31.0	30.4	22.0	54.8	37.5	88.7	33.2	25	-30	150	487	386	22340.0101	631	22350.0101
	70	31.0	30.4	22.0	54.8	37.5	88.7	33.2	25	-30	150	526	386	22340.0102	631	22350.0102
	80	31.0	30.4	22.0	54.8	37.5	88.7	33.2	25	-30	150	559	386	22340.0103	631	22350.0103
	90	31.0	30.4	22.0	54.8	37.5	88.7	33.2	25	-30	150	600	386	22340.0104	631	22350.0104
	100	31.0	30.4	22.0	54.8	37.5	88.7	33.2	25	-30	150	640	386	22340.0001	631	22350.0001
	110	31.0	30.4	22.0	54.8	37.5	88.7	33.2	25	-30	150	669	386	22340.0002	631	22350.0002
	120	31.0	30.4	22.0	54.8	37.5	88.7	33.2	25	-30	150	713	386	22340.0003	631	22350.0003
	130	31.0	30.4	22.0	54.8	37.5	88.7	33.2	25	-30	150	751	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.



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 button.

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. 246

Locating Bushings, with flange, for ball lock pins and socket pins. → p. 248

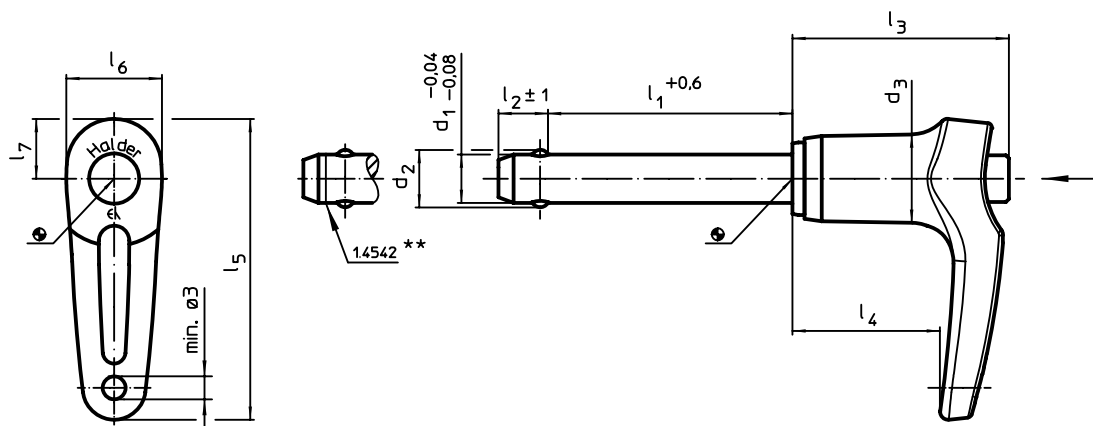
Retaining Cables → p. 249

Positioning Bushings, with collar, DIN 172 A → p. 424

Positioning Bushings, without collar, DIN 179 A → p. 427

Ball Lock Pins with L-handle, single acting - comply with NAS / MS17986 → p. 266

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	l ₇		min.	max.		Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear 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	22	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	24	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	23	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	25	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	26	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	26	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	29	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	30	14	22340.0111	24	22350.0111		

¹⁾ Shearing resistance similar to DIN 50141



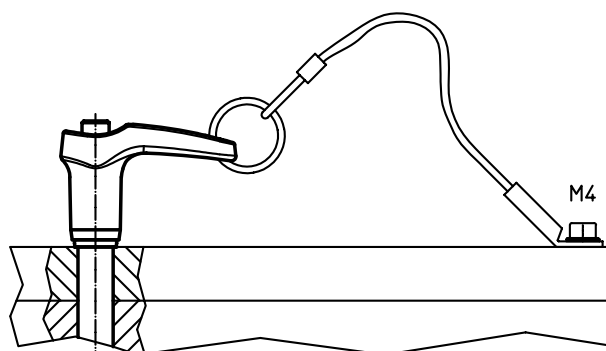
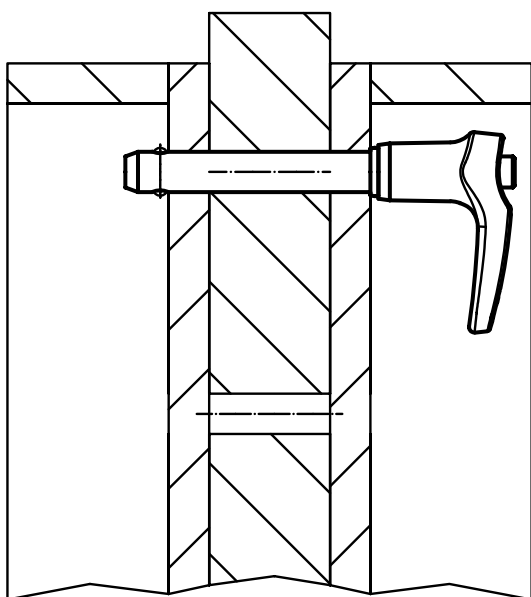
Dimensions										Location hole H11	 min. max.			Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d ₁ -0.04 -0.08	l ₁ +0.6	d ₂	d ₃	l ₂ ±1	l ₃	l ₄	l ₅	l ₆	l ₇					Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
[mm]										[mm]	[°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	22	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	30	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	33	21	22340.0120	35	22350.0120
8	80	7.0	11.8	7.0	31.6	21.9	43.8	12.6	8.5	6	-30	150	35	21	22340.0121	35	22350.0121
	10	9.5	14.7	8.2	35.8	24.4	49.7	15.8	9.9	8	-30	150	34	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	36	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
10	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	59	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	63	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	66	38	22340.0151	63	22350.0151
	15	12.0	14.7	9.6	35.8	24.4	49.7	15.8	9.9	10	-30	150	41	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
12	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	73	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	79	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	85	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	91	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	97	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	103	60	22340.0158	100	22350.0158
	20	14.5	18.2	10.6	35.1	22.7	57.1	20.2	12.6	12	-30	150	70	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	78	87	22340.0166	144	22350.0166
12	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	112	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	129	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	138	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	 min. max.		 [g]	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					Shearing resistance, two-shear ¹⁾ min. [kN]	Art. No.	Shearing resistance, two-shear ¹⁾ min. [kN]	Art. No.
[mm]										[mm]	[°C]						
16	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	161	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	200	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	216	155	22340.0180	257	22350.0180
	80	19.0	23.4	14.0	42.2	27.3	67.6	24.7	15.1	16	-30	150	231	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	246	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	262	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	302	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
20	50	24.8	23.4	17.0	43.1	27.3	67.6	24.7	15.1	20	-30	150	245	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	272	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	292	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
	100	24.8	23.4	17.0	43.1	27.3	67.6	24.7	15.1	20	-30	150	362	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	392	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	413	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	437	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
25	50	31.0	30.4	22.0	54.8	34.2	83.9	33.3	20.1	25	-30	150	453	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	490	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	523	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	567	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	596	386	22340.0204	631	22350.0204
	100	31.0	30.4	22.0	54.8	34.2	83.9	33.3	20.1	25	-30	150	635	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	672	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	710	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	754	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	784	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	830	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.



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 button.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.

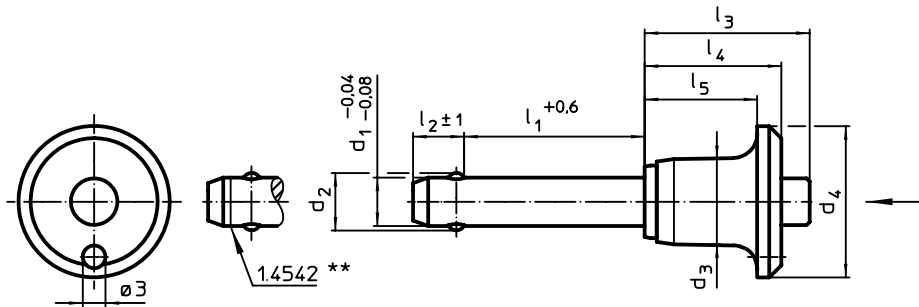
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins → p. 246
 Locating Bushings, with flange, for ball lock pins and socket pins → p. 248
 Retaining Cables → p. 249
 Positioning Bushings, with collar, DIN 172 A → p. 424
 Positioning Bushings, without collar, DIN 179 A → p. 427
 Ball Lock Pins with Button Handle, single acting - comply with NAS / MS17984 → p. 257

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions									Location hole H11	 min. max.		 [g]	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					Shearing resistance, two-shear ¹⁾ min. [kN]	Art. No.	Shearing resistance, two-shear ¹⁾ min. [kN]	Art. No.
[mm]									[mm]	[°C]						
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	20	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



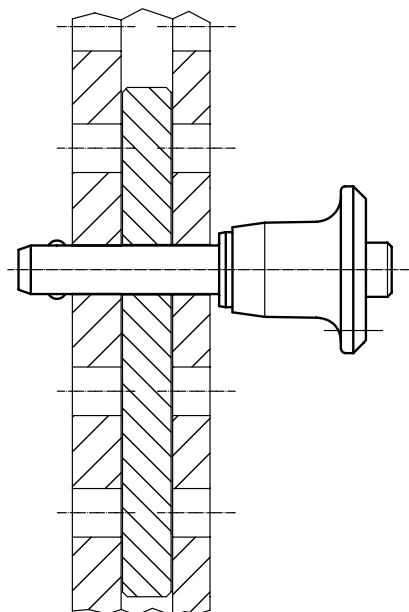
Dimensions									Location hole H11	 min. max.		 [g]	Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d_1 -0.04 -0.08	l_1 +0.6	d_2	d_3	d_4	l_2 ± 1	l_3	l_4	l_5					Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
[mm]									[mm]	[°C]			[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
8	80	7.0	11.3	20	7.0	20.7	17.6	14.6	6	-30	150	27	21	22340.0221	35	22350.0221
	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	29	38	22340.0234	63	22350.0234
	25	9.5	14.1	25	8.2	27.3	22.6	18.6	8	-30	150	31	38	22340.0235	63	22350.0235
	30	9.5	14.1	25	8.2	27.3	22.6	18.6	8	-30	150	33	38	22340.0236	63	22350.0236
	35	9.5	14.1	25	8.2	27.3	22.6	18.6	8	-30	150	35	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
10	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
	15	12.0	14.1	25	9.6	27.3	22.6	18.6	10	-30	150	33	60	22340.0259	100	22350.0259
	20	12.0	14.1	25	9.6	27.3	22.6	18.6	10	-30	150	36	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	42	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
12	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	77	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	88	60	22340.0257	100	22350.0257
	120	12.0	14.1	25	9.6	27.3	22.6	18.6	10	-30	150	94	60	22340.0258	100	22350.0258
	20	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	66	87	22340.0264	144	22350.0264
	25	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	70	87	22340.0265	144	22350.0265
	30	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	75	87	22340.0266	144	22350.0266
12	35	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	79	87	22340.0267	144	22350.0267
	40	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	83	87	22340.0268	144	22350.0268
	45	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	88	87	22340.0269	144	22350.0269
	50	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	92	87	22340.0270	144	22350.0270
	60	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	100	87	22340.0272	144	22350.0272
	70	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	109	87	22340.0274	144	22350.0274
	80	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	117	87	22340.0276	144	22350.0276
	90	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	126	87	22340.0260	144	22350.0260
	100	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	134	87	22340.0261	144	22350.0261
	110	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	143	87	22340.0262	144	22350.0262
	120	14.5	17.7	35	10.6	33.2	27.3	22.3	12	-30	150	151	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, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.		
[mm]									[mm]	[°C]		[g]	[kN]		[kN]			
16	30	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	151	155	22340.0271	257	22350.0271		
	35	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	156	155	22340.0273	257	22350.0273		
	40	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	163	155	22340.0275	257	22350.0275		
	45	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	171	155	22340.0277	257	22350.0277		
	50	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	182	155	22340.0278	257	22350.0278		
	60	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	197	155	22340.0279	257	22350.0279		
	70	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	213	155	22340.0280	257	22350.0280		
	80	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	224	155	22340.0281	257	22350.0281		
	90	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	244	155	22340.0282	257	22350.0282		
	100	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	255	155	22340.0283	257	22350.0283		
	110	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	270	155	22340.0284	257	22350.0284		
	120	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	291	155	22340.0285	257	22350.0285		
	130	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	301	155	22340.0286	257	22350.0286		
	140	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	317	155	22340.0287	257	22350.0287		
	150	19.0	23.4	40	14.0	42.2	34.5	28.5	16	-30	150	337	155	22340.0288	257	22350.0288		
20	50	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	244	244	22340.0289	403	22350.0289		
	60	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	265	244	22340.0290	403	22350.0290		
	70	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	291	244	22340.0291	403	22350.0291		
	80	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	316	244	22340.0292	403	22350.0292		
	90	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	335	244	22340.0293	403	22350.0293		
	100	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	363	244	22340.0294	403	22350.0294		
	110	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	384	244	22340.0295	403	22350.0295		
	120	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	413	244	22340.0296	403	22350.0296		
	130	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	432	244	22340.0297	403	22350.0297		
	140	24.8	23.4	40	17.0	43.1	34.5	28.5	20	-30	150	455	244	22340.0298	403	22350.0298		
25	50	31.0	30.4	50	22.0	54.8	43.5	36.5	25	-30	150	441	386	22340.0300	631	22350.0300		
	60	31.0	30.4	50	22.0	54.8	43.5	36.5	25	-30	150	473	386	22340.0301	631	22350.0301		
	70	31.0	30.4	50	22.0	54.8	43.5	36.5	25	-30	150	517	386	22340.0302	631	22350.0302		
	80	31.0	30.4	50	22.0	54.8	43.5	36.5	25	-30	150	555	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		
	100	31.0	30.4	50	22.0	54.8	43.5	36.5	25	-30	150	623	386	22340.0305	631	22350.0305		
	110	31.0	30.4	50	22.0	54.8	43.5	36.5	25	-30	150	658	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	742	386	22340.0308	631	22350.0308		
	140	31.0	30.4	50	22.0	54.8	43.5	36.5	25	-30	150	773	386	22340.0309	631	22350.0309		
150	31.0	30.4	50	22.0	54.8	43.5	36.5	25	-30	150	822	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.



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 button.

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. 246

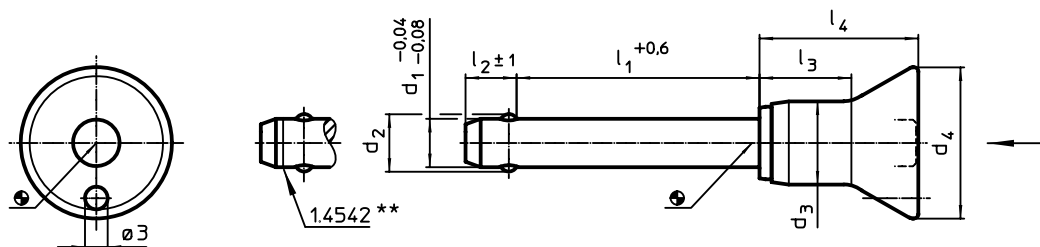
Locating Bushings, with flange, for ball lock pins and socket pins → p. 248

Retaining Cables → p. 249

Positioning Bushings, with collar, DIN 172 A → p. 424

Positioning Bushings, without collar, DIN 179 A → p. 427

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		max.		Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear 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	20	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	23	14	22340.1007	24	22350.1007
	50	5.5	10.3	20	6.0	11.6	21.0	5	250	24	14	22340.1008	24	22350.1008
	60	5.5	10.3	20	6.0	11.6	21.0	5	250	25	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	28	14	22340.1011	24	22350.1011

¹⁾ Shearing resistance similar to DIN 50141



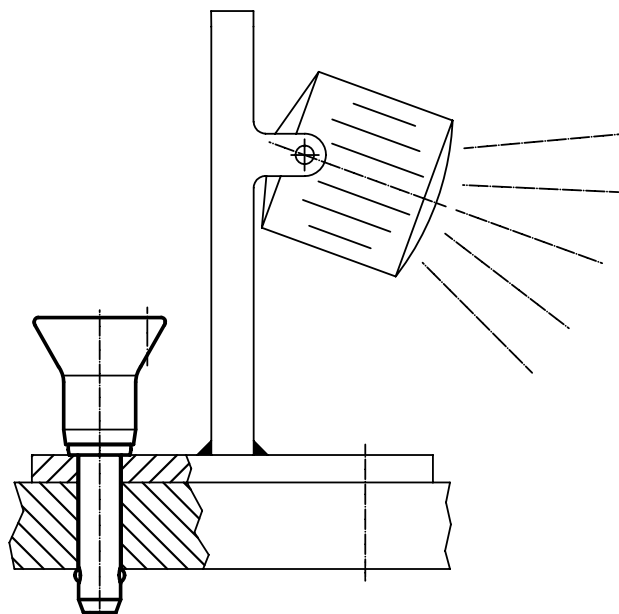
Dimensions								Location hole H11			Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d ₁ -0.04 -0.08	l ₁ +0.6	d ₂	d ₃	d ₄	l ₂ ±1	l ₃	l ₄		max.		Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
[mm]								[mm]	[°C]	[g]	[kN]		[kN]	
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	21	21	22340.1024	35	22350.1024
	25	7.0	10.3	20	7.0	11.6	21.0	6	250	22	21	22340.1025	35	22350.1025
	30	7.0	10.3	20	7.0	11.6	21.0	6	250	23	21	22340.1026	35	22350.1026
	35	7.0	10.3	20	7.0	11.6	21.0	6	250	24	21	22340.1027	35	22350.1027
	40	7.0	10.3	20	7.0	11.6	21.0	6	250	25	21	22340.1028	35	22350.1028
	45	7.0	10.3	20	7.0	11.6	21.0	6	250	26	21	22340.1029	35	22350.1029
	50	7.0	10.3	20	7.0	11.6	21.0	6	250	27	21	22340.1030	35	22350.1030
	60	7.0	10.3	20	7.0	11.6	21.0	6	250	29	21	22340.1019	35	22350.1019
	70	7.0	10.3	20	7.0	11.6	21.0	6	250	31	21	22340.1020	35	22350.1020
80	7.0	10.3	20	7.0	11.6	21.0	6	250	33	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	58	38	22340.1041	63	22350.1041
10	80	9.5	13.3	24	8.2	17.4	27.5	8	250	62	38	22340.1042	63	22350.1042
	90	9.5	13.3	24	8.2	17.4	27.5	8	250	65	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
	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
12	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
	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	81	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	98	87	22340.1070	144	22350.1070	
60	14.5	16.5	28	10.6	23.1	33.5	12	250	106	87	22340.1072	144	22350.1072	
70	14.5	16.5	28	10.6	23.1	33.5	12	250	115	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	132	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	 max.	 [g]	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, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear 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	193	155	22340.1071	257	22350.1071
	35	19.0	23.4	38	14.0	29.5	43.1	16	250	200	155	22340.1073	257	22350.1073
	40	19.0	23.4	38	14.0	29.5	43.1	16	250	207	155	22340.1075	257	22350.1075
	45	19.0	23.4	38	14.0	29.5	43.1	16	250	215	155	22340.1077	257	22350.1077
	50	19.0	23.4	38	14.0	29.5	43.1	16	250	223	155	22340.1078	257	22350.1078
	60	19.0	23.4	38	14.0	29.5	43.1	16	250	239	155	22340.1079	257	22350.1079
	70	19.0	23.4	38	14.0	29.5	43.1	16	250	254	155	22340.1080	257	22350.1080
	80	19.0	23.4	38	14.0	29.5	43.1	16	250	268	155	22340.1081	257	22350.1081
	90	19.0	23.4	38	14.0	29.5	43.1	16	250	284	155	22340.1082	257	22350.1082
	100	19.0	23.4	38	14.0	29.5	43.1	16	250	299	155	22340.1083	257	22350.1083
	110	19.0	23.4	38	14.0	29.5	43.1	16	250	317	155	22340.1084	257	22350.1084
	120	19.0	23.4	38	14.0	29.5	43.1	16	250	333	155	22340.1085	257	22350.1085
	130	19.0	23.4	38	14.0	29.5	43.1	16	250	349	155	22340.1086	257	22350.1086
	140	19.0	23.4	38	14.0	29.5	43.1	16	250	363	155	22340.1087	257	22350.1087
	150	19.0	23.4	38	14.0	29.5	43.1	16	250	376	155	22340.1088	257	22350.1088
20	50	24.8	23.4	38	17.0	29.5	43.1	20	250	282	244	22340.1089	406	22350.1089
	60	24.8	23.4	38	17.0	29.5	43.1	20	250	309	244	22340.1090	406	22350.1090
	70	24.8	23.4	38	17.0	29.5	43.1	20	250	333	244	22340.1091	403	22350.1091
	80	24.8	23.4	38	17.0	29.5	43.1	20	250	356	244	22340.1092	403	22350.1092
	90	24.8	23.4	38	17.0	29.5	43.1	20	250	381	244	22340.1093	403	22350.1093
	100	24.8	23.4	38	17.0	29.5	43.1	20	250	406	244	22340.1094	403	22350.1094
	110	24.8	23.4	38	17.0	29.5	43.1	20	250	424	244	22340.1095	403	22350.1095
	120	24.8	23.4	38	17.0	29.5	43.1	20	250	452	244	22340.1096	403	22350.1096
	130	24.8	23.4	38	17.0	29.5	43.1	20	250	472	244	22340.1097	403	22350.1097
	140	24.8	23.4	38	17.0	29.5	43.1	20	250	501	244	22340.1098	403	22350.1098
25	50	31.0	30.4	50	22.0	36.8	54.8	25	250	524	386	22340.1100	631	22350.1100
	60	31.0	30.4	50	22.0	36.8	54.8	25	250	562	386	22340.1101	631	22350.1101
	70	31.0	30.4	50	22.0	36.8	54.8	25	250	600	386	22340.1102	631	22350.1102
	80	31.0	30.4	50	22.0	36.8	54.8	25	250	643	386	22340.1103	631	22350.1103
	90	31.0	30.4	50	22.0	36.8	54.8	25	250	672	386	22340.1104	631	22350.1104
	100	31.0	30.4	50	22.0	36.8	54.8	25	250	713	386	22340.1105	631	22350.1105
	110	31.0	30.4	50	22.0	36.8	54.8	25	250	748	386	22340.1106	631	22350.1106
	120	31.0	30.4	50	22.0	36.8	54.8	25	250	798	386	22340.1107	631	22350.1107
	130	31.0	30.4	50	22.0	36.8	54.8	25	250	825	386	22340.1108	631	22350.1108
	140	31.0	30.4	50	22.0	36.8	54.8	25	250	873	386	22340.1109	631	22350.1109
	150	31.0	30.4	50	22.0	36.8	54.8	25	250	893	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 button.

MORE INFORMATION

Accessories

Can easily be fitted with retaining cable EH 22400.

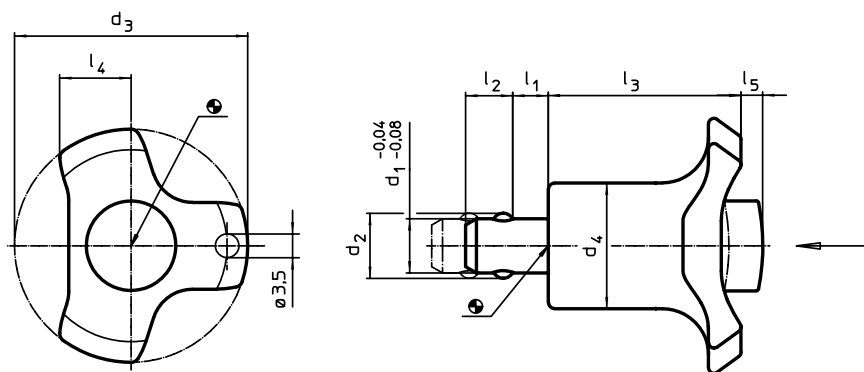
Further products

Locating Bushings, for ball lock pins and socket pins → p. 246

Locating Bushings, with flange, for ball lock pins and socket pins..... → p. 248

Retaining Cables..... → p. 249

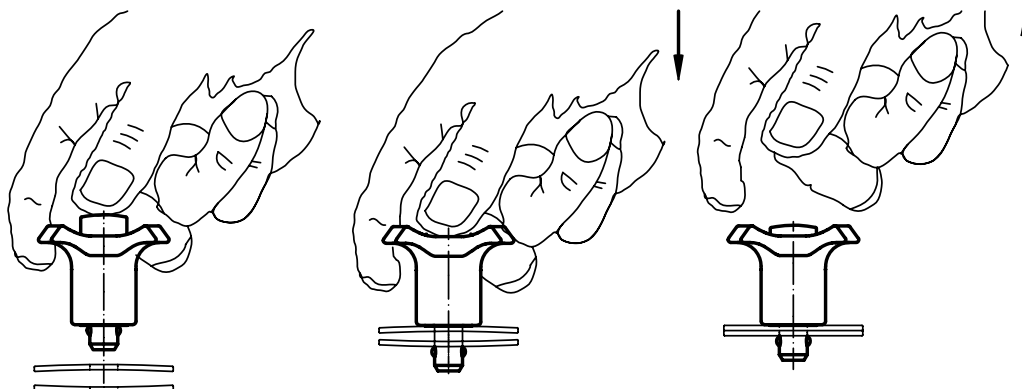
DRAWING



ORDER INFORMATION

Dimensions									Location hole H11	Clamp- ing force max.				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			min.	max.		
[mm]									[mm]	[N]	[°C]		[g]	
6	0 – 5	7.0	38	17.5	5.0	30.2	11.0	3	6	16	-30	80	22	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	24	22360.0020
	5 – 10	9.5	38	17.5	6.5	30.2	11.0	3	8	18	-30	80	26	22360.0022
10	0 – 5	12.0	47	23.0	8.7	36.0	11.0	4	10	21	-30	80	48	22360.0030
	5 – 10	12.0	47	23.0	8.7	36.0	11.0	4	10	23	-30	80	51	22360.0032
12	0 – 5	14.0	47	23.0	9.4	36.0	13.5	4	12	21	-30	80	51	22360.0040
	5 – 10	14.0	47	23.0	9.4	36.0	13.5	4	12	23	-30	80	55	22360.0042

APPLICATION EXAMPLE



Ball Lock Pins • self-locking, with standard handle

EH 22370. /EH 22380.



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 button.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.

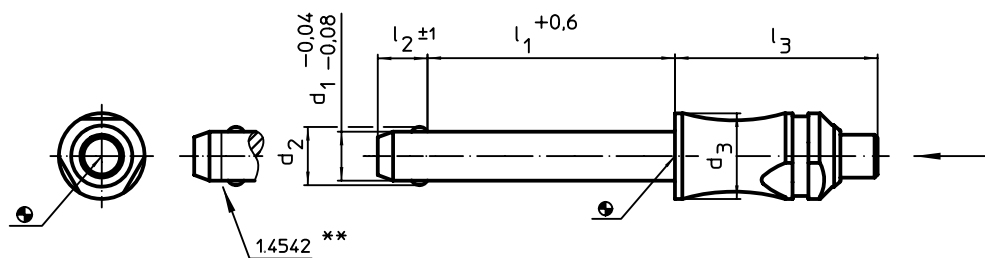
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Ball Lock Pins, self-locking, with standard handle, titanium → p. 234
 Locating Bushings, for ball lock pins and socket pins → p. 246
 Locating Bushings, with flange, for ball lock pins and socket pins → p. 248
 Retaining Cables → p. 249
 Positioning Bushings, with collar, DIN 172 A → p. 424
 Positioning Bushings, without collar, DIN 179 A → p. 427

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, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear 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	12	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	14	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

→

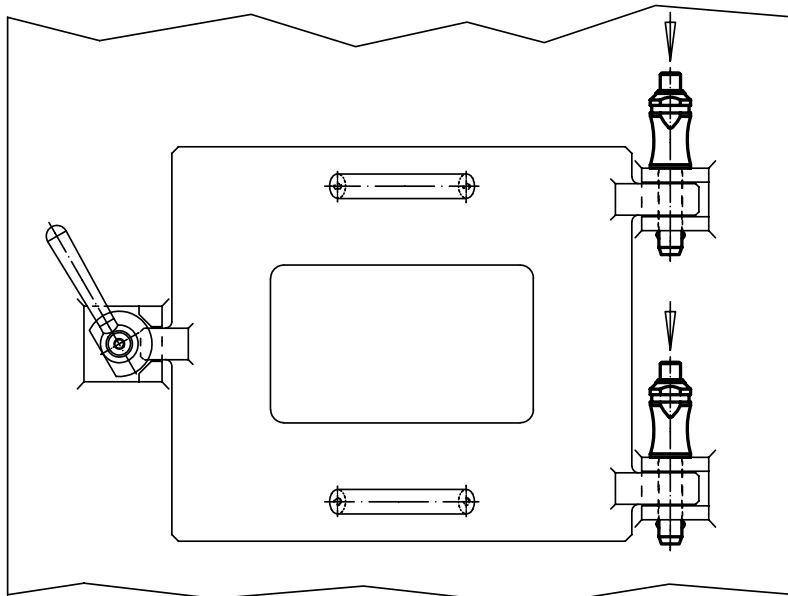
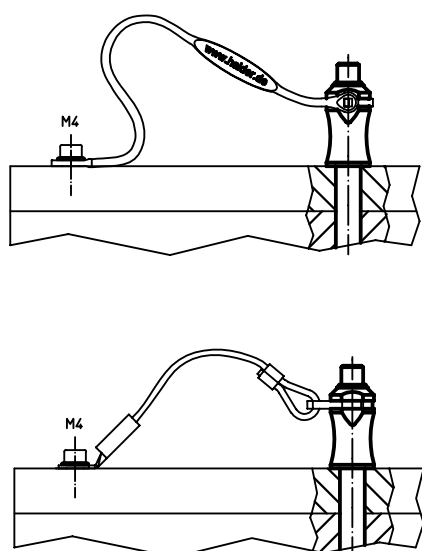
	Dimensions					Location hole H11	 max.	 [g]	Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
	d ₁ -0.04 -0.08	l ₁ +0.6	d ₂	d ₃	l ₂ ±1				Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
	[mm]					[mm]	[°C]		[kN]		[kN]	
6	10	7.0	10	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
8	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
	10	9.5	14	8.2	33.1	8	250	29	38	22370.0032	63	22380.0032
	15	9.5	14	8.2	33.1	8	250	31	38	22370.0033	63	22380.0033
	20	9.5	14	8.2	33.1	8	250	32	38	22370.0034	63	22380.0034
	25	9.5	14	8.2	33.1	8	250	34	38	22370.0035	63	22380.0035
	30	9.5	14	8.2	33.1	8	250	36	38	22370.0036	63	22380.0036
	35	9.5	14	8.2	33.1	8	250	38	38	22370.0037	63	22380.0037
	40	9.5	14	8.2	33.1	8	250	40	38	22370.0038	63	22380.0038
	45	9.5	14	8.2	33.1	8	250	42	38	22370.0039	63	22380.0039
10	50	9.5	14	8.2	33.1	8	250	44	38	22370.0040	63	22380.0040
	60	9.5	14	8.2	33.1	8	250	47	38	22370.0031	63	22380.0031
	70	9.5	14	8.2	33.1	8	250	51	38	22370.0041	63	22380.0041
	80	9.5	14	8.2	33.1	8	250	54	38	22370.0042	63	22380.0042
	90	9.5	14	8.2	33.1	8	250	58	38	22370.0043	63	22380.0043
	100	9.5	14	8.2	33.1	8	250	62	38	22370.0051	63	22380.0051
	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
12	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
12	120	12.0	14	9.6	33.1	10	250	98	60	22370.0058	100	22380.0058
	20	14.5	20	10.6	39.5	12	250	79	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	97	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
12	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	147	87	22370.0061	144	22380.0061
	110	14.5	20	10.6	39.5	12	250	156	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	 max.	 [g]	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				Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
[mm]						[mm]	[°C]		[kN]		[kN]	
16	30	19.0	20	14.0	39.5	16	250	123	155	22370.0086	257	22380.0086
	35	19.0	20	14.0	39.5	16	250	130	155	22370.0087	257	22380.0087
	40	19.0	20	14.0	39.5	16	250	138	155	22370.0088	257	22380.0088
	45	19.0	20	14.0	39.5	16	250	146	155	22370.0089	257	22380.0089
	50	19.0	20	14.0	39.5	16	250	154	155	22370.0090	257	22380.0090
	60	19.0	20	14.0	39.5	16	250	169	155	22370.0092	257	22380.0092
	70	19.0	20	14.0	39.5	16	250	185	155	22370.0094	257	22380.0094
	80	19.0	20	14.0	39.5	16	250	200	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	232	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	278	155	22370.0101	257	22380.0101
	140	19.0	20	14.0	39.5	16	250	294	155	22370.0102	257	22380.0102
	150	19.0	20	14.0	39.5	16	250	310	155	22370.0103	257	22380.0103
20	50	25.0	28	20.5	49.9	20	250	301	244	22370.0111	403	22380.0111
	60	25.0	28	20.5	49.9	20	250	326	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	375	244	22370.0116	403	22380.0116
	90	25.0	28	20.5	49.9	20	250	399	244	22370.0117	403	22380.0117
	100	25.0	28	20.5	49.9	20	250	423	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	472	244	22370.0124	403	22380.0124
	130	25.0	28	20.5	49.9	20	250	498	244	22370.0125	403	22380.0125
	140	25.0	28	20.5	49.9	20	250	520	244	22370.0126	403	22380.0126
25	50	30.8	28	22.0	49.9	25	250	399	386	22370.0129	631	22380.0129
	60	30.8	28	22.0	49.9	25	250	437	386	22370.0130	631	22380.0130
	70	30.8	28	22.0	49.9	25	250	477	386	22370.0131	631	22380.0131
	80	30.8	28	22.0	49.9	25	250	513	386	22370.0132	631	22380.0132
	90	30.8	28	22.0	49.9	25	250	551	386	22370.0133	631	22380.0133
	100	30.8	28	22.0	49.9	25	250	588	386	22370.0134	631	22380.0134
	110	30.8	28	22.0	49.9	25	250	627	386	22370.0135	631	22380.0135
	120	30.8	28	22.0	49.9	25	250	664	386	22370.0136	631	22380.0136
	130	30.8	28	22.0	49.9	25	250	703	386	22370.0137	631	22380.0137
	140	30.8	28	22.0	49.9	25	250	743	386	22370.0138	631	22380.0138
	150	30.8	28	22.0	49.9	25	250	779	386	22370.0139	631	22380.0139

¹⁾ Shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



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

EH 22390.

2



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 button.

MORE INFORMATION

Notes

Special types on request.

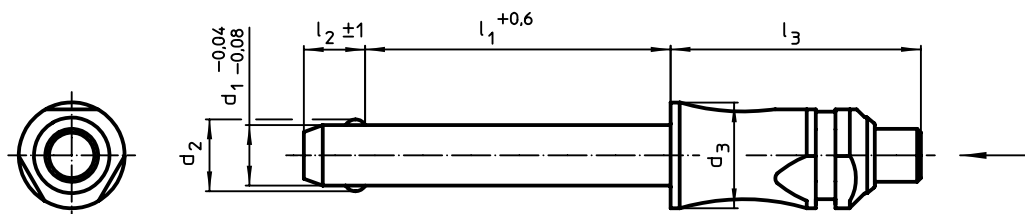
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Ball Lock Pins, self-locking, with standard handle → p. 231
Retaining Cables → p. 249

DRAWING



ORDER INFORMATION

Dimensions						Location hole H11	Shearing resistance, two- shear ¹⁾ min.	max.	[g]	Art. No.
d ₁ -0.04 -0.08	l ₁ +0.6	d ₂	d ₃	l ₂ ±1	l ₃	[mm]	[kN]	[°C]		
[mm]										
6	10	7.0	10	7.0	26.2	6	23	400	6.6	22390.0022
	20	7.0	10	7.0	26.2	6	23	400	7.7	22390.0024
	30	7.0	10	7.0	26.2	6	23	400	8.8	22390.0026
	40	7.0	10	7.0	26.2	6	23	400	9.9	22390.0028
	50	7.0	10	7.0	26.2	6	23	400	11.0	22390.0030
8	20	9.5	14	8.2	33.1	8	43	400	18.0	22390.0034
	30	9.5	14	8.2	33.1	8	43	400	20.0	22390.0036
	40	9.5	14	8.2	33.1	8	43	400	23.0	22390.0038
	50	9.5	14	8.2	33.1	8	43	400	25.0	22390.0040
10	20	12.0	14	9.6	33.1	10	43	400	22.0	22390.0044
	30	12.0	14	9.6	26.2	10	69	400	25.0	22390.0046
	40	12.0	14	9.6	26.2	10	69	400	29.0	22390.0048
	50	12.0	14	9.6	26.2	10	69	400	32.0	22390.0050
	60	12.0	14	9.6	26.2	10	69	400	35.0	22390.0052

¹⁾ Shearing resistance similar to DIN 50141 (determined by tests)

Ball Lock Pins • self-locking, with elastic handle

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 handle 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 button.

Characteristic

Types from stainless steel 1.4542 with marking below the balls.

MORE INFORMATION

Notes

Special types on request.

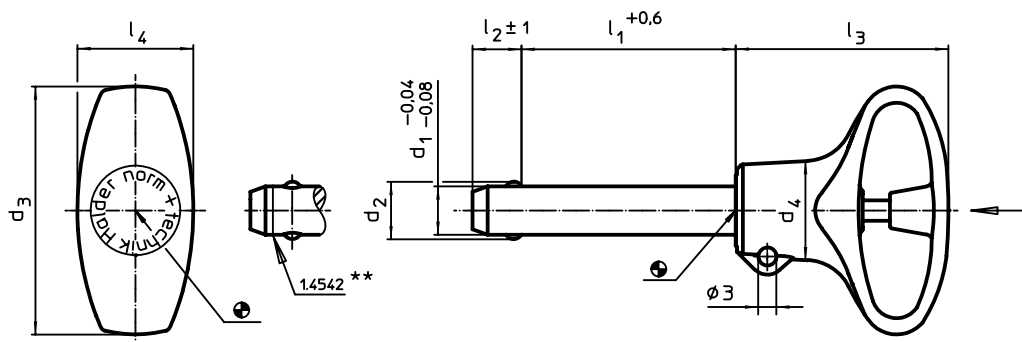
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins → p. 246
 Locating Bushings, with flange, for ball lock pins and socket pins → p. 248
 Retaining Cables → p. 249
 Positioning Bushings, with collar, DIN 172 A → p. 424
 Positioning Bushings, without collar, DIN 179 A → p. 427

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		min.	max.		Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear 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	9.2	14	22370.0712	24	22380.0712
	15	5.5	36	12.7	6.0	31.0	15.9	5	-30	80	9.9	14	22370.0713	24	22380.0713
	20	5.5	36	12.7	6.0	31.0	15.9	5	-30	80	11.0	14	22370.0714	24	22380.0714
	25	5.5	36	12.7	6.0	31.0	15.9	5	-30	80	11.0	14	22370.0715	24	22380.0715
	30	5.5	36	12.7	6.0	31.0	15.9	5	-30	80	12.0	14	22370.0716	24	22380.0716
6	10	7.0	36	12.7	7.0	31.0	15.9	6	-30	80	10.0	21	22370.0722	35	22380.0722
	15	7.0	36	12.7	7.0	31.0	15.9	6	-30	80	11.0	21	22370.0723	35	22380.0723
	20	7.0	36	12.7	7.0	31.0	15.9	6	-30	80	12.0	21	22370.0724	35	22380.0724
	25	7.0	36	12.7	7.0	31.0	15.9	6	-30	80	13.0	21	22370.0725	35	22380.0725
	30	7.0	36	12.7	7.0	31.0	15.9	6	-30	80	14.0	21	22370.0726	35	22380.0726
	35	7.0	36	12.7	7.0	31.0	15.9	6	-30	80	15.0	21	22370.0727	35	22380.0727
	40	7.0	36	12.7	7.0	31.0	15.9	6	-30	80	16.0	21	22370.0728	35	22380.0728
	45	7.0	36	12.7	7.0	31.0	15.9	6	-30	80	17.0	21	22370.0729	35	22380.0729
	50	7.0	36	12.7	7.0	31.0	15.9	6	-30	80	18.0	21	22370.0730	35	22380.0730

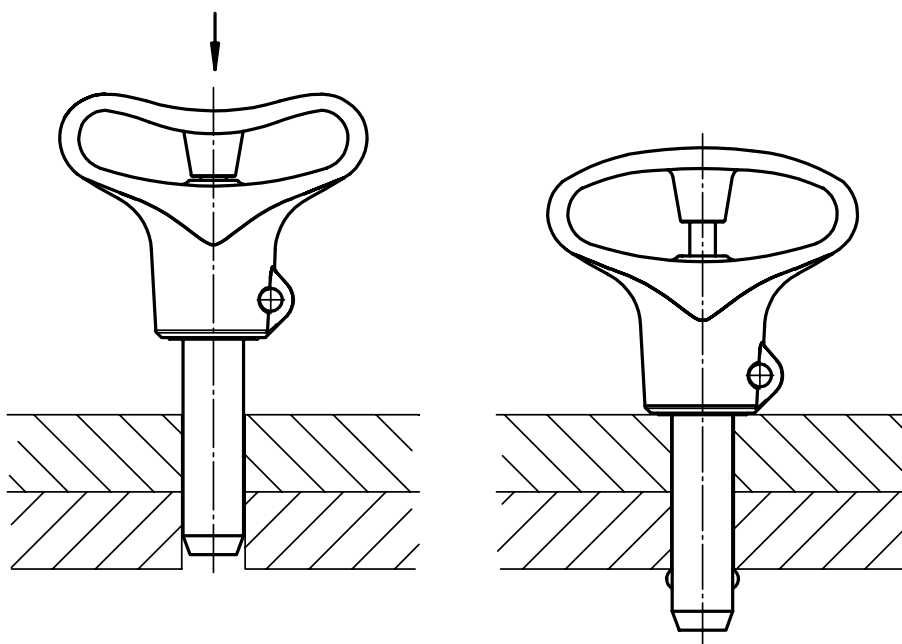
¹⁾ Shearing resistance similar to DIN 50141



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		min.	max.		Shearing resistance, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
[mm]								[mm]	[°C]		[g]	[kN]		[kN]	
8	20	9.5	41	16.4	8.2	34.8	19.2	8	-30	80	23.0	38	22370.0734	63	22380.0734
	25	9.5	41	16.4	8.2	34.8	19.2	8	-30	80	24.0	38	22370.0735	63	22380.0735
	30	9.5	41	16.4	8.2	34.8	19.2	8	-30	80	26.0	38	22370.0736	63	22380.0736
	35	9.5	41	16.4	8.2	34.8	19.2	8	-30	80	28.0	38	22370.0737	63	22380.0737
	40	9.5	41	16.4	8.2	34.8	19.2	8	-30	80	30.0	38	22370.0738	63	22380.0738
	45	9.5	41	16.4	8.2	34.8	19.2	8	-30	80	32.0	38	22370.0739	63	22380.0739
	50	9.5	41	16.4	8.2	34.8	19.2	8	-30	80	34.0	38	22370.0740	63	22380.0740
10	20	12.0	41	16.4	9.6	34.8	19.2	10	-30	80	30.0	60	22370.0744	100	22380.0744
	25	12.0	41	16.4	9.6	34.8	19.2	10	-30	80	32.0	60	22370.0745	100	22380.0745
	30	12.0	41	16.4	9.6	34.8	19.2	10	-30	80	35.0	60	22370.0746	100	22380.0746
	35	12.0	41	16.4	9.6	34.8	19.2	10	-30	80	38.0	60	22370.0747	100	22380.0747
	40	12.0	41	16.4	9.6	34.8	19.2	10	-30	80	41.0	60	22370.0748	100	22380.0748
	45	12.0	41	16.4	9.6	34.8	19.2	10	-30	80	44.0	60	22370.0749	100	22380.0749
	50	12.0	41	16.4	9.6	34.8	19.2	10	-30	80	47.0	60	22370.0750	100	22380.0750
	60	12.0	41	16.4	9.6	34.8	19.2	10	-30	80	53.0	60	22370.0752	100	22380.0752
12	25	14.5	49	21.2	10.6	40.5	24.8	12	-30	80	54.0	87	22370.0765	144	22380.0765
	30	14.5	49	21.2	10.6	40.5	24.8	12	-30	80	58.0	87	22370.0766	144	22380.0766
	35	14.5	49	21.2	10.6	40.5	24.8	12	-30	80	63.0	87	22370.0767	144	22380.0767
	40	14.5	49	21.2	10.6	40.5	24.8	12	-30	80	67.0	87	22370.0768	144	22380.0768
	45	14.5	49	21.2	10.6	40.5	24.8	12	-30	80	71.0	87	22370.0769	144	22380.0769
	50	14.5	49	21.2	10.6	40.5	24.8	12	-30	80	75.0	87	22370.0770	144	22380.0770
	60	14.5	49	21.2	10.6	40.5	24.8	12	-30	80	83.0	87	22370.0772	144	22380.0772
	70	14.5	49	21.2	10.6	40.5	24.8	12	-30	80	111.0	87	22370.0774	144	22380.0774
	80	14.5	49	21.2	10.6	40.5	24.8	12	-30	80	101.0	87	22370.0776	144	22380.0776
16	30	19.0	49	21.2	14.0	40.5	24.8	16	-30	80	92.0	155	22370.0786	257	22380.0786
	35	19.0	49	21.2	14.0	40.5	24.8	16	-30	80	98.0	155	22370.0787	257	22380.0787
	40	19.0	49	21.2	14.0	40.5	24.8	16	-30	80	109.0	155	22370.0788	257	22380.0788
	45	19.0	49	21.2	14.0	40.5	24.8	16	-30	80	114.0	155	22370.0789	257	22380.0789
	50	19.0	49	21.2	14.0	40.5	24.8	16	-30	80	125.0	155	22370.0790	257	22380.0790
	60	19.0	49	21.2	14.0	40.5	24.8	16	-30	80	139.0	155	22370.0792	257	22380.0792
	70	19.0	49	21.2	14.0	40.5	24.8	16	-30	80	156.0	155	22370.0794	257	22380.0794
	80	19.0	49	21.2	14.0	40.5	24.8	16	-30	80	171.0	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 button.

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. 240

Locating Bushings, for ball lock pins and socket pins → p. 246

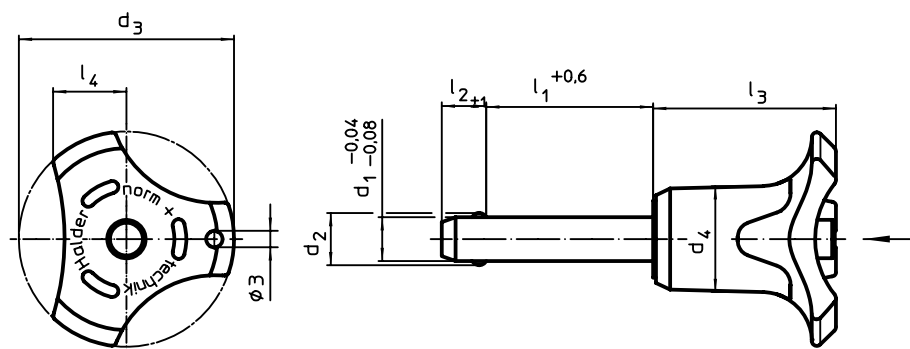
Locating Bushings, with flange, for ball lock pins and socket pins → p. 248

Retaining Cables → p. 249

Positioning Bushings, with collar, DIN 172 A → p. 424

Positioning Bushings, without collar, DIN 179 A → p. 427

DRAWING



ORDER INFORMATION

Dimensions								Location hole H11	Shearing resistance, two-shear ¹⁾ min.	Temperature		Weight	Art. No.			
d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄			min.	max.	[g]	orange	grey	blue	black
-0.04 -0.08	+0.6				±1			[mm]	[kN]	[°C]						
[mm]								[mm]								
5	10	5.5	33.2	14.5	6.0	26.7	10.8	5	14	-30	80	21	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	21	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



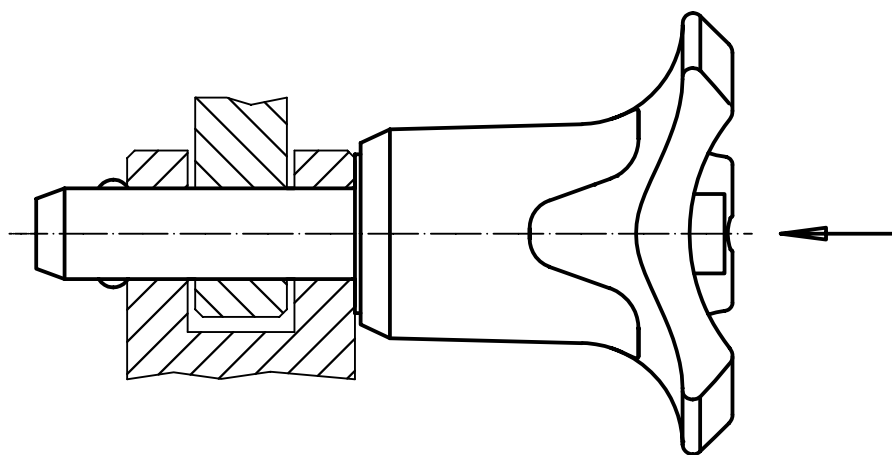
Dimensions								Location hole H11	Shearing resistance, two- shear ¹⁾ min.				Art. No.			
d ₁ -0.04 -0.08	l ₁ +0.6	d ₂	d ₃	d ₄	l ₂ ±1	l ₃	l ₄			min.	max.		orange	grey	blue	black
[mm]										[mm]	[kN]		[°C]		[g]	
6	10	7.0	33.2	14.5	7.0	26.7	10.8	6	21	-30	80	16	22370.0162	22370.0302	22370.0442	22370.0822
	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	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	38	22370.0172	22370.0312	22370.0452	22370.0832
	15	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	37	22370.0173	22370.0313	22370.0453	22370.0833
	20	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	39	22370.0174	22370.0314	22370.0454	22370.0834
	25	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	42	22370.0175	22370.0315	22370.0455	22370.0835
	30	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	44	22370.0176	22370.0316	22370.0456	22370.0836
	35	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	46	22370.0177	22370.0317	22370.0457	22370.0837
	40	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	47	22370.0178	22370.0318	22370.0458	22370.0838
	45	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	49	22370.0179	22370.0319	22370.0459	22370.0839
	50	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	51	22370.0180	22370.0320	22370.0460	22370.0840
	60	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	62	22370.0181	22370.0321	22370.0461	22370.0841
	70	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	65	22370.0182	22370.0322	22370.0462	22370.0842
	80	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	69	22370.0183	22370.0323	22370.0463	22370.0843
90	9.5	39.2	18.4	8.2	33.3	13.4	8	38	-30	80	36	22370.0171	22370.0311	22370.0451	22370.0831	
100	9.5	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	46	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	91	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, two- shear 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			orange	grey		blue	black			
[mm]										[mm]	[kN]		min.	max.	[°C]	[g]	
16	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	
	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	
20	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	
	100	25.0	57.1	33.8	20.5	50.7	21.5	20	244	-30	80	444	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	
	25	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	503	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	536	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	
100		30.8	57.1	33.8	22.0	50.7	21.5	25	386	-30	80	612	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	689	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	811	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.



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 button.

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.

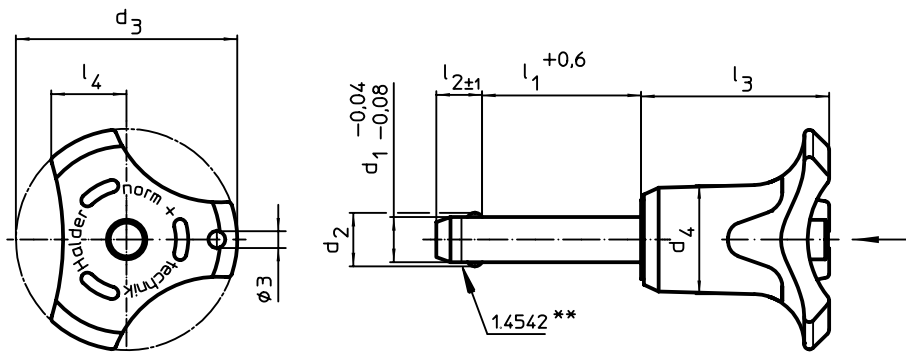
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Ball Lock Pins, self-locking, with combination handle. → p. 237
 Locating Bushings, for ball lock pins and socket pins → p. 246
 Locating Bushings, with flange, for ball lock pins and socket pins. → p. 248
 Retaining Cables → p. 249
 Positioning Bushings, with collar, DIN 172 A → p. 424
 Positioning Bushings, without collar, DIN 179 A → p. 427

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions								Location hole H11	Shearing resistance, two-shear ¹⁾ min.	Temperature		Weight	Art. No.			
d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄			min.	max.		orange	grey	blue	black
-0.04 -0.08	+0.6				±1			[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
5	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



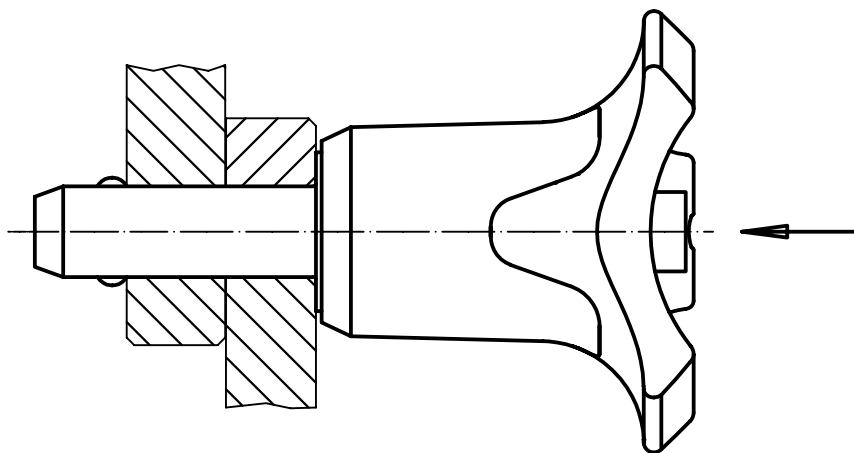
Dimensions								Location hole H11	Shearing resistance, two- shear ¹⁾ min.	 min. max.		 [g]	Art. No.			
d ₁ -0.04 +0.08	l ₁ +0.6	d ₂	d ₃	d ₄	l ₂ ±1	l ₃	l ₄						orange	grey	blue	black
[mm]								[mm]	[kN]	[°C]		[g]				
6	10	7.0	33.2	14.5	7.0	26.7	10.8	6	35	-30	80	16	22380.0162	22380.0302	22380.0442	22380.0822
	15	7.0	33.2	14.5	7.0	26.7	10.8	6	35	-30	80	12	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	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	38	22380.0172	22380.0312	22380.0452	22380.0832
	15	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	58	22380.0173	22380.0313	22380.0453	22380.0833
	20	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	40	22380.0174	22380.0314	22380.0454	22380.0834
	25	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	42	22380.0175	22380.0315	22380.0455	22380.0835
	30	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	42	22380.0176	22380.0316	22380.0456	22380.0836
	35	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	46	22380.0177	22380.0317	22380.0457	22380.0837
	40	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	47	22380.0178	22380.0318	22380.0458	22380.0838
	45	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	49	22380.0179	22380.0319	22380.0459	22380.0839
	50	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	51	22380.0180	22380.0320	22380.0460	22380.0840
	60	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	62	22380.0181	22380.0321	22380.0461	22380.0841
	70	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	65	22380.0182	22380.0322	22380.0462	22380.0842
10	80	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	69	22380.0183	22380.0323	22380.0463	22380.0843
	90	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	36	22380.0171	22380.0311	22380.0451	22380.0831
	100	9.5	39.2	18.4	8.2	33.3	13.4	8	63	-30	80	54	22380.0161	22380.0301	22380.0441	22380.0821
	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	53	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
12	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
	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
12	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, two- shear ¹⁾ min.	 min. max.		 [g]	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			orange	grey		blue	black			
[mm]										[mm]	[kN]		[°C]				
16	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	
	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	
20	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	
	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	
	25	50	30.8	57.1	33.8	22.0	50.7	21.5	25	631	-30	80	425	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	457	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	540	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	573	22380.0273	22380.0413	22380.0553	22380.0925	
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.

2



PRODUCT DESCRIPTION

For fixing and clamping of two parts or play-free application to the counterpart. Clamping range infinitely variable by hand via nut/lock nut.

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 button.

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. 246

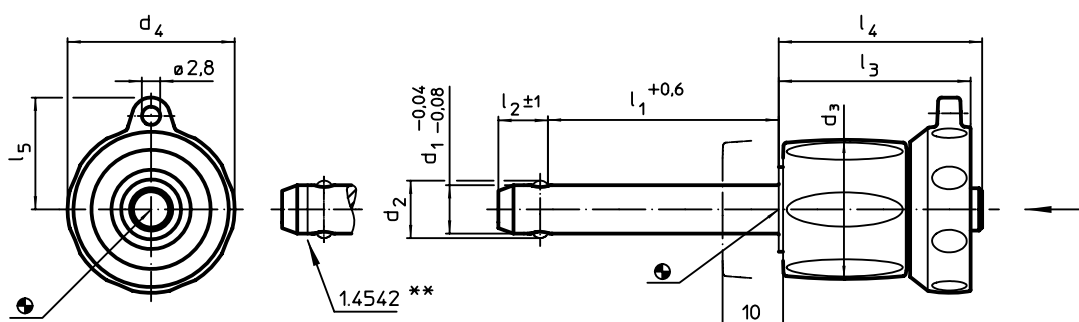
Locating Bushings, with flange, for ball lock pins and socket pins → p. 248

Retaining Cables → p. 249

Positioning Bushings, with collar, DIN 172 A → p. 424

Positioning Bushings, without collar, DIN 179 A → p. 427

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, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear 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	26	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	26	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	27	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	27	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

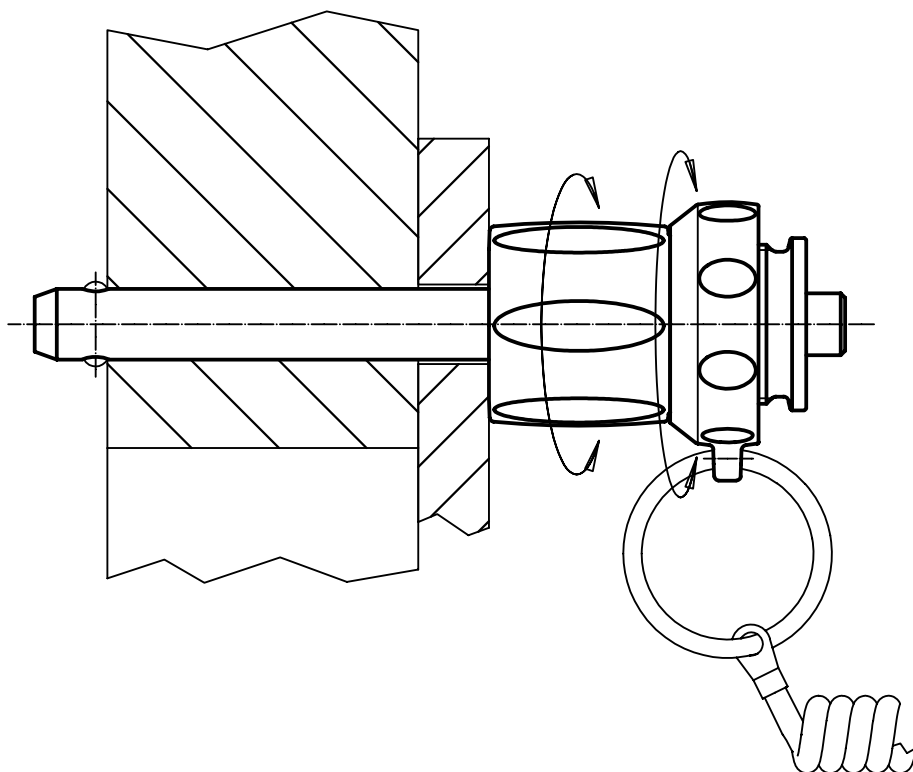
¹⁾ Shearing resistance similar to DIN 50141



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, two-shear ¹⁾ min.	Art. No.	Shearing resistance, two-shear ¹⁾ min.	Art. No.
[mm]										[mm]	[°C]		[g]	[kN]		[kN]
8	10 – 20	9.5	23.0	27.6	8.2	31.2	33.1	18.0	8	-30	80	58	38	22370.0614	63	22380.0614
	15 – 25	9.5	23.0	27.6	8.2	31.2	33.1	18.0	8	-30	80	60	38	22370.0615	63	22380.0615
	20 – 30	9.5	23.0	27.6	8.2	31.2	33.1	18.0	8	-30	80	60	38	22370.0616	63	22380.0616
	25 – 35	9.5	23.0	27.6	8.2	31.2	33.1	18.0	8	-30	80	62	38	22370.0617	63	22380.0617
	30 – 40	9.5	23.0	27.6	8.2	31.2	33.1	18.0	8	-30	80	64	38	22370.0618	63	22380.0618
	35 – 45	9.5	23.0	27.6	8.2	31.2	33.1	18.0	8	-30	80	65	38	22370.0619	63	22380.0619
	40 – 50	9.5	23.0	27.6	8.2	31.2	33.1	18.0	8	-30	80	65	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	65	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	80	60	22370.0630	100	22380.0630
12	50 – 60	12.0	23.0	27.6	9.6	31.2	33.1	18.0	10	-30	80	86	60	22370.0632	100	22380.0632
	15 – 25	14.5	29.0	34.6	10.6	36.7	39.5	21.8	12	-30	80	121	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	130	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	130	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	134	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	138	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	142	87	22370.0640	144	22380.0640
16	50 – 60	14.5	29.0	34.6	10.6	36.7	39.5	21.8	12	-30	80	150	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	159	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	167	87	22370.0646	144	22380.0646
	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	165	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	173	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	180	155	22370.0659	257	22380.0659
16	40 – 50	19.0	29.0	34.6	14.0	36.7	39.5	21.8	16	-30	80	188	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	203	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	218	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	234	155	22370.0666	257	22380.0666

¹⁾ Shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



Socket Pins • with spring-loaded balls

EH 22400.

2



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.

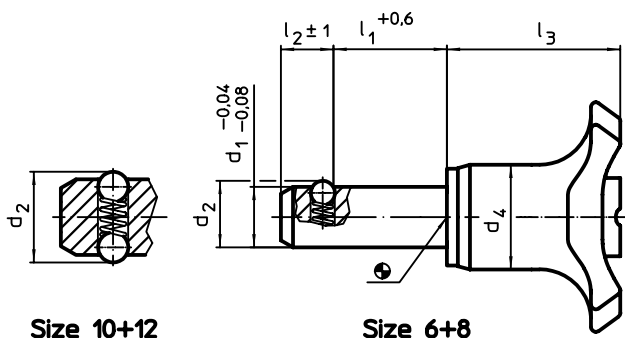
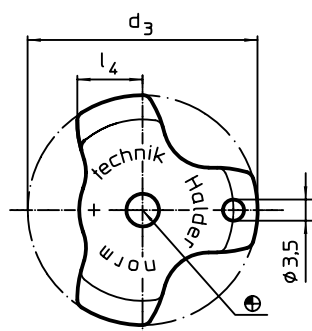
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Locating Bushings, for ball lock pins and socket pins → p. 246
Locating Bushings, with flange, for ball lock pins and socket pins. → p. 248
Retaining Cables → p. 249
Positioning Bushings, with collar, DIN 172 A → p. 424
Positioning Bushings, without collar, DIN 179 A → p. 427

DRAWING



ORDER INFORMATION

Dimensions								Location hole H11	Shearing resist- ance, two-shear	Tensile force max. unlubri- cated	 min. max.		 [g]	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							
[mm]								[mm]	[kN]	[N]	[°C]		[g]	
6	10	6.5	38	17.3	5.0	27.0	10.8	6	22	8	-30	80	16	22400.0062
	15	6.5	38	17.3	5.0	27.0	10.8	6	22	8	-30	80	17	22400.0064
	20	6.5	38	17.3	5.0	27.0	10.8	6	22	8	-30	80	18	22400.0066
	25	6.5	38	17.3	5.0	27.0	10.8	6	22	8	-30	80	19	22400.0068
	30	6.5	38	17.3	5.0	27.0	10.8	6	22	8	-30	80	19	22400.0070
	50	6.5	38	17.3	5.0	27.0	10.8	6	22	8	-30	80	24	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	23	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	40	22400.0095
10	15	12.0	38	17.3	8.7	28.6	10.8	10	62	30	-30	80	30	22400.0104
	20	12.0	38	17.3	8.7	28.6	10.8	10	62	30	-30	80	34	22400.0106
	25	12.0	38	17.3	8.7	28.6	10.8	10	62	30	-30	80	37	22400.0108
	30	12.0	38	17.3	8.7	28.6	10.8	10	62	30	-30	80	40	22400.0110
	50	12.0	38	17.3	8.7	28.6	10.8	10	62	30	-30	80	52	22400.0115
12	20	14.5	38	17.3	9.5	28.6	10.8	12	90	32	-30	80	42	22400.0122
	30	14.5	38	17.3	9.5	28.6	10.8	12	90	32	-30	80	51	22400.0124
	40	14.5	38	17.3	9.5	28.6	10.8	12	90	32	-30	80	60	22400.0126
	50	14.5	38	17.3	9.5	28.6	10.8	12	90	32	-30	80	69	22400.0128

Locating Bushings • for ball lock pins and socket pins

EH 22400.

2



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

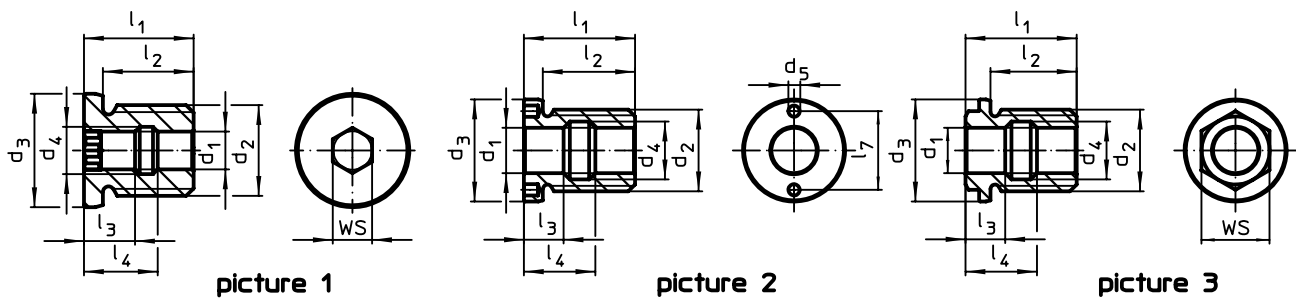
Assembly

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



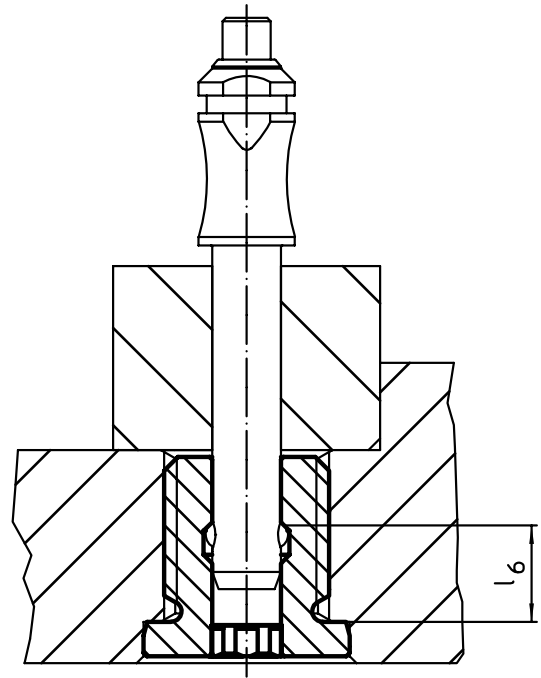
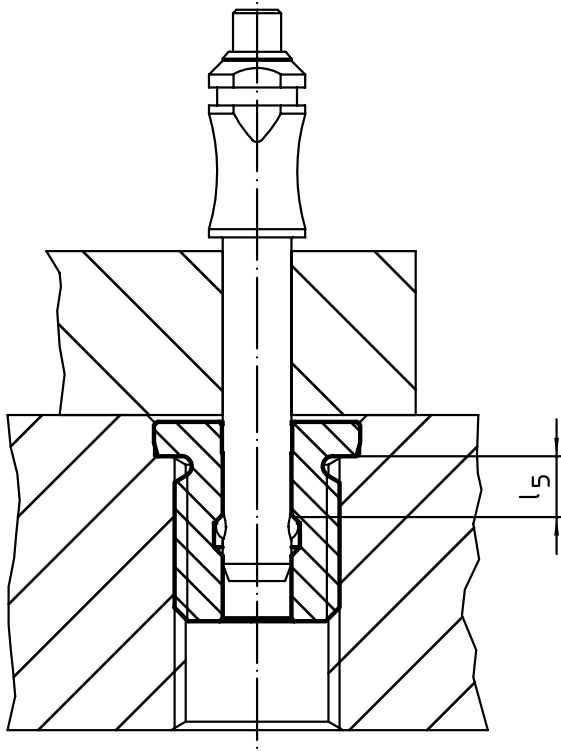
ORDER INFORMATION

d ₁ H11	d ₂	d ₃ h9	d ₄	d ₅ +0.1	Dimensions							WS		Art. No.
					l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇			
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	19	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	76	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	–	248	22400.0925
20	M36	43	25.5	5.1	49	42	17.5	31.5	11.9	23.1	30	–	364	22400.0926
25	M42	50	32.0	5.1	65	57	26.5	38.5	13.3	21.8	36	–	350	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	350	22400.0924

ACCESSORIES

	Suitable for size d ₁ [mm]	For finish picture	Pin spacing ±0.1 [mm]	Pin diameter -0.1 [mm]	Square drive [in]		Art. No.
						[g]	
adjustable face wrench, offset							
	10/12/16/20/25	2	–	5		309	22350.1991
face and socket wrench							
	16/20	2	30	5	1/2	243	22350.1998
	25	2	36	5	1/2	363	22350.1999

APPLICATION EXAMPLE



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.

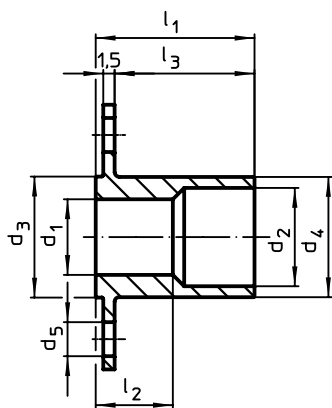
The bearing surface of the flange ensures optimum force distribution at components with thin walls.

All versions are corrosion and abrasion resistant.

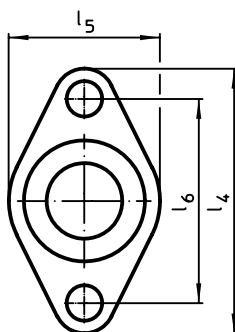
Material

- Stainless steel 1.4305

DRAWING



picture 1

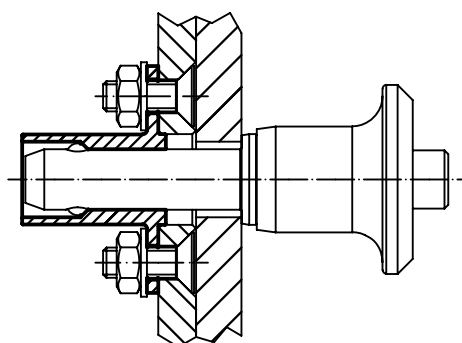


picture 2

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	l ₇		
[mm]														[g]	
with oval flange – picture 1															
5	8	10	9.9	3.4	–	–	12	5.4	9.5	25	15	19	5.8		22400.0305
6	8	10	9.9	3.4	–	–	13	5.3	10.5	25	15	19	5.5		22400.0306
8	10	12	11.9	4.5	–	–	19	10.3	16.5	30	18	22	9.8		22400.0308
10	13	16	15.9	4.5	–	–	21	10.2	18.5	35	20	27	18.0		22400.0310
12	15	19	18.9	4.5	–	–	27	15.2	24.5	40	24	30	33.0		22400.0312
16	20	24	23.9	5.5	–	–	30	15.3	27.5	50	30	40	51.0		22400.0316
with round flange – picture 2															
5	8	10	9.9	3.4	25	19	12	5.4	9.5	–	–	–	8.3		22400.0405
6	8	10	9.9	3.4	25	19	13	5.3	10.5	–	–	–	8.1		22400.0406
8	10	12	11.9	4.5	30	22	19	10.3	16.5	–	–	–	15.0		22400.0408
10	13	16	15.9	4.5	35	27	21	10.2	18.5	–	–	–	23.0		22400.0410
12	15	19	18.9	4.5	40	30	27	15.2	24.5	–	–	–	40.0		22400.0412
16	20	24	23.9	5.5	50	40	30	15.3	27.5	–	–	–	62.0		22400.0416

APPLICATION EXAMPLE



Retaining Cables

EH 22400.

2



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

Eyelet

- 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

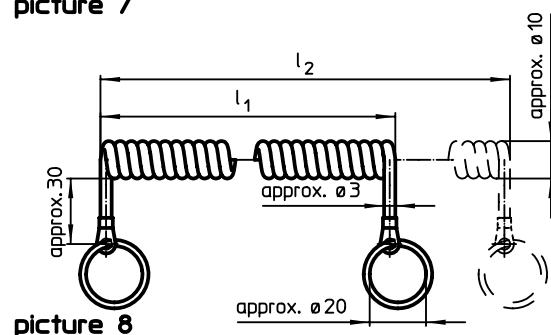
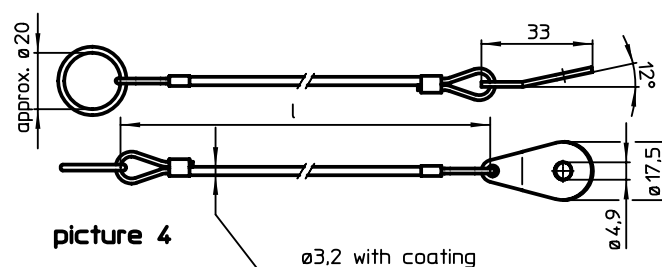
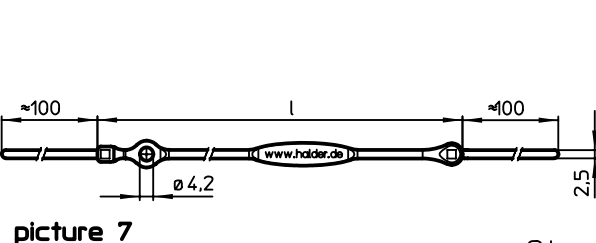
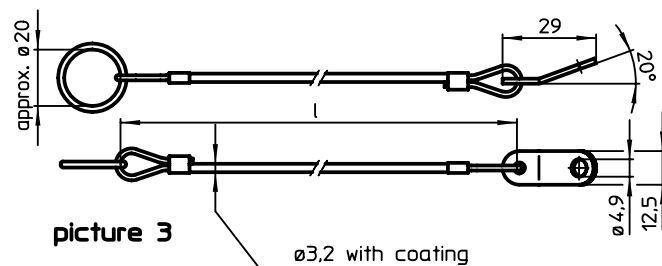
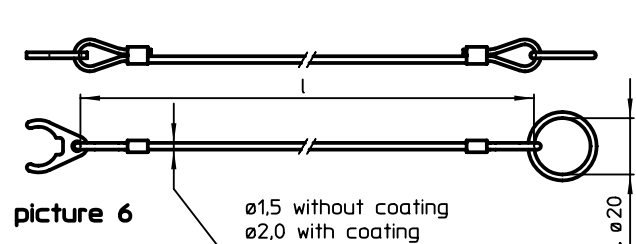
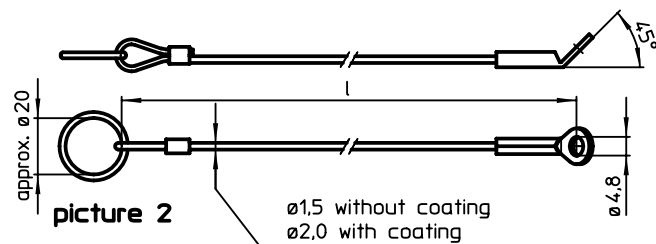
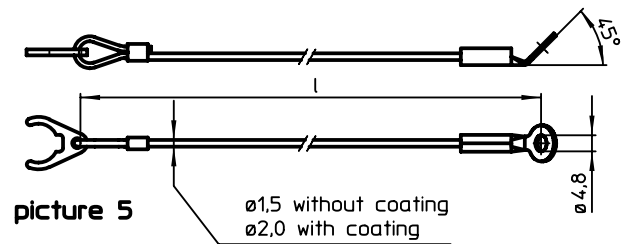
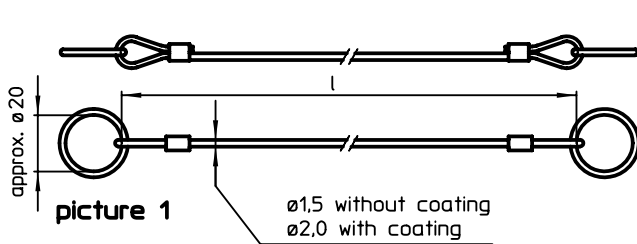
Notes

Special types on request. Models picture 3 and picture 4 correspond to MIL-DTL-83420.

Further products

Retaining Cables, for threaded lock pin → p. 279

DRAWING



ORDER INFORMATION

2

I	Dimensions		Suitable for size	 max.		Art. No.					
	I ₁	I ₂ max.				Thermo-plastic PA 6 coated, black	Thermo-plastic PA 6 coated, clear	Without coating	Thermoplastic PVC coated, green (transparent)	Thermo-plastic PA 6, grey	Thermo-plastic PUR, black
	[mm]		[mm]	[°C]	[g]						
stainless steel, with 2 attaching rings – picture 1											
150	–	–	–	80	7.8	22400.0940 ¹⁾	22400.0950 ¹⁾	–	–	–	–
				250	7.4	–	–	22400.0930 ¹⁾	–	–	–
200	–	–	–	80	8.4	22400.0941 ¹⁾	22400.0952 ¹⁾	–	–	–	–
				250	7.9	–	–	22400.0931 ¹⁾	–	–	–
300	–	–	–	80	9.7	22400.0943 ¹⁾	22400.0956 ¹⁾	–	–	–	–
				250	8.9	–	–	22400.0933 ¹⁾	–	–	–
stainless steel, with attaching ring and eyelet – picture 2											
150	–	–	–	80	7.7	22400.0945 ¹⁾	22400.0960 ¹⁾	–	–	–	–
				250	6.6	–	–	22400.0935 ¹⁾	–	–	–
200	–	–	–	80	7.5	22400.0946 ¹⁾	22400.0962 ¹⁾	–	–	–	–
				250	7.0	–	–	22400.0936 ¹⁾	–	–	–
300	–	–	–	80	8.6	22400.0948 ¹⁾	22400.0966 ¹⁾	–	–	–	–
				250	8.0	–	–	22400.0938 ¹⁾	–	–	–
stainless steel, with fixing tab, rectangular and attaching ring – picture 3											
150	–	–	–	80	11.0	–	–	–	22400.1301 ¹⁾	–	–
200	–	–	–	80	12.0	–	–	–	22400.1302 ¹⁾	–	–
300	–	–	–	80	14.0	–	–	–	22400.1303 ¹⁾	–	–
stainless steel, with fixing tab in drop shape and attaching ring – picture 4											
150	–	–	–	80	11.0	–	–	–	22400.1311 ¹⁾	–	–
200	–	–	–	80	12.0	–	–	–	22400.1312 ¹⁾	–	–
300	–	–	–	80	14.0	–	–	–	22400.1313 ¹⁾	–	–
stainless steel, with holding clip and eyelet – picture 5											
150	–	–	5/ 6	80	6.2	22400.1101 ²⁾	22400.1001 ²⁾	–	–	–	–
				250	5.8	–	–	22400.1201 ²⁾	–	–	–
			8/10	80	7.1	22400.1121 ²⁾	22400.1021 ²⁾	–	–	–	–
				250	6.7	–	–	22400.1221 ²⁾	–	–	–
			12/16	80	8.2	22400.1141 ²⁾	22400.1041 ²⁾	–	–	–	–
				250	7.9	–	–	22400.1241 ²⁾	–	–	–
200	–	–	20/25	80	11.0	22400.1161 ²⁾	22400.1061 ²⁾	–	–	–	–
				250	11.0	–	–	22400.1261 ²⁾	–	–	–
			5/ 6	80	6.8	22400.1102 ²⁾	22400.1002 ²⁾	–	–	–	–
				250	6.3	–	–	22400.1202 ²⁾	–	–	–
			8/10	80	7.7	22400.1122 ²⁾	22400.1022 ²⁾	–	–	–	–
				250	7.2	–	–	22400.1222 ²⁾	–	–	–
300	–	–	12/16	80	8.9	22400.1142 ²⁾	22400.1042 ²⁾	–	–	–	–
				250	8.4	–	–	22400.1242 ²⁾	–	–	–
			20/25	80	12.0	22400.1162 ²⁾	22400.1062 ²⁾	–	–	–	–
				250	11.0	–	–	22400.1262 ²⁾	–	–	–
			5/ 6	80	8.0	22400.1103 ²⁾	22400.1003 ²⁾	–	–	–	–
				250	7.3	–	–	22400.1203 ²⁾	–	–	–
300	–	–	8/10	80	8.9	22400.1123 ²⁾	22400.1023 ²⁾	–	–	–	–
				250	8.2	–	–	22400.1223 ²⁾	–	–	–
			12/16	80	10.0	22400.1143 ²⁾	22400.1043 ²⁾	–	–	–	–
				250	9.5	–	–	22400.1243 ²⁾	–	–	–
			20/25	80	13.0	22400.1163 ²⁾	22400.1063 ²⁾	–	–	–	–
				250	13.0	–	–	22400.1263 ²⁾	–	–	–
stainless steel, with holding clip and attaching ring – picture 6											
150	–	–	5/ 6	80	6.3	22400.1111 ²⁾	22400.1011 ²⁾	–	–	–	–
				250	5.9	–	–	22400.1211 ²⁾	–	–	–
			8/10	80	7.3	22400.1131 ²⁾	22400.1031 ²⁾	–	–	–	–
				250	6.8	–	–	22400.1231 ²⁾	–	–	–
			12/16	80	8.4	22400.1151 ²⁾	22400.1051 ²⁾	–	–	–	–
				250	8.0	–	–	22400.1251 ²⁾	–	–	–
300	–	–	20/25	80	11.0	22400.1171 ²⁾	22400.1071 ²⁾	–	–	–	–
				250	11.0	–	–	22400.1271 ²⁾	–	–	–

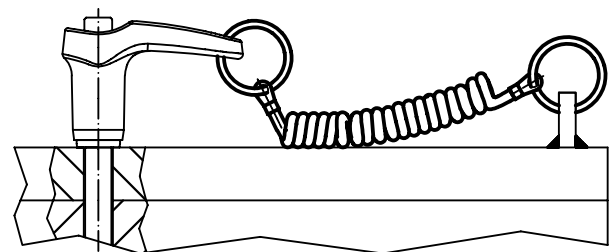
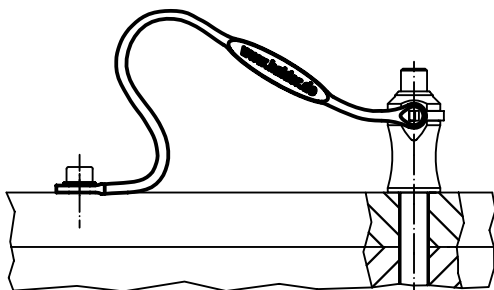
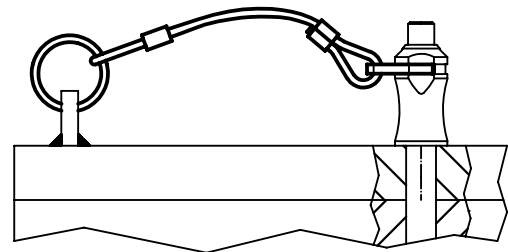
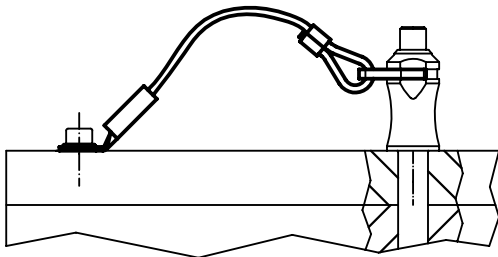
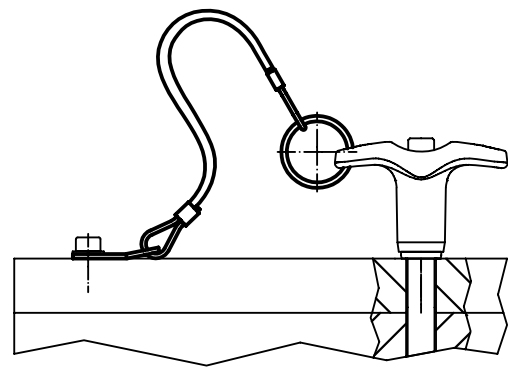
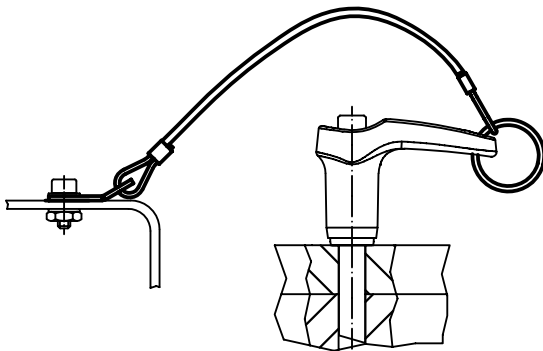
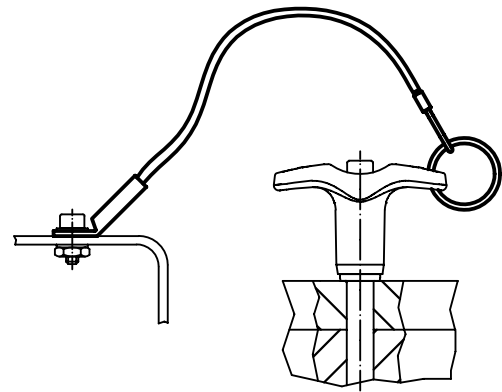
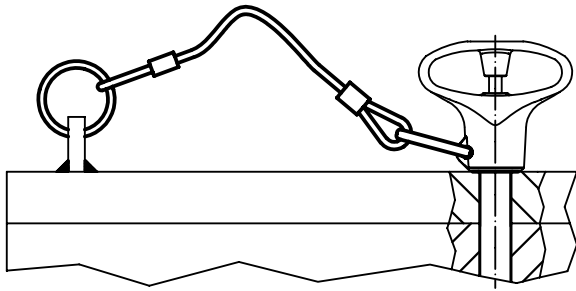
¹⁾ not for ball lock pins, basic type²⁾ for ball lock pins, basic type

I	Dimensions		Suitable for size			Art. No.								
	I ₁	I ₂ max.		max.	Thermo-plastic PA 6 coated, black	Thermo-plastic PA 6 coated, clear	Without coating	Thermoplastic PVC coated, green (transparent)	Thermo-plastic PA 6, grey	Thermo-plastic PUR, black				
	[mm]		[mm]	[°C]	[g]									
200	–	–	5/ 6	80	7.0	22400.1112²⁾	22400.1012²⁾	–	–	–	–			
				250	6.4	–	–	22400.1212²⁾	–	–	–			
			8/10	80	7.8	22400.1132²⁾	22400.1032²⁾	–	–	–	–			
				250	7.3	–	–	22400.1232²⁾	–	–	–			
			12/16	80	9.0	22400.1152²⁾	22400.1052²⁾	–	–	–	–			
				250	8.5	–	–	22400.1252²⁾	–	–	–			
			20/25	80	12.0	22400.1172²⁾	22400.1072²⁾	–	–	–	–			
				250	12.0	–	–	22400.1272²⁾	–	–	–			
			300	–	–	5/ 6	80	8.2	22400.1113²⁾	22400.1013²⁾	–	–	–	–
							250	7.4	–	–	22400.1213²⁾	–	–	–
8/10	80	9.0				22400.1133²⁾	22400.1033²⁾	–	–	–	–			
	250	8.6				–	–	22400.1233²⁾	–	–	–			
12/16	80	10.0				22400.1153²⁾	22400.1053²⁾	–	–	–	–			
	250	9.5				–	–	22400.1253²⁾	–	–	–			
20/25	80	13.0				22400.1173²⁾	22400.1073²⁾	–	–	–	–			
	250	13.0				–	–	22400.1273²⁾	–	–	–			
with double sided clamping/indexing mechanism – picture 7														
150	–	–				–	80	1.8	–	–	–	–	22400.0970	–
250	–	–	–	80	2.4	–	–	–	–	22400.0974	–			
spiral form, with attaching rings – picture 8														
–	100	600	–	80	15.0	–	–	–	–	–	22400.0980¹⁾			
	200	1200	–	80	16.0	–	–	–	–	–	22400.0982¹⁾			

¹⁾ not for ball lock pins, basic type²⁾ for ball lock pins, basic type

APPLICATION EXAMPLE

2



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

- Case-hardened steel, nitrided, yellow similar to RAL 1016

Spring

- Stainless steel

Assembly

Simple H11 boreholes are sufficient.

Mounting:

- Press in the button and hold it down
- Insert the lifting pin
- Release the button (The button must be back in its original position)

Dismantling:

- Press in the button and hold it down.

- Remove the lifting pin.

- Release the button.

Operation

Clamp lock pins can be used in blind holes. The holding forces achieved in an H11 borehole depends on the material of the counterpart:

- Steel, hardened - min. 30 N
- Steel, soft - min. 120 N
- Stainless steel, soft - min. 120 N
- Al, aluminum alloy - min. 250 N

MORE INFORMATION

Notes

Special types on request.

The clamp lock pin must not be used for lifting loads.

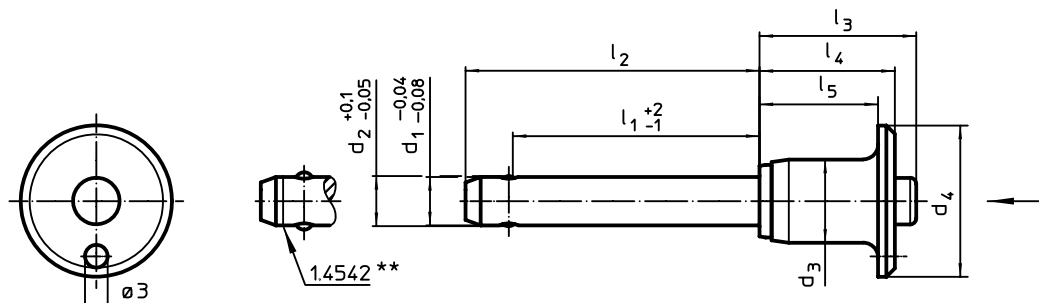
Accessories

Can easily be fitted with retaining cable EH 22400.

Further products

Retaining Cables → p. 249

DRAWING



** Types from stainless steel 1.4542 with marking.

ORDER INFORMATION

Dimensions									Holding force ¹⁾ min. Steel, soft	Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d ₁ -0.04 -0.08	l ₁ +2 -1	d ₂ +0.1 -0.05	d ₃	d ₄	l ₂	l ₃	l ₄	l ₅			min.	max.		Shearing resistance, two-shear ²⁾ min.	Art. No.	Shearing resistance, two-shear ²⁾ min.	Art. No.
[mm]											[N]	[mm]		[°C]	[g]	[kN]	
6	10	6.2	11.3	20	17.4	20.7	17.6	14.6	120	6	-30	150	13	21	22410.0022	35	22420.0022
	20	6.2	11.3	20	27.4	20.7	17.6	14.6	120	6	-30	150	15	21	22410.0024	35	22420.0024
	40	6.2	11.3	20	47.4	20.7	17.6	14.6	120	6	-30	150	19	21	22410.0028	35	22420.0028
	60	6.2	11.3	20	67.4	20.7	17.6	14.6	120	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	120	8	-30	150	25	38	22410.0042	63	22420.0042
	20	8.3	14.1	25	28.6	27.3	22.6	18.6	120	8	-30	150	29	38	22410.0044	63	22420.0044
	40	8.3	14.1	25	48.6	27.3	22.6	18.6	120	8	-30	150	36	38	22410.0048	63	22420.0048
	60	8.3	14.1	25	68.6	27.3	22.6	18.6	120	8	-30	150	43	38	22410.0052	63	22420.0052
	80	8.3	14.1	25	88.6	27.3	22.6	18.6	120	8	-30	150	51	38	22410.0056	63	22420.0056

¹⁾ The holding force depends on the material of the counterpart - for further values see "operation".

²⁾ Shearing resistance similar to DIN 50141

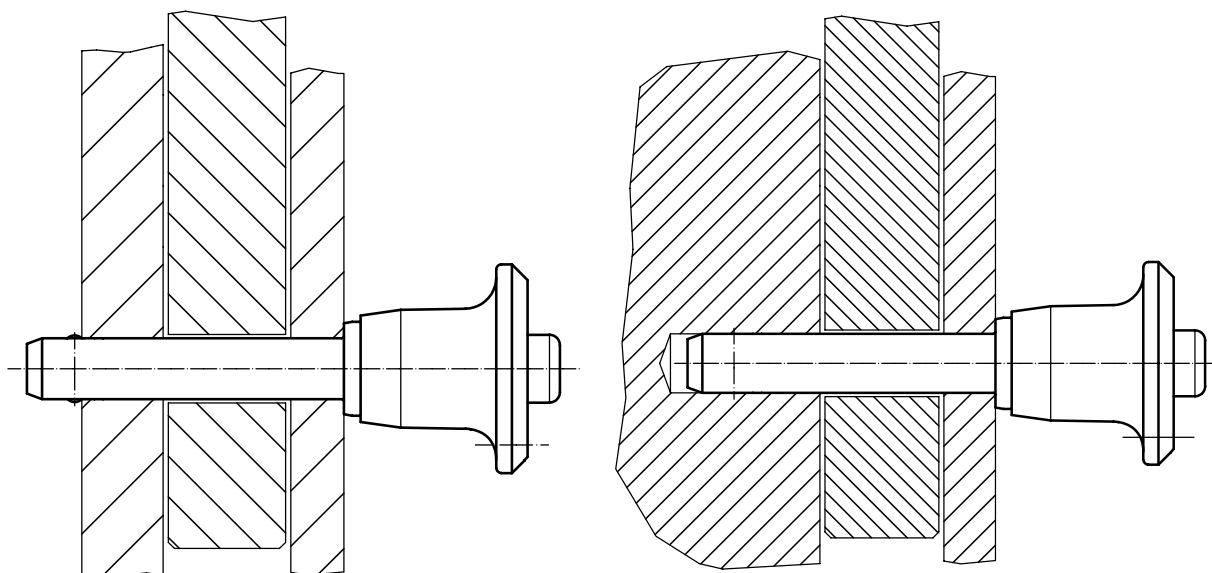


Dimensions									Holding force ¹⁾ min. Steel, soft	Location hole H11				Stainless steel 1.4305		Stainless steel 1.4542, precipitation-hardened	
d ₁ -0.04 -0.08	l ₁ +2 -1	d ₂ +0.1 -0.05	d ₃	d ₄	l ₂	l ₃	l ₄	l ₅			min.	max.		Shearing resistance, two-shear ²⁾ min.	Art. No.	Shearing resistance, two-shear ²⁾ min.	Art. No.
[mm]											[N]	[mm]		[°C]		[g]	[kN]
10	20	10.3	14.1	25	30.0	27.3	22.6	18.6	120	10	-30	150	35	60	22410.0062	100	22420.0062
	40	10.3	14.1	25	50.0	27.3	22.6	18.6	120	10	-30	150	47	60	22410.0066	100	22420.0066
	60	10.3	14.1	25	70.0	27.3	22.6	18.6	120	10	-30	150	59	60	22410.0070	100	22420.0070
	80	10.3	14.1	25	90.0	27.3	22.6	18.6	120	10	-30	150	70	60	22410.0072	100	22420.0072
	100	10.3	14.1	25	110.0	27.3	22.6	18.6	120	10	-30	150	82	60	22410.0074	100	22420.0074
12	20	12.3	17.7	35	31.0	33.2	27.3	22.3	120	12	-30	150	66	87	22410.0082	144	22420.0082
	40	12.3	17.7	35	51.0	33.2	27.3	22.3	120	12	-30	150	82	87	22410.0086	144	22420.0086
	60	12.3	17.7	35	71.0	33.2	27.3	22.3	120	12	-30	150	100	87	22410.0090	144	22420.0090
	80	12.3	17.7	35	91.0	33.2	27.3	22.3	120	12	-30	150	117	87	22410.0092	144	22420.0092
	100	12.3	17.7	35	111.0	33.2	27.3	22.3	120	12	-30	150	134	87	22410.0094	144	22420.0094
16	30	16.5	23.4	40	44.4	42.2	34.5	28.5	120	16	-30	150	150	155	22410.0102	257	22420.0102
	60	16.5	23.4	40	74.4	42.2	34.5	28.5	120	16	-30	150	196	155	22410.0107	257	22420.0107
	90	16.5	23.4	40	104.4	42.2	34.5	28.5	120	16	-30	150	242	155	22410.0110	257	22420.0110
	120	16.5	23.4	40	134.4	42.2	34.5	28.5	120	16	-30	150	290	155	22410.0113	257	22420.0113

¹⁾ The holding force depends on the material of the counterpart - for further values see "operation".

²⁾ Shearing resistance similar to DIN 50141

APPLICATION EXAMPLE



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-pins.com

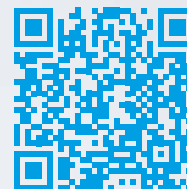


BALL LOCK PINS

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 and other products as for example our Bypass Pin Kits by logging on to www.halder.aero.



www.halder.aero



Ball Lock Pins • single acting - comply with NAS / MS17984

EH 4210.



PRODUCT DESCRIPTION

Ball Lock Pins according to MS17984 / NAS1333 - 1343 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 MS / NAS and tested to NAS 1332.

Surface treatment:

- All stainless steel parts are passivated according AMS2700
- All aluminium parts alloy anodized according MIL-A-8625

Heat treatment:

- Body: Rc. 40 min. (AMS2759, Condition H900)
- Spindle: Rc. 40 min. (AMS2759, Condition H900)
- Ball: Rc. 58-62 min. (AMS2759)

Material

Body

- Stainless steel, precipitation-hardened, passivated - CRES 17-4PH (specification AMS5643)

Spindle

- Stainless steel, precipitation-hardened, passivated - CRES 17-4PH (specification AMS5643)

Spring

- Stainless steel, passivated - CRES 302 (specification ASTM-A-313)

Handle

- Aluminium, black anodised - Alum.Alloy A380 (specification ASTM B85/B85)
- From 3/8" - Aluminium, black anodised - Alum.Alloy 6061-T6 (specification AMS-QQ-A200/8)

Attaching ring

- Stainless steel, passivated - CRES 302 (specification ASTM A-313/A313M)

Press button

- Stainless steel, passivated - CRES 303 (specification ASTM A484/484M)

Ball

- Stainless steel, precipitation-hardened, passivated - CRES 440C (specification AMS5630)

Operation

Ball lock pins single acting are self-locking and require a push of the button to release the balls.

MORE INFORMATION

Notes

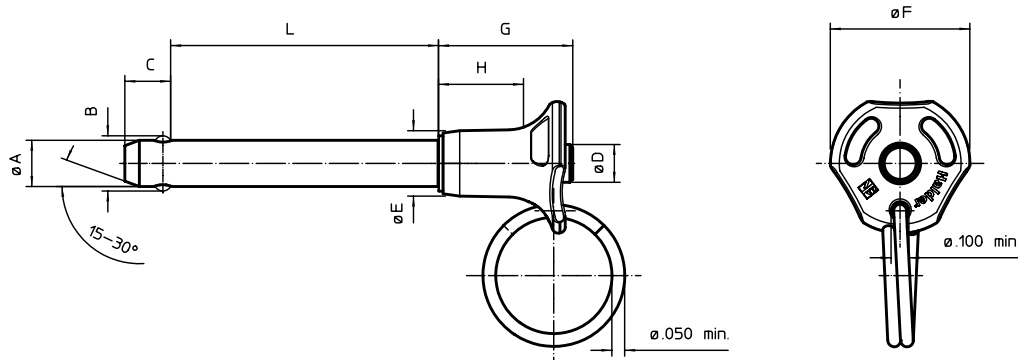
All further dimensions are available on request.

Other diameter / length combinations not listed which comply with the standard can be produced at short notice on customer request.

Special types on request.

- This product is manufactured in INCH dimensions.

DRAWING



ORDER INFORMATION

Nominal diameter A	A min.	A max.	Clamp- ing length L +0.02 0	Dimensions							Location hole max.	Shearing resistance, two-shear min.	 min. max.			Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.						
[in]	[in]	[in]	[in]	[in]							[in]	[lbf]	[°F]		[g]	
3/16	0.1870	0.1885	0.3	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	13.1	4210.A03
			0.4	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	13.4	4210.A04
			0.5	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	13.7	4210.A05
			0.6	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	14.1	4210.A06
			0.7	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	14.4	4210.A07
			0.8	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	14.8	4210.A08
			1.0	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	15.4	4210.A10



Nominal diameter A	A min.	A max.	Clamp- ing length L +0.02 0	Dimensions							Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.			min.	max.		
				[in]									[in]	[lbf]		
[in]	[in]	[in]	[in]	[in]							[in]	[lbf]	[°F]		[g]	
3/16	0.1870	0.1885	1.1	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	15.8	4210.A11
			1.2	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	16.1	4210.A12
			1.3	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	16.5	4210.A13
			1.4	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	16.8	4210.A14
			1.5	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	17.1	4210.A15
			1.6	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	17.5	4210.A16
			1.8	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	18.2	4210.A18
			2.0	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	18.8	4210.A20
			2.2	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	19.5	4210.A22
			2.8	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	21.6	4210.A28
			3.0	0.220	0.26	0.31	0.44	0.800	0.83	0.48	0.1940	5,150	-65	200	22.2	4210.A30
1/4	0.2470	0.2485	0.4	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	15.5	4210.B04
			0.5	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	16.1	4210.B05
			0.6	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	16.7	4210.B06
			0.7	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	17.3	4210.B07
			0.8	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	17.9	4210.B08
			0.9	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	18.5	4210.B09
			1.0	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	19.1	4210.B10
			1.1	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	19.8	4210.B11
			1.2	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	20.4	4210.B12
			1.3	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	21.0	4210.B13
			1.4	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	21.6	4210.B14
			1.5	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	22.2	4210.B15
			1.6	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	22.8	4210.B16
			1.7	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	23.4	4210.B17
			1.8	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	24.1	4210.B18
			1.9	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	24.7	4210.B19
			2.0	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	25.3	4210.B20
			2.1	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	25.9	4210.B21
			2.2	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	26.5	4210.B22
			2.3	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	27.1	4210.B23
			2.4	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	27.7	4210.B24
			2.5	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	28.4	4210.B25
			2.6	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	29.0	4210.B26
			2.8	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	30.2	4210.B28
			2.9	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	30.8	4210.B29
			3.1	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	32.0	4210.B31
			3.5	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	34.5	4210.B35
			4.2	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	38.8	4210.B42
			4.5	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	40.6	4210.B45
			5.0	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	43.7	4210.B50
			6.4	0.289	0.29	0.31	0.44	0.800	0.89	0.48	0.2540	9,200	-65	200	52.3	4210.B64
5/16	0.3095	0.3110	0.3	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	18.7	4210.C03
			0.5	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	20.6	4210.C05
			0.6	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	21.6	4210.C06
			0.7	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	22.5	4210.C07
			0.8	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	23.4	4210.C08
			1.0	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	25.3	4210.C10
			1.2	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	27.2	4210.C12
			1.3	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	28.2	4210.C13
			1.4	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	29.1	4210.C14
			1.5	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	30.1	4210.C15
			1.6	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	31.0	4210.C16
			1.7	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	32.0	4210.C17
			1.8	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	32.9	4210.C18
			1.9	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	33.8	4210.C19
			2.0	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	34.8	4210.C20



Nominal diameter A	A min.	A max.	Clamp- ing length L +0.02 0	Dimensions							Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.			min.	max.		
[in]	[in]	[in]	[in]	[in]							[in]	[lbf]	[°F]		[g]	
5/16	0.3095	0.3110	2.1	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	35.8	4210.C21
			2.2	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	36.7	4210.C22
			2.3	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	37.6	4210.C23
			2.5	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	39.6	4210.C25
			2.6	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	40.5	4210.C26
			2.7	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	41.4	4210.C27
			2.9	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	43.3	4210.C29
			3.0	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	44.3	4210.C30
			3.2	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	46.2	4210.C32
			3.4	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	48.0	4210.C34
			3.5	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	49.0	4210.C35
			3.6	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	50.0	4210.C36
			3.8	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	51.8	4210.C38
			4.9	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	62.3	4210.C49
			6.2	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	74.6	4210.C62
			6.7	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	79.3	4210.C67
			7.1	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	83.1	4210.C71
			7.4	0.375	0.33	0.31	0.49	1.135	0.93	0.48	0.3165	14,400	-65	200	85.9	4210.C74
3/8	0.3720	0.3735	0.7	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	31.8	4210.D07
			0.9	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	34.6	4210.D09
			1.0	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	35.9	4210.D10
			1.2	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	38.6	4210.D12
			1.3	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	40.0	4210.D13
			1.4	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	41.3	4210.D14
			1.5	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	42.7	4210.D15
			1.8	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	46.8	4210.D18
			2.0	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	49.5	4210.D20
			2.2	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	52.2	4210.D22
			2.4	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	54.9	4210.D24
			3.0	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	63.1	4210.D30
			3.2	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	65.8	4210.D32
			3.3	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	67.2	4210.D33
			5.0	0.440	0.36	0.39	0.57	1.135	1.04	0.62	0.3790	20,700	-65	200	90.3	4210.D50
7/16	0.4345	0.4360	1.2	0.509	0.38	0.39	0.63	1.400	1.16	0.62	0.4425	28,500	-65	200	49.8	4210.E12
			1.6	0.509	0.38	0.39	0.63	1.400	1.16	0.62	0.4425	28,500	-65	200	57.2	4210.E16
			2.0	0.509	0.38	0.39	0.63	1.400	1.16	0.62	0.4425	28,500	-65	200	64.6	4210.E20
			2.5	0.509	0.38	0.39	0.63	1.400	1.16	0.62	0.4425	28,500	-65	200	73.9	4210.E25
			2.6	0.509	0.38	0.39	0.63	1.400	1.16	0.62	0.4425	28,500	-65	200	75.7	4210.E26
			3.2	0.509	0.38	0.39	0.63	1.400	1.16	0.62	0.4425	28,500	-65	200	86.9	4210.E32
			4.0	0.509	0.38	0.39	0.63	1.400	1.16	0.62	0.4425	28,500	-65	200	102.0	4210.E40
			5.0	0.509	0.38	0.39	0.63	1.400	1.16	0.62	0.4425	28,500	-65	200	120.0	4210.E50
1/2	0.4970	0.4985	0.5	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	53.0	4210.F05
			0.8	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	61.0	4210.F08
			1.3	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	73.0	4210.F13
			1.4	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	75.0	4210.F14
			1.5	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	78.0	4210.F15
			1.7	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	82.0	4210.F17
			1.8	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	85.0	4210.F18
			2.0	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	90.0	4210.F20
			2.2	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	95.0	4210.F22
			2.4	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	100.0	4210.F24
			2.8	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	109.0	4210.F28
			3.0	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	114.0	4210.F30
			3.2	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	119.0	4210.F32
			4.0	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	138.0	4210.F40
			6.0	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	187.0	4210.F60
			9.0	0.594	0.46	0.56	0.72	1.400	1.19	0.72	0.5050	36,900	-65	200	260.0	4210.F90

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Nominal diameter A	A min.	A max.	Clamp- ing length L +0.02 0	Dimensions							Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.			min.	max.		
[in]	[in]	[in]	[in]	[in]							[in]	[lbf]	[°F]		[g]	
9/16	0.5595	0.5610	1.3	0.666	0.51	0.56	0.77	1.650	1.41	0.95	0.5675	46,700	-65	200	90.2	4210.G13
			1.5	0.666	0.51	0.56	0.77	1.650	1.41	0.95	0.5675	46,700	-65	200	96.4	4210.G15
			1.7	0.666	0.51	0.56	0.77	1.650	1.41	0.95	0.5675	46,700	-65	200	103.0	4210.G17
			2.0	0.666	0.51	0.56	0.77	1.650	1.41	0.95	0.5675	46,700	-65	200	112.0	4210.G20
			2.5	0.666	0.51	0.56	0.77	1.650	1.41	0.95	0.5675	46,700	-65	200	127.0	4210.G25
			3.4	0.666	0.51	0.56	0.77	1.650	1.41	0.95	0.5675	46,700	-65	200	155.0	4210.G34
5/8	0.6220	0.6235	4.0	0.666	0.51	0.56	0.77	1.650	1.41	0.95	0.5675	46,700	-65	200	174.0	4210.G40
			1.5	0.750	0.58	0.58	0.87	1.700	0.95	0.95	0.6300	57,800	-65	200	134.0	4210.H15
			1.8	0.750	0.58	0.58	0.87	1.700	0.95	0.95	0.6300	57,800	-65	200	146.0	4210.H18
			3.7	0.750	0.58	0.58	0.87	1.700	0.95	0.95	0.6300	57,800	-65	200	219.0	4210.H37
3/4	0.7470	0.7485	4.0	0.750	0.58	0.58	0.87	1.700	0.95	0.95	0.6300	57,800	-65	200	231.0	4210.H40
			2.0	0.887	0.67	0.70	1.00	1.900	1.68	1.14	0.7570	83,200	-65	200	218.0	4210.K20
			2.5	0.887	0.67	0.70	1.00	1.900	1.68	1.14	0.7570	83,200	-65	200	246.0	4210.K25
			3.0	0.887	0.67	0.70	1.00	1.900	1.68	1.14	0.7570	83,200	-65	200	274.0	4210.K30
7/8	0.8735	0.8750	4.0	0.887	0.67	0.70	1.00	1.900	1.68	1.14	0.7570	83,200	-65	200	329.0	4210.K40
			4.0	1.046	0.76	0.84	1.13	2.250	1.98	1.27	0.8820	112,500	-65	200	477.0	4210.L40
1	0.9970	0.9985	4.0	1.219	0.89	0.95	1.25	2.250	2.14	1.49	1.0100	147,200	-65	200	615.0	4210.M40

Ball Lock Pins • single acting - comply with NAS / MS17985

EH 4211.



PRODUCT DESCRIPTION

Ball Lock Pins according to MS17985 / NAS1333-1343 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 MS / NAS and tested to NAS 1332.

Surface treatment:

- All stainless steel parts are passivated according AMS2700
- All aluminium parts alloy anodized according MIL-A-8625

Heat treatment:

- Body: Rc. 40 min. (AMS2759, Condition H900)
- Spindle: Rc. 40 min. (AMS2759, Condition H900)
- Ball: Rc. 58-62 min. (AMS2759)

Material

Body

- Stainless steel, precipitation-hardened, passivated - CRES 17-4PH (specification AMS5643)

Spindle

- Stainless steel, precipitation-hardened, passivated - CRES 17-4PH (specification AMS5643)

Spring

- Stainless steel, passivated - CRES 302 (specification ASTM-A-313)

Handle

- Aluminium, black anodised - Alum.Alloy A380 (specification ASTM B85/B85)

Attaching ring

- Stainless steel, passivated - CRES 302 (specification ASTM A-313/A313M)

Press button

- Stainless steel, passivated - CRES 303 (specification ASTM A484/484M)

Ball

- Stainless steel, precipitation-hardened, passivated - CRES 440C (specification AMS5630)

Operation

Ball lock pins single acting are self-locking and require a push of the button to release the balls.

MORE INFORMATION

Notes

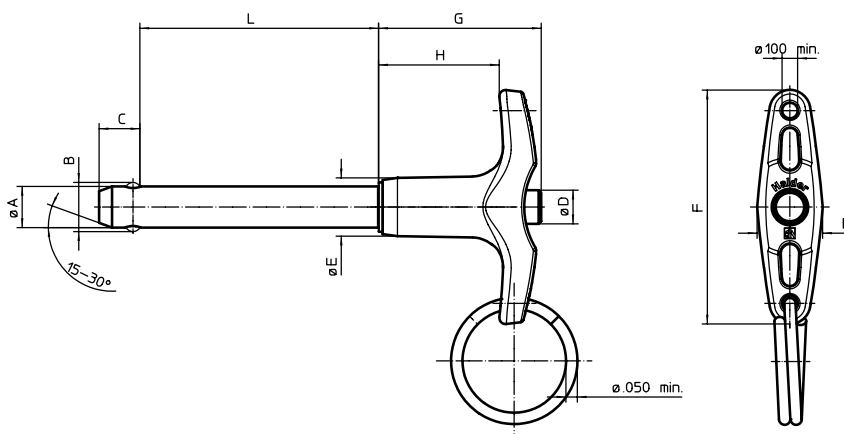
All further dimensions are available on request.

Other diameter / length combinations not listed which comply with the standard can be produced at short notice on customer request.

Special types on request.

- This product is manufactured in INCH dimensions.

DRAWING



ORDER INFORMATION

Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	Dimensions							Location hole max.	Shearing resistance, two-shear min.	Temperature		Weight	Art. No.
[in]	[in]	[in]	[in]	B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.	[in]	[lbf]	min.	max.	[g]	
3/16	0.1870	0.1885	0.3	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	18.5	4211.A03
			0.4	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	18.8	4211.A04
			0.5	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	19.1	4211.A05
			0.6	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	19.5	4211.A06
			0.7	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	19.8	4211.A07
			0.8	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	20.2	4211.A08



Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	Dimensions							Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.			min.	max.		
[in]	[in]	[in]	[in]	[in]							[in]	[lbf]	[°F]		[g]	
3/16	0.1870	0.1885	1.0	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	20.8	4211.A10
			1.1	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	21.2	4211.A11
			1.2	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	21.5	4211.A12
			1.3	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	21.9	4211.A13
			1.4	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	22.2	4211.A14
			1.5	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	22.5	4211.A15
			2.0	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	24.2	4211.A20
			2.1	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	24.6	4211.A21
			2.2	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	24.9	4211.A22
			2.3	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	25.3	4211.A23
			2.5	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	25.9	4211.A25
			2.6	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	26.3	4211.A26
			4.5	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	32.7	4211.A45
			6.0	0.220	0.260	0.310	0.500	1.815	1.27	0.800	0.1940	5,150	-65	200	37.8	4211.A60
1/4	0.2470	0.2485	0.5	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	21.5	4211.B05
			0.6	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	22.1	4211.B06
			0.7	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	22.7	4211.B07
			0.8	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	23.3	4211.B08
			0.9	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	23.9	4211.B09
			1.0	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	24.5	4211.B10
			1.1	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	25.2	4211.B11
			1.2	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	25.8	4211.B12
			1.3	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	26.4	4211.B13
			1.4	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	27.0	4211.B14
			1.5	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	27.6	4211.B15
			1.6	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	28.2	4211.B16
			1.7	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	28.8	4211.B17
			1.8	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	29.5	4211.B18
			2.0	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	30.7	4211.B20
			2.1	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	31.3	4211.B21
			2.3	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	32.5	4211.B23
			2.4	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	33.1	4211.B24
			2.5	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	33.8	4211.B25
			2.6	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	34.4	4211.B26
			2.7	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	35.0	4211.B27
			2.8	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	35.6	4211.B28
			2.9	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	36.2	4211.B29
			3.0	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	36.8	4211.B30
			3.1	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	37.4	4211.B31
			3.2	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	38.1	4211.B32
			3.5	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	39.9	4211.B35
			4.0	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	43.0	4211.B40
			5.0	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	49.1	4211.B50
			5.2	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	50.4	4211.B52
			6.0	0.289	0.290	0.310	0.500	1.815	1.27	0.800	0.2540	9,200	-65	200	55.3	4211.B60
5/16	0.3095	0.3110	0.3	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	23.1	4211.C03
			0.4	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	24.0	4211.C04
			0.5	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	25.0	4211.C05
			0.6	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	26.0	4211.C06
			0.8	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	27.8	4211.C08
			0.9	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	28.8	4211.C09
			1.0	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	29.7	4211.C10
			1.1	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	30.7	4211.C11
			1.2	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	31.6	4211.C12
			1.3	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	32.6	4211.C13
			1.5	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	34.5	4211.C15
			1.6	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	35.4	4211.C16
			1.8	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	37.3	4211.C18
			2.0	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	39.2	4211.C20
			2.2	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	41.1	4211.C22
			2.3	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	42.0	4211.C23
			2.4	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	43.0	4211.C24



Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	Dimensions							Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.			min.	max.		
				[in]									[°F]			
[in]	[in]	[in]	[in]								[in]	[lbf]			[g]	
5/16	0.3095	0.3110	2.6	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	44.9	4211.C26
			2.8	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	46.8	4211.C28
			2.9	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	47.7	4211.C29
			3.0	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	48.7	4211.C30
			3.2	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	50.6	4211.C32
			3.3	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	51.5	4211.C33
			3.4	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	52.4	4211.C34
			3.5	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	53.4	4211.C35
			3.8	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	56.2	4211.C38
			4.0	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	58.1	4211.C40
			4.1	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	59.1	4211.C41
			4.2	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	60.0	4211.C42
			4.3	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	61.0	4211.C43
			5.0	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	67.6	4211.C50
			6.0	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	77.1	4211.C60
			6.4	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	80.8	4211.C64
			7.0	0.375	0.330	0.310	0.500	1.815	1.27	0.800	0.3165	14,400	-65	200	86.5	4211.C70
3/8	0.3720	0.3735	0.9	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	43.5	4211.D09
			0.5	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	38.1	4211.D05
			0.7	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	40.8	4211.D07
			0.8	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	42.2	4211.D08
			1.0	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	44.9	4211.D10
			1.1	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	46.3	4211.D11
			1.2	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	47.6	4211.D12
			1.3	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	49.0	4211.D13
			1.4	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	50.3	4211.D14
			1.5	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	51.7	4211.D15
			1.6	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	53.1	4211.D16
			1.7	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	54.4	4211.D17
			1.8	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	55.8	4211.D18
			1.9	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	57.1	4211.D19
			2.0	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	58.5	4211.D20
			2.1	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	59.9	4211.D21
			2.2	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	61.2	4211.D22
			2.4	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	63.9	4211.D24
			2.5	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	65.3	4211.D25
			2.6	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	66.7	4211.D26
			2.8	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	69.4	4211.D28
			3.0	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	72.1	4211.D30
			3.1	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	73.5	4211.D31
			3.2	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	74.8	4211.D32
			3.4	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	77.5	4211.D34
			3.5	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	78.9	4211.D35
			4.0	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	85.7	4211.D40
			4.5	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	92.5	4211.D45
			4.8	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	96.6	4211.D48
			5.0	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	99.3	4211.D50
			5.5	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	106.0	4211.D55
			6.0	0.440	0.365	0.390	0.625	2.065	1.45	0.850	0.3790	20,700	-65	200	113.0	4211.D60
7/16	0.4345	0.4360	0.8	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	48.1	4211.E08
			1.0	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	51.8	4211.E10
			1.1	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	53.6	4211.E11
			1.2	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	55.5	4211.E12
			1.5	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	61.1	4211.E15
			1.8	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	66.7	4211.E18
			2.0	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	70.4	4211.E20
			2.1	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	72.2	4211.E21
			2.3	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	75.9	4211.E23
			2.4	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	77.8	4211.E24
			2.5	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	79.6	4211.E25
			2.6	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	81.5	4211.E26
			2.8	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	85.2	4211.E28



Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	Dimensions							Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.			min.	max.		
[in]	[in]	[in]	[in]								[in]	[lbf]	[°F]		[g]	
7/16	0.4345	0.4360	2.9	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	87.1	4211.E29
			3.0	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	88.9	4211.E30
			3.1	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	90.8	4211.E31
			3.2	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	92.6	4211.E32
			3.6	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	100.0	4211.E36
			4.0	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	107.0	4211.E40
			4.2	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	111.0	4211.E42
			4.6	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	119.0	4211.E46
			5.0	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	126.0	4211.E50
			5.3	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	132.0	4211.E53
			5.5	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	135.0	4211.E55
			5.6	0.509	0.380	0.390	0.625	2.065	1.47	0.850	0.4425	28,500	-65	200	137.0	4211.E56
1/2	0.4970	0.4985	7.2	0.509	0.380	0.390	0.625	2.065	1.60	0.850	0.4425	28,500	-65	200	167.0	4211.E72
			0.8	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	69.6	4211.F08
			0.9	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	72.1	4211.F09
			1.0	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	74.4	4211.F10
			1.1	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	76.9	4211.F11
			1.2	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	79.3	4211.F12
			1.3	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	81.8	4211.F13
			1.4	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	84.2	4211.F14
			1.5	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	86.6	4211.F15
			1.6	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	89.1	4211.F16
			1.7	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	91.5	4211.F17
			1.8	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	94.0	4211.F18
			1.9	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	96.4	4211.F19
			2.0	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	98.8	4211.F20
			2.1	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	101.0	4211.F21
			2.2	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	104.0	4211.F22
			2.3	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	106.0	4211.F23
			2.4	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	109.0	4211.F24
			2.5	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	111.0	4211.F25
			2.6	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	114.0	4211.F26
			2.8	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	118.0	4211.F28
			2.9	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	121.0	4211.F29
			3.1	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	126.0	4211.F31
			3.2	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	128.0	4211.F32
			3.3	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	138.0	4211.F33
			3.4	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	133.0	4211.F34
			3.5	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	135.0	4211.F35
			3.6	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	138.0	4211.F36
			3.7	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	140.0	4211.F37
			4.0	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	148.0	4211.F40
			4.2	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	153.0	4211.F42
			4.3	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	155.0	4211.F43
			4.4	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	157.0	4211.F44
			4.5	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	160.0	4211.F45
			4.7	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	165.0	4211.F47
			4.8	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	167.0	4211.F48
			5.0	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	172.0	4211.F50
			5.5	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	184.0	4211.F55
			6.4	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	206.0	4211.F64
			8.0	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	245.0	4211.F80
			9.0	0.594	0.460	0.565	0.800	2.345	1.60	0.885	0.5050	36,900	-65	200	270.0	4211.F90



Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	Dimensions							Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.			min.	max.		
				[in]									[in]	[lbf]		
[in]	[in]	[in]	[in]								[in]					
9/16	0.5595	0.5610	1.0	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	84.9	4211.G10
			1.2	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	91.2	4211.G12
			1.7	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	107.0	4211.G17
			2.4	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	128.0	4211.G24
			2.5	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	132.0	4211.G25
			3.2	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	153.0	4211.G32
			3.6	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	166.0	4211.G36
			4.0	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	178.0	4211.G40
			5.0	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	209.0	4211.G50
			5.5	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	225.0	4211.G55
5/8	0.6220	0.6240	6.1	0.666	0.510	0.565	0.800	2.345	1.60	0.885	0.5675	46,700	-65	200	244.0	4211.G61
			1.5	0.750	0.580	0.580	0.975	3.100	1.70	0.980	0.6300	57,800	-65	200	151.0	4211.H15
			2.6	0.750	0.580	0.580	0.975	3.100	1.70	0.980	0.6300	57,800	-65	200	193.0	4211.H26
			4.0	0.750	0.580	0.580	0.975	3.100	1.70	0.980	0.6300	57,800	-65	200	247.0	4211.H40
			4.5	0.750	0.580	0.580	0.975	3.100	1.70	0.980	0.6300	57,800	-65	200	267.0	4211.H45
3/4	0.7470	0.7485	6.0	0.750	0.580	0.580	0.975	3.100	1.70	0.980	0.6300	57,800	-65	200	324.0	4211.H60
			1.6	0.887	0.670	0.700	1.000	3.100	1.72	1.030	0.7570	83,200	-65	200	198.0	4211.K16
			2.5	0.887	0.670	0.700	1.000	3.100	1.72	1.030	0.7570	83,200	-65	200	248.0	4211.K25
			4.0	0.887	0.670	0.700	1.000	3.100	1.72	1.030	0.7570	83,200	-65	200	331.0	4211.K40
			5.0	0.887	0.670	0.700	1.000	3.100	1.72	1.030	0.7570	83,200	-65	200	387.0	4211.K50
7/8	0.8720	0.8735	8.0	0.887	0.670	0.700	1.000	3.100	1.72	1.030	0.7570	83,200	-65	200	553.0	4211.K80
			4.0	1.046	0.760	0.840	1.320	3.520	2.17	1.310	0.8820	112,500	-65	200	506.0	4211.L40
1	0.9970	0.9985	1.0	1.219	0.810	0.950	1.320	3.520	2.17	1.310	1.0100	147,200	-65	200	333.0	4211.M10
			1.5	1.219	0.810	0.950	1.320	3.520	2.17	1.310	1.0100	147,200	-65	200	383.0	4211.M15
			4.0	1.219	0.810	0.950	1.320	3.520	2.17	1.310	1.0100	147,200	-65	200	631.0	4211.M40
			5.0	1.219	0.810	0.950	1.320	3.520	2.17	1.310	1.0100	147,200	-65	200	581.0	4211.M50

Ball Lock Pins • single acting - comply with NAS / MS17986

EH 4212.



PRODUCT DESCRIPTION

Ball Lock Pins according to MS17986 / NAS1333-1343 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 MS / NAS and tested to NAS 1332.

Surface treatment:

- All stainless steel parts are passivated according AMS2700
- All aluminium parts alloy anodized according MIL-A-8625

Heat treatment:

- Body: Rc. 40 min. (AMS2759, Condition H900)
- Spindle: Rc. 40 min. (AMS2759, Condition H900)
- Ball: Rc. 58-62 min. (AMS2759)

Material

Body

- Stainless steel, precipitation-hardened, passivated - CRES 17-4PH (specification AMS5643)

Spindle

- Stainless steel, precipitation-hardened, passivated - CRES 17-4PH (specification AMS5643)

Spring

- Stainless steel, passivated - CRES 302 (specification ASTM-A-313)

Handle

- Aluminium, black anodised - Alum.Alloy A380 (specification ASTM B85/B85)

Attaching ring

- Stainless steel, passivated - CRES 302 (specification ASTM A-313/A313M)

Press button

- Stainless steel, passivated - CRES 303 (specification ASTM A484/484M)

Ball

- Stainless steel, precipitation-hardened, passivated - CRES 440C (specification AMS5630)

Operation

Ball lock pins single acting are self-locking and require a push of the button to release the balls.

MORE INFORMATION

Notes

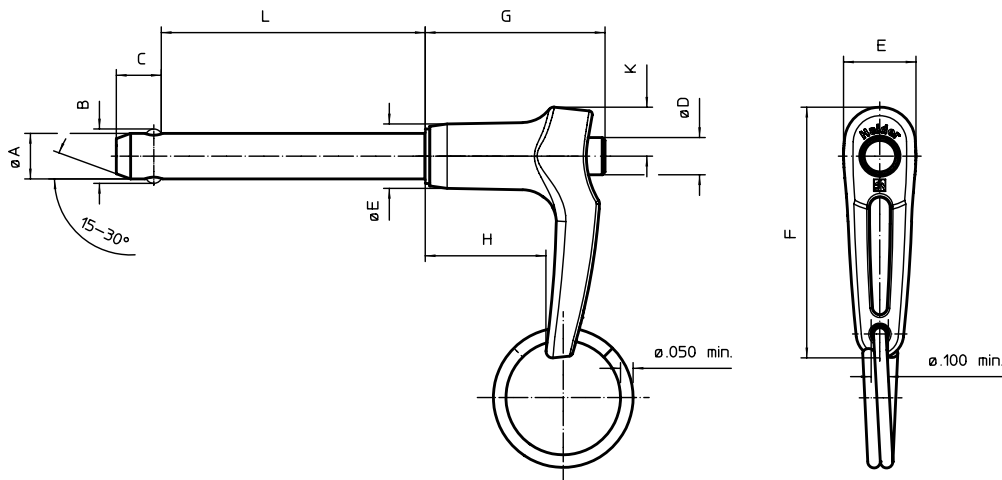
All further dimensions are available on request.

Other diameter / length combinations not listed which comply with the standard can be produced at short notice on customer request.

Special types on request.

- This product is manufactured in INCH dimensions.

DRAWING



ORDER INFORMATION

Nominal diameter A	A min.	A max.	Clamp- ing length L +0.02 0	Dimensions								Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.	K max.			min.	max.		
[in]	[in]	[in]	[in]	[in]								[in]	[lbf]	[°F]		[g]	
3/16	0.1870	0.1885	0.4	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	18.6	4212.A04
			0.5	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	18.9	4212.A05
			0.6	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	19.2	4212.A06
			0.8	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	19.9	4212.A08



Nominal diameter A	A min.	A max.	Clamp- ing length L +0.02 0	Dimensions								Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.	K max.			min.	max.		
				[in]										[in]	[lbf]		
[in]	[in]	[in]	[in]	[in]								[in]	[lbf]	[°F]		[g]	
3/16	0.1870	0.1885	1.0	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	20.6	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	21.6	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	22.0	4212.A14
			1.6	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	22.6	4212.A16
			1.7	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	23.0	4212.A17
			1.8	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	23.3	4212.A18
			2.0	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	24.0	4212.A20
			2.2	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	24.7	4212.A22
			2.3	0.220	0.260	0.310	0.500	1.80	1.27	0.76	0.34	0.1940	5,150	-65	200	25.0	4212.A23
			2.4	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	32.9	4212.B24
1/4	0.2470	0.2485	2.5	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	33.5	4212.B25
			0.4	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	20.6	4212.B04
			0.5	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	21.2	4212.B05
			0.6	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	21.8	4212.B06
			0.7	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	22.5	4212.B07
			0.8	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	23.1	4212.B08
			1.0	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	24.3	4212.B10
			1.2	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	25.6	4212.B12
			1.3	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	26.2	4212.B13
			1.4	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	26.8	4212.B14
			1.5	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	27.4	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	28.0	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	28.6	4212.B17
			1.8	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	29.2	4212.B18
			2.0	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	30.4	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	31.1	4212.B21
			2.6	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	34.2	4212.B26
			2.8	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	35.4	4212.B28
			3.0	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	36.6	4212.B30
			3.1	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	37.2	4212.B31
3.4	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	39.0	4212.B34			
3.6	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	40.3	4212.B36			
4.5	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	45.8	4212.B45			
5.2	0.289	0.290	0.310	0.500	1.80	1.27	0.76	0.34	0.2540	9,200	-65	200	50.1	4212.B52			
5/16	0.3095	0.3110	0.4	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	23.8	4212.C04
			0.5	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	24.8	4212.C05
			0.6	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	25.7	4212.C06
			0.7	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	26.7	4212.C07
			0.8	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	27.6	4212.C08
			1.0	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	29.5	4212.C10
			1.1	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	30.4	4212.C11
			1.2	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	31.4	4212.C12
			1.3	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	32.3	4212.C13
			1.4	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	33.3	4212.C14
			1.5	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	34.2	4212.C15
			1.6	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	35.2	4212.C16
			1.7	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	36.1	4212.C17
			1.8	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	37.1	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	39.0	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	41.8	4212.C23
			2.4	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	42.8	4212.C24
			2.5	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	43.7	4212.C25
			2.8	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	46.5	4212.C28
			2.9	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	47.5	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	48.4	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	51.3	4212.C33			
3.4	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	52.2	4212.C34			
3.6	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	54.1	4212.C36			
3.8	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	56.0	4212.C38			
4.0	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	64.0	4212.C40			
7.0	0.375	0.330	0.310	0.500	1.80	1.27	0.76	0.34	0.3165	14,400	-65	200	86.3	4212.C70			



Nominal diameter A	A min.	A max.	Clamp- ing length L +0.02 0	Dimensions								Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.	K max.			min.	max.		
				[in]										[°F]			
[in]	[in]	[in]	[in]	[in]								[in]	[lbf]	[°F]		[g]	
3/8	0.3720	0.3735	0.5	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	38.4	4212.D05
			0.8	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	42.5	4212.D08
			1.0	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	45.2	4212.D10
			1.2	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	48.0	4212.D12
			1.3	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	49.3	4212.D13
			1.4	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	50.7	4212.D14
			1.5	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	52.0	4212.D15
			1.6	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	53.4	4212.D16
			1.4	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	54.8	4212.D17
			1.8	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	56.1	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	58.8	4212.D20
			2.2	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	61.6	4212.D22
			2.4	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	64.3	4212.D24
			2.5	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	65.6	4212.D25
			2.6	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	67.0	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	72.4	4212.D30
			4.0	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	86.0	4212.D40
			4.5	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	92.8	4212.D45
			4.3	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	90.1	4212.D43
			4.8	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	96.9	4212.D48
5.0	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	99.6	4212.D50			
6.0	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	113.0	4212.D60			
6.3	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	117.0	4212.D63			
6.5	0.440	0.365	0.390	0.625	2.03	1.45	0.85	0.39	0.3790	20,700	-65	200	120.0	4212.D65			
7/16	0.4345	0.4360	1.0	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	52.1	4212.E10
			1.2	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	55.8	4212.E12
			1.3	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	57.7	4212.E13
			1.4	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	59.6	4212.E14
			1.5	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	61.4	4212.E15
			2.0	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	70.7	4212.E20
			2.1	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	72.5	4212.E21
			2.5	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	80.0	4212.E25
			2.6	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	81.8	4212.E26
			2.8	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	85.6	4212.E28
			3.0	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	89.2	4212.E30
			3.2	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	93.0	4212.E32
			3.5	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	98.5	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	108.0	4212.E40
			4.2	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	112.0	4212.E42
			5.5	0.509	0.380	0.390	0.625	2.03	1.47	0.85	0.39	0.4425	28,500	-65	200	136.0	4212.E55
1/2	0.4970	0.4985	0.7	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	67.8	4212.F07
			1.0	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	75.1	4212.F10
			1.2	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	80.0	4212.F12
			1.4	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	84.9	4212.F14
			1.5	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	87.2	4212.F15
			1.6	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	89.7	4212.F16
			1.7	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	92.2	4212.F17
			1.8	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	94.6	4212.F18
			1.9	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	97.0	4212.F19
			2.0	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	99.5	4212.F20
			2.1	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	102.0	4212.F21
			2.2	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	104.0	4212.F22
			2.3	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	107.0	4212.F23
			2.4	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	109.0	4212.F24
			2.5	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	112.0	4212.F25
			2.6	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	114.0	4212.F26
2.8	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	119.0	4212.F28			



Nominal diameter A	A min.	A max.	Clamp- ing length L +0.02 0	Dimensions								Location hole max.	Shearing resistance, two-shear min.				Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F max.	G max.	H min.	K max.			min.	max.		
[in]	[in]	[in]	[in]	[in]								[in]	[lbf]	[°F]		[g]	
1/2	0.4970	0.4985	2.9	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	121.0	4212.F29
			3.0	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	124.0	4212.F30
			3.1	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	126.0	4212.F31
			3.4	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	134.0	4212.F34
			3.5	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	136.0	4212.F35
			3.6	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	138.0	4212.F36
			3.7	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	141.0	4212.F37
			4.0	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	148.0	4212.F40
			4.1	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	151.0	4212.F41
			4.2	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	153.0	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	160.0	4212.F45
			4.8	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	168.0	4212.F48
			5.3	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	180.0	4212.F53
			5.5	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	185.0	4212.F55
			6.0	0.594	0.460	0.565	0.800	2.36	1.60	0.85	0.50	0.5050	36,900	-65	200	197.0	4212.F60
9/16	0.5595	0.5610	1.6	0.666	0.510	0.565	0.800	2.36	1.60	0.85	0.50	0.5675	46,700	-65	200	104.0	4212.G16
			1.7	0.666	0.510	0.565	0.800	2.36	1.60	0.85	0.50	0.5675	46,700	-65	200	107.0	4212.G17
			2.0	0.666	0.510	0.565	0.800	2.36	1.60	0.85	0.50	0.5675	46,700	-65	200	117.0	4212.G20
			2.5	0.666	0.510	0.565	0.800	2.36	1.60	0.85	0.50	0.5675	46,700	-65	200	132.0	4212.G25
			3.6	0.666	0.510	0.565	0.800	2.36	1.60	0.85	0.50	0.5675	46,700	-65	200	166.0	4212.G36
			4.0	0.666	0.510	0.565	0.800	2.36	1.60	0.85	0.50	0.5675	46,700	-65	200	179.0	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	210.0	4212.G50
			5.5	0.666	0.510	0.565	0.800	2.36	1.60	0.85	0.50	0.5675	46,700	-65	200	226.0	4212.G55
			6.0	0.666	0.510	0.565	0.800	2.36	1.60	0.85	0.50	0.5675	46,700	-65	200	241.0	4212.G60
5/8	0.6220	0.6235	7.5	0.666	0.510	0.565	0.800	2.36	1.60	0.85	0.50	0.5675	46,700	-65	200	288.0	4212.G75
			0.9	0.750	0.580	0.580	0.970	3.07	1.70	0.97	0.60	0.6300	57,800	-65	200	127.0	4212.H09
			2.0	0.750	0.580	0.580	0.970	3.07	1.70	0.97	0.60	0.6300	57,800	-65	200	170.0	4212.H20
3/4	0.7470	0.7485	4.0	0.750	0.580	0.580	0.970	3.07	1.70	0.97	0.60	0.6300	57,800	-65	200	247.0	4212.H40
			2.4	0.887	0.670	0.700	1.000	3.07	1.72	0.98	0.60	0.7570	83,200	-65	200	242.0	4212.K24
			3.5	0.887	0.670	0.700	1.000	3.07	1.72	0.98	0.60	0.7570	83,200	-65	200	303.0	4212.K35
			3.6	0.887	0.670	0.700	1.000	3.07	1.72	0.98	0.60	0.7570	83,200	-65	200	309.0	4212.K36
7/8	0.8720	0.8735	4.0	0.887	0.670	0.700	1.000	3.07	1.72	0.98	0.60	0.7570	83,200	-65	200	331.0	4212.K40
			4.0	1.046	0.760	0.840	1.320	3.70	2.17	1.20	0.80	0.8820	112,500	-65	200	509.0	4212.L40
1	0.9970	0.9985	4.0	1.219	0.890	0.840	1.320	3.70	2.17	1.20	0.80	1.0100	147,200	-65	200	631.0	4212.M40
			6.0	1.219	0.890	0.840	1.320	3.70	2.17	1.20	0.80	1.0100	147,200	-65	200	832.0	4212.M60

Ball Lock Pins • single acting - comply with NAS / MS17987

EH 4213.



PRODUCT DESCRIPTION

Ball Lock Pins according to MS17987 / NAS1333-1343 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 MS / NAS and tested to NAS 1332.

Protective treatment:

- All CRES parts are passivated according AMS2700

Heat treatment:

- Body: Rc. 40 min. (AMS2759, Condition H900)
- Spindle: Rc. 40 min. (AMS2759, Condition H900)
- Ball: Rc. 58-62 min. (AMS2759)

Material

Body

- Stainless steel, precipitation-hardened, passivated - CRES 17-4PH (specification AMS5643)

Spindle

- Stainless steel, precipitation-hardened, passivated - CRES 17-4PH (specification AMS5643)

Spring

- Stainless steel, passivated - CRES 302 (specification ASTM-A-313)

Handle

- Stainless steel, passivated - CRES 17-4PH (specification AMS5643)

Attaching ring

- Stainless steel, passivated - CRES 302 (specification ASTM A-313/A313M)

Press button

- Stainless steel, passivated - CRES 303 (specification ASTM A484/484M)

Ball

- Stainless steel, precipitation-hardened, passivated - CRES 440C (specification AMS5630)

Operation

Ball lock pins single acting are self-locking and require a push of the button to release the balls.

MORE INFORMATION

Notes

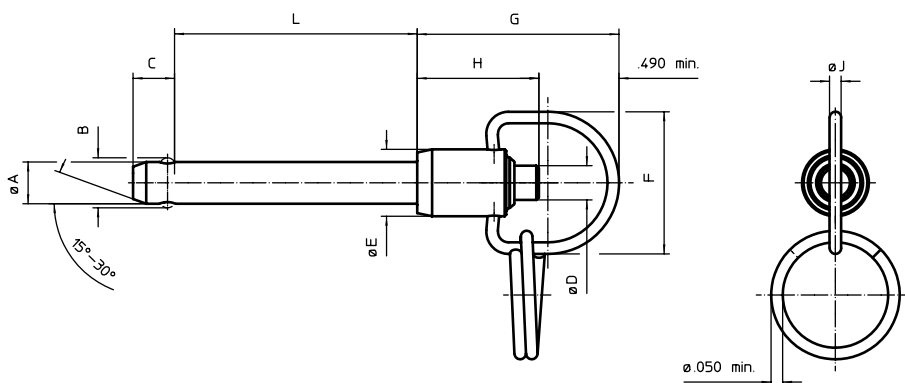
All further dimensions are available on request.

Other diameter / length combinations not listed which comply with the standard can be produced at short notice on customer request.

Special types on request.

- This product is manufactured in INCH dimensions.

DRAWING



ORDER INFORMATION

Dimensions												Location hole max.	Shearing resistance, two-shear min.			Art. No.	
Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	B ±0.005	C 0 -0.04	D max.	E max.	F min.	G max.	H min.	J min.			min.	max.		
[in]												[in]	[lbf]	[°F]		[g]	
3/16	0.1870	0.1885	0.3	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	20.1	4213.A03
			0.5	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	20.8	4213.A05
			0.6	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	21.1	4213.A06
			0.7	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	21.4	4213.A07
			0.8	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	21.8	4213.A08
			0.9	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	22.1	4213.A09



Dimensions												Location hole max.	Shearing resistance, two-shear min.				Art. No.
Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	B ±0.005	C 0 -0.04	D max.	E max.	F min.	G max.	H min.	J min.			min.	max.		
														[in]	[°F]		
3/16	0.1870	0.1885	1.0	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	22.5	4213.A10
			1.1	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	22.8	4213.A11
			1.2	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	23.1	4213.A12
			1.3	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	23.5	4213.A13
			1.4	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	23.8	4213.A14
			1.5	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	24.2	4213.A15
			1.6	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	24.5	4213.A16
			1.7	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	24.8	4213.A17
			1.8	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	25.2	4213.A18
			2.0	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	25.9	4213.A20
			2.2	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	26.5	4213.A22
			2.3	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	26.9	4213.A23
			2.5	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	27.6	4213.A25
			2.6	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	27.9	4213.A26
			3.1	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	29.6	4213.A31
			3.4	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	30.6	4213.A34
			4.0	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	32.7	4213.A40
			4.3	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	33.7	4213.A43
4.5	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	34.4	4213.A45			
4.6	0.220	0.260	0.310	0.53	1.06	1.45	0.73	0.08	0.1940	5,150	-65	200	34.7	4213.A46			
1/4	0.2470	0.2485	0.3	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	21.8	4213.B03
			0.4	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	22.4	4213.B04
			0.5	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	23.0	4213.B05
			0.6	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	23.6	4213.B06
			0.7	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	24.2	4213.B07
			0.8	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	24.9	4213.B08
			0.9	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	25.5	4213.B09
			1.0	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	26.1	4213.B10
			1.1	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	26.7	4213.B11
			1.2	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	27.3	4213.B12
			1.3	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	27.9	4213.B13
			1.4	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	28.5	4213.B14
			1.5	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	29.2	4213.B15
			1.6	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	29.8	4213.B16
			1.7	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	30.4	4213.B17
			1.8	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	31.0	4213.B18
			1.9	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	31.6	4213.B19
			2.0	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	32.2	4213.B20
			2.1	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	32.8	4213.B21
			2.2	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	33.5	4213.B22
			2.3	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	34.1	4213.B23
			2.4	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	34.7	4213.B24
			2.5	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	35.3	4213.B25
			2.6	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	35.9	4213.B26
			2.7	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	36.5	4213.B27
			2.8	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	37.2	4213.B28
			2.9	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	37.8	4213.B29
			3.0	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	38.4	4213.B30
			3.2	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	39.6	4213.B32
			3.3	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	40.2	4213.B33
			3.5	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	41.4	4213.B35
			3.6	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	42.1	4213.B36
			4.0	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	44.5	4213.B40
			4.2	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	45.8	4213.B42
			4.3	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	46.4	4213.B43
			4.7	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	48.8	4213.B47
			5.4	0.289	0.290	0.310	0.53	1.06	1.50	0.78	0.08	0.2540	9,200	-65	200	53.1	4213.B54



Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	Dimensions								Location hole max.	Shearing resistance, two-shear min.	 min. max.		 [g]	Art. No.
				B ±0.005	C 0 -0.04	D max.	E max.	F min.	G max.	H min.	J min.						
				[in]	[in]	[in]	[in]	[in]	[in]	[in]	[in]	[in]	[lbf]	[°F]	[°F]	[g]	
5/16	0.3095	0.3110	0.5	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	27.0	4213.C05
			0.6	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	27.9	4213.C06
			0.7	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	28.9	4213.C07
			0.8	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	29.8	4213.C08
			0.9	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	30.8	4213.C09
			1.0	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	31.7	4213.C10
			1.1	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	32.7	4213.C11
			1.2	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	33.6	4213.C12
			1.3	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	34.6	4213.C13
			1.4	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	35.5	4213.C14
			1.5	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	36.5	4213.C15
			1.6	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	37.4	4213.C16
			1.7	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	38.4	4213.C17
			1.8	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	39.3	4213.C18
			1.9	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	40.2	4213.C19
			2.0	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	41.2	4213.C20
			2.1	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	42.2	4213.C21
			2.2	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	43.1	4213.C22
			2.3	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	44.0	4213.C23
			2.5	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	45.9	4213.C25
			2.6	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	46.9	4213.C26
			2.9	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	49.7	4213.C29
			3.0	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	50.7	4213.C30
			3.2	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	52.6	4213.C32
			3.3	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	53.5	4213.C33
			3.4	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	54.4	4213.C34
			3.5	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	55.4	4213.C35
			3.6	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	56.3	4213.C36
			3.9	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	59.2	4213.C39
			4.0	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	60.1	4213.C40
			4.9	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	68.6	4213.C49
			6.0	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	79.1	4213.C60
			6.7	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	85.7	4213.C67
			6.9	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	87.6	4213.C69
			7.0	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	88.5	4213.C70
			7.1	0.375	0.330	0.310	0.59	1.06	1.65	0.83	0.08	0.3165	14,400	-65	200	89.5	4213.C71
3/8	0.3720	0.3735	0.5	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	41.2	4213.D05
			0.6	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	42.6	4213.D06
			0.7	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	44.0	4213.D07
			0.8	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	45.3	4213.D08
			0.9	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	46.6	4213.D09
			1.0	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	48.0	4213.D10
			1.1	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	49.4	4213.D11
			1.2	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	50.7	4213.D12
			1.3	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	52.1	4213.D13
			1.4	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	53.5	4213.D14
			1.5	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	54.8	4213.D15
			1.6	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	56.2	4213.D16
			1.7	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	57.5	4213.D17
			1.8	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	58.9	4213.D18
			1.9	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	60.2	4213.D19
			2.0	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	61.6	4213.D20
			2.2	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	64.4	4213.D22
			2.3	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	65.7	4213.D23
			2.4	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	67.1	4213.D24
			2.5	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	68.4	4213.D25
			2.6	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	69.8	4213.D26
			2.8	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	72.5	4213.D28
			2.9	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	73.9	4213.D29



Dimensions												Location hole max.	Shearing resistance, two-shear min.				Art. No.
Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	B ±0.005	C 0 -0.04	D max.	E max.	F min.	G max.	H min.	J min.			min.	max.		
														[in]	[°F]		
[in]												[in]	[lbf]	[°F]		[g]	
3/8	0.3720	0.3735	3.0	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	75.2	4213.D30
			3.1	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	76.6	4213.D31
			3.3	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	79.3	4213.D33
			3.4	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	80.7	4213.D34
			3.5	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	82.0	4213.D35
			3.6	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	83.4	4213.D36
			3.9	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	87.4	4213.D39
			4.0	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	88.8	4213.D40
			4.1	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	90.2	4213.D41
			4.3	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	92.9	4213.D43
			5.0	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	102.0	4213.D50
			7.0	0.440	0.365	0.390	0.65	1.06	1.65	0.94	0.08	0.3790	20,700	-65	200	130.0	4213.D70
7/16	0.4345	0.4360	0.6	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	48.3	4213.E06
			0.8	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	52.0	4213.E08
			1.0	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	55.7	4213.E10
			1.2	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	59.4	4213.E12
			1.3	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	61.3	4213.E13
			1.4	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	63.2	4213.E14
			1.5	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	65.0	4213.E15
			1.6	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	66.8	4213.E16
			1.9	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	72.4	4213.E19
			2.0	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	74.3	4213.E20
			2.1	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	76.1	4213.E21
			2.2	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	78.0	4213.E22
			2.4	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	81.7	4213.E24
			2.5	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	83.6	4213.E25
			2.6	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	85.4	4213.E26
			2.8	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	89.2	4213.E28
			3.0	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	92.8	4213.E30
			3.2	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	96.6	4213.E32
			4.0	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	111.0	4213.E40
			5.5	0.509	0.380	0.390	0.71	1.09	1.85	0.98	0.08	0.4425	28,500	-65	200	139.0	4213.E55
1/2	0.4970	0.4985	0.8	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	73.4	4213.F08
			0.9	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	75.8	4213.F09
			1.0	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	78.2	4213.F10
			1.1	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	80.7	4213.F11
			1.2	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	83.1	4213.F12
			1.3	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	85.6	4213.F13
			1.4	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	88.0	4213.F14
			1.5	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	90.4	4213.F15
			1.6	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	92.9	4213.F16
			1.8	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	97.7	4213.F18
			1.9	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	100.0	4213.F19
			2.0	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	103.0	4213.F20
			2.1	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	105.0	4213.F21
			2.3	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	110.0	4213.F23
			2.5	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	115.0	4213.F25
			2.8	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	122.0	4213.F28
			2.9	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	125.0	4213.F29
			3.0	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	127.0	4213.F30
			3.1	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	129.0	4213.F31
			3.3	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	134.0	4213.F33
			3.4	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	137.0	4213.F34
			3.5	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	139.0	4213.F35
			3.7	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	144.0	4213.F37
			3.9	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	149.0	4213.F39
			4.0	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	151.0	4213.F40
			4.2	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	156.0	4213.F42
			4.4	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	161.0	4213.F44
			4.5	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	164.0	4213.F45
4.6	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	166.0	4213.F46			
4.8	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	171.0	4213.F48			



Dimensions											Location hole max.	Shearing resistance, two-shear min.				Art. No.	
Nominal diameter A	A min.	A max.	Clamping length L +0.02 0	B ±0.005	C 0 -0.04	D max.	E max.	F min.	G max.	H min.			J min.	min.			max.
[in]													[in]	[lbf]			[°F]
1/2	0.4970	0.4985	5.0	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	176.0	4213.F50
			5.3	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	183.0	4213.F53
			5.5	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	188.0	4213.F55
			5.8	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	195.0	4213.F58
			6.5	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	212.0	4213.F65
			8.0	0.594	0.460	0.565	0.80	1.16	1.85	1.14	0.08	0.5050	36,900	-65	200	249.0	4213.F80
9/16	0.5595	0.5610	1.0	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	94.2	4213.G10
			1.2	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	100.0	4213.G12
			1.3	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	104.0	4213.G13
			1.5	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	110.0	4213.G15
			2.0	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	125.0	4213.G20
			2.2	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	132.0	4213.G22
			2.5	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	141.0	4213.G25
			2.7	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	147.0	4213.G27
			2.8	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	150.0	4213.G28
			3.0	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	156.0	4213.G30
			3.7	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	178.0	4213.G37
			4.2	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	194.0	4213.G42
			5.5	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	234.0	4213.G55
			6.5	0.666	0.510	0.565	0.84	1.16	2.03	1.14	0.08	0.5675	46,700	-65	200	265.0	4213.G65
5/8	0.6220	0.6235	3.9	0.750	0.580	0.580	0.90	1.24	2.25	1.40	0.12	0.6300	57,800	-65	200	252.0	4213.H39
			4.0	0.750	0.580	0.580	0.90	1.24	2.25	1.40	0.12	0.6300	57,800	-65	200	256.0	4213.H40
3/4	0.7470	0.7485	4.0	0.887	0.670	0.700	1.04	1.64	2.65	1.63	0.12	0.7570	83,200	-65	200	373.0	4213.K40
7/8	0.8720	0.8735	4.0	0.890	0.760	0.840	1.23	1.64	3.00	1.86	0.12	0.8820	112,500	-65	200	515.0	4213.L40
1	0.9970	0.9985	2.6	1.219	0.890	0.950	1.33	1.64	3.10	2.00	0.12	1.0100	147,200	-65	200	527.0	4213.M26
			4.0	1.219	0.890	0.950	1.33	1.64	3.10	2.00	0.12	1.0100	147,200	-65	200	665.0	4213.M40

Threaded Lock Pins • self-locking

EH 22355.

2



PRODUCT DESCRIPTION

Threaded lock pins are used for quick fastening, locking, adjusting, changing, clamping, connecting and securing. Quickly and easily unlockable for frequently repeated connections. By pressing the button, the threaded segments unlock and the threaded lock pin can be inserted into or removed from a threaded hole. A time-consuming screwing in and out is unnecessary.

The threaded lock pin is characterised by the following features:

- Corrosion-protected
- No time-consuming screwing in and out
- Self-locking due to spring load

Material

Pin part

- Steel, manganese-phosphated
- Stainless Steel

Handle

- Thermoplastic PA 6, black, dull similar to RAL 9005

Press button

- Aluminium, orange, anodised

Threaded element

- Stainless steel 1.4542, precipitation-hardened

Spring

- Stainless Steel

Assembly

Threaded lock pins can only be mounted into a thread that is true to gauge.

Mounting:

1. Press in the button and hold it down.
2. Insert the threaded lock pin.
3. Release the button (The button must be back in its original position.).
4. Tighten the threaded lock pin by hand as required.
5. It must be ensured that the threaded

segments are engaged in the mounting thread.

Dismantling:

1. Unscrew the threaded lock pin approx. a quarter of a turn anticlockwise.
2. Press in the button and hold it down.
3. Remove the threaded lock pin.
4. Release the button.

Operation

The threaded segments are unlocked by pressing the button.

MORE INFORMATION

Notes

Special types on request.
Due to the thread geometry, the clamping force is higher with the smaller thread sizes.

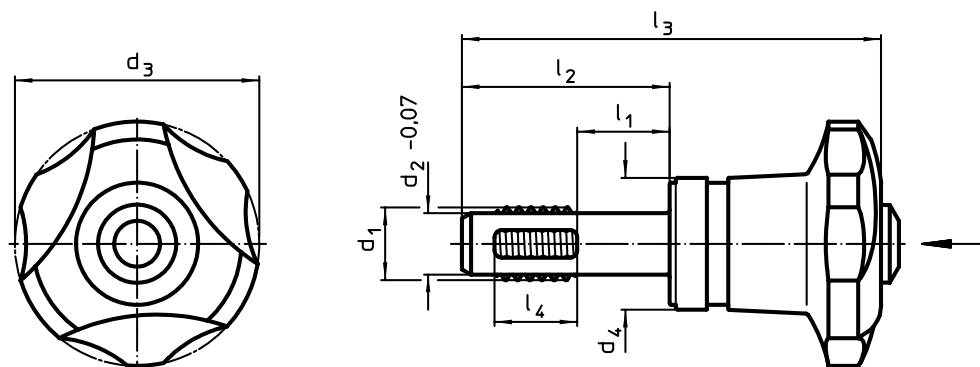
Accessories

Can easily be fitted with retaining cable EH 22355.

Further products

Threaded Lock Pins, self-locking, with axial bearing → p. 277
Retaining Cables, for threaded lock pin → p. 279

DRAWING



ORDER INFORMATION

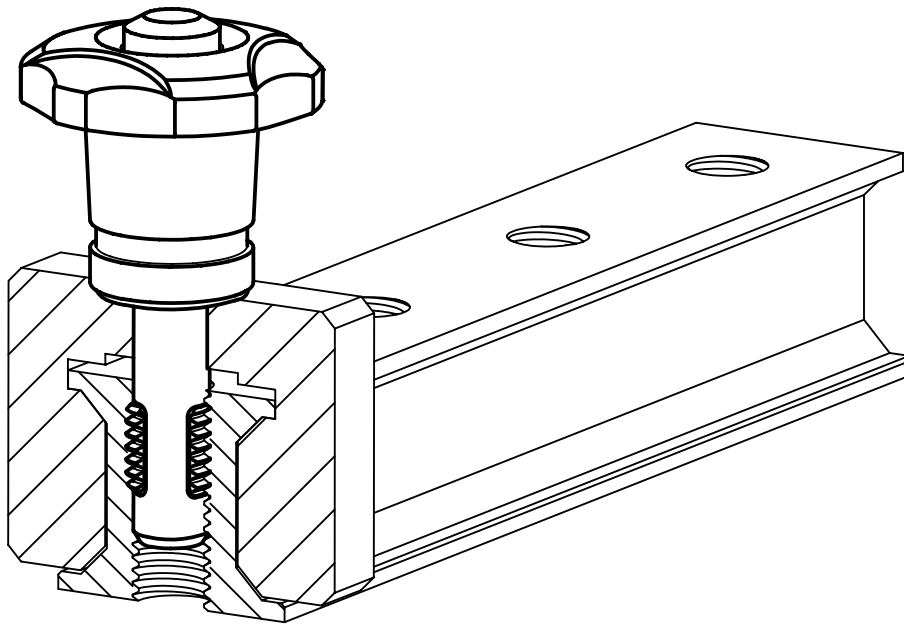
Dimensions								Locating thread			Tight- ening torque max.	Clamp- ing force max.	Estab- lished tight- ening torque ~ ¹⁾	Clamp- ing force ~ ²⁾		Steel, manganese-phos- phated		Stainless Steel	
d ₁	l ₁	d ₂ -0.07	d ₃ -1	d ₄	l ₂	l ₃	l ₄		min.	max.						Shearing resistance, two-shear ³⁾ min.	Art. No.	Shearing resistance, two-shear ³⁾ min.	Art. No.
[mm]									[°C]							[Nm]	[kN]	[Nm]	[kN]
M 8	10	6.62	40	21.6	23.8	58.4	8	M 8	-30	80	5	3.3	3.5	2.3	86	12.7	22355.0102	16.7	22355.1102
	20	6.62	40	21.6	33.8	68.4	8	M 8	-30	80	5	3.3	3.5	2.3	90	12.7	22355.0104	16.7	22355.1104
	30	6.62	40	21.6	43.8	78.4	8	M 8	-30	80	5	3.3	3.5	2.3	93	12.7	22355.0106	16.7	22355.1106
M10	10	8.35	40	21.6	26.0	60.6	10	M10	-30	80	5	2.9	3.5	2.0	93	20.6	22355.0202	27.1	22355.1202
	20	8.35	40	21.6	36.0	70.6	10	M10	-30	80	5	2.9	3.5	2.0	94	20.6	22355.0204	27.1	22355.1204
	30	8.35	40	21.6	46.0	80.6	10	M10	-30	80	5	2.9	3.5	2.0	99	20.6	22355.0206	27.1	22355.1206
M12	15	10.07	40	21.6	34.0	68.6	12	M12	-30	80	5	2.5	3.5	1.8	99	30.4	22355.0303	40.0	22355.1303
	30	10.07	40	21.6	49.0	83.6	12	M12	-30	80	5	2.5	3.5	1.8	108	30.4	22355.0306	40.0	22355.1306
	50	10.07	40	21.6	69.0	103.6	12	M12	-30	80	5	2.5	3.5	1.8	122	30.4	22355.0310	40.0	22355.1310
M16	15	13.80	40	21.6	34.0	68.6	12	M16	-30	80	5	2.1	3.5	1.5	116	62.9	22355.0503	82.7	22355.1503
	30	13.80	40	21.6	49.0	83.6	12	M16	-30	80	5	2.1	3.5	1.5	133	62.9	22355.0506	82.7	22355.1506
	50	13.80	40	21.6	69.0	103.6	12	M16	-30	80	5	2.1	3.5	1.5	155	62.9	22355.0510	82.7	22355.1510

¹⁾ Average hand force established in trials.

²⁾ Average value established in trials.

³⁾ Shearing resistance similar to DIN 50141; values apply to applications in plugged condition (without applied tightening torque).

APPLICATION EXAMPLE



Threaded Lock Pins • self-locking, with axial bearing

EH 22356.

2



PRODUCT DESCRIPTION

Threaded lock pins are used for quick fastening, locking, adjusting, changing, clamping, connecting and securing. Quickly and easily unlockable for frequently repeated connections. By pressing the button, the threaded segments unlock and the threaded lock pin can be inserted into or removed from a threaded hole. A time-consuming screwing in and out is unnecessary.

The thread lock pin is characterised by the following features and advantages:

- Corrosion-protected
- No time-consuming screwing in and unscrewing
- Self-locking due to spring force
- With axial bearing

The advantages of the axial bearing:

- Double clamping force with the same grip size by reducing surface friction.
- Protection of the component due to fixed contact surface.
- Low setting behaviour due to higher pretensioning force in the bolt or thread.
- Less force required to release.

Material

Pin part

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

Handle

- Thermoplastic PA 6, black, dull similar to RAL 9005

Press button

- Aluminium, orange, anodised

Threaded element

- Stainless steel 1.4542, precipitation-hardened

Axial bearing

- Steel, nitrided, blackened
- Stainless steel

Spring

- Stainless Steel

Assembly

Threaded lock pins can only be mounted into a thread that is true to gauge.

Mounting:

1. Press in the button and hold it down.
2. Insert the threaded lock pin.
3. Release the button (The button must be

back in its original position.).

4. Tighten the threaded lock pin by hand as required.
5. It must be ensured that the threaded segments are engaged in the mounting thread.

Dismantling:

1. Unscrew the threaded lock pin approx. a quarter of a turn anticlockwise.
2. Press in the button and hold it down.
3. Remove the threaded lock pin.
4. Release the button.

Operation

The threaded segments are unlocked by pressing the button.

MORE INFORMATION

Notes

Special types on request.
Due to the thread geometry, the clamping force is higher with the smaller thread sizes.

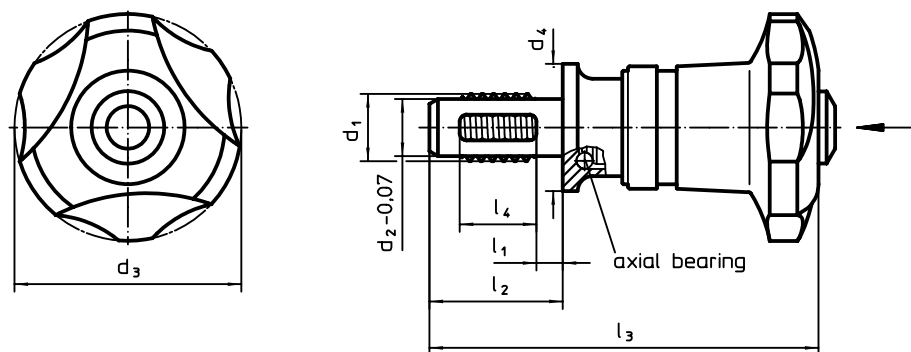
Accessories

Can easily be fitted with retaining cable EH 22355.

Further products

Threaded Lock Pins, self-locking. . . . → p. 275
Retaining Cables, for threaded lock pin → p. 279

DRAWING



ORDER INFORMATION

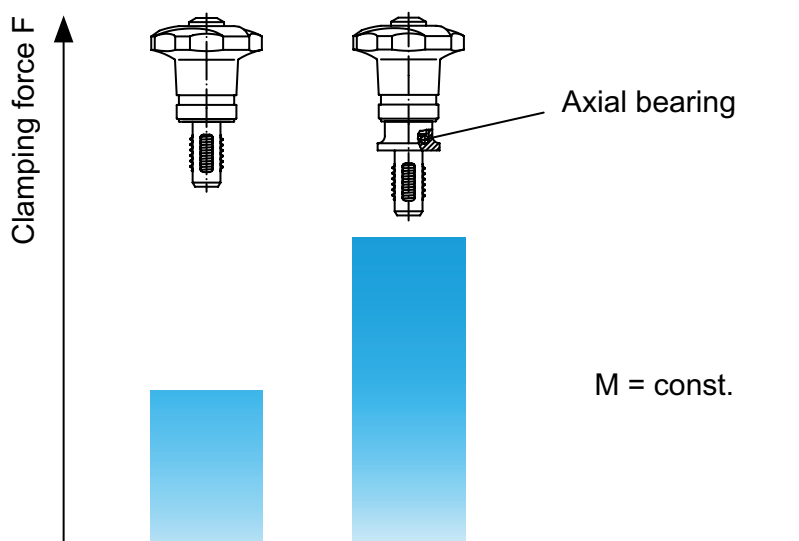
Dimensions								Locating thread			Tight- ening torque max.	Clamp- ing force max.	Estab- lished tight- ening torque ~ ¹⁾	Clamp- ing force ~ ²⁾		Heat-treated steel		Stainless steel	
d ₁	l ₁	d ₂ -0.07	d ₃	d ₄	l ₂	l ₃	l ₄		min.	max.						Shearing resistance, two-shear ³⁾ min.	Art. No.	Shearing resistance, two-shear ³⁾ min.	Art. No.
[mm]								[mm]	[°C]		[Nm]	[kN]	[Nm]	[kN]	[g]	[kN]		[kN]	
M 8	10	6.62	40	30	23.8	72.2	8	M 8	-30	80	5	4.8	3.5	3.3	96	35.9	22356.0102	36.4	22356.1102
	20	6.62	40	30	33.8	82.2	8	M 8	-30	80	5	4.8	3.5	3.3	98	35.9	22356.0104	36.4	22356.1104
	30	6.62	40	30	43.8	92.2	8	M 8	-30	80	5	4.8	3.5	3.3	101	35.9	22356.0106	36.4	22356.1106
M10	10	8.35	40	30	26.0	74.4	10	M10	-30	80	5	4.2	3.5	2.9	100	59.3	22356.0202	62.5	22356.1202
	20	8.35	40	30	36.0	84.4	10	M10	-30	80	5	4.2	3.5	2.9	180	59.3	22356.0204	62.5	22356.1204
	30	8.35	40	30	46.0	94.4	10	M10	-30	80	5	4.2	3.5	2.9	108	59.3	22356.0206	62.5	22356.1206
M12	15	10.07	40	30	34.0	82.4	12	M12	-30	80	5	3.7	3.5	2.6	184	85.4	22356.0303	86.8	22356.1303
	30	10.07	40	30	49.0	97.4	12	M12	-30	80	5	3.7	3.5	2.6	193	85.4	22356.0306	86.8	22356.1306
	50	10.07	40	30	69.0	117.4	12	M12	-30	80	5	3.7	3.5	2.6	206	85.4	22356.0310	86.8	22356.1310
M16	15	13.80	40	30	34.0	83.4	12	M16	-30	80	5	3.0	3.5	2.2	134	176.5	22356.0503	179.4	22356.1503
	30	13.80	40	30	49.0	98.4	12	M16	-30	80	5	3.0	3.5	2.2	150	176.5	22356.0506	179.4	22356.1506
	50	13.80	40	30	69.0	118.4	12	M16	-30	80	5	3.0	3.5	2.2	174	176.5	22356.0510	179.4	22356.1510

¹⁾ Average hand force established in trials.

²⁾ Average value established in trials.

³⁾ Shearing resistance similar to DIN 50141; values apply to applications in plugged condition (without applied tightening torque).

Increase of clamping force with axial bearing (while manual force is unchanged)



Retaining Cables • for threaded lock pin
EH 22355.



PRODUCT DESCRIPTION

These retaining cables are provided for attachment to the threaded lock pins EH 22355./EH22356 and act as loss prevention device.

Material

- Attaching ring**
 - Stainless Steel
- Holding clip**
 - Thermoplastic PA 6, black, dull similar to RAL 9005
- Eyelet**
 - Stainless steel

- Retaining cable**
 - Stainless steel
- Coating retaining cable**
 - Thermoplastic PA 6 coated, black

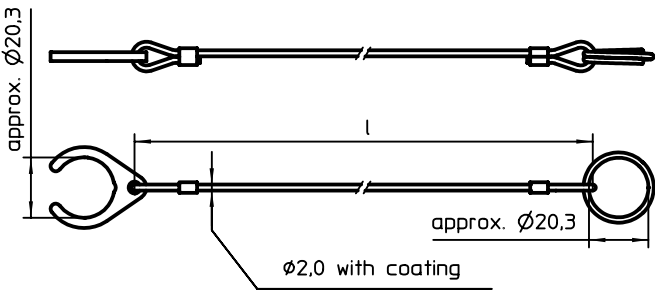
MORE INFORMATION

Notes
Special types on request.

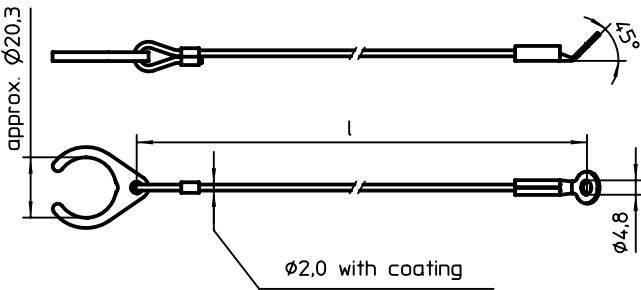
Further products

Retaining Cables → p. 249

DRAWING



picture 1

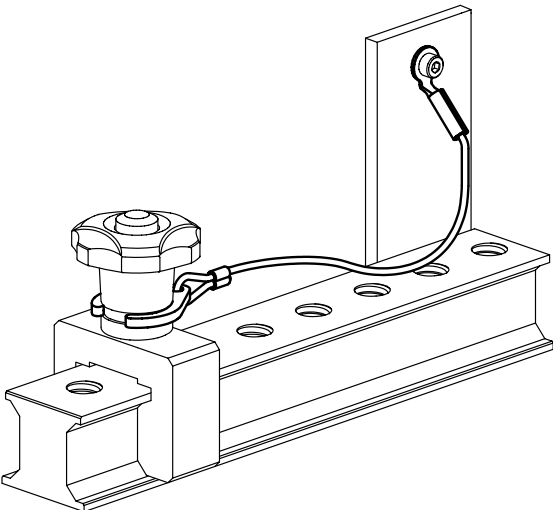


picture 2

ORDER INFORMATION

Dimensions l [mm]	 [g]	Art. No.
stainless steel, with holding clip and attaching ring – picture 1		
150	13.0	22355.6001
200	8.2	22355.6002
300	15.0	22355.6003
stainless steel, with holding clip and eyelet – picture 2		
150	9.9	22355.6011
200	10.0	22355.6012
300	15.0	22355.6013

APPLICATION EXAMPLE



Grub Screws • DIN 6332 with thrust point

EH 22540.

2



PRODUCT DESCRIPTION

Grub screws are clamping screws that can directly transmit forces via the thrust point. The pressure surface of the thrust point of the steel version is hardened.

For clamping sensitive surfaces, thrust pads EH 22560. (DIN 6311 and low version) can be attached on the thrust point. The snap ring of the thrust pad achieves a connection between the grub screw and the thrust pad that can be released by hand.

These grub screws with thrust points are particularly characterised by the additional radius "r" on the thrust point (optimisation compared to DIN 6332), which makes assembly in the thrust pad much easier.

The thrust point diameter of the grub screws is smaller than the core diameter of the thread, so that they can also be screwed in on the pin side.

Material

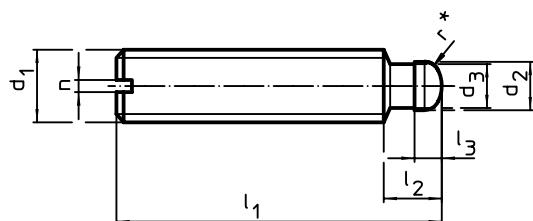
- Steel, blackened, quality 5.8, thrust point hardened
- Stainless steel

MORE INFORMATION

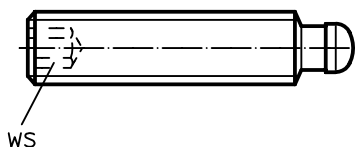
Further products

Thrust Pads, DIN 6311 and low model → p. 282

DRAWING

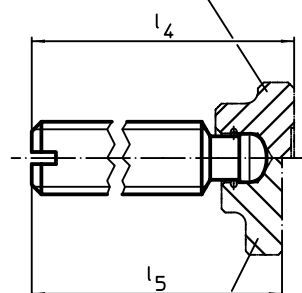


picture 1



picture 2

22560.0012–.0040 (steel)
22560.0112–.0140 (stainless steel)



22560.0425–.0440 (steel)
22560.1425–.1440 (stainless steel)

* to ease assembly the DIN 6332 specification has been completed by r

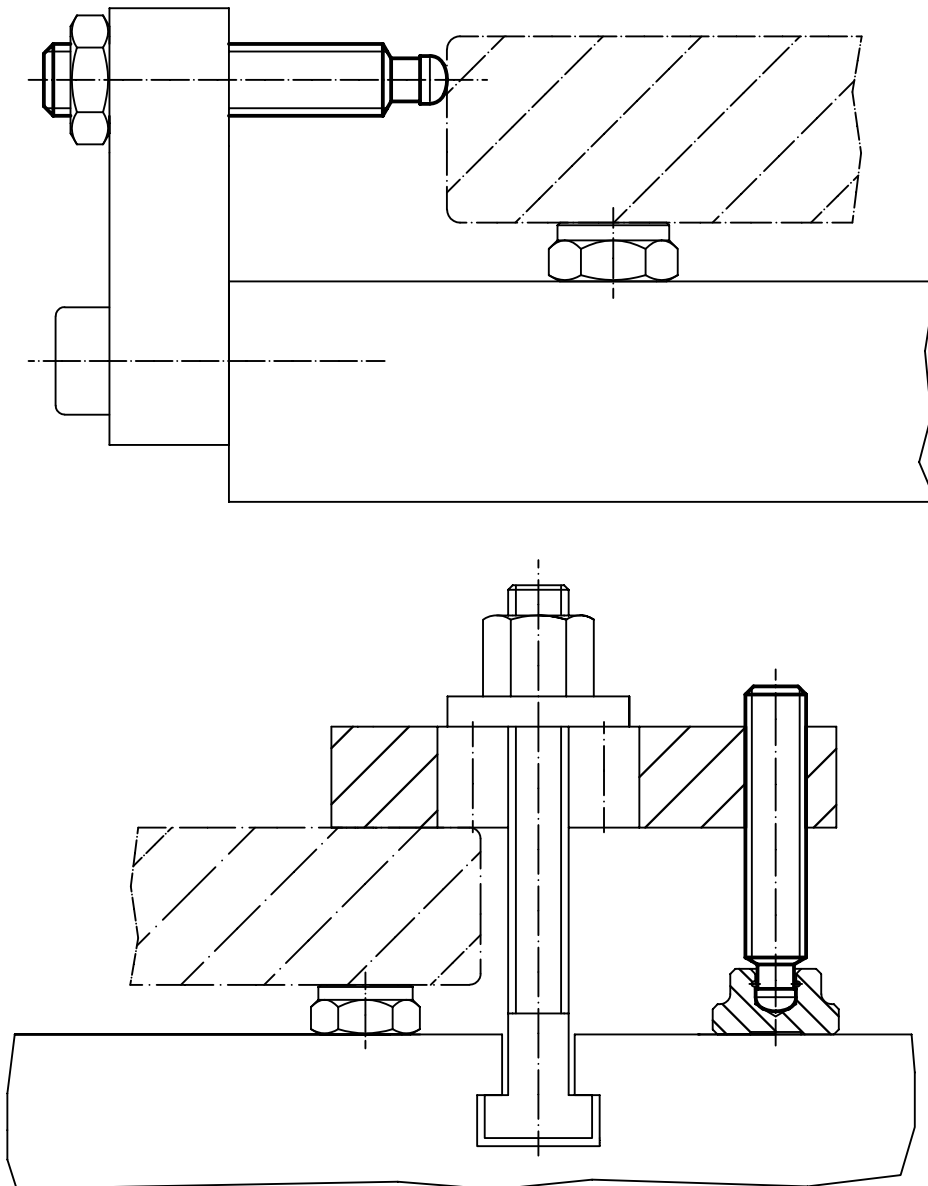
ORDER INFORMATION

Dimensions									WS		Art. No.	
d ₁	l ₁	d ₂ h11	d ₃	l ₂	l ₃	l ₄ ~	l ₅ ~	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	–	124.0	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

→

Dimensions									WS		Art. No.	
d ₁	l ₁	d ₂ h11	d ₃	l ₂	l ₃	l ₄ ~	l ₅ ~	n			Steel	Stainless steel
[mm]									[mm]	[g]		
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	51.0	22540.0422	22540.1422
	100	8.0	7.2	10.0	4.5	104.6	102.6	–	6	117.0	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	119.0	22540.0462	22540.1462
	125	12.0	11.0	12.0	5.0	130.4	127.9	–	8	154.0	22540.0463	22540.1463
M20	100	15.5	14.4	14.0	5.5	105.5	–	–	10	178.0	22540.0501	22540.1501
	125	15.5	14.4	14.0	5.5	130.5	–	–	10	230.0	22540.0502	22540.1502
	150	15.5	14.4	14.0	5.5	155.5	–	–	10	284.0	22540.0503	22540.1503

APPLICATION EXAMPLE



Thrust Pads • DIN 6311 and low model

EH 22560.

2



PRODUCT DESCRIPTION

Combinable with grub screws DIN 6332 with thrust point EH 22540.

Material

- Steel, case-hardened, blackened. Snap ring inlaid.
- Stainless steel

Assembly

The thrust pad is to be held the way the spring retainer lies in the recess with its

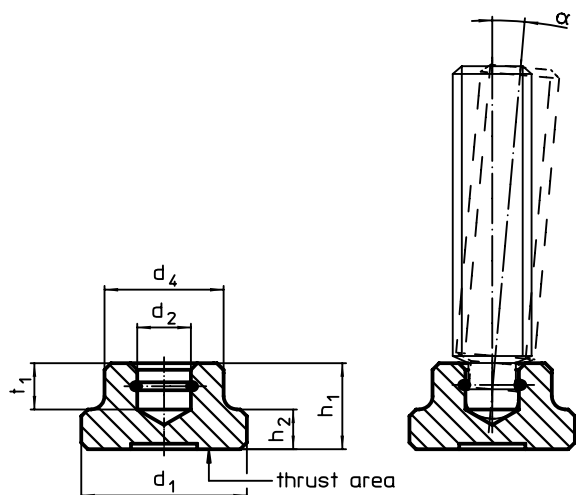
open side at the bottom. The grub screw is inclined as far as possible in the direction of the open side of the ring and pressed in.

MORE INFORMATION

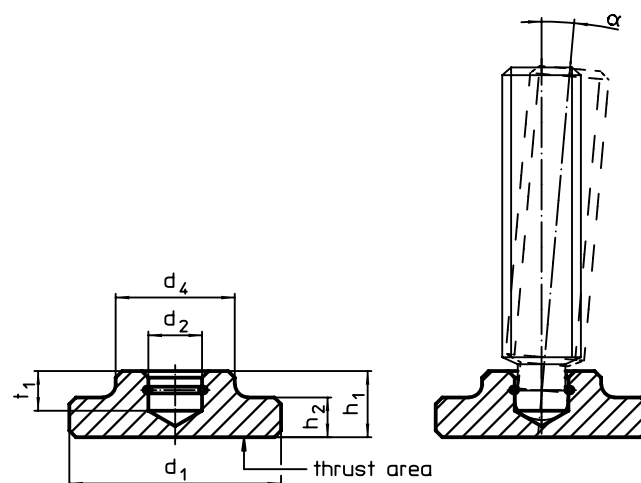
Further products

Grub Screws, DIN 6332 with thrust point. → p. 280

DRAWING



picture 1

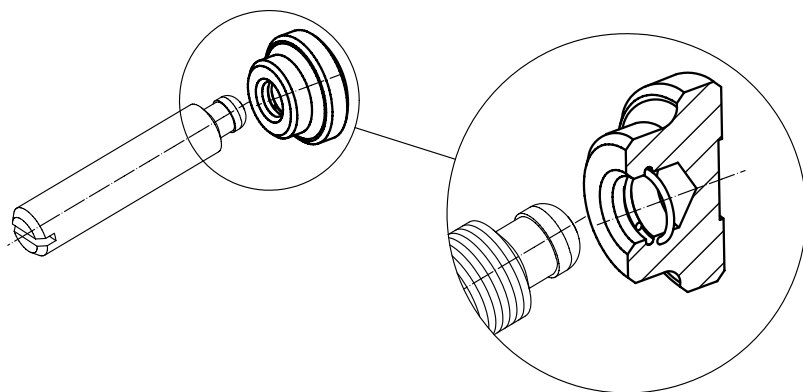


picture 2

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°	33.0	22560.0025	22560.0125
32	12.1	22	15	7.0	7.5	M16	5°	58.0	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



Thrust Pads • plastic

EH 22570.



PRODUCT DESCRIPTION

The plastic thrust pads (EH 22570.) can be combined with ball-headed grub screws (EH 22570.).

Material

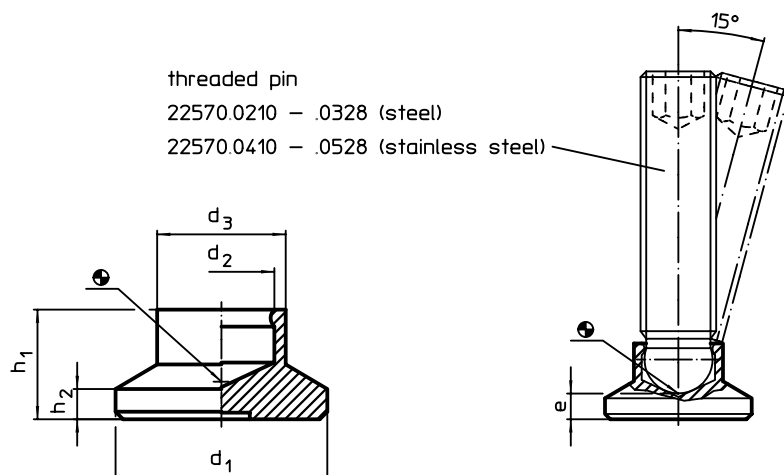
- Thermoplastic POM, black, dull

MORE INFORMATION

Further products

Grub Screws, ball-headed. → p. 284

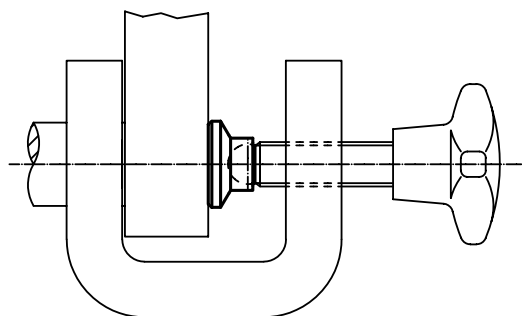
DRAWING



ORDER INFORMATION

d ₁	Dimensions				h ₁	h ₂	Load capacity for static load max.	For grub screws EH 22570.	min. max.		Art. No.
	d ₂	d ₃	e	[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	6.4 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

The ball-headed grub screws (EH 22570.) can be combined with plastic thrust pads (EH 22570.).

Material

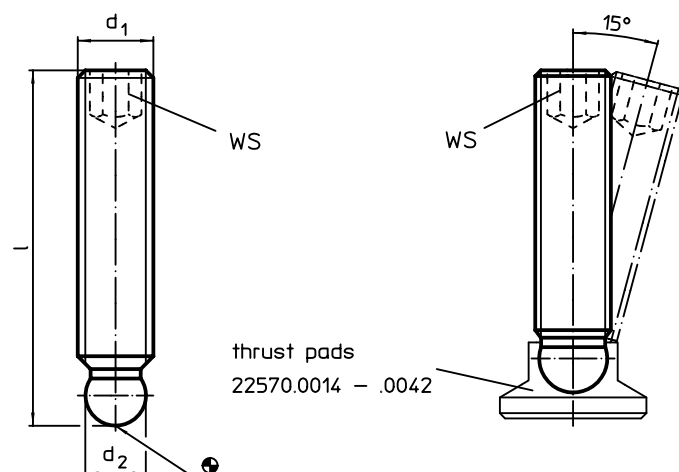
- Free cutting steel, quality 5.8, blackened
- Stainless steel 1.4305

MORE INFORMATION

Further products

Thrust Pads, plastic. → p. 283

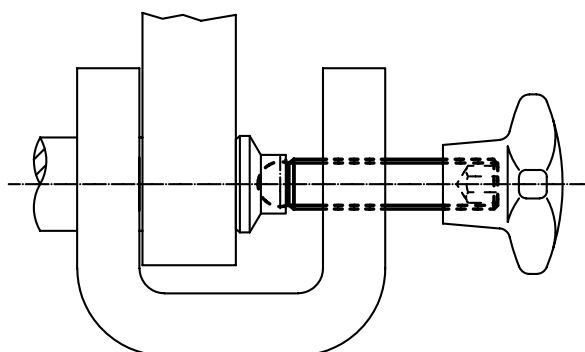
DRAWING



ORDER INFORMATION

d ₁	Dimensions		WS		Art. No.	
	l	d ₂ +0.05			Free cutting steel	Stainless steel
	[mm]		[mm]	[g]		
M 6	30	4.5	3	5.1	22570.0210	22570.0410
	40	4.5	3	5.9	22570.0214	22570.0414
	50	4.5	3	7.6	22570.0218	22570.0418
M 8	25	6.1	4	5.8	22570.0219	22570.0419
	40	6.1	4	11.0	22570.0220	22570.0420
	50	6.1	4	14.0	22570.0224	22570.0424
	63	6.1	4	18.0	22570.0228	22570.0428
M10	40	7.8	5	16.0	22570.0248	22570.0448
	50	7.8	5	21.0	22570.0250	22570.0450
	63	7.8	5	27.0	22570.0254	22570.0454
	80	7.8	5	36.0	22570.0258	22570.0458
M12	40	9.4	6	23.0	22570.0316	22570.0516
	63	9.4	6	39.0	22570.0320	22570.0520
	80	9.4	6	51.0	22570.0324	22570.0524
	100	9.4	6	65.0	22570.0328	22570.0528

APPLICATION EXAMPLE



Mounting Pads

EH 22590.

2



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

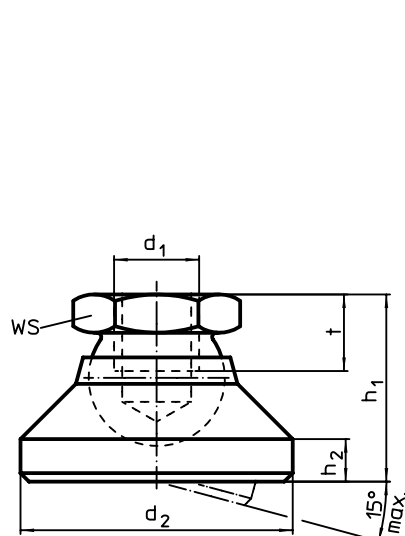
- Heat-treated steel, blackened
- Stainless steel 1.4305
- Thermoplastic POM, white

MORE INFORMATION

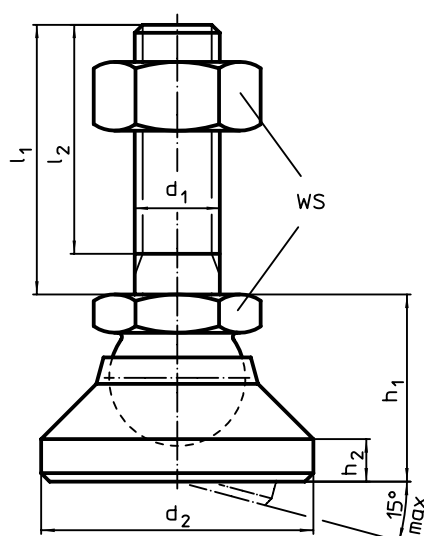
Notes

For the versions $d_1 = M10$ and $M12$ the lock nut conforms to DIN 934.

DRAWING



picture 1



picture 2

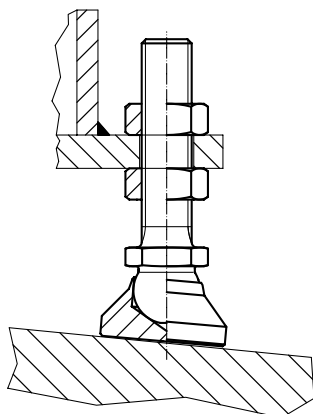
ORDER INFORMATION

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	Thermoplastic
[mm]							[mm]	[kN]	[°C]		[g]			
pad and ball element – picture 1														
M 6	–	20	–	14	2.5	5.0	10	10	–	250	15.0	22590.0006	–	–
								8	–	250	15.0	–	22590.0206	–
M 8	–	25	–	18	4.0	7.0	13	18	–	250	33.0	22590.0008	–	–
								14	–	250	33.0	–	22590.0208	–
M10	–	32	–	22	5.0	9.0	17	20	–	250	67.0	22590.0010	–	–
								16	–	250	67.0	–	22590.0210	–
M12	–	40	–	26	6.0	11.0	19	35	–	250	112.0	22590.0012	–	–
								28	–	250	113.0	–	22590.0212	–
M16	–	50	–	32	7.0	13.5	24	45	–	250	254.0	22590.0016	–	–
								36	–	250	256.0	–	22590.0216	–
M20	–	60	–	42	8.0	17.0	30	55	–	250	451.0	22590.0020	–	–
								44	–	250	452.0	–	22590.0220	–
M24	–	60	–	45	9.5	19.0	36	65	–	250	498.0	22590.0024	–	–
								52	–	250	504.0	–	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	Thermoplas- tic
[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	6.1	–	–	22590.0106
M 8	–	25	–	18	4.0	7.0	13	7	-30	80	13.0	–	–	22590.0108
M10	–	32	–	22	5.0	9.0	17	10	-30	80	26.0	–	–	22590.0110
M12	–	40	–	26	6.0	11.0	19	18	-30	80	40.0	–	–	22590.0112
M16	–	50	–	32	7.0	13.5	24	20	-30	80	75.0	–	–	22590.0116
M20	–	60	–	42	8.0	17.0	30	22	-30	80	150.0	–	–	22590.0120
M24	–	60	–	45	9.5	19.0	36	25	-30	80	184.0	–	–	22590.0124
pad and ball element with bolt from steel – picture 2														
M 6	60	20	57.0	14	2.5	–	10	10	–	250	29.0	22590.0410	–	–
								8	–	250	29.0	–	22590.0610	–
M 8	80	25	76.0	18	4.0	–	13	18	–	250	66.0	22590.0422	–	–
								14	–	250	66.0	–	22590.0622	–
M10	100	32	95.5	22	5.0	–	17	20	–	250	133.0	22590.0438	–	–
								16	–	250	134.0	–	22590.0638	–
	150	32	145.5	22	5.0	–	17	20	–	250	156.0	22590.0442	–	–
								16	–	250	158.0	–	22590.0642	–
M12	100	40	94.5	26	6.0	–	19	35	–	250	237.0	22590.0452	–	–
								28	–	250	212.0	–	22590.0652	–
	150	40	144.5	26	6.0	–	19	35	–	250	283.0	22590.0456	–	–
								28	–	250	248.0	–	22590.0656	–
M16	100	50	94.0	32	7.0	–	24	45	–	250	460.0	22590.0468	–	–
								36	–	250	412.0	–	22590.0668	–
	200	50	194.0	32	7.0	–	24	45	–	250	608.0	22590.0472	–	–
								36	–	250	624.0	–	22590.0672	–
M20	100	60	92.5	42	8.0	–	30	55	–	250	781.0	22590.0482	–	–
								44	–	250	790.0	–	22590.0682	–
	200	60	192.5	42	8.0	–	30	55	–	250	1015.0	22590.0488	–	–
								44	–	250	1031.0	–	22590.0688	–
M24	100	60	91.0	45	9.5	–	36	65	–	250	994.0	22590.0495	–	–
								52	–	250	1001.0	–	22590.0695	–
	200	60	191.0	45	9.5	–	36	65	–	250	1320.0	22590.0498	–	–
								52	–	250	1323.0	–	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	20.0	–	–	22590.0510
M 8	80	25	76.0	18	4.0	–	13	7	-30	80	46.0	–	–	22590.0522
M10	100	32	95.5	22	5.0	–	17	10	-30	80	93.0	–	–	22590.0538
	150	32	145.5	22	5.0	–	17	10	-30	80	117.0	–	–	22590.0542
M12	100	40	94.5	26	6.0	–	19	18	-30	80	139.0	–	–	22590.0552
	150	40	144.5	26	6.0	–	19	18	-30	80	175.0	–	–	22590.0556
M16	100	50	94.0	32	7.0	–	24	20	-30	80	300.0	–	–	22590.0568
	200	50	194.0	32	7.0	–	24	20	-30	80	399.0	–	–	22590.0572
M20	100	60	92.5	42	8.0	–	30	22	-30	80	523.0	–	–	22590.0582
	200	60	192.5	42	8.0	–	30	22	-30	80	759.0	–	–	22590.0588
M24	100	60	91.0	45	9.5	–	36	25	-30	80	735.0	–	–	22590.0595
	200	60	191.0	45	9.5	–	36	25	-30	80	1041.0	–	–	22590.0598

APPLICATION EXAMPLE



Mounting Pads • protected against slipping

EH 22590.

2



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 cap

- Rubber, black

Lock nut

- Steel, blackened, ISO 4032

- Steel, blackened, DIN 934
- Stainless Steel A2, ISO 4032
- Stainless Steel A2, DIN 934

Pad

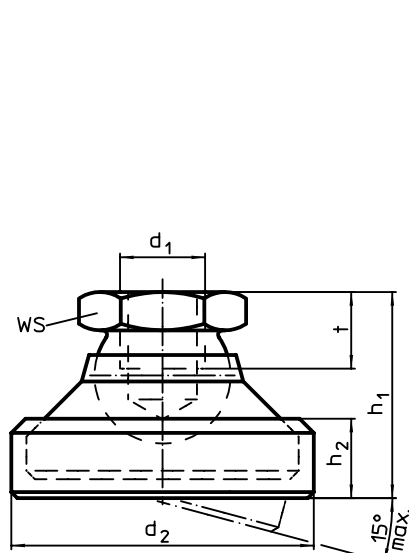
- Heat-treated steel, tempered, blackened
- Stainless steel 1.4305
- Thermoplastic POM, white

MORE INFORMATION

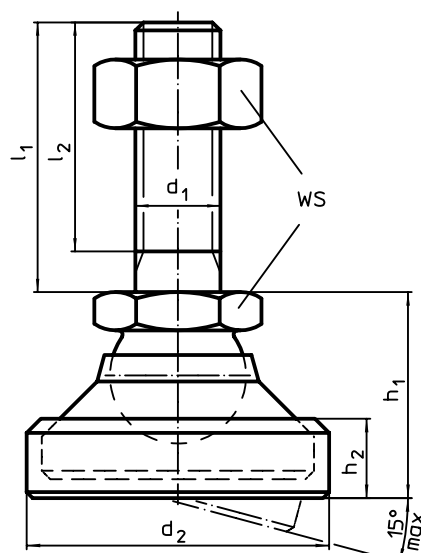
Notes

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	Thermoplastic
[mm]							[mm]	[kN]	[g]			
pad and ball element – picture 1												
M 6	–	22.5	–	16.5	6.4	5.0	10	10	19.0	22590.1006	–	–
								8	17.0	–	22590.1206	–
M 8	–	28.0	–	20.6	8.3	7.0	13	18	40.0	22590.1008	–	–
								14	36.0	–	22590.1208	–
M10	–	36.0	–	26.0	11.0	9.0	17	20	80.0	22590.1010	–	–
								16	74.0	–	22590.1210	–
M12	–	45.0	–	30.5	13.2	11.0	19	35	126.0	22590.1012	–	–
								28	123.0	–	22590.1212	–
M16	–	56.0	–	37.5	15.5	13.5	24	45	241.0	22590.1016	–	–
								36	241.0	–	22590.1216	–
M20	–	67.0	–	49.5	19.5	17.0	30	55	480.0	22590.1020	–	–
								44	500.0	–	22590.1220	–
M24	–	69.0	–	55.0	24.0	19.0	36	65	554.0	22590.1024	–	–
								52	517.0	–	22590.1224	–



Dimensions							WS	Load capacity for static load max.		Heat-treated steel	Art. No.	
d ₁	l ₁	d ₂	l ₂	h ₁ ~	h ₂	t					Stainless steel	Thermoplastic
[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	7.8	–	–	22590.1106
M 8	–	28.0	–	20.6	8.3	7.0	13	7	17.0	–	–	22590.1108
M10	–	36.0	–	26.0	11.0	9.0	17	10	34.0	–	–	22590.1110
M12	–	45.0	–	30.5	13.2	11.0	19	18	57.0	–	–	22590.1112
M16	–	56.0	–	37.5	15.5	13.5	24	20	96.0	–	–	22590.1116
M20	–	67.0	–	49.5	19.5	17.0	30	22	190.0	–	–	22590.1120
M24	–	69.0	–	55.0	24.0	19.0	36	25	240.0	–	–	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	32.0	22590.1410	–	–
								8	30.0	–	22590.1610	–
M 8	80	28.0	76.0	20.6	8.3	–	13	18	69.0	22590.1422	–	–
								14	71.0	–	22590.1622	–
M10	100	36.0	95.5	26.0	11.0	–	17	20	139.0	22590.1438	–	–
								16	150.0	–	22590.1638	–
	150	36.0	145.5	26.0	11.0	–	17	20	165.0	22590.1442	–	–
								16	169.0	–	22590.1642	–
M12	100	45.0	94.5	30.5	13.2	–	19	35	252.0	22590.1452	–	–
								28	227.0	–	22590.1652	–
	150	45.0	144.5	30.5	13.2	–	19	35	258.0	22590.1456	–	–
								28	258.0	–	22590.1656	–
M16	100	56.0	94.0	37.5	15.5	–	24	45	440.0	22590.1468	–	–
								36	441.0	–	22590.1668	–
	200	56.0	194.0	37.5	15.5	–	24	45	600.0	22590.1472	–	–
								36	630.0	–	22590.1672	–
M20	100	67.0	92.5	49.5	19.5	–	30	55	762.0	22590.1482	–	–
								44	762.0	–	22590.1682	–
	200	67.0	192.5	49.5	19.5	–	30	55	1080.0	22590.1488	–	–
								44	1065.0	–	22590.1688	–
M24	100	69.0	91.0	55.0	24.0	–	36	65	1020.0	22590.1495	–	–
								52	1000.0	–	22590.1695	–
	200	69.0	191.0	55.0	24.0	–	36	65	1287.0	22590.1498	–	–
								52	1287.0	–	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	21.0	–	–	22590.1510
M 8	80	28.0	76.0	20.6	8.3	–	13	7	49.0	–	–	22590.1522
M10	100	36.0	95.5	26.0	11.0	–	17	10	100.0	–	–	22590.1538
	150	36.0	145.5	26.0	11.0	–	17	10	124.0	–	–	22590.1542
M12	100	45.0	94.5	30.5	13.2	–	19	18	150.0	–	–	22590.1552
	150	45.0	144.5	30.5	13.2	–	19	18	184.0	–	–	22590.1556
M16	100	56.0	94.0	37.5	15.5	–	24	20	285.0	–	–	22590.1568
	200	56.0	194.0	37.5	15.5	–	24	20	414.0	–	–	22590.1572
M20	100	67.0	92.5	49.5	19.5	–	30	22	573.0	–	–	22590.1582
	200	67.0	192.5	49.5	19.5	–	30	22	704.0	–	–	22590.1588
M24	100	69.0	91.0	55.0	24.0	–	36	25	718.0	–	–	22590.1595
	200	69.0	191.0	55.0	24.0	–	36	25	1016.0	–	–	22590.1598

Mounting Pads • with fastening holes

EH 22590.

2



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

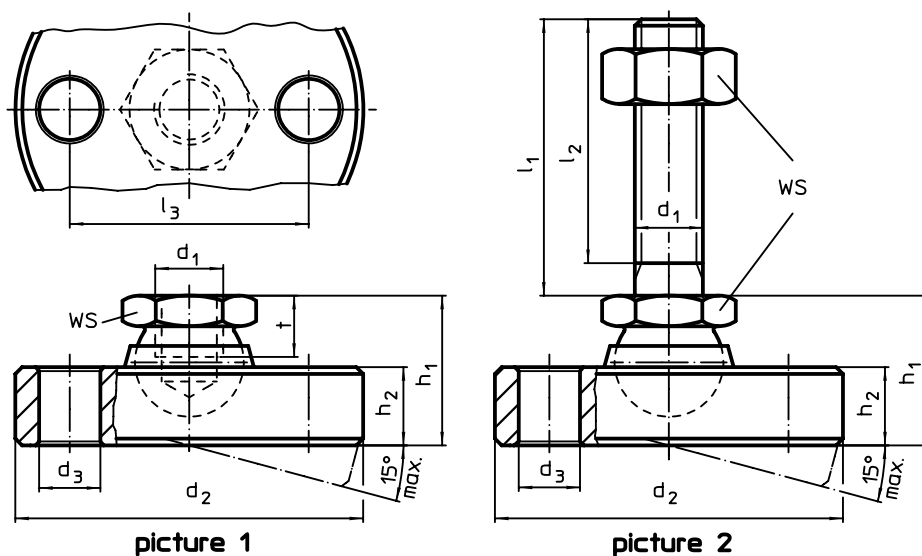
- Stainless steel 1.4305

MORE INFORMATION

Notes

For the versions $d_1 = M10$ and $M12$ the lock nut conforms to DIN 934.

DRAWING



ORDER INFORMATION

Dimensions									WS	Load capacity for static load max.		Art. No.
d ₁	l ₁	d ₂ -0.5	d ₃	l ₂	l ₃	h ₁ ~	h ₂	t				
[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	131	22590.0708
M10	–	60	9.0	–	44	22	11.5	9.0	17	16	251	22590.0710
M12	–	65	9.0	–	48	26	12.5	11.0	19	28	324	22590.0712
M16	–	70	9.0	–	54	32	13.5	13.5	24	36	492	22590.0716
M20	–	80	9.0	–	64	42	16.5	17.0	30	44	784	22590.0720
M24	–	100	11.0	–	78	45	20.5	19.0	36	52	1392	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	316	22590.0838
	150	60	9.0	145.5	44	22	11.5	–	17	16	340	22590.0842
M12	100	65	9.0	94.5	48	26	12.5	–	19	28	481	22590.0852
	150	65	9.0	144.5	48	26	12.5	–	19	28	510	22590.0856
M16	100	70	9.0	94.0	54	32	13.5	–	24	36	617	22590.0868
	200	70	9.0	194.0	54	32	13.5	–	24	36	905	22590.0872
M20	100	80	9.0	92.5	64	42	16.5	–	30	44	1125	22590.0882
	200	80	9.0	192.5	64	42	16.5	–	30	44	1408	22590.0888
M24	100	100	11.0	91.0	78	45	20.5	–	36	52	1906	22590.0895
	200	100	11.0	191.0	78	45	20.5	–	36	52	2000	22590.0898

Fulcrum Screws

EH 22591.

2



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

- Stainless steel 1.4305

Body

- Heat-treated steel, tempered, blackened
- Stainless steel 1.4305

MORE INFORMATION

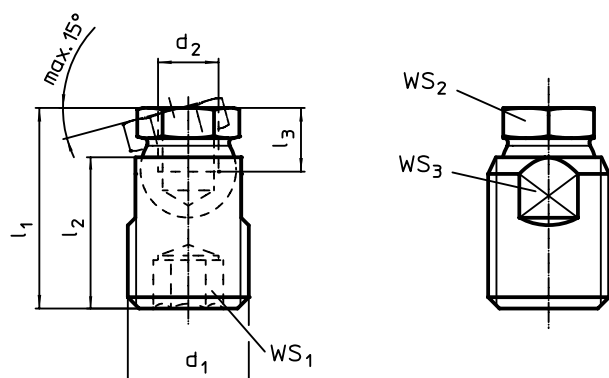
Notes

The fulcrum screws may exclusively be exposed to static loading.

Ball element

- Heat-treated steel, tempered, blackened

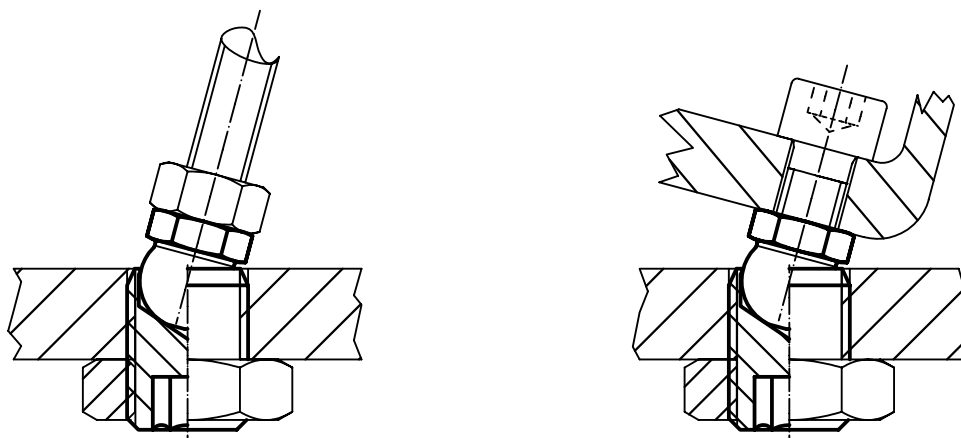
DRAWING



ORDER INFORMATION

d ₁	d ₂	Dimensions			WS ₁	WS ₂	WS ₃	Load capacity for static load max.		Art. No.
		l ₁ ±0.5 [mm]	l ₂	l ₃ min.	[mm]	[mm]	[mm]	[kN]	[g]	
steel										
M12	M 6	21.2	16	5.0	6	9	10	10	10	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	173	22591.0016
stainless steel										
M12	M 6	21.2	16	5.0	6	9	10	8	10	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	173	22591.0216

APPLICATION EXAMPLE



Support Legs

EH 22593.

2



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

Grub Screw

- 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

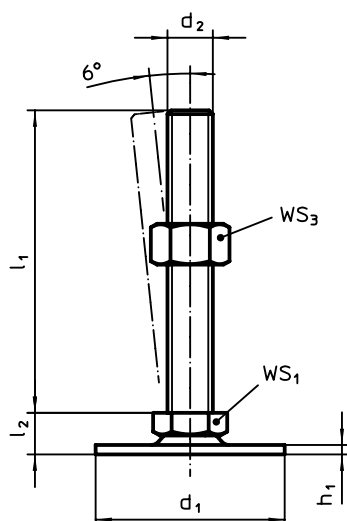
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4301, vibratory ground

MORE INFORMATION

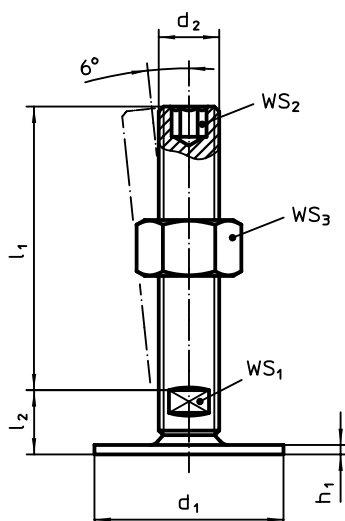
Further products

Support Legs, protected against slipping → p. 294

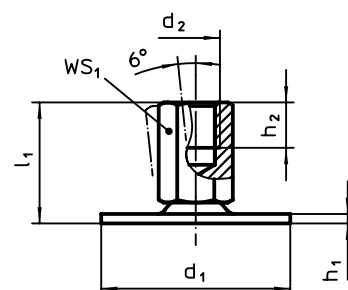
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

Dimensions						WS ₁	WS ₂	WS ₃		Art. No.	
d ₁	d ₂	l ₁	h ₁	h ₂	l ₂					Steel	Stainless steel
[mm]						[mm]	[mm]	[mm]	[g]		
with screw – picture 1											
40	M 8	40	2.0	–	11	17	–	13	45	22593.0005	22593.1505
		50	2.0	–	11	17	–	13	48	22593.0010	22593.1510
		63	2.0	–	11	17	–	13	48	22593.0015	22593.1515
	M10	50	2.0	–	11	17	–	16	62	22593.0020	22593.1520
		60	2.0	–	11	17	–	16	69	22593.0025	22593.1525
		80	2.0	–	11	17	–	16	76	22593.0030	22593.1530
		100	2.0	–	11	17	–	16	87	22593.0035	22593.1535
	M12	60	2.0	–	11	17	–	18	85	22593.0040	22593.1540
		80	2.0	–	11	17	–	18	98	22593.0045	22593.1545
		100	2.0	–	11	17	–	18	113	22593.0050	22593.1550
		125	2.0	–	11	17	–	18	132	22593.0055	22593.1555

→

Dimensions						WS ₁	WS ₂	WS ₃		Art. No.	
d ₁	d ₂	l ₁	h ₁	h ₂	l ₂					Steel	Stainless steel
[mm]						[mm]	[mm]	[mm]	[g]		
50	M 8	40	2.5	–	11	17	–	13	62	22593.0060	22593.1560
		50	2.5	–	11	17	–	13	68	22593.0065	22593.1565
		63	2.5	–	11	17	–	13	70	22593.0070	22593.1570
	M10	50	2.5	–	11	17	–	16	80	22593.0075	22593.1575
		60	2.5	–	11	17	–	16	86	22593.0080	22593.1580
		80	2.5	–	11	17	–	16	95	22593.0085	22593.1585
		100	2.5	–	11	17	–	16	106	22593.0090	22593.1590
	M12	60	2.5	–	11	17	–	18	102	22593.0095	22593.1595
		80	2.5	–	11	17	–	18	117	22593.0100	22593.1600
		100	2.5	–	11	17	–	18	132	22593.0105	22593.1605
		125	2.5	–	11	17	–	18	150	22593.0110	22593.1610
	60	M 8	40	2.5	–	11	17	–	13	81	22593.0115
50			2.5	–	11	17	–	13	83	22593.0120	22593.1620
63			2.5	–	11	17	–	13	87	22593.0125	22593.1625
M10		50	2.5	–	11	17	–	16	97	22593.0130	22593.1630
		60	2.5	–	11	17	–	16	103	22593.0135	22593.1635
		80	2.5	–	11	17	–	16	111	22593.0140	22593.1640
		100	2.5	–	11	17	–	16	122	22593.0145	22593.1645
M12		60	2.5	–	11	17	–	18	120	22593.0150	22593.1650
		80	2.5	–	11	17	–	18	134	22593.0155	22593.1655
		100	2.5	–	11	17	–	18	150	22593.0160	22593.1660
		125	2.5	–	11	17	–	18	167	22593.0165	22593.1665
80		M 8	40	3.0	–	12	17	–	13	144	22593.0170
	50		3.0	–	12	17	–	13	148	22593.0175	22593.1675
	63		3.0	–	12	17	–	13	152	22593.0180	22593.1680
	M10	50	3.0	–	12	17	–	16	163	22593.0185	22593.1685
		60	3.0	–	12	17	–	16	167	22593.0190	22593.1690
		80	3.0	–	12	17	–	16	176	22593.0195	22593.1695
		100	3.0	–	12	17	–	16	187	22593.0200	22593.1700
	M12	60	3.0	–	12	17	–	18	186	22593.0205	22593.1705
		80	3.0	–	12	17	–	18	199	22593.0210	22593.1710
		100	3.0	–	12	17	–	18	218	22593.0215	22593.1715
		125	3.0	–	12	17	–	18	231	22593.0220	22593.1720
		with screw – picture 2									
40	M16	75	2.0	–	17	12	8	24	154	22593.0605	22593.2105
		100	2.0	–	17	12	8	24	183	22593.0610	22593.2110
		125	2.0	–	17	12	8	24	217	22593.0615	22593.2115
		150	2.0	–	17	12	8	24	252	22593.0620	22593.2120
		200	2.0	–	17	12	8	24	315	22593.0625	22593.2125
50	M16	75	2.5	–	17	12	8	24	172	22593.0630	22593.2130
		100	2.5	–	17	12	8	24	205	22593.0635	22593.2135
		125	2.5	–	17	12	8	24	236	22593.0640	22593.2140
		150	2.5	–	17	12	8	24	270	22593.0645	22593.2145
		200	2.5	–	17	12	8	24	335	22593.0650	22593.2150
60	M16	75	2.5	–	17	12	8	24	187	22593.0655	22593.2155
		100	2.5	–	17	12	8	24	221	22593.0660	22593.2160
		125	2.5	–	17	12	8	24	252	22593.0665	22593.2165
		150	2.5	–	17	12	8	24	288	22593.0670	22593.2170
		200	2.5	–	17	12	8	24	352	22593.0675	22593.2175
80	M16	75	3.0	–	18	12	8	24	251	22593.0680	22593.2180
		100	3.0	–	18	12	8	24	285	22593.0685	22593.2185
		125	3.0	–	18	12	8	24	317	22593.0690	22593.2190
		150	3.0	–	18	12	8	24	349	22593.0695	22593.2195
		200	3.0	–	18	12	8	24	414	22593.0700	22593.2200
	M20	75	3.0	–	19	15	10	30	340	22593.0705	22593.2205
		100	3.0	–	19	15	10	30	393	22593.0710	22593.2210
		125	3.0	–	19	15	10	30	441	22593.0715	22593.2215
		150	3.0	–	19	15	10	30	494	22593.0720	22593.2220
		200	3.0	–	19	15	10	30	600	22593.0725	22593.2225
	M24	100	3.0	–	22	19	12	36	537	22593.0730	22593.2230
		125	3.0	–	22	19	12	36	610	22593.0735	22593.2235
		150	3.0	–	22	19	12	36	681	22593.0740	22593.2240
		200	3.0	–	22	19	12	36	829	22593.0745	22593.2245



Dimensions						WS ₁	WS ₂	WS ₃		Art. No.	
d ₁	d ₂	l ₁	h ₁	h ₂	l ₂					Steel	Stainless steel
[mm]						[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	–	–	57	22593.1015	22593.2515
	M16	37	2.0	16	–	22	–	–	93	22593.1020	22593.2520
50	M 8	25	2.5	8	–	14	–	–	59	22593.1025	22593.2525
	M10	28	2.5	10	–	14	–	–	58	22593.1030	22593.2530
	M12	32	2.5	12	–	17	–	–	76	22593.1035	22593.2535
	M16	37	2.5	16	–	22	–	–	112	22593.1040	22593.2540
60	M 8	25	2.5	8	–	14	–	–	76	22593.1045	22593.2545
	M10	28	2.5	10	–	14	–	–	77	22593.1050	22593.2550
	M12	32	2.5	12	–	17	–	–	92	22593.1055	22593.2555
	M16	37	2.5	16	–	22	–	–	127	22593.1060	22593.2560
80	M 8	26	3.0	8	–	14	–	–	140	22593.1065	22593.2565
	M10	29	3.0	10	–	14	–	–	144	22593.1070	22593.2570
	M12	32	3.0	12	–	17	–	–	160	22593.1075	22593.2575
	M16	38	3.0	16	–	22	–	–	195	22593.1080	22593.2580
	M20	45	3.0	20	–	27	–	–	256	22593.1085	22593.2585

Support Legs • protected against slipping

EH 22593.

2



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

Grub Screw

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

Rubber cap

- 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

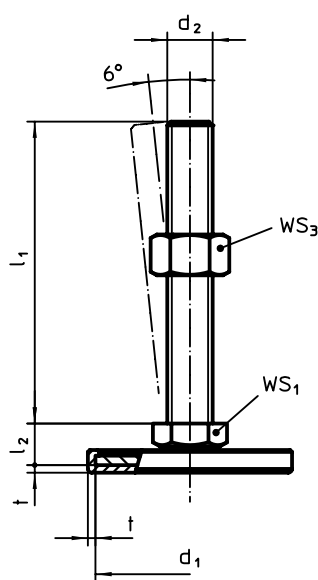
- Steel, zinc-plated by galvanization, passivated
- Stainless steel 1.4301, vibratory ground

MORE INFORMATION

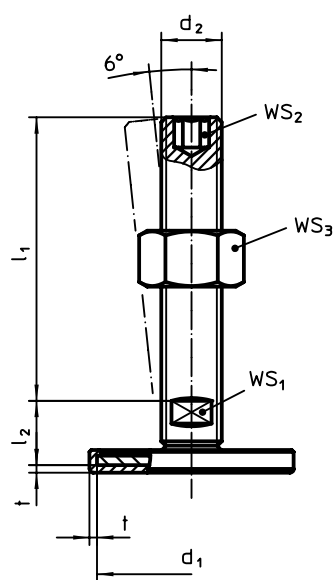
Further products

Support Legs → p. 291

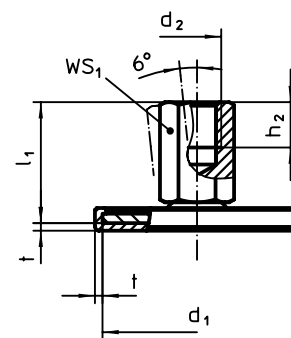
DRAWING



picture 1



picture 2



picture 3

ORDER INFORMATION

Dimensions						WS ₁	WS ₂	WS ₃		Art. No.	
d ₁	d ₂	l ₁	h ₂	l ₂	t					Steel	Stainless steel
[mm]						[mm]	[mm]	[mm]	[g]		
with screw – picture 1											
40	M 8	40	–	11	1.5	17	–	13	51	22593.0305	22593.1805
		50	–	11	1.5	17	–	13	51	22593.0310	22593.1810
		63	–	11	1.5	17	–	13	56	22593.0315	22593.1815
	M10	50	–	11	1.5	17	–	16	65	22593.0320	22593.1820
		60	–	11	1.5	17	–	16	71	22593.0325	22593.1825
		80	–	11	1.5	17	–	16	80	22593.0330	22593.1830
		100	–	11	1.5	17	–	16	94	22593.0335	22593.1835
	M12	60	–	11	1.5	17	–	18	86	22593.0340	22593.1840
		80	–	11	1.5	17	–	18	102	22593.0345	22593.1845
		100	–	11	1.5	17	–	18	118	22593.0350	22593.1850
		125	–	11	1.5	17	–	18	136	22593.0355	22593.1855

→

Dimensions						WS ₁	WS ₂	WS ₃		Art. No.		
d ₁	d ₂	l ₁	h ₂	l ₂	t					Steel	Stainless steel	
[mm]						[mm]	[mm]	[mm]	[g]			
50	M 8	40	–	11	2.0	17	–	13	70	22593.0360	22593.1860	
		50	–	11	2.0	17	–	13	74	22593.0365	22593.1865	
		63	–	11	2.0	17	–	13	77	22593.0370	22593.1870	
	M10	50	–	11	2.0	17	–	16	87	22593.0375	22593.1875	
		60	–	11	2.0	17	–	16	91	22593.0380	22593.1880	
		80	–	11	2.0	17	–	16	103	22593.0385	22593.1885	
		100	–	11	2.0	17	–	16	113	22593.0390	22593.1890	
	M12	60	–	11	2.0	17	–	18	109	22593.0395	22593.1895	
		80	–	11	2.0	17	–	18	110	22593.0400	22593.1900	
		100	–	11	2.0	17	–	18	139	22593.0405	22593.1905	
		125	–	11	2.0	17	–	18	156	22593.0410	22593.1910	
60	M 8	40	–	11	2.0	17	–	13	90	22593.0415	22593.1915	
		50	–	11	2.0	17	–	13	91	22593.0420	22593.1920	
		63	–	11	2.0	17	–	13	98	22593.0425	22593.1925	
	M10	50	–	11	2.0	17	–	16	110	22593.0430	22593.1930	
		60	–	11	2.0	17	–	16	110	22593.0435	22593.1935	
		80	–	11	2.0	17	–	16	122	22593.0440	22593.1940	
		100	–	11	2.0	17	–	16	132	22593.0445	22593.1945	
	M12	60	–	11	2.0	17	–	18	129	22593.0450	22593.1950	
		80	–	11	2.0	17	–	18	143	22593.0455	22593.1955	
		100	–	11	2.0	17	–	18	158	22593.0460	22593.1960	
		125	–	11	2.0	17	–	18	177	22593.0465	22593.1965	
		80	M 8	40	–	12	2.0	17	–	13	158	22593.0470
	50			–	12	2.0	17	–	13	164	22593.0475	22593.1975
63	–			12	2.0	17	–	13	166	22593.0480	22593.1980	
M10	50		–	12	2.0	17	–	16	176	22593.0485	22593.1985	
	60		–	12	2.0	17	–	16	181	22593.0490	22593.1990	
	80		–	12	2.0	17	–	16	192	22593.0495	22593.1995	
	100		–	12	2.0	17	–	16	201	22593.0500	22593.2000	
M12	60		–	12	2.0	17	–	18	199	22593.0505	22593.2005	
	80		–	12	2.0	17	–	18	213	22593.0510	22593.2010	
	100		–	12	2.0	17	–	18	230	22593.0515	22593.2015	
	125		–	12	2.0	17	–	18	245	22593.0520	22593.2020	
with screw – picture 2												
40	M16	75	–	17	1.5	12	8	24	154	22593.0805	22593.2305	
		100	–	17	1.5	12	8	24	186	22593.0810	22593.2310	
		125	–	17	1.5	12	8	24	219	22593.0815	22593.2315	
		150	–	17	1.5	12	8	24	254	22593.0820	22593.2320	
		200	–	17	1.5	12	8	24	318	22593.0825	22593.2325	
50	M16	75	–	17	2.0	12	8	24	177	22593.0830	22593.2330	
		100	–	17	2.0	12	8	24	209	22593.0835	22593.2335	
		125	–	17	2.0	12	8	24	244	22593.0840	22593.2340	
		150	–	17	2.0	12	8	24	278	22593.0845	22593.2345	
		200	–	17	2.0	12	8	24	342	22593.0850	22593.2350	
60	M16	75	–	17	2.0	12	8	24	196	22593.0855	22593.2355	
		100	–	17	2.0	12	8	24	228	22593.0860	22593.2360	
		125	–	17	2.0	12	8	24	262	22593.0865	22593.2365	
		150	–	17	2.0	12	8	24	295	22593.0870	22593.2370	
		200	–	17	2.0	12	8	24	358	22593.0875	22593.2375	
80	M16	75	–	18	2.0	12	8	24	266	22593.0880	22593.2380	
		100	–	18	2.0	12	8	24	299	22593.0885	22593.2385	
		125	–	18	2.0	12	8	24	332	22593.0890	22593.2390	
		150	–	18	2.0	12	8	24	358	22593.0895	22593.2395	
		200	–	18	2.0	12	8	24	432	22593.0900	22593.2400	
	M20	75	–	19	2.0	15	10	30	355	22593.0905	22593.2405	
		100	–	19	2.0	15	10	30	405	22593.0910	22593.2410	
		125	–	19	2.0	15	10	30	454	22593.0915	22593.2415	
		150	–	19	2.0	15	10	30	507	22593.0920	22593.2420	
		200	–	19	2.0	15	10	30	614	22593.0925	22593.2425	
	M24	100	–	22	2.0	19	12	36	546	22593.0930	22593.2430	
		125	–	22	2.0	19	12	36	626	22593.0935	22593.2435	
		150	–	22	2.0	19	12	36	693	22593.0940	22593.2440	
200		–	22	2.0	19	12	36	847	22593.0945	22593.2445		

→

Dimensions						WS ₁	WS ₂	WS ₃		Art. No.	
d ₁	d ₂	l ₁	h ₂	l ₂	t					Steel	Stainless steel
[mm]						[mm]	[mm]	[mm]	[g]		
with female thread – picture 3											
40	M 8	25	8	–	1.5	14	–	–	46	22593.1105	22593.2605
	M10	28	10	–	1.5	14	–	–	46	22593.1110	22593.2610
	M12	31	12	–	1.5	17	–	–	63	22593.1115	22593.2615
	M16	37	16	–	1.5	22	–	–	98	22593.1120	22593.2620
50	M 8	25	8	–	2.0	14	–	–	69	22593.1125	22593.2625
	M10	28	10	–	2.0	14	–	–	67	22593.1130	22593.2630
	M12	32	12	–	2.0	17	–	–	84	22593.1135	22593.2635
	M16	37	16	–	2.0	22	–	–	121	22593.1140	22593.2640
60	M 8	25	8	–	2.0	14	–	–	88	22593.1145	22593.2645
	M10	28	10	–	2.0	14	–	–	88	22593.1150	22593.2650
	M12	32	12	–	2.0	17	–	–	104	22593.1155	22593.2655
	M16	37	16	–	2.0	22	–	–	142	22593.1160	22593.2660
80	M 8	26	8	–	2.0	14	–	–	156	22593.1165	22593.2665
	M10	29	10	–	2.0	14	–	–	159	22593.1170	22593.2670
	M12	32	12	–	2.0	17	–	–	173	22593.1175	22593.2675
	M16	38	16	–	2.0	22	–	–	209	22593.1180	22593.2680
	M20	45	20	–	2.0	27	–	–	268	22593.1185	22593.2685

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

MORE INFORMATION

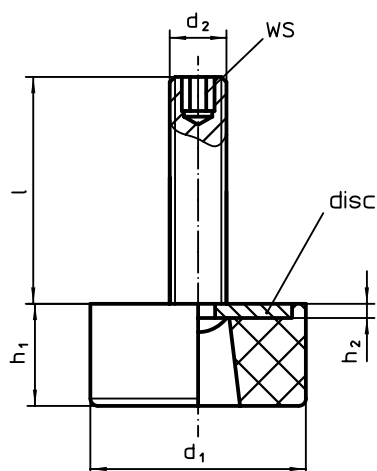
Further products

Rubber Endstop Buffers, cylindrical . . . → p. 718

Rubber Endstop Buffers, parabolic . . . → p. 720

Rubber Endstop Buffers, truncated cone form. → p. 721

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	18	22594.0015
	45	M 6	16	1.5	3	540	-30	120	21	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	44	22594.0030
38	40	M 8	20	2.0	4	920	-30	120	50	22594.0035
	65	M 8	20	2.0	4	920	-30	120	58	22594.0040
50	45	M10	22	2.5	5	2500	-30	120	98	22594.0045
	70	M10	22	2.5	5	2500	-30	120	111	22594.0050
64	45	M10	26	2.5	5	3700	-30	120	165	22594.0055
	70	M10	26	2.5	5	3700	-30	120	177	22594.0060

Seating Elements • with plastic bearing surface, orienting

EH 22600.



PRODUCT DESCRIPTION

Can be used as 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

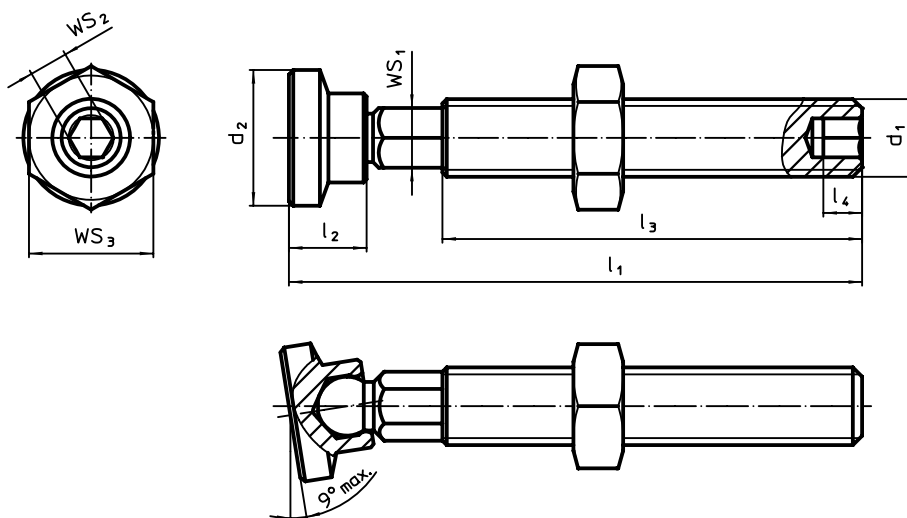
- Plastic (PEEK), blue

MORE INFORMATION

Notes

Special types on request.

DRAWING



ORDER INFORMATION

Dimensions						WS ₁	WS ₂	WS ₃	 min. max.		 [g]	Art. No.
d ₁	l ₁ ±1	d ₂	l ₂	l ₃	l ₄	[mm]	[mm]	[mm]	[°C]			
[mm]												
M 5	37.0	8.5	5.0	27.0	2.5	4.0	2.5	8	-60	250	4.9	22600.0005
M 6	44.0	8.5	5.0	31.5	3.0	4.5	3.0	10	-60	250	7.5	22600.0006
M 8	63.3	12.5	8.7	49.0	4.0	6.0	4.0	13	-60	250	20.0	22600.0008
M10	73.3	12.5	8.7	56.9	5.0	8.0	5.0	17	-60	250	37.0	22600.0010
M12	84.4	16.8	12.0	64.3	6.0	9.0	6.0	19	-60	250	61.0	22600.0012
M16	84.4	16.8	12.0	62.7	8.0	11.0	8.0	24	-60	250	106.0	22600.0016

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

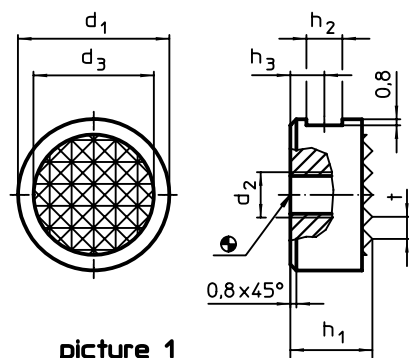
Ribbing

- Hard metal plate, brazed-in

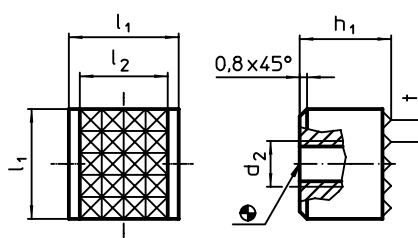
Assembly

Square type suitable for alignments, thus providing a bearing surface for high holding forces.

DRAWING



picture 1

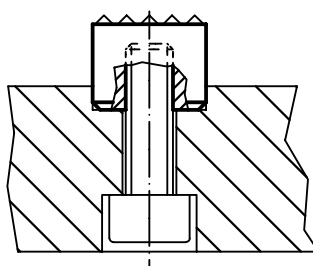
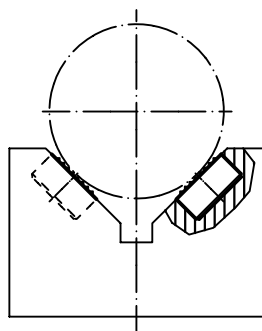


picture 2

ORDER INFORMATION

			Dimensions							Art. No.
d ₁	h ₁	l ₁	d ₂	d ₃	h ₂	h ₃	l ₂	t		
-0.13	-0.13	-0.13								
[mm]										
[g]										
round – picture 1										
10	10	–	M5	7.9	4.75	4.5	–	2.3	5.1	22620.0010
	12	–	M5	7.9	4.75	6.0	–	2.3	6.1	22620.0012
12	10	–	M5	9.5	4.75	4.5	–	3.0	7.6	22620.0020
	12	–	M5	9.5	4.75	6.0	–	3.0	9.1	22620.0022
16	10	–	M6	12.7	4.75	4.5	–	3.0	14.0	22620.0060
	12	–	M6	12.7	4.75	6.0	–	3.0	17.0	22620.0062
20	10	–	M6	15.9	4.75	4.5	–	3.0	23.0	22620.0080
	12	–	M6	15.9	4.75	6.0	–	3.0	27.0	22620.0082
25	10	–	M6	19.0	4.75	4.5	–	3.0	36.0	22620.0100
	12	–	M6	19.0	4.75	6.0	–	3.0	43.0	22620.0102
square – picture 2										
–	10	12	M5	–	–	–	10.3	3.0	11.0	22620.0152
	12	12	M5	–	–	–	10.3	3.0	12.0	22620.0154

APPLICATION EXAMPLE



Hard Metal Inserts • for locating hole

EH 22620.

2



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

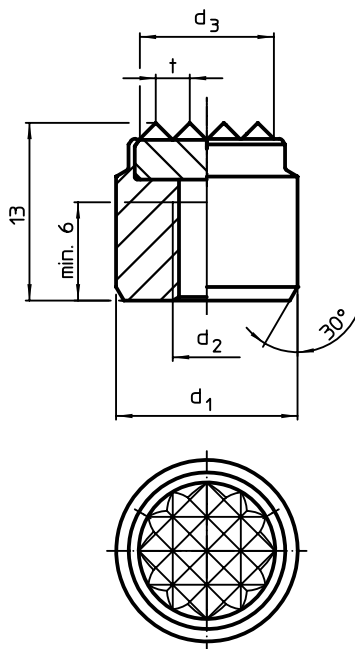
Body

- Heat-treated steel, tempered, phosphated

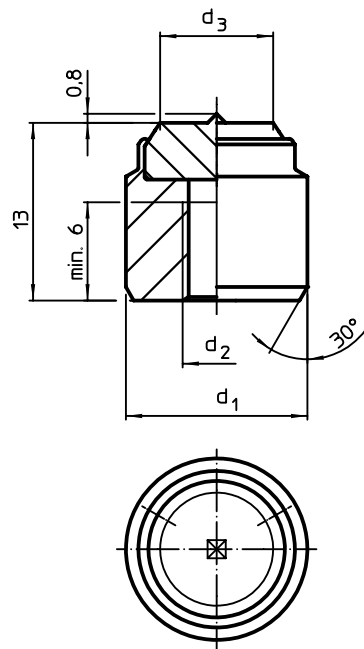
Assembly

Assembly via a locating hole, the insert can be fastened by means of a screw.

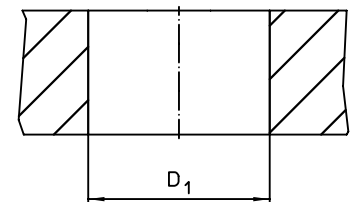
DRAWING



picture 1



picture 2



ORDER INFORMATION

d_1 n6	Dimensions			Location hole D_1 H7		Art. No.
	d_2	d_3	t			
				[mm]	[g]	
ribbed – picture 1						
10	M5	7.7	2	10	7.2	22620.0208
14	M6	10.6	2	14	15.0	22620.0211
16	M6	11.9	3	16	19.0	22620.0213
20	M6	16.0	3	20	31.0	22620.0215
25	M6	21.0	3	25	52.0	22620.0217
pointed – picture 2						
10	M5	6.3	–	10	7.5	22620.0228
14	M6	9.3	–	14	15.0	22620.0231
16	M6	10.0	–	16	20.0	22620.0233

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

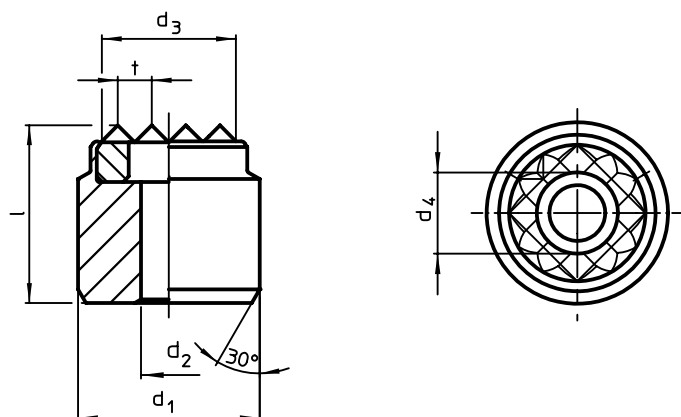
Body

- 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.

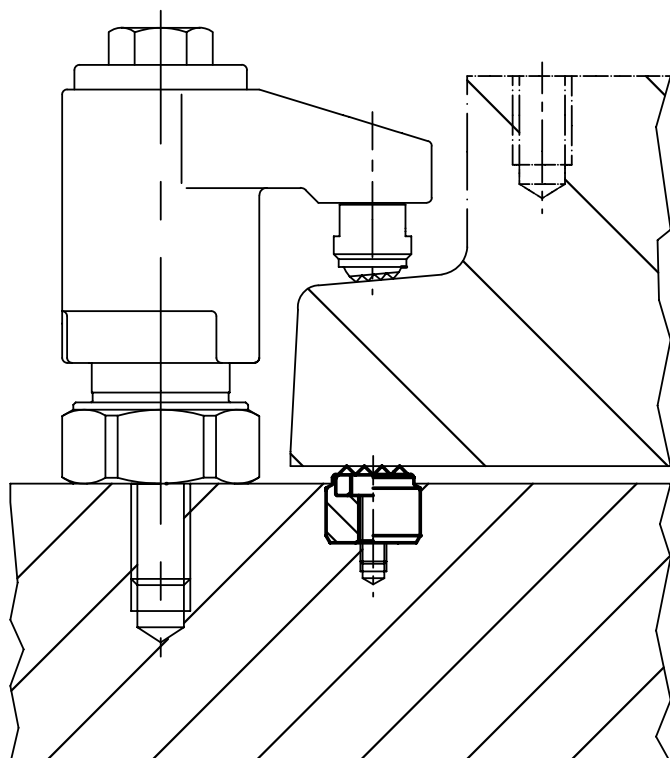
DRAWING



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

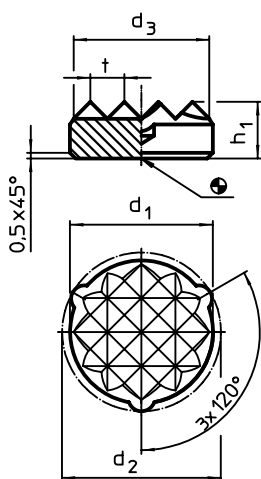
Insert

- Hard metal, ribbed
- Hard metal, pointed

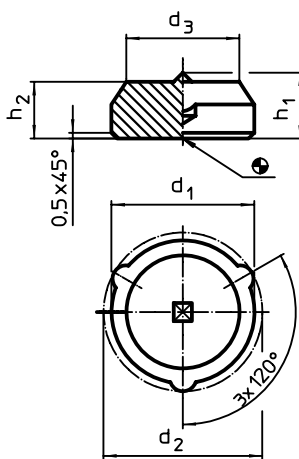
Assembly

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	5.8	22620.0611
12.6 ±0.10	13.4	11.9	5.0	–	3	6.7	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	21.0	22620.0617
pointed – picture 2							
8.3 ±0.10	9.1	6.3	5.8	5	–	3.6	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

Locating / 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.

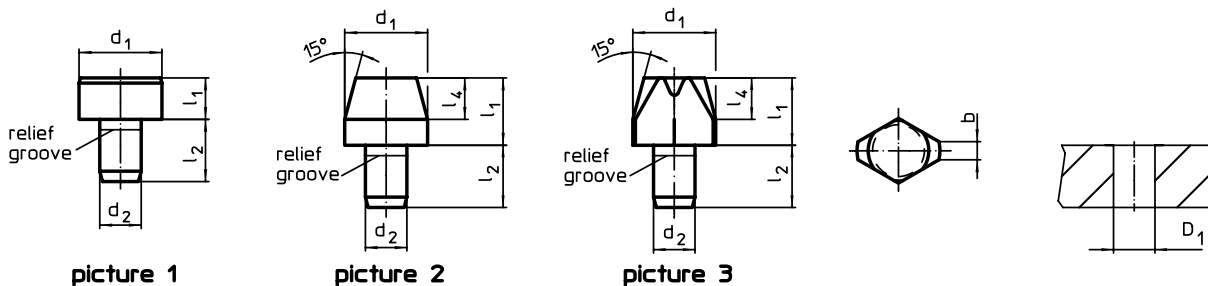
Flattened locating pin used to overcome differences in tolerances, between holes or to position an element in one direction only.

The bearing 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	53.0	22630.0014
locating pin, cylindric, DIN 6321, form B – picture 2								
6	7	–	4	6	4	4	1.7	22630.0020
	12	–	4	6	4	4	3.0	22630.0021
8	10	–	6	9	6	6	4.9	22630.0022
	16	–	6	9	6	6	8.0	22630.0023
10	10	–	6	9	6	6	6.9	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	22.0	22630.0028
	22	–	8	12	8	8	36.0	22630.0029
20	15	–	12	18	9	12	58.0	22630.0030
	25	–	12	18	9	12	73.0	22630.0031
25	15	–	12	18	9	12	66.0	22630.0032
	25	–	12	18	9	12	106.0	22630.0033
locating pin, flattened, DIN 6321, form C – picture 3								
6	7	1.0	4	6	4	4	1.3	22630.0040
	12	1.0	4	6	4	4	2.2	22630.0041
8	10	1.6	6	9	6	6	4.0	22630.0042
	16	1.6	6	9	6	6	5.5	22630.0043
10	10	2.5	6	9	6	6	5.6	22630.0044
	18	2.5	6	9	6	6	8.9	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

Seating Pins • partially DIN 6321 (old norm)

EH 22630.



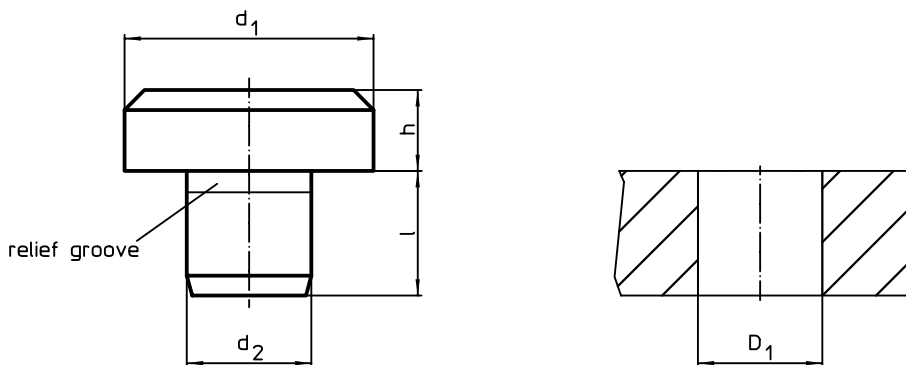
PRODUCT DESCRIPTION

To be used as feet and bearings.
Bearing surface without distortion.

Material

- Tool steel, hardened, ground

DRAWING



ORDER INFORMATION

d ₁	Dimensions			Location hole D ₁ H7		Art. No.
	h h9	d ₂ n6	l			
[mm]				[mm]	[g]	
DIN 6321 old norm						
6	5.0	4	6.0	4	1.8	22630.0001
10	8.0	6	8.0	6	6.2	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	124.0	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.

2



PRODUCT DESCRIPTION

Cylindric locating pins for locating workpieces in toleranced holes and also to be used as stops and feet.

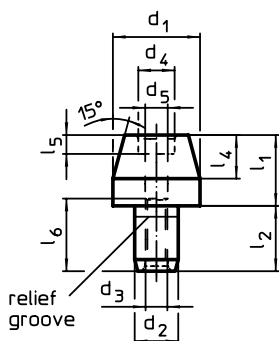
Flattened locating pins used to overcome differences in tolerances, between holes or to position an element in one direction only.

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.

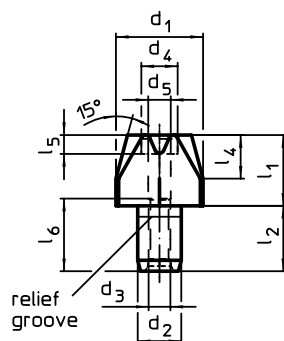
Material

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

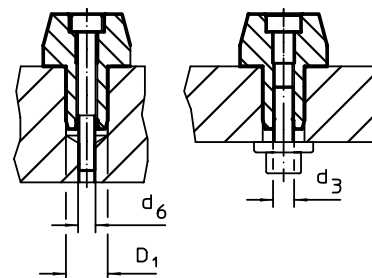
DRAWING



picture 1



picture 2



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	–	M 2	–	4	1.4	22630.0220¹⁾
	12	–	4	6	–	–	4	2.1	–	M 2	–	4	2.9	22630.0221¹⁾
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	M 3	13	8	19.0	22630.0228
	22	–	8	12	M4	6.5	8	3.3	3.1	M 3	13	8	32.0	22630.0229
20	15	–	12	18	M6	10.0	9	5.2	5.1	M 5	19	12	46.0	22630.0230
	25	–	12	18	M6	10.0	9	5.2	5.1	M 5	19	12	60.0	22630.0231
25	15	–	12	18	M6	10.0	9	5.2	5.1	M 5	19	12	59.0	22630.0232
	25	–	12	18	M6	10.0	9	5.2	5.1	M 5	19	12	96.0	22630.0233
locating pin, flattened, with bore hole – picture 2														
6	7	1.0	4	6	–	–	4	2.1	–	M 2	–	4	1.0	22630.0240¹⁾
	12	1.0	4	6	–	–	4	2.1	–	M 2	–	4	1.5	22630.0241¹⁾
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	5.8	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	M 3	13	8	14.0	22630.0248
	22	3.5	8	12	M4	6.5	8	3.3	3.1	M 3	13	8	22.0	22630.0249
20	15	5.0	12	18	M6	10.0	9	5.2	5.1	M 5	19	12	30.0	22630.0250
	25	5.0	12	18	M6	10.0	9	5.2	5.1	M 5	19	12	44.0	22630.0251
25	15	5.0	12	18	M6	10.0	9	5.2	5.1	M 5	19	12	41.0	22630.0252
	25	5.0	12	18	M6	10.0	9	5.2	5.1	M 5	19	12	62.0	22630.0253

¹⁾ can only be mounted from the top

Locating Pins • with ball end

EH 22630.



PRODUCT DESCRIPTION

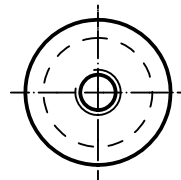
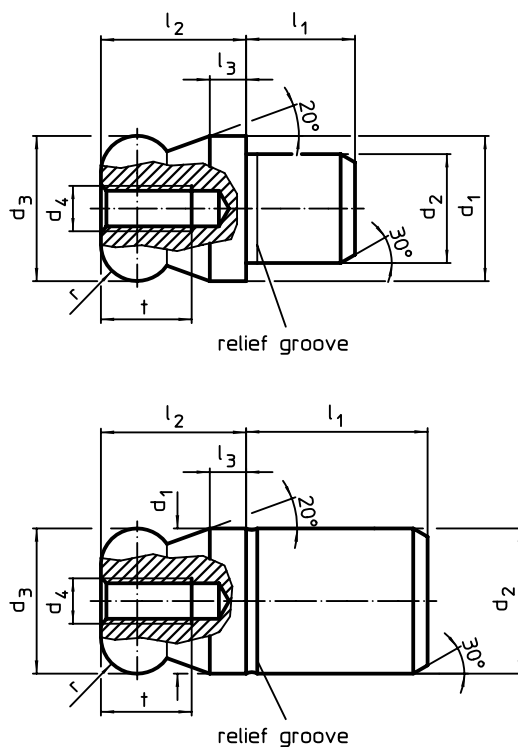
Ball ended locating pins facilitate easy inserting and removing avoiding clamping inclination.

Material

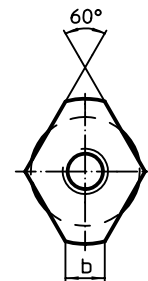
- Tool steel, hardened, blackened and ground

- Stainless steel 1.4305, ground, surface heat-treated

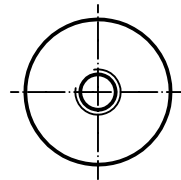
DRAWING



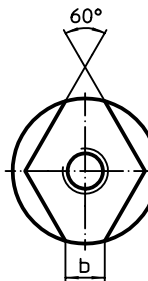
picture 1



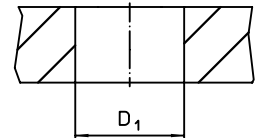
picture 2



picture 3



picture 4



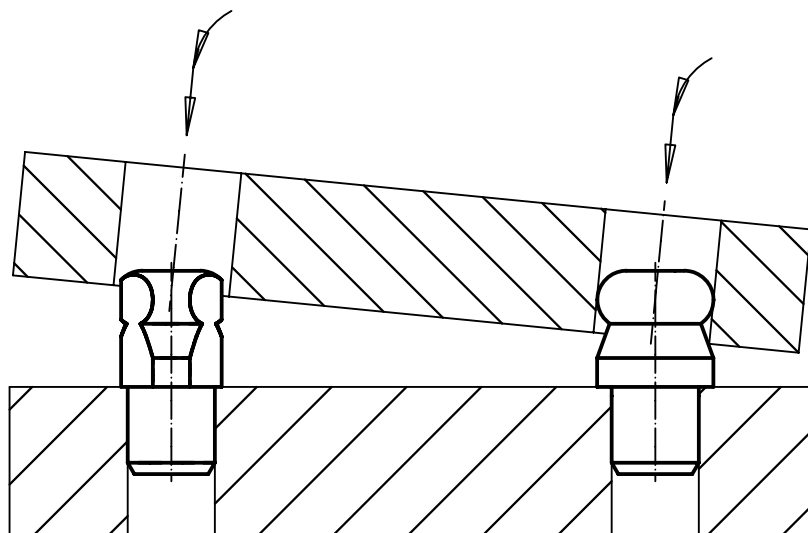
ORDER INFORMATION

d ₁ g6	d ₂ n6	d ₃ -0.01 -0.05	d ₄	Dimensions						Location hole D ₁ H7		Art. No.	
				l ₁	l ₂	l ₃	t	r	b			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	6.7	22630.0310	22630.0350
12	8	12	M4	8	12	3.0	8	3.0	–	8	11.0	22630.0312	22630.0352
16	12	16	M5	12	16	4.0	10	4.0	–	12	31.0	22630.0316	22630.0356
20	14	20	M5	14	20	5.0	10	5.0	–	14	58.0	22630.0320	22630.0360
22	16	22	M5	16	22	5.5	10	5.5	–	16	81.0	22630.0322	–
25	18	25	M5	18	25	6.0	10	6.0	–	18	118.0	22630.0325	–



d ₁ g6	d ₂ n6	d ₃ -0.01 -0.05	Dimensions							Location hole D ₁ H7		Art. No.	
			d ₄	l ₁	l ₂	l ₃	t	r	b			Tool steel	Stainless steel
with ball end flattened – picture 2													
10	7	10	M3	7	10	2.5	6	2.5	2.5	7	5.3	22630.0410	22630.0450
12	8	12	M4	8	12	3.0	8	3.0	2.5	8	8.0	22630.0412	22630.0452
16	12	16	M5	12	16	4.0	10	4.0	4.3	12	25.0	22630.0416	22630.0456
20	14	20	M5	14	20	5.0	10	5.0	5.0	14	46.0	22630.0420	22630.0460
22	16	22	M5	16	22	5.5	10	5.5	5.0	16	63.0	22630.0422	–
25	18	25	M5	18	25	6.0	10	6.0	5.6	18	92.0	22630.0425	–
with ball end plain, not stepped – picture 3													
8	8	8	M3	10	8	2.0	6	2.0	–	8	6.0	22630.0508	22630.0568
10	10	10	M3	13	10	2.5	6	2.5	–	10	12.0	22630.0510	22630.0570
12	12	12	M4	15	12	3.0	8	3.0	–	12	21.0	22630.0512	22630.0572
16	16	16	M5	20	16	4.0	10	4.0	–	16	51.0	22630.0516	22630.0576
20	20	20	M5	25	20	5.0	10	5.0	–	20	101.0	22630.0520	22630.0580
25	25	25	M5	25	25	6.0	10	6.0	–	25	176.0	22630.0525	–
30	30	30	M6	30	30	8.0	12	8.0	–	30	307.0	22630.0530	–
40	40	40	M6	40	40	10.0	12	10.0	–	40	729.0	22630.0540	–
50	50	50	M6	50	50	12.0	12	12.0	–	50	1422.0	22630.0550	–
with ball end flattened, not stepped – picture 4													
8	8	8	M3	10	8	2.0	6	2.0	1.9	8	5.0	22630.0608	22630.0668
10	10	10	M3	13	10	2.5	6	2.5	2.5	10	11.0	22630.0610	22630.0670
12	12	12	M4	15	12	3.0	8	3.0	2.5	12	17.0	22630.0612	22630.0672
16	16	16	M5	20	16	4.0	10	4.0	4.3	16	44.0	22630.0616	22630.0676
20	20	20	M5	25	20	5.0	10	5.0	5.0	20	88.0	22630.0620	22630.0680
25	25	25	M5	25	25	6.0	10	6.0	5.6	25	149.0	22630.0625	–
30	30	30	M6	30	30	8.0	12	8.0	8.8	30	270.0	22630.0630	–
40	40	40	M6	40	40	10.0	12	10.0	12.8	40	657.0	22630.0640	–
50	50	50	M6	50	50	12.0	12	12.0	16.7	50	1243.0	22630.0650	–

APPLICATION EXAMPLE



Feet • DIN 6320 with threaded shank

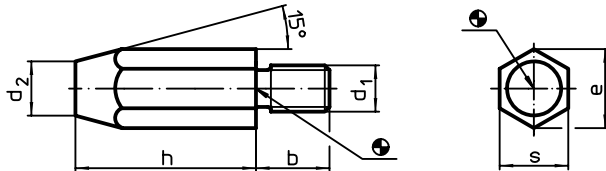
EH 22640.

**PRODUCT DESCRIPTION**

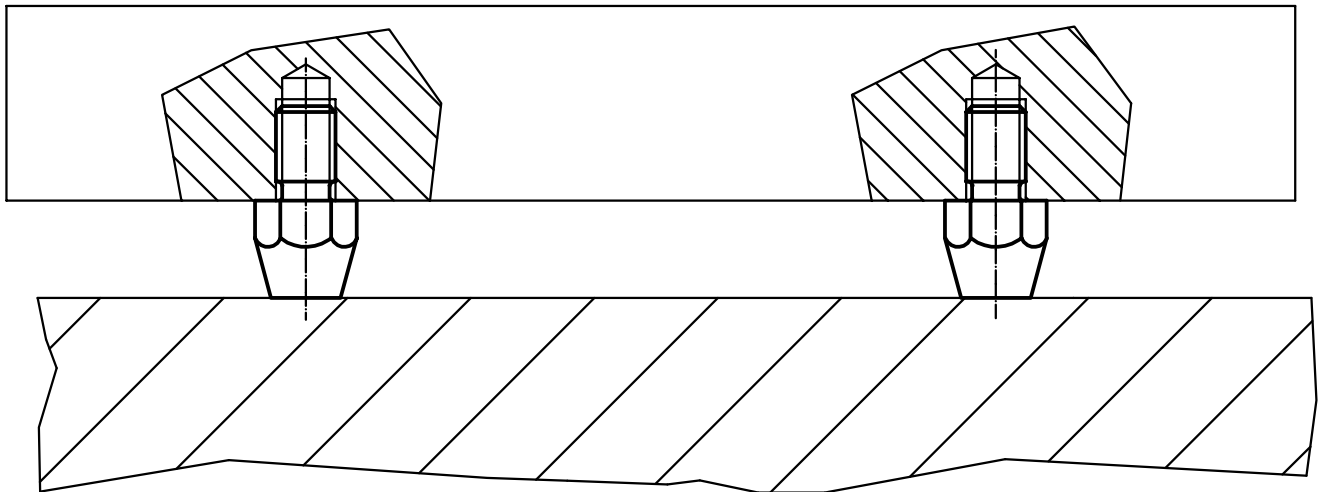
Feet can be used both as a foot and as a seating element and stop.
Bearing surface without distortion.

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	7.8	22640.0061
20	M 6	11	6	11.5	10	7	13.0	22640.0062
15	M 8	13	10	15.0	13	7	19.0	22640.0081
30	M 8	13	9	15.0	13	18	35.0	22640.0082
20	M10	16	13	19.6	17	32	41.0	22640.0101
40	M10	16	13	19.6	17	32	80.0	22640.0102
25	M12	20	15	21.9	19	60	70.0	22640.0121
50	M12	20	15	21.9	19	60	129.0	22640.0122

APPLICATION EXAMPLE

Seating Pins • ribbed or pointed

EH 22680.



PRODUCT DESCRIPTION

For workpieces showing a rough surface. Pointed type (picture 2) especially suitable for cast parts.

Material

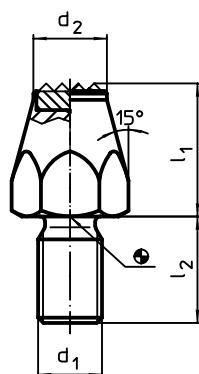
Insert

- Hard metal, ribbed
- Hard metal, pointed

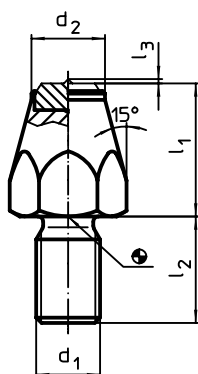
Body

- Heat-treated steel, tempered, blackened
- Free cutting steel, case-hardened, blackened

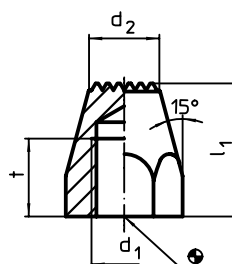
DRAWING



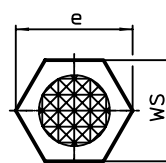
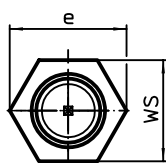
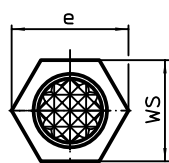
picture 1



picture 2



picture 3



ORDER INFORMATION

Dimensions							WS	Tightening torque max.	[g]	Art. No.
l_1	d_1	l_2	l_3	t	d_2	e				
[mm]							[mm]	[Nm]		
with hard metal insert, ribbed, and threaded shank – picture 1										
10	M 6	11	–	–	9.5	11.5	10	7	8.8	22680.0061
15	M 8	13	–	–	12.5	15.0	13	18	22.0	22680.0081
20	M10	15	–	–	12.5	19.6	17	32	39.0	22680.0101
25	M12	20	–	–	13.8	21.9	19	60	64.0	22680.0121
with hard metal insert, pointed, and threaded shank – picture 2										
10	M 6	11	0.8	–	9.5	11.5	10	7	9.1	22680.0063
15	M 8	13	0.8	–	12.5	15.0	13	18	22.0	22680.0083
20	M10	15	0.8	–	12.5	19.6	17	32	40.0	22680.0103
25	M12	20	0.8	–	13.8	21.9	19	60	65.0	22680.0123
case-hardened, ribbed, with female thread – picture 3										
20	M 8	–	–	10	9.0	15.0	13	18	14.0	22680.0142
25	M 8	–	–	10	9.0	15.0	13	18	20.0	22680.0144
	M10	–	–	13	12.5	19.6	17	32	31.0	22680.0164
30	M10	–	–	13	12.5	19.6	17	32	40.0	22680.0166
40	M10	–	–	13	12.5	19.6	17	32	60.0	22680.0168
25	M12	–	–	15	13.0	21.9	19	60	33.0	22680.0184
30	M12	–	–	15	13.0	21.9	19	60	44.0	22680.0186
40	M12	–	–	15	13.0	21.9	19	60	69.0	22680.0188

Seating Pins • pin shape

EH 22680.



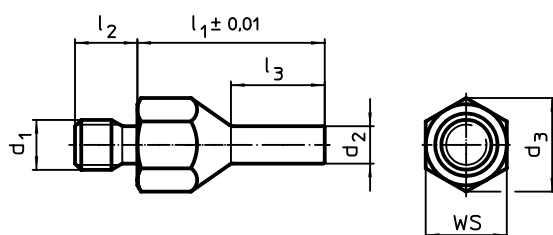
PRODUCT DESCRIPTION

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. Bearing surface induction hardened and ground.

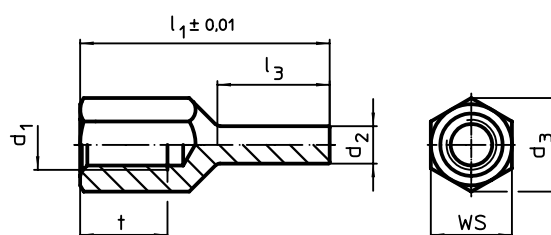
Material

- Heat-treated steel, tempered, blackened

DRAWING



picture 1



picture 2

ORDER INFORMATION

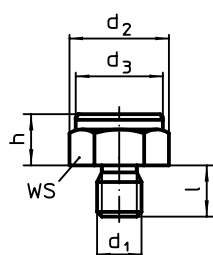
l_1 ± 0.01	d_1	d_2	Dimensions				WS	Tightening torque max.		Art. No.
			l_2	l_3	t	d_3	[mm]	[Nm]	[g]	
with male thread – picture 1										
20	M 6	4	8	10.0	–	11.0	10	7	7.7	22680.0402
30	M 6	4	8	15.0	–	11.0	10	7	12.0	22680.0404
	M 8	4	10	15.0	–	14.4	13	18	17.0	22680.0412
40	M 8	4	10	20.0	–	14.4	13	18	23.0	22680.0414
30	M 8	6	10	15.0	–	14.4	13	18	20.0	22680.0416
40	M 8	6	10	20.0	–	14.4	13	18	30.0	22680.0418
30	M10	6	14	15.0	–	19.0	17	32	30.0	22680.0422
50	M10	6	14	25.0	–	19.0	17	32	51.0	22680.0424
30	M10	8	14	15.0	–	19.0	17	32	35.0	22680.0426
50	M10	8	14	25.0	–	19.0	17	32	58.0	22680.0428
40	M12	6	14	20.0	–	21.2	19	60	48.0	22680.0432
60	M12	6	14	30.0	–	21.2	19	60	75.0	22680.0434
40	M12	8	14	20.0	–	21.2	19	60	56.0	22680.0436
60	M12	8	14	30.0	–	21.2	19	60	83.0	22680.0438
with female thread – picture 2										
20	M 6	4	–	8.5	6	11.0	10	7	5.7	22680.0452
30	M 6	4	–	13.5	9	11.0	10	7	8.9	22680.0454
	M 8	4	–	13.0	10	14.4	13	18	13.0	22680.0462
40	M 8	4	–	18.0	14	14.4	13	18	18.0	22680.0464
30	M 8	6	–	13.0	10	14.4	13	18	16.0	22680.0466
40	M 8	6	–	18.0	14	14.4	13	18	21.0	22680.0468
30	M10	6	–	12.0	10	19.0	17	32	24.0	22680.0472
50	M10	6	–	25.0	15	19.0	17	32	38.0	22680.0474
30	M10	8	–	12.0	10	19.0	17	32	28.0	22680.0476
50	M10	8	–	25.0	15	19.0	17	32	44.0	22680.0478
40	M12	6	–	18.0	12	21.2	19	60	36.0	22680.0482
60	M12	6	–	28.0	18	21.2	19	60	56.0	22680.0484
40	M12	8	–	18.0	12	21.2	19	60	41.0	22680.0486
60	M12	8	–	28.0	18	21.2	19	60	63.0	22680.0488

**PRODUCT DESCRIPTION**

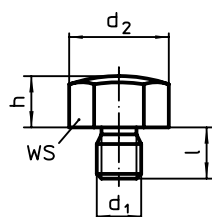
To be used as seats, stops and thrust pads.

Material

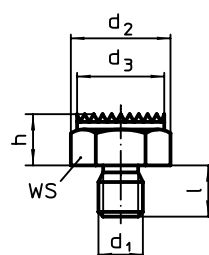
- Steel, case-hardened, blackened

DRAWING

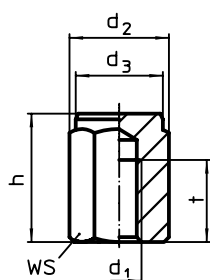
picture 1



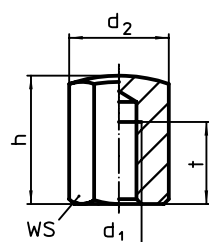
picture 2



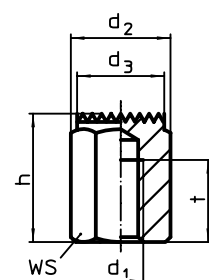
picture 3



picture 4



picture 5



picture 6

ORDER INFORMATION

Dimensions						WS	Tightening torque max.		Art. No.
h	d ₁	d ₂	d ₃	l	t				
[mm]						[mm]	[Nm]	[g]	
with male thread, bearing surface plain – picture 1									
10 ±0.01	M 8	19.4	17	10	–	17	18	21	22690.0021
	M10	21.9	19	12	–	19	32	28	22690.0031
15 ±0.01	M10	21.9	19	12	–	19	32	40	22690.0032
10 ±0.01	M12	25.2	22	14	–	22	60	40	22690.0001
	M12	25.2	22	14	–	22	60	55	22690.0002
15 ±0.01	M16	33.0	30	19	–	30	140	110	22690.0042
	M16	33.0	30	19	–	30	140	140	22690.0043
20 ±0.01	M20	40.0	36	24	–	36	290	214	22690.0052
25 ±0.01	M20	40.0	36	24	–	36	290	257	22690.0053
20 ±0.01	M24	46.0	41	29	–	41	498	300	22690.0062
25 ±0.01	M24	46.0	41	29	–	41	498	356	22690.0063
30 ±0.01	M24	46.0	41	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					WS	Tightening torque max.		Art. No.
	d ₁	d ₂	d ₃	l	t				
						[mm]	[Nm]	[g]	
with male thread, bearing surface spherical – picture 2									
10 ±0.10	M 8	19.4	–	10	–	17	18	20	22690.0121
	M10	21.9	–	12	–	19	32	27	22690.0131
15 ±0.10	M10	21.9	–	12	–	19	32	40	22690.0132
10 ±0.10	M12	25.2	–	14	–	22	60	37	22690.0101
15 ±0.10	M12	25.2	–	14	–	22	60	53	22690.0102
	M16	33.0	–	19	–	30	140	105	22690.0142
20 ±0.10	M16	33.0	–	19	–	30	140	135	22690.0143
	M20	40.0	–	24	–	36	290	206	22690.0152
25 ±0.10	M20	40.0	–	24	–	36	290	249	22690.0153
20 ±0.10	M24	46.0	–	29	–	41	498	285	22690.0162
25 ±0.10	M24	46.0	–	29	–	41	498	342	22690.0163
30 ±0.10	M24	46.0	–	29	–	41	498	398	22690.0164
with male thread, bearing surface ribbed – picture 3									
10 ±0.10	M 8	19.4	17	10	–	17	18	20	22690.0221
	M10	21.9	19	12	–	19	32	27	22690.0231
15 ±0.10	M10	21.9	19	12	–	19	32	39	22690.0232
10 ±0.10	M12	25.2	22	14	–	22	60	38	22690.0201
15 ±0.10	M12	25.2	22	14	–	22	60	54	22690.0202
	M16	33.0	30	19	–	30	140	106	22690.0242
20 ±0.10	M16	33.0	30	19	–	30	140	136	22690.0243
	M20	40.0	36	24	–	36	290	200	22690.0252
25 ±0.10	M20	40.0	36	24	–	36	290	243	22690.0253
20 ±0.10	M24	46.0	41	29	–	41	498	282	22690.0262
25 ±0.10	M24	46.0	41	29	–	41	498	338	22690.0263
30 ±0.10	M24	46.0	41	29	–	41	498	395	22690.0264
with female thread, bearing surface plain tolerance l ₁ = ±0,01 – picture 4									
15 ±0.01	M 8	19.4	17	15	6	17	25 ¹⁾	25	22690.0321
25 ±0.01	M 8	19.4	17	25	12	17	25 ¹⁾	42	22690.0323
20 ±0.01	M10	21.9	19	20	10	19	46 ¹⁾	40	22690.0333
30 ±0.01	M10	21.9	19	30	15	19	46 ¹⁾	61	22690.0335
40 ±0.01	M10	21.9	19	40	15	19	46 ¹⁾	85	22690.0337
20 ±0.01	M12	25.2	22	20	10	22	82 ¹⁾	52	22690.0301
25 ±0.01	M12	25.2	22	25	15	22	82 ¹⁾	65	22690.0302
30 ±0.01	M12	25.2	22	30	18	22	82 ¹⁾	79	22690.0303
40 ±0.01	M12	25.2	22	40	18	22	82 ¹⁾	111	22690.0304
50 ±0.01	M12	25.2	22	50	18	22	82 ¹⁾	142	22690.0305
30 ±0.01	M16	33.0	30	30	20	30	206 ¹⁾	141	22690.0343
50 ±0.01	M16	33.0	30	50	24	30	206 ¹⁾	256	22690.0345
40 ±0.01	M20	40.0	36	40	26	36	407 ¹⁾	268	22690.0353
60 ±0.01	M20	40.0	36	60	38	36	407 ¹⁾	415	22690.0355
40 ±0.01	M24	46.0	41	40	26	41	698 ¹⁾	341	22690.0363
60 ±0.01	M24	46.0	41	60	38	41	698 ¹⁾	530	22690.0365
with female thread, bearing surface spherical – picture 5									
15 ±0.10	M 8	19.4	–	15	6	17	25 ¹⁾	24	22690.0421
25 ±0.10	M 8	19.4	–	25	12	17	25 ¹⁾	41	22690.0423
20 ±0.10	M10	21.9	–	20	10	19	46 ¹⁾	38	22690.0433
30 ±0.10	M10	21.9	–	30	15	19	46 ¹⁾	60	22690.0435
40 ±0.10	M10	21.9	–	40	15	19	46 ¹⁾	84	22690.0437
20 ±0.10	M12	25.2	–	20	10	22	82 ¹⁾	50	22690.0401
25 ±0.10	M12	25.2	–	25	15	22	82 ¹⁾	62	22690.0402
30 ±0.10	M12	25.2	–	30	18	22	82 ¹⁾	76	22690.0403
40 ±0.10	M12	25.2	–	40	18	22	82 ¹⁾	109	22690.0404
50 ±0.10	M12	25.2	–	50	18	22	82 ¹⁾	141	22690.0405
30 ±0.10	M16	33.0	–	30	20	30	206 ¹⁾	136	22690.0443
50 ±0.10	M16	33.0	–	50	24	30	206 ¹⁾	252	22690.0445
40 ±0.10	M20	40.0	–	40	26	36	407 ¹⁾	261	22690.0453
60 ±0.10	M20	40.0	–	60	38	36	407 ¹⁾	408	22690.0455
40 ±0.10	M24	46.0	–	40	26	41	698 ¹⁾	327	22690.0463
60 ±0.10	M24	46.0	–	60	38	41	698 ¹⁾	514	22690.0465

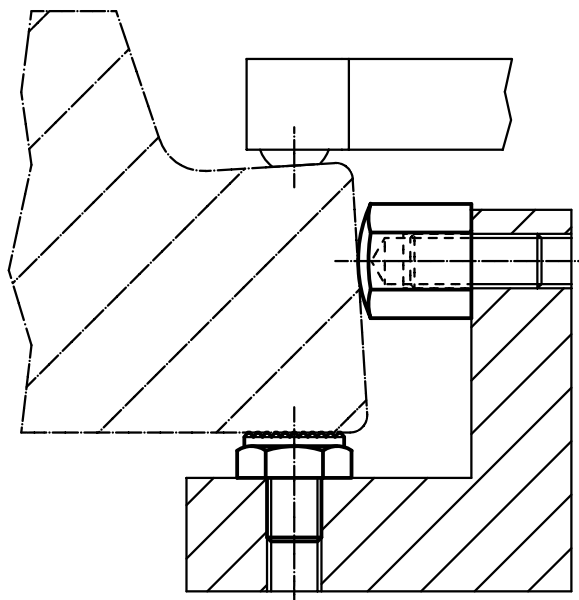
¹⁾ The tightening torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length.



Dimensions						WS	Tightening torque max.		Art. No.
h	d ₁	d ₂	d ₃	l	t				
[mm]						[mm]	[Nm]	[g]	
with female thread, bearing surface ribbed – picture 6									
15 ±0.10	M 8	19.4	17	15	6	17	25 ¹⁾	24	22690.0521
25 ±0.10	M 8	19.4	17	25	12	17	25 ¹⁾	41	22690.0523
20 ±0.10	M10	21.9	19	20	10	19	46 ¹⁾	38	22690.0533
30 ±0.10	M10	21.9	19	30	15	19	46 ¹⁾	60	22690.0535
40 ±0.10	M10	21.9	19	40	15	19	46 ¹⁾	84	22690.0537
20 ±0.10	M12	25.2	22	20	10	22	82 ¹⁾	50	22690.0501
25 ±0.10	M12	25.2	22	25	15	22	82 ¹⁾	63	22690.0502
30 ±0.10	M12	25.2	22	30	18	22	82 ¹⁾	77	22690.0503
40 ±0.10	M12	25.2	22	40	18	22	82 ¹⁾	109	22690.0504
50 ±0.10	M12	25.2	22	50	18	22	82 ¹⁾	141	22690.0505
30 ±0.10	M16	33.0	30	30	20	30	206 ¹⁾	137	22690.0543
50 ±0.10	M16	33.0	30	50	24	30	206 ¹⁾	254	22690.0545
40 ±0.10	M20	40.0	36	40	26	36	407 ¹⁾	254	22690.0553
60 ±0.10	M20	40.0	36	60	38	36	407 ¹⁾	401	22690.0555
40 ±0.10	M24	46.0	41	40	26	41	698 ¹⁾	322	22690.0563
60 ±0.10	M24	46.0	41	60	38	41	698 ¹⁾	408	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 with induction hardened bearing surface can be used as seats and stops.

Material

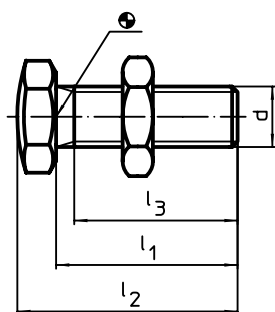
Seating Pins

- Heat-treated steel, tempered, quality 10.9, blackened / bearing surface induction hardened

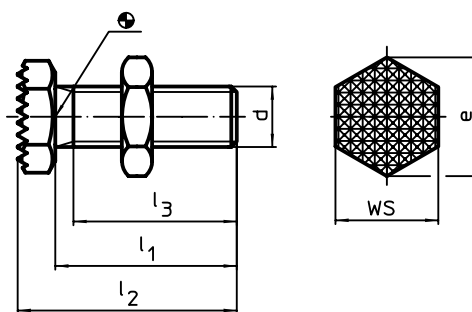
Nut

- Heat-treated steel, tempered, quality 8.8 (ISO 4035), blackened

DRAWING



picture 1



picture 2

ORDER INFORMATION

Dimensions				e	WS		Art. No.
d	l_1 ±1.5	l_2 ±1.5	l_3 min.				
[mm]					[mm]	[g]	
bearing surface spherical – picture 1							
M 6	20	23.5	19.0	11.5	10	6.7	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	48.0	22690.0612
M16	40	49.5	34.0	27.7	24	102.0	22690.0616
M20	45	57.0	37.0	34.6	30	187.0	22690.0620
M24	50	64.0	40.0	41.6	36	309.0	22690.0624
bearing surface ribbed – 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	16.0	22690.0628
M10	30	36.0	25.5	19.6	17	31.0	22690.0630
M12	35	42.0	29.7	21.9	19	49.0	22690.0632
M16	40	49.5	34.0	27.7	24	102.0	22690.0636
M20	45	57.0	37.0	34.6	30	184.0	22690.0640
M24	50	64.0	40.0	41.6	36	308.0	22690.0644

Pins • with plastic bearing surface

EH 22691.

2



PRODUCT DESCRIPTION

Pins with plastic bearing 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

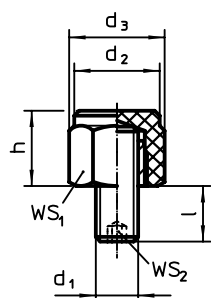
Grub Screw

- Stainless steel

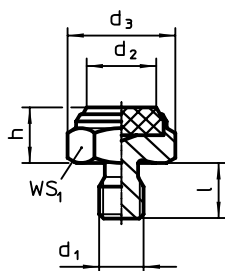
Body

- Plastic (PEEK), blue
- Stainless steel 1.4305

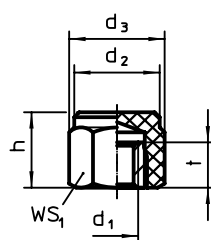
DRAWING



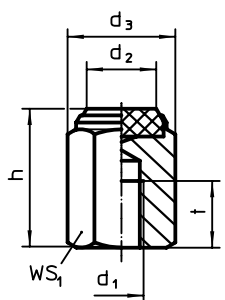
picture 1



picture 2



picture 3



picture 4

ORDER INFORMATION

Dimensions						WS ₁	WS ₂	Load capacity for static load max.	Tightening torque max.			Art. No.	
h ±0.1	d ₁	d ₂	d ₃	l	t					min.	max.		
[mm]						[mm]	[mm]	[kN]	[Nm]	[°C]		[g]	
with male thread, body made of plastic (PEEK), bearing surface plain – picture 1													
15	M 8	17.0	19.0	8 ±1	–	17	4	8.5	10	-60	250	12.0	22691.0122
20	M10	19.0	21.5	10 ±1	–	19	5	9.5	10	-60	250	21.0	22691.0133
	M12	22.0	25.0	14 ±1	–	22	6	14.0	10	-60	250	32.0	22691.0143
with male thread, plastic insert, bearing surface plain – picture 2													
10	M 8	12.5	19.4	10	–	17	–	11.5	18	-60	250	14.0	22691.0021
	M10	14.5	21.9	12	–	19	–	15.5	32	-60	250	20.0	22691.0031
15	M10	14.5	21.9	12	–	19	–	15.5	32	-60	250	32.0	22691.0032
10	M12	17.5	25.2	14	–	22	–	22.5	60	-60	250	28.0	22691.0041
15	M12	17.5	25.2	14	–	22	–	22.5	60	-60	250	45.0	22691.0042

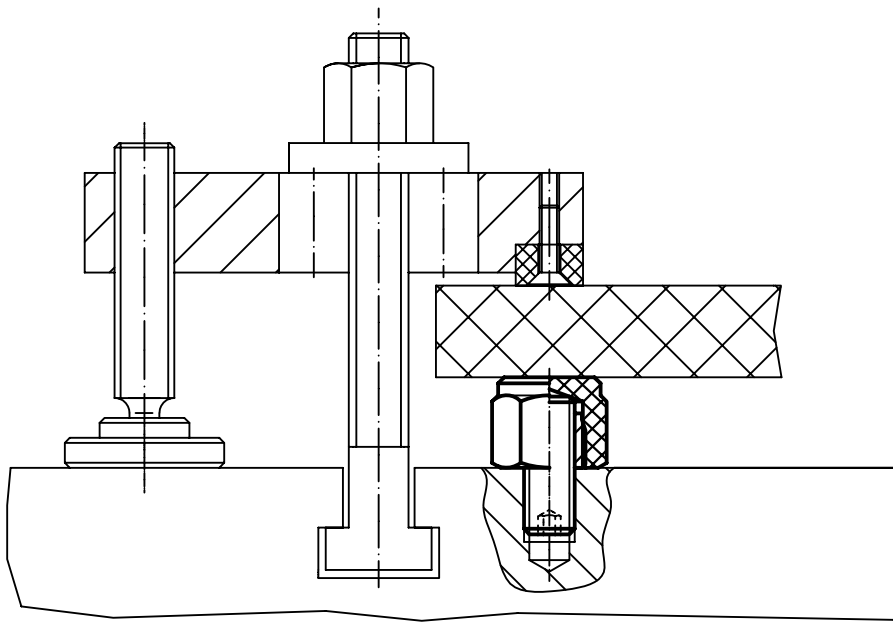
¹⁾ The tightening torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length.



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), bearing surface plain – picture 3													
15	M 8	17.0	19.0	–	9	17	–	8.5	10	-60	250	6.4	22691.0222
20	M10	19.0	21.5	–	10	19	–	9.5	10	-60	250	21.0	22691.0233
	M12	22.0	25.0	–	12	22	–	14.0	10	-60	250	13.0	22691.0243
with female thread, plastic insert (PEEK), bearing surface plain – picture 4													
25	M 8	12.5	19.4	–	12	17	–	11.5	18 ¹⁾	-60	250	35.0	22691.0324
30	M10	14.5	21.9	–	15	19	–	15.5	32 ¹⁾	-60	250	53.0	22691.0335
	M12	17.5	25.2	–	18	22	–	22.5	60 ¹⁾	-60	250	68.0	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



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.



Ball-Ended Thrust Screws • headed, ball protected against rotating

EH 22700.

2



PRODUCT DESCRIPTION

Ball-ended thrust screws can also be used for clamping, tightening or supporting of non-parallel surfaces.

The flat-faced, movable ball enables a flat load transmission.

Material

Ball

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

Screw

- Heat-treated steel, 1200 ± 100 N/mm²
- Stainless steel 1.4305

MORE INFORMATION

Notes

Note: Thread runout l_4 !

Ball protected against rotating.
Special types on request.

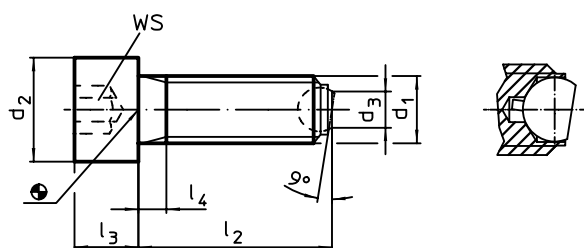
References

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

Further products

Ball-Ended Thrust Screws, headed,
flat-faced ball. → p. 323

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 diameter				Heat-treated steel	Stainless steel
[mm]							[mm]	[kN]	[g]		
flat-faced ball, bearing surface plain											
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	12.0	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	93.0	22700.0162	22700.0342
	60	24	10.7	16	6.0	12.0	14	36	121.0	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	183.0	22700.0172	—
	80	30	13.5	20	28.0	15.0	17	60	254.0	22700.0174	—
	100	30	13.5	20	48.0	15.0	17	60	303.0	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	422.0	22700.0184	—
	120	36	15.8	24	60.0	18.0	19	80	528.0	22700.0186	—

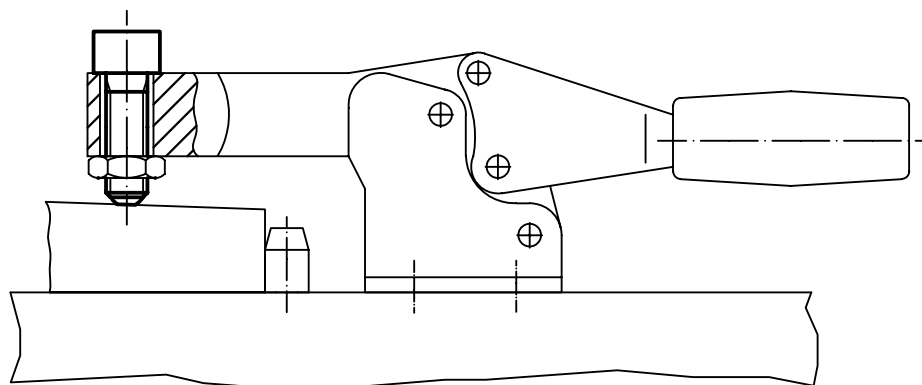
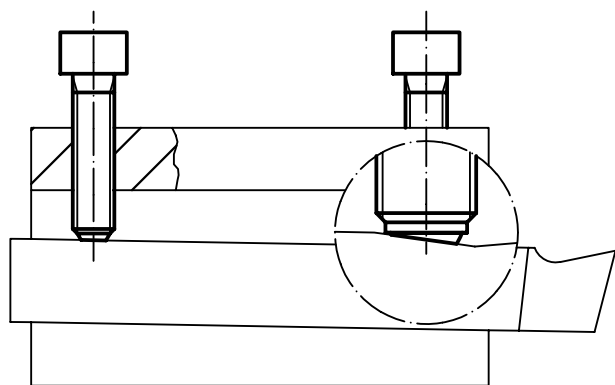
¹⁾ Statements on load capacity are not valid for the stainless steel type.



Dimensions							WS	Load capacity for static load ¹⁾ max.		Art. No.	
d ₁	l ₂ ~	d ₂	d ₃	l ₃	l ₄	Ball diameter				Heat-treated steel	Stainless steel
[mm]							[mm]	[kN]	[g]		
flat-faced ball, bearing surface ribbed											
M 8	20	13	4.5	8	3.5	5.5	6	9	12.0	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	44.0	22700.0206	—
M12	30	18	7.2	12	5.0	8.5	10	18	38.0	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	121.0	22700.0264	—
	80	24	10.7	16	36.0	12.0	14	36	153.0	22700.0266	—
M20	50	30	13.5	20	7.5	15.0	17	60	185.0	22700.0272	—
	80	30	13.5	20	28.0	15.0	17	60	253.0	22700.0274	—
	100	30	13.5	20	48.0	15.0	17	60	303.0	22700.0276	—
M24	60	36	15.8	24	9.0	18.0	19	80	321.0	22700.0282	—
	90	36	15.8	24	30.0	18.0	19	80	422.0	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

Ball-ended thrust screws can also be used for clamping, tightening or supporting of non-parallel surfaces.

The flat-faced, movable ball enables a flat load transmission.

Material

Ball

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

Screw

- Heat-treated steel, $1200 \pm 100 \text{ N/mm}^2$
- Stainless steel 1.4305

MORE INFORMATION

Notes

Ball protected against rotating.
Special types on request.

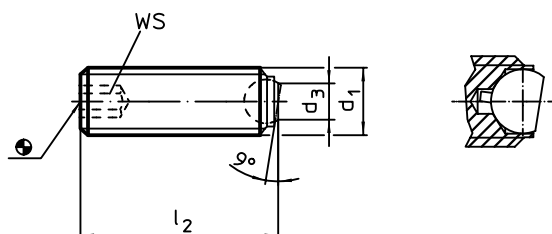
References

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

Further products

Ball-Ended Thrust Screws, headless, flat-faced ball → p. 327
Ball-Ended Thrust Screws, headless, with fine-pitch thread → p. 330
Ball-Ended Thrust Screws, headless, flat-faced ball and hexalobular socket → p. 333

DRAWING



ORDER INFORMATION

d ₁	Dimensions			WS	Load capacity for static load ¹⁾ max.		Art. No.	
	l ₂	d ₃	Ball diameter				Heat-treated steel	Stainless steel
[mm]								
flat-faced ball, bearing surface plain								
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	3.0	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	3.9	22700.0583	22700.0813
	20	4.5	5.5	4	9	5.1	22700.0584	22700.0814
	25	4.5	5.5	4	9	6.6	22700.0585	22700.0815
	30	4.5	5.5	4	9	8.3	22700.0586	22700.0816
M10	20	6.0	7.0	5	12	7.7	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	25.0	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	53.0	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	85.0	22700.0682	—
	50	15.8	18.0	12	80	125.0	22700.0684	—
	80	15.8	18.0	12	80	215.0	22700.0686	—

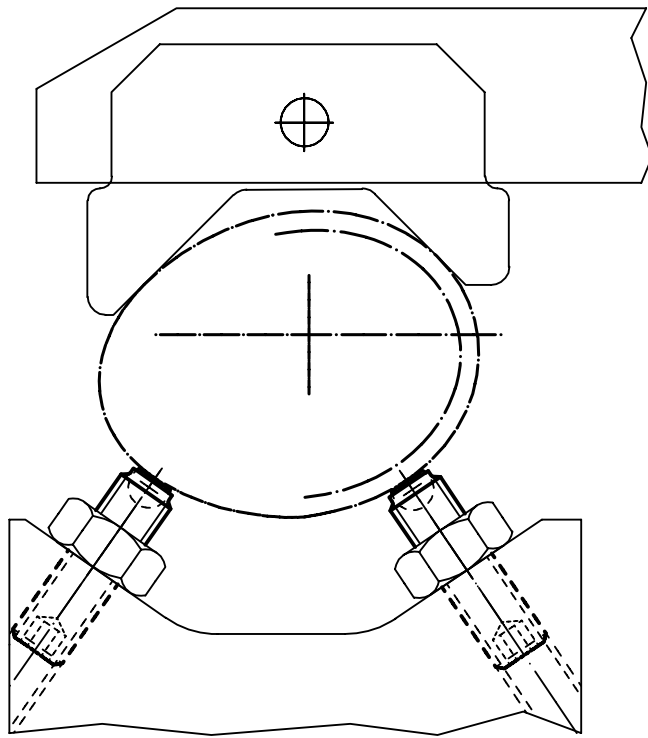
¹⁾ Statements on load capacity are not valid for the stainless steel type.



d ₁	Dimensions		Ball diameter	WS	Load capacity for static load ¹⁾ max.		Art. No.	
	l ₂	d ₃					Heat-treated steel	Stainless steel
[mm]								
[kN]								
[g]								
flat-faced ball, bearing surface ribbed								
M 8	16	4.5	5.5	4	9	3.9	22700.0693	—
	20	4.5	5.5	4	9	5.1	22700.0694	—
	25	4.5	5.5	4	9	6.6	22700.0695	—
	30	4.5	5.5	4	9	8.3	22700.0696	—
M10	20	6.0	7.0	5	12	7.7	22700.0703	—
	25	6.0	7.0	5	12	10.0	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	25.0	22700.0726	—
	50	7.2	8.5	6	18	31.0	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	40.0	22700.0764	—
	50	10.7	12.0	8	36	60.0	22700.0766	—
M20	30	13.5	15.0	10	60	52.0	22700.0772	—
	40	13.5	15.0	10	60	70.0	22700.0774	—
	50	13.5	15.0	10	60	89.0	22700.0775	—
	60	13.5	15.0	10	60	111.0	22700.0776	—
M24	35	15.8	18.0	12	80	85.0	22700.0782	—
	50	15.8	18.0	12	80	125.0	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.

2



PRODUCT DESCRIPTION

Ball-ended thrust screws can also be used for positioning and clamping, tightening or supporting of non-parallel surfaces.

Material

Ball

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

Screw

- Heat-treated steel, $1200 \pm 100 \text{ N/mm}^2$
- Stainless steel 1.4305

MORE INFORMATION

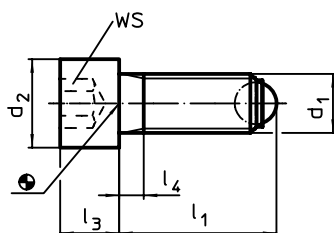
Notes

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	l₁ ~	d ₂	l ₃	l ₄	Ball diameter				Heat-treated steel	Stainless steel
[mm]						[mm]	[kN]	[g]		
round ball										
M 6	20.8	10	6	3.0	4.0	5	9	6.1	22710.0062	22710.0752
	30.8	10	6	3.0	4.0	5	9	7.9	22710.0064	22710.0754
	40.8	10	6	16.0	4.0	5	9	9.9	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	23.0	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	32.0	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	39.0	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	80.0	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	122.0	22710.0164	22710.0794
	83.3	24	16	36.0	12.0	14	60	154.0	22710.0166	22710.0796
M20	54.2	30	20	7.5	15.0	17	90	186.0	22710.0202	–
	84.2	30	20	28.0	15.0	17	90	255.0	22710.0204	–
	104.2	30	20	48.0	15.0	17	90	306.0	22710.0206	–
M24	64.7	36	24	9.0	18.0	19	120	327.0	22710.0242	–
	94.7	36	24	30.0	18.0	19	120	428.0	22710.0244	–
	124.7	36	24	60.0	18.0	19	120	532.0	22710.0246	–

¹⁾ Statements on load capacity are not valid for the stainless steel type.

Ball-Ended Thrust Screws • headed, flat-faced ball

EH 22710.



PRODUCT DESCRIPTION

Ball-ended thrust screws can also be used for clamping, tightening or supporting of non-parallel surfaces.

The flat-faced, movable ball enables a flat load transmission.

Material

Special types on request.

Ball

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

References

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

Screw

- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

Further products

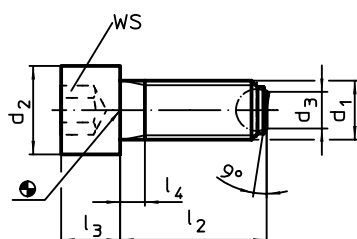
Ball-Ended Thrust Screws, headed, ball protected against rotating → p. 318

MORE INFORMATION

Notes

Ball not secured against rotating.

DRAWING



ORDER INFORMATION

Dimensions							WS	Load capacity for static load ¹⁾ max.		Art. No.	
d ₁	$\overset{\sim}{l_2}$	d ₂	d ₃	l ₃	l ₄	Ball diameter				Heat-treated steel	Stainless steel
[mm]							[mm]	[kN]	[g]		
bearing surface plain											
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	7.8	22710.0564	22710.0834
	40	10	3.2	6	16.0	4.0	5	9	9.9	22710.0566	22710.0836
M 8	20	13	4.5	8	3.5	5.5	6	15	12.0	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	32.0	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	80.0	22710.0626	22710.0866
M16	40	24	10.7	16	6.0	12.0	14	60	95.0	22710.0662	22710.0872
	60	24	10.7	16	6.0	12.0	14	60	121.0	22710.0664	22710.0874
	80	24	10.7	16	36.0	12.0	14	60	153.0	22710.0666	22710.0876
M20	50	30	13.5	20	7.5	15.0	17	90	185.0	22710.0702	–
	80	30	13.5	20	28.0	15.0	17	90	254.0	22710.0704	–
	100	30	13.5	20	48.0	15.0	17	90	304.0	22710.0706	–
M24	60	36	15.8	24	9.0	18.0	19	120	323.0	22710.0742	–
	90	36	15.8	24	30.0	18.0	19	120	424.0	22710.0744	–
	120	36	15.8	24	60.0	18.0	19	120	526.0	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 diameter				Heat-treated steel	Stainless steel
[mm]							[mm]	[kN]	[g]		
bearing surface ribbed											
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	38.0	22710.0922	—
	50	18	7.2	12	5.0	8.5	10	30	52.0	22710.0924	—
	80	18	7.2	12	44.0	8.5	10	30	80.0	22710.0926	—
M16	40	24	10.7	16	6.0	12.0	14	60	93.0	22710.0962	—
	60	24	10.7	16	6.0	12.0	14	60	121.0	22710.0964	—
	80	24	10.7	16	36.0	12.0	14	60	152.0	22710.0966	—
M20	50	30	13.5	20	7.5	15.0	17	90	184.0	22710.0972	—
	80	30	13.5	20	28.0	15.0	17	90	255.0	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	426.0	22710.0984	—
	120	36	15.8	24	60.0	18.0	19	120	528.0	22710.0986	—

¹⁾ Statements on load capacity are not valid for the stainless steel type.

Ball-Ended Thrust Screws • headless, round ball

EH 22720.



PRODUCT DESCRIPTION

Ball-ended thrust screws with thermoplastic ball are used for pressure sensitive pieces. Ball-ended thrust screws can also be used for positioning and clamping, tightening or supporting of non-parallel surfaces.

Material

Ball

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

Screw

- Heat-treated steel, 1200 ±100 N/mm²
- Stainless steel 1.4305

MORE INFORMATION

Notes

Ball not secured against rotating.

Special types on request.

References

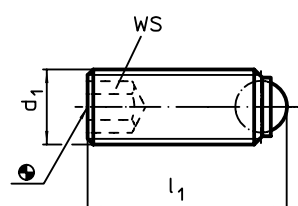
Thread lock on request, please refer to appendix - Technical Data -

Further products

Ball-Ended Thrust Screws, headless, with fine-pitch thread → p. 330

Ball-Ended Thrust Screws, headless, round ball and hexalobular socket. . . → p. 332

DRAWING



ORDER INFORMATION

Dimensions			WS	Load capacity for static load ¹⁾ max.				Art. No.	
d ₁	l ₁	Ball diameter			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	0.1	22720.0032	22720.0747
	7.5	1.5	1.5	2.5	–	250	0.2	22720.0033	22720.0748
	10.0	1.5	1.5	2.5	–	250	0.3	22720.0034	22720.0749
M 4	6.0	2.5	2.0	3.5	–	250	0.3	22720.0042	22720.0750
	8.0	2.5	2.0	3.5	–	250	0.4	22720.0043	22720.0752
	10.0	2.5	2.0	3.5	–	250	0.5	22720.0044	22720.0754
	12.0	2.5	2.0	3.5	–	250	0.7	22720.0045	22720.0756
	16.0	2.5	2.0	3.5	–	250	1.0	22720.0046	22720.0758
M 5	8.0	3.0	2.5	4.5	–	250	0.7	22720.0052	22720.0760
	10.0	3.0	2.5	4.5	–	250	0.9	22720.0053	22720.0761
	12.0	3.0	2.5	4.5	–	250	1.1	22720.0054	22720.0762
	16.0	3.0	2.5	4.5	–	250	1.6	22720.0055	22720.0763
	20.0	3.0	2.5	4.5	–	250	2.0	22720.0056	22720.0764
	25.0	3.0	2.5	4.5	–	250	2.6	22720.0058	22720.0765
M 6	10.8	4.0	3.0	9.0	–	250	1.3	22720.0062	22720.0770
	12.8	4.0	3.0	9.0	–	250	1.7	22720.0063	22720.0772
	16.8	4.0	3.0	9.0	–	250	2.3	22720.0064	22720.0774
	20.8	4.0	3.0	9.0	–	250	3.0	22720.0065	22720.0775
	25.8	4.0	3.0	9.0	–	250	3.8	22720.0066	22720.0776
M 8	11.2	5.5	4.0	15.0	–	250	2.5	22720.0081	22720.0780
	13.2	5.5	4.0	15.0	–	250	2.8	22720.0082	22720.0782
	17.2	5.5	4.0	15.0	–	250	4.0	22720.0083	22720.0783
	21.2	5.5	4.0	15.0	–	250	5.2	22720.0084	22720.0784
	26.2	5.5	4.0	15.0	–	250	6.7	22720.0085	22720.0785
	31.2	5.5	4.0	15.0	–	250	8.3	22720.0086	22720.0786

¹⁾ Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).



d ₁	Dimensions		WS	Load capacity for static load ¹⁾ max.	 min. max. [°C]		 [g]	Art. No.	
	l ₁	Ball diameter						Heat-treated steel	Stainless steel
	[mm]		[mm]	[kN]					
M10	13.7	7.0	5.0	20.0	–	250	4.7	22720.0101	22720.0790
	17.7	7.0	5.0	20.0	–	250	6.0	22720.0102	22720.0792
	21.7	7.0	5.0	20.0	–	250	8.0	22720.0103	22720.0793
	26.7	7.0	5.0	20.0	–	250	10.0	22720.0104	22720.0794
	31.7	7.0	5.0	20.0	–	250	13.0	22720.0105	22720.0795
	36.7	7.0	5.0	20.0	–	250	15.0	22720.0106	22720.0796
	41.7	7.0	5.0	20.0	–	250	18.0	22720.0108	22720.0798
M12	18.0	8.5	6.0	30.0	–	250	9.2	22720.0121	22720.0800
	22.0	8.5	6.0	30.0	–	250	11.0	22720.0122	22720.0802
	27.0	8.5	6.0	30.0	–	250	14.0	22720.0123	22720.0803
	32.0	8.5	6.0	30.0	–	250	18.0	22720.0124	22720.0804
	42.0	8.5	6.0	30.0	–	250	25.0	22720.0126	22720.0806
	52.0	8.5	6.0	30.0	–	250	32.0	22720.0128	22720.0808
M16	23.3	12.0	8.0	60.0	–	250	22.0	22720.0161	22720.0810
	28.3	12.0	8.0	60.0	–	250	27.0	22720.0162	22720.0812
	38.3	12.0	8.0	60.0	–	250	41.0	22720.0164	22720.0814
	53.3	12.0	8.0	60.0	–	250	61.0	22720.0166	22720.0816
M20	34.2	15.0	10.0	90.0	–	250	52.0	22720.0202	–
	44.2	15.0	10.0	90.0	–	250	73.0	22720.0204	–
	54.2	15.0	10.0	90.0	–	250	94.0	22720.0205	–
	64.2	15.0	10.0	90.0	–	250	114.0	22720.0206	–
M24	39.7	18.0	12.0	120.0	–	250	89.0	22720.0242	–
	54.7	18.0	12.0	120.0	–	250	133.0	22720.0244	–
	84.7	18.0	12.0	120.0	–	250	223.0	22720.0246	–
round ball from thermoplastic									
M 4	6.0	2.5	2.0	0.3	-30	80	0.2	22720.0342	22720.0252
	8.0	2.5	2.0	0.3	-30	80	0.4	22720.0343	22720.0253
	10.0	2.5	2.0	0.3	-30	80	0.5	22720.0344	22720.0254
	12.0	2.5	2.0	0.3	-30	80	0.6	22720.0345	22720.0255
	16.0	2.5	2.0	0.3	-30	80	0.9	22720.0346	22720.0256
M 5	8.0	3.0	2.5	0.5	-30	80	0.8	22720.0352	22720.0262
	10.0	3.0	2.5	0.5	-30	80	0.7	22720.0353	22720.0263
	12.0	3.0	2.5	0.5	-30	80	1.0	22720.0354	22720.0264
	16.0	3.0	2.5	0.5	-30	80	1.5	22720.0355	22720.0265
	20.0	3.0	2.5	0.5	-30	80	1.9	22720.0356	22720.0266
	25.0	3.0	2.5	0.5	-30	80	2.5	22720.0358	22720.0267
M 6	10.8	4.0	3.0	0.9	-30	80	1.1	22720.0362	22720.0272
	12.8	4.0	3.0	0.9	-30	80	1.4	22720.0363	22720.0273
	16.8	4.0	3.0	0.9	-30	80	2.1	22720.0364	22720.0274
	20.8	4.0	3.0	0.9	-30	80	2.8	22720.0365	22720.0275
	25.8	4.0	3.0	0.9	-30	80	3.6	22720.0366	22720.0276
M 8	11.2	5.5	4.0	1.5	-30	80	1.9	22720.0381	22720.0281
	13.2	5.5	4.0	1.5	-30	80	2.3	22720.0382	22720.0282
	17.2	5.5	4.0	1.5	-30	80	3.6	22720.0383	22720.0283
	21.2	5.5	4.0	1.5	-30	80	4.6	22720.0384	22720.0284
	26.2	5.5	4.0	1.5	-30	80	6.3	22720.0385	22720.0285
	31.2	5.5	4.0	1.5	-30	80	7.7	22720.0386	22720.0286
M10	13.7	7.0	5.0	2.0	-30	80	3.5	22720.0401	22720.0291
	17.7	7.0	5.0	2.0	-30	80	4.9	22720.0402	22720.0292
	21.7	7.0	5.0	2.0	-30	80	6.8	22720.0403	22720.0293
	26.7	7.0	5.0	2.0	-30	80	9.2	22720.0404	22720.0294
	31.7	7.0	5.0	2.0	-30	80	12.0	22720.0405	22720.0295
	36.7	7.0	5.0	2.0	-30	80	14.0	22720.0406	22720.0296
	41.7	7.0	5.0	2.0	-30	80	16.0	22720.0408	22720.0297
M12	18.0	8.5	6.0	3.0	-30	80	7.1	22720.0421	22720.0301
	22.0	8.5	6.0	3.0	-30	80	8.8	22720.0422	22720.0302
	27.0	8.5	6.0	3.0	-30	80	12.0	22720.0423	22720.0303
	32.0	8.5	6.0	3.0	-30	80	16.0	22720.0424	22720.0304
	42.0	8.5	6.0	3.0	-30	80	23.0	22720.0426	22720.0306
	52.0	8.5	6.0	3.0	-30	80	30.0	22720.0428	22720.0308

¹⁾ Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).

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. Ball-ended thrust screws can also be used for clamping, tightening or supporting of non-parallel surfaces. The flat-faced, movable ball enables a flat load transmission.

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

Ball not secured against rotating.
Special types on request.

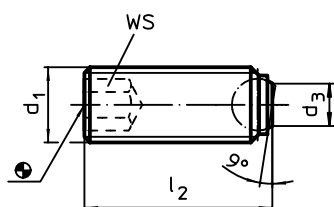
References

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

Further products

Ball-Ended Thrust Screws, headless, ball protected against rotating → p. 320
Ball-Ended Thrust Screws, headless, with fine-pitch thread → p. 330
Ball-Ended Thrust Screws, headless, short. → p. 331
Ball-Ended Thrust Screws, headless, flat-faced ball and hexalobular socket. → p. 333

DRAWING



ORDER INFORMATION

Dimensions				WS	Load capacity for static load ¹⁾ max.				Art. No.	
d ₁	l ₂	d ₃	Ball diameter			min.	max.		Heat-treated steel	Stainless steel
[mm]				[mm]	[kN]	[°C]		[g]		
bearing surface plain										
M 4	5.6	1.8	2.5	2.0	3.5	–	250	0.3	22720.0542	22720.0827
	7.6	1.8	2.5	2.0	3.5	–	250	0.4	22720.0543	22720.0828
	9.6	1.8	2.5	2.0	3.5	–	250	0.6	22720.0544	22720.0829
	11.6	1.8	2.5	2.0	3.5	–	250	0.7	22720.0545	22720.0830
	15.6	1.8	2.5	2.0	3.5	–	250	1.0	22720.0546	22720.0832
M 5	7.5	2.2	3.0	2.5	4.5	–	250	0.6	22720.0552	22720.0833
	9.5	2.2	3.0	2.5	4.5	–	250	0.9	22720.0553	22720.0834
	11.5	2.2	3.0	2.5	4.5	–	250	1.1	22720.0554	22720.0835
	15.5	2.2	3.0	2.5	4.5	–	250	1.6	22720.0555	22720.0836
	19.5	2.2	3.0	2.5	4.5	–	250	2.0	22720.0556	22720.0837
M 6	24.5	2.2	3.0	2.5	4.5	–	250	2.6	22720.0558	22720.0838
	10.0	3.2	4.0	3.0	9.0	–	250	1.3	22720.0562	22720.0840
	12.0	3.2	4.0	3.0	9.0	–	250	1.6	22720.0563	22720.0842
	16.0	3.2	4.0	3.0	9.0	–	250	2.3	22720.0564	22720.0844
	20.0	3.2	4.0	3.0	9.0	–	250	3.0	22720.0565	22720.0845
M 8	25.0	3.2	4.0	3.0	9.0	–	250	3.8	22720.0566	22720.0846
	10.0	4.5	5.5	4.0	15.0	–	250	2.4	22720.0581	22720.0850
	12.0	4.5	5.5	4.0	15.0	–	250	2.8	22720.0582	22720.0852
	16.0	4.5	5.5	4.0	15.0	–	250	4.1	22720.0583	22720.0853
	20.0	4.5	5.5	4.0	15.0	–	250	5.1	22720.0584	22720.0854
	25.0	4.5	5.5	4.0	15.0	–	250	6.7	22720.0585	22720.0855
	30.0	4.5	5.5	4.0	15.0	–	250	8.2	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 diameter			min.	max.		Heat-treated steel	Stainless steel	
[mm]				[mm]	[kN]	[°C]		[g]			
M10	12.0	6.0	7.0	5.0	20.0	–	250	4.5	22720.0601	22720.0860	
	16.0	6.0	7.0	5.0	20.0	–	250	5.9	22720.0602	22720.0862	
	20.0	6.0	7.0	5.0	20.0	–	250	7.8	22720.0603	22720.0863	
	25.0	6.0	7.0	5.0	20.0	–	250	10.0	22720.0604	22720.0864	
	30.0	6.0	7.0	5.0	20.0	–	250	13.0	22720.0605	22720.0865	
	35.0	6.0	7.0	5.0	20.0	–	250	15.0	22720.0606	22720.0866	
	40.0	6.0	7.0	5.0	20.0	–	250	18.0	22720.0608	22720.0868	
M12	16.0	7.2	8.5	6.0	30.0	–	250	8.8	22720.0621	22720.0870	
	20.0	7.2	8.5	6.0	30.0	–	250	11.0	22720.0622	22720.0872	
	25.0	7.2	8.5	6.0	30.0	–	250	14.0	22720.0623	22720.0873	
	30.0	7.2	8.5	6.0	30.0	–	250	18.0	22720.0624	22720.0874	
	40.0	7.2	8.5	6.0	30.0	–	250	25.0	22720.0626	22720.0876	
M16	20.0	10.7	12.0	8.0	60.0	–	250	21.0	22720.0661	22720.0880	
	25.0	10.7	12.0	8.0	60.0	–	250	26.0	22720.0662	22720.0882	
	35.0	10.7	12.0	8.0	60.0	–	250	40.0	22720.0664	22720.0884	
	50.0	10.7	12.0	8.0	60.0	–	250	60.0	22720.0666	22720.0886	
M20	30.0	13.5	15.0	10.0	90.0	–	250	50.0	22720.0702	–	
	40.0	13.5	15.0	10.0	90.0	–	250	71.0	22720.0704	–	
	50.0	13.5	15.0	10.0	90.0	–	250	92.0	22720.0705	–	
	60.0	13.5	15.0	10.0	90.0	–	250	111.0	22720.0706	–	
M24	35.0	15.8	18.0	12.0	120.0	–	250	85.0	22720.0742	–	
	50.0	15.8	18.0	12.0	120.0	–	250	129.0	22720.0744	–	
	80.0	15.8	18.0	12.0	120.0	–	250	218.0	22720.0746	–	
flat-faced ball from thermoplastic, bearing surface plain (protected against rotating)											
M 4	5.9	1.8	2.5	2.0	0.3	-30	80	0.4	22720.0452	22720.0492	
	7.9	1.8	2.5	2.0	0.3	-30	80	0.3	22720.0453	22720.0493	
	9.9	1.8	2.5	2.0	0.3	-30	80	0.5	22720.0454	22720.0494	
	11.9	1.8	2.5	2.0	0.3	-30	80	0.7	22720.0455	22720.0495	
	15.9	1.8	2.5	2.0	0.3	-30	80	0.9	22720.0456	22720.0496	
M 5	7.8	2.1	3.0	2.5	0.5	-30	80	0.6	22720.0462	22720.0502	
	9.8	2.1	3.0	2.5	0.5	-30	80	0.8	22720.0463	22720.0503	
	11.8	2.1	3.0	2.5	0.5	-30	80	1.0	22720.0464	22720.0504	
	15.8	2.1	3.0	2.5	0.5	-30	80	1.5	22720.0465	22720.0505	
	19.8	2.1	3.0	2.5	0.5	-30	80	1.9	22720.0466	22720.0506	
M 6	24.8	2.1	3.0	2.5	0.5	-30	80	2.5	22720.0467	22720.0507	
	10.3	3.0	4.0	3.0	0.9	-30	80	1.1	22720.0472	22720.0512	
	12.3	3.0	4.0	3.0	0.9	-30	80	1.4	22720.0473	22720.0513	
	16.3	3.0	4.0	3.0	0.9	-30	80	2.1	22720.0474	22720.0514	
	20.3	3.0	4.0	3.0	0.9	-30	80	2.8	22720.0475	22720.0515	
M 8	25.3	3.0	4.0	3.0	0.9	-30	80	3.6	22720.0476	22720.0516	
	10.4	4.2	5.5	4.0	1.5	-30	80	1.9	22720.0482	22720.0522	
	12.4	4.2	5.5	4.0	1.5	-30	80	2.3	22720.0483	22720.0523	
	16.4	4.2	5.5	4.0	1.5	-30	80	3.4	22720.0484	22720.0524	
	20.4	4.2	5.5	4.0	1.5	-30	80	4.6	22720.0485	22720.0525	
M10	25.4	4.2	5.5	4.0	1.5	-30	80	6.2	22720.0486	22720.0526	
	30.4	4.2	5.5	4.0	1.5	-30	80	7.8	22720.0487	22720.0527	
	bearing surface ribbed										
	M 8	10.0	4.5	5.5	4.0	15.0	–	250	2.4	22720.0891	–
		12.0	4.5	5.5	4.0	15.0	–	250	2.7	22720.0892	–
16.0		4.5	5.5	4.0	15.0	–	250	3.9	22720.0893	–	
20.0		4.5	5.5	4.0	15.0	–	250	5.1	22720.0894	–	
25.0		4.5	5.5	4.0	15.0	–	250	6.7	22720.0895	–	
M10	30.0	4.5	5.5	4.0	15.0	–	250	8.2	22720.0896	–	
	12.0	6.0	7.0	5.0	20.0	–	250	4.5	22720.0901	–	
	16.0	6.0	7.0	5.0	20.0	–	250	5.8	22720.0902	–	
	20.0	6.0	7.0	5.0	20.0	–	250	7.7	22720.0903	–	
	25.0	6.0	7.0	5.0	20.0	–	250	10.0	22720.0904	–	
M10	30.0	6.0	7.0	5.0	20.0	–	250	13.0	22720.0905	–	
	35.0	6.0	7.0	5.0	20.0	–	250	15.0	22720.0906	–	
	40.0	6.0	7.0	5.0	20.0	–	250	17.0	22720.0908	–	

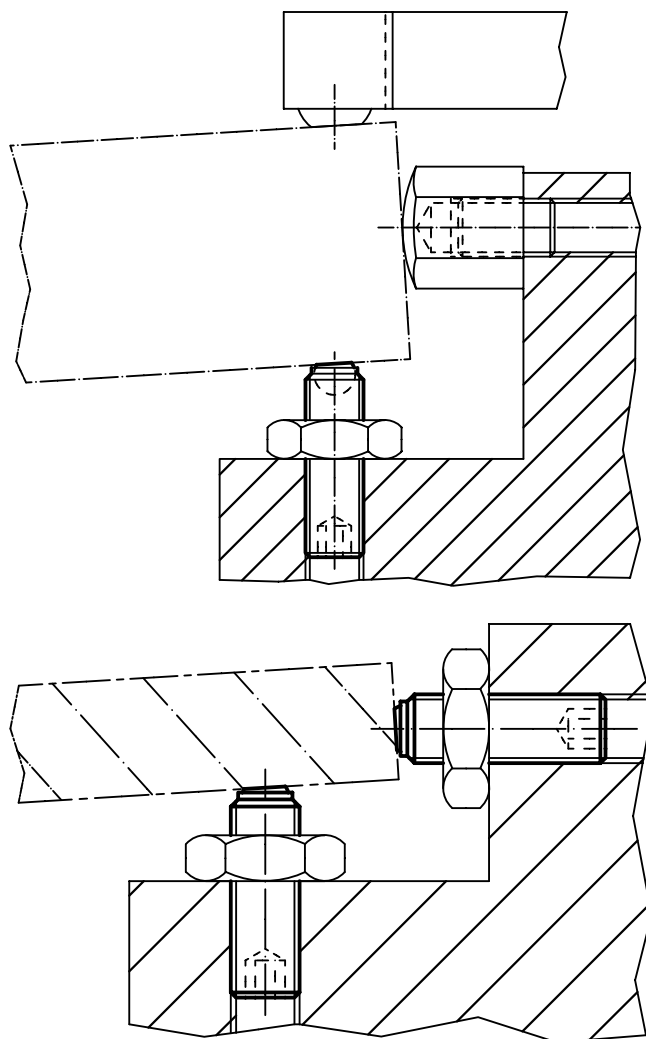
¹⁾ Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).



d ₁	Dimensions			WS	Load capacity for static load ¹⁾ max.	 min. max. [°C]		 [g]	Art. No.	
	l ₂	d ₃	Ball diameter						Heat-treated steel	Stainless steel
[mm]				[mm]	[kN]					
M12	16.0	7.2	8.5	6.0	30.0	–	250	8.8	22720.0921	–
	20.0	7.2	8.5	6.0	30.0	–	250	10.0	22720.0922	–
	25.0	7.2	8.5	6.0	30.0	–	250	14.0	22720.0923	–
	30.0	7.2	8.5	6.0	30.0	–	250	18.0	22720.0924	–
	40.0	7.2	8.5	6.0	30.0	–	250	25.0	22720.0926	–
	50.0	7.2	8.5	6.0	30.0	–	250	32.0	22720.0928	–
M16	20.0	10.7	12.0	8.0	60.0	–	250	21.0	22720.0961	–
	25.0	10.7	12.0	8.0	60.0	–	250	26.0	22720.0962	–
	35.0	10.7	12.0	8.0	60.0	–	250	40.0	22720.0964	–
	50.0	10.7	12.0	8.0	60.0	–	250	60.0	22720.0966	–
M20	30.0	13.5	15.0	10.0	90.0	–	250	49.0	22720.0972	–
	40.0	13.5	15.0	10.0	90.0	–	250	70.0	22720.0974	–
	50.0	13.5	15.0	10.0	90.0	–	250	91.0	22720.0975	–
	60.0	13.5	15.0	10.0	90.0	–	250	111.0	22720.0976	–
M24	35.0	15.8	18.0	12.0	120.0	–	250	84.0	22720.0982	–
	50.0	15.8	18.0	12.0	120.0	–	250	125.0	22720.0984	–
	80.0	15.8	18.0	12.0	120.0	–	250	217.0	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.

2



PRODUCT DESCRIPTION

Ball-ended thrust screws can also be used for positioning and clamping, tightening or supporting of non-parallel surfaces.
The fine-pitch thread allows a precise adjustment.
The flat-faced, movable ball enables a flat load transmission.

Material

Ball

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

Screw

- Heat-treated steel, $1200 \pm 100 \text{ N/mm}^2$
- Stainless steel 1.4305

MORE INFORMATION

Notes

Ball not secured against rotating.
Special types on request.

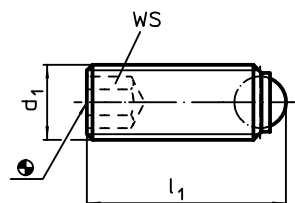
References

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

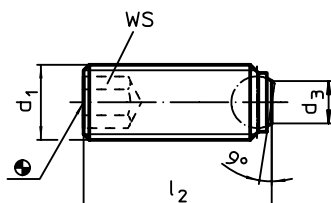
Further products

Ball-Ended Thrust Screws, headless, ball protected against rotating → p. 320
Ball-Ended Thrust Screws, headless, round ball → p. 325
Ball-Ended Thrust Screws, headless, flat-faced ball → p. 327

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 diameter	[mm]	[kN]	[°C]	[g]	Heat-treated steel	Stainless steel
[mm]										
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	0.7	22720.5032	22720.6032
M4 x 0,5	6.0	–	–	2.5	2.0	3.5	250	0.3	22720.5040	22720.6040
	10.0	–	–	2.5	2.0	3.5	250	0.6	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	1.5	22720.5060	22720.6060
	12.8	–	–	4.0	3.0	9.0	250	2.2	22720.5061	22720.6061
	16.8	–	–	4.0	3.0	9.0	250	2.7	22720.5062	22720.6062
	20.8	–	–	4.0	3.0	9.0	250	3.4	22720.5063	22720.6063
	25.8	–	–	4.0	3.0	9.0	250	4.4	22720.5064	22720.6064
M8 x 1	11.2	–	–	5.5	4.0	15.0	250	2.5	22720.5070	22720.6070
	21.2	–	–	5.5	4.0	15.0	250	5.5	22720.5073	22720.6073
flat-faced ball, bearing surface plain – picture 2										
M4 x 0,35	–	5.6	1.3	2.5	2.0	3.5	250	0.3	22720.5230	22720.6230
		9.6	1.3	2.5	2.0	3.5	250	0.7	22720.5232	22720.6232
M4 x 0,5	–	5.6	1.3	2.5	2.0	3.5	250	0.3	22720.5240	22720.6240
		9.6	1.3	2.5	2.0	3.5	250	0.6	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	1.5	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	2.6	22720.5262	22720.6262
		20.0	3.2	4.0	3.0	9.0	250	3.4	22720.5263	22720.6263
		25.0	3.2	4.0	3.0	9.0	250	4.4	22720.5264	22720.6264
M8 x 1	–	10.0	4.5	5.5	4.0	15.0	250	2.5	22720.5270	22720.6270
		20.0	4.5	5.5	4.0	15.0	250	5.4	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.



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. Ball-ended thrust screws can also be used for clamping, tightening or supporting of non-parallel surfaces.

The flat-faced, movable ball enables a flat load transmission.

Material

Special types on request.

Ball

- Ball-bearing steel, hardened

References

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

Screw

- Heat-treated steel, $1200 \pm 100 \text{ N/mm}^2$

Further products

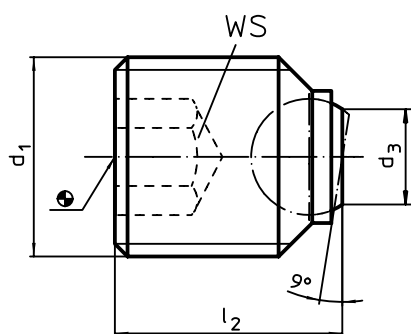
Ball-Ended Thrust Screws, headless, flat-faced ball → p. 327

MORE INFORMATION

Notes

Ball not secured against rotating.

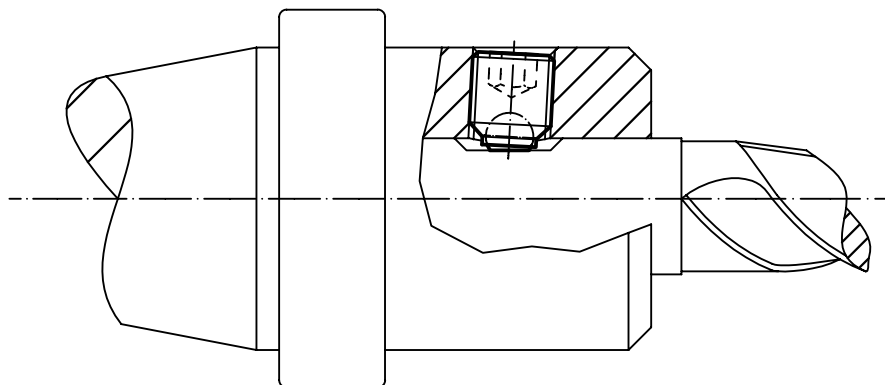
DRAWING



ORDER INFORMATION

Dimensions				WS	Load capacity for static load max.		Art. No.
d ₁	l ₂	d ₃	Ball diameter				
[mm]				[mm]	[kN]	[g]	
flat-faced ball, bearing surface plain, for straight shanks DIN 1835 E							
M14	16	7.2	8.5	6	30	12	22720.0641
M16	16	7.2	8.5	8	30	15	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

Ball-ended thrust screws can also be used for positioning and clamping, tightening or supporting of non-parallel surfaces.

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

Special types on request.

Ball

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

References

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

Screw

- Heat-treated steel, $1200 \pm 100 \text{ N/mm}^2$
- Stainless steel 1.4305

Further products

Ball-Ended Thrust Screws, headless, round ball. → p. 325

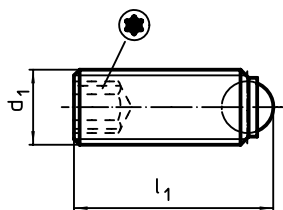
Ball-Ended Thrust Screws, headless, flat-faced ball and hexalobular socket. → p. 333

MORE INFORMATION

Notes

Ball not secured against rotating.

DRAWING



ORDER INFORMATION

Dimensions				Load capacity for static load ¹⁾ max.	 max.	 [g]	Art. No.	
d ₁	l ₁	Ball diameter					Heat-treated steel	Stainless steel
[mm]							[kN]	[°C]
round ball								
M4	6.0	2.5	8	3.5	250	0.3	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	0.7	22720.1052	22720.2052
	12.0	3.0	10	4.5	250	1.2	22720.1054	22720.2054
M6	10.8	4.0	15	9.0	250	1.4	22720.1062	22720.2062
	16.8	4.0	15	9.0	250	2.5	22720.1064	22720.2064

¹⁾ Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).

Ball-Ended Thrust Screws • headless, flat-faced ball and hexalobular socket

EH 22720.



PRODUCT DESCRIPTION

Ball-ended thrust screws can also be used for clamping, tightening or supporting of non-parallel surfaces.

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

MORE INFORMATION

Notes

Ball not secured against rotating.
Special types on request.

References

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

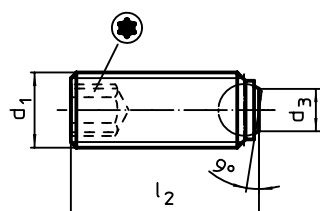
Further products

Ball-Ended Thrust Screws, headless, ball protected against rotating → p. 320

Ball-Ended Thrust Screws, headless, flat-faced ball → p. 327

Ball-Ended Thrust Screws, headless, round ball and hexalobular socket. . . . → p. 332

DRAWING



ORDER INFORMATION

Dimensions					Load capacity for static load ¹⁾ max.	 max.	 [g]	Art. No.	
d ₁	l ₂	d ₃	Ball diameter					Heat-treated steel	Stainless steel
[mm]					[kN]	[°C]			
flat-faced ball, bearing surface plain									
M4	5.6	1.8	2.5	8	3.5	250	0.3	22720.1542	22720.2542
	9.6	1.8	2.5	8	3.5	250	0.6	22720.1544	22720.2544
M5	7.5	2.2	3.0	10	4.5	250	0.7	22720.1552	22720.2552
	11.5	2.2	3.0	10	4.5	250	1.2	22720.1554	22720.2554
M6	10.0	3.2	4.0	15	9.0	250	1.4	22720.1562	22720.2562
	16.0	3.2	4.0	15	9.0	250	2.4	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

- Stainless steel 1.4305

Pad

- Brass

MORE INFORMATION

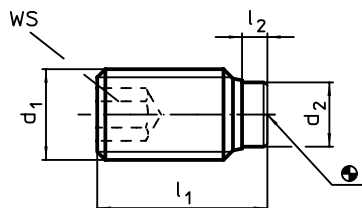
Further products

Thrust Screws, with plastic pad. → p. 335

Screw

- Heat-treated steel, $1200 \pm 100 \text{ N/mm}^2$

DRAWING



ORDER INFORMATION

d ₁	Dimensions			WS	max. [°C]	[g]	Art. No.	
	l ₁	l ₂	d ₂				Heat-treated steel	Stainless steel
[mm]				[mm]				
M 3	5.0	1.0	1.5	1.5	250	0.1	22760.0032	22760.0432
	7.5	1.0	1.5	1.5	250	0.2	22760.0034	22760.0434
	10.0	1.0	1.5	1.5	250	0.3	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	0.6	22760.0044	22760.0444
	16.5	1.2	2.5	2.0	250	1.0	22760.0046	22760.0446
M 5	6.0	1.0	3.0	2.5	250	0.5	22760.0050	—
	8.5	1.3	3.0	2.5	250	0.7	22760.0052	22760.0452
	12.5	1.3	3.0	2.5	250	1.2	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	0.7	22760.0060	—
	11.5	1.9	4.0	3.0	250	1.5	22760.0062	22760.0462
	17.5	1.9	4.0	3.0	250	2.5	22760.0064	22760.0464
	26.5	1.9	4.0	3.0	250	4.0	22760.0066	22760.0466
M 8	8.0	1.4	5.5	4.0	250	1.7	22760.0080	—
	12.0	2.5	5.5	4.0	250	2.9	22760.0082	22760.0482
	22.0	2.5	5.5	4.0	250	5.7	22760.0086	22760.0486
	32.0	2.5	5.5	4.0	250	8.7	22760.0088	22760.0488
M10	10.0	1.5	7.0	5.0	250	3.4	22760.0100	—
	14.0	2.7	7.0	5.0	250	5.4	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	6.4	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	19.0	22760.0126	22760.0526
	42.5	3.4	8.5	6.0	250	26.0	22760.0128	22760.0528

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

- Stainless steel 1.4305

Pad

- Thermoplastic POM, white

MORE INFORMATION

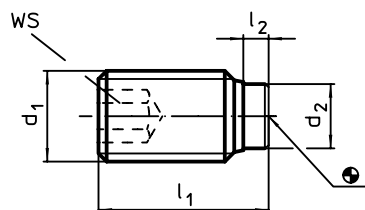
Further products

Thrust Screws, with brass pad → p. 334

Screw

- Steel, blackened

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	0.1	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	0.4	22760.0638	—
M 4	7.0	1.0	2.0	1.5	-30	80	0.3	22760.0642	22760.0242
	9.0	1.0	2.0	1.5	-30	80	0.4	—	22760.0243
				2.0	-30	80	0.5	22760.0643	—
	11.0	1.0	2.0	1.5	-30	80	0.6	—	22760.0244
				2.0	-30	80	0.7	22760.0644	—
	13.0	1.0	2.0	1.5	-30	80	0.7	—	22760.0245
				2.0	-30	80	0.7	22760.0645	—
	17.0	1.0	2.0	1.5	-30	80	1.0	—	22760.0246
2.0				-30	80	1.1	22760.0646	—	
M 5	21.0	1.0	2.0	1.5	-30	80	1.3	—	22760.0247
	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	0.9	22760.0653	22760.0253
	13.0	1.0	3.0	2.5	-30	80	1.2	22760.0654	22760.0254
	17.0	1.0	3.0	2.5	-30	80	1.6	22760.0655	22760.0255
	21.0	1.0	3.0	2.5	-30	80	2.2	22760.0656	22760.0256
M 6	26.0	1.0	3.0	2.5	-30	80	2.6	—	22760.0257
	11.3	1.3	3.5	3.0	-30	80	1.3	22760.0662	22760.0262
	13.3	1.3	3.5	3.0	-30	80	1.7	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	3.0	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	5.1	22760.0667	22760.0267
	41.3	1.3	3.5	3.0	-30	80	6.3	—	22760.0268
M 8	51.3	1.3	3.5	3.0	-30	80	7.9	—	22760.0270
	13.6	1.6	5.0	4.0	-30	80	2.5	22760.0682	22760.0282
	17.6	1.6	5.0	4.0	-30	80	3.7	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	6.5	22760.0685	22760.0285
	33.6	1.6	5.0	4.0	-30	80	8.8	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

→

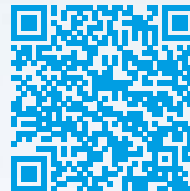
Dimensions				WS				Art. No.	
d ₁	l ₁ ~	l ₂ ~	d ₂		min.	max.		Stainless steel	Steel
[mm]				[mm]	[°C]		[g]		
M10	17.9	1.9	6.5	5.0	-30	80	5.4	22760.0702	22760.0302
	21.9	1.9	6.5	5.0	-30	80	7.2	22760.0703	22760.0303
	26.9	1.9	6.5	5.0	-30	80	9.9	22760.0704	22760.0304
	33.9	1.9	6.5	5.0	-30	80	13.0	22760.0705	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	9.1	22760.0722	22760.0322
	27.1	2.1	8.0	6.0	-30	80	13.0	22760.0723	22760.0323
	34.1	2.1	8.0	6.0	-30	80	18.0	22760.0724	22760.0324
	42.1	2.1	8.0	6.0	-30	80	23.0	22760.0725	22760.0325
	52.1	2.1	8.0	6.0	-30	80	30.0	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	53.0	—	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](http://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.

2



PRODUCT DESCRIPTION

Self-aligning pads are used as stop, support and thrust pad and are suitable for installation in clamping elements.

Material

- Stainless steel 1.4057, heat-treated

Ball

- Ball-bearing steel, hardened, bright
- Stainless steel 1.3541, nickel-plated

Body

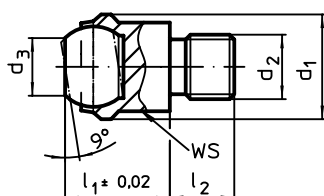
- Heat-treated steel, tempered, phosphated

MORE INFORMATION

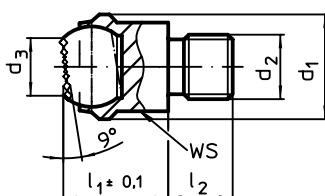
Notes

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

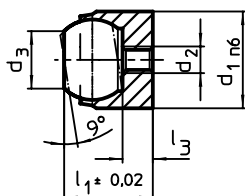
DRAWING



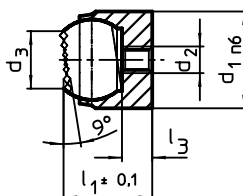
picture 1



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 diameter	Ø H7	Depth min.					Heat-treated steel	Stainless steel
[mm]							[mm]		[mm]	[kN]	[Nm]	[g]		
with male thread, flat-faced ball, bearing surface plain – picture 1														
13	M 6	7.2	13	8	–	10	–	–	11	10	10.0	12.0	22730.0012	22730.0112
	M 8	7.2	13	8	–	10	–	–	11	10	25.0	13.0	22730.0013	22730.0113
20	M 8	10.5	18	10	–	16	–	–	17	25	25.0	39.0	22730.0018	22730.0118
	M10	10.5	18	10	–	16	–	–	17	25	46.0	40.0	22730.0019	22730.0119
	M12	10.5	18	12	–	16	–	–	17	25	82.0	43.0	22730.0020	22730.0120
30	M16	20.0	27	16	–	25	–	–	27	90	206.0	151.0	22730.0030	22730.0130
50	M20	34.5	35	20	–	40	–	–	41	165	407.0	489.0	22730.0050	22730.0150
	M24	34.5	35	24	–	40	–	–	41	165	698.0	518.0	22730.0060	22730.0160
with male thread, flat-faced ball, bearing surface ribbed – picture 2														
13	M 6	7.2	13	8	–	10	–	–	11	10	10.0	12.0	22730.0312	–
	M 8	7.2	13	8	–	10	–	–	11	10	25.0	13.0	22730.0313	–
20	M 8	10.5	18	10	–	16	–	–	17	25	25.0	38.0	22730.0318	–
	M10	10.5	18	10	–	16	–	–	17	25	46.0	40.0	22730.0319	–
	M12	10.5	18	12	–	16	–	–	17	25	82.0	43.0	22730.0320	–
30	M16	20.0	27	16	–	25	–	–	27	90	206.0	149.0	22730.0330	–
50	M20	34.5	35	20	–	40	–	–	41	165	407.0	484.0	22730.0350	–
	M24	34.5	35	24	–	40	–	–	41	165	698.0	513.0	22730.0360	–
for locating hole, flat-faced ball, bearing surface plain – picture 3														
12 n6	M 3	7.2	11	–	3.2	10	12	6	–	10 ¹⁾	1.3	8.0	22730.0412	22730.0452
18 n6	M 4	10.5	17	–	4.0	16	18	8	–	25 ¹⁾	2.9	29.0	22730.0418	22730.0458
28 n6	M 5	20.0	25	–	5.5	25	28	13	–	90 ¹⁾	6.0	109.0	22730.0428	22730.0468
for locating hole, flat-faced ball, bearing surface ribbed – picture 4														
12 n6	M 3	7.2	11	–	3.2	10	12	6	–	10 ¹⁾	1.3	7.9	22730.0712	–
18 n6	M 4	10.5	17	–	4.0	16	18	8	–	25 ¹⁾	2.9	29.0	22730.0718	–
28 n6	M 5	20.0	25	–	5.5	25	28	13	–	90 ¹⁾	6.0	108.0	22730.0728	–

¹⁾ Applies only when the minimum bore depth is kept to.

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

- Stainless steel 1.4057, heat-treated

Ball

- Hard metal, ribbed, nickel-plated

Body

- Heat-treated steel, tempered, phosphated

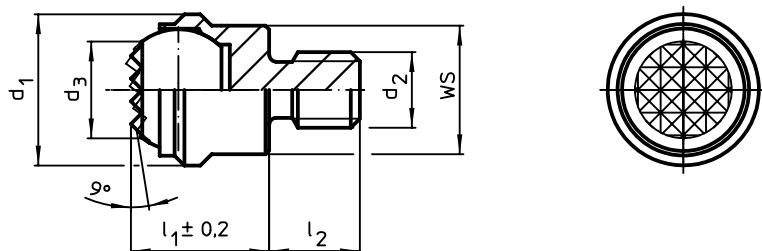
MORE INFORMATION

Notes

Ball protected against rotating.

Loading capacity valid for steel and stainless steel designs.

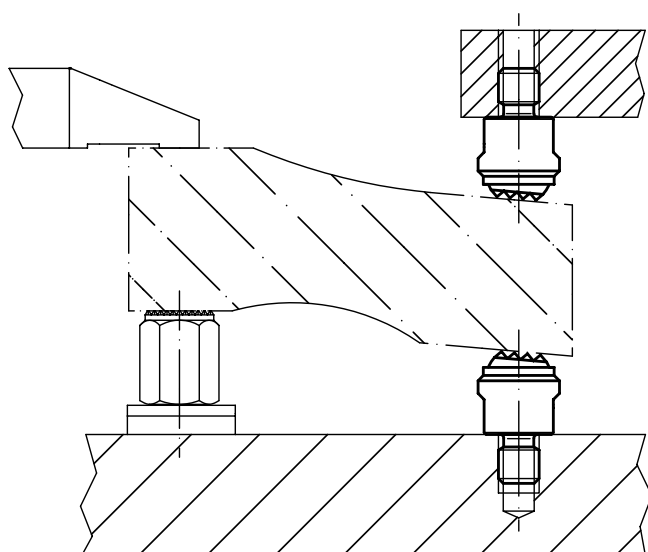
DRAWING



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 diameter					Heat-treated steel	Stainless steel
[mm]						[mm]	[kN]	[Nm]	[g]		
with male thread, flat-faced ball, bearing surface ribbed											
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	15	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	50	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	186	22730.0381	22730.0399
50	M20	34.5	35	20	40	41	165	407	633	22730.0382	22730.0400
	M24	34.5	35	24	40	41	165	698	664	22730.0383	22730.0401

APPLICATION EXAMPLE



Self-Aligning Pads • self-resetting

EH 22731.

2



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

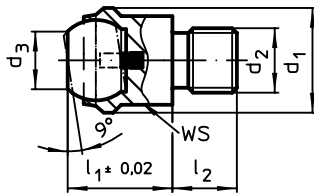
MORE INFORMATION

Notes

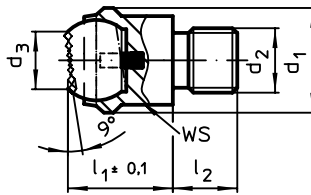
Ball protected against rotating.

Loading capacity valid for steel and stainless steel designs.

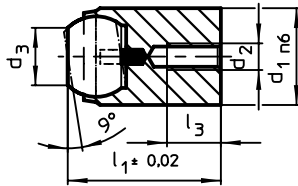
DRAWING



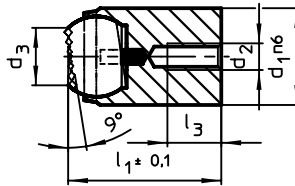
picture 1



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 diameter	Ø H7	Depth min.	[mm]	[kN]	[Nm]	[g]	Heat-treated steel	Stainless steel
[mm]														
with male thread, flat-faced ball, bearing surface plain – picture 1														
13	M 6	7.2	13	8	–	10	–	–	11	10	10.0	12	22731.0012	22731.0112
	M 8	7.2	13	8	–	10	–	–	11	10	25.0	13	22731.0013	22731.0113
20	M 8	10.5	18	10	–	16	–	–	17	25	25.0	38	22731.0018	22731.0118
	M10	10.5	18	10	–	16	–	–	17	25	46.0	40	22731.0019	22731.0119
30	M12	10.5	18	12	–	16	–	–	17	25	82.0	43	22731.0020	22731.0120
	M16	20.0	27	16	–	25	–	–	27	90	206.0	149	22731.0030	22731.0130
50	M20	34.5	35	20	–	40	–	–	41	165	407.0	486	22731.0050	22731.0150
	M24	34.5	35	24	–	40	–	–	41	165	698.0	516	22731.0060	22731.0160
with male thread, flat-faced ball, bearing surface ribbed – picture 2														
13	M 6	7.2	13	8	–	10	–	–	11	10	10.0	12	22731.0312	–
	M 8	7.2	13	8	–	10	–	–	11	10	25.0	13	22731.0313	–
20	M 8	10.5	18	10	–	16	–	–	17	25	25.0	37	22731.0318	–
	M10	10.5	18	10	–	16	–	–	17	25	46.0	40	22731.0319	–
30	M12	10.5	18	12	–	16	–	–	17	25	82.0	43	22731.0320	–
	M16	20.0	27	16	–	25	–	–	27	90	206.0	149	22731.0330	–
50	M20	34.5	35	20	–	40	–	–	41	165	407.0	482	22731.0350	–
	M24	34.5	35	24	–	40	–	–	41	165	698.0	511	22731.0360	–

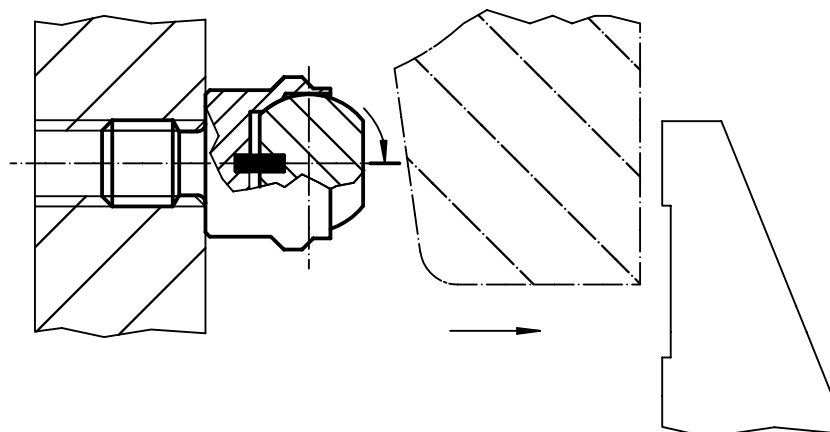
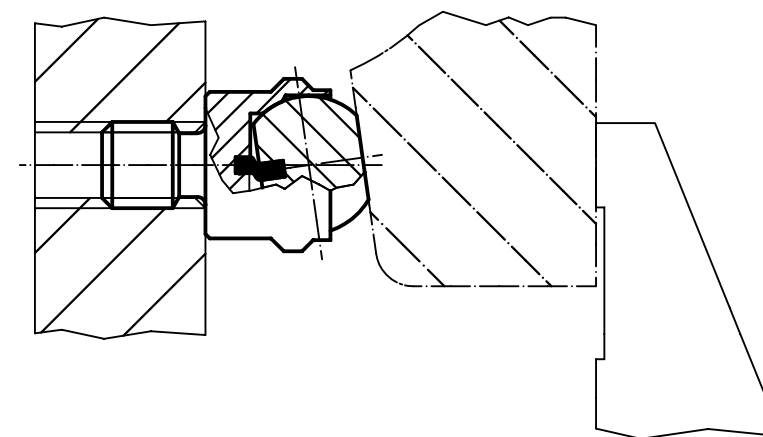
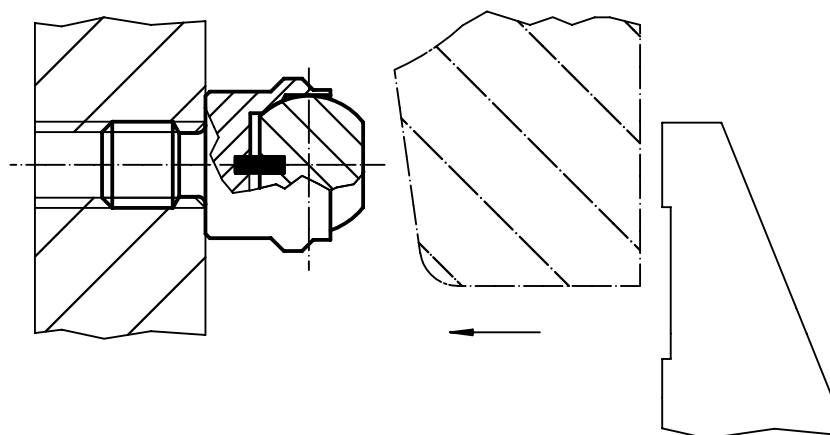
¹⁾ Applies only when the minimum bore depth is kept to.



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 diameter	Ø H7	Depth min.	[mm]	[kN]	[Nm]	[g]	Heat-treated steel	Stainless steel
[mm]														
for locating hole, flat-faced ball, bearing surface plain – picture 3														
12 n6	M 3	7.2	17	–	3.2	10	12	12	–	10 ¹⁾	1.3	13	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	151	22731.0428	22731.0468
for locating hole, flat-faced ball, bearing surface ribbed – picture 4														
12 n6	M 3	7.2	17	–	3.2	10	12	12	–	10 ¹⁾	1.3	13	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

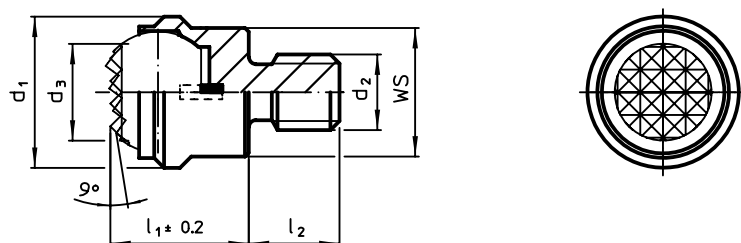
Ball

- Hard metal, ribbed, nickel-plated

Body

- Heat-treated steel, tempered, phosphated
- Stainless steel 1.4057, heat-treated

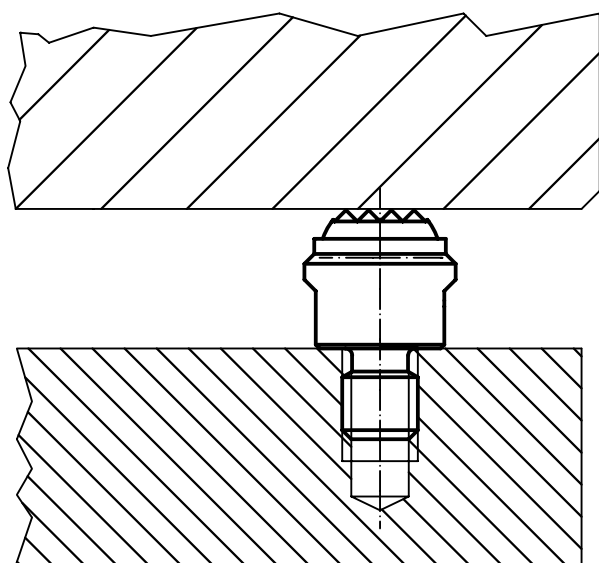
DRAWING



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 diameter					Heat-treated steel	Stainless steel
[mm]						[mm]	[kN]	[Nm]	[g]		
with male thread, flat-faced ball, bearing surface ribbed											
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	15	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	53	22731.0380	22731.0398
30	M16	20.0	27	16	25	27	90	206	186	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



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

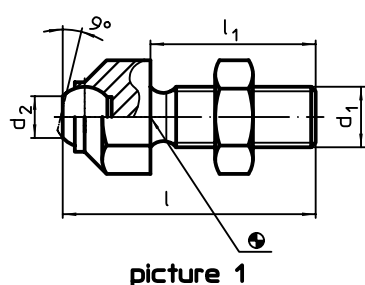
- Steel, blackened (ISO 4035)
- Stainless steel

MORE INFORMATION

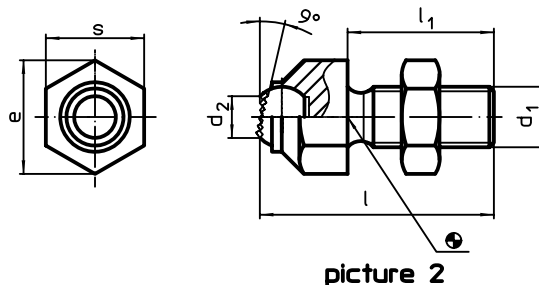
Notes

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

DRAWING



picture 1

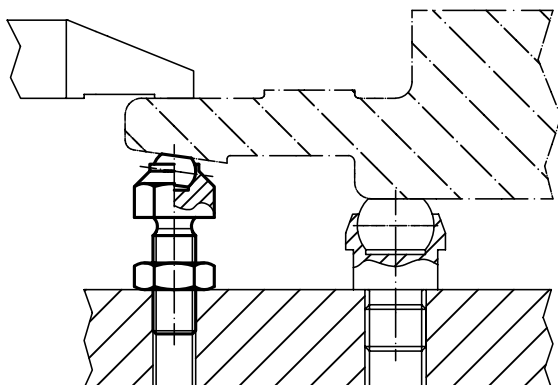


picture 2

ORDER INFORMATION

Dimensions						Load capacity for static load max.	Tightening torque max.		Art. No.	
d ₁	l	l ₁	d ₂	e	Ball diameter				Heat-treated steel	Stainless steel
[mm]						[kN]	[Nm]	[g]		
with flat-faced ball, bearing surface plain – picture 1										
M 8	36.6	25	5.8	14.5	8.5	8	25	20	22740.0013	22740.0113
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	57	22740.0017	22740.0117
M16	60.7	40	10.5	27.0	16.0	25	206	131	22740.0024	22740.0124
M20	77.3	50	20.0	33.0	25.0	90	407	277	22740.0030	22740.0130
M24	100.0	70	20.0	40.0	25.0	90	698	471	22740.0036	22740.0136
M30 x 1,5	100.0	65	34.6	51.0	40.0	165	1355	975	22740.0046	22740.0146
with flat-faced ball, bearing surface ribbed – picture 2										
M 8	36.6	25	5.8	14.5	8.5	8	25	20	22740.0313	–
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	–
M16	60.7	40	10.5	27.0	16.0	25	206	130	22740.0324	–
M20	77.3	50	20.0	33.0	25.0	90	407	276	22740.0330	–
M24	100.0	70	20.0	40.0	25.0	90	698	472	22740.0336	–
M30 x 1,5	100.0	65	34.6	51.0	40.0	165	1355	920	22740.0346	–

APPLICATION EXAMPLE



Self-Aligning Pads • adjustable, self-resetting

EH 22741.

2



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

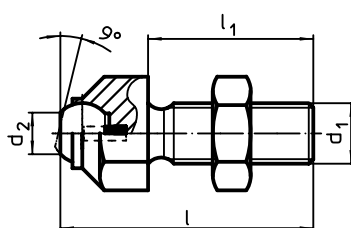
Notes

Ball protected against rotating.

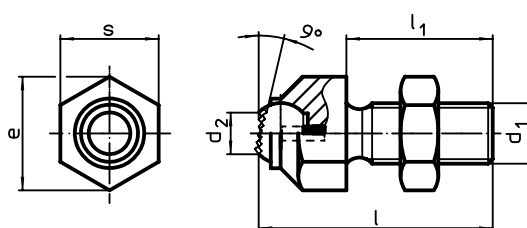
Loading capacity valid for steel and stainless steel designs.

Special types on request.

DRAWING



picture 1

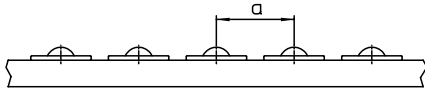


picture 2

ORDER INFORMATION

d ₁	l	Dimensions				Ball diameter	Load capacity for static load max.	Tightening torque max.		Art. No.	
		l ₁	d ₂	e	Heat-treated steel					Stainless steel	
											[mm]
with flat-faced ball, bearing surface plain – picture 1											
M 8	36.6	25	5.8	14.5	8.5	8	25	20	22741.0013	22741.0113	
M10	45.7	30	8.6	19.0	12.0	8	46	44	22741.0016	22741.0116	
M12	50.7	35	8.6	19.0	12.0	15	82	56	22741.0017	22741.0117	
M16	60.7	40	10.5	27.0	16.0	25	206	128	22741.0024	22741.0124	
M20	77.3	50	20.0	33.0	25.0	90	407	273	22741.0030	22741.0130	
M24	100.0	70	20.0	40.0	25.0	90	698	466	22741.0036	22741.0136	
M30 x 1,5	100.0	65	34.6	51.0	40.0	165	1355	885	22741.0046	22741.0146	
with flat-faced ball, bearing surface ribbed – picture 2											
M 8	36.6	25	5.8	14.5	8.5	8	25	20	22741.0313	–	
M10	45.7	30	8.6	19.0	12.0	8	46	44	22741.0316	–	
M12	50.7	35	8.6	19.0	12.0	15	82	56	22741.0317	–	
M16	60.7	40	10.5	27.0	16.0	25	206	128	22741.0324	–	
M20	77.3	50	20.0	33.0	25.0	90	407	278	22741.0330	–	
M24	100.0	70	20.0	40.0	25.0	90	698	466	22741.0336	–	
M30 x 1,5	100.0	65	34.6	51.0	40.0	165	1355	915	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 10^6 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

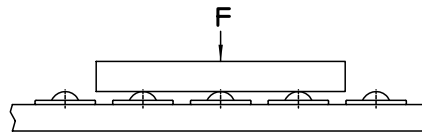
Ball transfer units with felt seals are temperatureresistant up to a permanent operating temperature of 100 °C. At temperatures exceeding 100 °C, only non-galvanized ball transfer units with steel load ball and without felt seal should be used. Observe the reduction in load capacity! The load capacity 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	°F
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 work-piece to be conveyed suitable, the calculation can be based on the number of ball transfer units under load.

Example:

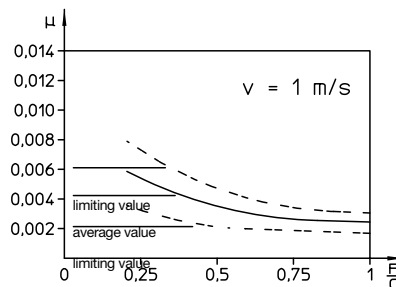
Weight of the article to be conveyed = 300 kg

Ball transfer unit load

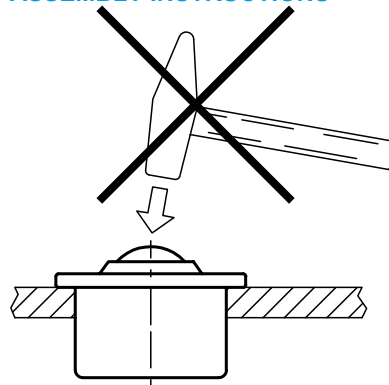
$$a = \frac{300 \text{ kg}}{3} = 100 \text{ kg}$$

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 module 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

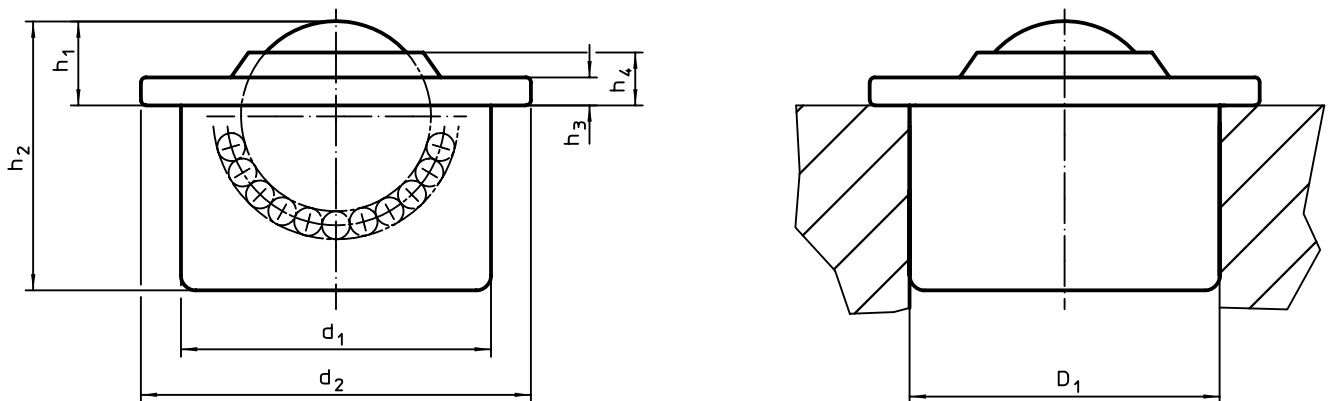
- Ball-bearing steel
- Stainless steel

MORE INFORMATION

Further products

Tolerance Rings → p. 347

DRAWING



ORDER INFORMATION

d_1	Ball diameter	d_2	Dimensions				Location hole $D_1^{1)}$	Dynamic carrying figure C		Art. No.
			h_1	h_2	h_3	h_4				
[mm]										
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	6.8	22750.0000 ²⁾
18.0 ±0.055	12	23	7.4 ±0.15	15.5	2.0	4.3	17.97 +0.03	250	18.0	22750.0002 ²⁾
24.0 ±0.065	15	31	9.5 ±0.20	21.5	2.5	6.1	23.95 +0.05	500	40.0	22750.0004 ²⁾
36.0 ±0.080	22	45	9.8 ±0.20	29.5	2.9	5.7	35.90 +0.05	1300	131.0	22750.0008
45.0 ±0.080	30	55	13.8 ±0.30	37.5	3.7	7.9	44.85 +0.05	2500	277.0	22750.0012
62.0 ±0.095	45	75	19.0 ±0.40	53.7	4.2	10.3	61.83 +0.07	6000	741.0	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	7.0	22750.0020 ²⁾
18.0 ±0.055	12	23	7.4 ±0.15	15.5	2.0	4.3	17.97 +0.03	180	18.0	22750.0022 ²⁾
24.0 ±0.065	15	31	9.5 ±0.20	21.5	2.5	6.1	23.95 +0.05	370	40.0	22750.0024 ²⁾
36.0 ±0.080	22	45	9.8 ±0.20	29.5	2.9	5.7	35.90 +0.05	970	132.0	22750.0028
45.0 ±0.080	30	55	13.8 ±0.30	37.5	3.7	7.9	44.85 +0.05	1900	273.0	22750.0032
62.0 ±0.095	45	75	19.0 ±0.40	53.7	4.2	10.3	61.83 +0.07	4500	739.0	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	7.0	22750.0040 ²⁾
18.0 ±0.055	12	23	7.4 ±0.15	15.5	2.0	4.3	17.97 +0.03	180	17.0	22750.0042 ²⁾
24.0 ±0.065	15	31	9.5 ±0.20	21.5	2.5	6.1	23.95 +0.05	370	39.0	22750.0044 ²⁾
36.0 ±0.080	22	45	9.8 ±0.20	29.5	2.9	5.7	35.90 +0.05	970	133.0	22750.0048
45.0 ±0.080	30	55	13.8 ±0.30	37.5	3.7	7.9	44.85 +0.05	1900	272.0	22750.0052

¹⁾ Reference value for 2 mm sheet steel/ 5 mm aluminium (force fit)

²⁾ without felt seal



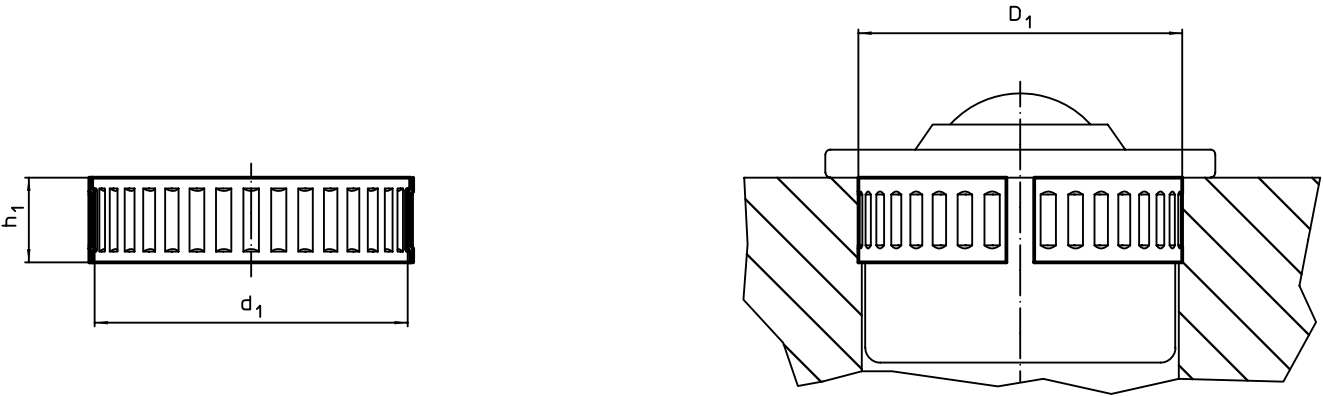
PRODUCT DESCRIPTION

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

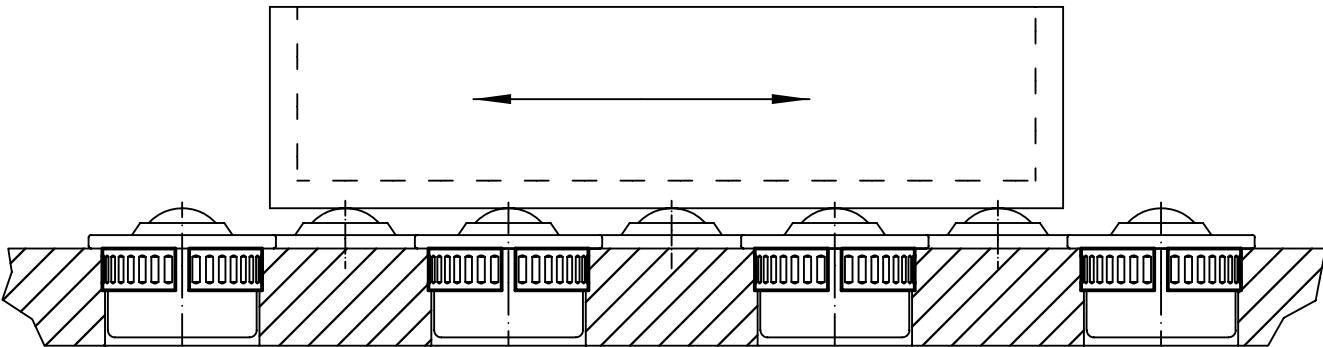
DRAWING



ORDER INFORMATION

Dimensions		Location hole		Art. No.
d ₁	h ₁ +0.2	D ₁		
[mm]		[mm]	[g]	
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.

2



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.

Material

Cap

- Steel, zinc-plated by galvanization

Housing

- Steel, zinc-plated by galvanization

Ball

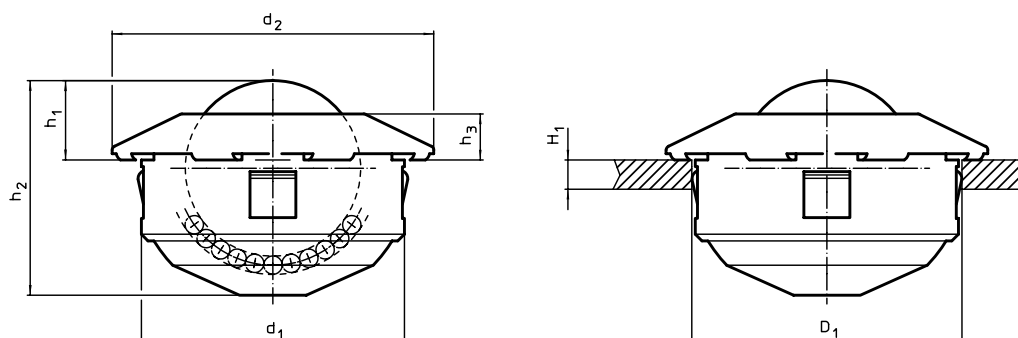
- Ball-bearing steel
- Stainless steel

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



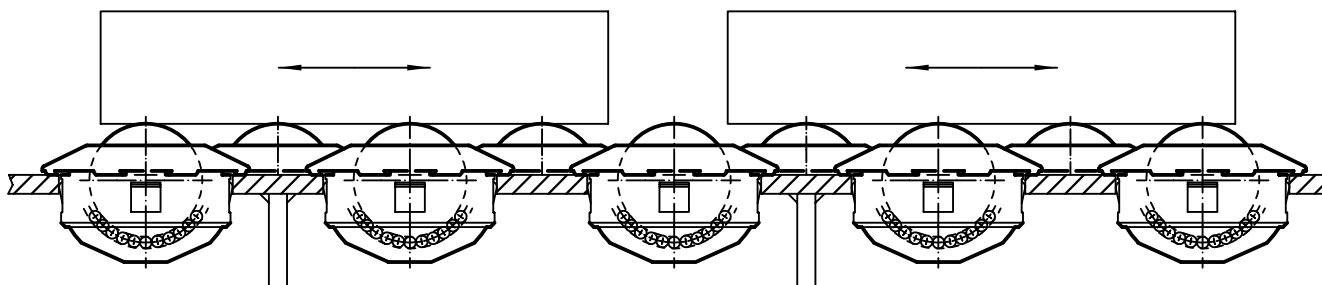
ORDER INFORMATION

d ₁	Ball diameter	Dimensions				H ₁ min.	Location hole D ₁	Dynamic carrying figure C		Art. No.
		d ₂	h ₁	h ₂	h ₃					
		[mm]								
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		Art. No.
	[mm]	[g]	
assembly tool			
	24	451	22750.0144
	36	480	22750.0148
	45	503	22750.0152

APPLICATION EXAMPLE



**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

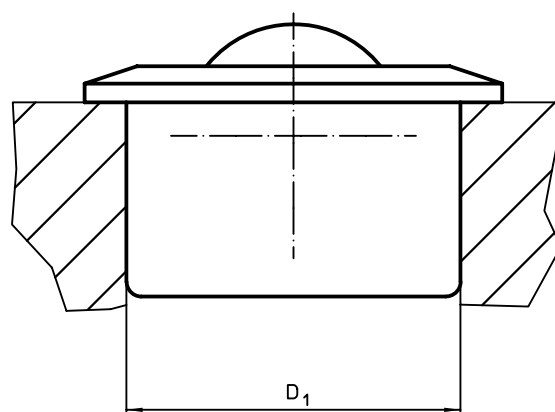
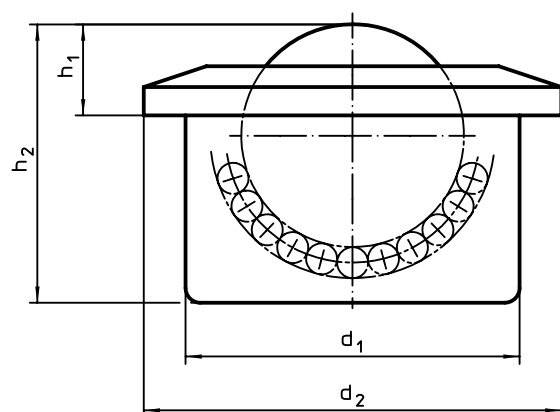
- Plastic, white

Ball

- Thermoplastic POM, white

Bearing ball

- Plastic
- Stainless steel

DRAWING**ORDER INFORMATION**

Dimensions					Location hole D ₁ H7	Dynamic carrying figure C	 min. max.		 [g]	Art. No.
d ₁	Ball diameter	d ₂	h ₁	h ₂			[°C]			
[mm]							[N]			
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	30	22751.0022
bearing ball: stainless steel										
24	16	31	9.8	21	23.95	300	-40	80	11	22751.0115
36	24	45	9.8	30	35.95	500	-40	80	30	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

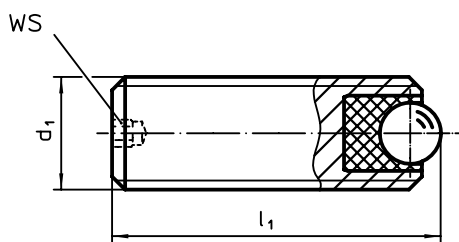
- Ball-bearing steel, hardened
- Stainless steel, hardened

Screw

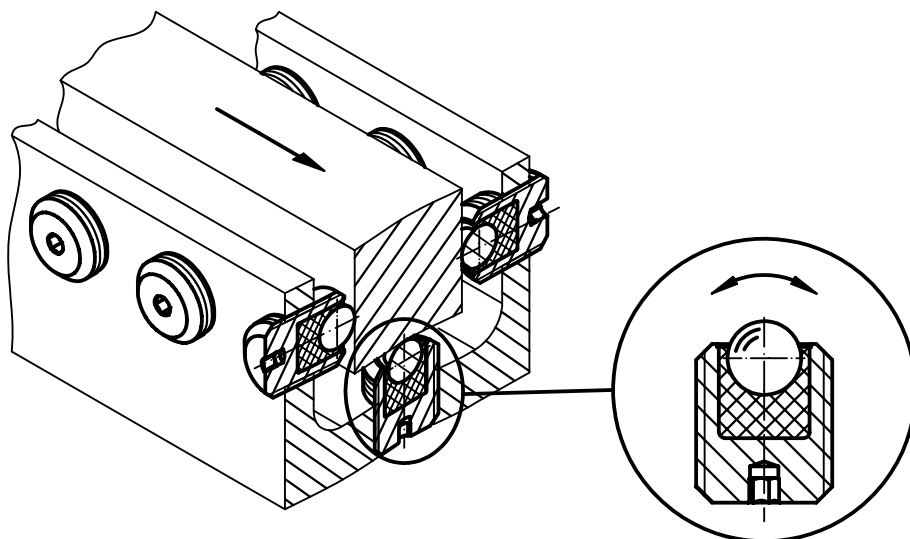
- Free cutting steel, blackened
- Stainless steel 1.4305

MORE INFORMATION**Notes**

Special types on request.

DRAWING**ORDER INFORMATION**

Dimensions			WS	Static carry- ing figure C_0	Tightening torque max.	 min. max. [°C]		 [g]	Art. No.	
d_1	l_1	Ball diameter							Free cutting steel	Stainless steel
	[mm]		[mm]	[N]	[Nm]					
M 6	8	2.5	1.5	172	0.11	-50	90	1.0	22752.0061	22752.0561
	16	2.5	1.5	172	0.11	-50	90	2.4	22752.0064	22752.0564
M 8	10	3.5	1.5	336	0.28	-50	90	2.4	22752.0081	22752.0581
	20	3.5	1.5	336	0.28	-50	90	5.5	22752.0084	22752.0584
M10	12	4.5	2.0	556	0.58	-50	90	4.2	22752.0101	22752.0601
	25	4.5	2.0	556	0.58	-50	90	11.0	22752.0104	22752.0604
M12	16	6.5	2.5	1161	1.44	-50	90	7.7	22752.0121	22752.0621
	35	6.5	2.5	1161	1.44	-50	90	21.0	22752.0124	22752.0624
M16	20	8.5	3.0	1986	3.21	-50	90	20.0	22752.0161	22752.0661
	50	8.5	3.0	1986	3.21	-50	90	58.0	22752.0166	22752.0666

APPLICATION EXAMPLE

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 $> 20^{\circ}\text{C}$, the carrying figure decreases linearly. (Example: at 90°C the load bearing capacity is max. 60%)

Material

Housing

- Stainless steel

Bearing

- Plastic

Ball

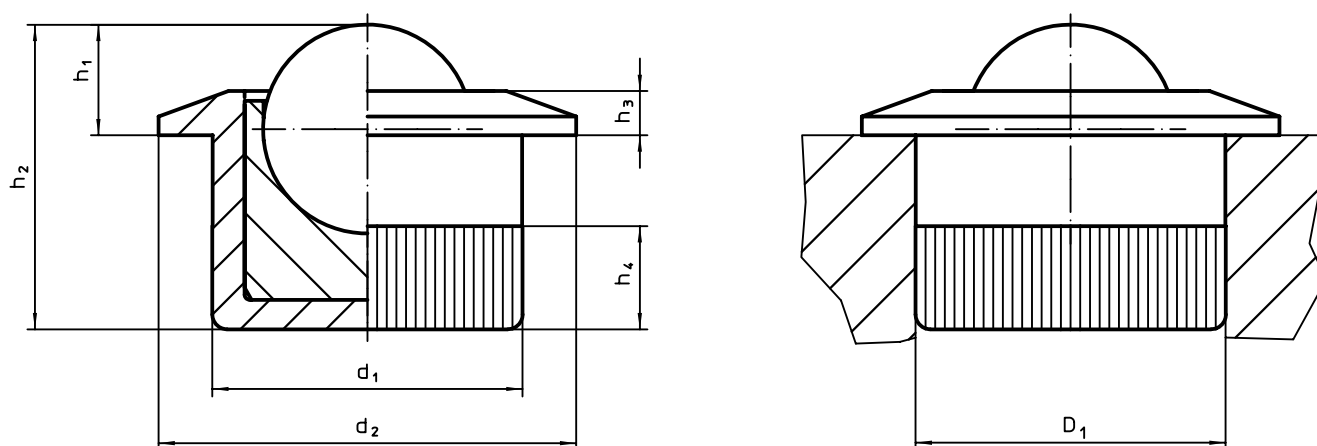
- Stainless steel, hardened

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.

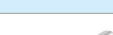
DRAWING



ORDER INFORMATION

Dimensions							Location hole D ₁ H7	Static carrying figure C ₀				Art. No.
d ₁	Ball diameter	d ₂	h ₁	h ₂	h ₃	h ₄			min.	max.		
[mm]									[mm]	[N]		
10.0	6.5	13	3.2	11.2	1.2	4.2	10.0	1161	-50	90	4.1	22753.0065
12.6	8.5	17	4.5	12.4	1.8	4.2	12.6	1986	-50	90	8.1	22753.0085

ACCESSORIES

	Suitable for ball caster		Art. No.
	[mm]	[g]	
assembly tool			
	10.0	118	22753.9965
	12.6	125	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

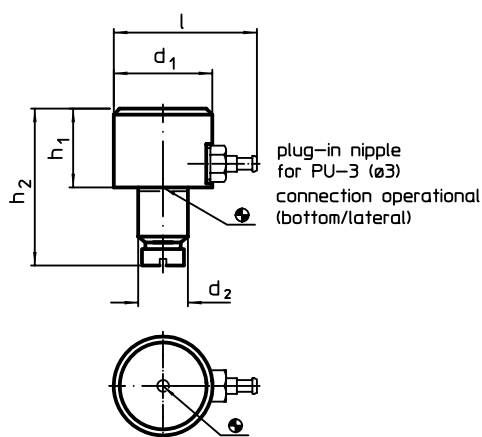
Notes

Further information on request.

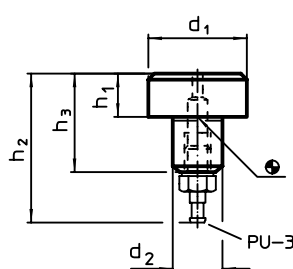
Further products

Monitoring Units, for positioning sensors, pneumatic → p. 356

DRAWING



picture 1

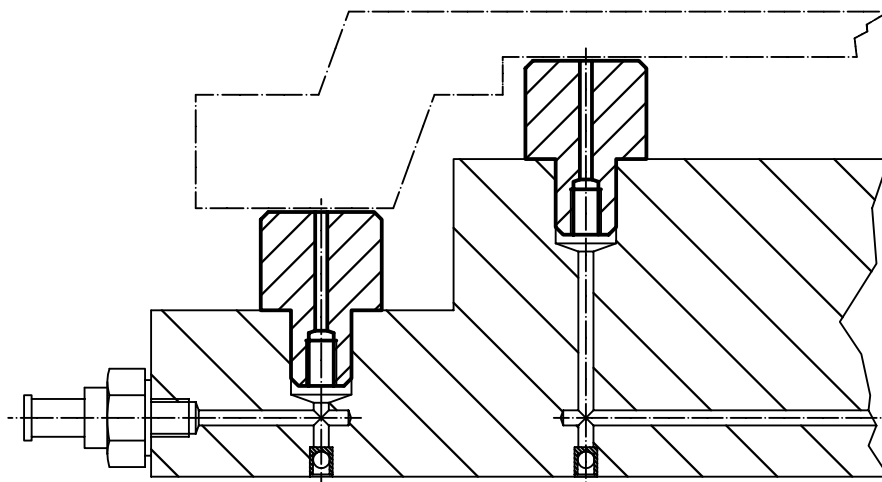


picture 2

ORDER INFORMATION

Dimensions							Art. No.
d_1	h_1 h9	d_2 n6	h_2	h_3	l		
[mm]						[g]	
bottom/lateral connection – picture 1							
16	13	8	27.0	–	28.0	24	22800.0010
25	20	12	39.0	–	36.5	93	22800.0020
bottom connection – picture 2							
16	5	8	28.5	15	–	12	22800.0100

APPLICATION EXAMPLE



Positioning Sensors • pneumatic

EH 22800.

2



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

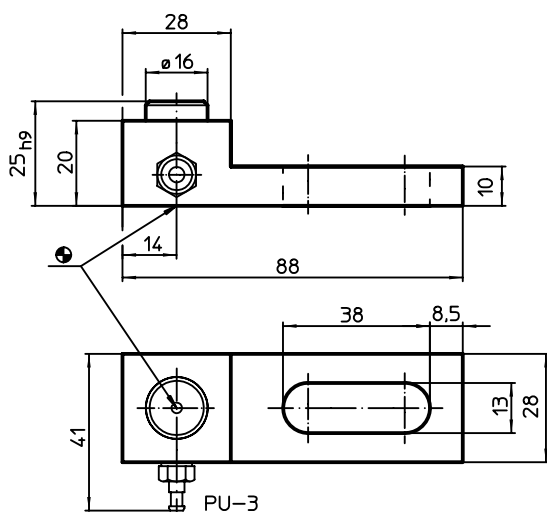
Notes

Further information on request.

Further products

Monitoring Units, for positioning sensors, pneumatic → p. 356

DRAWING

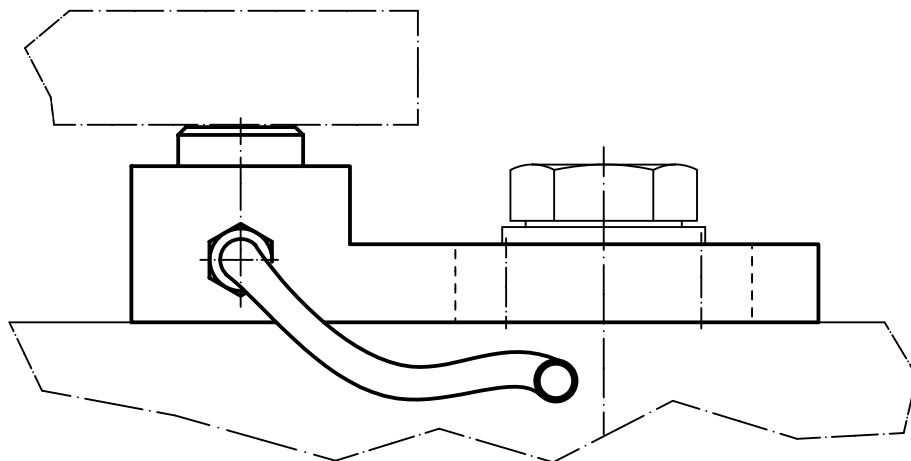


ORDER INFORMATION

	Art. No.
with holding bar	22800.0400

237

APPLICATION EXAMPLE



Positioning Sensors • self-aligning, pneumatic

EH 22800.



PRODUCT DESCRIPTION

Used in jigs and fixtures as positioning control for unmachined workpieces (version flat-faced ball, bearing surface ribbed) or pre-machined workpieces (flat-faced ball, bearing surface plain).

The response accuracy for the flat-faced ball version with plain bearing surface is in the range of 0.015-0.075 mm depending on the workpiece and for the flat-faced ball version with ribbed bearing surface constant at 0.005 mm.

The system is monitored by the compressed-air backwash which indicated on the monitoring unit (Art. No. 22800.0701).

Material

Ball

- Ball-bearing steel, hardened

Body

- Heat-treated steel, tempered, phosphated

MORE INFORMATION

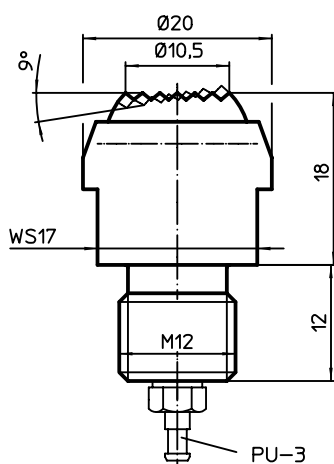
Notes

Further information on request.

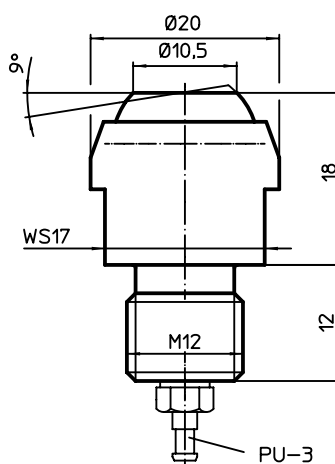
Further products

Monitoring Units, for positioning sensors, pneumatic → p. 356

DRAWING



picture 1

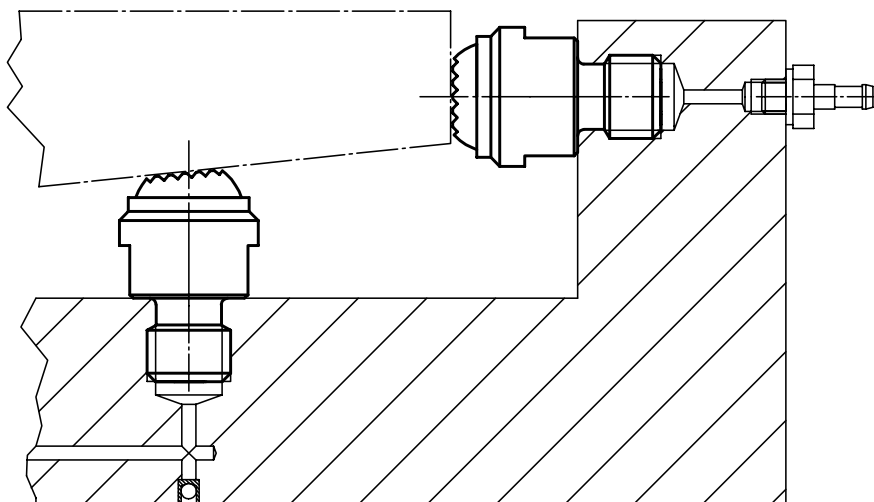


picture 2

ORDER INFORMATION

Load capacity for static load max. [kN]	 [g]	Art. No.
flat-faced ball, bearing surface ribbed		
15	49	22800.0220
flat-faced ball, bearing surface plain		
15	49	22800.0320

APPLICATION EXAMPLE



Positioning Sensors • self-aligning, pneumatic

EH 22800.

2



PRODUCT DESCRIPTION

Used in jigs and fixtures as positioning control for unmachined 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. 22800.0701).

Material

Seal

- PVC

Supporting bar

- Steel, blackened

Ball

- Ball-bearing steel, hardened

Body

- Heat-treated steel, tempered, phosphated

Plug-in nipple

- Brass

MORE INFORMATION

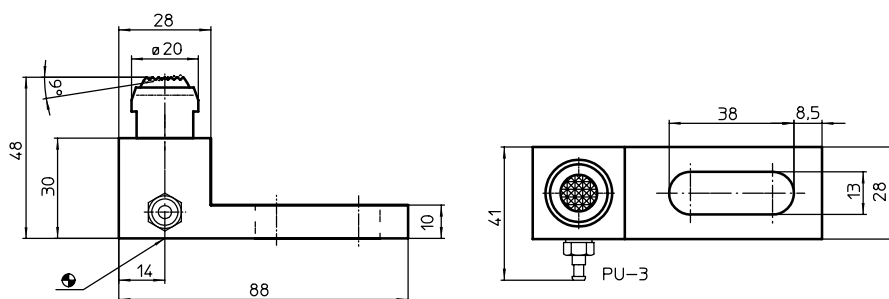
Notes

Further information on request.

Further products

Monitoring Units, for positioning sensors, pneumatic → p. 356

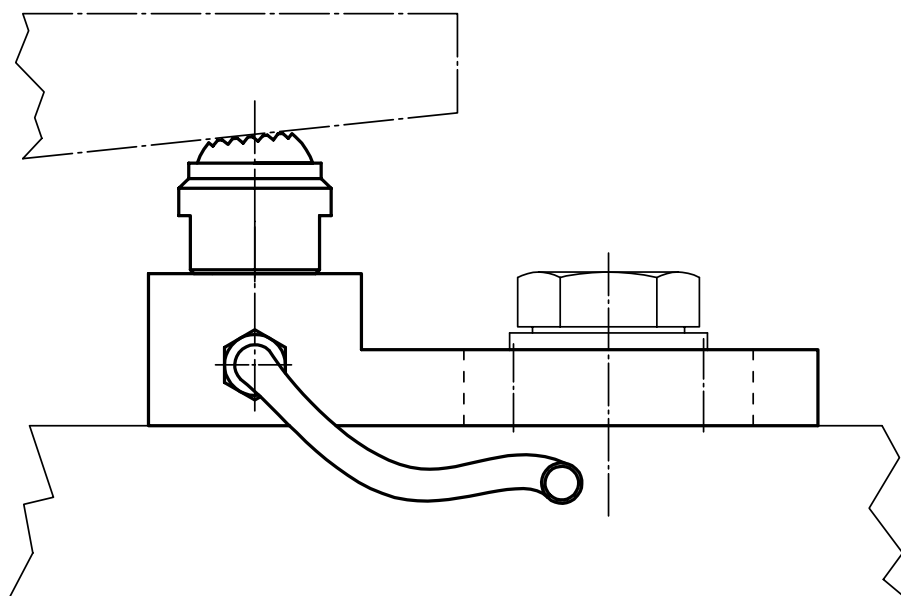
DRAWING



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

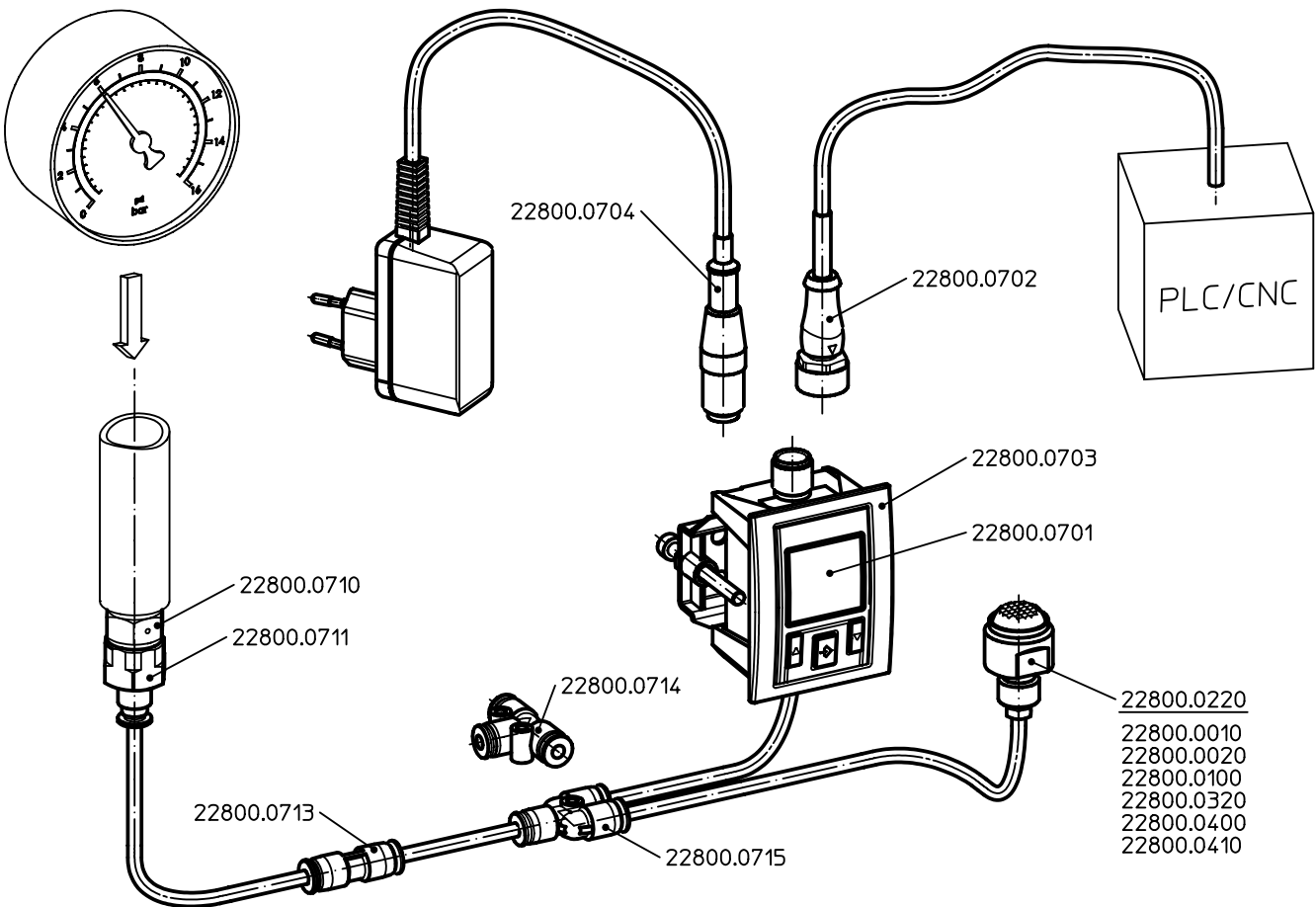
Housing
▪ Plastic

MORE INFORMATION

Notes
Further information on request.



DRAWING



ORDER INFORMATION

Working pressure		Art. No.
[bar]	[g]	
backwash pressure sensor with LCD display, Ø 4 mm pneumatic hose connection, analogue and digital output signals		
0 – 10	162	22800.0701

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	–	84.0	22800.0702
installation frame for backwash pressure sensor, for installation into a control panel (max. wall thickness 5 mm)				
	–	–	26.0	22800.0703
plug-in power supply, input 100-240 V AC / output 24 V DC 500 mA, with M12 plug socket				
	1500	–	100.0	22800.0704
pressure regulator, max. input pressure 12 bar / output pressure 2 bar, 1/4" male thread two-sided				
	–	–	22.0	22800.0710
connection piece for connecting pressure regulator and pneumatic hose, 1/4" female thread on push-in connector (pneumatic hose Ø 4 mm)				
	–	–	17.0	22800.0711
pneumatic hose Ø 4 mm				
	5000	4	43.0	22800.0712
push-in connector, for pneumatic hose Ø 4 mm				
	–	–	4.7	22800.0713
T-push-in connector for pneumatic hose Ø 4 mm				
	–	–	7.6	22800.0714
Y-push-in connector for pneumatic hose Ø 4 mm				
	–	–	7.5	22800.0715

Retrieval Units • with sensor

EH 22810.



The retrieval 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



Retrieval Unit with sensor



Radio transmitter



You will find further information
as well as your contact persons under:
www.halder.com/RetrievalUnits

Radio receiver
(antenna + receiver)

Retrieval Units • with sensor

EH 22810.

2



PRODUCT DESCRIPTION

For retrieve a workpiece on a seating element.

The retrieval 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 retrieval 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 retrieval signal can be transferred by radio. The version with bushing must be used to connect the retrieval unit to the radio transmitter.

The retrieval 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

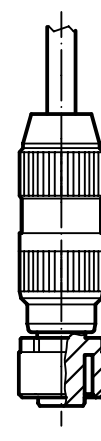
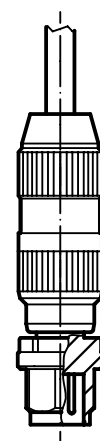
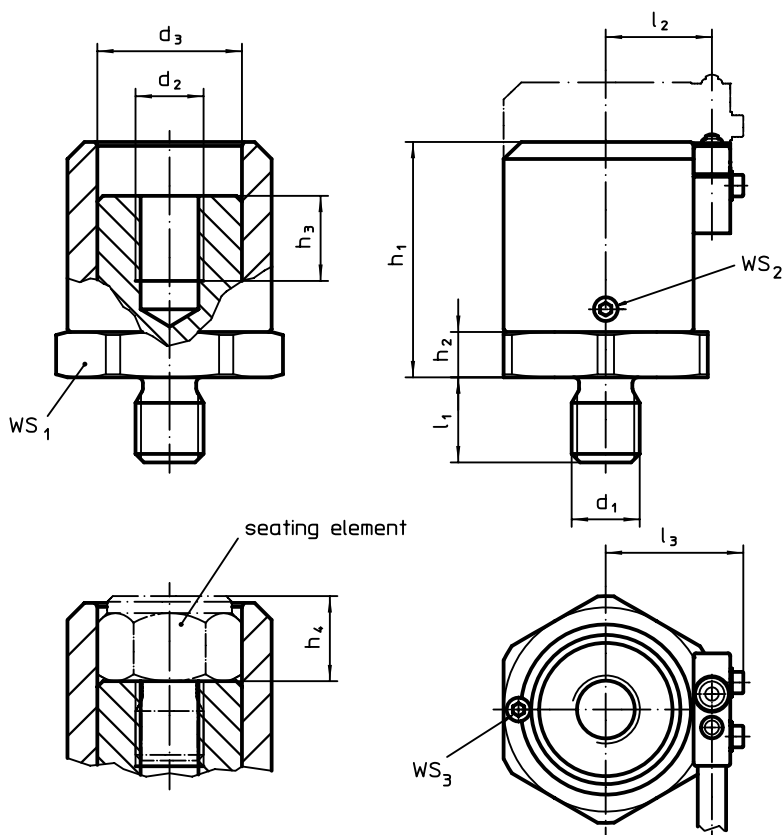
Further information on request.

Erwin Halder KG is a registered electrical equipment manufacturer (WEEE-Reg. No. DE 47048902).

Further products

Index Plungers, with sensor	→ p. 139
Pins	→ p. 311
Pins, with plastic bearing surface	→ p. 315
Radio Transmitters, for retrieval unit	→ p. 361
Radio Receivers, for retrieval unit	→ p. 362
Sensing Elements, with sensor adapter	→ p. 690
Sensing Elements, with actuating bolt, protected against rotating	→ p. 691

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.		
[mm]												[mm]			[°C]		[g]	
retrieval 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	344	22810.0012
retrieval 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	408	22810.1012

ACCESSORIES

	 [g]	Art. No.
	sensor with bush and silicone cable	
	99	22810.9001
	sensor with plug and silicone cable	
	96	22810.9002

Radio Transmitters • for retrieval unit
EH 22810.



PRODUCT DESCRIPTION

For cable-free transfer of the retrieval signal.
The radio transmitter is installed close to the retrieval unit, and connected to the bushing of the silicone cable. 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.



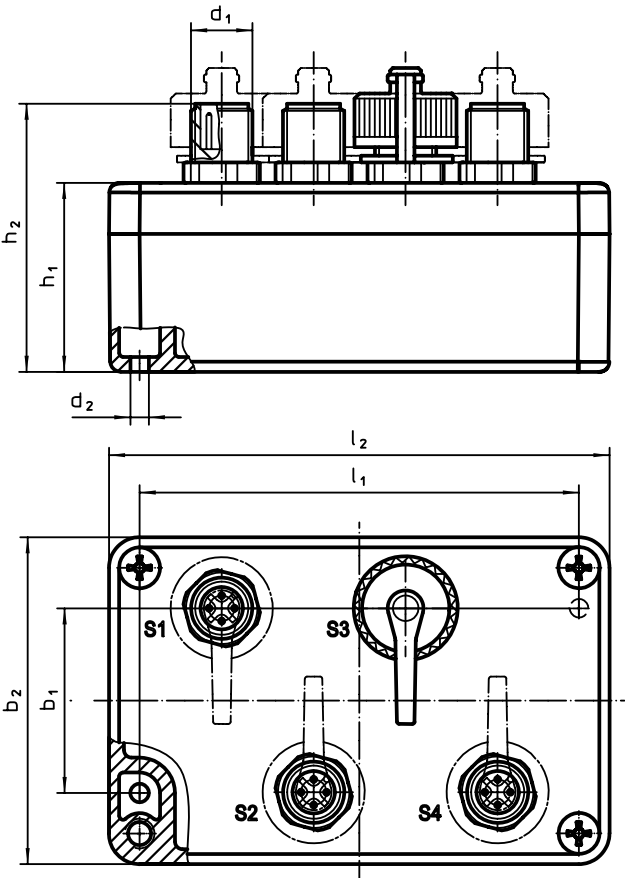
MORE INFORMATION

Notes
An AA battery (3.6 V) is included in the scope of delivery.

Further information on request.

Further products
Radio Receivers, for retrieval unit . . . → p. 362

DRAWING



ORDER INFORMATION

Dimensions								For art. no.		Art. No.
l ₂	b ₂	h ₂	b ₁	d ₁	d ₂	h ₁	l ₁			
[mm]									[g]	
universal radio transmitter with protective caps										
98	64	52.5	36	M12 x 1	4.5	37	86	22810.0008 / .0012	288	22810.9010

ACCESSORIES

		Art. No.
	[g]	
protection cap		
	4.9	22810.9011

Radio Receivers • for retrieval unit
EH 22810.



PRODUCT DESCRIPTION

For cable-free reception of the signal from the retrieval unit. The antenna receives the radio signal from the retrieval 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.

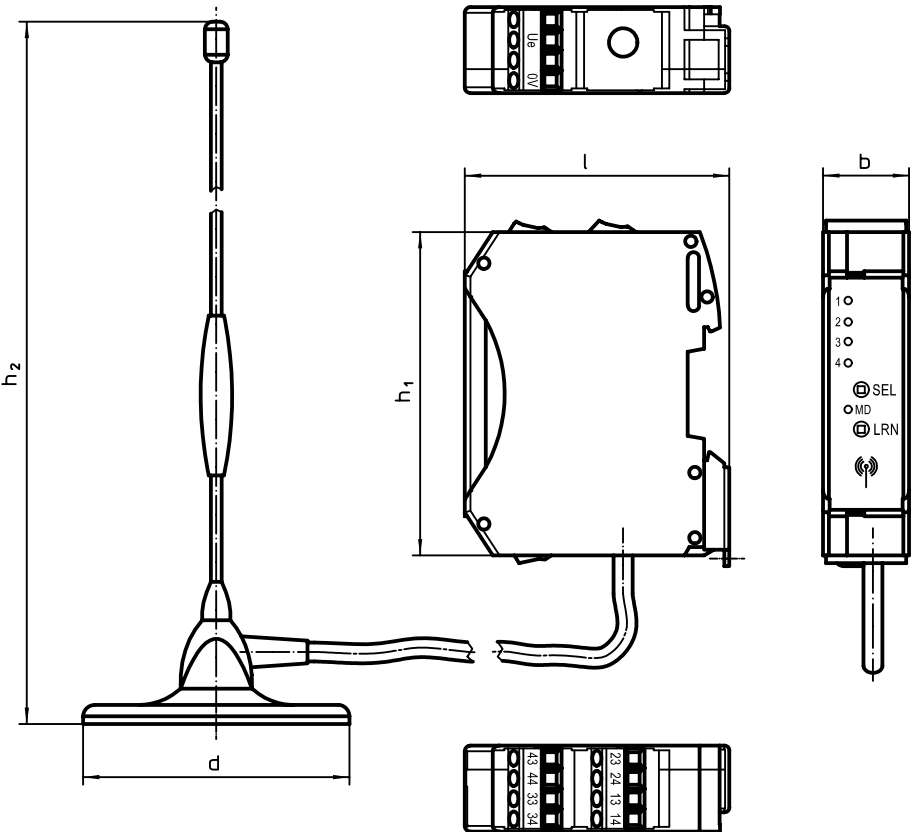
MORE INFORMATION

Notes

Further information on request.



DRAWING



ORDER INFORMATION

Dimensions						Art. No.
l	b	h ₁	d	h ₂		
[mm]						
universal radio receiver and radio antenna						
70	23	90	70	350	447	22810.9020

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

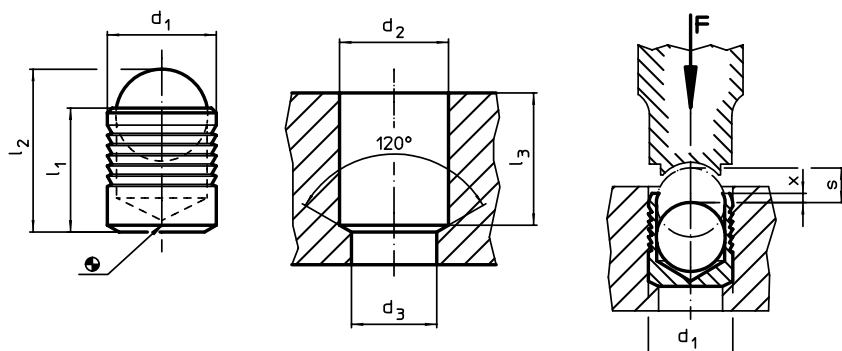
Further products

Expander® Sealing Plugs, body from stainless steel → p. 364

Expander® Sealing Plugs, body and ball from stainless steel → p. 365

Setting Dies, for Expander® sealing plug → p. 367

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]	
4	4.0	5.2	4	3.3	3.8	0.2	1.50	0.4	22880.0004
5	5.5	7.0	5	4.3	5.3	0.4	2.00	0.8	22880.0005
6	6.5	8.6	6	5.3	6.3	0.4	2.50	1.2	22880.0006
7	7.5	10.1	7	6.4	7.3	0.4	3.00	1.9	22880.0007
8	8.5	11.7	8	7.4	8.3	0.3	3.50	2.8	22880.0008
9	10.0	13.7	9	8.4	9.8	0.4	4.00	4.2	22880.0009
10	11.0	15.2	10	9.4	10.8	0.4	4.50	6.1	22880.0010
12	13.0	18.0	12	10.6	12.8	0.4	5.50	9.6	22880.0012
14	15.0	20.8	14	12.7	14.5	0.4	6.35	15.0	22880.0014
16	17.0	23.7	16	14.7	16.5	0.6	7.00	22.0	22880.0016
18	19.0	26.3	18	16.7	18.5	0.6	8.00	32.0	22880.0018
20	22.0	30.5	20	18.7	21.5	0.8	9.00	44.0	22880.0020
22	25.0	34.2	22	20.7	24.5	0.8	10.00	58.0	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-AISI7Mg 3.2371
d ₁ 4-10 mm	p [bar]						
	350	350	350	350	350	320	320
	pTest [bar]						
d ₁ 12-22 mm	1100	1100	1100	1100	1100	1000	1000
	p [bar]						
	280	280	280	280	280	250	250
d ₁ 12-22 mm	pTest [bar]						
	900	900	900	900	900	800	800

Expander® Sealing Plugs • body from stainless 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

- Stainless steel 1.4305

Ball

- Roller bearing steel, heat-treated, tempered

MORE INFORMATION

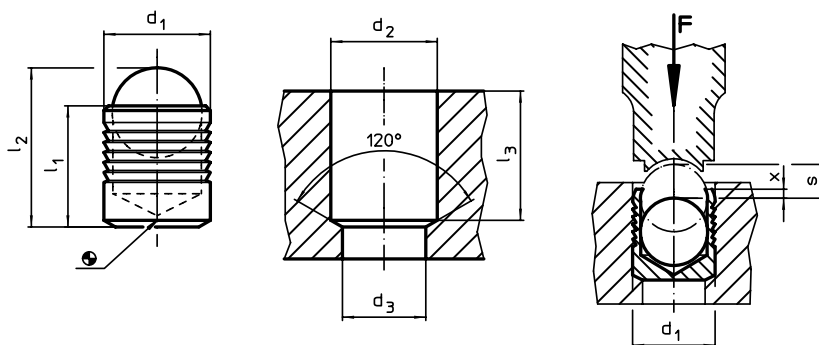
Further products

Expander® Sealing Plugs, body from case-hardened steel → p. 363

Expander® Sealing Plugs, body and ball from stainless steel → p. 365

Setting Dies, for Expander® sealing plug → p. 367

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]	
body from stainless steel, ball from steel									
3	3.6	4.6	3	2.2	3.4	0.4	1.20	0.2	22880.0053
4	4.0	5.2	4	3.3	3.8	0.2	1.50	0.4	22880.0054
5	5.5	7.0	5	4.3	5.3	0.4	2.00	0.7	22880.0055
6	6.5	8.6	6	5.3	6.3	0.4	2.50	1.3	22880.0056
7	7.5	10.1	7	6.4	7.3	0.4	3.00	1.9	22880.0057
8	8.5	11.7	8	7.4	8.3	0.3	3.50	3.2	22880.0058
9	10.0	13.7	9	8.4	9.8	0.4	4.00	4.5	22880.0059
10	11.0	15.2	10	9.4	10.8	0.4	4.50	6.1	22880.0060
12	13.0	18.0	12	10.6	12.8	0.4	5.50	9.7	22880.0062
14	15.0	20.8	14	12.7	14.5	0.4	6.35	15.0	22880.0064
16	17.0	23.7	16	14.7	16.5	0.6	7.00	22.0	22880.0066
18	19.0	26.3	18	16.7	18.5	0.6	8.00	31.0	22880.0068
20	22.0	30.5	20	18.7	21.5	0.8	9.00	46.0	22880.0070
22	25.0	34.2	22	20.7	24.5	0.8	10.00	58.0	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

Expander® Sealing Plugs • body and ball from stainless 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

- Stainless steel 1.4305

Ball

- Stainless steel 1.4301

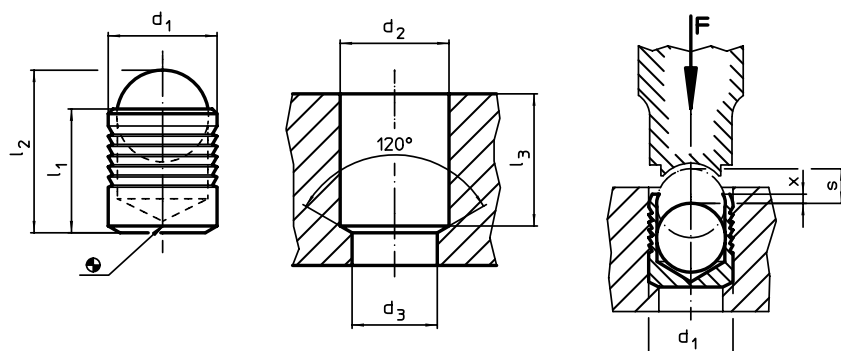
MORE INFORMATION

Further products

Expander® Sealing Plugs, body from case-hardened steel → p. 363

Expander® Sealing Plugs, body from stainless steel → p. 364

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]	
body and ball from stainless steel									
3	3.6	4.55	3	2.2	3.4	0.4	1.20	0.2	22880.0083
4	4.0	5.10	4	3.3	3.8	0.2	1.50	0.3	22880.0084
5	5.5	7.05	5	4.3	5.3	0.4	2.00	0.7	22880.0085
6	6.5	8.60	6	5.3	6.3	0.4	2.50	1.2	22880.0086
7	7.5	10.05	7	6.4	7.3	0.4	3.00	1.9	22880.0087
8	8.5	11.60	8	7.4	8.3	0.3	3.50	2.9	22880.0088
9	10.0	13.50	9	8.4	9.8	0.4	4.00	4.0	22880.0089
10	11.0	15.05	10	9.4	10.8	0.4	4.50	5.5	22880.0090
12	13.0	17.80	12	10.6	12.8	0.4	5.50	9.4	22880.0092
14	15.0	20.45	14	12.7	14.5	0.4	6.35	14.8	22880.0094

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

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

CONSTRUCTIONAL GUIDELINES, ASSEMBLY INSTRUCTIONS

2



COMPONENT REQUIREMENTS
(22880.0004 – 22880.0094)

Drilling Holes

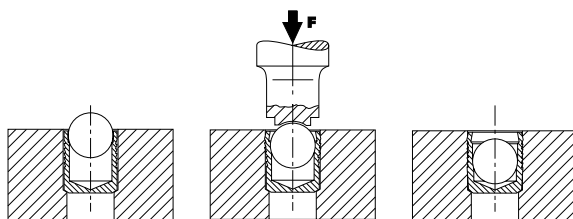
- The counterbore relation d_2/d_3 has to be according to the catalogue specification.
- Roundness tolerances have to be within $t = 0,05$ mm.
- With hard materials (see picture 1) the drilling roughness has to be $R_z=10$ to 30 μm .
- Drilling tolerance $d_1 = + 0,1$ mm.
- Longitudinal rifles and spiral 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

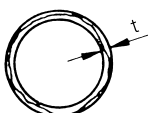
- The Expander® Sealing Plug has to be inserted into the counterbore hole with the ball facing out. The upper sleeve edge must not protrude the working piece. Mounting dimensions given in the catalogue have to be considered.
- When having only a small or no counterbore hole at all the sleeve bottom has 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.

Tools

For the assembly of Expander® Sealing Plugs, please use setting dies according to the catalogue specification.



Roundness Tolerance



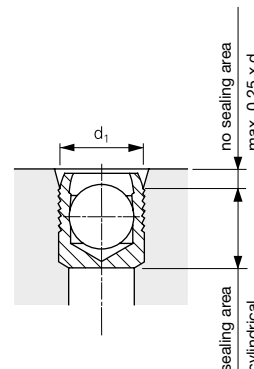
To achieve a secure functioning of the Expander® Sealing Plugs in respect to pressure effectiveness and sealing, a roundness tolerance of $t = 0,05$ mm has to be adhered to.

Drilling Tolerance

The drilling tolerance is $+ 0,1$ mm.

Drilling Conicity

Within the active sealing area, the drilling hole has to be cylindrical. The drilling hole entrance may be conical up to $0,25 \times d_1$ 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 $\varnothing 6$ mm to the **next larger diameter** directly in a single step.
- Use multiple steps to drill out Expander® Sealing Plugs with diameters of $\varnothing 6$ mm or more and **then bore to the next larger diameter** according standard sheet.
- Clear the hole of chips or any left-over body remnants and clean the hole (oil-free and grease-free).
- Insert a new Expander® Sealing Plug.

Important

Always insert the Expander® Sealing Plugs with the next larger size following disassembly.

Please refer to the technical data following these product information pages.

Setting Dies • for Expander® Sealing plug

EH 22880.



PRODUCT DESCRIPTION

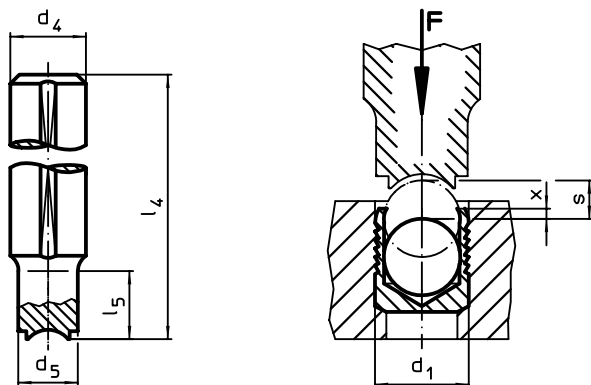
Expander® sealing plugs are used for safe, quick and economic sealing of bore holes in fluid technology, e.g. hydraulic drilling holes in jig and fixture construction. Assembly is effected by pressing in the sealing plug into the drilling hole by means of the prescribed setting die.

Please refer to the technical data following these product information pages.

Material

- Tool steel, heat-treated

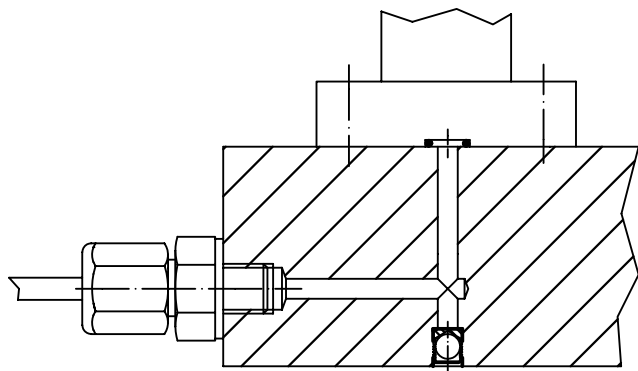
DRAWING



ORDER INFORMATION

Dimensions								Art. No.
d ₁	d ₄ h9	d ₅	l ₄	l ₅	x ±0.2	s		
[mm]								
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	102	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



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

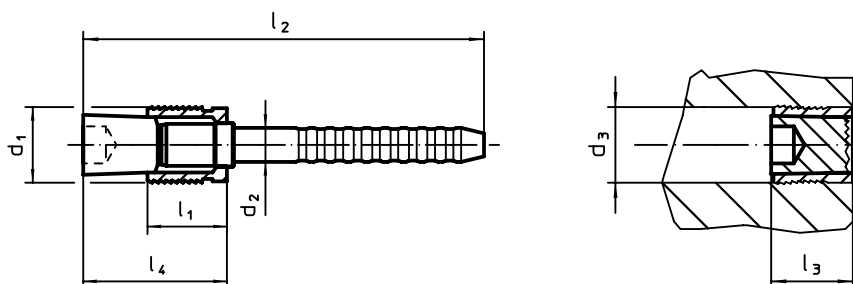
- Steel

MORE INFORMATION

Further products

Assembly Tools, for Expander® sealing plugs with pull-anchor → p. 371

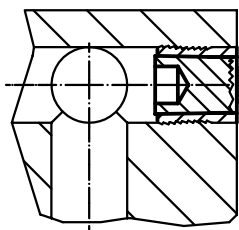
DRAWING



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]								
4	2.50	4	4.5	39	6.5	9	1.7	22880.0304
5	3.00	5	5.5	41	7.5	10	2.5	22880.0305
6	3.40	6	6.5	38	8.5	12	3.5	22880.0306
7	4.10	7	7.5	38	9.5	14	5.1	22880.0307
8	4.20	8	8.5	40	10.5	15	6.4	22880.0408
9	4.50	9	9.5	43	11.0	17	8.1	22880.0409
10	4.75	10	10.5	45	12.5	19	10.0	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

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

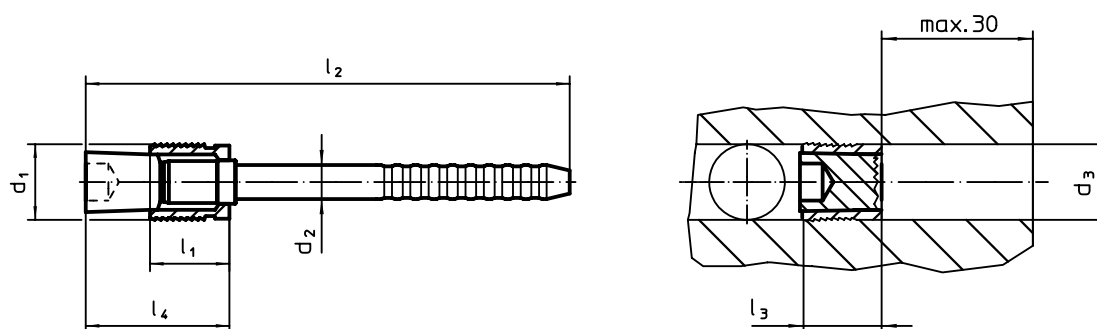
MORE INFORMATION

Further products

Distance Bushings, for Expander® sealing plugs with elongated pull-anchor . . → p. 370

Assembly Tools, for Expander® sealing plugs with pull-anchor → p. 371

DRAWING



ORDER INFORMATION

d ₁	d ₂	d ₃ +0.12 0	Dimensions					Art. No.
			l ₁	l ₂	l ₃ max.	l ₄ max.		
			[mm]					
4	2.50	4	4.5	69	6.5	9	3.5	22880.0414
5	3.00	5	5.5	71	7.5	10	4.3	22880.0415
6	3.40	6	6.5	73	8.0	12	6.4	22880.0416
7	4.10	7	7.5	68	9.0	14	7.9	22880.0417
8	4.20	8	8.5	70	10.5	15	10.0	22880.0418
9	4.50	9	9.5	73	11.0	17	12.0	22880.0419
10	4.75	10	10.5	75	12.5	19	15.0	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-AISi7Mg 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

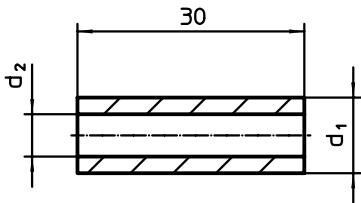
To be used for Expander® sealing plugs with elongated pull-anchor.

Material

Body

- Case-hardened steel, case-hardened

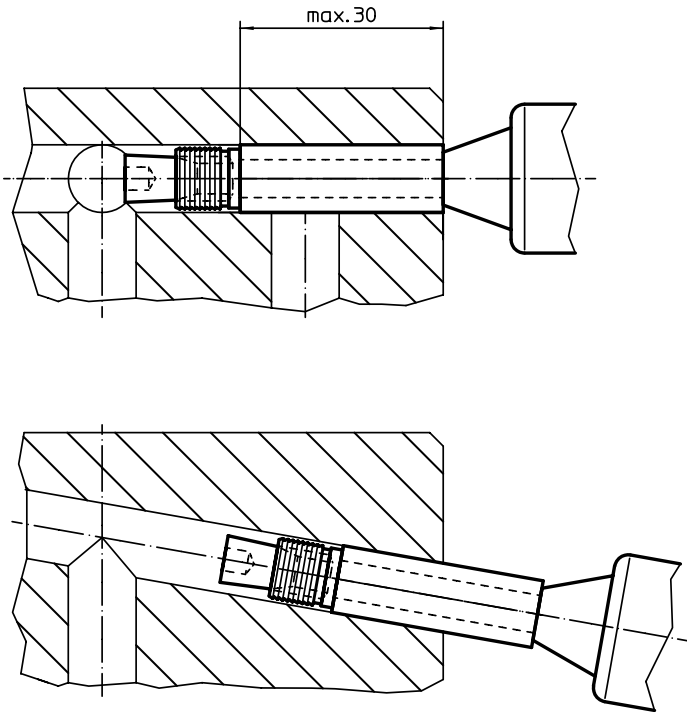
DRAWING



ORDER INFORMATION

Dimensions			Art. No.
d ₁	d ₂		
[mm]		[g]	
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	7.2	22880.0428
9	5.2	9.6	22880.0429
10	5.6	12.0	22880.0430

APPLICATION EXAMPLE



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:

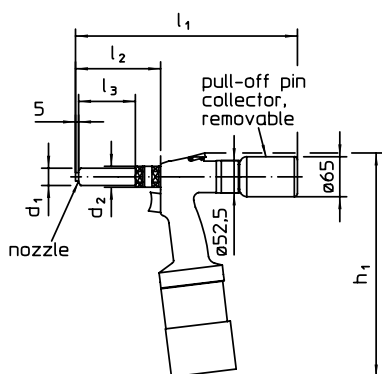
- Working pressure min. 5 bar / max. 7 bar
- Air volume required at 5.6 bar = 3.5 l
- Working noise < 75 dB(A)
- Cycle time 2 s

Attention: For original equipment the assembly tools include the ram, the clamping jaws, and the housing for the clamping jaws. In the original equipment nozzles are not included. They have to be ordered separately.

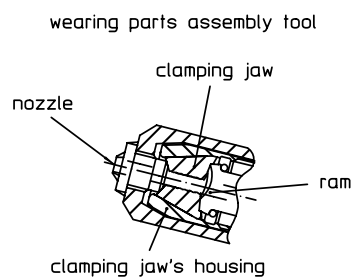
Material

- On request

DRAWING



picture 1



picture 2

ORDER INFORMATION

Tensile force	Stroke	Dimensions							Art. No.
[kN]	[mm]	d ₁	d ₂	l ₁	l ₂	l ₃	h ₁	[g]	
assembly tool, pneumatically operated (ExTool 030), for sizes (d ₁) 4 to 6 – picture 1									
19 [at 7 bar]	25	23	26	353	133	73.5	356	5350	22880.0510
assembly tool, pneumatically operated (ExTool 040-1), for sizes (d ₁) 7 to 10 – picture 1									
24 [at 7 bar]	18	28	34	353	133	92.0	356	408	22880.0520

ACCESSORIES

	Description	Dimensions Nominal size d ₁ [mm]	[g]	Art. No.
ExTool 030 (22880.0510)				
	nozzle – picture 2	4	6.3	22880.0532
		5	7.1	22880.0533
		6	7.0	22880.0534
	ram – picture 2	–	13.0	22880.0560
	clamping jaw – picture 2	–	7.1	22880.0561
	clamping jaw's housing – picture 2	–	39.0	22880.0562
ExTool 040-1 (22880.0520)				
	nozzle – picture 2	7	9.5	22880.0535
		8	11.0	22880.0526
		9	9.5	22880.0527
		10	9.7	22880.0528
	ram – picture 2	–	20.0	22880.0570
	clamping jaw – picture 2	–	10.0	22880.0571
	clamping jaw's housing – picture 2	–	41.0	22880.0572

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

CONSTRUCTIONAL GUIDELINES, ASSEMBLY INSTRUCTIONS



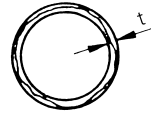
COMPONENT REQUIREMENTS (22880.0304 – 22880.0420)

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.**

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.

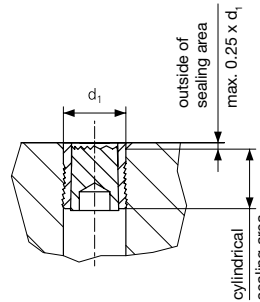


Drilling Tolerance

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 $0,25 \times d_1$ as this zone does not have any primary influence on the sealing function.



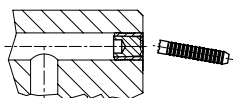
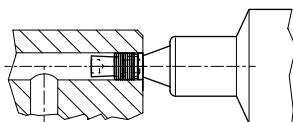
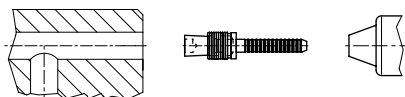
ASSEMBLY INSTRUCTIONS – MOUNTING PROCEDURE

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 neither 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.

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 a 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.

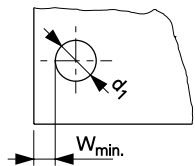
CONSTRUCTIONAL GUIDELINES, ASSEMBLY INSTRUCTIONS

WALL THICKNESSES / EDGE DISTANCES

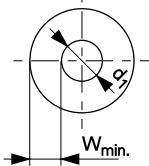
The Expander® Sealing Plug is anchored to the basic material by radial expansion of the sleeve. Depending on the basic materials' characteristics forces resulting from this type of anchorage as well as the hydraulic pressures and temperature loads will necessitate minimum wall thicknesses and edge distances.

Distance to outer profile

straight

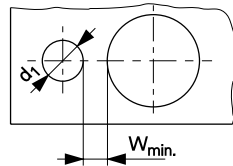


round



Wall Thickness

between drilled holes



For standard values of minimum wall thicknesses and edge distances (Wmin) refer to table.

Calculation of standard values

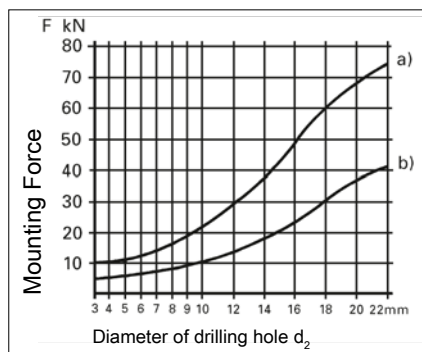
Diameter of the Expander® Sealing Plug: $d_1 \geq 4 \text{ mm}$: $W_{\min} = f_{\min} \times d_1$

$d_1 < 4 \text{ mm}$: $W_{\min} = f_{\min} \times d_1 + 0,5$

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-AISI7Mg 3.2371
Tensile strength Rm N/mm ²	1000	560	250	500	480	340	300
Min. breaking elongation A5 / %	6	6	-	7	8	8	4
Average permanent elongation limit R _{p0.2} N/mm ²	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

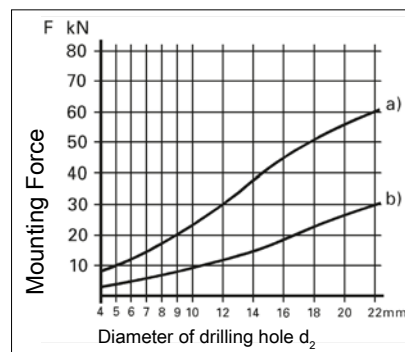
MOUNTING / ASSEMBLY FORCES

Expander® Sealing Plug sleeve from stainless steel
Art. No. 22880.0053 to 22880.0094



Measured in steel having a tensile strength of $R_m = 1000 \text{ N/mm}^2$. 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.

2



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® body (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 $R_z = 10-30 \mu\text{m}$ has to be adhered to.

Expander® Sealing Plug

Art. No. 22880.0004 to 22880.0094

Requirements to achieve maximum operation reliability

- Drilling tolerance $d_1 = +0,1 \text{ mm}$,
- Consideration of counterbore hole relations,
- Consideration of counterbore hole relations,
- Roundness tolerance $t = 0,05 \text{ mm}$,
- 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. 22880.0304 to 22880.0420

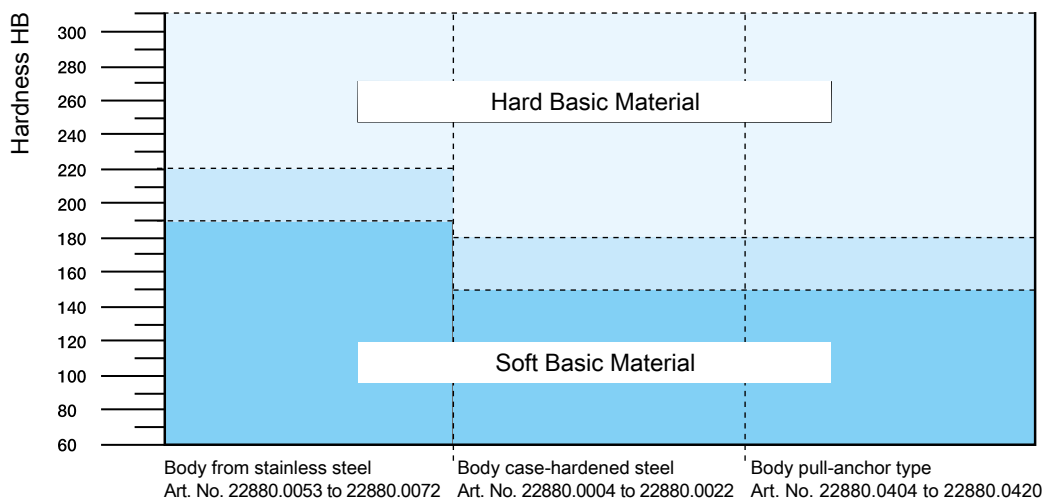
Requirements to achieve maximum operation reliability

- Drilling tolerance $d_1 = +0,12 \text{ mm}$,
- Roundness tolerance $t = 0,05 \text{ mm}$,
- 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 $R_z = 10-30 \mu\text{m}$ is necessary to achieve the required pressure values. When having roughness $R_z = 30 \mu\text{m}$, leakages may occur.

Expander® Sealing Plug



For the allowed working pressures, the anchorage must be achieved via the drilling roughness. Roughness: $R_z = 10-30 \mu\text{m}$.

Intermediate area: For the allowed working pressures anchorage has to be achieved via the drilling roughness of the basic material. Roughness: $R_z = 10-30 \mu\text{m}$.

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).

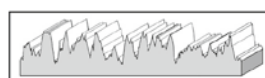
Picture 1 Selection Diagram



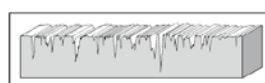
Picture 2



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 (Picture 5).

Swing Bolts • DIN 444, form B

EH 22980.

2



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

References

For torques please refer to appendix - Technical Data -

MORE INFORMATION

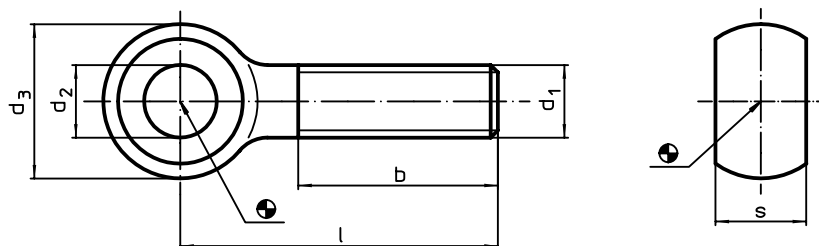
Notes

Special types on request.

Further products

Swing Bolts, DIN 444, form B, quality 8.8 high precision design. → p. 376

DRAWING



ORDER INFORMATION

Dimensions							Art. No.	
d ₁	l	d ₂ H9	d ₃	b	s		Heat-treated steel	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	11.0	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
M 8	80	6	14	18	7	20.0	22980.0222	22980.0422
	40	8	18	22	9	22.0	22980.0232	22980.0432
	50	8	18	22	9	26.0	22980.0234	22980.0434
	60	8	18	22	9	30.0	22980.0236	22980.0436
M 10	80	8	18	22	9	37.0	22980.0240	22980.0440
	100	8	18	22	9	44.0	22980.0244	22980.0444
	50	10	20	26	12	40.0	22980.0252	22980.0452
	60	10	20	26	12	43.0	22980.0254	22980.0454
M12	75	10	20	26	12	51.0	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
	50	12	25	30	14	59.0	22980.0272	22980.0472
M16	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
M20	60	16	32	38	17	128.0	22980.0292	22980.0492
	80	16	32	38	17	159.0	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
M24	150	16	32	44	17	265.0	22980.0308	22980.0508
	100	18	40	46	22	323.0	22980.0312	22980.0512
	120	18	40	46	22	373.0	22980.0316	22980.0516
	160	18	40	52	22	466.0	22980.0324	22980.0524
M24	200	18	40	52	22	562.0	22980.0332	22980.0532
	100	22	45	54	25	443.0	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
M24	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

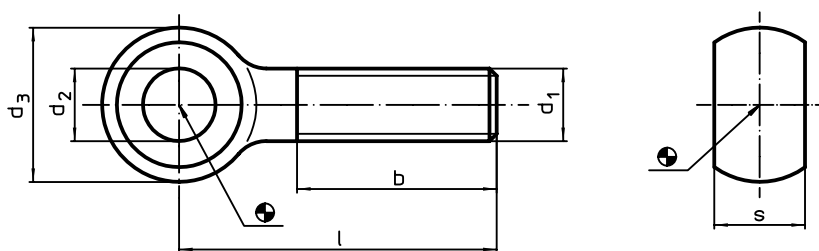
References

For torques please refer to appendix - Technical Data -

Further products

Swing Bolts, DIN 444, form B → p. 375

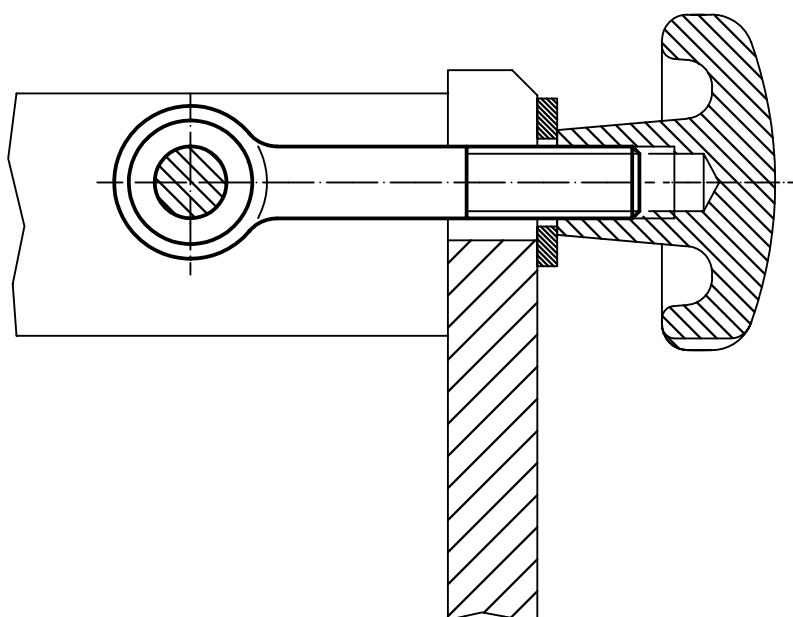
DRAWING



ORDER INFORMATION

Dimensions							Art. No.
d ₁	l	d ₂ H7	d ₃	b	s -0.2		
[mm]						[g]	
M 8	40	8	18	22	9	28	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

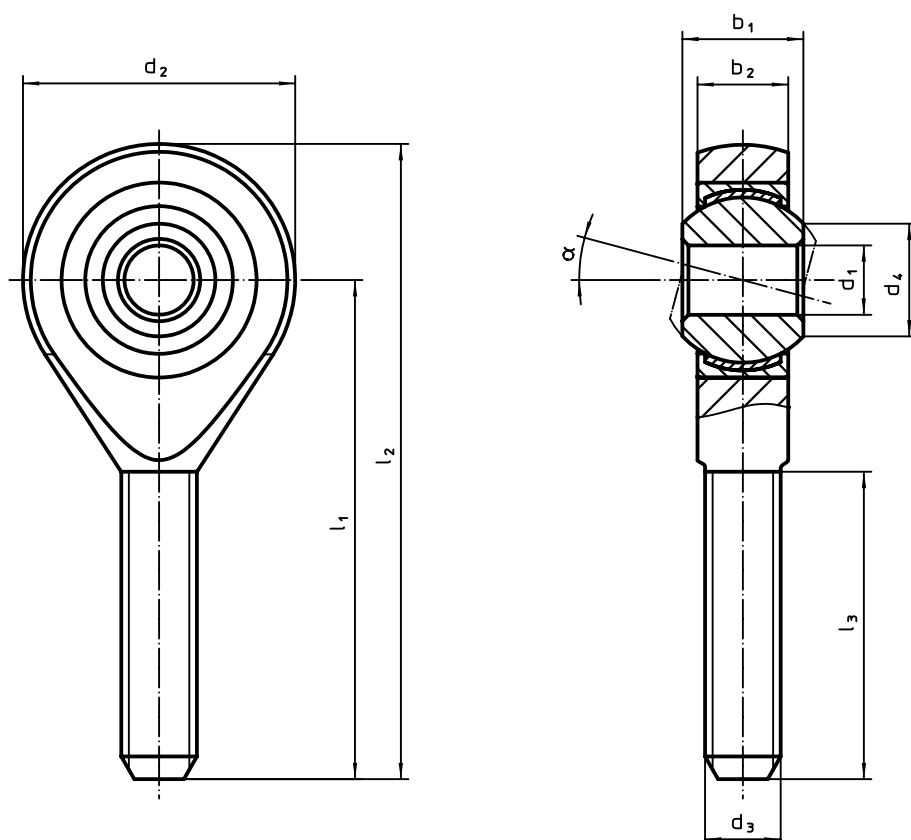
Bearing

- PTFE fabric

Bearing shell

- Free cutting steel, zinc-plated by galvanization
- Stainless steel 1.4571

DRAWING



ORDER INFORMATION

Dimensions									α	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					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	14	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	38	11.0	22982.0106	16.1	22982.0306
10	48	14	10.50	28	M10	12.9	62	28	13°	23.4	350	62	17.4	22982.0108	25.5	22982.0308
12	54	16	12.00	32	M12	15.4	70	32	13°	32.0	300	94	23.5	22982.0110	34.5	22982.0310
14	60	19	13.50	36	M14	16.8	78	38	16°	42.0	260	135	21.0	22982.0112	39.5	22982.0312

→

Dimensions									α	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					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	202	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	270	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	350	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	459	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	607	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	14	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	39	11.0	22982.0128	16.1	22982.0328
10	48	14	10.50	28	M10	12.9	62	28	13°	23.4	350	61	17.4	22982.0130	25.5	22982.0330
12	54	16	12.00	32	M12	15.4	70	32	13°	32.0	300	93	23.5	22982.0132	34.5	22982.0332
14	60	19	13.50	36	M14	16.8	78	38	16°	42.0	260	133	21.0	22982.0134	39.5	22982.0334
16	66	21	15.00	42	M16	19.3	87	40	15°	52.5	230	202	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	269	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	347	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	455	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	604	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

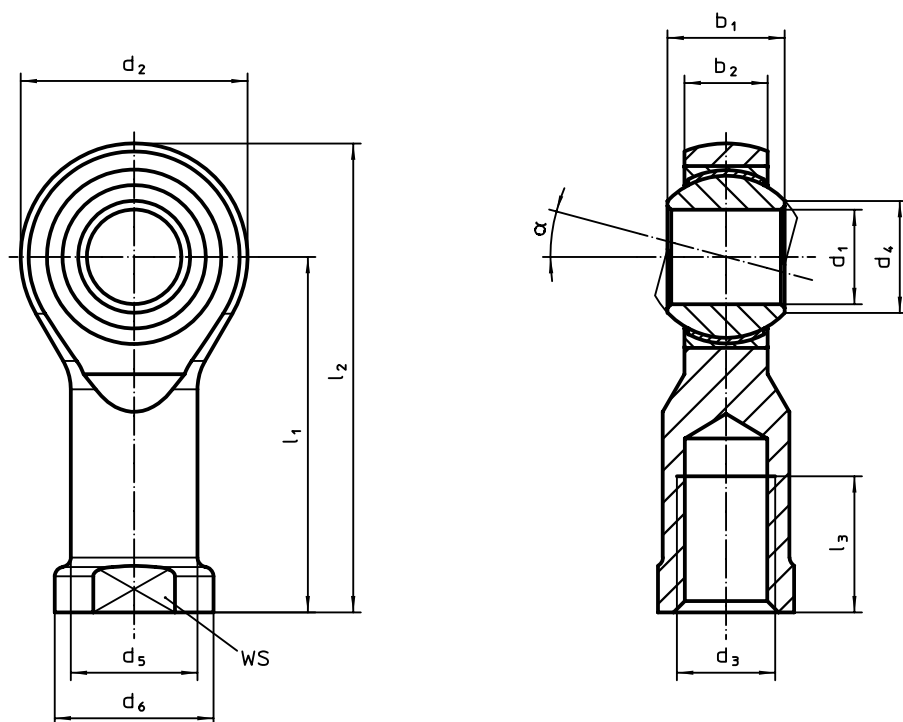
Bearing

- PTFE fabric

Bearing shell

- Free cutting steel, zinc-plated by galvanization
- Stainless steel 1.4571

DRAWING



ORDER INFORMATION

Dimensions												α	WS	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							Static carrying figure C_0	Static carrying figure C_0
[mm]													[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°	9	7.5	600	18	8.0	22982.0202	11.8
6	30	9	6.75	20	M 6	8.9	10.0	13	40	12	13°	11	9.3	530	26	8.9	22982.0204	13.1
8	36	12	9.00	24	M 8	10.4	12.5	16	48	16	14°	13	16.7	420	47	14.1	22982.0206	20.7
10	43	14	10.50	28	M10	12.9	15.0	19	57	20	13°	17	23.4	350	76	19.3	22982.0208	28.3
12	50	16	12.00	32	M12	15.4	17.5	22	66	22	13°	19	32.0	300	113	23.5	22982.0210	34.5
14	57	19	13.50	36	M14	16.8	20.0	25	75	25	16°	22	42.0	260	165	21.0	22982.0212	39.5

→

Dimensions													α	WS	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								Static carrying figure C ₀	Art. No.	Static carrying figure C ₀	Art. No.
[mm]														[mm]	[kN]	[U/min]	[g]	[kN]		[kN]	
16	64	21	15.00	42	M16	19.3	22.0	27	85	28	15°	22		52.5	230	235	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°	27		64.0	210	317	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°	32		78.0	190	413	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°	32		97.0	170	528	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°	36		122.0	150	725	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°	9		7.5	600	19	8.0	22982.0224		11.8	22982.0424
6	30	9	6.75	20	M 6	8.9	10.0	13	40	12	13°	11		9.3	530	26	8.9	22982.0226		13.1	22982.0426
8	36	12	9.00	24	M 8	10.4	12.5	16	48	16	14°	13		16.7	420	47	14.1	22982.0228		20.7	22982.0428
10	43	14	10.50	28	M10	12.9	15.0	19	57	20	13°	17		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°	19		32.0	300	113	23.5	22982.0232		34.5	22982.0432
14	57	19	13.50	36	M14	16.8	20.0	25	75	25	16°	22		42.0	260	164	21.0	22982.0234		39.5	22982.0434
16	64	21	15.00	42	M16	19.3	22.0	27	85	28	15°	22		52.5	230	235	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°	27		64.0	210	318	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°	32		78.0	190	416	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°	32		97.0	170	526	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°	36		122.0	150	716	62.0	22982.0244		118.0	22982.0444

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.

d ₁	Radial play [mm]	
	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 C₀

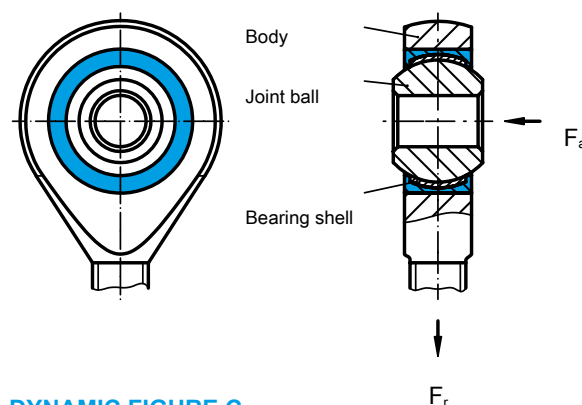
C₀ identifies the permissible radial load at standstill and with the load at rest which a rod end is capable of withstanding at the weakest cross section without deforming. The specified C₀ values are determined by way of calculation based on the respective material properties and verified by subjecting 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 C₀ 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.

