



HALDER

NORM+TECHNIK

STANDARD PARTS

are available from

MARYLAND METRICS

P.O. Box 261 Owings Mills, MD 21117 USA

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web: <http://mdmetric.com/prod/halder> email: sales@mdmetric.com

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Note: HALDER part numbers have changed in 2010. Part numbers now contain a zero on either side of the decimal point. Example: old number 2208.006 is now 22080.0006

Order example:

Spring plunger
with ball and internal hexagon,
stainless steel, standard spring load
 $d_1 = M 8$

Please prefix the HALDER part number with 'R660-'
Example: R660-EH 22030.0208

Ref. No. **EH 22030.0208**

Article-
group

Finish

The complete product catalogues for Workholding Systems and Standard Parts including CAD capable product drawings in 2D and 3D are available on our website. CAD drawings are accessible via the Internet for download or viewing at <http://mdmetric.com/prod/halder/cad.htm>

Catalogues for all Halder products are also available at <http://mdmetric.com/prod/halder/halder1.htm>

Machine and Fixture Elements

EH 22030.
Spring Plungers
with ball and internal
hexagon



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EH 22030.
Spring Plungers
with pin and
internal hexagon



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EH 22030.
Spring Plungers
with ball, headed,
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EH 22080.
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EH 22080.
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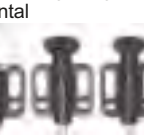
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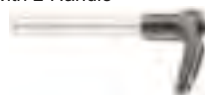
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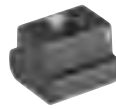
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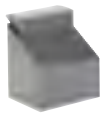
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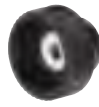
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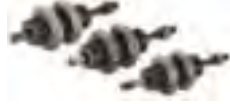
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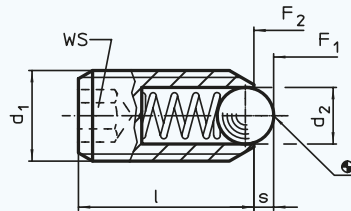
Machine and Fixture Elements



EH 22030.

Spring Plungers

with ball and internal hexagon



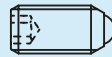
>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -
Spring range and forces are precisely tested.

Material:

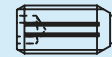
- Body:** • Free cutting steel, blackened • Stainless steel 1.4305
Ball: • Ball-bearing steel, hardened • Stainless steel, hardened
Spring: • Stainless steel

Characteristic:

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



Standard spring load



Heavy spring load

Note:

To be used for locating or for applying pressure, as a detent or for ejection.
Temperature range up to 250 °C.

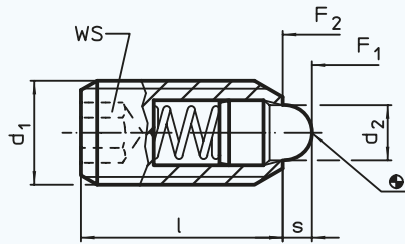
Ref. No.	Finish	d ₁	d ₂	l	s	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	Δg	
22030.0003	free cutting steel, standard spring load	M 3	1,5	8	0,4	1,5	3,0	4,5	0,30	
22030.0004		M 4	2,5	12	0,8	2,0	8,5	14,0	0,70	
22030.0005		M 5	3,0	14	0,9	2,5	8,0	14,0	1,20	
22030.0006		M 6	3,5	15	1,0	3,0	11,0	18,0	1,80	
22030.0008		M 8	4,5	18	1,5	4,0	18,0	31,0	3,90	
22030.0010		M 10	6,0	23	2,0	5,0	24,0	45,0	8,10	
22030.0012		M 12	8,0	26	2,5	6,0	26,0	49,0	13,00	
22030.0016		M 16	10,0	33	3,5	8,0	41,0	86,0	32,00	
22030.0020		M 20	12,0	43	4,5	10,0	56,0	111,0	66,00	
22030.0024		M 24	15,0	48	5,5	12,0	81,0	151,0	106,00	
22030.0045	free cutting steel, heavy spring load	M 5	3,0	14	0,9	2,5	15,0	22,0	1,20	
22030.0046		M 6	3,5	15	1,0	3,0	19,0	28,0	1,80	
22030.0048		M 8	4,5	18	1,5	4,0	36,0	62,0	4,10	
22030.0050		M 10	6,0	23	2,0	5,0	57,0	104,0	8,20	
22030.0052		M 12	8,0	26	2,5	6,0	61,0	110,0	13,00	
22030.0056		M 16	10,0	33	3,5	8,0	68,0	142,0	32,00	
22030.0060		M 20	12,0	43	4,5	10,0	84,0	166,0	66,00	
22030.0064		M 24	15,0	48	5,5	12,0	127,0	237,0	106,00	
22030.0203		stainless steel, standard spring load	M 3	1,5	8	0,4	1,5	3,0	4,5	0,28
22030.0204			M 4	2,5	12	0,8	2,0	8,5	14,0	0,80
22030.0205	M 5		3,0	14	0,9	2,5	8,0	14,0	1,30	
22030.0206	M 6		3,5	15	1,0	3,0	11,0	18,0	1,90	
22030.0208	M 8		4,5	18	1,5	4,0	18,0	31,0	4,10	
22030.0210	M 10		6,0	23	2,0	5,0	24,0	45,0	8,20	
22030.0212	M 12		8,0	26	2,5	6,0	26,0	49,0	13,00	
22030.0216	M 16		10,0	33	3,5	8,0	41,0	86,0	32,00	
22030.0220	M 20		12,0	43	4,5	10,0	56,0	111,0	67,00	
22030.0224	M 24		15,0	48	5,5	12,0	81,0	151,0	107,00	
22030.0245	stainless steel, heavy spring load	M 5	3,0	14	0,9	2,5	15,0	22,0	1,20	
22030.0246		M 6	3,5	15	1,0	3,0	19,0	28,0	1,90	
22030.0248		M 8	4,5	18	1,5	4,0	36,0	62,0	4,20	
22030.0250		M 10	6,0	23	2,0	5,0	57,0	104,0	8,20	
22030.0252		M 12	8,0	26	2,5	6,0	61,0	110,0	13,00	
22030.0256		M 16	10,0	33	3,5	8,0	68,0	142,0	32,00	
22030.0260		M 20	12,0	43	4,5	10,0	84,0	166,0	66,00	
22030.0264		M 24	15,0	48	5,5	12,0	127,0	237,0	107,00	

* statistical average value

EH 22030.

Spring Plungers

with pin and internal hexagon



>>> Special types upon request. <<<

Thread lock upon request, please refer to appendix - Technical Data - Spring range and forces are precisely tested.

Material:

Body: • Free cutting steel, blackened
• Stainless steel 1.4305
Pin: • Free cutting steel, hardened, blackened
• Stainless steel 1.4305
Spring: • Stainless steel

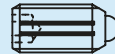
Characteristic:

Standard spring load: no marking

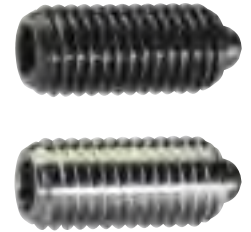
Heavy spring load: marked with two lines



Standard spring load



Heavy spring load



Note:

To be used for locating or for applying pressure, as a detent or for ejection.
Temperature range up to 250 °C.

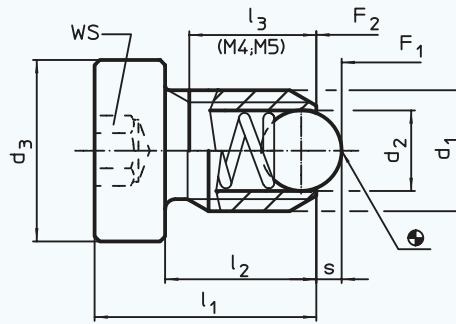
Ref. No.	Finish	d ₁	d ₂	l	s	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	μg
22030.0104	free cutting steel,	M 4	1,8	12	1,5	2,0	4,5	12,5	0,6
22030.0105	standard	M 5	2,4	14	2,0	2,5	5,0	13,0	1,3
22030.0106	spring load	M 6	2,7	15	2,0	3,0	6,0	17,0	1,9
22030.0108		M 8	3,8	18	2,0	4,0	16,0	33,0	4,2
22030.0110		M 10	4,5	23	2,5	5,0	19,0	42,0	8,5
22030.0112		M 12	6,2	26	3,5	6,0	22,0	57,0	13,0
22030.0116		M 16	8,5	33	4,5	8,0	38,0	78,0	32,0
22030.0120		M 20	10,0	43	6,5	10,0	39,0	81,0	67,0
22030.0124		M 24	13,0	48	8,0	12,0	72,0	155,0	106,0
22030.0146	free cutting steel,	M 6	2,7	15	2,0	3,0	11,0	25,0	2,0
22030.0148	heavy	M 8	3,8	18	2,0	4,0	23,0	59,0	4,2
22030.0150	spring load	M 10	4,5	23	2,5	5,0	20,0	54,0	8,5
22030.0152		M 12	6,2	26	3,5	6,0	38,0	96,0	13,0
22030.0156		M 16	8,5	33	4,5	8,0	50,0	100,0	32,0
22030.0160		M 20	10,0	43	6,5	10,0	52,0	133,0	67,0
22030.0164		M 24	13,0	48	8,0	12,0	91,0	223,0	106,0
22030.0304	stainless steel,	M 4	1,8	12	1,5	2,0	4,5	12,5	0,7
22030.0305	standard	M 5	2,4	14	2,0	2,5	5,0	13,0	1,2
22030.0306	spring load	M 6	2,7	15	2,0	3,0	6,0	17,0	2,1
22030.0308		M 8	3,8	18	2,0	4,0	16,0	33,0	4,2
22030.0310		M 10	4,5	23	2,5	5,0	19,0	42,0	8,6
22030.0312		M 12	6,2	26	3,5	6,0	22,0	57,0	13,0
22030.0316		M 16	8,5	33	4,5	8,0	38,0	78,0	32,0
22030.0320		M 20	10,0	43	6,5	10,0	39,0	81,0	67,0
22030.0324		M 24	13,0	48	8,0	12,0	72,0	155,0	104,0
22030.0346	stainless steel,	M 6	2,7	15	2,0	3,0	11,0	25,0	1,9
22030.0348	heavy	M 8	3,8	18	2,0	4,0	23,0	59,0	4,4
22030.0350	spring load	M 10	4,5	23	2,5	5,0	20,0	54,0	8,6
22030.0352		M 12	6,2	26	3,5	6,0	38,0	96,0	14,0
22030.0356		M 16	8,5	33	4,5	8,0	50,0	100,0	32,0
22030.0360		M 20	10,0	43	6,5	10,0	52,0	133,0	68,0
22030.0364		M 24	13,0	48	8,0	12,0	91,0	223,0	105,0

* statistical average value

EH 22030.

Spring Plungers

with ball, headed, internal hexagon



>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -
Spring range and forces are precisely tested.

Material:

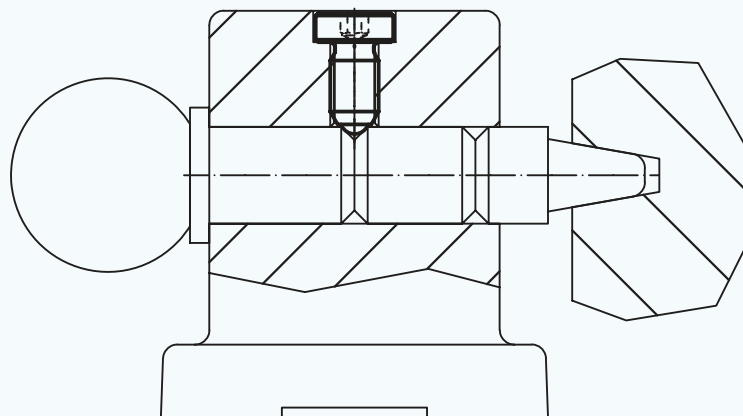
Body: • Free cutting steel, blackened • Stainless steel 1.4305
Ball: • Ball-bearing steel, hardened • Stainless steel, hardened
Spring: • Stainless steel

Note:

To be used for locating or for applying pressure, as a detent or for ejection. Precise screwing depth due to head (respect l_3 for M 4 / M 5).
Temperature range up to 250 °C.

Ref. No.	Finish	d_1	d_2	d_3	l_1	l_2	l_3	s	WS	Spring load F_1 $N \approx^*$	Spring load F_2 $N \approx^*$	μg
22030.0930	free cutting steel, standard spring load	M 4	2,5	6	12	9,0	7,5	0,8	2,0	8	14	1,0
22030.0931		M 5	3,0	8	14	10,0	8,2	0,9	2,5	8	14	2,3
22030.0932		M 6	3,5	10	15	10,0	-	1,0	3,0	11	18	3,9
22030.0933		M 8	4,5	13	18	12,5	-	1,5	4,0	18	31	7,7
22030.0934		M 10	6,0	16	23	17,0	-	2,0	5,0	24	45	14,0
22030.0935	M 12	8,0	18	26	19,0	-	2,5	6,0	26	49	21,0	
22030.0940	stainless steel, standard spring load	M 4	2,5	6	12	9,0	7,5	0,8	2,0	8	14	1,1
22030.0941		M 5	3,0	8	14	10,0	8,2	0,9	2,5	8	14	2,3
22030.0942		M 6	3,5	10	15	10,0	-	1,0	3,0	11	18	3,9
22030.0943		M 8	4,5	13	18	12,5	-	1,5	4,0	18	31	7,8
22030.0944		M 10	6,0	16	23	17,0	-	2,0	5,0	24	45	14,0
22030.0945		M 12	8,0	18	26	19,0	-	2,5	6,0	26	49	21,0

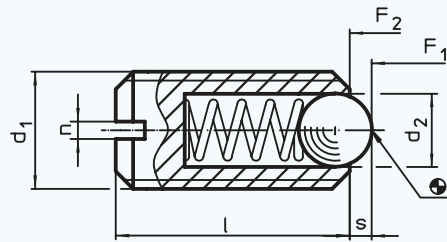
* statistical average value



EH 22040.

Spring Plungers

plastic



>>> Special types upon request. <<<
Thread lock upon request.
Spring range and forces are precisely tested.

Material:

Body: • Thermoplastic POM, blue
Ball: • Stainless steel, hardened
• Thermoplastic POM, white
Spring: • Stainless steel

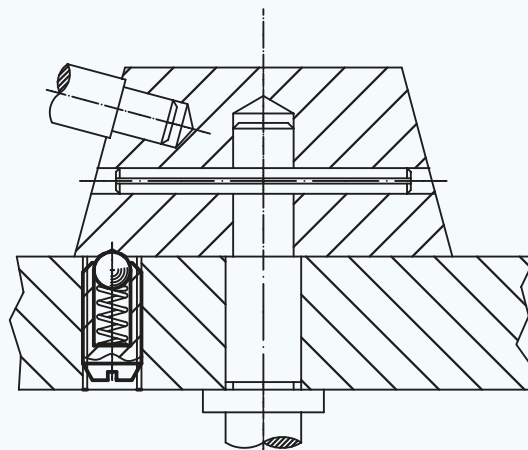


Note:

To be used for locating or for applying pressure, as a detent or for ejection.
Temperature range from - 30 °C up to + 50 °C.

Ref. No.	Finish	d ₁	d ₂	l	s	n	Spring load F ₁ N _≈ *	Spring load F ₂ N _≈ *	μg
22040.0006	ball from	M 6	3,5	14	0,9	1,0	12	17	0,6
22040.0008	stainless steel	M 8	5,0	16	1,5	1,2	20	35	1,3
22040.0010		M 10	6,0	19	1,9	1,5	25	45	2,6
22040.0406	ball from	M 6	3,5	14	0,9	1,0	12	17	0,5
22040.0408	thermoplastic	M 8	5,0	16	1,5	1,2	20	35	1,0
22040.0410		M 10	6,0	19	1,9	1,5	25	45	1,8

* statistical average value

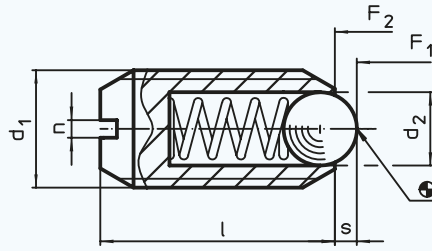




EH 22050.

Spring Plungers

with ball and slot



>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -
Spring range and forces are precisely tested.

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
Heavy spring load: marked with two lines



Standard spring load



Heavy spring load

Note:

To be used for locating or for applying pressure, as a detent or for ejection.
Temperature range up to 250 °C.

Ref. No.	Finish	d ₁	d ₂	l	s	n	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g	
22050.0003	free cutting steel, standard spring load	M 3	1,5	7	0,4	0,40	3,0	4,5	0,2	
22050.0004		M 4	2,5	9	0,8	0,60	8,5	14,0	0,4	
22050.0005		M 5	3,0	12	0,9	0,80	8,0	14,0	1,0	
22050.0006		M 6	3,5	14	1,0	1,00	11,0	18,0	1,7	
22050.0008		M 8	4,5	16	1,5	1,20	18,0	31,0	3,5	
22050.0010		M 10	6,0	19	2,0	1,50	24,0	45,0	6,6	
22050.0012		M 12	8,0	22	2,5	2,00	26,0	49,0	11,0	
22050.0016		M 16	10,0	24	3,5	2,00	41,0	86,0	23,0	
22050.0020		M 20	12,0	30	4,5	2,50	56,0	111,0	45,0	
22050.0024		M 24	15,0	34	5,5	3,00	81,0	151,0	72,0	
22050.0205	free cutting steel, heavy spring load	M 5	3,0	12	0,9	0,80	15,0	22,0	1,0	
22050.0206		M 6	3,5	14	1,0	1,00	19,0	28,0	1,7	
22050.0208		M 8	4,5	16	1,5	1,20	36,0	62,0	3,6	
22050.0210		M 10	6,0	19	2,0	1,50	57,0	104,0	6,6	
22050.0212		M 12	8,0	22	2,5	2,00	61,0	110,0	11,0	
22050.0216		M 16	10,0	24	3,5	2,00	68,0	142,0	23,0	
22050.0220		M 20	12,0	30	4,5	2,50	84,0	166,0	43,0	
22050.0224		M 24	15,0	34	5,5	3,00	127,0	237,0	73,0	
22050.0402		stainless steel, standard spring load	M 2	1,0	4	0,3	0,25	0,8	1,5	0,1
22050.0403			M 3	1,5	7	0,4	0,40	3,0	4,5	0,2
22050.0404	M 4		2,5	9	0,8	0,60	8,5	14,0	0,4	
22050.0405	M 5		3,0	12	0,9	0,80	8,0	14,0	1,0	
22050.0406	M 6		3,5	14	1,0	1,00	11,0	18,0	1,7	
22050.0408	M 8		4,5	16	1,5	1,20	18,0	31,0	3,7	
22050.0410	M 10		6,0	19	2,0	1,50	24,0	45,0	6,8	
22050.0412	M 12		8,0	22	2,5	2,00	26,0	49,0	11,0	
22050.0416	M 16		10,0	24	3,5	2,00	41,0	86,0	23,0	
22050.0420	M 20		12,0	30	4,5	2,50	56,0	111,0	45,0	
22050.0424	M 24		15,0	34	5,5	3,00	81,0	151,0	70,0	
22050.0605	stainless steel, heavy spring load		M 5	3,0	12	0,9	0,80	15,0	22,0	1,2
22050.0606			M 6	3,5	14	1,0	1,00	19,0	28,0	1,9
22050.0608			M 8	4,5	16	1,5	1,20	36,0	62,0	3,6
22050.0610		M 10	6,0	19	2,0	1,50	57,0	104,0	6,7	
22050.0612		M 12	8,0	22	2,5	2,00	61,0	110,0	11,0	
22050.0616		M 16	10,0	24	3,5	2,00	68,0	142,0	23,0	
22050.0620		M 20	12,0	30	4,5	2,50	84,0	166,0	45,0	
22050.0624		M 24	15,0	34	5,5	3,00	127,0	237,0	72,0	

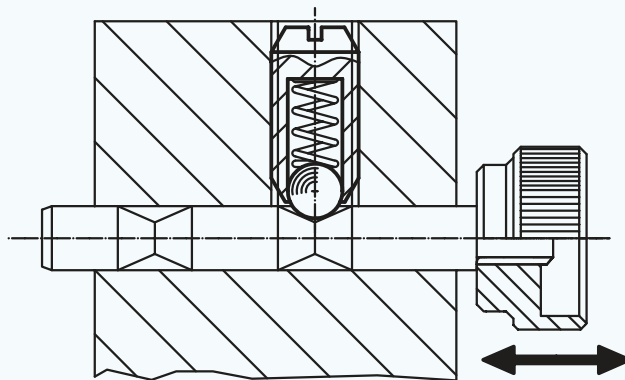
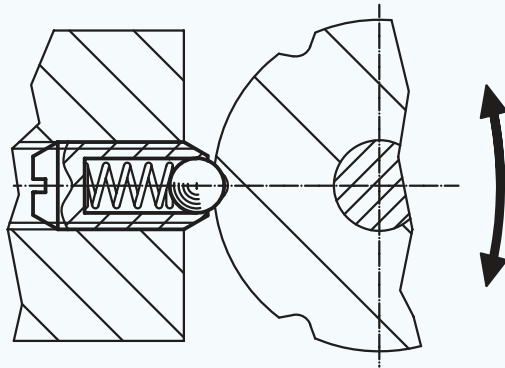
* statistical average value

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EH 22050.

**Spring
Plungers**

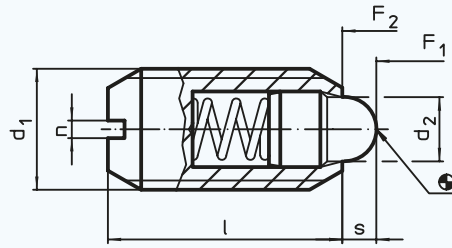
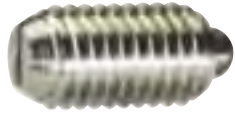
with ball and slot



EH 22050.

Spring Plungers

with pin and slot



>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -
Spring range and forces are precisely tested.

Material:

- Body:** • Free cutting steel, blackened • Stainless steel 1.4305
Pin: • Free cutting steel, hardened, blackened • Stainless steel 1.4305
Spring: • Stainless steel

Characteristic:

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



Standard spring load



Heavy spring load

Note:

To be used for locating or for applying pressure, as a detent or for ejection.
Temperature range up to 250 °C.

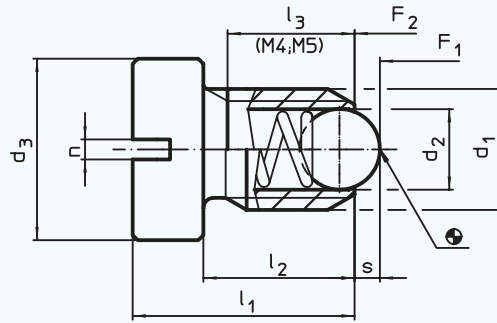
Ref. No.	Finish	d ₁	d ₂	l	s	n	Spring load F ₁ N≈*	Spring load F ₂ N≈*	μg
22050.0104	free cutting steel,	M 4	1,8	9	1,5	0,6	4,5	12,5	0,4
22050.0105	standard	M 5	2,4	12	2,0	0,8	5,0	13,0	1,1
22050.0106	spring load	M 6	2,7	14	2,0	1,0	6,0	17,0	1,8
22050.0108		M 8	3,8	16	2,0	1,2	16,0	33,0	3,7
22050.0110		M 10	4,5	19	2,5	1,5	19,0	42,0	7,1
22050.0112		M 12	6,2	22	3,5	2,0	22,0	57,0	11,0
22050.0116		M 16	8,5	24	4,5	2,0	38,0	78,0	23,0
22050.0120		M 20	10,0	30	6,5	2,5	39,0	81,0	46,0
22050.0124		M 24	13,0	34	8,0	3,0	72,0	155,0	73,0
22050.0306	free cutting steel,	M 6	2,7	14	2,0	1,0	11,0	25,0	1,8
22050.0308	heavy	M 8	3,8	16	2,0	1,2	23,0	59,0	3,8
22050.0310	spring load	M 10	4,5	19	2,5	1,5	20,0	54,0	7,0
22050.0312		M 12	6,2	22	3,5	2,0	38,0	96,0	11,0
22050.0316		M 16	8,5	24	4,5	2,0	50,0	100,0	23,0
22050.0320		M 20	10,0	30	6,5	2,5	52,0	133,0	46,0
22050.0324		M 24	13,0	34	8,0	3,0	91,0	223,0	74,0
22050.0504	stainless steel,	M 4	1,8	9	1,5	0,6	4,5	12,5	0,6
22050.0505	standard	M 5	2,4	12	2,0	0,8	5,0	13,0	1,3
22050.0506	spring load	M 6	2,7	14	2,0	1,0	6,0	17,0	2,0
22050.0508		M 8	3,8	16	2,0	1,2	16,0	33,0	3,9
22050.0510		M 10	4,5	19	2,5	1,5	19,0	42,0	7,2
22050.0512		M 12	6,2	22	3,5	2,0	22,0	57,0	11,0
22050.0516		M 16	8,5	24	4,5	2,0	38,0	78,0	23,0
22050.0520		M 20	10,0	30	6,5	2,5	39,0	81,0	47,0
22050.0524		M 24	13,0	34	8,0	3,0	72,0	155,0	74,0
22050.0706	stainless steel,	M 6	2,7	14	2,0	1,0	11,0	25,0	2,0
22050.0708	heavy	M 8	3,8	16	2,0	1,2	23,0	59,0	4,0
22050.0710	spring load	M 10	4,5	19	2,5	1,5	20,0	54,0	7,1
22050.0712		M 12	6,2	22	3,5	2,0	38,0	96,0	11,0
22050.0716		M 16	8,5	24	4,5	2,0	50,0	100,0	23,0
22050.0720		M 20	10,0	30	6,5	2,5	52,0	133,0	47,0
22050.0724		M 24	13,0	34	8,0	3,0	91,0	223,0	75,0

* statistical average value

EH 22050.

Spring Plungers

headed, with ball and slot



>>> Special types upon request. <<<

Thread lock upon request, please refer to appendix - Technical Data - Spring range and forces are precisely tested.

Material:

Body: • Free cutting steel, blackened • Stainless steel 1.4305
Ball: • Ball-bearing steel, hardened • Stainless steel, hardened
Spring: • Stainless steel

Note:

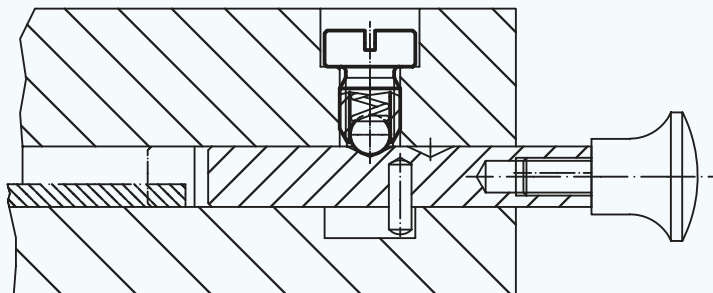
To be used for locating or for applying pressure, as a detent or for ejection. Precise screwing depth due to head (respect l_3 for M 4 / M 5).

Temperature range up to 250 °C.



Ref. No.	Finish	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	s	n	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22050.0930	free cutting steel,	M 4	2,5	6	9,5	6,5	5,0	0,8	0,6	8	14	0,92
22050.0931	standard	M 5	3,0	8	12,5	8,5	6,7	0,9	0,8	8	14	2,10
22050.0932	spring load	M 6	3,5	10	14,0	9,0	-	1,0	1,0	11	18	3,70
22050.0933		M 8	4,5	13	16,5	11,0	-	1,5	1,2	18	31	7,50
22050.0934		M 10	6,0	16	20,0	14,0	-	2,0	1,5	24	45	14,00
22050.0935		M 12	8,0	18	22,0	15,0	-	2,5	2,0	26	49	19,00
22050.0940	stainless steel,	M 4	2,5	6	9,5	6,5	5,0	0,8	0,6	8	14	1,20
22050.0941	standard	M 5	3,0	8	12,5	8,5	6,7	0,9	0,8	8	14	2,40
22050.0942	spring load	M 6	3,5	10	14,0	9,0	-	1,0	1,0	11	18	3,90
22050.0943		M 8	4,5	13	16,5	11,0	-	1,5	1,2	18	31	7,90
22050.0944		M 10	6,0	16	20,0	14,0	-	2,0	1,5	24	45	14,00
22050.0945		M 12	8,0	18	22,0	15,0	-	2,5	2,0	26	49	20,00

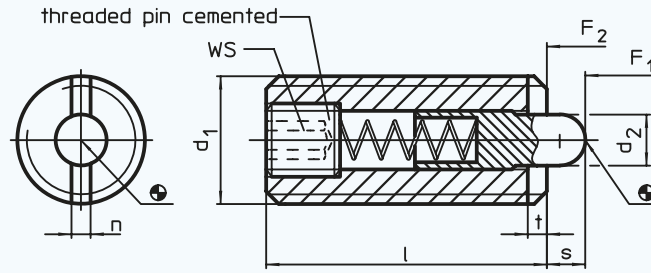
* statistical average value



EH 22060.

Spring Plungers

with internal hexagon



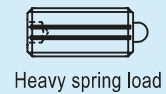
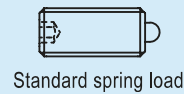
>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -
Spring range and forces are precisely tested.

Material:

- Body:** • Free cutting steel, blackened • Stainless steel 1.4305
Pin: • Free cutting steel, hardened, blackened • Stainless steel 1.4305 • Thermoplastic POM, white
Spring: • Stainless steel

Characteristic:

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



Note:

To be used for locating or for applying pressure, as a detent or for ejection.
Spring plungers can be mounted and removed by means of the slot or internal hexagon.

Ref. No.	Finish	d_1	d_2	l	n	s	t	WS	Spring load F_1 $N \approx^*$	Spring load F_2 $N \approx^*$	max. C	μg
22060.0003	free cutting steel, standard	M 3	1,0	12	0,4	1,0	0,5	0,7	2,0	4,0	+250	0,40
22060.0004	spring load	M 4	1,5	15	0,6	1,5	0,6	1,3	4,5	16,0	+250	0,93
22060.0005		M 5	2,4	18	1,2	2,3	0,8	1,5	6,0	19,0	+250	1,70
22060.0006		M 6	2,7	20	1,3	2,5	0,9	2,0	6,0	19,0	+250	2,80
22060.0008		M 8	3,5	22	1,5	3,0	1,4	2,5	10,0	39,0	+250	5,80
22060.0010		M 10	4,0	22	1,5	3,0	1,4	3,0	10,0	39,0	+250	9,20
22060.0012		M 12	6,0	28	2,7	4,0	2,0	4,0	12,0	53,0	+250	16,00
22060.0016		M 16	7,5	32	3,2	5,0	2,5	5,0	45,0	100,0	+250	35,00
22060.0020		M 20	10,0	40	3,7	7,0	3,0	6,0	52,0	125,0	+250	68,00
22060.0024		M 24	12,0	52	3,7	10,0	3,0	8,0	70,0	170,0	+250	131,00
22060.0105	free cutting steel, heavy	M 5	2,4	18	1,2	2,3	0,8	1,5	11,0	40,0	+250	1,60
22060.0106	spring load	M 6	2,7	20	1,3	2,5	0,9	2,0	15,0	43,0	+250	2,80
22060.0108		M 8	3,5	22	1,5	3,0	1,4	2,5	20,0	75,0	+250	5,80
22060.0110		M 10	4,0	22	1,5	3,0	1,4	3,0	20,0	75,0	+250	9,30
22060.0112		M 12	6,0	28	2,7	4,0	2,0	4,0	45,0	120,0	+250	16,00
22060.0116		M 16	7,5	32	3,2	5,0	2,5	5,0	64,0	160,0	+250	33,00
22060.0120		M 20	10,0	40	3,7	7,0	3,0	6,0	75,0	195,0	+250	67,00
22060.0124		M 24	12,0	52	3,7	10,0	3,0	8,0	75,0	245,0	+250	129,00
22060.0204	free cutting steel, pad from thermoplastic, standard	M 4	1,5	15	0,6	1,5	0,6	1,3	4,5	16,0	-30/+50	0,86
22060.0205	spring load	M 5	2,4	18	1,2	2,3	0,8	1,5	6,0	19,0	-30/+50	1,50
22060.0206		M 6	2,7	20	1,3	2,5	0,9	2,0	6,0	19,0	-30/+50	2,30
22060.0208		M 8	3,5	22	1,5	3,0	1,4	2,5	10,0	39,0	-30/+50	5,10
22060.0210		M 10	4,0	22	1,5	3,0	1,4	3,0	10,0	39,0	-30/+50	8,10
22060.0212		M 12	6,0	28	2,7	4,0	2,0	4,0	12,0	53,0	-30/+50	14,00
22060.0216		M 16	7,5	32	3,2	5,0	2,5	5,0	45,0	100,0	-30/+50	31,00

* statistical average value

Continued from previous page

EH 22060.

Spring Plungers

with internal hexagon

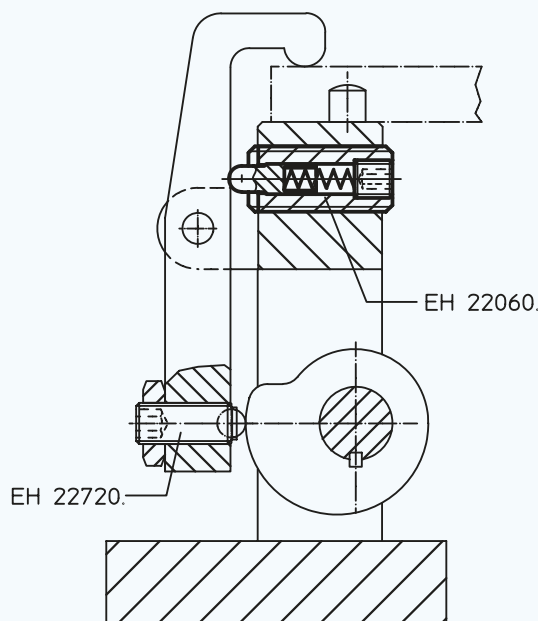
Best.-Nr.	Ausführung	d ₁	d ₂	l	n	s	t	SW	Federkraft F ₁ N≈*	Federkraft F ₂ N≈*	max. C	g
22060.0404	stainless steel,	M 4	1,5	15	0,6	1,5	0,6	1,3	4,5	16,0	+250	1,10
22060.0405	standard	M 5	2,4	18	1,2	2,3	0,8	1,5	6,0	19,0	+250	1,70
22060.0406	spring load	M 6	2,7	20	1,3	2,5	0,9	2,0	6,0	19,0	+250	2,80
22060.0408		M 8	3,5	22	1,5	3,0	1,4	2,5	10,0	39,0	+250	5,90
22060.0410		M 10	4,0	22	1,5	3,0	1,4	3,0	10,0	39,0	+250	9,50
22060.0412		M 12	6,0	28	2,7	4,0	2,0	4,0	12,0	53,0	+250	17,00
22060.0416		M 16	7,5	32	3,2	5,0	2,5	5,0	45,0	100,0	+250	35,00
22060.0420		M 20	10,0	40	3,7	7,0	3,0	6,0	52,0	125,0	+250	68,00
22060.0604	stainless steel,	M 4	1,5	15	0,6	1,5	0,6	1,3	4,5	16,0	-30/+50	0,93
22060.0605	pin from thermoplastic,	M 5	2,4	18	1,2	2,3	0,8	1,5	6,0	19,0	-30/+50	1,60
22060.0606	standard	M 6	2,7	20	1,3	2,5	0,9	2,0	6,0	19,0	-30/+50	2,50
22060.0608	spring load	M 8	3,5	22	1,5	3,0	1,4	2,5	10,0	39,0	-30/+50	5,10
22060.0610		M 10	4,0	22	1,5	3,0	1,4	3,0	10,0	39,0	-30/+50	8,50
22060.0612		M 12	6,0	28	2,7	4,0	2,0	4,0	12,0	53,0	-30/+50	14,00
22060.0616		M 16	7,5	32	3,2	5,0	2,5	5,0	45,0	100,0	-30/+50	32,00



Ref. No.	Finish	d ₁	g
22060.0803	screwdriver	M 3	13
22060.0804	for the following	M 4	29
22060.0805	thread sizes	M 5	61
22060.0806		M 6	65
22060.0808		M 8	108
22060.0810		M 10	124
22060.0812		M 12	112
22060.0816		M 16	173
22060.0820		M 20	226
22070.0838		M 24	258



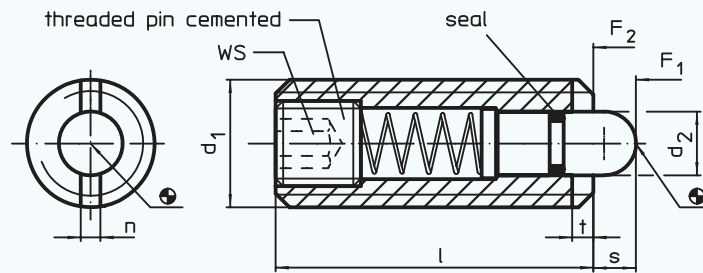
* statistischer Mittelwert



EH 22060.

Spring Plungers

with internal hexagon and seal



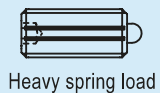
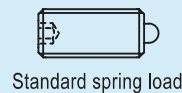
>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -
Spring range and forces are precisely tested.

Material:

- Body:** • Free cutting steel, blackened • Stainless steel 1.4305
Pin: • Free cutting steel, hardened, blackened • Stainless steel 1.4305
Spring: • Stainless steel
Seal: • NBR plastic

Characteristic:

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




Note:

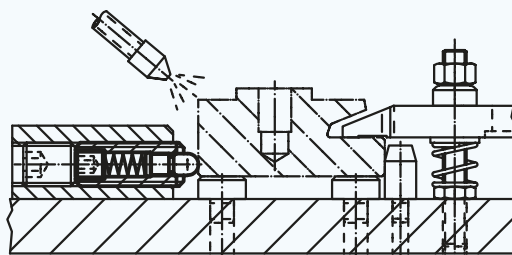
To be used for locating or for applying pressure, as a detent or for ejection. By means of the seal, liquid cannot penetrate into the spring plunger. Spring plungers can be mounted and removed by means of the slot or internal hexagon. Temperature range from - 30 °C up to + 80 °C. Compared to EH 22060., i.e. "no seal", there are deviations in dimension l, spring load and temperature range.

Ref. No.	Finish	d ₁	d ₂	l	n	s	t	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	μg
22060.0048	free cutting steel,	M 8	3,8	26	1,5	3,0	1,4	2,5	9	24	6,9
22060.0050	standard	M 10	4,0	28	1,5	3,5	1,4	3,0	15	30	11,0
22060.0052	spring load	M 12	6,0	35	2,7	4,0	2,0	4,0	24	50	20,0
22060.0056		M 16	7,5	40	3,2	5,0	2,5	5,0	36	58	43,0
22060.0148	free cutting steel,	M 8	3,8	26	1,5	3,0	1,4	2,5	17	39	6,6
22060.0150	heavy	M 10	4,0	28	1,5	3,5	1,4	3,0	22	43	12,0
22060.0152	spring load	M 12	6,0	35	2,7	4,0	2,0	4,0	40	80	20,0
22060.0156		M 16	7,5	40	3,2	5,0	2,5	5,0	44	113	45,0
22060.0448	stainless steel,	M 8	3,8	26	1,5	3,0	1,4	2,5	9	24	7,2
22060.0450	standard	M 10	4,0	28	1,5	3,5	1,4	3,0	15	30	12,0
22060.0452	spring load	M 12	6,0	35	2,7	4,0	2,0	4,0	24	50	20,0
22060.0456		M 16	7,5	40	3,2	5,0	2,5	5,0	36	58	44,0

Ref. No.	Finish	d ₁	μg
22060.0808	screwdriver	M 8	108
22060.0810	for the following	M 10	124
22060.0812	thread sizes	M 12	112
22060.0816		M 16	173



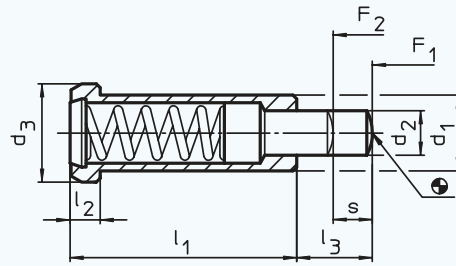
* statistical average value



EH 22070.

Spring Plungers

smooth



>>> Special types upon request. <<<
Spring range and forces are precisely tested.

Material:

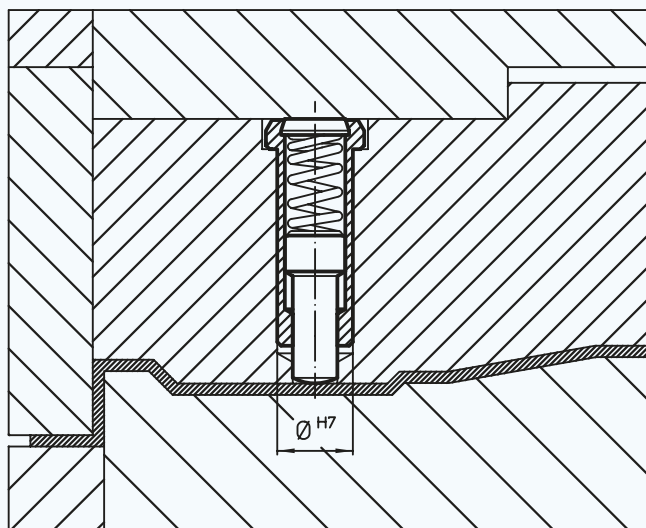
Body: • Free cutting steel, blackened **Pin:** • Steel, case-hardened, blackened **Spring:** • Stainless steel

Note:

Ejection pins and spring stops in tool-making.
It is impossible for the complete spring plunger or any of its individual parts to come out of the retaining bore.
Temperature range up to 250 °C.

Ref. No.	d ₁ 0 -0,05	d ₂	d ₃	l ₁	l ₂	l ₃	s Spring- range	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22070.0006	6	2,7	8	20	3,2	6	3,5	10	22	4,2
22070.0008	8	3,9	10	24	3,2	8	4,5	30	88	7,7
22070.0010	10	5,9	13	30	4,0	10	5,5	42	110	16,0
22070.0012	12	7,9	16	36	5,0	12	6,5	50	130	27,0

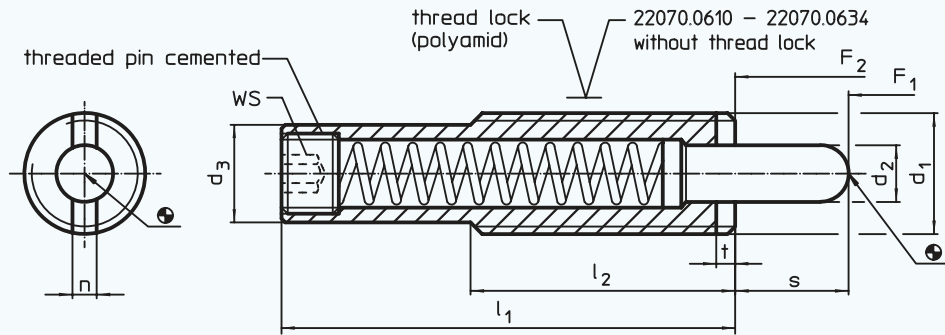
* statistical average value



EH 22070.

Spring Plungers

long



>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -
Spring range and forces are precisely tested.

Material:

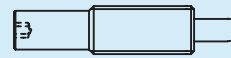
Body: • Free cutting steel, blackened
• Heat-treated steel, tempered, blackened

Pin: • Steel, case-hardened, blackened

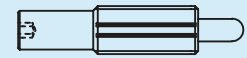
Spring: • Stainless steel

Characteristic:

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



Standard spring load



Heavy spring load

Note:


To be used for ejecting, as a detent, for applying pressure or as a shock element.
Spring plungers can be fitted and removed by means of the slot or internal hexagon.

Ref. No.	Finish	d ₁	s	d ₂	d ₃	l ₁	l ₂	n	t	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	μg	
22070.0408	body from free cutting steel, standard spring load	M 10	8	4,0	7,8	35	25	1,5	1,4	3	6,0	16	13	
22070.0412		M 12	10	5,5	9,5	43	35	2,7	2,0	4	4,0	18	22	
22070.0430		M 16	10	8,0	13,4	48	35	3,2	3,0	6	7,0	24	47	
22070.0432		M 16	10	8,0	13,4	58	35	3,2	3,0	6	15,0	42	52	
22070.0436		M 16	15	8,0	13,4	58	35	3,2	3,0	6	9,0	33	54	
22070.0440		M 16	20	8,0	13,4	58	35	3,2	3,0	6	4,0	23	55	
22070.0442		M 16	20	8,0	13,4	83	35	3,2	3,0	6	11,0	43	71	
22070.0444		M 16	25	8,0	13,4	98	35	3,2	3,0	6	13,0	41	81	
22070.0450		M 16	30	8,0	13,4	98	35	3,2	3,0	6	13,0	47	83	
22070.0452		M 16	30	8,0	13,4	118	35	3,2	3,0	6	24,0	110	97	
22070.0455		M 16	40	8,0	13,4	148	35	3,2	3,0	6	13,0	63	117	
22070.0460		M 16	50	8,0	13,4	148	35	3,2	3,0	6	7,0	43	117	
22070.0480	M 24	15	10,0	19,6	60	45	3,7	3,0	8	14,0	87	132		
22070.0512	body from free cutting steel, heavy spring load	M 12	10	5,5	9,5	43	35	2,7	2,0	4	7,0	46	23	
22070.0530		M 16	10	8,0	13,4	48	35	3,2	3,0	6	10,0	43	47	
22070.0532		M 16	10	8,0	13,4	58	35	3,2	3,0	6	14,0	84	54	
22070.0536		M 16	15	8,0	13,4	58	35	3,2	3,0	6	10,0	57	55	
22070.0542		M 16	20	8,0	13,4	83	35	3,2	3,0	6	18,0	72	72	
22070.0544		M 16	25	8,0	13,4	98	35	3,2	3,0	6	20,0	70	82	
22070.0550		M 16	30	8,0	13,4	98	35	3,2	3,0	6	20,0	80	83	
22070.0555		M 16	40	8,0	13,4	148	35	3,2	3,0	6	21,0	113	121	
22070.0560		M 16	50	8,0	13,4	148	35	3,2	3,0	6	13,0	75	121	
22070.0580		M 24	15	10,0	19,6	60	45	3,7	3,0	8	24,0	192	134	
22070.0610		body from heat treated steel, standard spring load, without locking	M 16	11	7,3	13,4	80	35	3,2	3,0	8	17,0	74	69
22070.0612			M 16	21	7,3	13,4	120	35	3,2	3,0	8	21,0	81	96
22070.0614	M 16		31	7,3	13,4	150	35	3,2	3,0	8	21,0	89	117	
22070.0616	M 16		41	7,3	13,4	200	35	3,2	3,0	8	16,0	80	149	
22070.0630	M 22		21	9,0	19,0	130	50	3,5	4,0	8	80,0	214	211	
22070.0632	M 22		31	9,0	19,0	168	50	3,5	4,0	8	70,0	210	278	
22070.0634	M 22		41	9,0	19,0	226	50	3,5	4,0	8	76,0	208	358	

* statistical average value

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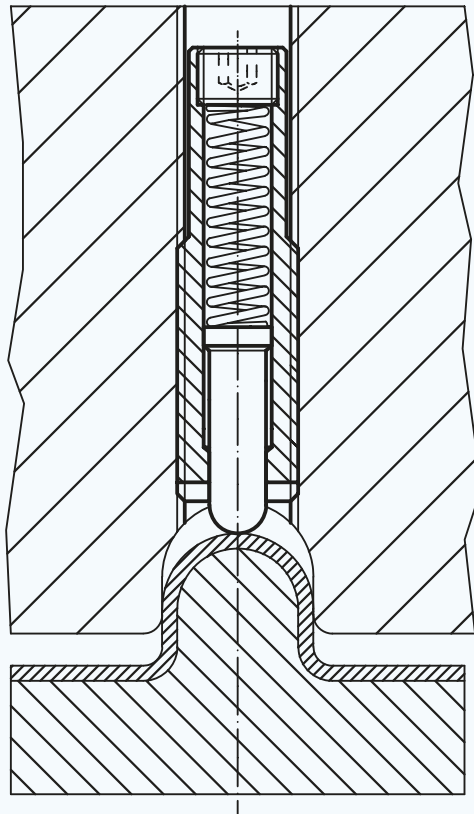
EH 22070.

Ref. No.	Finish	d ₁		g
22070.0830	screwdriver	M 10		87
22070.0832	for the following	M 12		88
22070.0834	thread sizes	M 16		110
22070.0836		M 22		245
22070.0838		M 24		258

**Spring
Plungers**

long

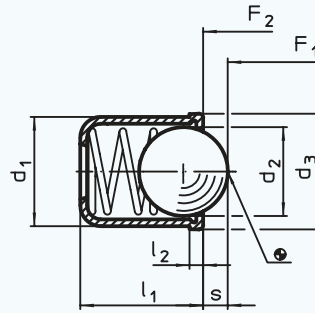
* statistical average value



EH 22080.

Spring Plungers

smooth,
with collar and ball



>>> Special types upon request. <<<
Spring range and forces are precisely tested.

Material:

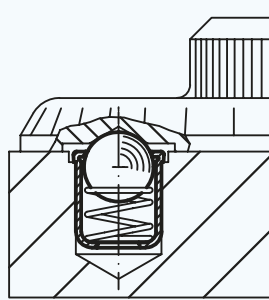
- Body:** • Stainless steel 1.4303
• Brass
• Thermoplastic POM, blue
- Ball:** • Stainless steel, hardened
• Thermoplastic POM, white
- Spring:** • Stainless steel

Note:

To be used for locating or for applying pressure, as a detent and for ejection.

Ref. No.	Finish	d ₁ +0,1	d ₂	d ₃	l ₁	l ₂ ≈	s	Spring load F ₁ N≈*	Spring load F ₂ N≈*	max. C	g
22080.0003	body and ball from stainless steel	3	2,38	3,5	4,0	0,75	0,70	1,8	3,5	+250	0,20
22080.0004		4	3,00	4,6	5,0	0,90	1,00	2,5	6,0	+250	0,30
22080.0005		5	4,00	5,6	6,0	0,90	1,40	3,0	6,5	+250	0,60
22080.0006		6	5,00	6,5	7,0	1,00	1,80	5,5	11,5	+250	1,00
22080.0008		8	6,50	8,5	9,0	1,10	2,40	7,0	12,5	+250	2,10
22080.0010		10	8,50	11,0	13,0	1,50	3,30	8,5	18,5	+250	4,40
22080.0012		12	10,00	13,0	16,0	2,30	4,00	12,0	26,5	+250	7,30
22080.0203	body from brass,	3	2,38	3,6	4,0	0,60	0,60	1,8	3,5	+250	0,20
22080.0204	ball from	4	3,00	4,5	5,0	1,00	0,80	3,0	6,0	+250	0,50
22080.0205	stainless steel	5	4,00	5,5	6,0	1,00	1,00	4,0	6,5	+250	0,80
22080.0206		6	5,00	6,5	7,0	1,00	1,60	6,0	11,5	+250	1,30
22080.0208		8	6,50	8,5	9,0	1,00	1,90	8,0	12,5	+250	2,80
22080.0403	body from thermoplastic,	3	2,00	3,6	4,0	0,60	0,55	1,7	3,5	-30/+50	0,09
22080.0404	ball from	4	3,00	4,6	5,0	1,00	0,80	3,0	6,5	-30/+50	0,20
22080.0405	stainless steel	5	4,00	5,6	6,0	1,00	1,00	6,0	9,4	-30/+50	0,40
22080.0406		6	5,00	6,5	7,0	1,00	1,60	6,2	12,6	-30/+50	0,70
22080.0408		8	6,50	8,5	9,0	1,00	1,90	10,0	20,4	-30/+50	1,50
22080.0410		10	8,00	11,0	13,5	1,50	2,40	11,9	22,3	-30/+50	3,20
22080.0412		12	10,00	13,0	16,0	1,50	3,30	14,0	25,0	-30/+50	5,80
22080.0604	body and ball	4	3,00	4,6	5,0	1,00	0,80	2,5	6,5	-30/+50	0,10
22080.0605	from thermoplastic	5	4,00	5,6	6,0	1,00	1,00	6,0	9,4	-30/+50	0,20
22080.0606		6	5,00	6,5	7,0	1,00	1,60	6,5	13,0	-30/+50	0,30
22080.0608		8	6,50	8,5	9,0	1,00	1,90	8,0	18,0	-30/+50	0,60
22080.0610		10	8,00	11,0	13,5	1,50	2,40	12,0	23,0	-30/+50	1,50
22080.0612		12	10,00	13,0	16,0	1,50	3,30	13,0	25,0	-30/+50	2,50

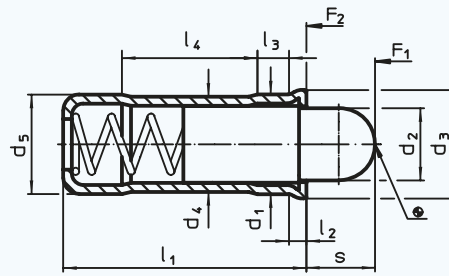
* statistical average value



EH 22080.

Spring Plungers

smooth, with collar and pin



>>> Special types upon request. <<<
Spring range and forces are precisely tested.

Material:

Body: • Stainless steel 1.4303

Pin: • Stainless steel 1.4305
• Thermoplastic POM, white

Spring: • Stainless steel

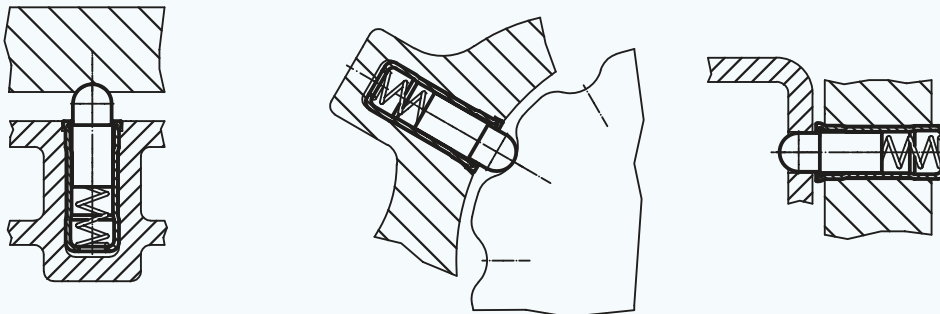
Note:

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



Ref. No.	Finish	d ₁ +0,1	d ₂	d ₃	d ₄	d ₅ ±0,05	l ₁	l ₂ ≈	l ₃ ≈	l ₄ ≈	s	max. C	Spring load F ₁ N≈*	Spring load F ₂ N≈*	Δ g
22080.0104	body and bolt from stainless steel	4	2,8	4,6	3,85	4	10,7	0,9	1,8	5,6	2,7	+250	3,0	8,2	0,7
22080.0105		5	3,8	5,6	4,85	5	12,0	0,9	2,1	6,0	4,0	+250	3,3	9,0	1,2
22080.0106		6	4,8	6,5	5,85	6	15,0	1,0	2,3	8,2	5,5	+250	6,1	12,0	2,2
22080.0108		8	6,2	8,5	7,55	8	18,0	1,1	2,9	9,5	6,5	+250	10,7	17,0	4,2
22080.0110		10	8,0	11,0	9,55	10	26,0	1,5	3,5	15,0	8,0	+250	16,2	29,0	9,0
22080.0124	body from stainless steel,	4	2,8	4,6	3,85	4	10,7	0,9	1,8	5,6	2,7	-30/+50	3,0	8,2	0,5
22080.0125		5	3,8	5,6	4,85	5	12,0	0,9	2,1	6,0	4,0	-30/+50	3,3	9,0	0,8
22080.0126	pad from thermoplastic	6	4,8	6,5	5,85	6	15,0	1,0	2,3	8,2	5,5	-30/+50	6,1	12,0	1,3
22080.0128		8	6,2	8,5	7,55	8	18,0	1,1	2,9	9,5	6,5	-30/+50	10,7	17,0	2,5
22080.0130		10	8,0	11,0	9,55	10	26,0	1,5	3,5	15,0	8,0	-30/+50	16,2	29,0	5,0

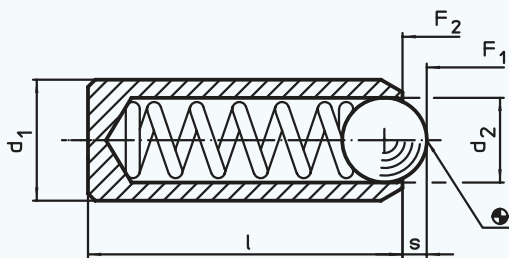
* statistical average value



EH 22080.

Spring Plungers

smooth,
without collar



>>> Special types upon request. <<<
Spring range and forces are precisely tested.

Material:

Body: • Stainless steel 1.4305 **Ball:** • Stainless steel, hardened **Spring:** • Stainless steel

Note:

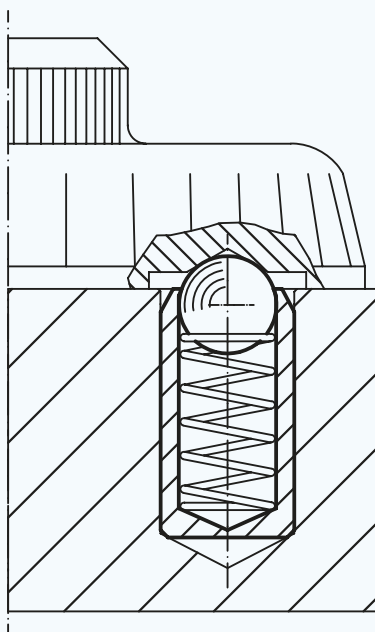
To be used for locating or for applying pressure, as a detent or for ejection.

Temperature range up to 250 °C.

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

Ref. No.	Finish	d ₁ ±0,04	d ₂	l	s	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22080.0310	body and ball from stainless steel	3,0	2,0	7	0,65	4,5	7,5	0,4
22080.0312		3,5	2,5	9	0,80	6,0	14,5	0,6
22080.0315		4,0	3,0	11	0,90	8,0	14,0	0,8
22080.0317		4,5	3,2	12	0,95	9,5	16,5	1,1
22080.0320		5,0	3,5	13	1,00	11,0	18,0	1,5
22080.0322		5,5	4,0	14	1,20	15,5	25,0	1,9
22080.0325		6,0	4,5	15	1,50	18,0	31,0	2,3

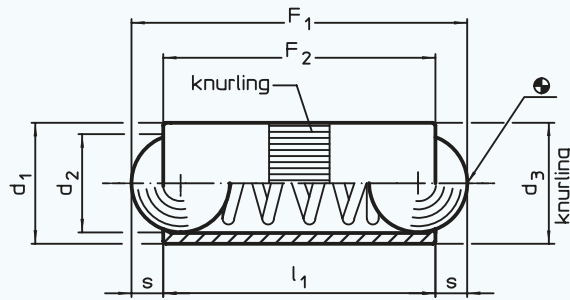
* statistical average value



EH 22090.

Spring Plungers

double ended



>>> Special types upon request. <<<
Spring range and forces are precisely tested.

Material:

Body: • Brass

Ball: • Stainless steel, hardened

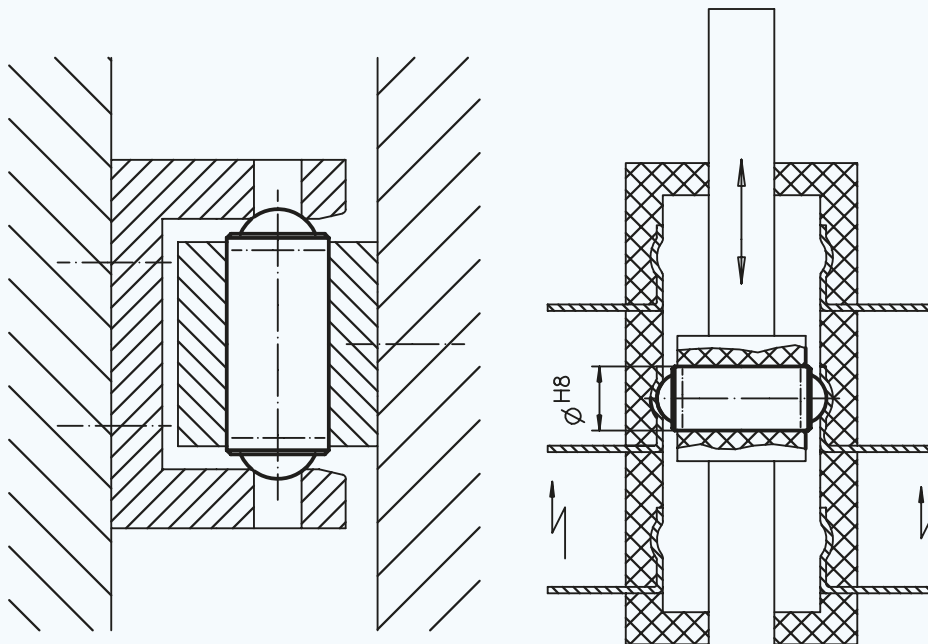
Spring: • Stainless steel

Note:

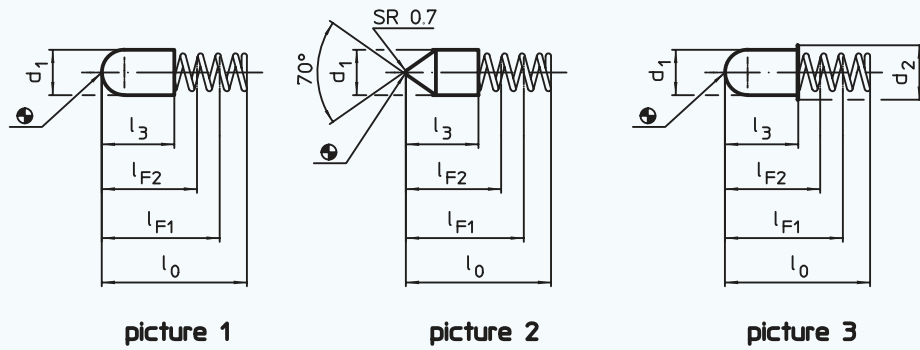
To be used for locating and securing, as well as electric connection.

Ref. No.	d ₁ h10	d ₂	d ₃ +0,05	l ₁	s	Spring load F ₁ N≈*	Spring load F ₂ N≈*	μ g
22090.0025	2,5	2,0	2,52	5,3	0,65	1,3	2,5	0,22
22090.0030	3,0	2,5	3,02	7,3	0,80	2,0	4,5	0,34
22090.0040	4,0	3,0	4,03	9,0	0,90	2,5	7,5	0,65
22090.0050	5,0	4,0	5,03	10,8	1,20	3,5	8,0	1,27
22090.0060	6,0	5,0	6,03	12,6	1,60	3,5	10,5	1,99
22090.0070	7,0	6,0	7,03	14,0	2,00	4,0	12,0	3,00
22090.0080	8,0	6,5	8,03	18,0	2,10	6,0	15,0	5,10

* statistical average value



EH 22100.
Spring Bodies



>>> Special springs upon request. <<<

Material:

- Body:**
- Steel, nickel-plated
 - Stainless steel 1.4303
 - Brass, nickel-plated

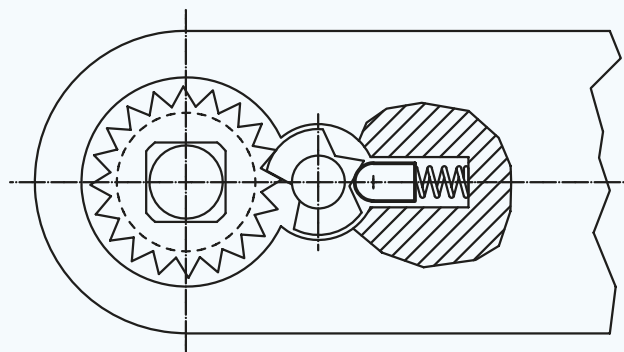
- Spring:**
- Stainless steel 1.4310

Note:

To be used for locating or as a detent.
Temperature range up to 250 °C.

Ref. No.	Finish	d ₁ ±0,05	l ₀	d ₂	l ₃	l _{F1}	l _{F2}	Spring load F ₁ N≈*	Spring load F ₂ N≈*	R N/mm	g
22100.0012	body from steel,	2,2	16	-	7,8	12,0	10,5	2,20	3,0	0,53	0,20
22100.0016	round	2,6	8	-	3,8	6,5	5,2	1,10	2,0	0,70	0,07
22100.0022	(picture 1)	3,0	12	-	6,0	9,0	8,7	6,20	6,8	2,00	0,20
22100.0024		3,0	16	-	8,5	13,0	10,7	4,80	8,4	1,60	0,20
22100.0034		3,4	12	-	6,0	9,0	7,8	5,00	7,0	1,69	0,20
22100.0036		3,4	15	-	7,3	12,0	8,2	5,90	13,3	1,95	0,20
22100.0042		4,0	14	-	8,0	12,0	9,0	5,00	12,3	2,45	0,40
22100.0052		5,0	16	-	8,0	13,0	10,4	8,00	15,0	2,70	0,60
22100.0124	body from stainless steel,	3,0	16	-	8,0	13,0	10,6	4,80	8,6	1,60	0,30
22100.0137	round	3,6	18	-	9,0	15,0	11,5	6,70	14,5	2,24	0,40
22100.0144	(picture 1)	4,0	16	-	7,5	13,0	11,4	8,00	12,3	2,70	0,42
22100.0212	body from steel,	2,2	16	-	7,8	12,0	10,5	2,20	3,0	0,53	0,20
22100.0222	tipped	3,0	11	-	5,0	9,0	6,7	1,60	3,4	0,78	0,20
22100.0224	(picture 2)	3,0	16	-	8,5	13,0	10,7	4,80	8,4	1,60	0,30
22100.0323	body from brass, round, with collar (picture 3)	3,0	13	4,0	6,3	10,0	9,0	5,30	7,0	1,75	0,30
22100.0373	body from stainless steel, round, with collar (picture 3)	3,0	13	4,1	7,0	10,0	8,9	5,30	7,2	1,75	0,20

* statistical average value





Spring Plungers – Inch

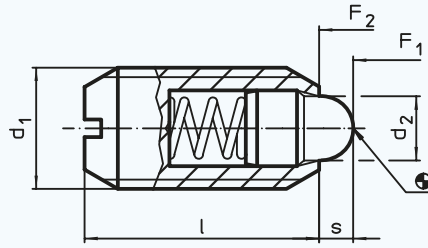




EH 2B020.

Spring Plungers

with pin and slot
UNC / UNF



>>> Special types upon request. <<<
Spring range and forces are precisely tested.

Material:

Body:

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

Pin:

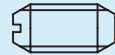
- Free cutting steel, hardened, blackened
- Stainless steel 1.4305 (ASTM-A-582)

Spring:

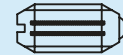
- Stainless steel

Characteristic:

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



Standard spring load



Heavy spring load

Note:

To be used as a detent or for locating, positioning, indexing, locking, latching and ejecting.
Temperature range for types without thread lock up to 482 °F.
Thread lock: Polyamide spot coating (for details please refer to the technical data pages).
Thread: 2A-UNC / UNF

Please pay attention to the technical instructions after these product pages.

Ref. No. without thread lock	Ref. No. with thread lock	Finish	d ₁ *	l*	s*	d ₂ *	Spring load F ₁ lbs. ≈**	Spring load F ₂ lbs. ≈**	μ oz.
2B020.0033	2B020.0233	free cutting steel,	UNC 6-32	3/8	.063	.046	0.5	1.5	0.021
2B020.0036	2B020.0236	standard	UNC 8-32	7/16	.052	.070	0.8	1.5	0.032
2B020.0038	2B020.0238	spring load	UNF 8-36	7/16	.052	.070	0.8	1.5	0.032
2B020.0040	2B020.0240		UNF 10-32	15/32	.065	.093	1.0	2.5	0.042
2B020.0042	2B020.0242		UNC 1/4-20	17/32	.078	.119	1.1	3.5	0.074
2B020.0046	2B020.0246		UNC 5/16-18	37/64	.084	.135	1.0	4.0	0.123
2B020.0048	2B020.0248		UNC 3/8-16	5/8	.110	.186	1.5	4.5	0.187
2B020.0050	2B020.0250		UNC 1/2-13	3/4	.151	.248	1.8	5.5	0.377
2B020.0052	2B020.0252		UNC 5/8-11	1 1/16	.215	.310	2.0	8.5	0.885
2B020.0063	2B020.0263	free cutting steel,	UNC 6-32	3/8	.063	.046	0.5	2.5	0.018
2B020.0066	2B020.0266	heavy spring load	UNC 8-32	7/16	.052	.070	1.8	4.6	0.032
2B020.0068	2B020.0268		UNF 8-36	7/16	.052	.070	1.8	4.6	0.032
2B020.0070	2B020.0270		UNF 10-32	15/32	.065	.093	2.6	6.3	0.042
2B020.0072	2B020.0272		UNC 1/4-20	17/32	.078	.119	3.0	9.7	0.074
2B020.0076	2B020.0276		UNC 5/16-18	37/64	.084	.135	3.8	13.0	0.123
2B020.0078	2B020.0278		UNC 3/8-16	5/8	.110	.186	4.5	16.0	0.190
2B020.0080	2B020.0280		UNC 1/2-13	3/4	.151	.248	5.0	22.4	0.384
2B020.0082	2B020.0282		UNC 5/8-11	1 1/16	.215	.310	7.0	43.5	0.907

* All dimensions are stated in inch.

** statistical average value



Continued from previous page

EH 2B020.

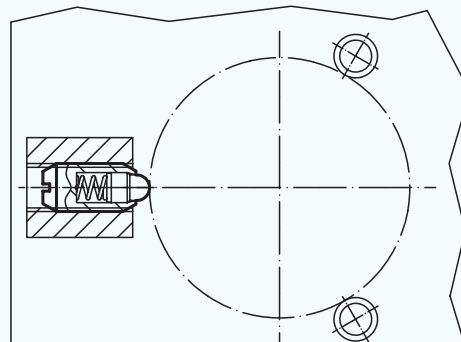
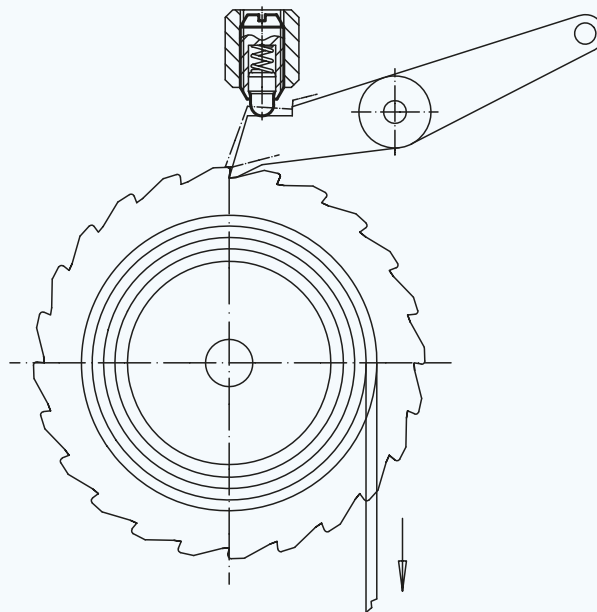
Ref. No. without thread lock	Ref. No. with thread lock	Finish		d_1^*	l^*	s^*	d_2^*	Spring load F_1 lbs. \approx^{**}	Spring load F_2 lbs. \approx^{**}	ω oz.
2B020.0133	2B020.0333	stainless steel, standard spring load	UNC	6-32	3/8	.063	.046	0.5	1.5	0.021
2B020.0136	2B020.0336		UNC	8-32	7/16	.052	.070	0.8	1.5	0.032
2B020.0138	2B020.0338		UNF	8-36	7/16	.052	.070	0.8	1.5	0.032
2B020.0140	2B020.0340		UNF	10-32	15/32	.065	.093	1.0	2.5	0.042
2B020.0142	2B020.0342		UNC	1/4-20	17/32	.078	.119	1.1	3.5	0.074
2B020.0146	2B020.0346		UNC	5/16-18	37/64	.084	.135	1.0	4.0	0.123
2B020.0148	2B020.0348		UNC	3/8-16	5/8	.110	.186	1.5	4.5	0.190
2B020.0150	2B020.0350		UNC	1/2-13	3/4	.151	.248	1.8	5.5	0.388
2B020.0152	2B020.0352		UNC	5/8-11	1 1/16	.215	.310	2.0	8.5	0.892
2B020.0163	2B020.0363	stainless steel, heavy spring load	UNC	6-32	3/8	.063	.046	0.5	2.5	0.014
2B020.0166	2B020.0366		UNC	8-32	7/16	.052	.070	1.8	4.6	0.032
2B020.0168	2B020.0368		UNF	8-36	7/16	.052	.070	1.8	4.6	0.032
2B020.0170	2B020.0370		UNF	10-32	15/32	.065	.093	2.6	6.3	0.042
2B020.0172	2B020.0372		UNC	1/4-20	17/32	.078	.119	3.0	9.7	0.071
2B020.0176	2B020.0376		UNC	5/16-18	37/64	.084	.135	3.8	13.0	0.123
2B020.0178	2B020.0378		UNC	3/8-16	5/8	.110	.186	4.5	16.0	0.194
2B020.0180	2B020.0380		UNC	1/2-13	3/4	.151	.248	5.0	22.4	0.399
2B020.0182	2B020.0382		UNC	5/8-11	1 1/16	.215	.310	7.0	43.5	0.914

* All dimensions are stated in inch.

** statistical average value

Spring Plungers

with pin and slot
UNC / UNF

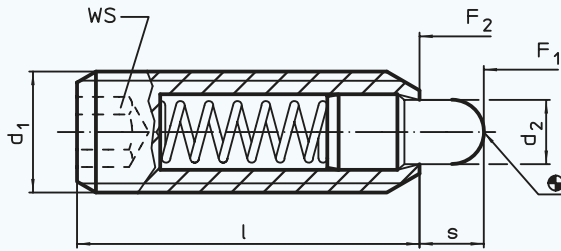




EH 2B030.

Spring Plungers

with pin and internal hexagon
UNC / UNF



>>> Special types upon request. <<<
Spring range and forces are precisely tested.

Material:

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

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

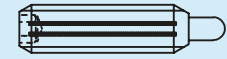
Spring: • Stainless steel

Characteristic:

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



Standard spring load



Heavy spring load

Note:

To be used as a detent or for locating, positioning, indexing, locking, latching and ejecting.
Temperature range for types without thread lock up to 482 °F.

Thread lock: Polyamide spot coating (for details please refer to the technical data pages).

Thread: 2A-UNC / UNF

Please pay attention to the technical instructions after these product pages.

Ref. No. without thread lock	Ref. No. with thread lock	Finish	d ₁ *	l*	s*	d ₂ *	WS*	Spring load F ₁ lbs. ≈**	Spring load F ₂ lbs. ≈**	oz.
2B030.0033	2B030.0233	free cutting steel, standard spring load	UNC 6-32	17/32	.063	.046	1/16	0.5	1.5	0.025
2B030.0036	2B030.0236		UNC 8-32	5/8	.094	.070	5/64	0.8	2.3	0.042
2B030.0040	2B030.0240		UNF 10-32	3/4	.125	.093	3/32	1.4	2.7	0.063
2B030.0042	2B030.0242		UNC 1/4-20	1	.188	.119	1/8	1.0	4.0	0.134
2B030.0044	2B030.0244		UNF 1/4-28	1	.188	.119	1/8	1.0	4.0	0.145
2B030.0046	2B030.0246		UNC 5/16-18	1	.188	.135	5/32	1.5	4.5	0.205
2B030.0048	2B030.0248		UNC 3/8-16	1 1/8	.188	.186	3/16	2.7	7.2	0.335
2B030.0050	2B030.0250		UNC 1/2-13	1 1/4	.250	.248	1/4	2.7	9.3	0.656
2B030.0052	2B030.0252		UNC 5/8-11	1 1/2	.313	.310	5/16	3.5	10.6	1.242
2B030.0053	2B030.0253		UNC 3/4-10	1 3/4	.313	.374	3/8	5.5	14.5	2.152
2B030.0054	2B030.0254	UNC 1-8	2 13/32	.50	.499	3/8	4.0	31.0	5.443	
2B030.0063	2B030.0263	free cutting steel, heavy spring load	UNC 6-32	17/32	.063	.046	1/16	1.5	3.4	0.026
2B030.0066	2B030.0266		UNC 8-32	5/8	.094	.070	5/64	2.6	6.6	0.042
2B030.0070	2B030.0270		UNF 10-32	3/4	.125	.093	3/32	3.2	9.0	0.067
2B030.0072	2B030.0272		UNC 1/4-20	1	.188	.119	1/8	3.1	10.1	0.134
2B030.0074	2B030.0274		UNF 1/4-28	1	.188	.119	1/8	3.1	10.1	0.145
2B030.0076	2B030.0276		UNC 5/16-18	1	.188	.135	5/32	3.0	15.0	0.207
2B030.0078	2B030.0278		UNC 3/8-16	1 1/8	.188	.186	3/16	5.5	12.7	0.335
2B030.0080	2B030.0280		UNC 1/2-13	1 1/4	.250	.248	1/4	6.6	16.0	0.649
2B030.0082	2B030.0282		UNC 5/8-11	1 1/2	.313	.310	5/16	10.5	22.2	1.245
2B030.0083	2B030.0283		UNC 3/4-10	1 3/4	.313	.374	3/8	6.7	33.0	2.187
2B030.0084	2B030.0284	UNC 1-8	2 13/32	.50	.499	3/8	16.0	60.0	5.538	

* All dimensions are stated in inch.

** statistical average value



Continued from previous page

EH 2B030.

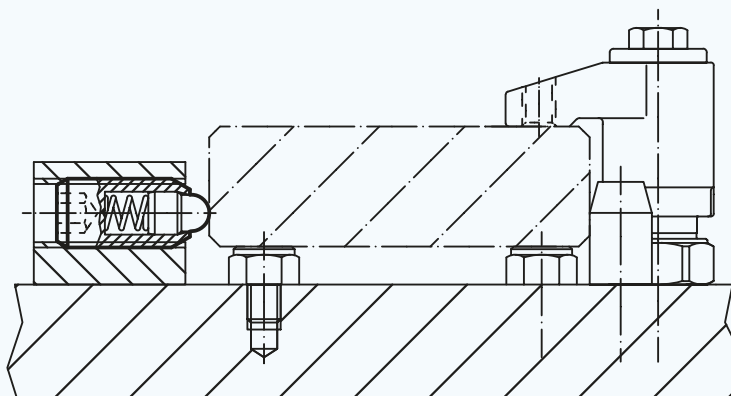
Ref. No. without thread lock	Ref. No. with thread lock	Finish	d ₁ *	l*	s*	d ₂ *	WS*	Spring load F ₁ lbs. ≈**	Spring load F ₂ lbs. ≈**	⚡ oz.	
2B030.0133	2B030.0333	stainless steel, standard spring load	UNC 6-32	17/32	.063	.046	1/16	0.5	1.5	0.018	
2B030.0136	2B030.0336		UNC 8-32	5/8	.094	.070	5/64	0.8	2.3	0.039	
2B030.0140	2B030.0340		UNF 10-32	3/4	.125	.093	3/32	1.4	2.7	0.063	
2B030.0142	2B030.0342		UNC 1/4-20	1	.188	.119	1/8	1.0	4.0	0.131	
2B030.0144	2B030.0344		UNF 1/4-28	1	.188	.119	1/8	1.0	4.0	0.141	
2B030.0146	2B030.0346		UNC 5/16-18	1	.188	.135	5/32	1.5	4.5	0.208	
2B030.0148	2B030.0348		UNC 3/8-16	1 1/8	.188	.186	3/16	2.7	7.2	0.328	
2B030.0150	2B030.0350		UNC 1/2-13	1 1/4	.250	.248	1/4	2.7	9.3	0.653	
2B030.0152	2B030.0352		UNC 5/8-11	1 1/2	.313	.310	5/16	3.5	10.6	1.242	
2B030.0153	2B030.0353		UNC 3/4-10	1 3/4	.313	.374	3/8	5.5	14.5	2.180	
2B030.0154	2B030.0354		UNC 1-8	2 13/32	.50	.499	3/8	4.0	31.0	5.474	
2B030.0163	2B030.0363		stainless steel, heavy spring load	UNC 6-32	17/32	.063	.046	1/16	1.5	3.4	0.025
2B030.0166	2B030.0366			UNC 8-32	5/8	.094	.070	5/64	2.6	6.6	0.042
2B030.0170	2B030.0370	UNF 10-32		3/4	.125	.093	3/32	3.2	9.0	0.063	
2B030.0172	2B030.0372	UNC 1/4-20		1	.188	.119	1/8	3.1	10.1	0.131	
2B030.0174	2B030.0374	UNF 1/4-28		1	.188	.119	1/8	3.1	10.1	0.145	
2B030.0176	2B030.0376	UNC 5/16-18		1	.188	.135	5/32	3.0	15.0	0.212	
2B030.0178	2B030.0378	UNC 3/8-16		1 1/8	.188	.186	3/16	5.5	12.7	0.339	
2B030.0180	2B030.0380	UNC 1/2-13		1 1/4	.250	.248	1/4	6.6	16.0	0.653	
2B030.0182	2B030.0382	UNC 5/8-11		1 1/2	.313	.310	5/16	10.5	22.2	1.252	
2B030.0183	2B030.0383	UNC 3/4-10		1 3/4	.313	.374	3/8	6.7	33.0	2.198	
2B030.0184	2B030.0384	UNC 1-8		2 13/32	.50	.499	3/8	16.0	60.0	5.524	

* All dimensions are stated in inch.

** statistical average value

Spring Plungers

with pin and internal hexagon
UNC / UNF

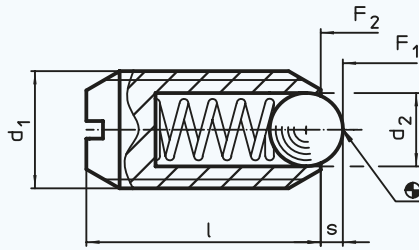




EH 2B050.

Spring Plungers

with ball and slot
UNC / UNF



>>> Special types upon request. <<<
Spring range and forces are precisely tested.



Material:

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

Ball: • Stainless steel, hardened

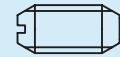
Spring: • Stainless steel

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

Note:

To be used as a detent or for locating, positioning, indexing, locking, latching and ejecting.
Temperature range for types without thread lock up to 482 °F.

Thread lock: Polyamide spot coating (for details please refer to the technical data pages).

Thread: 2A-UNC / UNF

Please pay attention to the technical instructions after these product pages.

Ref. No. without thread lock	Ref. No. with thread lock	Finish	d ₁ *	l*	s*	d ₂ *	Spring load F ₁ lbs. ≈**	Spring load F ₂ lbs. ≈**	oz.
2B050.0010	2B050.0210	free cutting steel,	UNF 10-32	33/64	.025	3/32	0.9	1.5	0.049
2B050.0012	2B050.0212	light spring load	UNC 1/4-20	17/32	.035	1/8	2.1	4.0	0.074
2B050.0016	2B050.0216		UNC 5/16-18	37/64	.040	5/32	2.0	4.6	0.123
2B050.0018	2B050.0218		UNC 3/8-16	5/8	.048	3/16	2.5	5.0	0.193
2B050.0020	2B050.0220		UNC 1/2-13	3/4	.072	9/32	3.0	6.0	0.397
2B050.0022	2B050.0222		UNC 5/8-11	63/64	.096	3/8	4.5	9.0	0.787
2B050.0031	2B050.0231	free cutting steel,	UNF 4-48	3/16	.020	1/16	0.1	0.5	0.008
2B050.0032	2B050.0232	standard	UNC 5-40	1/4	.020	1/16	0.3	0.8	0.016
2B050.0033	2B050.0233	spring load	UNC 6-32	5/16	.023	5/64	0.5	1.0	0.020
2B050.0035	2B050.0235		UNF 6-40	5/16	.023	5/64	0.5	1.0	0.020
2B050.0036	2B050.0236		UNC 8-32	11/32	.025	3/32	0.8	1.3	0.026
2B050.0038	2B050.0238		UNF 8-36	11/32	.025	3/32	0.8	1.3	0.026
2B050.0040	2B050.0240		UNF 10-32	33/64	.025	3/32	2.0	3.1	0.049
2B050.0042	2B050.0242		UNC 1/4-20	17/32	.035	1/8	3.8	6.8	0.073
2B050.0046	2B050.0246		UNC 5/16-18	37/64	.040	5/32	4.0	8.4	0.123
2B050.0048	2B050.0248		UNC 3/8-16	5/8	.048	3/16	5.0	10.3	0.198
2B050.0050	2B050.0250		UNC 1/2-13	3/4	.072	9/32	6.0	12.0	0.406
2B050.0052	2B050.0252		UNC 5/8-11	63/64	.096	3/8	9.0	18.0	0.811
2B050.0070	2B050.0270	free cutting steel,	UNF 10-32	33/64	.025	3/32	3.3	4.8	0.049
2B050.0072	2B050.0272	heavy spring load	UNC 1/4-20	17/32	.035	1/8	5.6	8.6	0.073
2B050.0076	2B050.0276		UNC 5/16-18	37/64	.040	5/32	6.0	11.1	0.122
2B050.0078	2B050.0278		UNC 3/8-16	5/8	.048	3/16	7.5	15.1	0.196
2B050.0080	2B050.0280		UNC 1/2-13	3/4	.072	9/32	6.0	24.0	0.408
2B050.0082	2B050.0282		UNC 5/8-11	63/64	.096	3/8	7.0	40.0	0.825

* All dimensions are stated in inch.

** statistical average value



Continued from previous page

EH 2B050.

Ref. No. without thread lock	Ref. No. with thread lock	Finish	d ₁ *	l*	s*	d ₂ *	Spring load F ₁ lbs. ≈**	Spring load F ₂ lbs. ≈**	μ oz.
2B050.0110	2B050.0310	stainless steel, light spring load	UNF 10-32	33/64	.025	3/32	0.9	1.5	0.048
2B050.0112	2B050.0312		UNC 1/4-20	17/32	.035	1/8	2.1	4.0	0.071
2B050.0116	2B050.0316		UNC 5/16-18	37/64	.040	5/32	2.0	4.6	0.123
2B050.0118	2B050.0318		UNC 3/8-16	5/8	.048	3/16	2.5	5.0	0.190
2B050.0120	2B050.0320		UNC 1/2-13	3/4	.072	9/32	3.0	6.0	0.397
2B050.0122	2B050.0322		UNC 5/8-11	63/64	.096	3/8	4.5	9.0	0.790
2B050.0131	2B050.0331	stainless steel, standard spring load	UNF 4-48	3/16	.020	1/16	0.1	0.5	0.005
2B050.0132	2B050.0332		UNC 5-40	1/4	.020	1/16	0.3	0.8	0.015
2B050.0133	2B050.0333		UNC 6-32	5/16	.023	5/64	0.5	1.0	0.018
2B050.0135	2B050.0335		UNF 6-40	5/16	.023	5/64	0.5	1.0	0.019
2B050.0136	2B050.0336		UNC 8-32	11/32	.025	3/32	0.8	1.3	0.026
2B050.0138	2B050.0338		UNF 8-36	11/32	.025	3/32	0.8	1.3	0.026
2B050.0140	2B050.0340		UNF 10-32	33/64	.025	3/32	2.0	3.1	0.049
2B050.0142	2B050.0342		UNC 1/4-20	17/32	.035	1/8	3.8	6.8	0.072
2B050.0146	2B050.0346		UNC 5/16-18	37/64	.040	5/32	4.0	8.4	0.123
2B050.0148	2B050.0348		UNC 3/8-16	5/8	.048	3/16	5.0	10.3	0.198
2B050.0150	2B050.0350		UNC 1/2-13	3/4	.072	9/32	6.0	12.0	0.396
2B050.0152	2B050.0352		UNC 5/8-11	63/64	.096	3/8	9.0	18.0	0.813
2B050.0170	2B050.0370	stainless steel, heavy spring load	UNF 10-32	33/64	.025	3/32	3.3	4.8	0.046
2B050.0172	2B050.0372		UNC 1/4-20	17/32	.035	1/8	5.6	8.6	0.074
2B050.0176	2B050.0376		UNC 5/16-18	37/64	.040	5/32	6.0	11.1	0.123
2B050.0178	2B050.0378		UNC 3/8-16	5/8	.048	3/16	7.5	15.1	0.197
2B050.0180	2B050.0380		UNC 1/2-13	3/4	.072	9/32	6.0	24.0	0.409
2B050.0182	2B050.0382		UNC 5/8-11	63/64	.096	3/8	7.0	40.0	0.825

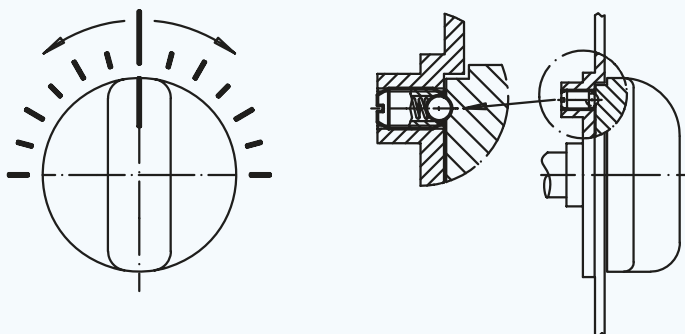
Spring Plungers

with ball and slot
UNC / UNF



* All dimensions are stated in inch.

** statistical average value



Spring Plungers - INCH

Technical Data



Spring forces F1, F2 and range s are subject to precise testing.



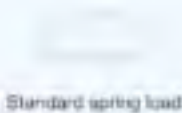
High quality and little abrasion due to the use of hardened bolts.



Absolute functional security due to one-piece body design.



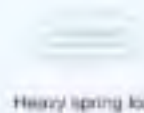
Clear, uniform and visible designation of the spring force by means of constant body marking.



Standard spring load



Light spring load



Heavy spring load

Conversion table

Measurements

Inch (in)	in	Millimeter (mm)	in x 25.4 = mm
Millimeter (mm)	mm	Inch (in)	mm x 0,03937 = in

Weight/Force

Ounce (oz)	oz	Gram (g)	oz x 28 = g
Gram (g)	g	Ounce (oz)	g x 0,0357 = oz
Pounds (lb)	lb	Kilogram (kg)	lb x 0,4536 = kg
Kilogram (kg)	kg	Pound (lb)	kg x 2,205 = lb
Kilogram (kg)	kg	Newton (N)	kg x 9,81 = N
Newton (N)	N	Kilogram (kg)	N / 9,81 = kg

Temperature

Degree Fahrenheit (°F)	°F	Degree Centigrade (°C)	(°F - 32) x 5/9 = °C
Degree Centigrade (°C)	°C	Degree Fahrenheit (°F)	°C x 9/5 + 32 = °F

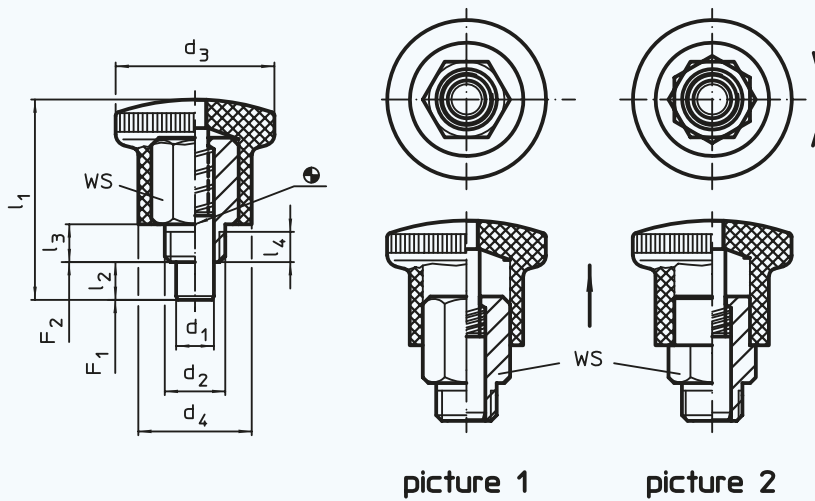
Torque

Foot-pounds (ft-lbs)	ft-lbs	Newton-Meter (Nm)	ft-lbs x 1,36 = Nm
Newton-Meter (Nm)	Nm	Foot-pounds (ft-lbs)	Nm x 0,74 = ft-lbs



EH 22110.

**Index
Plungers
mini indexes**



Material:

Body: • Steel, galvanized
• Stainless steel 1.4305

Locking pin: • Stainless steel 1.4305

Knob: • Thermoplastic PA 6, black, dull
• Not removable

Note:

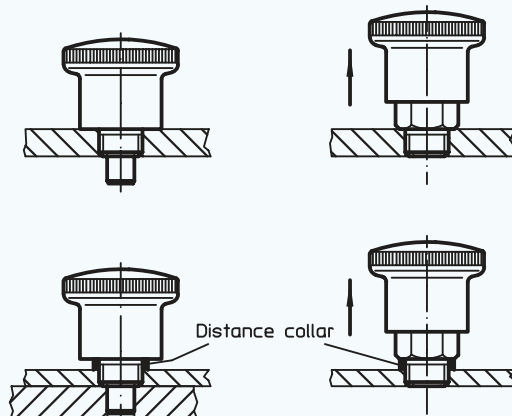
Performance in the smallest space requirements. Particularly suitable to be screwed into thin walled pieces. When using the self-locking type the knob is pulled-out, turned 30° and secured by a notched catch. Temperature range from - 30 °C up to + 80 °C.

Assembly instruction: 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.).

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ 0 -0,06	d ₂	d ₃	d ₄	l ₁	l ₂ min.	l ₃	l ₄ min.	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22110.0024	22110.0044	without locking	4	M 8 x 0,75	21	15	26,5	5	5	3,5	10	4,5	12	14
22110.0026	22110.0046	(picture 1)	5	M 8 x 0,75	21	15	26,5	5	5	3,5	10	4,5	12	14
22110.0028	22110.0048		6	M 10 x 1	25	18	34,0	7	7	4,5	12	5,0	18	25
22110.0030	22110.0050		7	M 10 x 1	25	18	34,0	7	7	4,5	12	5,0	18	26
22110.0034	22110.0054	with locking	4	M 8 x 0,75	21	15	26,5	5	5	3,5	10	4,5	12	13
22110.0036	22110.0056	(picture 2)	5	M 8 x 0,75	21	15	26,5	5	5	3,5	10	4,5	12	14
22110.0038	22110.0058		6	M 10 x 1	25	18	34,0	7	7	4,5	12	5,0	18	24
22110.0040	22110.0060		7	M 10 x 1	25	18	34,0	7	7	4,5	12	5,0	18	25

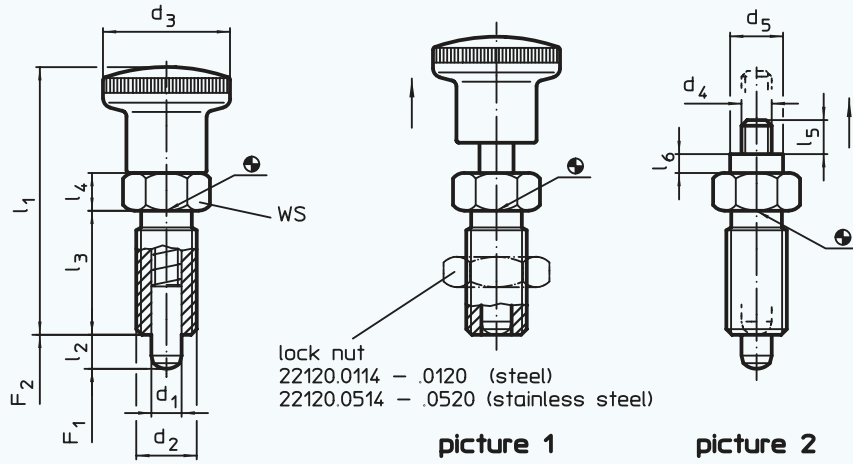
* statistical average value



EH 22110.

**Index
Plungers
compact**

with hexagon collar



Material:

Body: • Steel, blackened
• Stainless steel 1.4305

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

Knob: • Thermoplastic PA 6, black, dull
• Not removable

Note:

For indexing purposes.

Types with / without lock have the same building height. Due to a thread recess the index bolt can be completely screwed in.

Temperature range from - 30 °C up to + 80 °C.

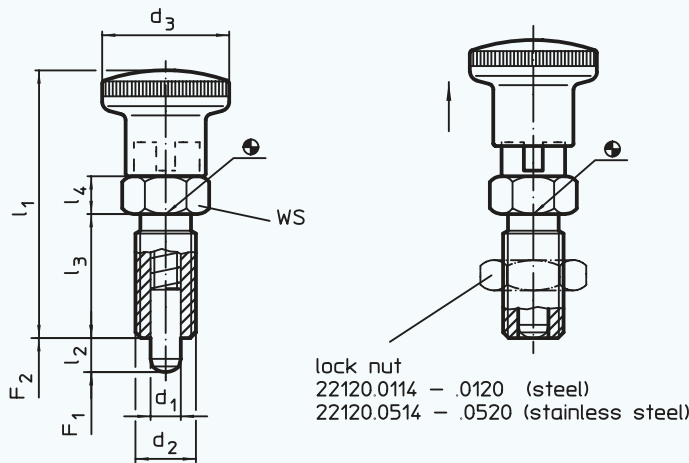
Lock nuts have to be purchased separately.

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

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ -0,02 -0,04	l ₂ min.	d ₂	d ₃	d ₄	d ₅	l ₁	l ₃	l ₄	l ₅	l ₆	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	μg
22110.0103	22110.0203	with knob	4	4	M 8 x 1	16	-	-	35	16	5	-	-	10	4,5	12,0	10
22110.0104	22110.0204	(picture 1)	4	6	M 8 x 1	16	-	-	35	16	5	-	-	10	4,0	12,5	10
22110.0106	22110.0206		5	5	M 10 x 1	19	-	-	40	18	6	-	-	12	5,0	15,0	18
22110.0107	22110.0207		5	8	M 10 x 1	19	-	-	40	18	6	-	-	12	5,0	18,0	18
22110.0109	22110.0209		6	6	M 12 x 1,5	23	-	-	48	22	6	-	-	14	6,5	19,0	29
22110.0110	22110.0210		6	9	M 12 x 1,5	23	-	-	48	22	6	-	-	14	6,0	25,0	29
22110.0112	22110.0212		8	8	M 16 x 1,5	28	-	-	58	26	8	-	-	17	8,5	26,0	62
22110.0113	22110.0213		8	12	M 16 x 1,5	28	-	-	58	26	8	-	-	17	8,5	28,0	62
22110.0115	22110.0215		10	12	M 16 x 1,5	28	-	-	58	26	8	-	-	17	9,5	38,0	63
22110.0116	22110.0216		12	15	M 20 x 1,5	28	-	-	67	33	10	-	-	22	11,5	40,0	117
22110.0143	22110.0243	without knob	4	4	M 8 x 1	-	M 3	7	-	16	5	4,5	2,5	10	4,5	12,0	9
22110.0144	22110.0244	(picture 2)	4	6	M 8 x 1	-	M 3	7	-	16	5	4,5	2,5	10	4,0	12,5	9
22110.0146	22110.0246		5	5	M 10 x 1	-	M 4	8	-	18	6	5,5	3,0	12	5,0	15,0	16
22110.0147	22110.0247		5	8	M 10 x 1	-	M 4	8	-	18	6	5,5	3,0	12	5,0	18,0	16
22110.0149	22110.0249		6	6	M 12 x 1,5	-	M 5	9	-	22	6	7,0	3,5	14	6,5	19,0	25
22110.0150	22110.0250		6	9	M 12 x 1,5	-	M 5	9	-	22	6	7,0	3,5	14	6,0	25,0	25
22110.0152	22110.0252		8	8	M 16 x 1,5	-	M 6	10	-	26	8	8,5	4,0	17	8,5	26,0	55
22110.0153	22110.0253		8	12	M 16 x 1,5	-	M 6	10	-	26	8	8,5	4,0	17	8,5	28,0	55
22110.0155	22110.0255		10	12	M 16 x 1,5	-	M 6	10	-	26	8	8,5	4,0	17	9,5	38,0	56
22110.0156	22110.0256		12	15	M 20 x 1,5	-	M 6	12	-	33	10	8,5	4,0	22	11,5	40,0	111

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₂	μg
22120.0114	22120.0514	lock nuts	M 8 x 1,0	2,7
22120.0115	22120.0515	ISO 8675 (DIN 439)	M 10 x 1,0	5,2
22120.0116	22120.0516	for the following sizes	M 12 x 1,5	7,4
22120.0118	22120.0518		M 16 x 1,5	18,0
22120.0120	22120.0520		M 20 x 1,5	32,0

* statistical average value



lock nut
 22120.0114 - .0120 (steel)
 22120.0514 - .0520 (stainless steel)

EH 22110.

Index Plungers compact

with hexagon collar and locking



Material:

Body: • Steel, blackened
 • Stainless steel 1.4305

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

Knob: • Thermoplastic PA 6, black, dull
 • Not removable

Note:

For indexing purposes.

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

Executions with / without lock have the same building height. Due to a thread recess the index bolt can be completely screwed in.

Temperature range from - 30 °C up to + 80 °C. Lock nuts have to be purchased separately.

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

Ref. No. Steel	Ref. No. Stainless steel	d ₁ -0,02 -0,04	l ₂ min.	d ₂	d ₃	l ₁	l ₃	l ₄	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22110.0123	22110.0223	4	4	M 8 x 1	16	35	16	5	10	4,5	12,0	12
22110.0124	22110.0224	4	6	M 8 x 1	16	35	16	5	10	4,0	12,5	12
22110.0126	22110.0226	5	5	M 10 x 1	19	40	18	6	12	5,0	15,0	20
22110.0127	22110.0227	5	8	M 10 x 1	19	40	18	6	12	5,0	18,0	20
22110.0129	22110.0229	6	6	M 12 x 1,5	23	48	22	6	14	6,5	19,0	31
22110.0130	22110.0230	6	9	M 12 x 1,5	23	48	22	6	14	6,0	25,0	33
22110.0132	22110.0232	8	8	M 16 x 1,5	28	58	26	8	17	8,5	26,0	65
22110.0133	22110.0233	8	12	M 16 x 1,5	28	58	26	8	17	8,5	28,0	68
22110.0135	22110.0235	10	12	M 16 x 1,5	28	58	26	8	17	9,5	38,0	69
22110.0136	22110.0236	12	15	M 20 x 1,5	28	67	33	10	22	11,5	40,0	125

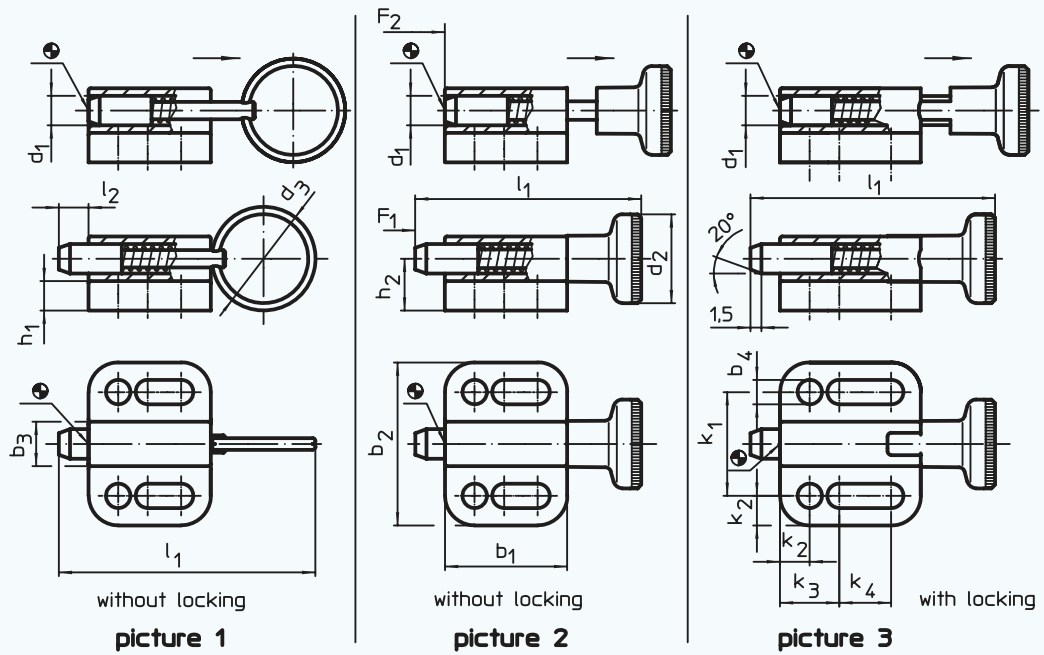
Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₂	g
22120.0114	22120.0514	lock nuts	M 8 x 1,0	2,7
22120.0115	22120.0515	ISO 8675 (DIN 439)	M 10 x 1,0	5,2
22120.0116	22120.0516	for the following sizes	M 12 x 1,5	7,4
22120.0118	22120.0518		M 16 x 1,5	18,0
22120.0120	22120.0520		M 20 x 1,5	32,0

* statistical average value

EH 22110.

Index Plungers

with mounting flange, horizontal



Material:

- Housing:** • Zinc die-cast, plastic coated, black
Knob: • Thermoplastic PA 6, black, dull
 • Not removable

- Locking pin:** • Stainless steel 1.4305
Pull-ring: • Stainless steel 1.4310

Note:

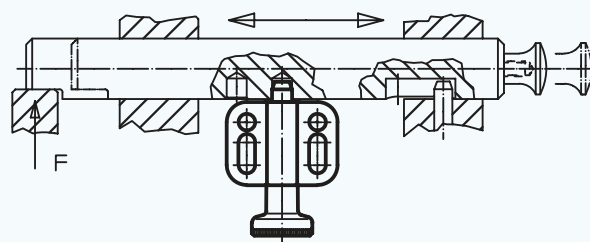
Assembly by means of washers ISO 7092.

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

Temperature range from - 30 °C up to + 80 °C; pull-ring design up to 100 °C.

Ref. No.	Finish	d ₁ h9	d ₂	d ₃	b ₁	b ₂	b ₃	b ₄ -0,2	h ₁	h ₂	k ₁ ±0,05	k ₂	k ₃	k ₄	l ₁	l ₂ min.	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22110.0304	with pull-ring,	4	-	14	16,5	22	6	3,3	4,0	7,0	14	4,0	8	4,5	34,0	4	3	12	10
22110.0305	no locking	5	-	18	22,0	28	8	4,3	4,5	9,5	18	5,0	10	7,0	44,5	5	5	24	20
22110.0306	(picture 1)	6	-	24	27,5	32	10	5,4	5,0	10,5	21	5,5	12	10,0	57,0	6	5	21	40
22110.0308		8	-	30	33,0	34	12	5,4	6,0	12,5	23	5,5	12	15,5	71,0	8	6	22	58
22110.0324	with knob,	4	12	-	16,5	22	6	3,3	4,0	7,0	14	4,0	8	4,5	30,5	4	3	12	11
22110.0325	no locking	5	16	-	22,0	28	8	4,3	4,5	9,5	18	5,0	10	7,0	40,0	5	5	24	20
22110.0326	(picture 2)	6	18	-	27,5	32	10	5,4	5,0	10,5	21	5,5	12	10,0	49,0	6	5	21	37
22110.0328		8	21	-	33,0	34	12	5,4	6,0	12,5	23	5,5	12	15,5	59,0	8	6	22	61
22110.0344	with knob	4	12	-	19,0	22	6	3,3	4,0	7,0	14	4,0	8	7,0	33,0	4	3	12	10
22110.0345	and locking	5	16	-	25,5	28	8	4,3	4,5	9,5	18	5,0	10	10,5	43,5	5	5	24	26
22110.0346	(picture 3)	6	18	-	30,5	32	10	5,4	5,0	10,5	21	5,5	12	13,0	52,0	6	5	21	40
22110.0348		8	21	-	37,5	34	12	5,4	6,0	12,5	23	5,5	12	20,0	63,5	8	6	22	67

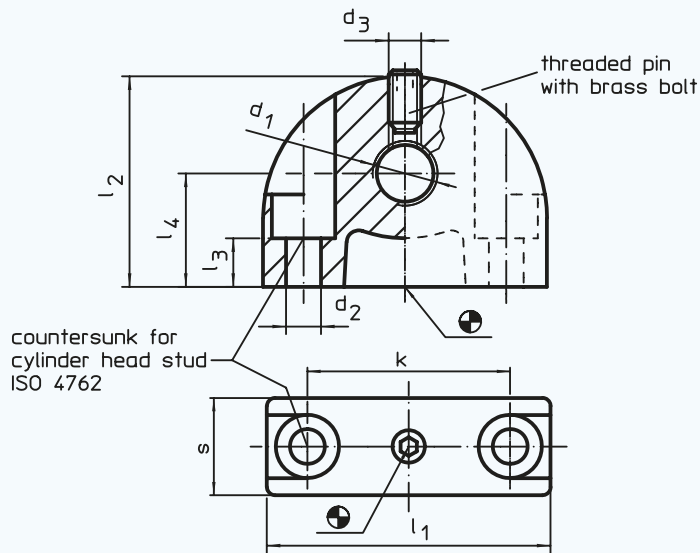
* statistical average value



EH 22110.

Mounting Blocks

zinc die-cast,
for index plungers and
index bolts



Material:

Body: • Zinc die-cast, plastic coated, black

Grub screw: • Steel, blackened, with brass bolt

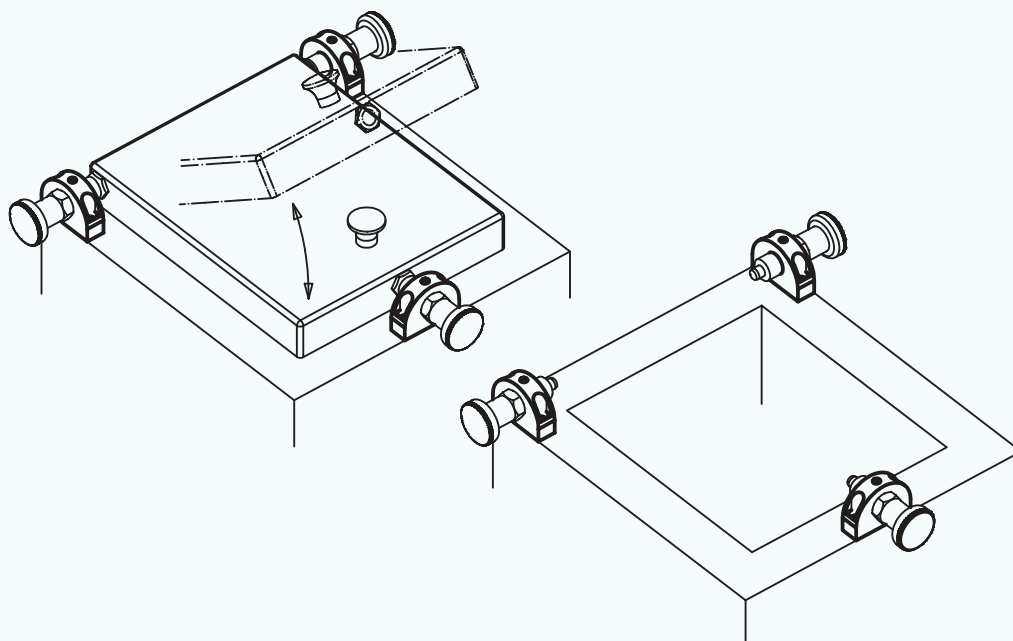
Note:

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

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

Temperature range up to 100 °C.

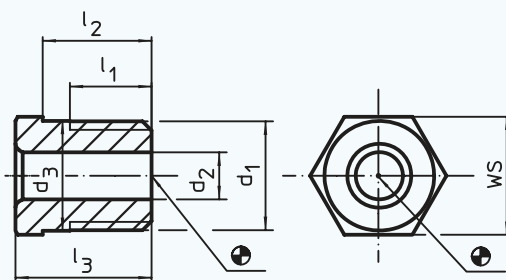
Ref. No.	Finish	d_1	d_2	d_3	k	l_1	l_2	l_3 -0,2	l_4	s	$\frac{g}{g}$
22110.0408	mounting hole	M 8 x 1	4,3	M 4	25	35	26	11,5	14	12	39
22110.0410	vertically to	M 10 x 1	4,3	M 4	25	35	26	11,5	14	12	36
22110.0412	index bolt / index plunger	M 12 x 1,5	4,3	M 4	25	35	26	11,5	14	12	41
22110.0416		M 16 x 1,5	5,3	M 5	35	47	34	15,5	18	14	77
22110.0420		M 20 x 1,5	5,3	M 5	35	47	34	15,5	18	14	68



EH 22110.

Locating Bushings

for index bolts and index plungers



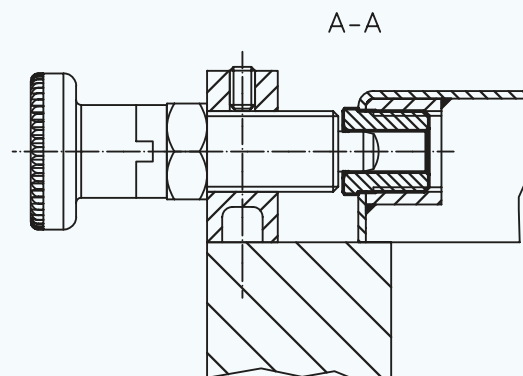
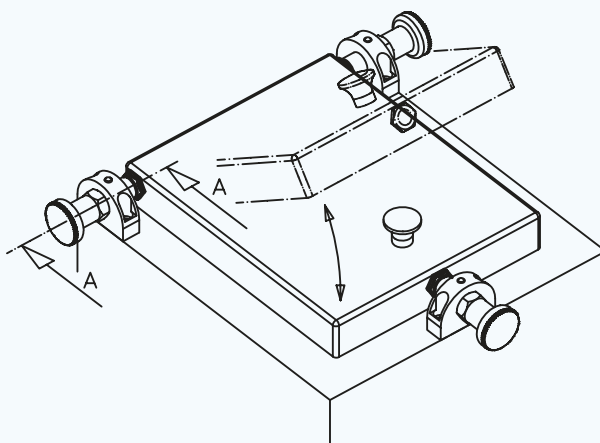
Material:

- Steel, nitrided

Note:

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

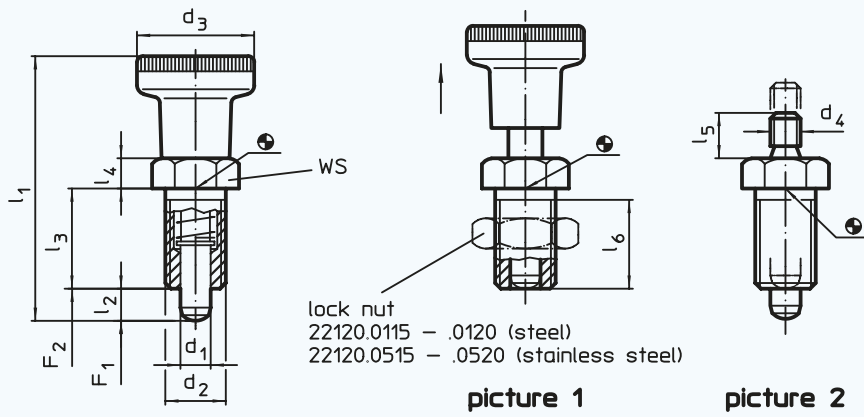
Ref. No.	d ₁	For stud	d ₂ +0,1	d ₃ ±0,3	l ₁ min.	l ₂ -0,3	l ₃	WS	g
22110.0454	M 12 x 1,5	4	4,2	12,1	9	12	15	13	10
22110.0455	M 12 x 1,5	5	5,2	12,1	9	12	15	13	10
22110.0456	M 12 x 1,5	6	6,2	12,1	9	12	15	13	9
22110.0458	M 16 x 1,5	8	8,2	16,1	11	14	17	17	18
22110.0460	M 16 x 1,5	10	10,2	16,1	11	14	17	17	14
22110.0462	M 16 x 1,5	12	12,2	16,1	11	14	17	17	9



EH 22120.

Index Plungers

with hexagon collar



picture 1

picture 2

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
• Not removable

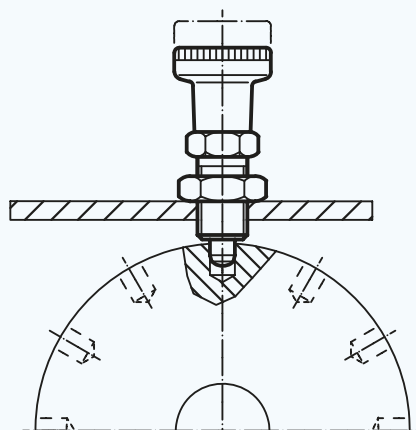
Note:

For indexing purposes.
Temperature range from - 30 °C up to + 80 °C.
Lock nuts have to be purchased separately.

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ -0,02 -0,04	d ₂	d ₃	d ₄	l ₁ ≈	l ₂ min.	l ₃	l ₄	l ₅	l ₆ min.	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22120.0005	22120.0405	with knob	5	M 10 x 1,0	21	-	45,0	5	17	5	-	15	12	6,0	14	19
22120.0006	22120.0406	(picture 1)	6	M 12 x 1,5	25	-	54,5	6	20	6	-	17	14	5,5	13	31
22120.0008	22120.0408		8	M 16 x 1,5	31	-	69,0	8	26	8	-	23	19	11,5	28	71
22120.0010	22120.0410		10	M 20 x 1,5	31	-	80,0	10	33	10	-	30	22	23,0	54	115
22120.0025	22120.0425	without knob,	5	M 10 x 1,0	-	M 5	-	5	17	5	6	15	12	6,0	14	14
22120.0026	22120.0426	(picture 2)	6	M 12 x 1,5	-	M 6	-	6	20	6	10	17	14	5,5	13	23
22120.0028	22120.0428		8	M 16 x 1,5	-	M 8	-	8	26	8	12	23	19	11,5	28	54
22120.0030	22120.0430		10	M 20 x 1,5	-	M 8	-	10	33	10	12	30	22	23,0	54	79

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₂	g
22120.0115	22120.0515	lock nuts	M 10 x 1,0	5,2
22120.0116	22120.0516	ISO 8675 (DIN 439)	M 12 x 1,5	7,4
22120.0118	22120.0518	for the following sizes	M 16 x 1,5	18,0
22120.0120	22120.0520		M 20 x 1,5	32,0

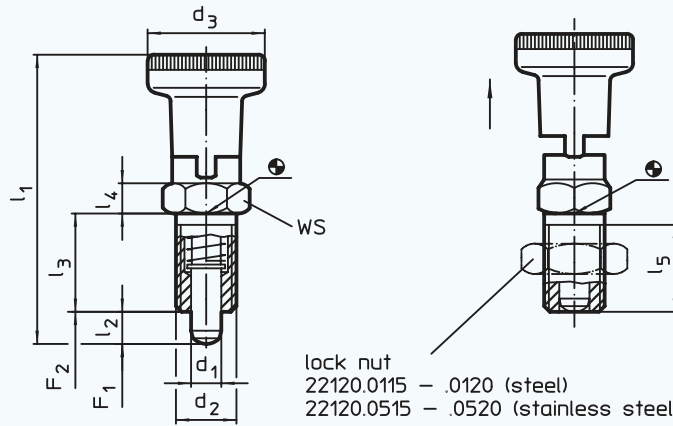
* statistical average value



EH 22120.

**Index
Plungers**

with hexagon collar
and locking



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
• Not removable

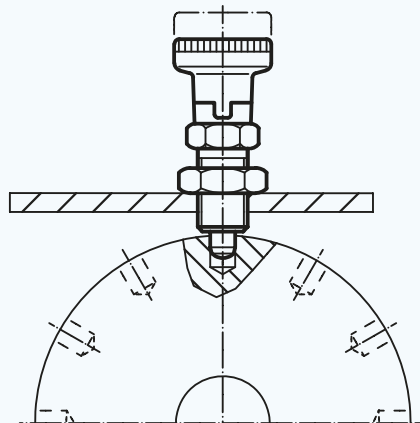
Note:

For indexing purposes.
The knob is pulled out, turned 90° and secured by a notched catch (when locking pin must not project).
Temperature range from - 30 °C up to + 80 °C.
Lock nuts have to be purchased separately.

Ref. No. Steel	Ref. No. Stainless steel	d ₁ -0,02 -0,04	d ₂	d ₃	l ₁ ≈	l ₂ min.	l ₃	l ₄	l ₅ min.	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	μg
22120.0205	22120.0605	5	M 10 x 1,0	21	51,0	5	17	5	15	12	6,0	14	22
22120.0206	22120.0606	6	M 12 x 1,5	25	61,0	6	20	6	17	14	5,5	13	36
22120.0208	22120.0608	8	M 16 x 1,5	31	75,5	8	26	8	23	19	11,5	28	79
22120.0210	22120.0610	10	M 20 x 1,5	31	91,0	10	33	10	30	22	28,0	54	134

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₂	μg
22120.0115	22120.0515	lock nuts	M 10 x 1,0	5,2
22120.0116	22120.0516	ISO 8675 (DIN 439)	M 12 x 1,5	7,4
22120.0118	22120.0518	for the following sizes	M 16 x 1,5	18,0
22120.0120	22120.0520		M 20 x 1,5	32,0

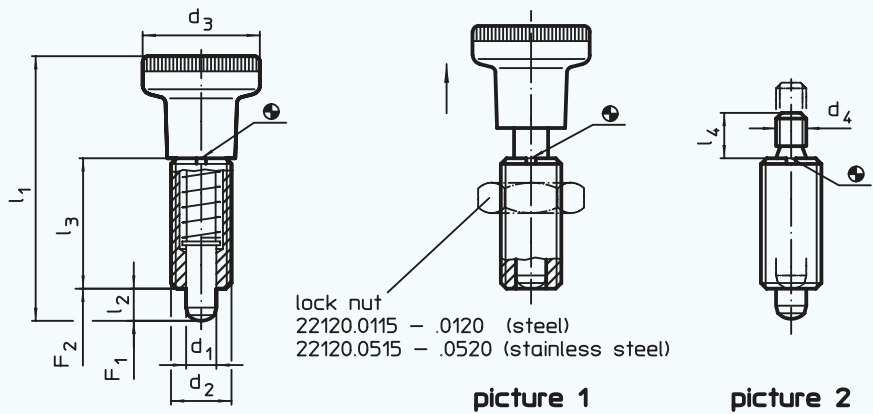
* statistical average value



EH 22120.

Index Plungers

fully threaded body



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
• Not removable

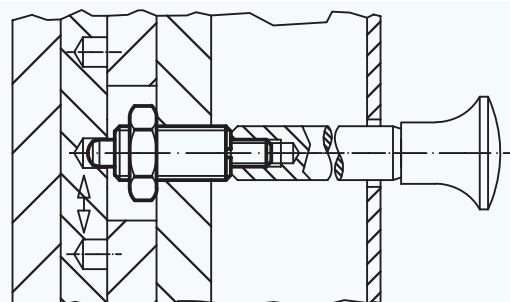
Note:

For indexing purposes.
Suitable screwdrivers are available.
Temperature range from - 30 °C up to + 80 °C.
Lock nuts have to be purchased separately.

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ -0,02 -0,04	d ₂	d ₃	d ₄	l ₁ ≈	l ₂ min.	l ₃	l ₄	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22120.0045	22120.0445	with knob (picture 1)	5	M 10 x 1,0	21	-	45,0	5	22	-	6,0	14	17
22120.0046	22120.0446		6	M 12 x 1,5	25	-	54,5	6	26	-	5,5	13	27
22120.0048	22120.0448		8	M 16 x 1,5	31	-	69,0	8	34	-	11,5	28	63
22120.0050	22120.0450		10	M 20 x 1,5	31	-	80,0	10	41	-	23,0	54	104
22120.0065	22120.0465	without knob, (picture 2)	5	M 10 x 1,0	-	M 5	-	5	22	6	6,0	14	12
22120.0066	22120.0466		6	M 12 x 1,5	-	M 6	-	6	26	10	5,5	13	12
22120.0068	22120.0468		8	M 16 x 1,5	-	M 8	-	8	34	12	11,5	28	46
22120.0070	22120.0470		10	M 20 x 1,5	-	M 8	-	10	43	12	23,0	54	87

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₂	g
22120.0115	22120.0515	lock nuts	M 10 x 1,0	5,2
22120.0116	22120.0516	ISO 8675 (DIN 439)	M 12 x 1,5	7,4
22120.0118	22120.0518	for the following sizes	M 16 x 1,5	18,0
22120.0120	22120.0520		M 20 x 1,5	32,0
22120.0955		Assembly tool for the following sizes	M 10 x 1,0	9,5
22120.0956		M 12 x 1,5	14,0	
22120.0958		M 16 x 1,5	25,0	
22120.0960		M 20 x 1,5	27,0	

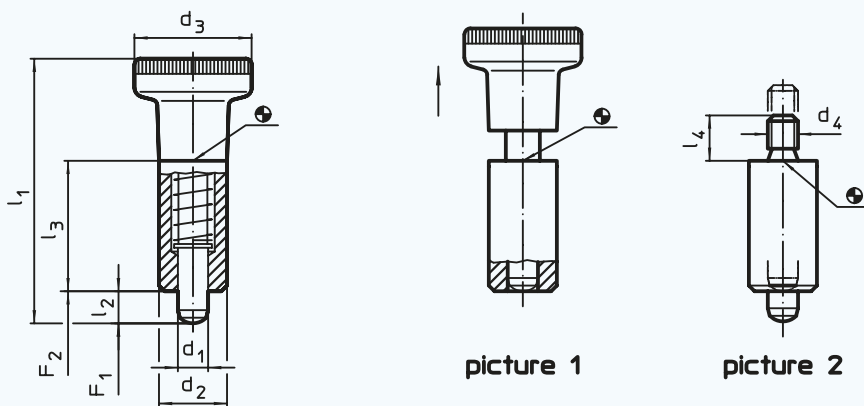
* statistical average value



EH 22120.

**Index
Plungers**

unthreaded, weldable



Material:

Body: • Steel, blackened, weldable

Locking pin: • Steel, hardened

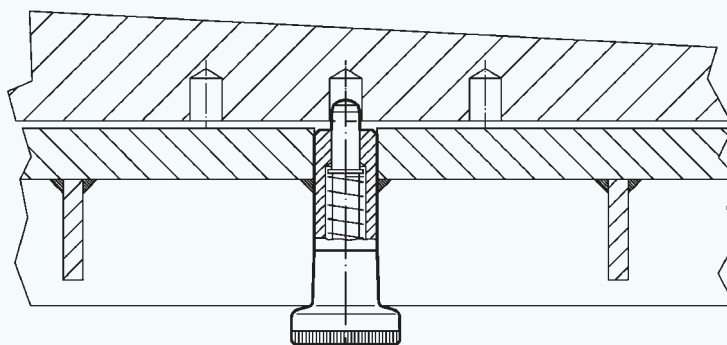
Knob: • Thermoplastic PA 6, black
• Not removable

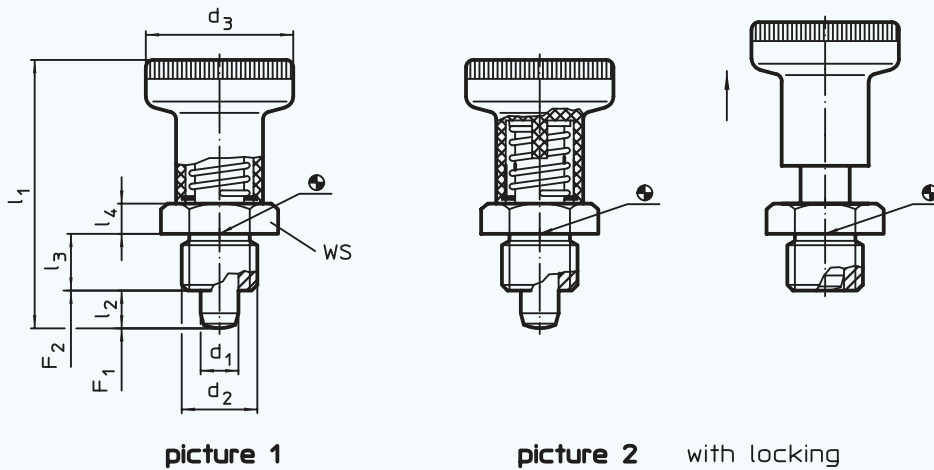
Note:

For indexing purposes.
Attached by welding or glueing.
Temperature range from - 30 °C up to + 80 °C.

Ref. No.	Finish	d ₁ -0,02 -0,04	d ₂ h9	d ₃	d ₄	l ₁ ≈	l ₂ min.	l ₃	l ₄	Spring load F ₁ N≈*	Spring load F ₂ N≈*	± g
22120.0805	with knob	5	12	21	-	45,0	5	22	-	7,0	16	25
22120.0806	(picture 1)	6	14	25	-	54,5	6	26	-	6,5	15	40
22120.0808		8	18	31	-	69,0	8	34	-	12,0	31	84
22120.0825	without knob	5	12	-	M 5	-	5	22	6	7,0	16	19
22120.0826	(picture 2)	6	14	-	M 6	-	6	26	10	6,5	15	32
22120.0828		8	18	-	M 8	-	8	34	12	12,0	31	67

* statistical average value





EH 22120.

Index Plungers

with hexagon collar, short



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
• Not removable

Note:

For indexing purposes.

The small dimensions are a feature of these index plungers.

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

Temperature range from - 30 °C up to + 80 °C.

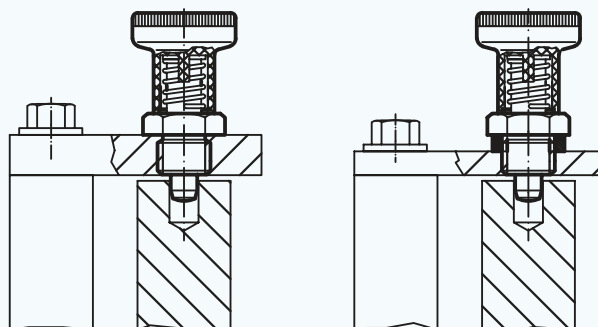
Lock nuts have to be purchased separately.

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

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ -0,02 -0,04	d ₂	d ₃	l ₁ ≈	l ₂ min.	l ₃ -0,15	l ₄	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	±g
22120.0226	22120.0246	without locking	6	M 12 x 1,5	25	45	6	10	5	17	7	19	35
22120.0228	22120.0248	(picture 1)	8	M 16 x 1,5	31	54	8	12	6	19	14	24	62
22120.0236	22120.0256	with locking	6	M 12 x 1,5	25	45	6	10	5	17	7	19	35
22120.0238	22120.0258	(picture 2)	8	M 16 x 1,5	31	54	8	12	6	19	14	24	61

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₂	±g
22120.0116	22120.0516	lock nuts	M 12 x 1,5	7,4
22120.0118	22120.0518	ISO 8675 (DIN 439) for the following sizes	M 16 x 1,5	18,0

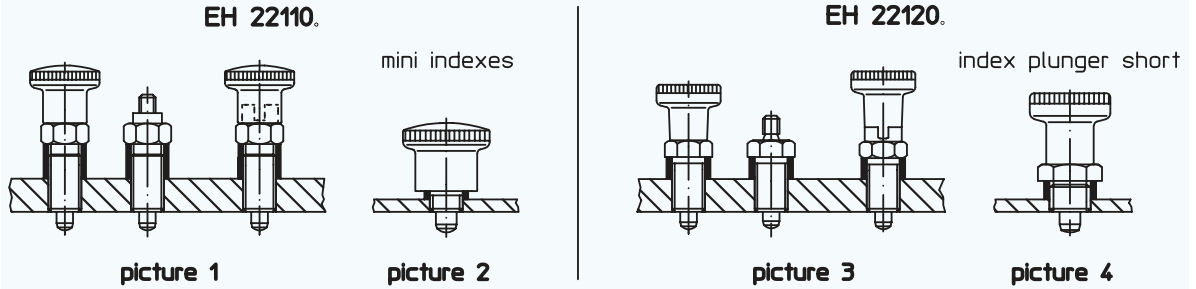
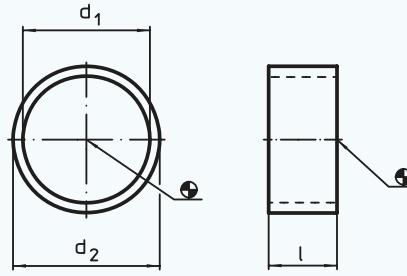
* statistical average value



EH 22120.

Distance Collars

for index plungers



Material:

- Steel, blackened
- Stainless steel 1.4305

Note:

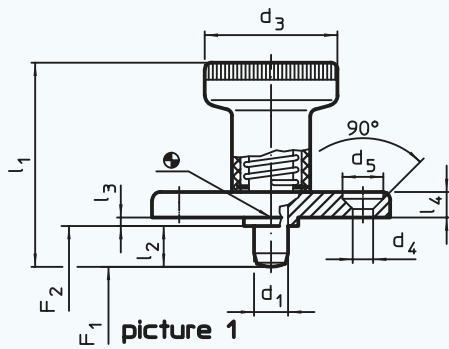
Distance collars adapt the thread of index plungers to different thread reaches.

Ref. No. Steel	Ref. No. Stainless steel	d ₁ H12	l ±0,1	d ₂ -0,1	For index plungers size	For finish picture	g
22120.0832	22120.0632	8	2	10	4	1 / 2	0,52
22120.0833	22120.0633	8	3	10	4	1	0,61
22120.0834	22120.0634	8	4	10	4	1	1,10
22120.0836	22120.0636	8	6	10	4	1	1,23
22120.0838	22120.0638	8	8	10	4	1	1,60
22120.0840	22120.0640	8	10	10	4	1	2,00
22120.0842	22120.0642	10	2	12	5	1 / 2 / 3	0,62
22120.0844	22120.0644	10	4	12	5	1 / 2 / 3	1,10
22120.0846	22120.0646	10	6	12	5	1 / 3	1,50
22120.0848	22120.0648	10	8	12	5	1 / 3	2,10
22120.0850	22120.0650	10	10	12	5	1 / 3	2,32
22120.0852	22120.0652	10	12	12	5	1 / 3	3,00
22120.0862	22120.0662	12	2	14	6	1	0,60
22120.0864	22120.0664	12	4	14	6	1	1,30
22120.0866	22120.0666	12	6	14	6	1	1,90
22120.0868	22120.0668	12	8	14	6	1	2,50
22120.0872	22120.0672	12	2	17	6	3 / 4	2,00
22120.0874	22120.0674	12	4	17	6	3 / 4	3,40
22120.0875	22120.0675	12	5	17	6	3 / 4	4,40
22120.0876	22120.0676	16	4	17	8	1	0,70
22120.0877	22120.0677	16	6	17	8	1	1,00
22120.0878	22120.0678	16	8	17	8	1	1,40
22120.0879	22120.0679	16	10	17	8	1	2,00
22120.0880	22120.0680	16	12	17	8	1	2,10
22120.0882	22120.0682	16	2	19	8	3 / 4	1,20
22120.0884	22120.0684	16	4	19	8	3 / 4	2,80
22120.0886	22120.0686	16	6	19	8	3 / 4	3,80
22120.0888	22120.0688	16	8	19	8	3 / 4	4,80
22120.0890	22120.0690	16	10	19	8	3	6,10
22120.0892	22120.0692	16	12	19	8	3	7,50

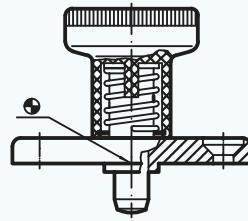
EH 22120.

Index Plungers

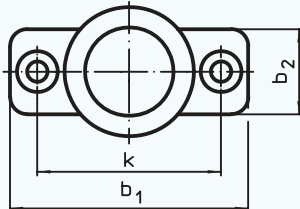
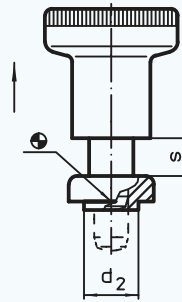
with mounting flange



picture 1



picture 2 with locking



Material:

Flange: • Zinc die-cast, galvanized

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

Knob: • Thermoplastic PA 6, black, dull
• Not removable

Note:

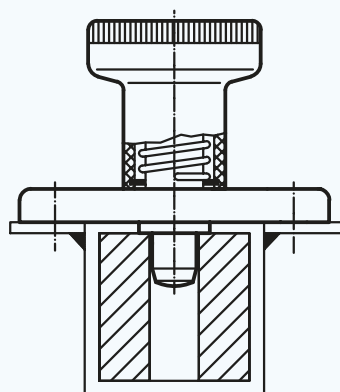
For indexing purposes.

The small dimensions are a feature of these index plungers. For fixing onto thin walled parts. When using locking index plungers, the knob is pulled out, turned 90° and secured by a notched catch.

Temperature range from - 30 °C up to + 80 °C.

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ -0,02 -0,04	l ₂	b ₁	b ₂	d ₂ -0,02 -0,1	d ₃	d ₄	d ₅	k	l ₁	l ₃ -0,15	l ₄	s	Spring load F ₁ N≈*	Spring load F ₂ N≈*	±g
22120.0926	22120.0966	without locking	6	6	40	18	10	25	4,3	8,3	30	37	2,5	4,5	6	8,5	22	26
22120.0927	22120.0967	(picture 1)	6	14	40	18	10	25	4,3	8,3	30	45	2,5	4,5	6	8,5	22	38
22120.0928	22120.0968		8	8	46	20	12	31	5,3	10,4	34	44	2,5	5,5	8	15,5	28	59
22120.0929	22120.0969		8	18	46	20	12	31	5,3	10,4	34	54	2,5	5,5	8	15,5	28	63
22120.0936	22120.0976	with locking	6	6	40	18	10	25	4,3	8,3	30	37	2,5	4,5	6	8,5	22	36
22120.0937	22120.0977	(picture 2)	6	14	40	18	10	25	4,3	8,3	30	45	2,5	4,5	6	8,5	22	38
22120.0938	22120.0978		8	8	46	20	12	31	5,3	10,4	34	44	2,5	5,5	8	15,5	28	60
22120.0939	22120.0979		8	18	46	20	12	31	5,3	10,4	34	54	2,5	5,5	8	15,5	28	63

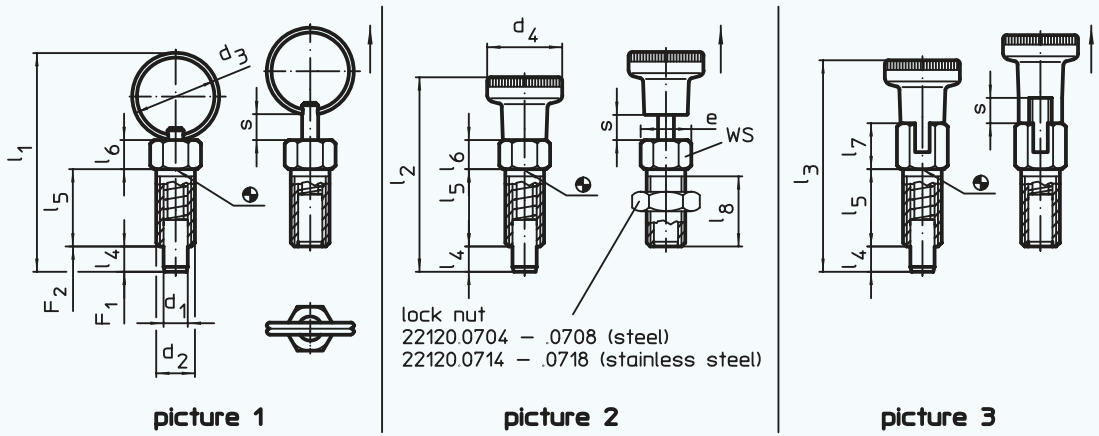
* statistical average value



EH 22120.

**Index
Plungers**

simple finish



Material:

Body: • Steel, galvanized
• Stainless steel 1.4305

Knob: • Thermoplastic PA 6, black, dull
• Not removable

Locking pin: • Stainless steel 1.4305

Lock nut: • Steel, galvanized
• Stainless steel

Pull-ring: • Stainless steel 1.4310

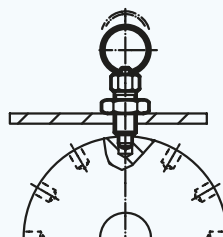
Note:

Simple finish having very small dimensions.
Application is limited to cases not requiring a precise positioning.
Lock nuts have to be purchased separately.
Temperature range from - 30 °C up to + 80 °C.
Pull-ring type (picture 1) up to 250 °C.

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ h9	d ₂	d ₃	d ₄	e	l ₁ ≈	l ₂	l ₃	l ₄ =s min	l ₅	l ₆	l ₇	l ₈	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22120.0724	22120.0774	with pull-ring,	4	M 6	14	-	6,9	34,5	-	-	4	12	4,5	-	10,0	6	3	12	4,0
22120.0725	22120.0775	no locking	5	M 8	18	-	9,2	45,0	-	-	5	16	6,0	-	13,5	8	5	24	8,0
22120.0726	22120.0776	(picture 1)	6	M 10	24	-	11,5	57,5	-	-	6	20	7,5	-	17,0	10	5	21	17,0
22120.0728	22120.0778		8	M 12	30	-	13,8	71,0	-	-	8	24	9,0	-	20,5	12	6	22	30,0
22120.0744	22120.0784	with knob,	4	M 6	-	12	6,9	-	30,5	-	4	12	4,5	-	10,0	6	3	12	4,0
22120.0745	22120.0785	no locking	5	M 8	-	16	9,2	-	40,0	-	5	16	6,0	-	13,5	8	5	24	9,2
22120.0746	22120.0786	(picture 2)	6	M 10	-	18	11,5	-	49,0	-	6	20	7,5	-	17,0	10	5	21	18,0
22120.0748	22120.0788		8	M 12	-	21	13,8	-	59,0	-	8	24	9,0	-	20,5	12	6	22	32,0
22120.0764	22120.0794	with knob	4	M 6	-	12	6,9	-	-	33,0	4	12	-	7,0	10,0	6	3	12	4,2
22120.0765	22120.0795	and locking	5	M 8	-	16	9,2	-	-	43,5	5	16	-	9,5	13,5	8	5	24	9,8
22120.0766	22120.0796	(picture 3)	6	M 10	-	18	11,5	-	-	52,0	6	20	-	10,5	17,0	10	5	21	18,0
22120.0768	22120.0798		8	M 12	-	21	13,8	-	-	63,5	8	24	-	13,5	20,5	12	6	22	32,0

Ref. No. Steel	Ref. No. Stainless steel 1.4305	Finish	d ₂	g
22120.0704	22120.0714	lock nuts ISO 4035 for the following sizes	M 6	1,3
22120.0705	22120.0715		M 8	2,8
22120.0706	22120.0716		M 10	5,3
22120.0708	22120.0718		M 12	7,6

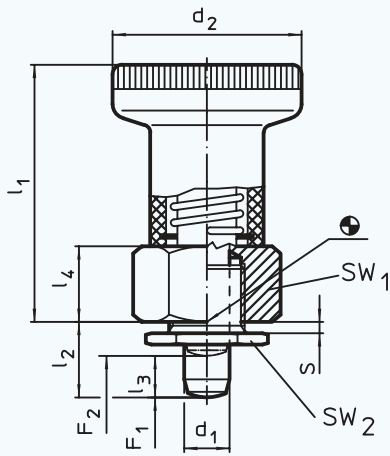
* statistical average value



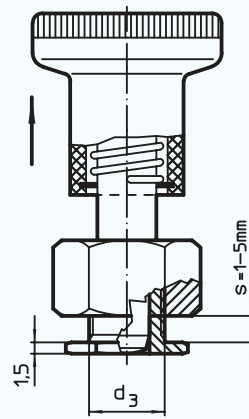
EH 22120.

Index Plungers

for thin-walled pieces



picture 1



with locking

picture 2

Material:

Body: • Steel, galvanized

Locking pin: • Stainless steel
1.4305, nickel-plated

Knob: • Thermoplastic PA 6, black, dull
• Not removable

Note:

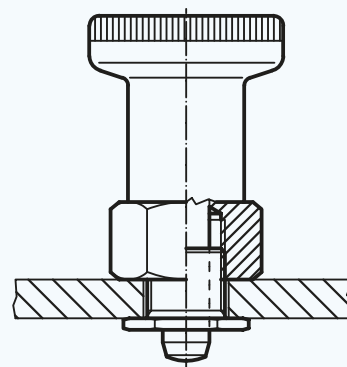
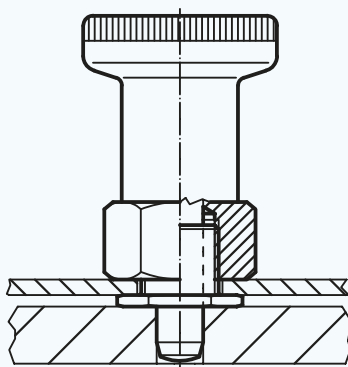
Index plungers with throughgoing bore for thin-walled pieces. By means of a fastening collet, the index plungers can be mounted into pieces having a wall thickness of 1-5 mm. When using the self-locking execution the knob is pulled-out, turned 90° and secured by a notched catch. Depending on the clamping length, the bolt may project. Temperature range from - 30 °C to + 80 °C.

Ref. No.	Finish	d ₁ -0,02 -0,04	l ₂	d ₂	d ₃	l ₁	l ₃	l ₄	s	WS ₁	WS ₂	Spring load F ₁ N≈*	Spring load F ₂ N≈*	μg
22120.0266	without locking	6	8,5	25	10	34	6,0	10	1-5	17	14	8,5	22	39
22120.0267	(picture 1)	6	10,5	25	10	34	6,0	10	1-5	17	14	8,5	22	40
22120.0268		8	10,0	31	12	40	7,5	12	1-5	19	16	15,5	28	63
22120.0269		8	12,0	31	12	40	7,5	12	1-5	19	16	15,5	28	63
22120.0286	with locking	6	8,5	25	10	34	6,0	10	1-5	17	14	8,5	22	39
22120.0287	(picture 2)	6	10,5	25	10	34	6,0	10	1-5	17	14	8,5	22	39
22120.0288		8	10,0	31	12	40	7,5	12	1-5	19	16	15,5	28	61
22120.0289		8	12,0	31	12	40	7,5	12	1-5	19	16	15,5	28	62

Ref. No.	Finish	μg
22120.0299	flat ring spanner to counter WS ₂	27

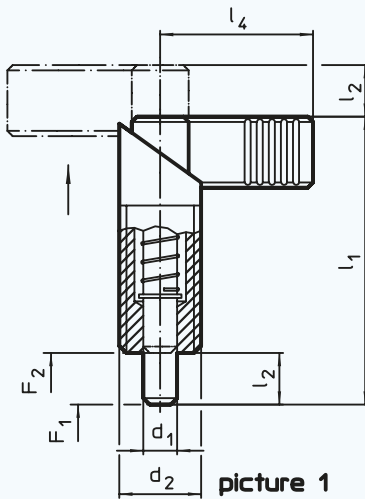


* statistical average value

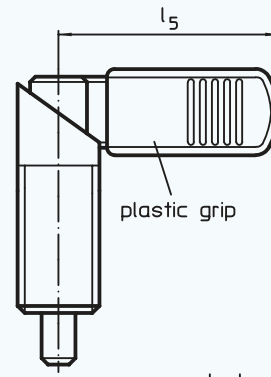


EH 22120.

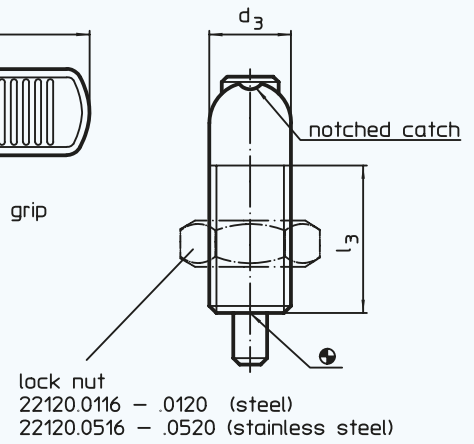
Index Bolts



picture 1



picture 2



lock nut
22120.0116 - .0120 (steel)
22120.0516 - .0520 (stainless steel)

Material:

- Body:** • Free cutting steel, blackened
• Stainless steel 1.4305
- Locking pin:** • Steel, hardened
• Stainless steel 1.4305, nickel-plated
- Plastic grip:** • Thermoplastic, black, dull

Note:

For indexing purposes. By turning the index bolt 180° the locking pin will be pulled-in and secured by a notched catch (when locking pin must not project).
Plastic grip allows for a better handling. Temperature resistance of plastic grip from - 30 °C up to + 80 °C.
Lock nuts have to be purchased separately.

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ -0,02 -0,04	d ₂	d ₃	l ₁ ≈	l ₂ min.	l ₃ +1,5	l ₄	l ₅	Spring load F ₁ N≈*	Spring load F ₂ N≈*	↕ g	
22120.0313	22120.0323	without plastic grip (picture 1)	5	M 12 x 1,5	12	47	8	26	26	-	8,5	19,5	29	
22120.0314	22120.0324		6	M 12 x 1,5	12	47	8	26	26	-	8,5	19,5	29	
22120.0316	22120.0326	with plastic grip (picture 2)	6	M 16 x 1,5	16	56	10	30	32	-	11,5	30,5	59	
22120.0315	22120.0325		8	M 12 x 1,5	12	47	8	26	26	-	8,5	19,5	30	
22120.0317	22120.0327		8	M 16 x 1,5	16	56	10	30	32	-	11,5	30,5	61	
22120.0318	22120.0328		8	M 20 x 1,5	20	69	12	36	37	-	21,0	57,5	121	
22120.0319	22120.0329		10	M 16 x 1,5	16	56	10	30	32	-	11,5	30,5	64	
22120.0320	22120.0330		10	M 20 x 1,5	20	69	12	36	37	-	21,0	57,5	123	
22120.0322	22120.0332		12	M 20 x 1,5	20	69	12	36	37	-	21,0	57,5	127	
22120.0353	22120.0363		with plastic grip (picture 2)	5	M 12 x 1,5	12	47	8	26	-	32	8,5	19,5	30
22120.0354	22120.0364			6	M 12 x 1,5	12	47	8	26	-	32	8,5	19,5	30
22120.0356	22120.0366			6	M 16 x 1,5	16	56	10	30	-	42	11,5	30,5	61
22120.0355	22120.0365	8		M 12 x 1,5	12	47	8	26	-	32	8,5	19,5	32	
22120.0357	22120.0367	8		M 16 x 1,5	16	56	10	30	-	42	11,5	30,5	63	
22120.0358	22120.0368	8		M 20 x 1,5	20	69	12	36	-	52	21,0	57,5	124	
22120.0359	22120.0369	10		M 16 x 1,5	16	56	10	30	-	42	11,5	30,5	66	
22120.0360	22120.0370	10		M 20 x 1,5	20	69	12	36	-	52	21,0	57,5	128	
22120.0362	22120.0372	12		M 20 x 1,5	20	69	12	36	-	52	21,0	57,5	131	

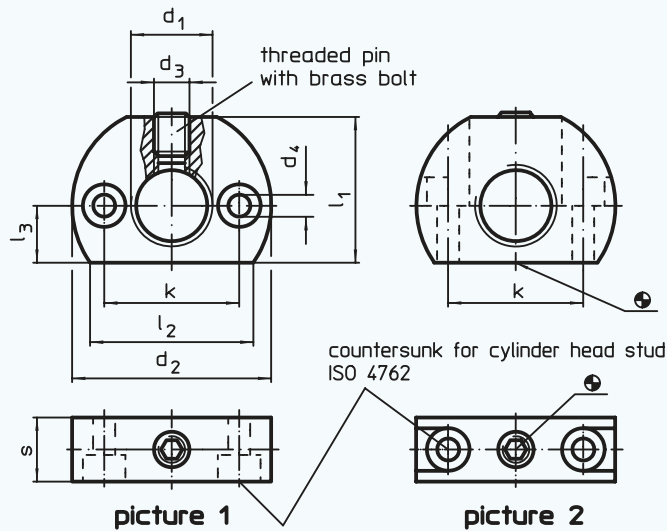
Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₂	↕ g
22120.0116	22120.0516	lock nuts	M 12 x 1,5	7,4
22120.0118	22120.0518	ISO 8675 (DIN 439)	M 16 x 1,5	18,0
22120.0120	22120.0520	for the following sizes	M 20 x 1,5	32,0

* statistical average value

EH 22120.

Mounting Blocks

for index bolts and index plungers



Material:

Body:

- Steel, blackened
- Stainless steel 1.4305

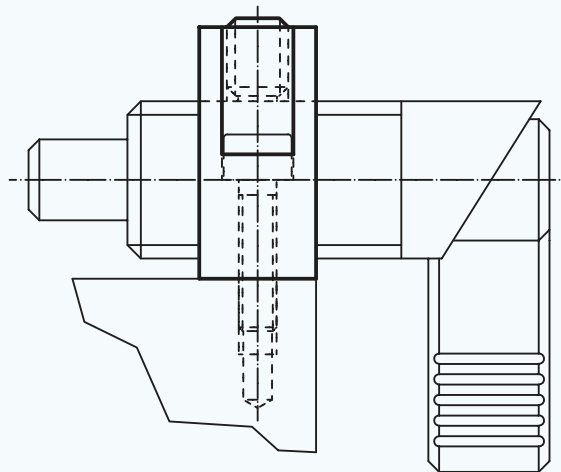
Grub screw:

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

Note:

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

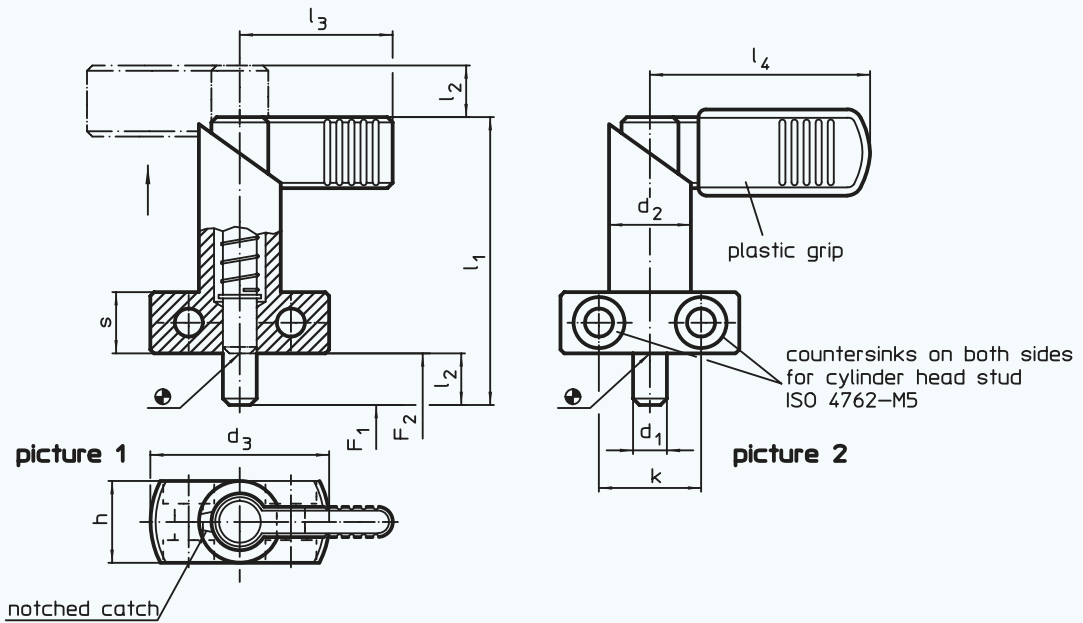
Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁	d ₂	d ₃	d ₄	k ±0,1	l ₁	l ₂ ≈	l ₃	s	g
22120.0345	22120.0545	mounting hole parallel to index bolt and index plunger (picture 1)	M 12 x 1,5	32	M 5	4,5	21	22	26,5	9	12	43
22120.0346	22120.0546		M 16 x 1,5	46	M 8	5,5	32	33	37,0	13	15	122
22120.0350	22120.0550		M 20 x 1,5	46	M 8	5,5	32	33	37,0	13	15	109
22120.0347	22120.0547	mounting hole vertical to index bolt and index plungers (picture 2)	M 12 x 1,5	32	M 5	4,5	21	22	26,5	9	12	37
22120.0348	22120.0548		M 16 x 1,5	46	M 8	5,5	32	33	37,0	13	15	106
22120.0352	22120.0552		M 20 x 1,5	46	M 8	5,5	32	33	37,0	13	15	94



EH 22120.

Index Bolts

with mounting flange



Material:

Body: • Steel, blackened **Locking pin:** • Steel, nitrided, black **Plastic grip:** • Thermoplastic, black, dull

Note:

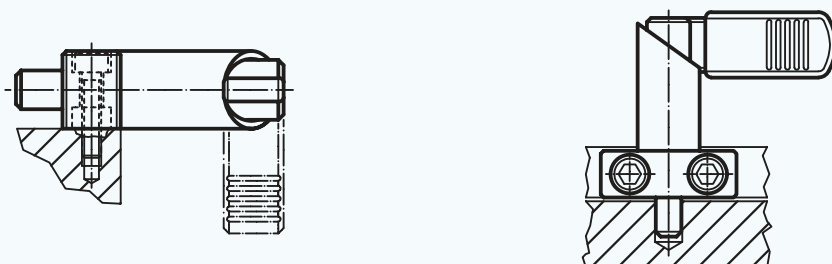
For indexing purposes. Index bolt for lateral fastening. Right and left mounting is possible due to countersinks on both sides. By turning the index bolt 180° the locking pin will be pulled-in and secured by a notched catch (when locking pin must not project).

Plastic grip allows for a better handling.

Temperature resistance of plastic grip from - 30 °C up to + 80 °C.

Ref. No.	Finish	d ₁ 0 -0,05	l ₂	d ₂	d ₃	h	k	l ₁	l ₃	l ₄	s	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
22120.0376	without plastic grip	6	10	16	35	16	20	56	32	-	12	12	32	82
22120.0378	(picture 1)	8	10	16	35	16	20	56	32	-	12	12	32	85
22120.0379		8	12	20	40	20	22	69	37	-	15	21	58	163
22120.0381		10	10	16	35	16	20	56	32	-	12	12	32	85
22120.0382		10	12	20	40	20	22	69	37	-	15	21	58	167
22120.0384		12	12	20	40	20	22	69	37	-	15	21	58	168
22120.0386	with plastic grip	6	10	16	35	16	20	56	-	42	12	12	32	83
22120.0388	(picture 2)	8	10	16	35	16	20	56	-	42	12	12	32	85
22120.0389		8	12	20	40	20	22	69	-	52	15	21	58	169
22120.0391		10	10	16	35	16	20	56	-	42	12	12	32	86
22120.0392		10	12	20	40	20	22	69	-	52	15	21	58	171
22120.0394		12	12	20	40	20	22	69	-	52	15	21	58	171

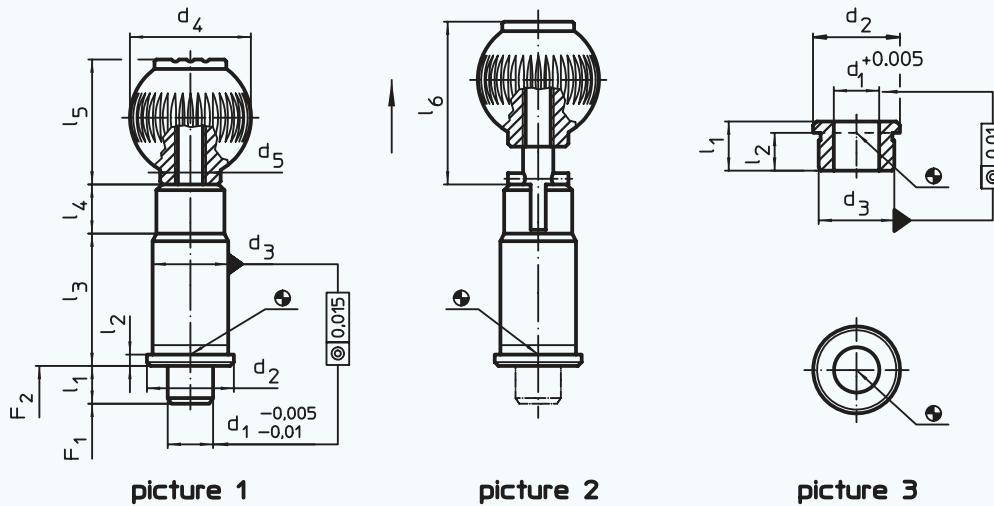
* statistical average value



EH 22130.

Precision Index Plungers

with cylindrical pin



Material:

- Pin:** • Case-hardened steel, case-hardened, blackened and ground
- Ball grip:** • Thermoplastic, greyish black
- Body:** • Case-hardened steel, case-hardened, blackened and ground
- Bushing:** • Case-hardened steel, case-hardened, blackened and ground

Note:

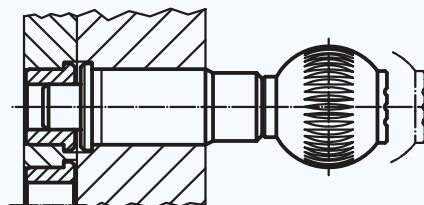
Precision index plungers together with bushings are a perfect combination for quick positioning and mounting. The precise tolerance of both, the precision index plunger and the bushing, guarantees a high repeatability of these two elements. When using locking index plungers the knob is pulled-out and turned 90°.

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

Ref. No.	Finish	d ₁	d ₂	d ₃ n6	d ₄	d ₅	l ₁ min.	l ₂	l ₃	l ₄	l ₅	l ₆	Spring load F ₁ N≈*	Spring load F ₂ N≈*	⌀ g
22130.0010	without locking	10	19	16	25	M 6	10	2,5	31	13	25,0	-	15	30	79
22130.0012	(picture 1)	12	23	20	32	M 8	10	3,0	35	13	33,0	-	15	35	138
22130.0016		16	28	25	40	M 10	10	3,0	42	13	41,5	-	20	50	226
22130.0020		20	33	30	40	M 10	10	3,0	50	13	41,5	-	36	63	350
22130.0025		25	42	38	50	M 10	10	3,0	60	13	51,0	-	20	73	649
22130.0060	with locking	10	19	16	25	M 6	10	2,5	31	13	25,0	36,5	15	30	79
22130.0062	(picture 2)	12	23	20	32	M 8	10	3,0	35	13	33,0	44,5	15	35	136
22130.0066		16	28	25	40	M 10	10	3,0	42	13	41,5	53,0	20	50	228
22130.0070		20	33	30	40	M 10	10	3,0	50	13	41,5	53,0	36	63	350
22130.0075		25	42	38	50	M 10	10	3,0	60	13	51,0	62,5	20	73	649

Ref. No.	Finish	d ₁	d ₂	d ₃ n6	l ₁ min.	l ₂	⌀ g
22130.0090	cylindrical bushing	10	19	16	11	8,5	11
22130.0092	(picture 3)	12	23	20	13	10,0	22
22130.0093		16	28	25	17	14,0	40
22130.0094		20	33	30	16	13,0	51
22130.0096		25	42	38	19	16,0	99

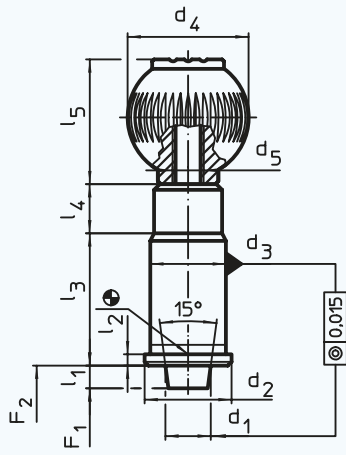
* statistical average value



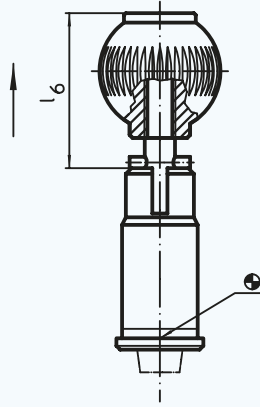
EH 22130.

Precision Index Plungers

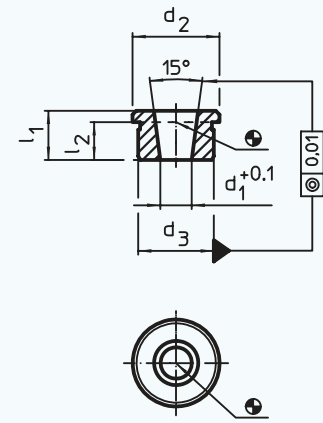
with tapered pin



picture 1



picture 2



picture 3

Material:

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

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

Ball grip: • Thermoplastic, greyish black

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

Note:

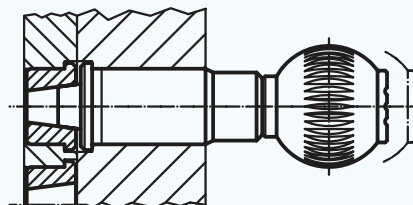
Precision index plungers together with bushings are a perfect combination for quick positioning and mounting. The precise tolerance of both, the precision index plunger and the bushing, guarantees a high repeatability of these two elements. When using locking index plungers the knob is pulled-out and turned 90°.

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

Ref. No.	Finish	Nominal diameter	d ₁	d ₂	d ₃ n6	d ₄	d ₅	l ₁ min.	l ₂	l ₃	l ₄	l ₅	l ₆	Spring load F ₁ N≈*	Spring load F ₂ N≈*	μg
22130.0110	without locking	10	10	19	16	25	M 6	6	2,5	31	13	25,0	-	19	29	78
22130.0112	(picture 1)	12	12	23	20	32	M 8	6	3,0	35	13	33,0	-	22	35	135
22130.0116		16	16	28	25	40	M 10	6	3,0	42	13	41,5	-	30	50	227
22130.0120		20	20	33	30	40	M 10	6	3,0	50	13	41,5	-	46	63	348
22130.0125		25	25	42	38	50	M 10	6	3,0	60	13	51,0	-	39	73	654
22130.0160	with locking	10	10	19	16	25	M 6	6	2,5	31	13	25,0	32,5	19	29	78
22130.0162	(picture 2)	12	12	23	20	32	M 8	6	3,0	35	13	33,0	40,5	22	35	135
22130.0166		16	16	28	25	40	M 10	6	3,0	42	13	41,5	49,0	30	50	228
22130.0170		20	20	33	30	40	M 10	6	3,0	50	13	41,5	49,0	46	63	348
22130.0175		25	25	42	38	50	M 10	6	3,0	60	13	51,0	58,5	39	73	651

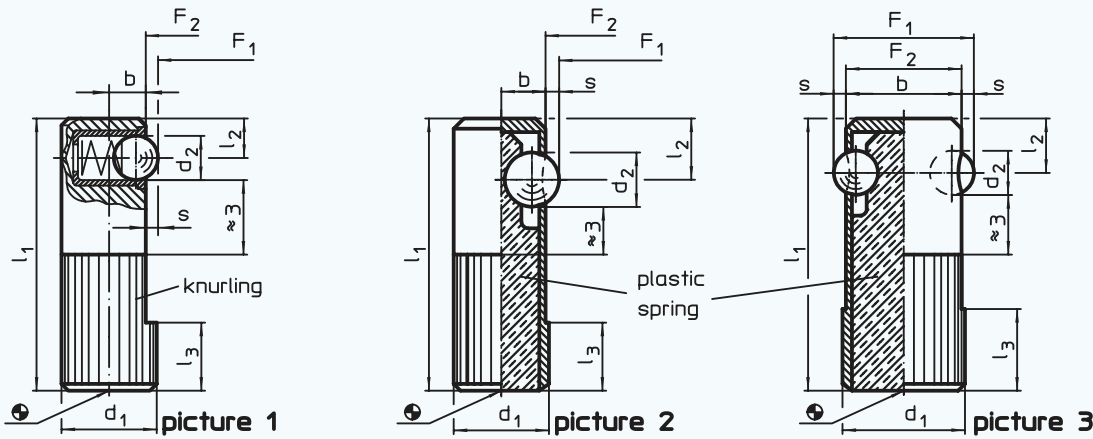
Ref. No.	Finish	Nominal diameter	d ₁	d ₂	d ₃ n6	l ₁ min.	l ₂	μg
22130.0190	tapered bushing	10	7,10	19	16	11	8,5	13
22130.0192	(picture 3)	12	8,28	23	20	13	10,0	25
22130.0193		16	11,52	28	25	17	14,0	47
22130.0194		20	15,49	33	30	16	13,0	60
22130.0196		25	19,70	42	38	19	16,0	114

* statistical average value



EH 22140.

Lateral Spring Plungers



>>> Special types upon request. <<<

Material:

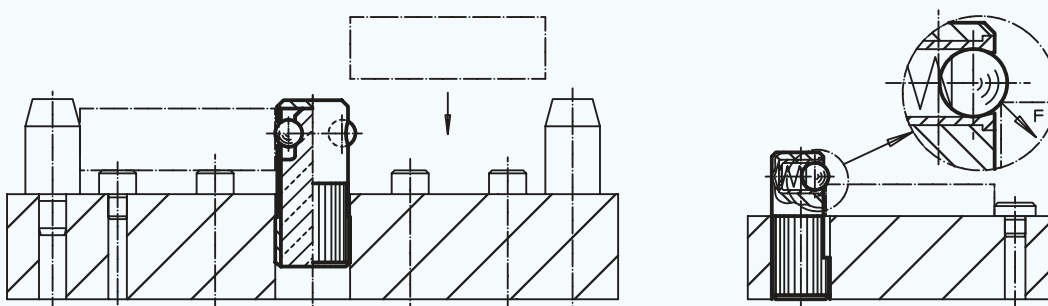
- Body:** • Free cutting steel, blackened
- Ball:** • Ball-bearing steel, hardened
• Stainless steel, hardened
• Thermoplastic POM, white
- Spring:** • Stainless steel
• Plastic (PU)

Note:

Insertion bore l_3 to be considered.
For positioning or applying pressure.

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

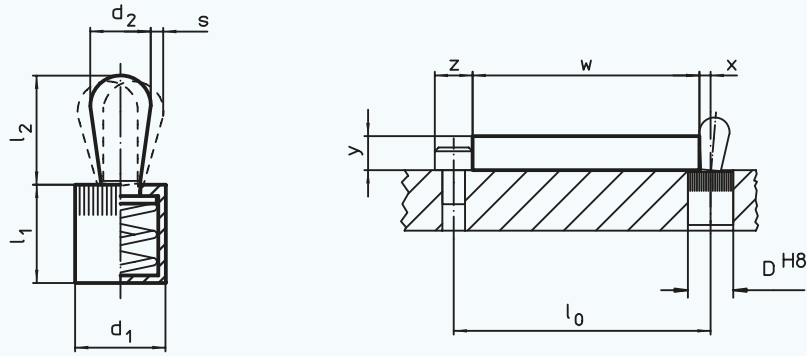
* statistical average value



EH 22150.

Lateral Plungers

smooth, without seal



Material:

- Body:** • Aluminium, silver passivated **Pin:** • Steel, case-hardened, galvanized
• Thermoplastic POM, white **Spring:** • Spring steel wire, chromed

Note:

To be used for positioning and applying pressure. Lateral plungers are installed by pressing in. Application temperature with steel pin up to 250 °C, with plastic pin up to 80 °C.

Formula for calculating the center distance for the mounting hole: $l_0 = z/2 + w + x$

l_0 = center distance, y = work piece height, w = work piece length, x = stroke, z = stop diameter

Calculation dimension x for work pieces larger than $l_2 - d_2/2$: $x = d_2/2 - s$

Calculation dimension x for work pieces smaller than $l_2 - d_2/2$: $x = d_2/2 - s - [(l_2 - d_2/2 - y) \times 0,123]$

Ref. No.	Finish	d ₁	d ₂	Spring load F max. N≈*	l ₁ -1	l ₂	s +/-	x y=1	x y=2	x y=3	x y=4,5	x y=6	x y=8	⌚ g
22150.0010	steel pin,	6	3	10	7	4,0	0,5	0,8	1,0	1,0	1,0	1,0	1,0	0,60
22150.0011	without seal	6	3	20	7	4,0	0,5	0,8	1,0	1,0	1,0	1,0	1,0	0,63
22150.0012		6	3	40	7	4,0	0,5	0,8	1,0	1,0	1,0	1,0	1,0	0,66
22150.0020		10	5	20	11	6,7	0,8	-	1,5	1,7	1,7	1,7	1,7	2,60
22150.0021		10	5	50	11	6,7	0,8	-	1,5	1,7	1,7	1,7	1,7	2,80
22150.0022		10	5	100	11	6,7	0,8	-	1,5	1,7	1,7	1,7	1,7	3,00
22150.0025		10	6	40	11	10,7	1,0	-	-	-	1,7	1,9	1,9	3,40
22150.0026		10	6	75	11	10,7	1,0	-	-	-	1,7	1,9	1,9	3,60
22150.0027		10	6	150	11	10,7	1,0	-	-	-	1,7	1,9	1,9	3,90
22150.0030		12	8	50	13	13,9	1,3	-	-	-	-	2,5	2,7	6,80
22150.0031		12	8	100	13	13,9	1,3	-	-	-	-	2,5	2,7	7,30
22150.0032		12	8	200	13	13,9	1,3	-	-	-	-	2,5	2,7	7,80
22150.0040		16	10	100	17	16,7	1,6	-	-	-	-	-	3,1	14,00
22150.0041		16	10	200	17	16,7	1,6	-	-	-	-	-	3,1	15,00
22150.0042		16	10	300	17	16,7	1,6	-	-	-	-	-	3,1	15,00
22150.0050	thermoplastic pin,	6	3	10	7	4,0	0,5	0,8	1,0	1,0	1,0	1,0	1,0	0,34
22150.0060	without seal	10	5	20	11	6,7	0,8	-	1,5	1,7	1,7	1,7	1,7	1,30
22150.0062		10	6	40	11	10,7	1,0	-	-	-	1,7	1,9	1,9	1,54
22150.0070		12	8	50	13	13,9	1,3	-	-	-	-	2,5	2,7	2,90
22150.0080		16	10	100	17	16,7	1,6	-	-	-	-	-	3,1	6,60

Ref. No.	Finish	d ₁	⌚ g
22150.0830	mounting tool	6	19
22150.0831		10	49
22150.0832		12	65
22150.0833		16	105

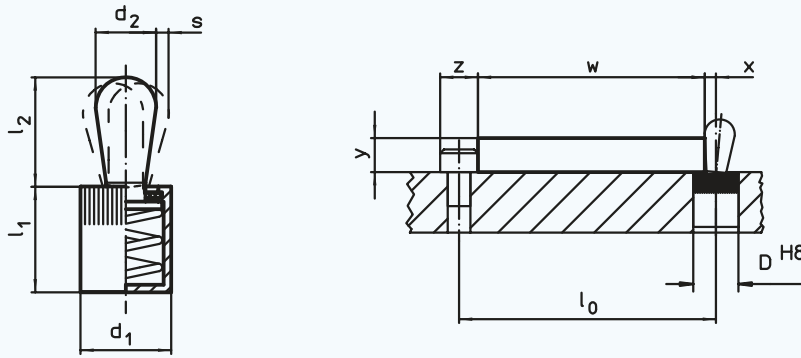


* statistical average value

EH 22150.

Lateral Plungers

smooth, with seal



Material:

Body: • Aluminium, gold passivated

Pin: • Steel, case-hardened, galvanized
• Thermoplastic POM, white

Spring: • Spring steel wire, chromed

Seal: • CR

Note:

To be used for positioning and applying pressure. Sealed against chips and dirt. Lateral plungers are installed by pressing in.

Application temperature with steel pin up to 110 °C, with plastic pin up to 80 °C.

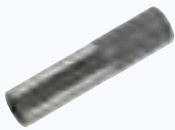
Formula for calculating the center distance for the mounting hole: $l_0 = z/2 + w + x$

l_0 = center distance, y = work piece height, w = work piece length, x = stroke, z = stop diameter

Calculation dimension x for work pieces larger than $l_2 - d_2/2$: $x = d_2/2 - s$

Calculation dimension x for work pieces smaller than $l_2 - d_2/2$: $x = d_2/2 - s - [(l_2 - d_2/2 - y) \times 0,123]$

Ref. No.	Finish	d ₁	d ₂	Spring load F max. N≈*	l ₁ -1	l ₂	s +/-	x y=1	x y=2	x y=3	x y=4,5	x y=6	x y=8	±g
22150.0110	steel pin, with seal	6	3	10	7	4	0,5	0,8	1,0	1,0	1,0	1,0	1,0	0,60
22150.0111	steel pin, with seal	6	3	20	7	4	0,5	0,8	1,0	1,0	1,0	1,0	1,0	0,60
22150.0112	steel pin, with seal	6	3	40	7	4	0,5	0,8	1,0	1,0	1,0	1,0	1,0	0,70
22150.0120	steel pin, with seal	10	5	20	12	6	0,8	-	1,5	1,7	1,7	1,7	1,7	2,60
22150.0121	steel pin, with seal	10	5	50	12	6	0,8	-	1,5	1,7	1,7	1,7	1,7	2,90
22150.0122	steel pin, with seal	10	5	100	12	6	0,8	-	1,5	1,7	1,7	1,7	1,7	3,00
22150.0125	steel pin, with seal	10	6	40	12	10	1,0	-	-	-	1,7	1,9	1,9	3,40
22150.0126	steel pin, with seal	10	6	75	12	10	1,0	-	-	-	1,7	1,9	1,9	3,60
22150.0127	steel pin, with seal	10	6	150	12	10	1,0	-	-	-	1,7	1,9	1,9	3,90
22150.0130	steel pin, with seal	12	8	50	14	13	1,3	-	-	-	-	2,5	2,7	6,90
22150.0131	steel pin, with seal	12	8	100	14	13	1,3	-	-	-	-	2,5	2,7	7,50
22150.0132	steel pin, with seal	12	8	200	14	13	1,3	-	-	-	-	2,5	2,7	7,90
22150.0140	steel pin, with seal	16	10	100	18	16	1,6	-	-	-	-	-	3,1	15,00
22150.0141	steel pin, with seal	16	10	200	18	16	1,6	-	-	-	-	-	3,1	15,00
22150.0142	steel pin, with seal	16	10	300	18	16	1,6	-	-	-	-	-	3,1	16,00
22150.0150	thermoplastic pin, with seal	6	3	10	7	4	0,5	0,8	1,0	1,0	1,0	1,0	1,0	0,46
22150.0160	thermoplastic pin, with seal	10	5	20	12	6	0,8	-	1,5	1,7	1,7	1,7	1,7	1,40
22150.0165	thermoplastic pin, with seal	10	6	40	12	10	1,0	-	-	-	1,7	1,9	1,9	1,60
22150.0170	thermoplastic pin, with seal	12	8	50	14	13	1,3	-	-	-	-	2,5	2,7	2,92
22150.0180	thermoplastic pin, with seal	16	10	100	18	16	1,6	-	-	-	-	-	3,1	7,30

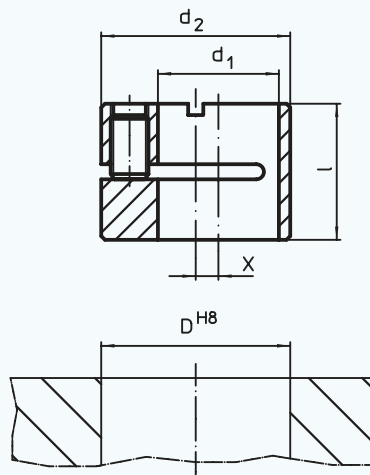
Ref. No.	Finish	d ₁	±g
22150.0830	mounting tool 	6	19
22150.0831		10	49
22150.0832		12	65
22150.0833		16	105

* statistical average value

EH 22150.

**Eccentric
Mounting
Bushings**

for lateral plungers,
smooth



Material:

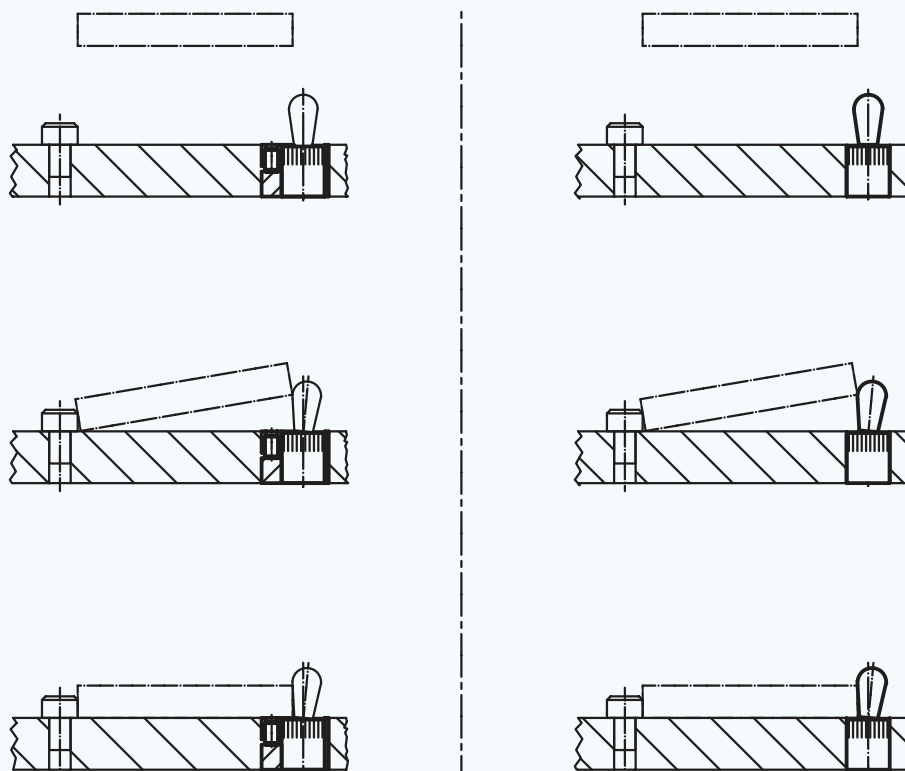
Body: • Steel, blackened

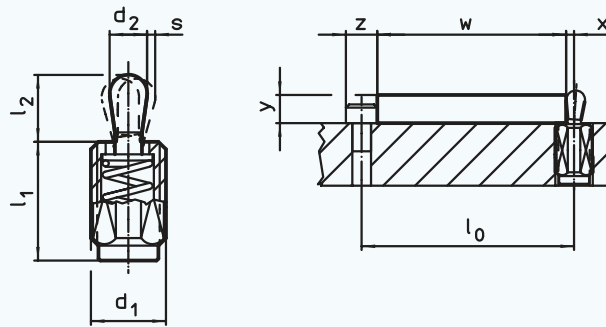
Note:

The eccentric is used in conjunction with smooth lateral plungers EH 22150. for positioning or clamping work pieces with large tolerances.

The eccentric is fitted and positioned by clamping with a threaded pin.

Ref. No.	d ₁ H7	d ₂ h9	l	x	±g
22150.0806	6	12	9,9	2	5,5
22150.0810	10	16	11,9	2	9,5
22150.0812	12	18	13,9	2	13,0
22150.0816	16	25	17,9	3	35,0

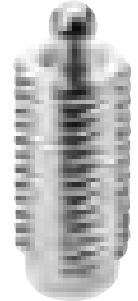




EH 22150.

Lateral Plungers

with thread and steel pin, without seal



Material:

Body: • Steel, chromed

Pin: • Steel, case-hardened, galvanized

Spring: • Spring steel wire, chromed

Note:

To be used for positioning and applying pressure. Lateral plungers are installed by screwing in by means of a mounting tool. Application temperature up to 250 °C.


Formula for calculating the center distance for the mounting hole: $l_0 = z/2 + w + x$

l_0 = center distance, y = work piece height, w = work piece length, x = stroke, z = stop diameter

Calculation dimension x for work pieces larger than $l_2 - d_2/2$: $x = d_2/2 - s$

Calculation dimension x for work pieces smaller than $l_2 - d_2/2$: $x = d_2/2 - s - [(l_2 - d_2/2 - y) \times 0,123]$

Ref. No.	Finish	d ₁	l ₁ -1,5	Spring load F max. N≈*	d ₂	l ₂	s +/-	±g
22150.0310	steel pin,	M 12	11,5	20	5	6,7	0,8	4,0
22150.0311	without seal	M 12	11,5	50	5	6,7	0,8	4,1
22150.0312		M 12	11,5	100	5	6,7	0,8	4,4
22150.0314		M 12	19,0	20	5	6,7	0,8	5,9
22150.0315		M 12	19,0	50	5	6,7	0,8	6,4
22150.0316		M 12	19,0	100	5	6,7	0,8	6,9
22150.0318		M 12	26,5	20	5	6,7	0,8	7,9
22150.0319		M 12	26,5	50	5	6,7	0,8	8,3
22150.0320		M 12	26,5	100	5	6,7	0,8	9,0
22150.0330		M 12	11,5	40	6	10,7	1,0	4,8
22150.0331		M 12	11,5	75	6	10,7	1,0	4,9
22150.0332		M 12	11,5	150	6	10,7	1,0	5,4
22150.0334		M 12	19,0	40	6	10,7	1,0	6,6
22150.0335		M 12	19,0	75	6	10,7	1,0	7,1
22150.0336		M 12	19,0	150	6	10,7	1,0	7,7
22150.0338		M 12	26,5	40	6	10,7	1,0	8,6
22150.0339		M 12	26,5	75	6	10,7	1,0	9,6
22150.0340		M 12	26,5	150	6	10,7	1,0	10,0
22150.0350		M 18 x 1,5	18,0	100	10	16,7	1,6	19,0
22150.0351		M 18 x 1,5	18,0	200	10	16,7	1,6	20,0
22150.0352		M 18 x 1,5	18,0	300	10	16,7	1,6	21,0
22150.0354		M 18 x 1,5	31,5	100	10	16,7	1,6	28,0
22150.0355		M 18 x 1,5	31,5	200	10	16,7	1,6	29,0
22150.0356		M 18 x 1,5	31,5	300	10	16,7	1,6	30,0
22150.0358		M 18 x 1,5	45,0	100	10	16,7	1,6	36,0
22150.0359		M 18 x 1,5	45,0	200	10	16,7	1,6	39,0
22150.0360		M 18 x 1,5	45,0	300	10	16,7	1,6	40,0

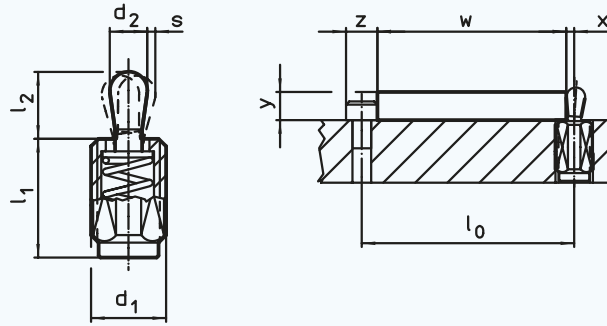
Ref. No.	Finish	d ₁	±g
22150.0820	mounting tool 	M 12	76
22150.0822		M 18 x 1,5	137

* statistical average value

EH 22150.

Lateral Plungers

with thread and plastic pin, without seal



Material:

Body: • Steel, chromed

Pin: • Thermoplastic POM, white

Spring: • Spring steel wire, chromed

Note:

To be used for positioning and applying pressure. Lateral plungers are installed by screwing in by means of a mounting tool. Application temperature up to 80 °C.


Formula for calculating the center distance for the mounting hole: $l_0 = z/2 + w + x$.

l_0 = center distance, y = work piece height, w = work piece length, x = stroke, z = stop diameter

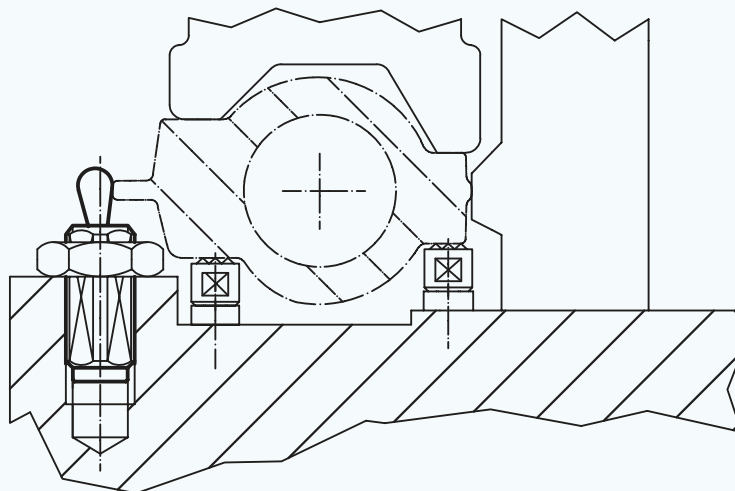
Calculation dimension x for work pieces larger than $l_2 - d_2/2$: $x = d_2/2 - s$

Calculation dimension x for work pieces smaller than $l_2 - d_2/2$: $x = d_2/2 - s - [(l_2 - d_2/2 - y) \times 0,123]$

Ref. No.	Finish	d ₁	l ₁ -1,5	Spring load F max. N=*	d ₂	l ₂	s +/-	g
22150.0370	thermoplastic pin, without seal	M 12	11,5	20	5	6,7	0,8	2,7
22150.0373		M 12	11,5	40	6	10,7	1,0	3,1
22150.0375		M 12	19,0	20	5	6,7	0,8	4,6
22150.0380		M 12	19,0	40	6	10,7	1,0	4,8
22150.0383		M 12	26,5	20	5	6,7	0,8	6,5
22150.0385		M 12	26,5	40	6	10,7	1,0	6,8
22150.0390		M 18 x 1,5	18,0	100	10	16,7	1,6	12,0
22150.0393		M 18 x 1,5	31,5	100	10	16,7	1,6	20,0
22150.0395		M 18 x 1,5	45,0	100	10	16,7	1,6	30,0

Ref. No.	Finish	d ₁	g
22150.0820	mounting tool 	M 12	76
22150.0822		M 18 x 1,5	137

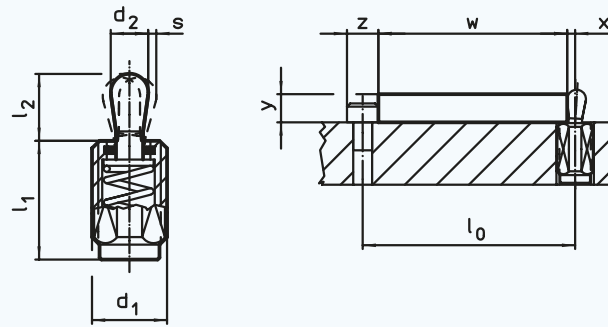
* statistical average value



EH 22150.

Lateral Plungers

with thread and steel pin, with seal



Material:

- Body:** • Steel, chromed
Spring: • Spring steel wire, chromed
Pin: • Steel, case-hardened, galvanized
Seal: • CR

Note:

To be used for positioning and applying pressure. Sealed against chips and dirt.
 Lateral plungers are installed by screwing in with a mounting tool.
 Application temperature up to 110 °C.


Formula for calculating the center distance for the mounting hole: $l_0 = z/2 + w + x$.

l_0 = center distance, y = work piece height, w = work piece length, x = stroke, z = stop diameter

Calculation dimension x for work pieces bigger than $l_2 - d_2/2$: $x = d_2/2 - s$

Calculation dimension x for work pieces smaller than $l_2 - d_2/2$: $x = d_2/2 - s - [(l_2 - d_2/2 - y) \times 0,123]$

Ref. No.	Finish	d ₁	l ₁ -1,5	Spring load F max. N≈*	d ₂	l ₂	s +/-	g
22150.0410	steel pin,	M 12	11,5	20	5	6	0,8	3,8
22150.0411	with seal	M 12	11,5	50	5	6	0,8	4,1
22150.0412		M 12	11,5	100	5	6	0,8	4,2
22150.0414		M 12	19,0	20	5	6	0,8	5,6
22150.0415		M 12	19,0	50	5	6	0,8	6,3
22150.0416		M 12	19,0	100	5	6	0,8	6,6
22150.0418		M 12	26,5	20	5	6	0,8	7,5
22150.0419		M 12	26,5	50	5	6	0,8	8,1
22150.0420		M 12	26,5	100	5	6	0,8	8,7
22150.0430		M 12	11,5	40	6	10	1,0	4,7
22150.0431		M 12	11,5	75	6	10	1,0	4,8
22150.0432		M 12	11,5	150	6	10	1,0	5,4
22150.0434		M 12	19,0	40	6	10	1,0	6,5
22150.0435		M 12	19,0	75	6	10	1,0	6,9
22150.0436		M 12	19,0	150	6	10	1,0	7,6
22150.0438		M 12	26,5	40	6	10	1,0	8,3
22150.0439		M 12	26,5	75	6	10	1,0	8,9
22150.0440		M 12	26,5	150	6	10	1,0	10,0
22150.0450		M 18 x 1,5	18,0	100	10	16	1,6	20,0
22150.0451		M 18 x 1,5	18,0	200	10	16	1,6	20,0
22150.0452		M 18 x 1,5	18,0	300	10	16	1,6	20,0
22150.0454		M 18 x 1,5	31,5	100	10	16	1,6	28,0
22150.0455		M 18 x 1,5	31,5	200	10	16	1,6	29,0
22150.0456		M 18 x 1,5	31,5	300	10	16	1,6	29,0
22150.0458		M 18 x 1,5	45,0	100	10	16	1,6	36,0
22150.0459		M 18 x 1,5	45,0	200	10	16	1,6	40,0
22150.0460		M 18 x 1,5	45,0	300	10	16	1,6	38,0

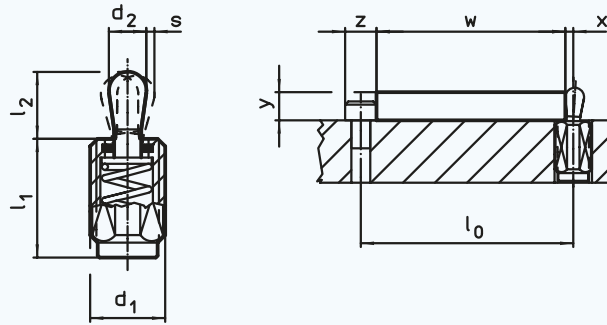
Ref. No.	Finish	d ₁	g
22150.0820	mounting tool 	M 12	76
22150.0822		M 18 x 1,5	137

* statistical average value

EH 22150.

Lateral Plungers

with thread and plastic pin, with seal



Material:

Body: • Steel, chromed
Spring: • Spring steel wire, chromed

Pin: • Thermoplastic POM, white
Seal: • CR

Note:

To be used for positioning and applying pressure. Sealed against chips and dirt. Lateral plungers are installed by screwing in with a mounting tool.

Application temperature up to 80 °C.


Formula for calculating the center distance for the mounting hole: $l_0 = z/2 + w + x$.

l_0 = center distance, y = work piece height, w = work piece length, x = stroke, z = stop diameter

Calculation dimension x for work pieces bigger than $l_2 - d_2/2$: $x = d_2/2 - s$

Calculation dimension x for work pieces smaller than $l_2 - d_2/2$: $x = d_2/2 - s - [(l_2 - d_2/2 - y) \times 0,123]$

Ref. No.	Finish	d ₁	l ₁ -1,5	Spring load F max. N≈*	d ₂	l ₂	s +/-	g
22150.0470	thermoplastic pin, with seal	M 12	11,5	20	5	6	0,8	2,6
22150.0473		M 12	11,5	40	6	10	1,0	2,7
22150.0475		M 12	19,0	20	5	6	0,8	4,4
22150.0480		M 12	19,0	40	6	10	1,0	4,5
22150.0483		M 12	26,5	20	5	6	0,8	6,1
22150.0485		M 12	26,5	40	6	10	1,0	6,2
22150.0490		M 18 x 1,5	18,0	100	10	16	1,6	12,0
22150.0493		M 18 x 1,5	31,5	100	10	16	1,6	21,0
22150.0495		M 18 x 1,5	45,0	100	10	16	1,6	30,0

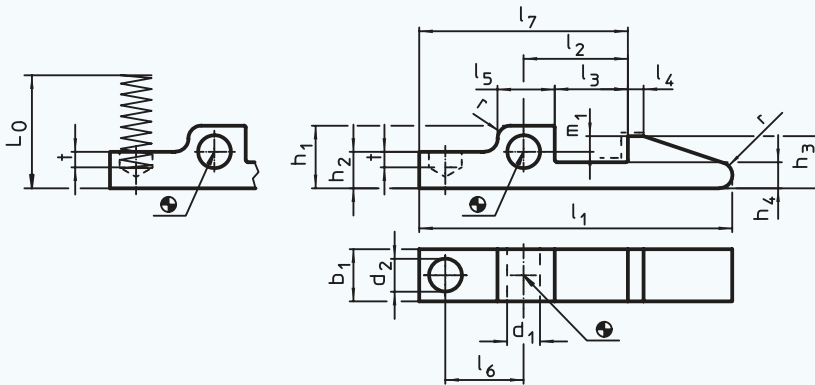
Ref. No.	Finish	d ₁	g
22150.0820	mounting tool 	M 12	76
22150.0822		M 18 x 1,5	137

* statistical average value

EH 22200.

Spring-Loaded Catches

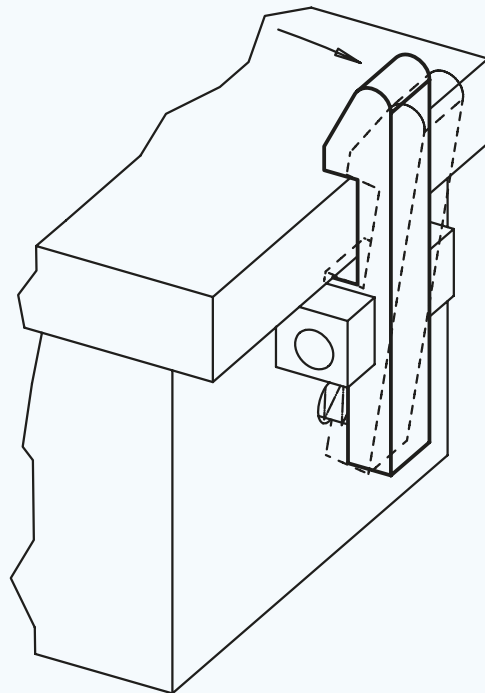
DIN 6310
catches with spring



Material:

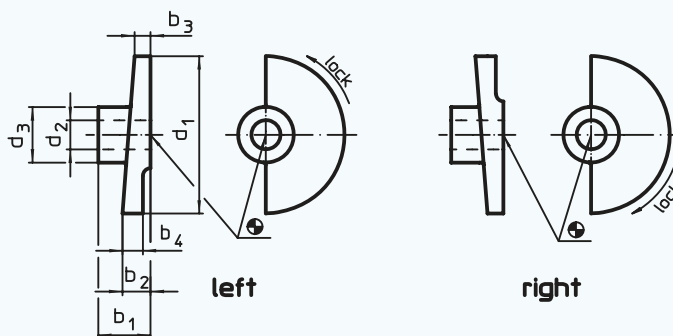
- Heat-treated steel, blackened.
Hardened where shown by ___ line.

Ref. No.	l ₁	b ₁ -0,2	d ₁ E9	d ₂	h ₁	h ₂	h ₃	h ₄	L ₀ ≈	Spring rate R N / mm ≈	l ₂ ±0,1	l ₃	l ₄	l ₅	l ₆	l ₇	m ₁	t	r	ϕ _g
22200.0045	45	8	4	5,0	9,5	5,5	8	4	17,8	3,0	15	10	2	9	11	30	2,5	1,5	1,6	15
22200.0060	60	10	5	6,3	12,0	7,0	10	5	21,2	4,0	20	14	3	11	15	40	3,0	3,0	2,5	32
22200.0080	80	14	6	8,0	15,0	9,0	14	7	25,1	4,8	30	22	5	14	23	60	5,0	5,0	4,0	80



EH 22260.

Door Catches



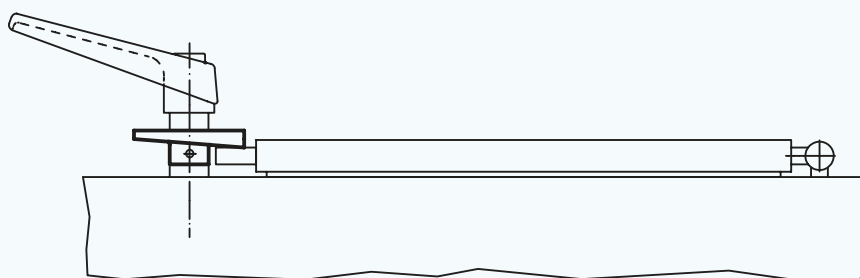
Material:

- Dry powdered metal

Note:

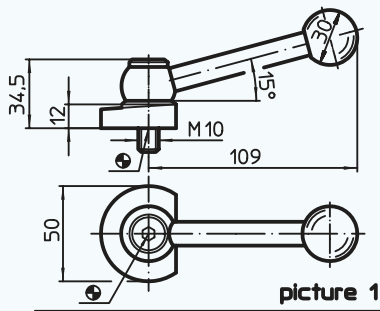
Not suitable for fastening by welded connection. Secure by using pins.

Ref. No.	Finish	d ₁	d ₂ H8	d ₃	b ₁	b ₂	b ₃	b ₄	g
22260.0008	locking by	35	8	18	15	7	3	7,0	30
22260.0010	turning to the right	35	10	18	15	7	3	7,0	31
22260.0012		65	12	23	20	10	5	7,2	103
22260.0016		80	16	27	24	12	6	8,8	174
22260.0108	locking by	35	8	18	15	7	3	7,0	34
22260.0110	turning to the left	35	10	18	15	7	3	7,0	31
22260.0112		65	12	23	20	10	5	7,2	103
22260.0116		80	16	27	24	12	6	8,8	175

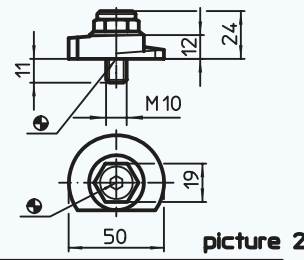


EH 22260.

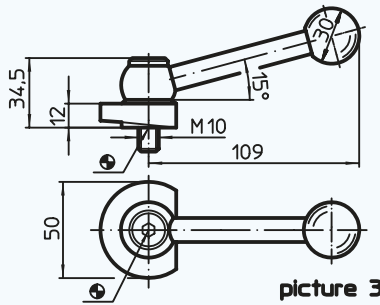
Clamping Catches



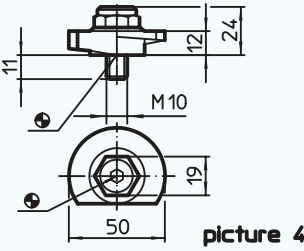
picture 1



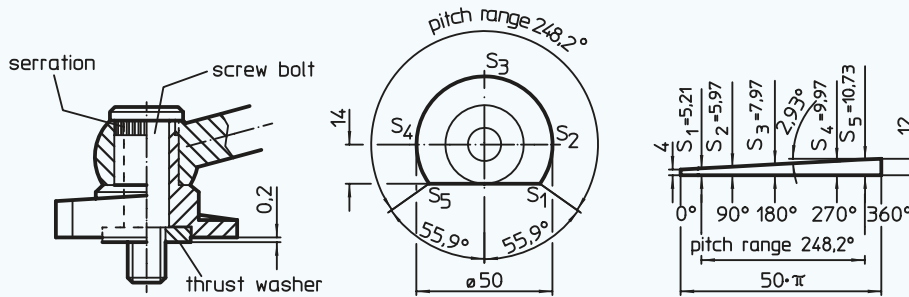
picture 2



picture 3



picture 4



Material:

Body:

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

Ball knob:

- DIN 319 plastic (PF31), black

Screw:

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

Note:

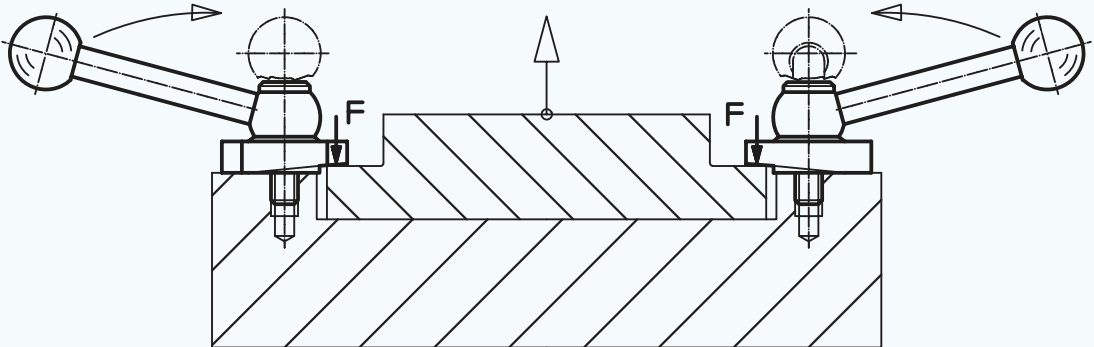
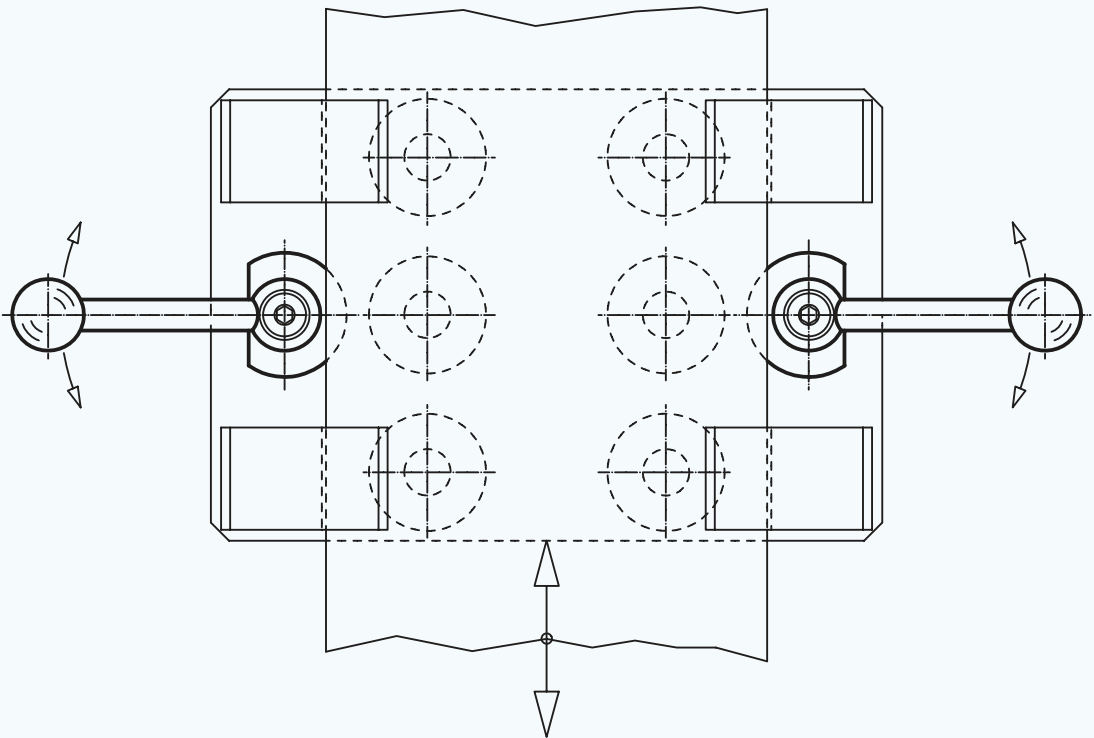
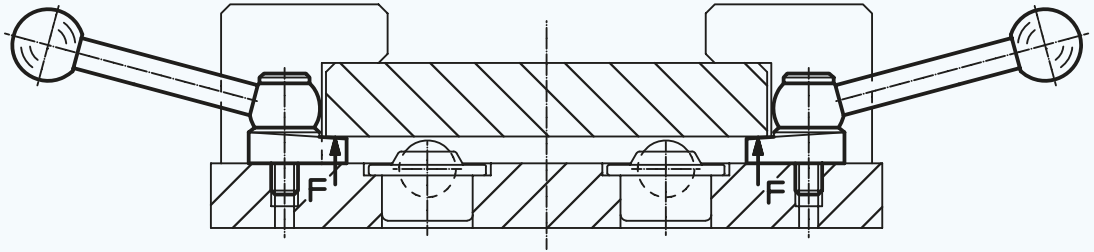
The bolt and the disc adjustable. Once screwed in, the lever can easily be turned to the desired position. For ref. nos. 22260.0250 / .0251 and 22260.0450 / .0451, the serration helps to put the clamping lever to the preferred position. Left turn type can be supplied upon request.

Ref. No. Steel	Ref. No. Stainless steel	Finish	g
22260.0250	22260.0251	with adjustable clamping lever; pitch opposite to bearing surface (picture 1).	304
22260.0350	22260.0351	with clamping bolt; pitch opposite to bearing surface (picture 2).	154
22260.0450	22260.0451	with adjustable clamping lever; pitch on bearing surface (picture 3).	302
22260.0550	22260.0551	with clamping bolt; pitch on bearing surface (picture 4).	154

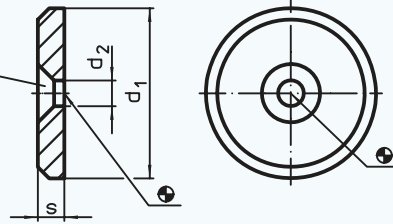
EH 22260.

Continued from previous page

**Clamping
Catches**



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



EH 22270.

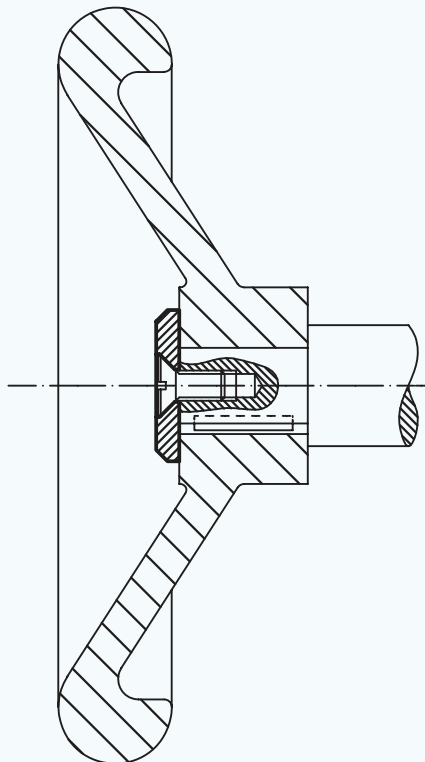
Shaft-End Washers



Material:

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

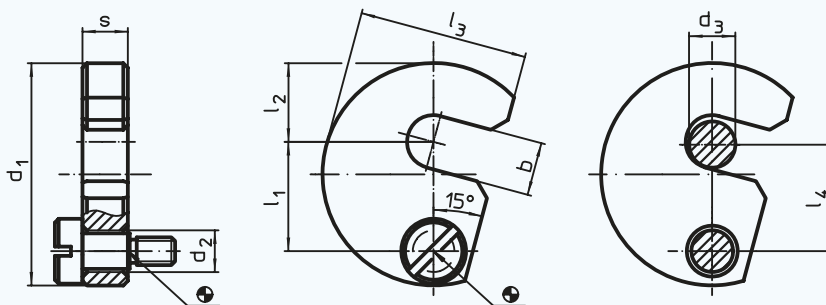
Ref. No. Steel	Ref. No. Stainless steel	d ₁	d ₂	s	g
22270.0016	22270.0116	16	4,5	3,0	3,6
22270.0020	22270.0120	20	4,5	3,0	6,1
22270.0022	22270.0122	22	5,5	3,5	8,1
22270.0025	22270.0125	25	5,5	3,5	11,0
22270.0028	22270.0128	28	5,5	3,5	14,0
22270.0032	22270.0132	32	6,6	4,0	22,0
22270.0036	22270.0136	36	6,6	4,0	28,0
22270.0040	22270.0140	40	6,6	5,0	44,0
22270.0045	22270.0145	45	6,6	6,0	66,0
22270.0052	22270.0152	52	6,6	6,0	91,0



EH 22280.

Captive C-Washers

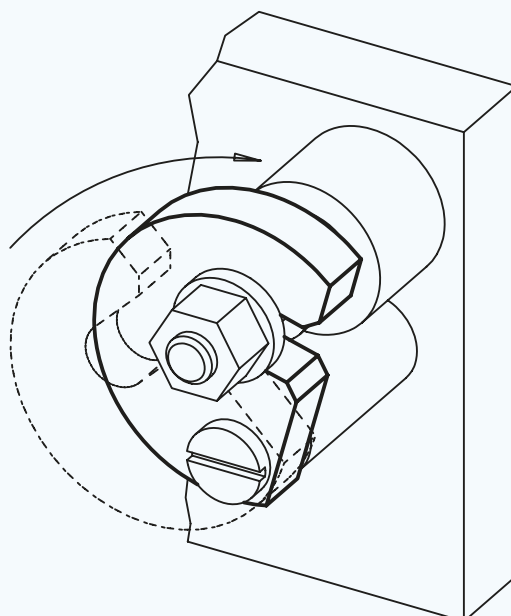
DIN 6371 with countersunk screw DIN 923



Material:

Captive C-Washer: • Heat-treated steel, tempered, blackened **Countersunk screw:** • Quality 5.8, blackened

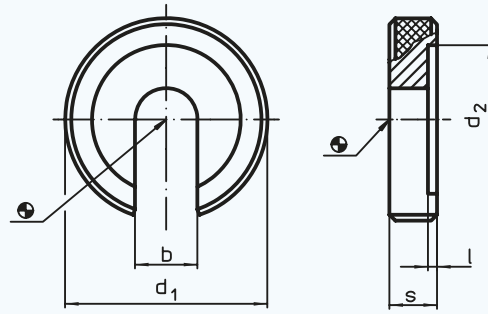
Ref. No.	Size	b	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	s -0,2	Suitable screw DIN 923	g
22280.0006	6	7,5	38	9	6	19,6	11	29,0	19	9,8	M 6 x 10	66
22280.0008	8	9,5	43	9	8	21,6	14	32,5	21	9,8	M 6 x 10	81
22280.0010	10	11,5	48	9	10	23,6	17	36,5	23	9,8	M 6 x 10	99
22280.0012	12	13,5	61	11	12	29,6	22	45,0	29	11,8	M 8 x 12	194
22280.0016	16	17,5	68	11	16	33,6	25	50,0	33	11,8	M 8 x 12	229
22280.0020	20	21,5	74	11	20	36,6	28	55,0	36	11,8	M 8 x 12	265
22280.0024	24	25,5	82	11	24	40,6	32	62,0	40	15,8	M 8 x 16	430
22280.0030	30	32,0	97	11	30	49,0	39	73,0	48	15,8	M 8 x 16	584



EH 22290.

C-Washers

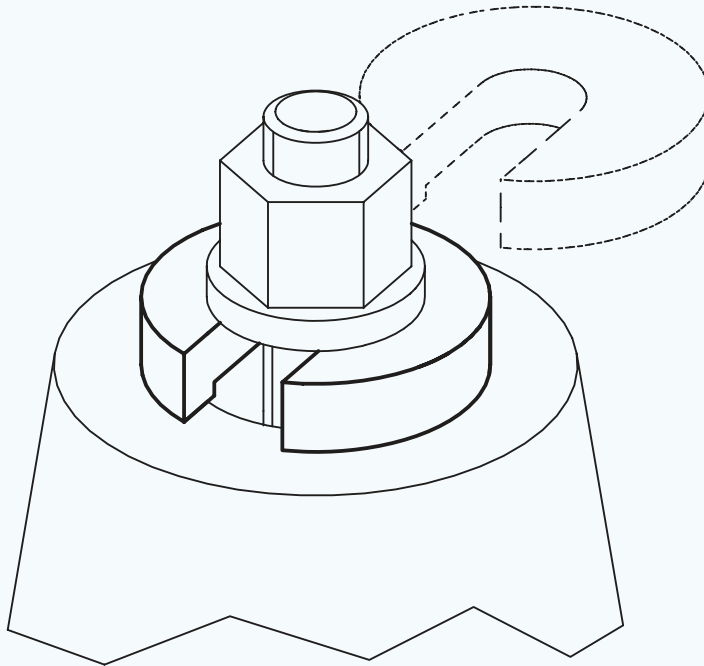
DIN 6372



Material:

- Heat-treated steel, tempered, blackened

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

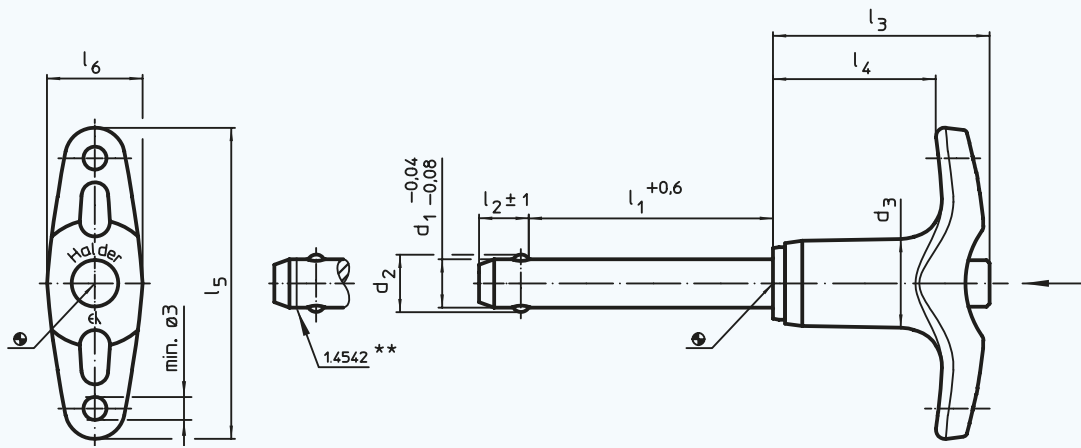




EH 22340. / EH 22350.

Ball Lock Pins

self-locking,
with T-Handle



>>> Special types upon request. <<<

** Types from stainless steel 1.4542 with marking.

Material:

- Pin part:**
- Stainless steel 1.4305
 - Stainless steel 1.4542, precipitation-hardened, hard-coated (marking)
- Spring:**
- Stainless steel

Handle: • Aluminium, black similar to RAL 9005

Press bolt: • Stainless steel, black

Note:

Press button to release pin

EH 22340. stainless steel 1.4305

EH 22350. stainless steel 1.4542, precipitation-hardened, hard-coated.

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.

The features of this ball lock pin are:

- ergonomic grip,
- corrosion-resistant,
- temperature range from - 30 °C up to + 150 °C,
- solid, hardened, hard-coated, abrasion-resistant pin, having an extreme load capacity (stainless steel 1.4542),
- can easily be fitted with retaining cable EH 22400.

Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	l ₂	l ₃	l ₄	l ₅	l ₆	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	g
22340.0012	22350.0012	5	10	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	14	24	19
22340.0013	22350.0013	5	15	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	14	24	20
22340.0014	22350.0014	5	20	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	14	24	20
22340.0015	22350.0015	5	25	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	14	24	21
22340.0016	22350.0016	5	30	5,5	11,8	6,0	31,6	24,1	45,2	12,7	5	14	24	22
22340.0022	22350.0022	6	10	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	21	35	20
22340.0023	22350.0023	6	15	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	21	35	21
22340.0024	22350.0024	6	20	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	21	35	22
22340.0025	22350.0025	6	25	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	21	35	23
22340.0026	22350.0026	6	30	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	21	35	24
22340.0027	22350.0027	6	35	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	21	35	25
22340.0028	22350.0028	6	40	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	21	35	26
22340.0029	22350.0029	6	45	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	21	35	27
22340.0030	22350.0030	6	50	7,0	11,8	7,0	31,6	24,1	45,2	12,7	6	21	35	28
22340.0034	22350.0034	8	20	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	38	63	37
22340.0035	22350.0035	8	25	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	38	63	39
22340.0036	22350.0036	8	30	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	38	63	41
22340.0037	22350.0037	8	35	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	38	63	43
22340.0038	22350.0038	8	40	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	38	63	44
22340.0039	22350.0039	8	45	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	38	63	46
22340.0040	22350.0040	8	50	9,5	14,7	8,2	35,8	26,9	51,5	15,8	8	38	63	48

* Shearing resistance similar to DIN 50141

Also available in

INCH

Continued from previous page

**EH 22340. /
EH 22350.**

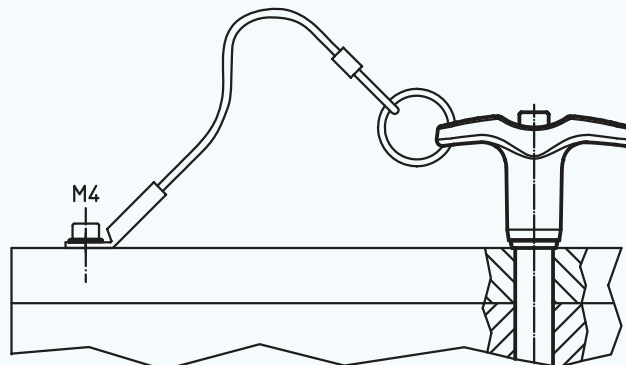
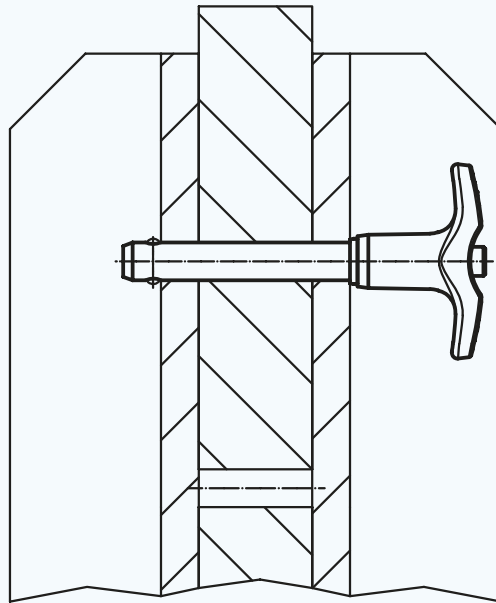
Ball Lock Pins

**self-locking,
with T-Handle**



Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	l ₂	l ₃	l ₄	l ₅	l ₆	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	± g
22340.0044	22350.0044	10	20	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	60	100	44
22340.0045	22350.0045	10	25	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	60	100	47
22340.0046	22350.0046	10	30	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	60	100	49
22340.0047	22350.0047	10	35	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	60	100	52
22340.0048	22350.0048	10	40	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	60	100	55
22340.0049	22350.0049	10	45	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	60	100	58
22340.0050	22350.0050	10	50	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	60	100	61
22340.0052	22350.0052	10	60	12,0	14,7	9,6	35,8	26,9	51,5	15,8	10	60	100	67
22340.0065	22350.0065	12	25	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	87	144	73
22340.0066	22350.0066	12	30	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	87	144	77
22340.0067	22350.0067	12	35	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	87	144	81
22340.0068	22350.0068	12	40	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	87	144	86
22340.0069	22350.0069	12	45	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	87	144	90
22340.0070	22350.0070	12	50	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	87	144	94
22340.0072	22350.0072	12	60	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	87	144	103
22340.0074	22350.0074	12	70	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	87	144	111
22340.0076	22350.0076	12	80	14,5	18,2	10,6	35,1	25,3	59,1	20,2	12	87	144	119

* Shearing resistance similar to DIN 50141

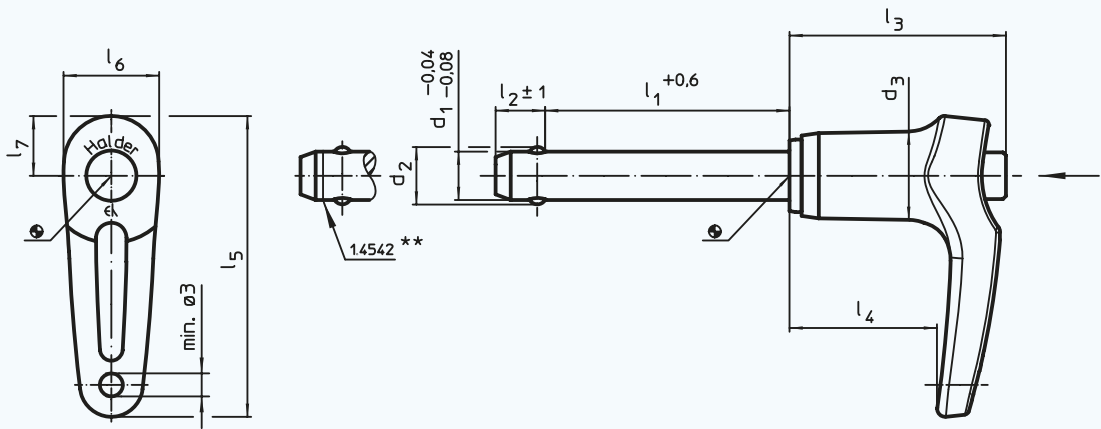


Also available in
INCH

**EH 22340. /
EH 22350.**

Ball Lock Pins

self-locking,
with L-Handle



>>> Special types upon request. <<<

** Types from stainless steel 1.4542 with marking.

Material:

Pin part: • Stainless steel 1.4305
• Stainless steel 1.4542, precipitation-hardened,
hard-coated (marking)

Handle: • Aluminium, black similar to RAL 9005

Spring: • Stainless steel

Press bolt: • Stainless steel, black

Note:

Press button to release pin

EH 22340. stainless steel 1.4305

EH 22350. stainless steel 1.4542, precipitation-hardened, hard-coated.

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.

The features of this ball lock pin are:

- ergonomic grip,
- corrosion-resistant,
- temperature range from - 30 °C up to + 150 °C,
- solid, hardened, hard-coated, abrasion-resistant pin, having an extreme load capacity (stainless steel 1.4542),
- can easily be fitted with retaining cable EH 22400.

Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	g
22340.0112	22350.0112	5	10	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	14	24	20
22340.0113	22350.0113	5	15	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	14	24	21
22340.0114	22350.0114	5	20	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	14	24	21
22340.0115	22350.0115	5	25	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	14	24	22
22340.0116	22350.0116	5	30	5,5	11,8	6,0	31,6	21,9	43,8	12,6	8,5	5	14	24	23
22340.0122	22350.0122	6	10	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	21	35	21
22340.0123	22350.0123	6	15	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	21	35	22
22340.0124	22350.0124	6	20	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	21	35	23
22340.0125	22350.0125	6	25	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	21	35	24
22340.0126	22350.0126	6	30	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	21	35	25
22340.0127	22350.0127	6	35	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	21	35	26
22340.0128	22350.0128	6	40	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	21	35	27
22340.0129	22350.0129	6	45	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	21	35	28
22340.0130	22350.0130	6	50	7,0	11,8	7,0	31,6	21,9	43,8	12,6	8,5	6	21	35	29
22340.0134	22350.0134	8	20	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	38	63	37
22340.0135	22350.0135	8	25	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	38	63	39
22340.0136	22350.0136	8	30	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	38	63	41
22340.0137	22350.0137	8	35	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	38	63	43
22340.0138	22350.0138	8	40	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	38	63	45
22340.0139	22350.0139	8	45	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	38	63	46
22340.0140	22350.0140	8	50	9,5	14,7	8,2	35,8	24,4	49,7	15,8	9,9	8	38	63	48

* Shearing resistance similar to DIN 50141

Also available in

INCH

Continued from previous page

**EH 22340. /
EH 22350.**

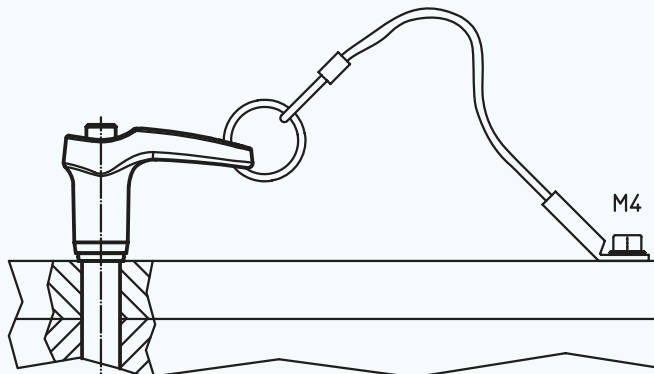
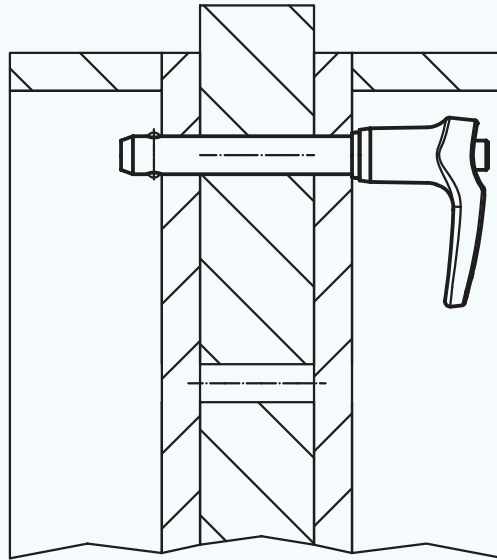
Ball Lock Pins

**self-locking,
with L-Handle**



Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	±g
22340.0144	22350.0144	10	20	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	60	100	44
22340.0145	22350.0145	10	25	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	60	100	47
22340.0146	22350.0146	10	30	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	60	100	50
22340.0147	22350.0147	10	35	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	60	100	53
22340.0148	22350.0148	10	40	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	60	100	56
22340.0149	22350.0149	10	45	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	60	100	58
22340.0150	22350.0150	10	50	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	60	100	62
22340.0152	22350.0152	10	60	12,0	14,7	9,6	35,8	24,4	49,7	15,8	9,9	10	60	100	67
22340.0165	22350.0165	12	25	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	87	144	73
22340.0166	22350.0166	12	30	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	87	144	77
22340.0167	22350.0167	12	35	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	87	144	82
22340.0168	22350.0168	12	40	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	87	144	86
22340.0169	22350.0169	12	45	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	87	144	90
22340.0170	22350.0170	12	50	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	87	144	94
22340.0172	22350.0172	12	60	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	87	144	103
22340.0174	22350.0174	12	70	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	87	144	111
22340.0176	22350.0176	12	80	14,5	18,2	10,6	35,1	22,7	57,1	20,2	12,6	12	87	144	120

* Shearing resistance similar to DIN 50141

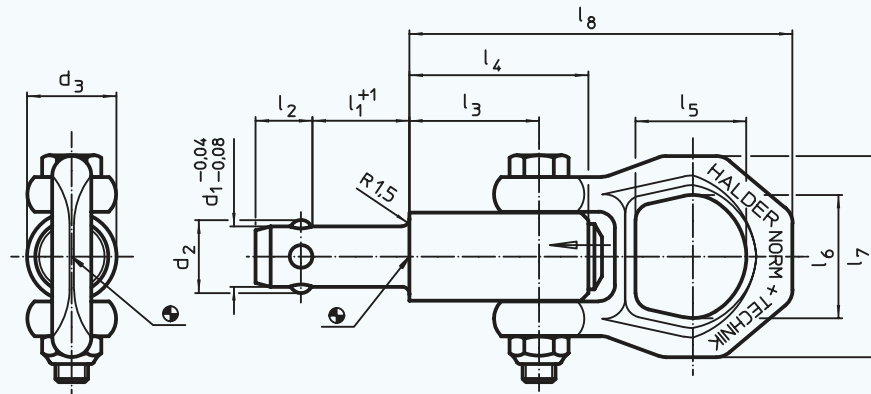


Also available in
INCH

EH 22350.

Lifting Pins

self-locking



Material:

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

Spring: • Stainless steel

Shackle: • Heat-treated steel, tempered, manganese phosphated

Press bolt: • Aluminium, red anodised

Note:

Press button to release pin

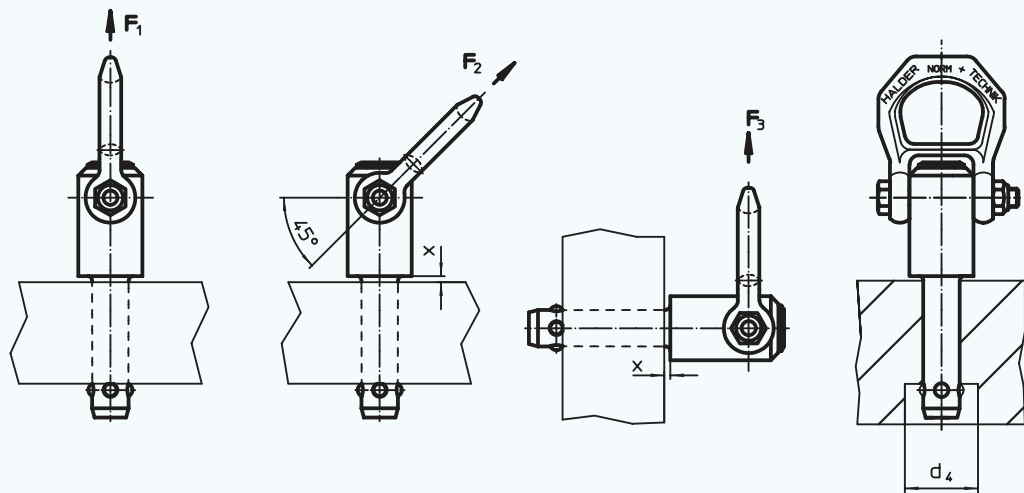
Heavy-duty lifting element for quick and easy use, with moveable shackle and locking stud to provide protection of unintentional unlocking. Special lifting devices, e.g. threads for ring bolts, are no longer required on the work piece. Simple H11 boreholes are sufficient.

This lifting pin offers the following advantages:

- corrosion resistant
- temperature range up to 250 °C.
- locating bushings 22350.0910 - .0936. can be supplied as an accessory.

Ref. No.	d ₁	l ₁	d ₂	d ₃	d ₄ min.	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	x min.*	x max.	Location hole H11	F ₁ kN*	F ₂ kN*	F ₃ kN*	g
22350.0621	10	15	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1	226
22350.0623	10	25	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	15	10	2,7	2,4	2,1	238
22350.0625	10	35	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	25	10	2,7	2,4	2,1	244
22350.0627	10	50	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	35	10	2,7	2,4	2,1	252
22350.0631	12	15	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	10	12	3,5	3,2	2,8	238
22350.0633	12	25	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	20	12	3,5	3,2	2,8	243
22350.0635	12	35	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	25	12	3,5	3,2	2,8	251
22350.0637	12	50	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	45	12	3,5	3,2	2,8	268
22350.0641	16	25	18,6	25,0	19,2	15,1	31,0	44,5	27	30	49	92,8	1,5	20	16	4,8	4,5	4,1	312
22350.0643	16	50	18,6	25,0	19,2	15,1	31,0	44,5	27	30	49	92,8	1,5	40	16	4,8	4,5	4,1	353
22350.0645	16	75	18,6	25,0	19,2	15,1	31,0	44,5	27	30	49	92,8	1,5	55	16	4,8	4,5	4,1	388

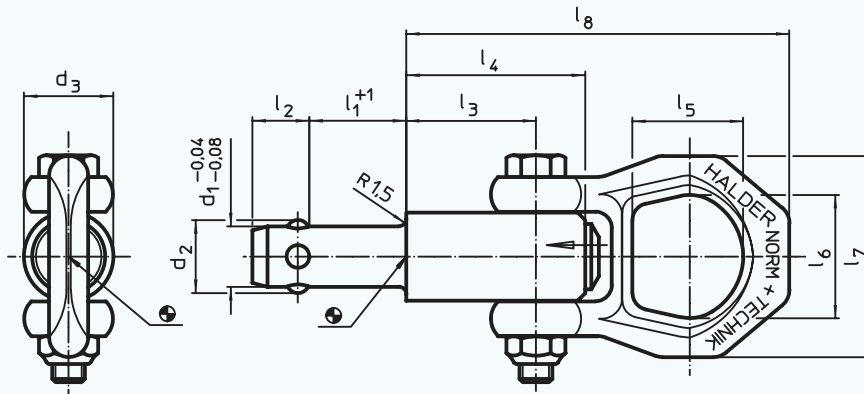
* for a 5-fold safety



EH 22350.

Lifting Pins

self-locking,
stainless steel



Material:

Pin part: • Stainless steel 1.4542, precipitation-hardened, passivated

Shackle: • Stainless steel 1.4571

Spring: • Stainless steel

Press bolt: • Aluminium, red anodised

Note:

Press button to release pin

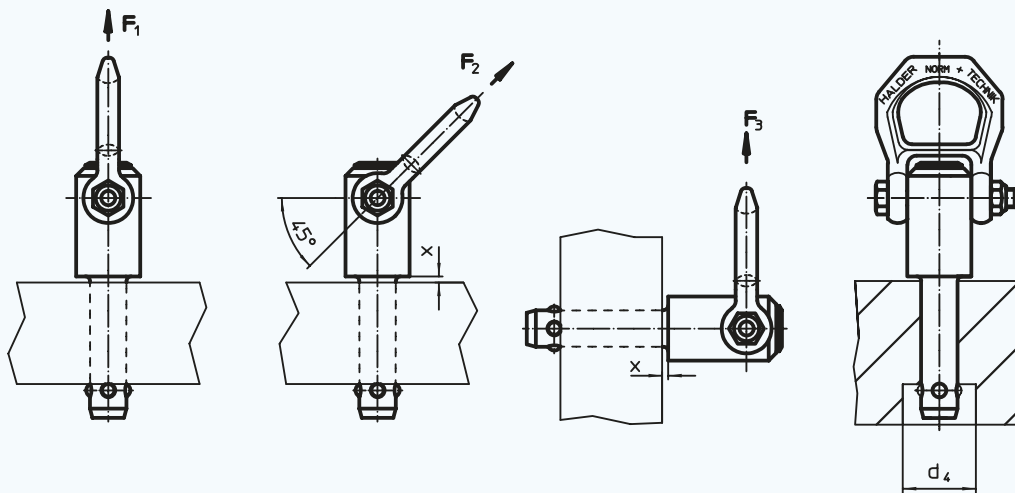
Heavy-duty lifting element for quick and easy use, with moveable shackle and locking stud to provide protection of accidental unlocking. Special lifting devices, e.g. threads for ring bolts, are no longer required on the work piece. Simple H11 boreholes are sufficient.

This lifting pin offers the following advantages:

- corrosion and weathering resistant, thus also suitable for outdoor application
- very solid, precipitation-hardened pin, having an extreme load capacity, high abrasion-resistance
- temperature range up to 250 °C
- suitable locating bushings can be obtained as an accessory - refer to 22350.0910 - .0936.

Ref. No.	d ₁	l ₁	d ₂	d ₃	d ₄ min.	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	x min.*	x max.	Location hole H11	F ₁ kN*	F ₂ kN*	F ₃ kN*	g
22350.0721	10	15	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1	233
22350.0723	10	25	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	15	10	2,7	2,4	2,1	243
22350.0725	10	35	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	25	10	2,7	2,4	2,1	250
22350.0727	10	50	11,7	21,5	12,2	10,2	25,7	36,0	27	30	49	87,5	1,5	35	10	2,7	2,4	2,1	257
22350.0731	12	15	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	10	12	3,5	3,2	2,8	246
22350.0733	12	25	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	20	12	3,5	3,2	2,8	255
22350.0735	12	35	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	25	12	3,5	3,2	2,8	265
22350.0737	12	50	14,2	21,5	14,7	11,0	25,7	36,0	27	30	49	87,5	1,5	45	12	3,5	3,2	2,8	273
22350.0741	16	25	18,6	25,0	19,2	15,1	31,0	44,5	27	30	49	92,8	1,5	20	16	4,8	4,5	4,1	325
22350.0743	16	50	18,6	25,0	19,2	15,1	31,0	44,5	27	30	49	92,8	1,5	40	16	4,8	4,5	4,1	367
22350.0745	16	75	18,6	25,0	19,2	15,1	31,0	44,5	27	30	49	92,8	1,5	55	16	4,8	4,5	4,1	403

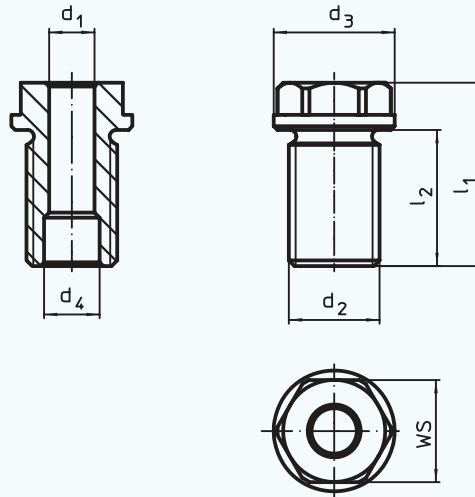
* for a 5-fold safety



EH 22350.

Locating Bushings

for lifting pins



Material:

- Stainless steel 1.4542, precipitation-hardened, passivated

Note:

Locating bushings are used for quick and safe locating of lifting pins EH 22350.

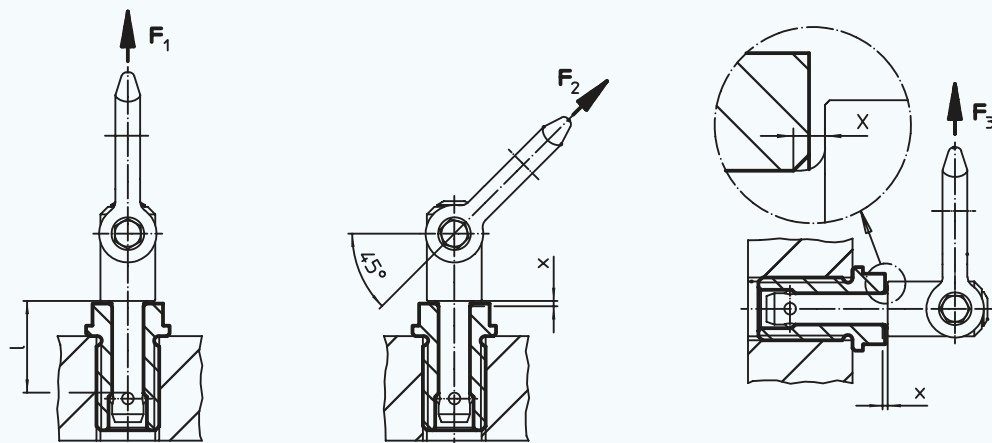
Features:

- ensure safe tolerances and consistent function
- easily incorporable into different materials
- can be used in thin-walled pieces
- corrosion-resistant
- abrasion-resistant.

Suitable locating bushes can be obtained for each lifting pin.

Ref. No.	d ₁ H11	For nominal length l	d ₂	d ₃ -0,2	d ₄ +0,3	l ₁	l ₂	WS	x*	F ₁ kN*	F ₂ kN*	F ₃ kN*	Starting torque max. Nm	For lifting pin	g
22350.0910	10	15	M 20 x 1,5	28	12,2	35,5	24	24	1,5	2,7	2,4	2,1	145	22350.0621 / .0721	70
22350.0912	10	25	M 20 x 1,5	28	12,2	35,5	24	24	1,5	2,7	2,4	2,1	145	22350.0623 / .0723	73
22350.0914	10	35	M 20	28	12,2	46,0	29	24	1,5	2,7	2,4	2,1	130	22350.0625 / .0725	93
22350.0916	10	50	M 20	28	12,2	65,0	49	24	1,5	2,7	2,4	2,1	130	22350.0627 / .0727	117
22350.0920	12	15	M 24 x 1,5	32	14,7	35,5	24	27	1,5	3,5	3,2	2,8	220	22350.0631 / .0731	94
22350.0922	12	25	M 24 x 1,5	32	14,7	36,5	24	27	1,5	3,5	3,2	2,8	220	22350.0633 / .0733	102
22350.0924	12	35	M 24	32	14,7	48,5	36	27	1,5	3,5	3,2	2,8	200	22350.0635 / .0735	119
22350.0926	12	50	M 24	32	14,7	72,5	60	27	1,5	3,5	3,2	2,8	200	22350.0637 / .0737	164
22350.0930	16	25	M 30 x 2	39	19,2	44,0	29	30	1,5	4,8	4,5	4,1	440	22350.0641 / .0741	163
22350.0934	16	50	M 30	39	19,2	66,0	44	30	1,5	4,8	4,5	4,1	400	22350.0643 / .0743	236
22350.0936	16	75	M 30	39	19,2	96,0	74	30	1,5	4,8	4,5	4,1	400	22350.0645 / .0745	323

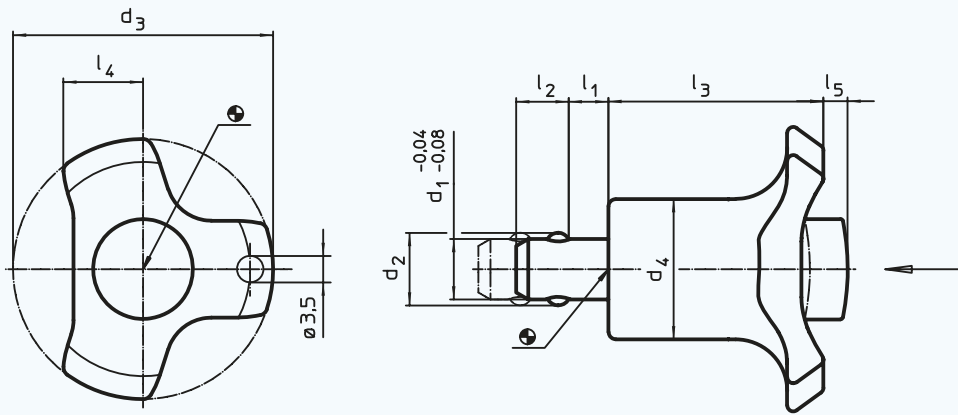
* for a 5-fold safety



EH 22360.

Clamping Pins

self-locking,
with span
compensation



Material:

Pin part: • Stainless steel 1.4305 **Handle:** • Thermoplastic PA 6, grey **Spring:** • Stainless steel

Note:

Press button to release pin

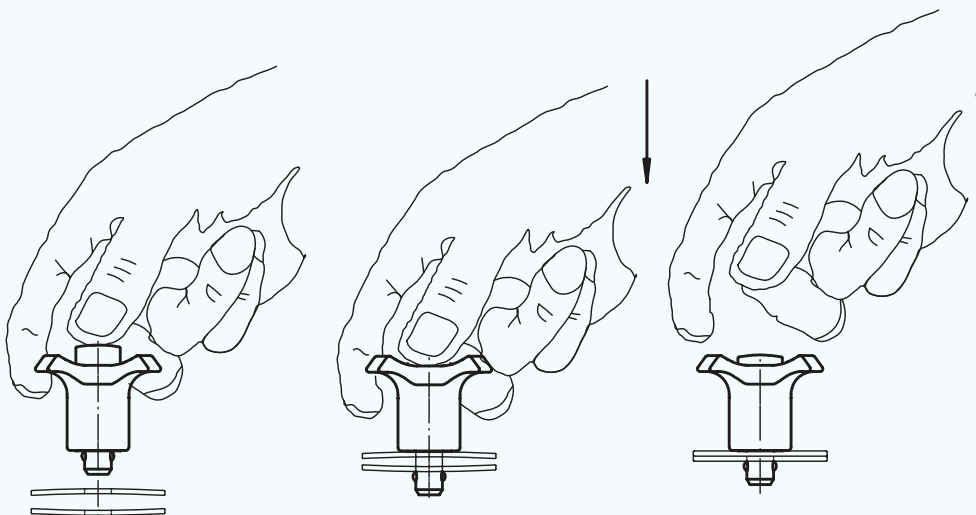
Used for locking and simultaneously tightly connecting thin walled plates.

Clamping distance of 5 mm for clamping of sheets for welding work, for protection, coverings, to close doors etc.

This clamping pin offers the following advantages:

- corrosion resistant
- ergonomic grip
- can easily be fitted with retaining cable EH 22400.
- temperature range from - 30 °C up to + 80 °C.

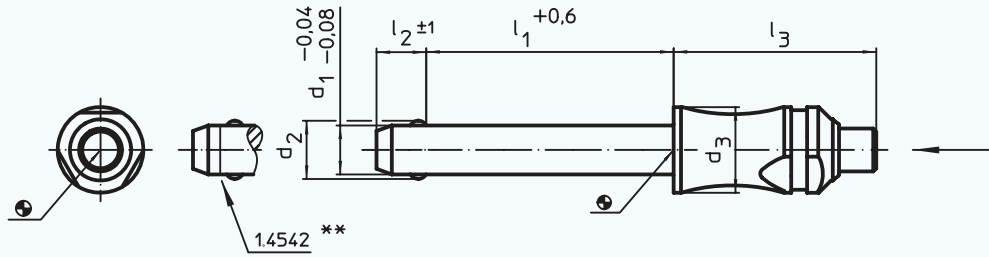
Ref. No.	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	l ₅ Un-clamped	Location hole H11	Clamping force N max.	g
22360.0010	6	0 - 5	7,0	38	17,5	5,0	30,2	11,0	3	6	16	19
22360.0012	6	5 - 10	7,0	38	17,5	5,0	30,2	11,0	3	6	18	23
22360.0020	8	0 - 5	9,5	38	17,5	6,5	30,2	11,0	3	8	16	22
22360.0022	8	5 - 10	9,5	38	17,5	6,5	30,2	11,0	3	8	18	25
22360.0030	10	0 - 5	12,0	47	23,0	8,7	36,0	11,0	4	10	21	45
22360.0032	10	5 - 10	12,0	47	23,0	8,7	36,0	11,0	4	10	23	47
22360.0040	12	0 - 5	14,0	47	23,0	9,4	36,0	13,5	4	12	21	47
22360.0042	12	5 - 10	14,0	47	23,0	9,4	36,0	13,5	4	12	23	54



**EH 22370. /
EH 22380.**

Ball Lock Pins

self-locking,
basic type



>>> Special types upon request. <<<

** Types from stainless steel 1.4542 with marking.

Material:

Pin part: • Stainless steel 1.4305
• Stainless steel 1.4542, precipitation-hardened, hard-coated (marking)

Spring: • Stainless steel

Note:

Press button to release pin

EH 22370. stainless steel 1.4305

EH 22380. stainless steel 1.4542, precipitation hardened, hard coated

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.

The features of this ball lock pin are:

- corrosion-resistant
- solid, hardened, hard coated, abrasion-resistant pin, having an extreme load capacity (stainless steel 1.4542)
- solid construction with recessed grip
- can easily be fitted with retaining cable EH 22400.
- temperature range up to 250 °C.

Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	l ₂	l ₃	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	g
22370.0012	22380.0012	5	10	5,5	10	6,0	26,2	5	14	24	10
22370.0013	22380.0013	5	15	5,5	10	6,0	26,2	5	14	24	11
22370.0014	22380.0014	5	20	5,5	10	6,0	26,2	5	14	24	12
22370.0015	22380.0015	5	25	5,5	10	6,0	26,2	5	14	24	13
22370.0016	22380.0016	5	30	5,5	10	6,0	26,2	5	14	24	13
22370.0022	22380.0022	6	10	7,0	10	7,0	26,2	6	21	35	11
22370.0023	22380.0023	6	15	7,0	10	7,0	26,2	6	21	35	12
22370.0024	22380.0024	6	20	7,0	10	7,0	26,2	6	21	35	13
22370.0025	22380.0025	6	25	7,0	10	7,0	26,2	6	21	35	14
22370.0026	22380.0026	6	30	7,0	10	7,0	26,2	6	21	35	15
22370.0027	22380.0027	6	35	7,0	10	7,0	26,2	6	21	35	16
22370.0028	22380.0028	6	40	7,0	10	7,0	26,2	6	21	35	17
22370.0029	22380.0029	6	45	7,0	10	7,0	26,2	6	21	35	18
22370.0030	22380.0030	6	50	7,0	10	7,0	26,2	6	21	35	19
22370.0034	22380.0034	8	20	9,6	14	8,2	33,1	8	38	63	33
22370.0035	22380.0035	8	25	9,6	14	8,2	33,1	8	38	63	34
22370.0036	22380.0036	8	30	9,6	14	8,2	33,1	8	38	63	36
22370.0037	22380.0037	8	35	9,6	14	8,2	33,1	8	38	63	38
22370.0038	22380.0038	8	40	9,6	14	8,2	33,1	8	38	63	40
22370.0039	22380.0039	8	45	9,6	14	8,2	33,1	8	38	63	42
22370.0040	22380.0040	8	50	9,6	14	8,2	33,1	8	38	63	44
22370.0044	22380.0044	10	20	12,0	14	9,6	33,1	10	60	100	39
22370.0045	22380.0045	10	25	12,0	14	9,6	33,1	10	60	100	42
22370.0046	22380.0046	10	30	12,0	14	9,6	33,1	10	60	100	45
22370.0047	22380.0047	10	35	12,0	14	9,6	33,1	10	60	100	48
22370.0048	22380.0048	10	40	12,0	14	9,6	33,1	10	60	100	51
22370.0049	22380.0049	10	45	12,0	14	9,6	33,1	10	60	100	54
22370.0050	22380.0050	10	50	12,0	14	9,6	33,1	10	60	100	57
22370.0052	22380.0052	10	60	12,0	14	9,6	33,1	10	60	100	63

* Shearing resistance similar to DIN 50141

Continued from previous page

**EH 22370. /
EH 22380.**

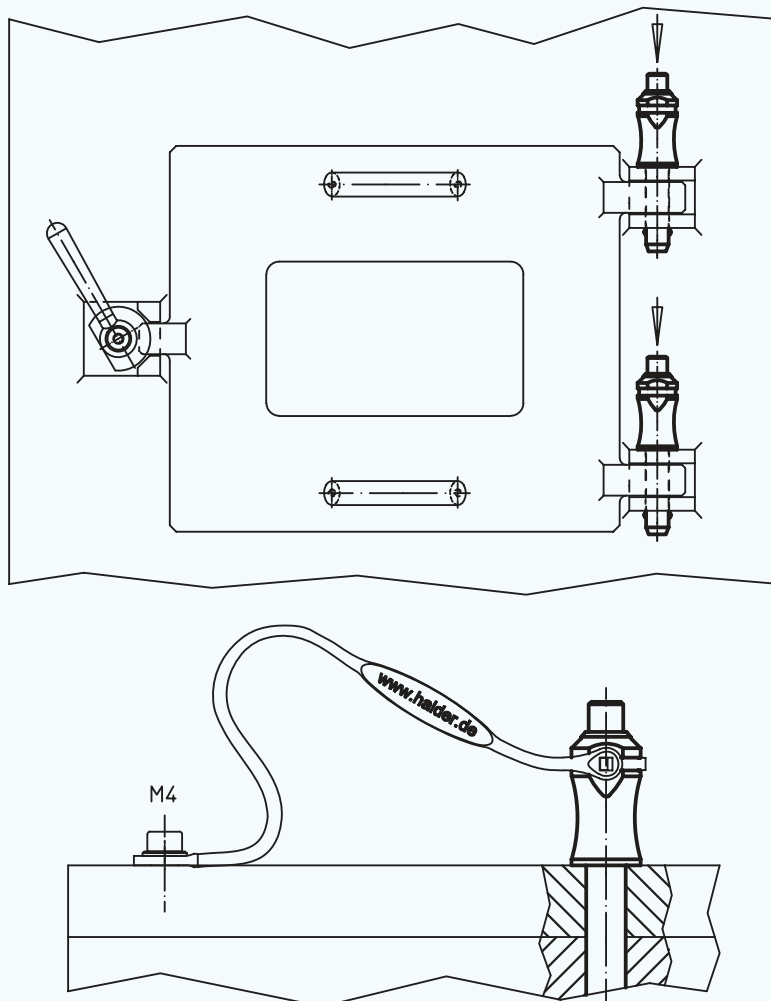
Ball Lock Pins

self-locking,
basic type



Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	l ₂	l ₃	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	g
22370.0065	22380.0065	12	25	14,5	20	10,6	39,5	12	87	144	84
22370.0066	22380.0066	12	30	14,5	20	10,6	39,5	12	87	144	88
22370.0067	22380.0067	12	35	14,5	20	10,6	39,5	12	87	144	92
22370.0068	22380.0068	12	40	14,5	20	10,6	39,5	12	87	144	96
22370.0069	22380.0069	12	45	14,5	20	10,6	39,5	12	87	144	101
22370.0070	22380.0070	12	50	14,5	20	10,6	39,5	12	87	144	105
22370.0072	22380.0072	12	60	14,5	20	10,6	39,5	12	87	144	113
22370.0074	22380.0074	12	70	14,5	20	10,6	39,5	12	87	144	122
22370.0076	22380.0076	12	80	14,5	20	10,6	39,5	12	87	144	130
22370.0086	22380.0086	16	30	19,0	20	14,0	39,5	16	155	257	120
22370.0087	22380.0087	16	35	19,0	20	14,0	39,5	16	155	257	127
22370.0088	22380.0088	16	40	19,0	20	14,0	39,5	16	155	257	135
22370.0089	22380.0089	16	45	19,0	20	14,0	39,5	16	155	257	143
22370.0090	22380.0090	16	50	19,0	20	14,0	39,5	16	155	257	150
22370.0092	22380.0092	16	60	19,0	20	14,0	39,5	16	155	257	166
22370.0094	22380.0094	16	70	19,0	20	14,0	39,5	16	155	257	181
22370.0096	22380.0096	16	80	19,0	20	14,0	39,5	16	155	257	196
22370.0112	22380.0112	20	60	25,0	28	20,5	50,1	20	244	403	322
22370.0116	22380.0116	20	80	25,0	28	20,5	50,1	20	244	403	370
22370.0120	22380.0120	20	100	25,0	28	20,5	50,1	20	244	403	414
22370.0124	22380.0124	20	120	25,0	28	20,5	50,1	20	244	403	466

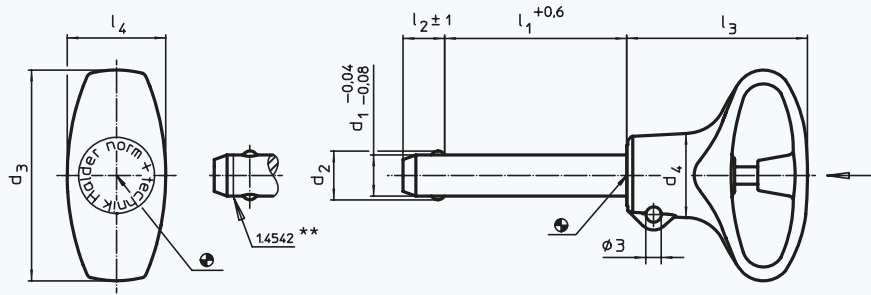
* Shearing resistance similar to DIN 50141



**EH 22370. /
EH 22380.**

Ball Lock Pins

self-locking,
with elastic grip



>>> Special types upon request. <<<

** Types from stainless steel 1.4542 with marking.

Material:

Pin part: • Stainless steel 1.4305
• Stainless steel 1.4542, precipitation-hardened, hard-coated (marking)

Handle: • Thermoplastic (PBT/TPE), grey / orange

Note:

Press button to release pin

EH 22370. stainless steel 1.4305

EH 22380. stainless steel 1.4542, precipitation hardened, hard coated

For quick fastening, locking, adjusting, changing and securing. Multiple 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.

The features of this ball lock pin are:

- elastic and ergonomic grip with integrated reset (locking)
- new, modern, patented design
- corrosion-resistant
- solid, hardened, hard coated, abrasion-resistant pin, having an extreme load capacity (stainless steel 1.4542)
- can easily be fitted with retaining cable EH 22400.
- temperature range from - 30 °C up to + 80 °C.

Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	g
22370.0712	22380.0712	5	10	5,5	36	12,7	6,0	31,0	15,9	5	14	24	9
22370.0713	22380.0713	5	15	5,5	36	12,7	6,0	31,0	15,9	5	14	24	10
22370.0714	22380.0714	5	20	5,5	36	12,7	6,0	31,0	15,9	5	14	24	11
22370.0715	22380.0715	5	25	5,5	36	12,7	6,0	31,0	15,9	5	14	24	11
22370.0716	22380.0716	5	30	5,5	36	12,7	6,0	31,0	15,9	5	14	24	12
22370.0722	22380.0722	6	10	7,0	36	12,7	7,0	31,0	15,9	6	21	35	10
22370.0723	22380.0723	6	15	7,0	36	12,7	7,0	31,0	15,9	6	21	35	11
22370.0724	22380.0724	6	20	7,0	36	12,7	7,0	31,0	15,9	6	21	35	12
22370.0725	22380.0725	6	25	7,0	36	12,7	7,0	31,0	15,9	6	21	35	13
22370.0726	22380.0726	6	30	7,0	36	12,7	7,0	31,0	15,9	6	21	35	14
22370.0727	22380.0727	6	35	7,0	36	12,7	7,0	31,0	15,9	6	21	35	15
22370.0728	22380.0728	6	40	7,0	36	12,7	7,0	31,0	15,9	6	21	35	16
22370.0729	22380.0729	6	45	7,0	36	12,7	7,0	31,0	15,9	6	21	35	18
22370.0730	22380.0730	6	50	7,0	36	12,7	7,0	31,0	15,9	6	21	35	18
22370.0734	22380.0734	8	20	9,6	41	16,4	8,2	34,8	19,2	8	38	63	23
22370.0735	22380.0735	8	25	9,6	41	16,4	8,2	34,8	19,2	8	38	63	25
22370.0736	22380.0736	8	30	9,6	41	16,4	8,2	34,8	19,2	8	38	63	26
22370.0737	22380.0737	8	35	9,6	41	16,4	8,2	34,8	19,2	8	38	63	28
22370.0738	22380.0738	8	40	9,6	41	16,4	8,2	34,8	19,2	8	38	63	30
22370.0739	22380.0739	8	45	9,6	41	16,4	8,2	34,8	19,2	8	38	63	32
22370.0740	22380.0740	8	50	9,6	41	16,4	8,2	34,8	19,2	8	38	63	34
22370.0744	22380.0744	10	20	12,0	41	16,4	9,6	34,8	19,2	10	60	100	30
22370.0745	22380.0745	10	25	12,0	41	16,4	9,6	34,8	19,2	10	60	100	32
22370.0746	22380.0746	10	30	12,0	41	16,4	9,6	34,8	19,2	10	60	100	35
22370.0747	22380.0747	10	35	12,0	41	16,4	9,6	34,8	19,2	10	60	100	38
22370.0748	22380.0748	10	40	12,0	41	16,4	9,6	34,8	19,2	10	60	100	41
22370.0749	22380.0749	10	45	12,0	41	16,4	9,6	34,8	19,2	10	60	100	44
22370.0750	22380.0750	10	50	12,0	41	16,4	9,6	34,8	19,2	10	60	100	47
22370.0752	22380.0752	10	60	12,0	41	16,4	9,6	34,8	19,2	10	60	100	53

* Shearing resistance similar to DIN 50141

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**EH 22370. /
EH 22380.**

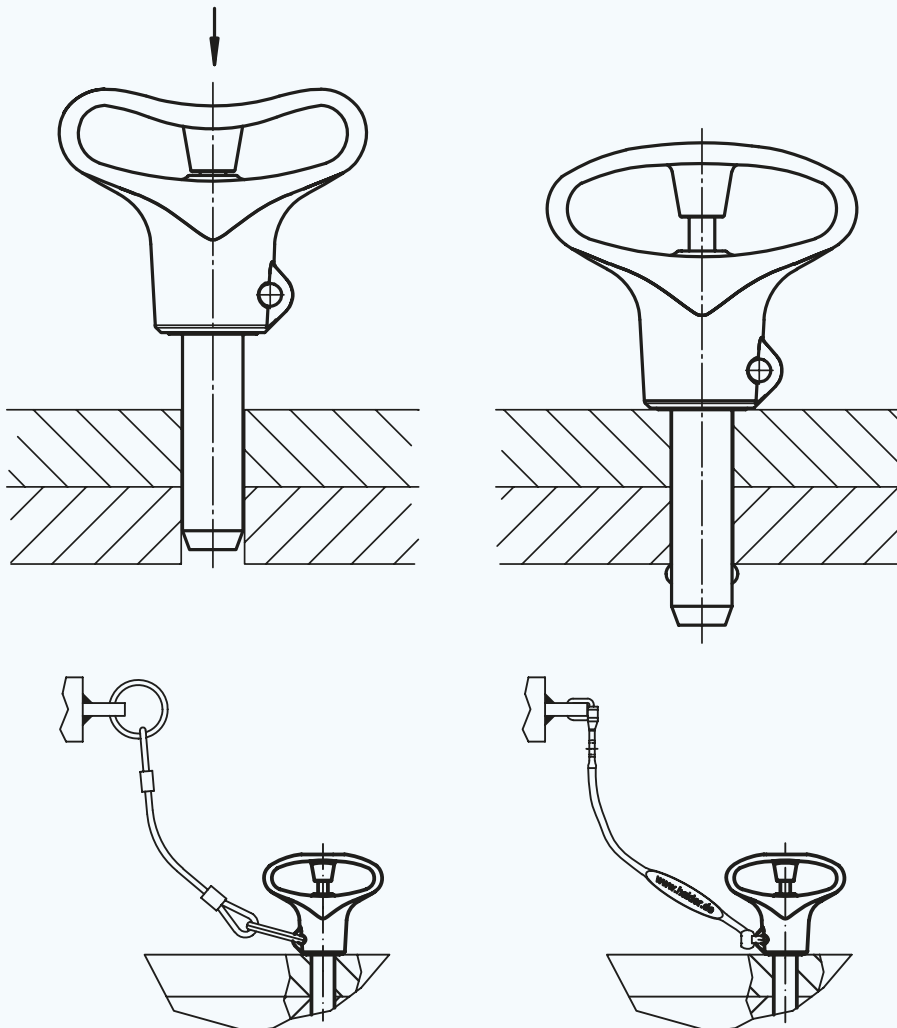
Ball Lock Pins

**self-locking,
with elastic grip**



Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	± g
22370.0765	22380.0765	12	25	14,5	49	21,2	10,6	40,5	24,8	12	87	144	54
22370.0766	22380.0766	12	30	14,5	49	21,2	10,6	40,5	24,8	12	87	144	59
22370.0767	22380.0767	12	35	14,5	49	21,2	10,6	40,5	24,8	12	87	144	63
22370.0768	22380.0768	12	40	14,5	49	21,2	10,6	40,5	24,8	12	87	144	67
22370.0769	22380.0769	12	45	14,5	49	21,2	10,6	40,5	24,8	12	87	144	71
22370.0770	22380.0770	12	50	14,5	49	21,2	10,6	40,5	24,8	12	87	144	75
22370.0772	22380.0772	12	60	14,5	49	21,2	10,6	40,5	24,8	12	87	144	84
22370.0774	22380.0774	12	70	14,5	49	21,2	10,6	40,5	24,8	12	87	144	93
22370.0776	22380.0776	12	80	14,5	49	21,2	10,6	40,5	24,8	12	87	144	101
22370.0786	22380.0786	16	30	19,0	49	21,2	14,0	40,5	24,8	16	155	257	91
22370.0787	22380.0787	16	35	19,0	49	21,2	14,0	40,5	24,8	16	155	257	98
22370.0788	22380.0788	16	40	19,0	49	21,2	14,0	40,5	24,8	16	155	257	106
22370.0789	22380.0789	16	45	19,0	49	21,2	14,0	40,5	24,8	16	155	257	114
22370.0790	22380.0790	16	50	19,0	49	21,2	14,0	40,5	24,8	16	155	257	121
22370.0792	22380.0792	16	60	19,0	49	21,2	14,0	40,5	24,8	16	155	257	137
22370.0794	22380.0794	16	70	19,0	49	21,2	14,0	40,5	24,8	16	155	257	152
22370.0796	22380.0796	16	80	19,0	49	21,2	14,0	40,5	24,8	16	155	257	167

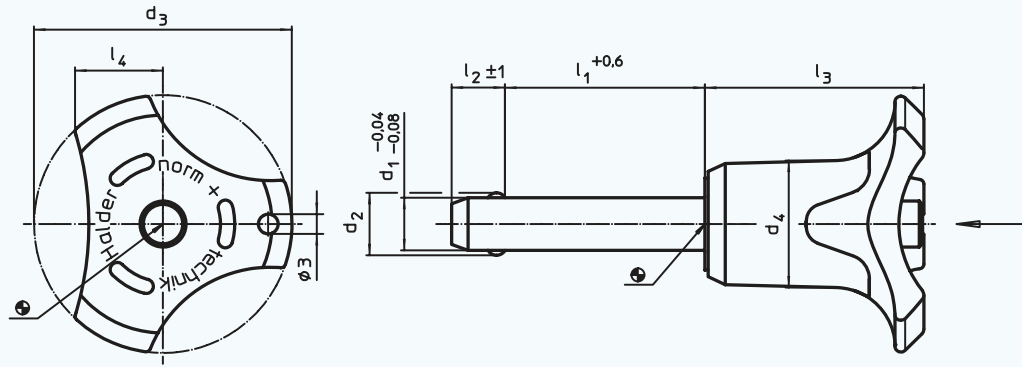
* Shearing resistance similar to DIN 50141



EH 22370.

Ball Lock Pins

self-locking



>>> Special types upon request. <<<

Material:

Pin part: • Stainless steel 1.4305
• Stainless steel 1.4542 - refer to EH 22380.

Handle: • Thermoplastic PA 6
grey / orange,
grey / blue,
grey / grey

Note:

Press button to release pin

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.

The features of this ball lock pin are:

- corrosion-resistant
- ergonomic grip, different colour combinations
- grip design provides protection of unintentional unlocking
- can easily be fitted with retaining cable EH 22400.
- temperature range from - 30 °C up to + 80 °C.

Ref. No. orange	Ref. No. grey	Ref. No. blue	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	Location hole H11	Shearing resistance, double kN min.*	g
22370.0152	22370.0292	22370.0432	5	10	5,5	33,2	14,5	6,0	26,7	10,8	5	14	15
22370.0153	22370.0293	22370.0433	5	15	5,5	33,2	14,5	6,0	26,7	10,8	5	14	15
22370.0154	22370.0294	22370.0434	5	20	5,5	33,2	14,5	6,0	26,7	10,8	5	14	16
22370.0155	22370.0295	22370.0435	5	25	5,5	33,2	14,5	6,0	26,7	10,8	5	14	17
22370.0156	22370.0296	22370.0436	5	30	5,5	33,2	14,5	6,0	26,7	10,8	5	14	18
22370.0162	22370.0302	22370.0442	6	10	7,0	33,2	14,5	7,0	26,7	10,8	6	21	16
22370.0163	22370.0303	22370.0443	6	15	7,0	33,2	14,5	7,0	26,7	10,8	6	21	17
22370.0164	22370.0304	22370.0444	6	20	7,0	33,2	14,5	7,0	26,7	10,8	6	21	18
22370.0165	22370.0305	22370.0445	6	25	7,0	33,2	14,5	7,0	26,7	10,8	6	21	19
22370.0166	22370.0306	22370.0446	6	30	7,0	33,2	14,5	7,0	26,7	10,8	6	21	20
22370.0167	22370.0307	22370.0447	6	35	7,0	33,2	14,5	7,0	26,7	10,8	6	21	21
22370.0168	22370.0308	22370.0448	6	40	7,0	33,2	14,5	7,0	26,7	10,8	6	21	22
22370.0169	22370.0309	22370.0449	6	45	7,0	33,2	14,5	7,0	26,7	10,8	6	21	23
22370.0170	22370.0310	22370.0450	6	50	7,0	33,2	14,5	7,0	26,7	10,8	6	21	24
22370.0174	22370.0314	22370.0454	8	20	9,6	39,2	19,3	8,2	33,3	13,4	8	38	40
22370.0175	22370.0315	22370.0455	8	25	9,6	39,2	19,3	8,2	33,3	13,4	8	38	42
22370.0176	22370.0316	22370.0456	8	30	9,6	39,2	19,3	8,2	33,3	13,4	8	38	44
22370.0177	22370.0317	22370.0457	8	35	9,6	39,2	19,3	8,2	33,3	13,4	8	38	46
22370.0178	22370.0318	22370.0458	8	40	9,6	39,2	19,3	8,2	33,3	13,4	8	38	47
22370.0179	22370.0319	22370.0459	8	45	9,6	39,2	19,3	8,2	33,3	13,4	8	38	49
22370.0180	22370.0320	22370.0460	8	50	9,6	39,2	19,3	8,2	33,3	13,4	8	38	51
22370.0184	22370.0324	22370.0464	10	20	12,0	39,2	19,3	9,6	33,3	13,4	10	60	47
22370.0185	22370.0325	22370.0465	10	25	12,0	39,2	19,3	9,6	33,3	13,4	10	60	49
22370.0186	22370.0326	22370.0466	10	30	12,0	39,2	19,3	9,6	33,3	13,4	10	60	53
22370.0187	22370.0327	22370.0467	10	35	12,0	39,2	19,3	9,6	33,3	13,4	10	60	55
22370.0188	22370.0328	22370.0468	10	40	12,0	39,2	19,3	9,6	33,3	13,4	10	60	58
22370.0189	22370.0329	22370.0469	10	45	12,0	39,2	19,3	9,6	33,3	13,4	10	60	61
22370.0190	22370.0330	22370.0470	10	50	12,0	39,2	19,3	9,6	33,3	13,4	10	60	64
22370.0192	22370.0332	22370.0472	10	60	12,0	39,2	19,3	9,6	33,3	13,4	10	60	70

* Shearing resistance similar to DIN 50141

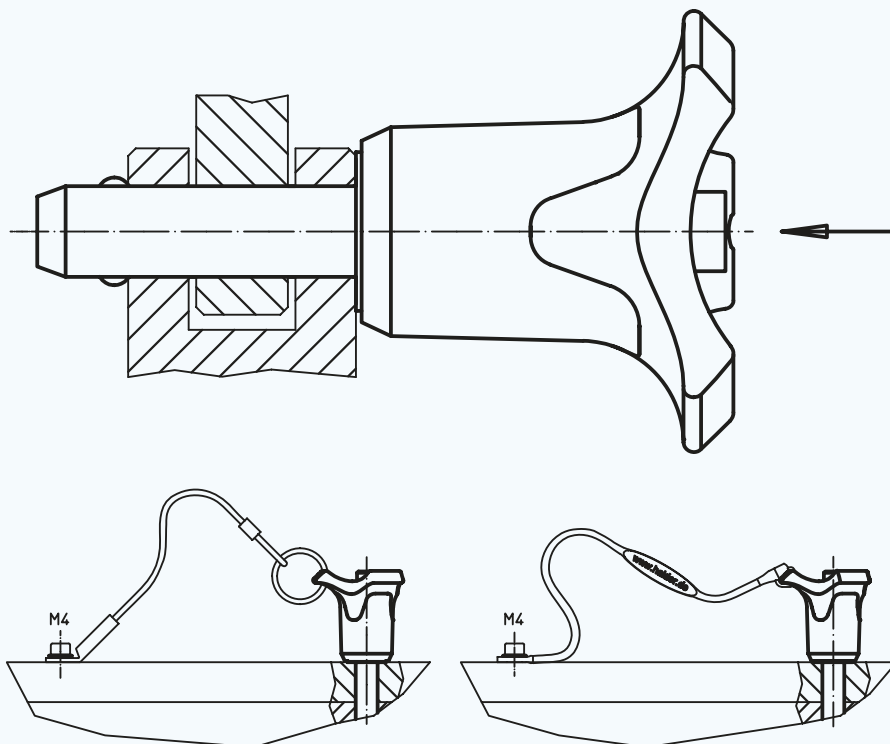
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EH 22370.

Ball Lock Pins
self-locking

Ref. No. orange	Ref. No. grey	Ref. No. blue	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	Location hole H11	Shearing resistance, double kN min.*	g
22370.0205	22370.0345	22370.0485	12	25	14,5	47,6	26,3	10,6	39,7	16,7	12	87	96
22370.0206	22370.0346	22370.0486	12	30	14,5	47,6	26,3	10,6	39,7	16,7	12	87	100
22370.0207	22370.0347	22370.0487	12	35	14,5	47,6	26,3	10,6	39,7	16,7	12	87	105
22370.0208	22370.0348	22370.0488	12	40	14,5	47,6	26,3	10,6	39,7	16,7	12	87	109
22370.0209	22370.0349	22370.0489	12	45	14,5	47,6	26,3	10,6	39,7	16,7	12	87	113
22370.0210	22370.0350	22370.0490	12	50	14,5	47,6	26,3	10,6	39,7	16,7	12	87	117
22370.0212	22370.0352	22370.0492	12	60	14,5	47,6	26,3	10,6	39,7	16,7	12	87	126
22370.0214	22370.0354	22370.0494	12	70	14,5	47,6	26,3	10,6	39,7	16,7	12	87	134
22370.0216	22370.0356	22370.0496	12	80	14,5	47,6	26,3	10,6	39,7	16,7	12	87	143
22370.0226	22370.0366	22370.0506	16	30	19,0	47,6	26,3	14,0	39,7	16,7	16	155	132
22370.0227	22370.0367	22370.0507	16	35	19,0	47,6	26,3	14,0	39,7	16,7	16	155	140
22370.0228	22370.0368	22370.0508	16	40	19,0	47,6	26,3	14,0	39,7	16,7	16	155	148
22370.0229	22370.0369	22370.0509	16	45	19,0	47,6	26,3	14,0	39,7	16,7	16	155	155
22370.0230	22370.0370	22370.0510	16	50	19,0	47,6	26,3	14,0	39,7	16,7	16	155	168
22370.0232	22370.0372	22370.0512	16	60	19,0	47,6	26,3	14,0	39,7	16,7	16	155	178
22370.0234	22370.0374	22370.0514	16	70	19,0	47,6	26,3	14,0	39,7	16,7	16	155	194
22370.0236	22370.0376	22370.0516	16	80	19,0	47,6	26,3	14,0	39,7	16,7	16	155	208
22370.0252	22370.0392	22370.0532	20	60	25,0	57,1	35,4	20,5	50,7	21,5	20	244	343
22370.0256	22370.0396	22370.0536	20	80	25,0	57,1	35,4	20,5	50,7	21,5	20	244	392
22370.0260	22370.0400	22370.0540	20	100	25,0	57,1	35,4	20,5	50,7	21,5	20	244	440
22370.0264	22370.0404	22370.0544	20	120	25,0	57,1	35,4	20,5	50,7	21,5	20	244	488

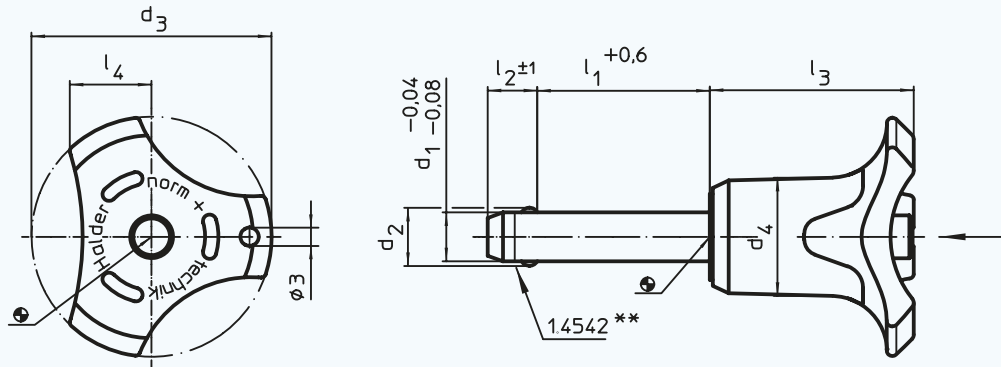
* Shearing resistance similar to DIN 50141



EH 22380.

Ball Lock Pins

self-locking,
precipitation
hardened



>>> Special types upon request. <<<
** Types from stainless steel 1.4542 with marking.

Material:

Pin part: • Stainless steel 1.4542, precipitation-hardened, hard-coated (marking)
• Stainless steel 1.4305 - refer to EH 22370.

Handle: • Thermoplastic PA 6 grey / orange, grey / blue, grey / grey
Spring: • Stainless steel

Note:

Press button to release pin

For quick fastening, locking, adjusting, changing and securing. Quickly and easily unlockable for frequently repeated connections.

The features of this ball lock pin are:

- solid, hardened, hard coated, abrasion-resistant pin, having an extreme load capacity (stainless steel 1.4542)
- corrosion-resistant
- ergonomic grip, different colour combinations
- grip design provides protection of unintentional unlocking
- can easily be fitted with retaining cable EH 22400.
- temperature range from - 30 °C up to + 80 °C.

Ref. No. orange	Ref. No. grey	Ref. No. blue	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	Location hole H11	Shearing resistance, double kN min.*	g
22380.0152	22380.0292	22380.0432	5	10	5,5	33,2	14,5	6,0	26,7	10,8	5	24	15
22380.0153	22380.0293	22380.0433	5	15	5,5	33,2	14,5	6,0	26,7	10,8	5	24	15
22380.0154	22380.0294	22380.0434	5	20	5,5	33,2	14,5	6,0	26,7	10,8	5	24	16
22380.0155	22380.0295	22380.0435	5	25	5,5	33,2	14,5	6,0	26,7	10,8	5	24	17
22380.0156	22380.0296	22380.0436	5	30	5,5	33,2	14,5	6,0	26,7	10,8	5	24	18
22380.0162	22380.0302	22380.0442	6	10	7,0	33,2	14,5	7,0	26,7	10,8	6	35	16
22380.0163	22380.0303	22380.0443	6	15	7,0	33,2	14,5	7,0	26,7	10,8	6	35	17
22380.0164	22380.0304	22380.0444	6	20	7,0	33,2	14,5	7,0	26,7	10,8	6	35	18
22380.0165	22380.0305	22380.0445	6	25	7,0	33,2	14,5	7,0	26,7	10,8	6	35	19
22380.0166	22380.0306	22380.0446	6	30	7,0	33,2	14,5	7,0	26,7	10,8	6	35	20
22380.0167	22380.0307	22380.0447	6	35	7,0	33,2	14,5	7,0	26,7	10,8	6	35	21
22380.0168	22380.0308	22380.0448	6	40	7,0	33,2	14,5	7,0	26,7	10,8	6	35	22
22380.0169	22380.0309	22380.0449	6	45	7,0	33,2	14,5	7,0	26,7	10,8	6	35	23
22380.0170	22380.0310	22380.0450	6	50	7,0	33,2	14,5	7,0	26,7	10,8	6	35	24
22380.0174	22380.0314	22380.0454	8	20	9,6	39,2	19,3	8,2	33,3	13,4	8	63	40
22380.0175	22380.0315	22380.0455	8	25	9,6	39,2	19,3	8,2	33,3	13,4	8	63	42
22380.0176	22380.0316	22380.0456	8	30	9,6	39,2	19,3	8,2	33,3	13,4	8	63	44
22380.0177	22380.0317	22380.0457	8	35	9,6	39,2	19,3	8,2	33,3	13,4	8	63	46
22380.0178	22380.0318	22380.0458	8	40	9,6	39,2	19,3	8,2	33,3	13,4	8	63	47
22380.0179	22380.0319	22380.0459	8	45	9,6	39,2	19,3	8,2	33,3	13,4	8	63	49
22380.0180	22380.0320	22380.0460	8	50	9,6	39,2	19,3	8,2	33,3	13,4	8	63	51
22380.0184	22380.0324	22380.0464	10	20	12,0	39,2	19,3	9,6	33,3	13,4	10	100	47
22380.0185	22380.0325	22380.0465	10	25	12,0	39,2	19,3	9,6	33,3	13,4	10	100	49
22380.0186	22380.0326	22380.0466	10	30	12,0	39,2	19,3	9,6	33,3	13,4	10	100	53
22380.0187	22380.0327	22380.0467	10	35	12,0	39,2	19,3	9,6	33,3	13,4	10	100	55
22380.0188	22380.0328	22380.0468	10	40	12,0	39,2	19,3	9,6	33,3	13,4	10	100	58
22380.0189	22380.0329	22380.0469	10	45	12,0	39,2	19,3	9,6	33,3	13,4	10	100	61
22380.0190	22380.0330	22380.0470	10	50	12,0	39,2	19,3	9,6	33,3	13,4	10	100	64
22380.0192	22380.0332	22380.0472	10	60	12,0	39,2	19,3	9,6	33,3	13,4	10	100	70

* Shearing resistance similar to DIN 50141

Continued from previous page

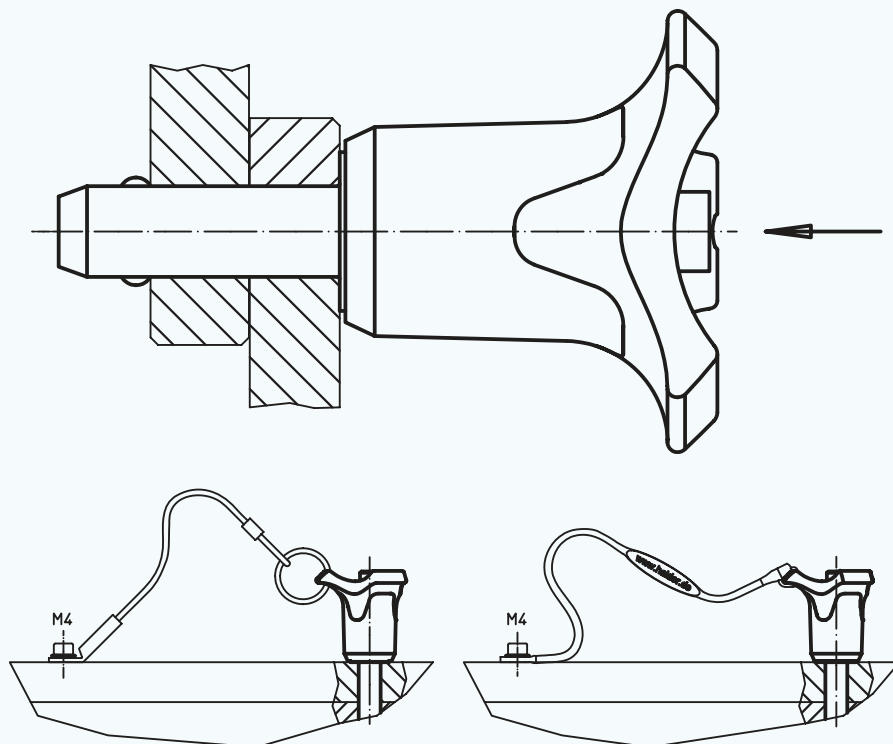
EH 22380.

Ball Lock Pins

**self-locking,
precipitation
hardened**

Ref. No. orange	Ref. No. grey	Ref. No. blue	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	Location hole H11	Shearing resistance, double kN min.*	g
22380.0205	22380.0345	22380.0485	12	25	14,5	47,6	26,3	10,6	39,7	16,7	12	144	96
22380.0206	22380.0346	22380.0486	12	30	14,5	47,6	26,3	10,6	39,7	16,7	12	144	100
22380.0207	22380.0347	22380.0487	12	35	14,5	47,6	26,3	10,6	39,7	16,7	12	144	105
22380.0208	22380.0348	22380.0488	12	40	14,5	47,6	26,3	10,6	39,7	16,7	12	144	109
22380.0209	22380.0349	22380.0489	12	45	14,5	47,6	26,3	10,6	39,7	16,7	12	144	113
22380.0210	22380.0350	22380.0490	12	50	14,5	47,6	26,3	10,6	39,7	16,7	12	144	117
22380.0212	22380.0352	22380.0492	12	60	14,5	47,6	26,3	10,6	39,7	16,7	12	144	126
22380.0214	22380.0354	22380.0494	12	70	14,5	47,6	26,3	10,6	39,7	16,7	12	144	134
22380.0216	22380.0356	22380.0496	12	80	14,5	47,6	26,3	10,6	39,7	16,7	12	144	143
22380.0226	22380.0366	22380.0506	16	30	19,0	47,6	26,3	14,0	39,7	16,7	16	257	132
22380.0227	22380.0367	22380.0507	16	35	19,0	47,6	26,3	14,0	39,7	16,7	16	257	140
22380.0228	22380.0368	22380.0508	16	40	19,0	47,6	26,3	14,0	39,7	16,7	16	257	148
22380.0229	22380.0369	22380.0509	16	45	19,0	47,6	26,3	14,0	39,7	16,7	16	257	155
22380.0230	22380.0370	22380.0510	16	50	19,0	47,6	26,3	14,0	39,7	16,7	16	257	168
22380.0232	22380.0372	22380.0512	16	60	19,0	47,6	26,3	14,0	39,7	16,7	16	257	178
22380.0234	22380.0374	22380.0514	16	70	19,0	47,6	26,3	14,0	39,7	16,7	16	257	194
22380.0236	22380.0376	22380.0516	16	80	19,0	47,6	26,3	14,0	39,7	16,7	16	257	208
22380.0252	22380.0392	22380.0532	20	60	25,0	57,1	35,4	20,5	50,7	21,5	20	403	343
22380.0256	22380.0396	22380.0536	20	80	25,0	57,1	35,4	20,5	50,7	21,5	20	403	392
22380.0260	22380.0400	22380.0540	20	100	25,0	57,1	35,4	20,5	50,7	21,5	20	403	440
22380.0264	22380.0404	22380.0544	20	120	25,0	57,1	35,4	20,5	50,7	21,5	20	403	488

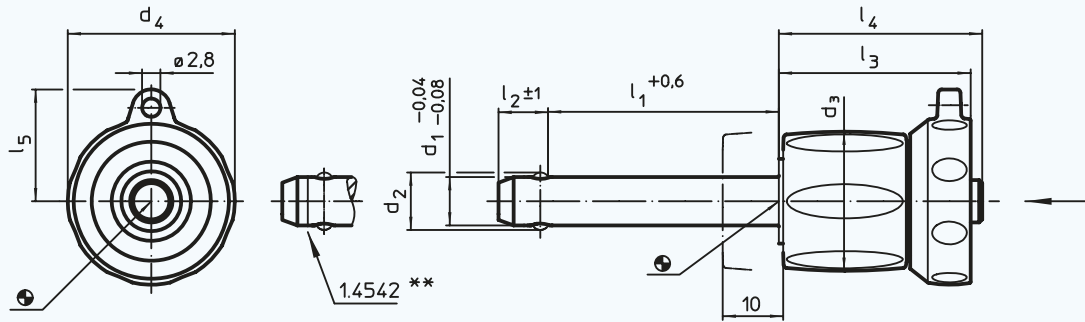
* Shearing resistance similar to DIN 50141



EH 22370. / EH 22380.

Ball Lock Pins

self-locking,
adjustable
clamping length



>>> Special types upon request. <<<

** Types from stainless steel 1.4542 with marking.

Material:

Pin part:

- Stainless steel 1.4305
- Stainless steel 1.4542, precipitation-hardened, hard-coated (marking)

Spring:

- Stainless steel

Adjusting nut:

- Thermoplastic, silver

Lock nut:

- Thermoplastic, black

Note:

Press button to release pin

EH 22370. stainless steel 1.4305

EH 22380. stainless steel 1.4542, precipitation hardened, hard coated

To mount or clamp workpieces, remove remaining play or slack via variable locknuts.

The features of this ball-lock pin are:

- corrosion-resistant
- solid, hardened, hard coated pin, having an extreme load capacity and being highly abrasion-resistant (stainless steel 1.4542)
- can easily be fitted with retaining cable EH 22400.
- temperature range from - 30 °C up to + 80 °C.

Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	l ₅	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	Δ g
22370.0592	22380.0592	5	0-10	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	14	24	24
22370.0593	22380.0593	5	5-15	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	14	24	25
22370.0594	22380.0594	5	10-20	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	14	24	26
22370.0595	22380.0595	5	15-25	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	14	24	27
22370.0596	22380.0596	5	20-30	5,5	17,6	23,6	6,0	25,7	26,2	15,9	5	14	24	27
22370.0602	22380.0602	6	0-10	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	21	35	25
22370.0603	22380.0603	6	5-15	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	21	35	26
22370.0604	22380.0604	6	10-20	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	21	35	27
22370.0605	22380.0605	6	15-25	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	21	35	28
22370.0606	22380.0606	6	20-30	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	21	35	29
22370.0607	22380.0607	6	25-35	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	21	35	30
22370.0608	22380.0608	6	30-40	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	21	35	31
22370.0609	22380.0609	6	35-45	7,0	17,6	23,6	7,0	25,7	26,2	15,9	6	21	35	32
22370.0610	22380.0610	6	40-50	7,0	17,6	23,6	7,0	25,7	26,2	15,9	8	38	63	33
22370.0614	22380.0614	8	10-20	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	38	63	57
22370.0615	22380.0615	8	15-25	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	38	63	58
22370.0616	22380.0616	8	20-30	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	38	63	60
22370.0617	22380.0617	8	25-35	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	38	63	62
22370.0618	22380.0618	8	30-40	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	38	63	64
22370.0619	22380.0619	8	35-45	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	38	63	66
22370.0620	22380.0620	8	40-50	9,6	23,0	27,6	8,2	31,2	33,1	18,0	8	38	63	68
22370.0624	22380.0624	10	10-20	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	60	100	63
22370.0625	22380.0625	10	15-25	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	60	100	66
22370.0626	22380.0626	10	20-30	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	60	100	69
22370.0627	22380.0627	10	25-35	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	60	100	72
22370.0628	22380.0628	10	30-40	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	60	100	75
22370.0629	22380.0629	10	35-45	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	60	100	78
22370.0630	22380.0630	10	40-50	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	60	100	81
22370.0632	22380.0632	10	50-60	12,0	23,0	27,6	9,6	31,2	33,1	18,0	10	60	100	87

* Shearing resistance similar to DIN 50141

Continued from previous page

**EH 22370. /
EH 22380.**

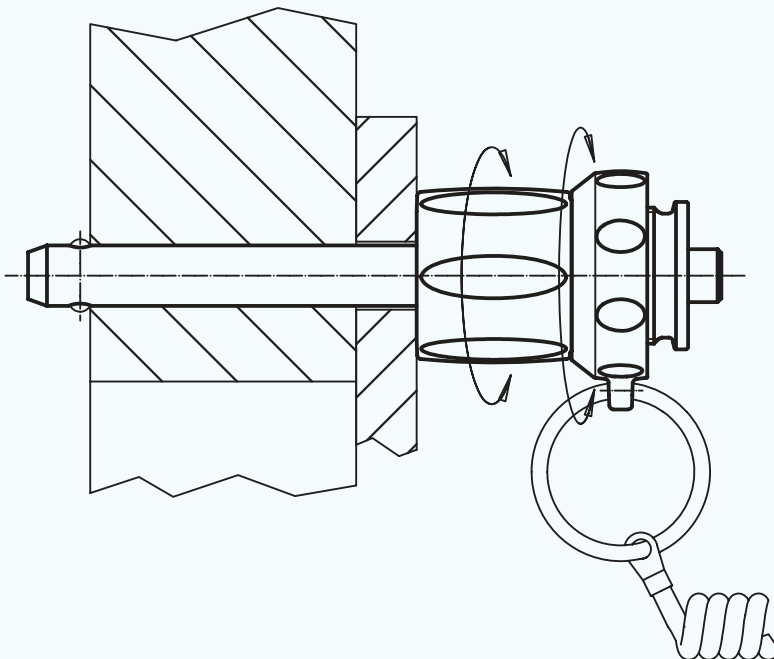
Ball Lock Pins

**self-locking,
adjustable
clamping length**



Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel 1.4542	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	l ₅	Location hole H11	Shearing resistance, double kN min. 1.4305*	Shearing resistance, double kN min. 1.4542*	± g
22370.0635	22380.0635	12	15-25	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	87	144	123
22370.0636	22380.0636	12	20-30	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	87	144	127
22370.0637	22380.0637	12	25-35	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	87	144	131
22370.0638	22380.0638	12	30-40	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	87	144	135
22370.0639	22380.0639	12	35-45	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	87	144	140
22370.0640	22380.0640	12	40-50	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	87	144	144
22370.0642	22380.0642	12	50-60	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	87	144	152
22370.0644	22380.0644	12	60-70	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	87	144	161
22370.0646	22380.0646	12	70-80	14,5	29,0	34,6	10,6	36,7	39,5	21,8	12	87	144	169
22370.0656	22380.0656	16	20-30	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	155	257	159
22370.0657	22380.0657	16	25-35	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	155	257	166
22370.0658	22380.0658	16	30-40	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	155	257	174
22370.0659	22380.0659	16	35-45	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	155	257	182
22370.0660	22380.0660	16	40-50	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	155	257	189
22370.0662	22380.0662	16	50-60	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	155	257	205
22370.0664	22380.0664	16	60-70	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	155	257	220
22370.0666	22380.0666	16	70-80	19,0	29,0	34,6	14,0	36,7	39,5	21,8	16	155	257	235

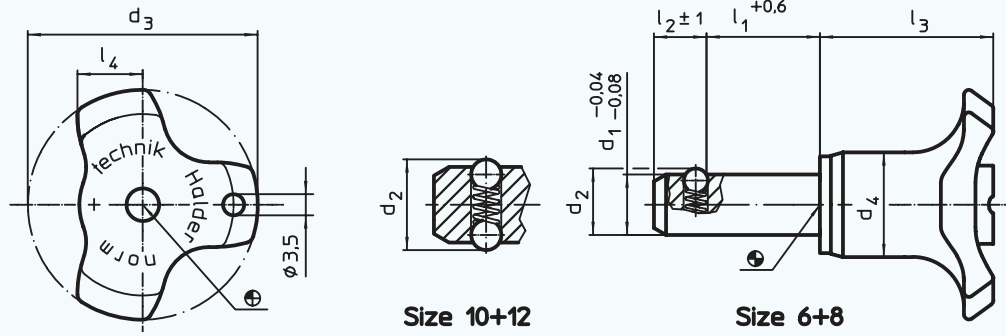
* Shearing resistance similar to DIN 50141



EH 22400.

Socket Pins

with spring-loaded balls



Size 10+12

Size 6+8

Material:

Pin part: • Stainless steel 1.4305 **Handle:** • Thermoplastic PA 6, grey **Spring:** • Stainless steel

Note:

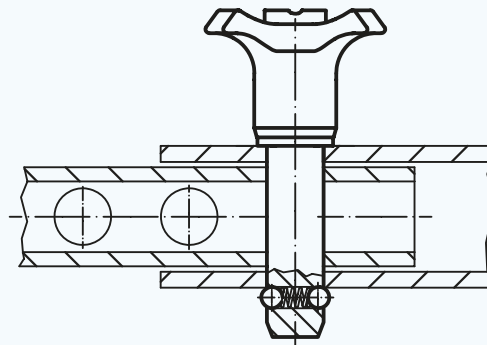
For a quick and easy locating and securing of axes and bolts.

Security Note: Balls are spring-loaded and not locked as in article groups EH 22340., EH 22350., EH 22360., EH 22370. and EH 22380.

This socket pin offers the following advantages:

- corrosion-resistant
- ergonomic grip
- can easily be fitted with retaining cable EH 22400.
- temperature range - 30 °C up to + 80 °C.

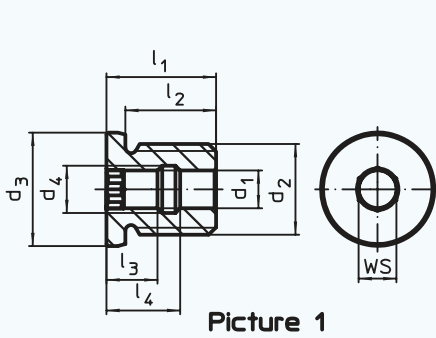
Ref. No.	d ₁	l ₁	d ₂	d ₃	d ₄	l ₂	l ₃	l ₄	Location hole H11	Shearing resistance, double kN	Tensile force not lubricated N max.	g
22400.0062	6	10	6,5	38	17,3	5,0	27,0	10,8	6	22	8	14
22400.0064	6	15	6,5	38	17,3	5,0	27,0	10,8	6	22	8	16
22400.0066	6	20	6,5	38	17,3	5,0	27,0	10,8	6	22	8	16
22400.0068	6	25	6,5	38	17,3	5,0	27,0	10,8	6	22	8	17
22400.0070	6	30	6,5	38	17,3	5,0	27,0	10,8	6	22	8	18
22400.0075	6	50	6,5	38	17,3	5,0	27,0	10,8	6	22	8	23
22400.0084	8	15	8,7	38	17,3	6,3	28,6	10,8	8	40	15	21
22400.0086	8	20	8,7	38	17,3	6,3	28,6	10,8	8	40	15	22
22400.0088	8	25	8,7	38	17,3	6,3	28,6	10,8	8	40	15	25
22400.0090	8	30	8,7	38	17,3	6,3	28,6	10,8	8	40	15	27
22400.0095	8	50	8,7	38	17,3	6,3	28,6	10,8	8	40	15	33
22400.0104	10	15	12,0	38	17,3	8,7	28,6	10,8	10	62	30	32
22400.0106	10	20	12,0	38	17,3	8,7	28,6	10,8	10	62	30	35
22400.0108	10	25	12,0	38	17,3	8,7	28,6	10,8	10	62	30	38
22400.0110	10	30	12,0	38	17,3	8,7	28,6	10,8	10	62	30	39
22400.0115	10	50	12,0	38	17,3	8,7	28,6	10,8	10	62	30	53
22400.0122	12	20	14,5	38	17,3	9,5	28,6	10,8	12	90	32	43
22400.0124	12	30	14,5	38	17,3	9,5	28,6	10,8	12	90	32	52
22400.0126	12	40	14,5	38	17,3	9,5	28,6	10,8	12	90	32	61
22400.0128	12	50	14,5	38	17,3	9,5	28,6	10,8	12	90	32	68



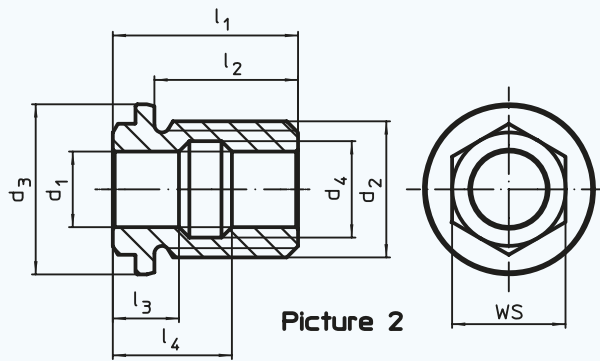
EH 22400.

Locating Bushings

for ball lock pins and socket pins



Picture 1



Picture 2

Material:

- Stainless steel 1.4305

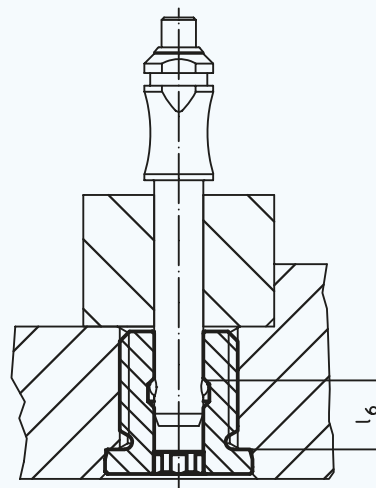
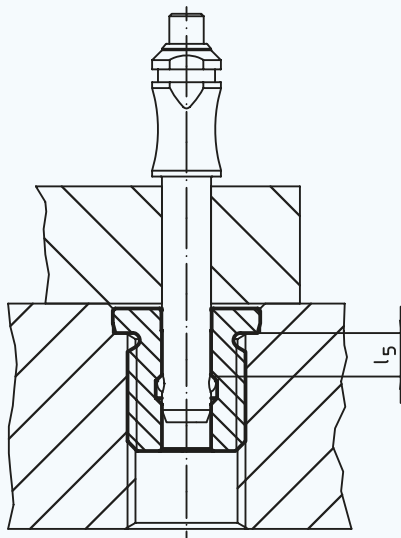
Note:

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.

Features:

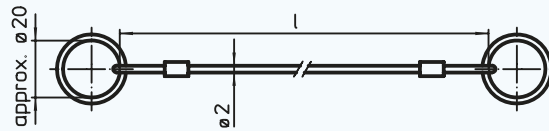
- optimized centering due to precise collar (e.g. quick mounting of plates and components)
- ensure safe tolerances and consistent function
- easily incorporable into different materials
- can be used in thin-walled pieces
- corrosion-resistant
- abrasion-resistant
- application from both sides.

Ref. No.	Finish	d ₁ H11	d ₂	d ₃ h9	d ₄	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	WS	g
22400.0905	with internal hexagon (picture 1)	5	M 12	18	6,0	19	15	9,0	13,0	5,1	9,0	5	15
22400.0906		6	M 12	18	7,5	19	15	9,4	13,0	5,6	8,8	6	13
22400.0908		8	M 16	22	10,0	25	20	12,0	17,0	7,3	11,7	8	29
22400.0910		10	M 24	30	12,5	29	24	13,5	19,5	8,9	14,1	10	75
22400.0912		12	M 24	30	15,0	29	24	14,0	20,0	9,6	14,4	12	66
22400.0916	with outer hexagon (picture 2)	16	M 30	36	19,5	39	29	15,5	23,5	6,1	12,8	24	124
22400.0920		20	M 36	45	25,5	49	38	17,5	31,5	7,7	19,3	30	208

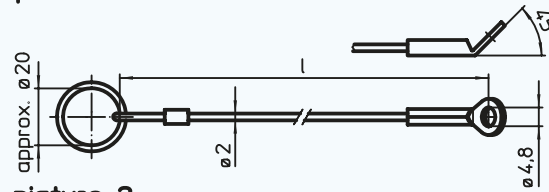


EH 22400.

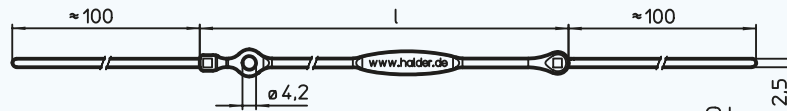
Retaining Cables



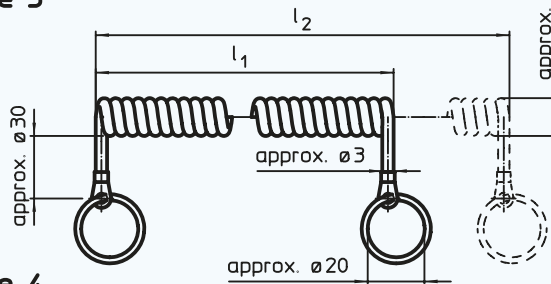
picture 1



picture 2



picture 3



picture 4

Material:

- Retaining cable:**
- Stainless steel
 - Thermoplastic PA 6, grey
 - Thermoplastic PUR, black, with steel thread

- Ring:**
- Stainless steel
 - Brass, tinned

- Attaching ring:**
- Stainless steel

Note:

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.
 Plastic version (picture 3): cut-off projecting ends without burr after being fastened.
 Spiral form design (picture 4) with very high effective working length.
 Temperature range up to + 80 °C, design without plastic coating up to 250 °C.

Ref. No. Plastic PVC, clear coated*	Ref. No. Plastic PVC, black coated*	Ref. No. without coating*	Finish	l	g
22400.0950	22400.0940	22400.0930	stainless steel,	150	6,5
22400.0952	22400.0941	22400.0931	with 2 holding rings	200	6,4
22400.0956	22400.0943	22400.0933	(picture 1)	300	7,5
22400.0960	22400.0945	22400.0935	stainless steel,	150	6,9
22400.0962	22400.0946	22400.0936	with holding ring and loop to be	200	7,6
22400.0966	22400.0948	22400.0938	screwed (picture 2)	300	8,6

* not for simple finish ball-lock pins

Continued from previous page

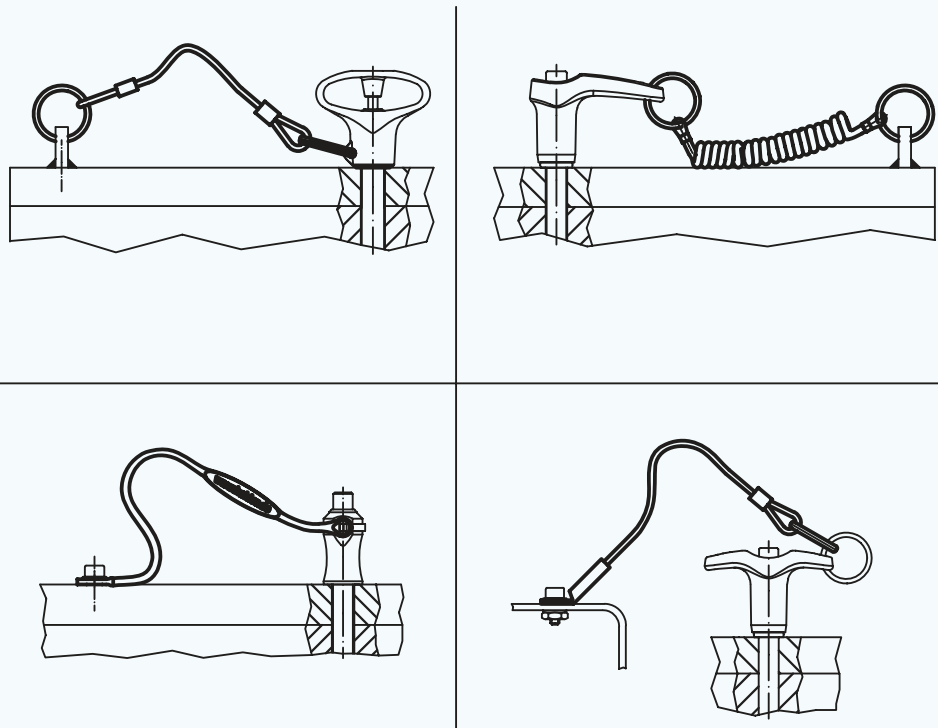
EH 22400.

Retaining Cables

Ref. No.	Finish	l	$\frac{g}{g}$
22400.0970	thermoplastic	150	2,1
22400.0974	with double sided clamping/indexing mechanism (picture 3)	250	2,7

Ref. No.*	Finish	l ₁	l ₂ max.	$\frac{g}{g}$
22400.0980	spiral form, with fastening rings, black coated	100	600	11,5
22400.0982	(picture 4)	200	1200	17,4

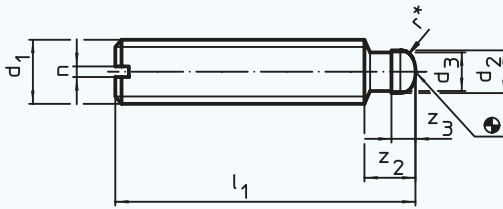
* not for simple finish ball-lock pins



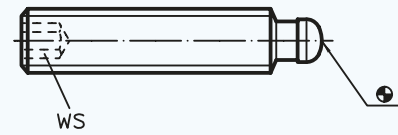
EH 22540.

Grub Screws

DIN 6332
with thrust point



picture 1



picture 2



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

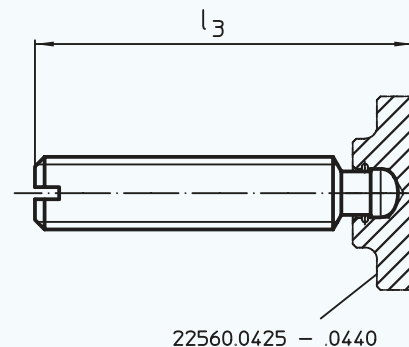
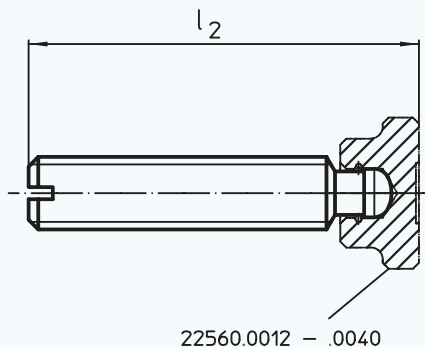
Material:

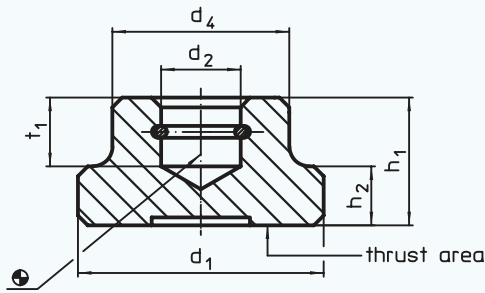
- Steel, quality 5.8, blackened; thrust point hardened

Note:

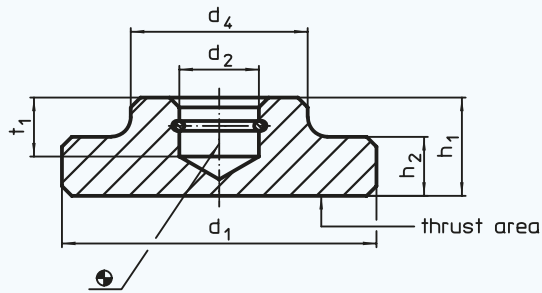
For combination with thrust pads with spring retainer DIN 6311 form S, (EH 22560.) and clamping screws DIN 6332.

Ref. No.	Finish	d ₁	l ₁	d ₂ h11	d ₃	z ₂	z ₃	l ₂ ≈	l ₃ ≈	n	WS	g
22540.0061	slotted (S) (picture 1)	M 6	30	4,5	4,0	6,0	2,5	32,1	-	1,0	-	4,5
22540.0062		M 6	50	4,5	4,0	6,0	2,5	52,1	-	1,0	-	7,8
22540.0081		M 8	40	6,0	5,4	7,5	3,0	43,0	42,5	1,2	-	11,0
22540.0082		M 8	60	6,0	5,4	7,5	3,0	63,0	62,5	1,2	-	17,0
22540.0101		M 10	60	8,0	7,2	9,0	4,5	63,6	62,6	1,6	-	27,0
22540.0102		M 10	80	8,0	7,2	9,0	4,5	83,6	82,6	1,6	-	37,0
22540.0121		M 12	60	8,0	7,2	10,0	4,5	64,6	62,6	2,0	-	38,0
22540.0122		M 12	80	8,0	7,2	10,0	4,5	84,6	82,6	2,0	-	51,0
22540.0123		M 12	100	8,0	7,2	10,0	4,5	104,6	102,6	2,0	-	65,0
22540.0161		M 16	80	12,0	11,0	12,0	5,0	85,4	82,9	2,5	-	100,0
22540.0162		M 16	100	12,0	11,0	12,0	5,0	105,4	102,9	2,5	-	126,0
22540.0163		M 16	125	12,0	11,0	12,0	5,0	130,4	127,9	2,5	-	160,0
22540.0201		M 20	100	15,5	14,4	14,0	5,5	105,5	-	3,0	-	190,0
22540.0202	M 20	125	15,5	14,4	14,0	5,5	130,5	-	3,0	-	240,0	
22540.0203	M 20	150	15,5	14,4	14,0	5,5	155,5	-	3,0	-	290,0	
22540.0361	with internal hexagon (IS) (picture 2)	M 6	30	4,5	4,0	6,0	2,5	32,1	-	-	3	4,3
22540.0362		M 6	50	4,5	4,0	6,0	2,5	52,1	-	-	3	7,6
22540.0381		M 8	40	6,0	5,4	7,5	3,0	43,0	42,5	-	4	11,0
22540.0382		M 8	60	6,0	5,4	7,5	3,0	63,0	62,5	-	4	17,0
22540.0401		M 10	60	8,0	7,2	9,0	4,5	63,6	62,6	-	5	26,0
22540.0402		M 10	80	8,0	7,2	9,0	4,5	83,6	82,6	-	5	36,0
22540.0421		M 12	60	8,0	7,2	10,0	4,5	64,6	62,6	-	6	36,0
22540.0422		M 12	80	8,0	7,2	10,0	4,5	84,6	82,6	-	6	57,0
22540.0423		M 12	100	8,0	7,2	10,0	4,5	104,6	102,6	-	6	64,0
22540.0461		M 16	80	12,0	11,0	12,0	5,0	85,4	82,9	-	8	91,0
22540.0462		M 16	100	12,0	11,0	12,0	5,0	105,4	102,9	-	8	118,0
22540.0463		M 16	125	12,0	11,0	12,0	5,0	130,4	127,9	-	8	150,0
22540.0501		M 20	100	15,5	14,4	14,0	5,5	105,5	-	-	10	182,0
22540.0502	M 20	125	15,5	14,4	14,0	5,5	130,5	-	-	10	233,0	
22540.0503	M 20	150	15,5	14,4	14,0	5,5	155,5	-	-	10	284,0	





picture 1



picture 2

EH 22560.

Thrust Pads

DIN 6311 and low model



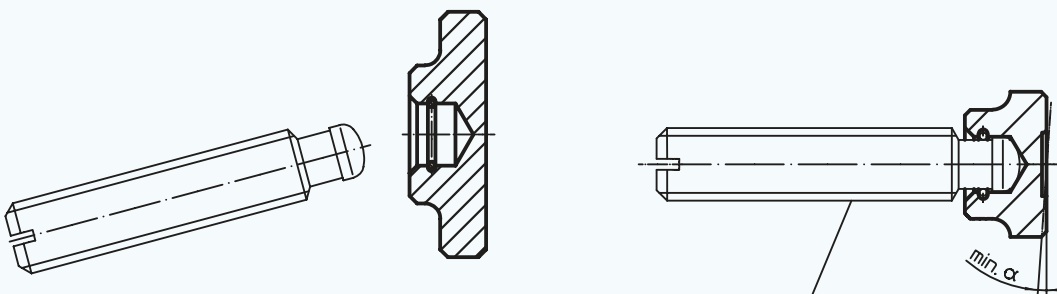
Material:

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

Note:

Combination with DIN 6332 (EH 22540).

Ref. No.	Finish	d ₁	d ₂ H12	d ₄	h ₁	h ₂	t ₁	For grub screws with thrust point DIN 6332	min. α	g
22560.0012	DIN 6311 with	12	4,6	10	7	2,5	4,0	M 6	7°	4,3
22560.0016	snap ring,	16	6,1	12	9	4,0	5,0	M 8	4°	9,4
22560.0020	form S	20	8,1	15	11	5,0	6,0	M 10	3°	18,0
22560.0025	(picture 1)	25	8,1	18	13	6,0	7,0	M 12	3°	30,0
22560.0032		32	12,1	22	15	7,0	7,5	M 16	5°	59,0
22560.0040		40	15,6	28	16	9,0	8,0	M 20	4°	106,0
22560.0425	low model with	25	6,1	12	8	4,0	4,5	M 8	4°	18,0
22560.0432	increased thrust area	32	8,1	18	10	6,0	6,0	M 10 / M 12	3°	43,0
22560.0440	and spring retainer (picture 2)	40	12,1	22	12	7,0	7,0	M 16	5°	75,0



22540.0061 - .0503

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.

EH 22570.

Thrust Pads

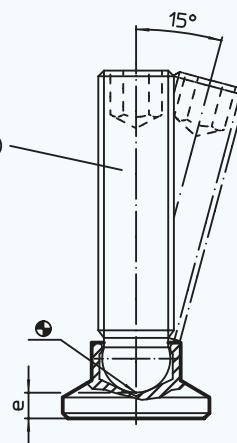
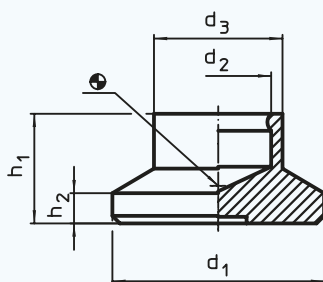
plastic



threaded pin

22570.0210 – .0328 (steel)

22570.0410 – .0528 (stainless steel)



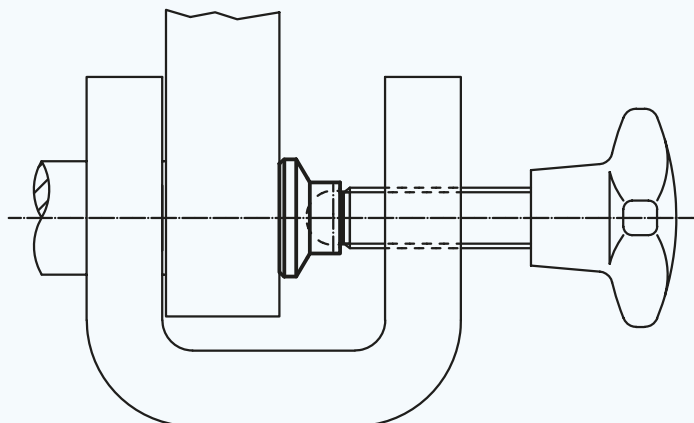
Material:

- Thermoplastic POM, black, dull

Note:

For combination with ball-headed grub screws EH 22570.

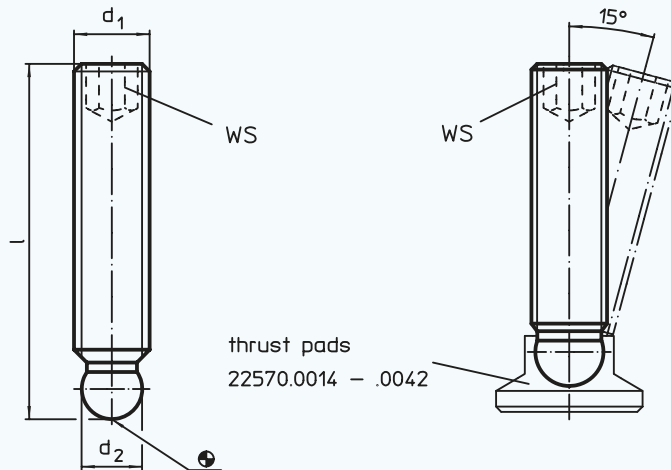
Ref. No.	d ₁	d ₂	d ₃	e ≈	h ₁	h ₂	Load capacity for static load kN max.	For grub screws EH 22570.	μg
22570.0014	15	4,5	8,6	3,6	7,6	2,5	3,5	M 6	1,1
22570.0015	15	6,1	8,6	2,5	7,6	2,5	3,5	M 8	1,0
22570.0017	18	6,1	10,8	4,2	9,2	2,5	3,5	M 8	1,7
22570.0018	18	7,8	10,8	3,4	9,2	2,5	3,5	M 10	2,0
22570.0019	21	6,1	12,8	5,0	10,0	3,0	3,5	M 8	3,0
22570.0020	21	7,8	12,8	4,3	10,0	3,0	3,5	M 10	2,6
22570.0021	21	9,4	12,8	3,4	10,0	3,0	3,5	M 12	2,4
22570.0023	25	6,1	13,0	5,5	10,5	3,0	3,5	M 8	4,0
22570.0024	25	7,8	13,0	4,6	10,5	3,0	3,5	M 10	3,6
22570.0025	25	9,4	13,0	3,6	10,5	3,0	3,5	M 12	3,4
22570.0032	32	6,1	14,0	6,0	11,0	3,0	3,5	M 8	5,0
22570.0033	32	7,8	14,0	5,0	11,0	3,0	3,5	M 10	5,0
22570.0034	32	9,4	14,0	4,2	11,0	3,0	3,5	M 12	5,0
22570.0040	40	6,1	16,0	8,0	13,0	4,0	3,5	M 8	11,0
22570.0041	40	7,8	16,0	7,0	13,0	4,0	3,5	M 10	10,0
22570.0042	40	9,4	16,0	6,2	13,0	4,0	3,5	M 12	10,0



EH 22570.

Grub Screws

ball-headed



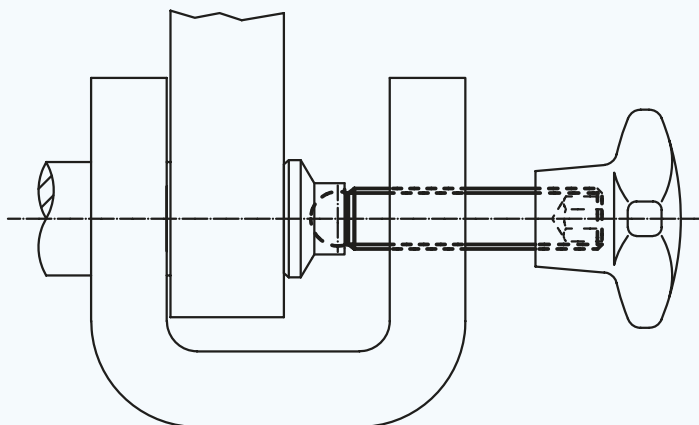
Material:

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

Note:

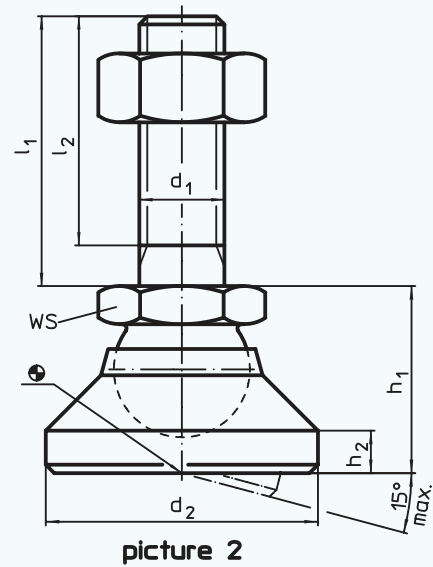
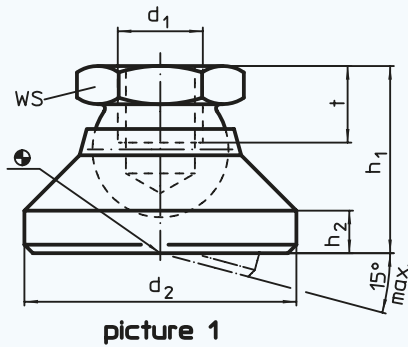
For combination with plastic thrust pads EH 22570.

Ref. No. Steel	Ref. No. Stainless steel	d ₁	l	d ₂ +0,05	WS	⌀ g
22570.0210	22570.0410	M 6	30	4,47	3	5,1
22570.0214	22570.0414	M 6	40	4,47	3	5,9
22570.0218	22570.0418	M 6	50	4,47	3	7,6
22570.0219	22570.0419	M 8	25	6,10	4	5,8
22570.0220	22570.0420	M 8	40	6,10	4	11,0
22570.0224	22570.0424	M 8	50	6,10	4	14,0
22570.0228	22570.0428	M 8	63	6,10	4	18,0
22570.0248	22570.0448	M 10	40	7,80	5	16,0
22570.0250	22570.0450	M 10	50	7,80	5	21,0
22570.0254	22570.0454	M 10	63	7,80	5	27,0
22570.0258	22570.0458	M 10	80	7,80	5	36,0
22570.0316	22570.0516	M 12	40	9,40	6	23,0
22570.0320	22570.0520	M 12	63	9,40	6	39,0
22570.0324	22570.0524	M 12	80	9,40	6	51,0
22570.0328	22570.0528	M 12	100	9,40	6	65,0



EH 22590.

Mounting Pads



Material:

Pad:

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

Ball bearing:

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

Ball bearing with bolt:

- Heat-treated steel, blackened
- Stainless steel 1.4305
- Lock nut ISO 4032 or DIN 934 (M 10/M 12)

Note:

To be used as foot or thrust pad.
Temperature range of thermoplastic type from - 30 °C up to + 80 °C.

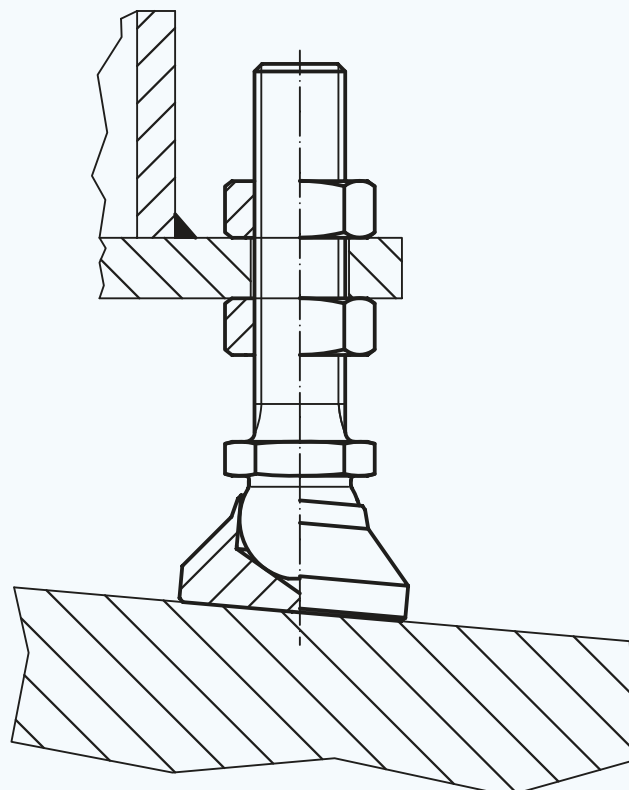
Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁	l ₁	d ₂	l ₂	h ₁ ≈	h ₂	t	WS	Load capacity for static load Steel kN max.	Load capacity for static load Stainless steel kN max.	μg
22590.0006	22590.0206	pad and ball bearing (picture 1)	M 6	-	20	-	14	2,5	5,0	10	10	8	15
22590.0008	22590.0208		M 8	-	25	-	18	4,0	7,0	13	18	14	33
22590.0010	22590.0210		M 10	-	32	-	22	5,0	9,0	17	20	16	66
22590.0012	22590.0212		M 12	-	40	-	26	6,0	11,0	19	35	28	112
22590.0016	22590.0216		M 16	-	50	-	32	7,0	13,5	24	45	36	220
22590.0020	22590.0220		M 20	-	60	-	42	8,0	17,0	30	55	44	413
22590.0024	22590.0224		M 24	-	60	-	45	9,5	19,0	36	65	52	462
-	22590.0106	pad from plastic, ball bearing from stainless steel (picture 1)	M 6	-	20	-	14	2,5	5,0	10	-	4	6
-	22590.0108		M 8	-	25	-	18	4,0	7,0	13	-	7	13
-	22590.0110		M 10	-	32	-	22	5,0	9,0	17	-	10	26
-	22590.0112		M 12	-	40	-	26	6,0	11,0	19	-	18	40
-	22590.0116		M 16	-	50	-	32	7,0	13,5	24	-	20	75
-	22590.0120		M 20	-	60	-	42	8,0	17,0	30	-	22	150
-	22590.0124		M 24	-	60	-	45	9,5	19,0	36	-	25	184

Continued from previous page

EH 22590.

Mounting Pads

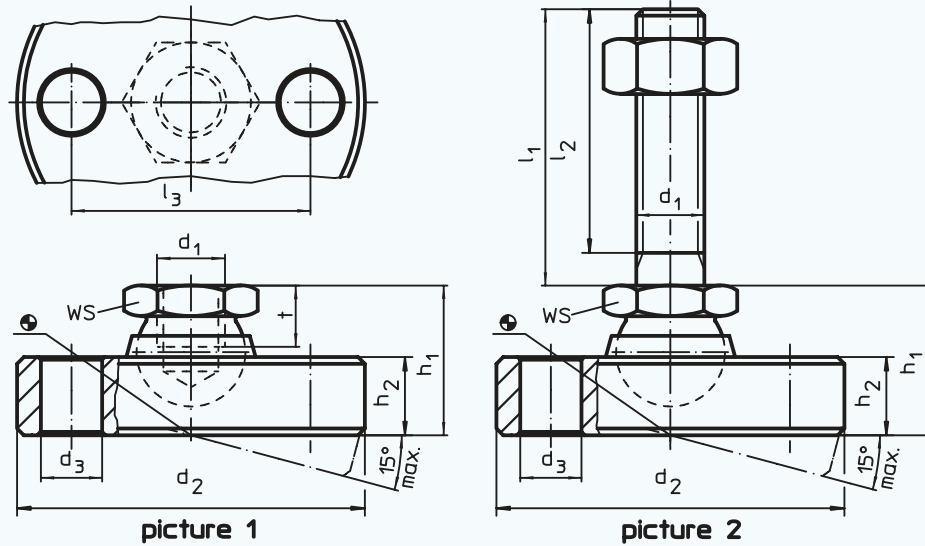
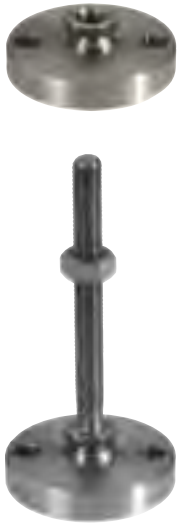
Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁	l ₁	d ₂	l ₂	h ₁ ≈	h ₂	t	WS	Load capacity for static load Steel kN max.	Load capacity for static load Stainless steel kN max.	μg
22590.0410	22590.0610	pad and	M 6	60	20	57,0	14	2,5	-	10	10	8	29
22590.0422	22590.0622	ball bearing	M 8	80	25	76,0	18	4,0	-	13	18	14	66
22590.0438	22590.0638	with bolt	M 10	100	32	95,5	22	5,0	-	17	20	16	133
22590.0442	22590.0642	from steel	M 10	150	32	145,5	22	5,0	-	17	20	16	159
22590.0452	22590.0652	(picture 2)	M 12	100	40	94,5	26	6,0	-	19	35	28	211
22590.0456	22590.0656		M 12	150	40	144,5	26	6,0	-	19	35	28	247
22590.0468	22590.0668		M 16	100	50	94,0	32	7,0	-	24	45	36	407
22590.0472	22590.0672		M 16	200	50	194,0	32	7,0	-	24	45	36	540
22590.0482	22590.0682		M 20	100	60	92,5	42	8,0	-	30	55	44	722
22590.0488	22590.0688		M 20	200	60	192,5	42	8,0	-	30	55	44	924
22590.0495	22590.0695		M 24	100	60	91,0	45	9,5	-	36	65	52	935
22590.0498	22590.0698		M 24	200	60	191,0	45	9,5	-	36	65	52	1231
-	22590.0510	pad from	M 6	60	20	57,0	14	2,5	-	10	-	4	20
-	22590.0522	thermoplastic,	M 8	80	25	76,0	18	4,0	-	13	-	7	46
-	22590.0538	ball bearing	M 10	100	32	95,5	22	5,0	-	17	-	10	92
-	22590.0542	with bolt from	M 10	150	32	145,5	22	5,0	-	17	-	10	118
-	22590.0552	stainless steel	M 12	100	40	94,5	26	6,0	-	19	-	18	139
-	22590.0556	(picture 2)	M 12	150	40	144,5	26	6,0	-	19	-	18	173
-	22590.0568		M 16	100	50	94,0	32	7,0	-	24	-	20	264
-	22590.0572		M 16	200	50	194,0	32	7,0	-	24	-	20	393
-	22590.0582		M 20	100	60	92,5	42	8,0	-	30	-	22	463
-	22590.0588		M 20	200	60	192,5	42	8,0	-	30	-	22	664
-	22590.0595		M 24	100	60	91,0	45	9,5	-	36	-	25	662
-	22590.0598		M 24	200	60	191,0	45	9,5	-	36	-	25	960



EH 22590.

Mounting Pads

with fastening holes



Material:

Pad:

- Stainless steel 1.4305

Ball bearing:

- Stainless steel 1.4305

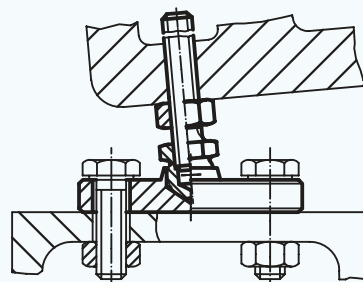
Ball bearing with bolt:

- Stainless steel 1.4305
- Lock nut ISO 4032 or DIN 934 (M 10/M 12)

Note:

To be used as foot or thrust pad.
Including two mounting holes in pad.

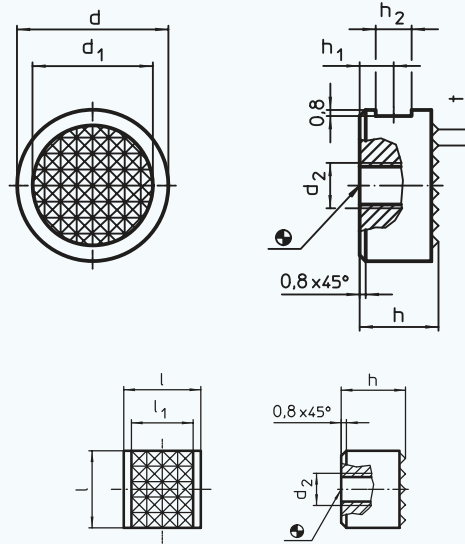
Ref. No.	Finish	d ₁	l ₁	d ₂ -0,5	d ₃	l ₂	l ₃	h ₁ ≈	h ₂	t	WS	Load capacity for static load kN max.	μg
22590.0706	pad and	M 6	-	45	6,6	-	32	14	6,5	5,0	10	8	79
22590.0708	ball bearing	M 8	-	50	6,6	-	38	18	8,5	7,0	13	14	130
22590.0710	from	M 10	-	60	9,0	-	44	22	11,5	9,0	17	16	250
22590.0712	stainless steel	M 12	-	65	9,0	-	48	26	12,5	11,0	19	28	326
22590.0716	(picture 1)	M 16	-	70	9,0	-	54	32	13,5	13,5	24	36	427
22590.0720		M 20	-	80	9,0	-	64	42	16,5	17,0	30	44	718
22590.0724		M 24	-	100	11,0	-	78	45	20,5	19,0	36	52	1304
22590.0810	pad and	M 6	60	45	6,6	57,0	32	14	6,5	-	10	8	93
22590.0822	ball bearing	M 8	80	50	6,6	76,0	38	18	8,5	-	13	14	163
22590.0838	with bolt	M 10	100	60	9,0	95,5	44	22	11,5	-	17	16	318
22590.0842	from	M 10	150	60	9,0	145,5	44	22	11,5	-	17	16	341
22590.0852	stainless steel	M 12	100	65	9,0	94,5	48	26	12,5	-	19	28	423
22590.0856	(picture 2)	M 12	150	65	9,0	144,5	48	26	12,5	-	19	28	459
22590.0868		M 16	100	70	9,0	94,0	54	32	13,5	-	24	36	615
22590.0872		M 16	200	70	9,0	194,0	54	32	13,5	-	24	36	746
22590.0882		M 20	100	80	9,0	92,5	64	42	16,5	-	30	44	1029
22590.0888		M 20	200	80	9,0	192,5	64	42	16,5	-	30	44	1231
22590.0895		M 24	100	100	11,0	91,0	78	45	20,5	-	36	52	1775
22590.0898		M 24	200	100	11,0	191,0	78	45	20,5	-	36	52	2075



EH 22620.

Grippers round/square

with ribbed hard metal insert



Material:

Body: • Tool steel, blackened

Ribbing: • Hard metal plate, brazed-in

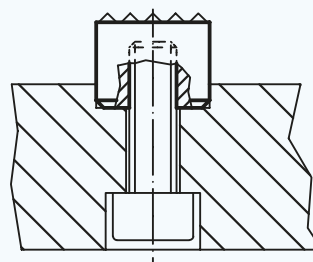
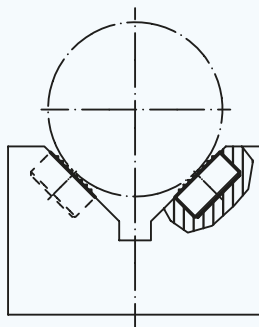
Note:

Threaded body helps installation in jig and fixture systems, clamping jaws, clamping arms, claw feed systems etc. for transmission of high turning moments and holding forces, e.g. on cast and forged pieces.

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

Ref. No. round	d -0,13	h -0,13	d ₁	d ₂	h ₁	h ₂	t	g
22620.0010	10	10	7,9	M 5	4,5	4,75	2,3	5
22620.0012	10	12	7,9	M 5	6,0	4,75	2,3	6
22620.0020	12	10	9,5	M 5	4,5	4,75	3,0	8
22620.0022	12	12	9,5	M 5	6,0	4,75	3,0	9
22620.0060	16	10	12,7	M 6	4,5	4,75	3,0	14
22620.0062	16	12	12,7	M 6	6,0	4,75	3,0	17
22620.0080	20	10	15,9	M 6	4,5	4,75	3,0	23
22620.0082	20	12	15,9	M 6	6,0	4,75	3,0	27
22620.0100	25	10	19,0	M 6	4,5	4,75	3,0	36
22620.0102	25	12	19,0	M 6	6,0	4,75	3,0	43

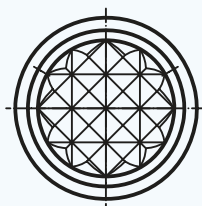
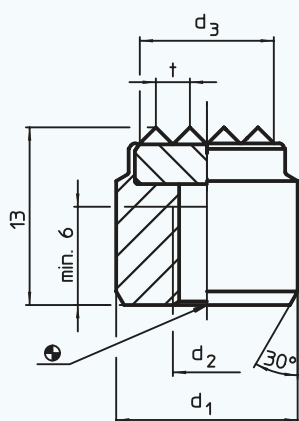
Ref. No. square	l -0,13	h -0,13	l ₁	d ₂	t	g
22620.0152	12	10	10,3	M 5	3	11
22620.0154	12	12	10,3	M 5	3	12



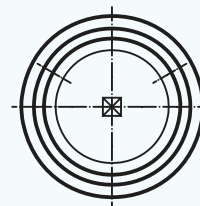
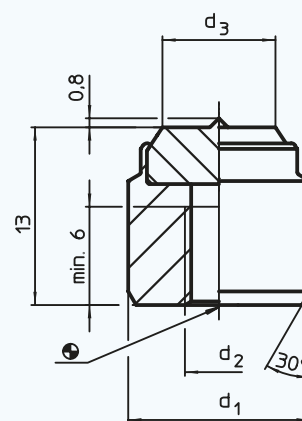
EH 22620.

Hard Metal Inserts

with locating hole



picture 1



picture 2

Material:

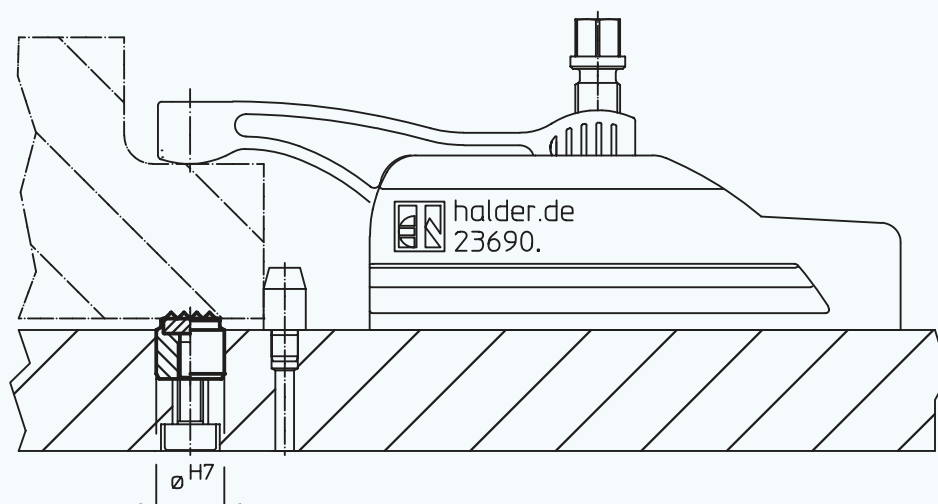
Body: • Heat-treated steel, tempered, phosphated

Insert: • Hard metal, ribbed
• Hard metal, pointed

Note:

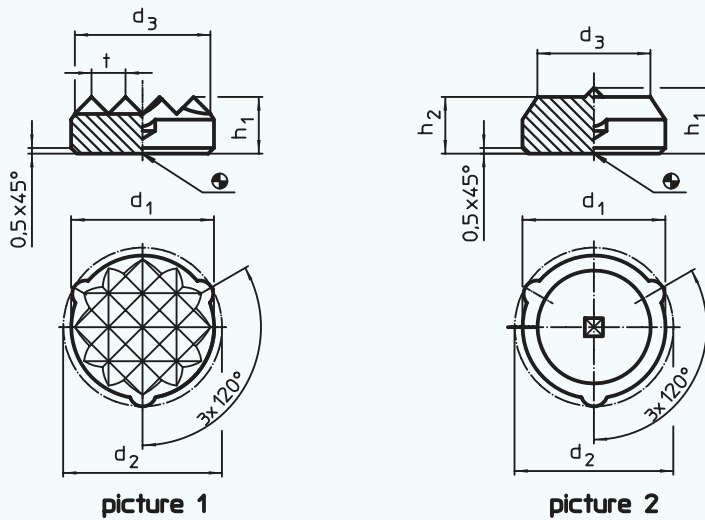
Basic element with female thread to be mounted into clamping devices, clamping jaws, clamping arms, claw feed systems and so forth. Floating transmission of high holding forces, e.g. on cast or forged pieces. Assembly via a locating hole, the insert can be fastened by means of a screw.

Ref. No.	Finish	d ₁ n6	d ₂	d ₃ ≈	t	g
22620.0208	ribbed	10	M 5	7,7	2	8
22620.0211	(picture 1)	14	M 6	10,6	2	15
22620.0213		16	M 6	11,9	3	20
22620.0228	pointed	10	M 5	6,3	–	8
22620.0231	(picture 2)	14	M 6	9,3	–	16
22620.0233		16	M 6	10,0	–	21



EH 22620.

Hard Metal Inserts



Material:

- Insert:**
- Hard metal, ribbed
 - Hard metal, pointed

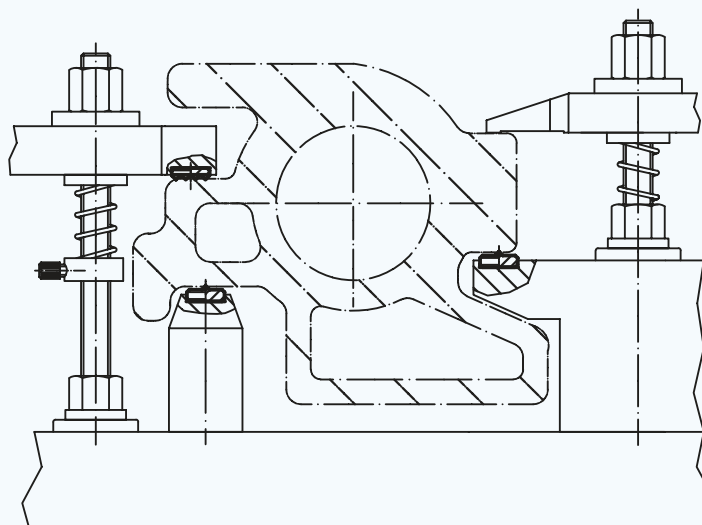
Note:

Basic element to be mounted into jig and fixture systems, 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.

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

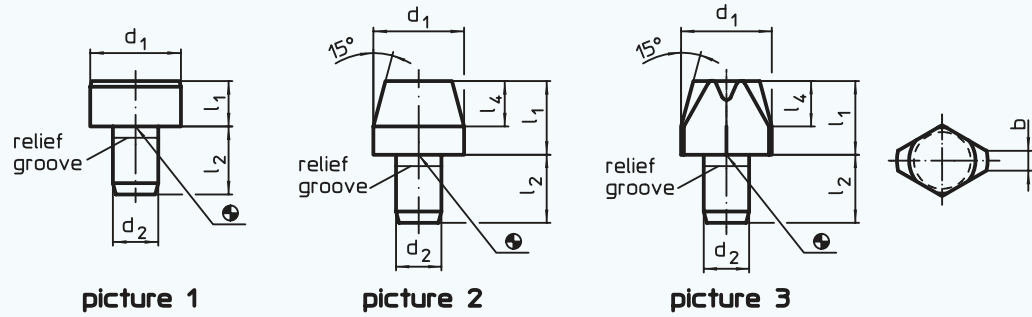
Ref. No.	Finish	d_1 $\pm 0,1$	d_2 $\pm 0,2$	d_3 \approx	h_1	h_2	t	$\frac{g}{g}$
22620.0608	ribbed	8,3	9,1	7,7	5,0	–	2	3,3
22620.0611	(picture 1)	11,3	12,1	10,6	5,0	–	2	6,1
22620.0613		12,6	13,4	11,9	5,0	–	3	7,1
22620.0628	pointed	8,3	9,1	6,3	5,8	5	–	3,3
22620.0631	(picture 2)	11,3	12,1	9,3	5,8	5	–	6,7
22620.0633		12,6	13,4	10,0	5,8	5	–	8,2



EH 22630.

Locating and Seating Pins

DIN 6321



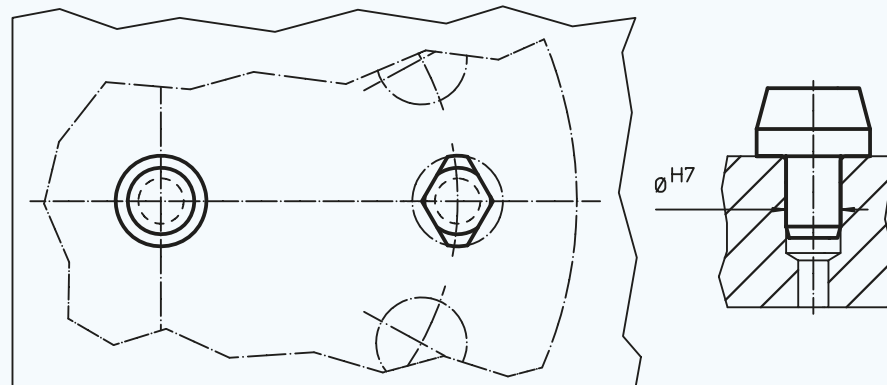
Material:

- Tool steel, hardened, ground. Bearing surface of form 'A' without center.

Note:

Cylindric locating pin for locating work pieces 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.

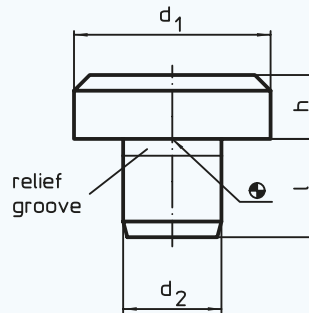
Ref. No. short	Ref. No. long	Finish	d ₁ g6	l ₁ short	l ₁ long	b	d ₂ n6	l ₂	l ₄	g short	g long
22630.0011	-	seating pin, DIN 6321	6	5	-	-	4	6	-	1,8	-
22630.0012	-	form A,	10	6	-	-	6	9	-	5,7	-
22630.0013	-	tolerance l ₁ = h9	16	8	-	-	8	12	-	17,0	-
22630.0014	-	(picture 1)	25	10	-	-	12	18	-	50,0	-
22630.0020	22630.0021	locating pin, cylindric,	6	7	12	-	4	6	4	2,2	3
22630.0022	22630.0023	DIN 6321, form B	8	10	16	-	6	9	6	5,4	8
22630.0024	22630.0025	(picture 2)	10	10	18	-	6	9	6	7,4	12
22630.0026	22630.0027		12	10	18	-	6	9	6	10,0	17
22630.0028	22630.0029		16	13	22	-	8	12	8	23,0	36
22630.0030	22630.0031		20	15	25	-	12	18	9	47,0	72
22630.0032	22630.0033		25	15	25	-	12	18	9	66,0	106
22630.0040	22630.0041	locating pin, diamond,	6	7	12	1,0	4	6	4	1,8	2
22630.0042	22630.0043	DIN 6321,	8	10	16	1,6	6	9	6	4,5	6
22630.0044	22630.0045	form C	10	10	18	2,5	6	9	6	6,0	9
22630.0046	22630.0047	(picture 3)	12	10	18	2,5	6	9	6	7,0	11
22630.0048	22630.0049		16	13	22	3,5	8	12	8	17,0	26
22630.0050	22630.0051		20	15	25	5,0	12	18	9	39,0	55
22630.0052	22630.0053		25	15	25	5,0	12	18	9	49,0	72



EH 22630.

Seating Pins

partially DIN 6321
(old norm)



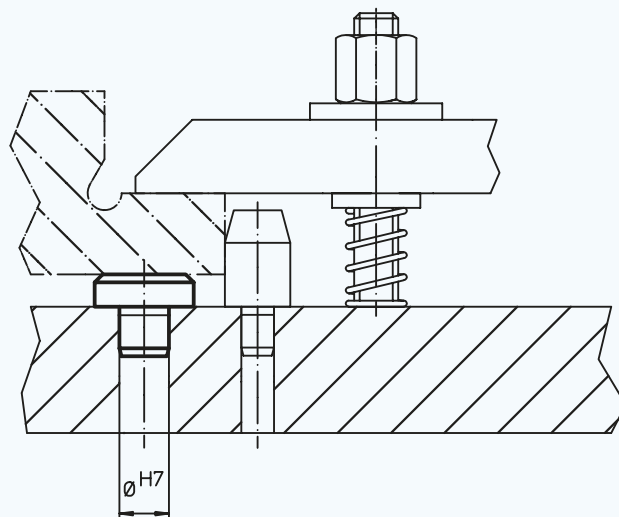
Material:

- Tool steel, hardened, ground

Note:

To be used as feet and bearings. Load bearing surface without distortion.

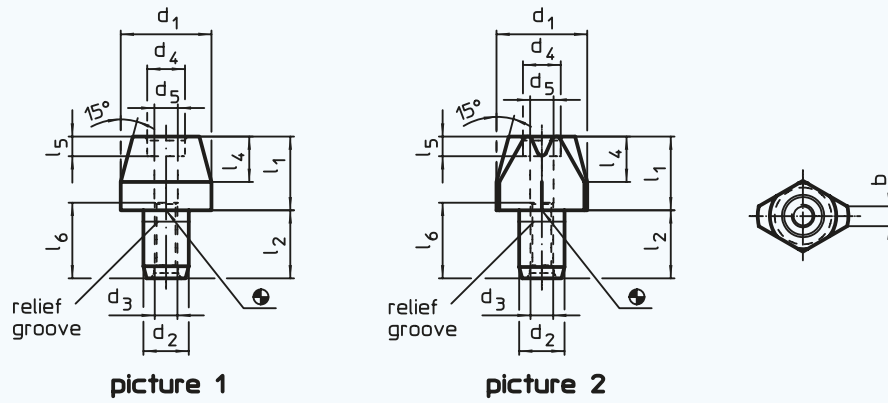
Ref. No.	Finish	d_1	h h9	d_2 n6	l	$\frac{g}{g}$
22630.0001	DIN 6321	6	5,0	4	6,0	1,8
22630.0002	old norm	10	8,0	6	8,0	6,5
22630.0003		16	5,0	8	10,0	11,0
22630.0004		16	13,0	8	10,0	24,0
22630.0005		25	8,0	12	14,0	41,0
22630.0006		25	20,0	12	14,0	88,0
22630.0007		40	13,0	20	20,0	171,0
22630.0008		40	32,0	20	20,0	358,0
22630.0110	intermediate sizes	6	2,5	4	6,5	1,2
22630.0112		6	4,5	4	8,5	1,9
22630.0116		8	4,0	5	8,0	3,1
22630.0118		8	7,0	5	8,0	4,2
22630.0120		10	4,5	6	8,5	4,4
22630.0124		12	6,0	6	10,0	7,6
22630.0126		12	10,0	6	10,0	11,0
22630.0130		20	6,0	10	12,0	21,0
22630.0132		20	12,0	10	12,0	36,0
22630.0135		25	30,0	12	14,0	125,0
22630.0137		30	25,0	16	20,0	164,0
22630.0140		30	40,0	16	20,0	248,0
22630.0144		30	50,0	16	20,0	305,0
22630.0148		30	65,0	16	20,0	385,0
22630.0152		30	80,0	20	20,0	485,0
22630.0156		30	100,0	20	20,0	594,0



EH 22630.

Locating Pins

with bore hole similar to DIN 6321



Material:

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

Note:

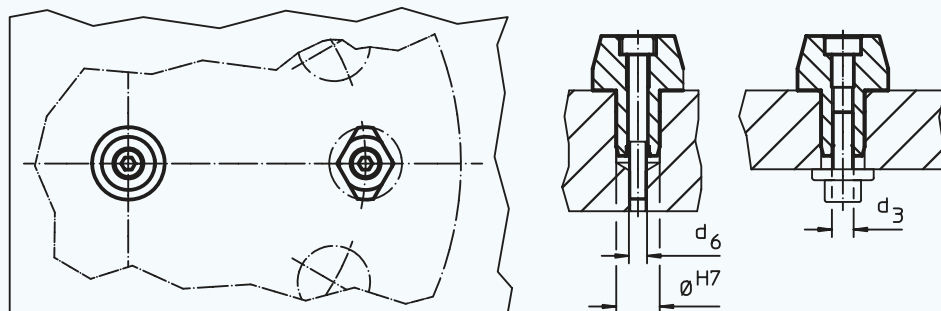
Cylindrical locating pins for locating work pieces in toleranced holes and also to be used as stops and feet.

Diamond 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 also be used for dismounting). The outer dimensions are similar to DIN 6321.

Ref. No. short	Ref. No. long	Finish	d ₁ g6	l ₁ short	l ₁ long	b	d ₂ k6	l ₂	d ₃	d ₄	l ₄	d ₅	l ₅	d ₆	l ₆	g short	g long
22630.0220*	22630.0221*	locating pin, cylindric,	6	7	12	-	4	6	-	-	4	2,1	-	M 2	-	1,2	2,9
22630.0222	22630.0223	with bore hole	8	10	16	-	6	9	M 3	-	6	2,6	-	M 2,5	10	4,2	6,4
22630.0224	22630.0225	(picture 1)	10	10	18	-	6	9	M 3	5,0	6	2,6	2,6	M 2,5	10	6,1	10,0
22630.0226	22630.0227		12	10	18	-	6	9	M 3	5,0	6	2,6	2,6	M 2,5	10	8,0	15,0
22630.0228	22630.0229		16	13	22	-	8	12	M 4	6,5	8	3,3	3,1	M 3	13	19,0	32,0
22630.0230	22630.0231		20	15	25	-	12	18	M 6	10,0	9	5,2	5,1	M 5	19	38,0	60,0
22630.0232	22630.0233		25	15	25	-	12	18	M 6	10,0	9	5,2	5,1	M 5	19	58,0	96,0
22630.0240*	22630.0241*	locating pin, diamond,	6	7	12	1,0	4	6	-	-	4	2,1	-	M 2	-	1,0	1,9
22630.0242	22630.0243	with bore hole	8	10	16	1,6	6	9	M 3	-	6	2,6	-	M 2,5	10	3,4	4,4
22630.0244	22630.0245	(picture 2)	10	10	18	2,5	6	9	M 3	5,0	6	2,6	2,6	M 2,5	10	4,6	7,3
22630.0246	22630.0247		12	10	18	2,5	6	9	M 3	5,0	6	2,6	2,6	M 2,5	10	6,1	10,0
22630.0248	22630.0249		16	13	22	3,5	8	12	M 4	6,5	8	3,3	3,1	M 3	13	15,0	22,0
22630.0250	22630.0251		20	15	25	5,0	12	18	M 6	10,0	9	5,2	5,1	M 5	19	30,0	44,0
22630.0252	22630.0253		25	15	25	5,0	12	18	M 6	10,0	9	5,2	5,1	M 5	19	41,0	62,0

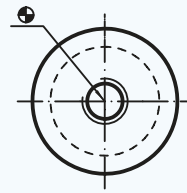
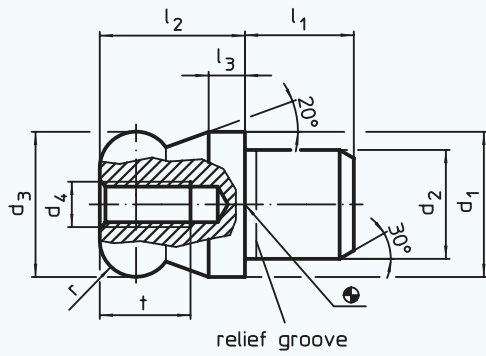
* can only be mounted from the top



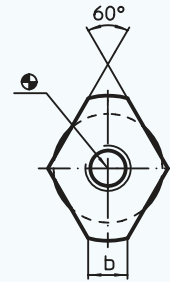
EH 22630.

Straight Pins

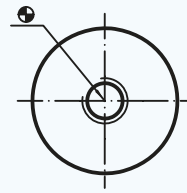
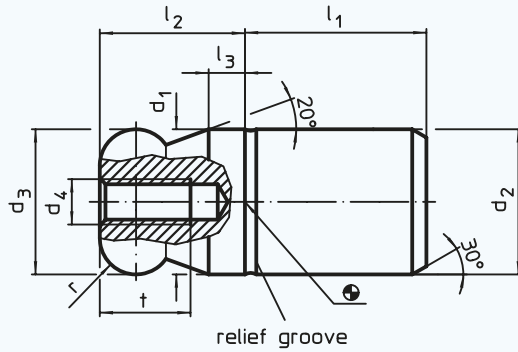
with ball end



picture 1



picture 2



picture 3



picture 4



Material:

- Tool steel, hardened, blackened and ground
- Stainless steel 1.4305, ground, surface heat-treated

Note:

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

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ g6	d ₂ n6	d ₃ -0,01 -0,05	d ₄	l ₁	l ₂	l ₃	t	r	b	g
22630.0310	22630.0350	with ball end	10	7	10	M 3	7	10	2,5	6	2,5	-	7
22630.0312	22630.0352	plain	12	8	12	M 4	8	12	3,0	8	3,0	-	11
22630.0316	22630.0356	(picture 1)	16	12	16	M 5	12	16	4,0	10	4,0	-	31
22630.0320	22630.0360		20	14	20	M 5	14	20	5,0	10	5,0	-	58
22630.0322	-		22	16	22	M 5	16	22	5,5	10	5,5	-	81
22630.0325	-		25	18	25	M 5	18	25	6,0	10	6,0	-	118
22630.0410	22630.0450	with ball end	10	7	10	M 3	7	10	2,5	6	2,5	2,5	5
22630.0412	22630.0452	flattened	12	8	12	M 4	8	12	3,0	8	3,0	2,5	8
22630.0416	22630.0456	(picture 2)	16	12	16	M 5	12	16	4,0	10	4,0	4,3	25
22630.0420	22630.0460		20	14	20	M 5	14	20	5,0	10	5,0	5,0	46
22630.0422	-		22	16	22	M 5	16	22	5,5	10	5,5	5,0	63
22630.0425	-		25	18	25	M 5	18	25	6,0	10	6,0	5,6	92

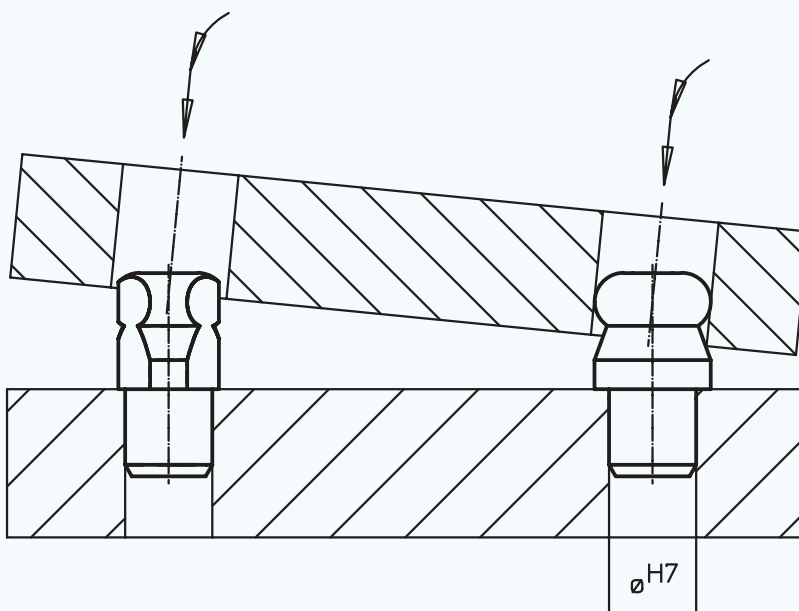
EH 22630.

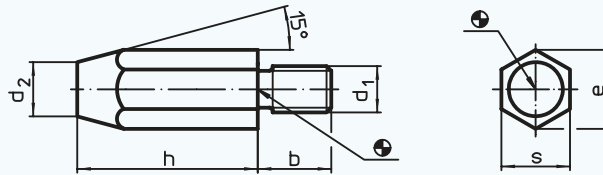
Continued from previous page

Straight Pins

with ball end

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁ g6	d ₂ n6	d ₃ -0,01 -0,05	d ₄	l ₁	l ₂	l ₃	t	r	b	g
22630.0508	22630.0568	plain ball, not stepped (picture 3)	8	8	8	M 3	10	8	2,0	6	2,0	-	6
22630.0510	22630.0570		10	10	10	M 3	13	10	2,5	6	2,5	-	12
22630.0512	22630.0572		12	12	12	M 4	15	12	3,0	8	3,0	-	21
22630.0516	22630.0576		16	16	16	M 5	20	16	4,0	10	4,0	-	51
22630.0520	22630.0580		20	20	20	M 5	25	20	5,0	10	5,0	-	101
22630.0525	-	25	25	25	M 5	25	25	6,0	10	6,0	-	176	
22630.0530	-	30	30	30	M 6	30	30	8,0	12	8,0	-	307	
22630.0540	-	40	40	40	M 6	40	40	10,0	12	10,0	-	729	
22630.0550	-	50	50	50	M 6	50	50	12,0	12	12,0	-	1422	
22630.0608	22630.0668	flat-faced ball, not stepped (picture 4)	8	8	8	M 3	10	8	2,0	6	2,0	1,9	5
22630.0610	22630.0670		10	10	10	M 3	13	10	2,5	6	2,5	2,5	11
22630.0612	22630.0672		12	12	12	M 4	15	12	3,0	8	3,0	2,5	17
22630.0616	22630.0676		16	16	16	M 5	20	16	4,0	10	4,0	4,3	44
22630.0620	22630.0680		20	20	20	M 5	25	20	5,0	10	5,0	5,0	88
22630.0625	-	25	25	25	M 5	25	25	6,0	10	6,0	5,6	149	
22630.0630	-	30	30	30	M 6	30	30	8,0	12	8,0	8,8	270	
22630.0640	-	40	40	40	M 6	40	40	10,0	12	10,0	12,8	657	
22630.0650	-	50	50	50	M 6	50	50	12,0	12	12,0	16,7	1243	





EH 22640.

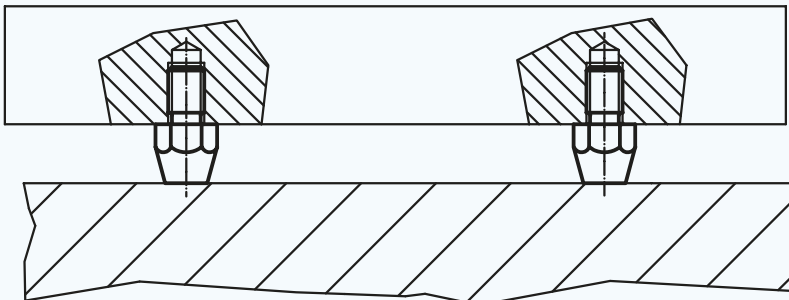
Feet

DIN 6320 with threaded shank

Material:

- Heat-treated steel, unhardened, blackened
- Surface without centre

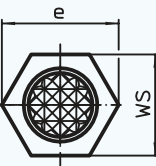
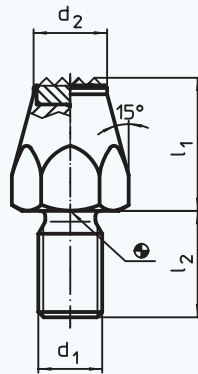
Ref. No.	h	d ₁	b	d ₂	e	s	g
22640.0061	10	M 6	11	8	11,5	10	8
22640.0062	20	M 6	11	6	11,5	10	13
22640.0081	15	M 8	13	10	15,0	13	19
22640.0082	30	M 8	13	9	15,0	13	35
22640.0101	20	M 10	16	13	19,6	17	41
22640.0102	40	M 10	16	13	19,6	17	81
22640.0121	25	M 12	20	15	21,9	19	70
22640.0122	50	M 12	20	15	21,9	19	129



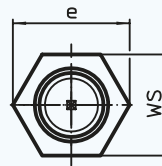
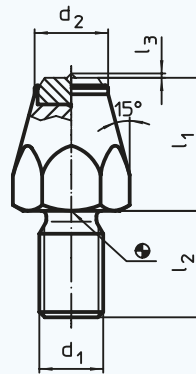
EH 22680.

Locating Pins

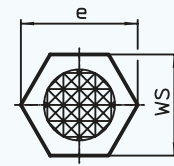
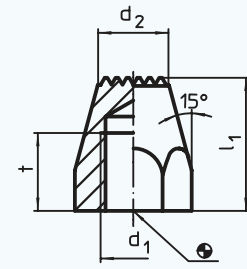
ribbed or pointed



picture 1



picture 2



picture 3

Material:

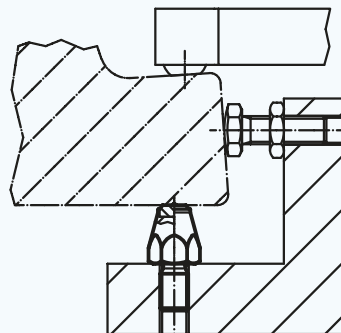
- Body:**
- Heat-treated steel, tempered, blackened
 - Free cutting steel, case-hardened, blackened (only picture 3)

- Insert:**
- Hard metal plate, ribbed/pointed

Note:

For work pieces showing a rough surface. Pointed type especially suitable for cast parts.

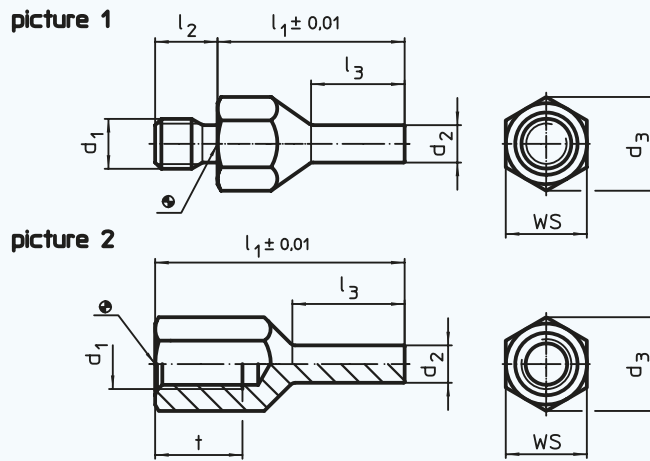
Ref. No.	Finish	l_1	d_1	l_2	l_3	t	d_2	e	WS	$\frac{r}{g}$
22680.0061	with hard metal insert, ribbed, and threaded shank (picture 1)	10	M 6	11	-	-	9,5	11,5	10	9
22680.0081		15	M 8	13	-	-	12,5	15,0	13	22
22680.0101		20	M 10	15	-	-	12,5	19,6	17	40
22680.0121		25	M 12	20	-	-	13,8	21,9	19	64
22680.0063	with hard metal insert, pointed, and threaded shank (picture 2)	10	M 6	11	0,8	-	9,5	11,5	10	9
22680.0083		15	M 8	13	0,8	-	12,5	15,0	13	23
22680.0103		20	M 10	15	0,8	-	12,5	19,6	17	40
22680.0123		25	M 12	20	0,8	-	13,8	21,9	19	65
22680.0142	case-hardened, ribbed, with female thread (picture 3)	20	M 8	-	-	10	9,0	15,0	13	14
22680.0144		25	M 8	-	-	10	9,0	15,0	13	20
22680.0164		25	M 10	-	-	13	12,5	19,6	17	31
22680.0166		30	M 10	-	-	13	12,5	19,6	17	40
22680.0168		40	M 10	-	-	13	12,5	19,6	17	60
22680.0184		25	M 12	-	-	15	13,0	21,9	19	33
22680.0186	30	M 12	-	-	15	13,0	21,9	19	44	
22680.0188	40	M 12	-	-	15	13,0	21,9	19	69	



EH 22680.

Locating Pins

pin-shaped



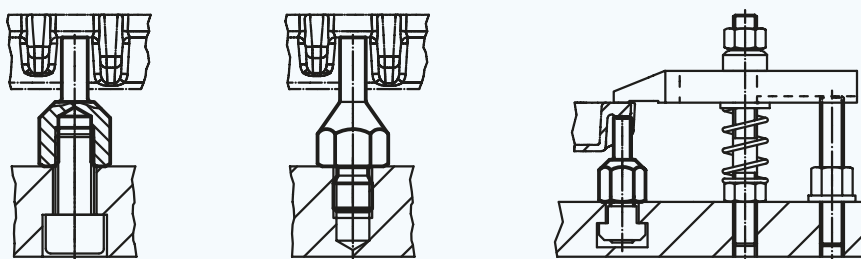
Material:

- Heat-treated steel, tempered, blackend; surface induction hardened and ground

Note:

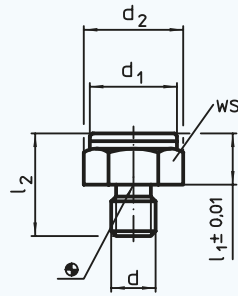
To be used as solid and precise seat and stop. The pin-shaped form of this locating pin allows an application in components with narrow seating points.

Ref. No.	Finish	$l_1 \pm 0,01$	d_1	d_2	l_2	l_3	t	d_3	WS	$\frac{g}{g}$
22680.0402	with male thread	20	M 6	4	8	10,0	–	11,0	10	8
22680.0404	(picture 1)	30	M 6	4	8	15,0	–	11,0	10	12
22680.0412		30	M 8	4	10	15,0	–	14,4	13	17
22680.0414		40	M 8	4	10	20,0	–	14,4	13	23
22680.0416		30	M 8	6	10	15,0	–	14,4	13	20
22680.0418		40	M 8	6	10	20,0	–	14,4	13	27
22680.0422		30	M 10	6	14	15,0	–	19,0	17	30
22680.0424		50	M 10	6	14	25,0	–	19,0	17	51
22680.0426		30	M 10	8	14	15,0	–	19,0	17	35
22680.0428		50	M 10	8	14	25,0	–	19,0	17	58
22680.0432		40	M 12	6	14	20,0	–	21,2	19	48
22680.0434		60	M 12	6	14	30,0	–	21,2	19	75
22680.0436		40	M 12	8	14	20,0	–	21,2	19	56
22680.0438		60	M 12	8	14	30,0	–	21,2	19	83
22680.0452	with female thread	20	M 6	4	–	8,5	6	11,0	10	6
22680.0454	(picture 2)	30	M 6	4	–	13,5	9	11,0	10	9
22680.0462		30	M 8	4	–	13,0	10	14,4	13	13
22680.0464		40	M 8	4	–	18,0	14	14,4	13	18
22680.0466		30	M 8	6	–	13,0	10	14,4	13	16
22680.0468		40	M 8	6	–	18,0	14	14,4	13	21
22680.0472		30	M 10	6	–	12,0	10	19,0	17	24
22680.0474		50	M 10	6	–	25,0	15	19,0	17	38
22680.0476		30	M 10	8	–	12,0	10	19,0	17	28
22680.0478		50	M 10	8	–	25,0	15	19,0	17	44
22680.0482		40	M 12	6	–	18,0	12	21,2	19	36
22680.0484		60	M 12	6	–	28,0	18	21,2	19	56
22680.0486		40	M 12	8	–	18,0	12	21,2	19	41
22680.0488		60	M 12	8	–	28,0	18	21,2	19	63

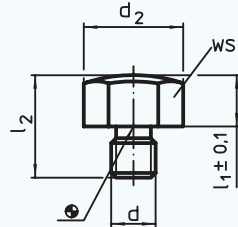


EH 22690.

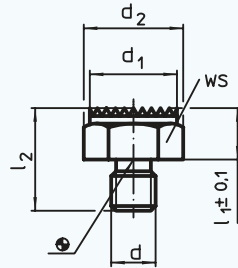
Screwed Rest Buttons



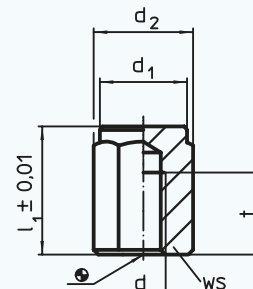
picture 1



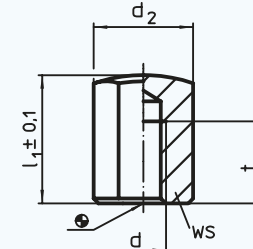
picture 2



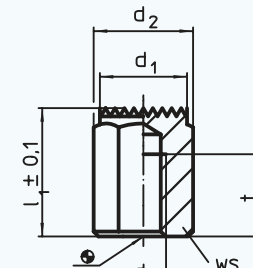
picture 3



picture 4



picture 5



picture 6

Material:

- Steel, case-hardened, blackened

Note:

To be used as seats, stops and thrust pads.

Ref. No.	Finish	l_1	d	d_1	d_2	l_2	t	WS	Starting torque max. Nm*	\pm g
22690.0021	with male thread and plain surface tolerance $l_1 = \pm 0,01$ (picture 1)	10	M 8	17	19,4	20	-	17	18	21
22690.0031		10	M 10	19	21,9	22	-	19	32	28
22690.0032		15	M 10	19	21,9	27	-	19	32	40
22690.0001		10	M 12	22	25,2	24	-	22	60	34
22690.0002		15	M 12	22	25,2	29	-	22	60	56
22690.0042		15	M 16	30	33,0	34	-	30	140	110
22690.0043	20	M 16	30	33,0	39	-	30	140	140	
22690.0121	with male thread and spherical surface (picture 2)	10	M 8	-	19,4	20	-	17	18	20
22690.0131		10	M 10	-	21,9	22	-	19	32	27
22690.0132		15	M 10	-	21,9	27	-	19	32	40
22690.0101		10	M 12	-	25,2	24	-	22	60	37
22690.0102		15	M 12	-	25,2	29	-	22	60	53
22690.0142		15	M 16	-	33,0	34	-	30	140	105
22690.0143	20	M 16	-	33,0	39	-	30	140	135	
22690.0221	with male thread and ribbed surface (picture 3)	10	M 8	17	19,4	20	-	17	18	20
22690.0231		10	M 10	19	21,9	22	-	19	32	27
22690.0232		15	M 10	19	21,9	27	-	19	32	39
22690.0201		10	M 12	22	25,2	24	-	22	60	38
22690.0202		15	M 12	22	25,2	29	-	22	60	54
22690.0242		15	M 16	30	33,0	34	-	30	140	106
22690.0243		20	M 16	30	33,0	39	-	30	140	136

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

Continued from previous page

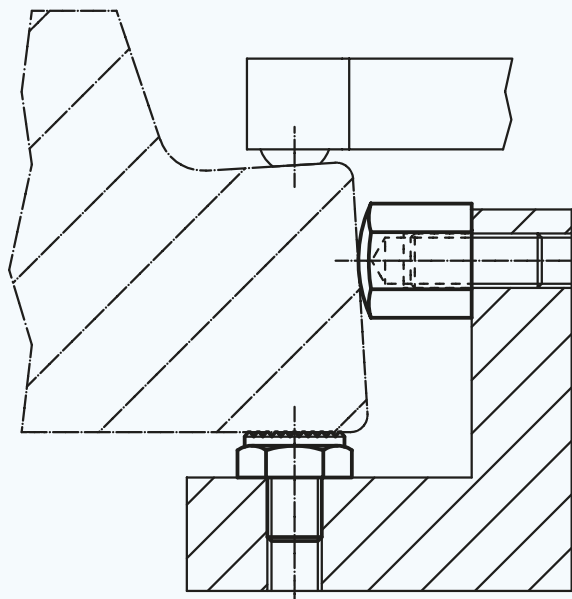
EH 22690.

Screwed Rest Buttons

Ref. No.	Finish	l ₁	d	d ₁	d ₂	l ₂	t	WS	Starting torque max. Nm	g
22690.0321	with female thread	15	M 8	17	19,4	-	6	17	25	25
22690.0323	and plain surface	25	M 8	17	19,4	-	12	17	25	42
22690.0333	tolerance l ₁ = ± 0,01	20	M 10	19	21,9	-	10	19	46	40
22690.0335	(picture 4)	30	M 10	19	21,9	-	15	19	46	61
22690.0337		40	M 10	19	21,9	-	15	19	46	85
22690.0301		20	M 12	22	25,2	-	10	22	82	52
22690.0302		25	M 12	22	25,2	-	15	22	82	65
22690.0303		30	M 12	22	25,2	-	18	22	82	79
22690.0304		40	M 12	22	25,2	-	18	22	82	111
22690.0305		50	M 12	22	25,2	-	18	22	82	142
22690.0343		30	M 16	30	33,0	-	20	30	206	140
22690.0345		50	M 16	30	33,0	-	24	30	206	257
22690.0421	with female thread	15	M 8	-	19,4	-	6	17	25	24
22690.0423	and spherical surface	25	M 8	-	19,4	-	12	17	25	41
22690.0433	(picture 5)	20	M 10	-	21,9	-	10	19	46	38
22690.0435		30	M 10	-	21,9	-	15	19	46	60
22690.0437		40	M 10	-	21,9	-	15	19	46	84
22690.0401		20	M 12	-	25,2	-	10	22	82	50
22690.0402		25	M 12	-	25,2	-	15	22	82	62
22690.0403		30	M 12	-	25,2	-	18	22	82	76
22690.0404		40	M 12	-	25,2	-	18	22	82	109
22690.0405		50	M 12	-	25,2	-	18	22	82	141
22690.0443		30	M 16	-	33,0	-	20	30	206	136
22690.0445		50	M 16	-	33,0	-	24	30	206	252
22690.0521	with female thread	15	M 8	17	19,4	-	6	17	25	24
22690.0523	and ribbed surface	25	M 8	17	19,4	-	12	17	25	41
22690.0533	(picture 6)	20	M 10	19	21,9	-	10	19	46	38
22690.0535		30	M 10	19	21,9	-	15	19	46	60
22690.0537		40	M 10	19	21,9	-	15	19	46	84
22690.0501		20	M 12	22	25,2	-	10	22	82	50
22690.0502		25	M 12	22	25,2	-	15	22	82	63
22690.0503		30	M 12	22	25,2	-	18	22	82	77
22690.0504		40	M 12	22	25,2	-	18	22	82	109
22690.0505		50	M 12	22	25,2	-	18	22	82	141
22690.0543		30	M 16	30	33,0	-	20	30	206	137
22690.0545		50	M 16	30	33,0	-	24	30	206	254



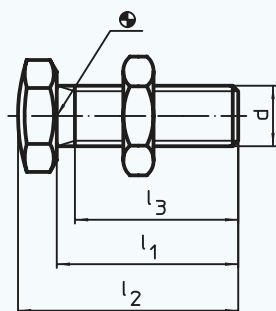
* The torque of bolts with female thread is for threaded pins, quality 8. The bolt has to be tightened over the total thread length.



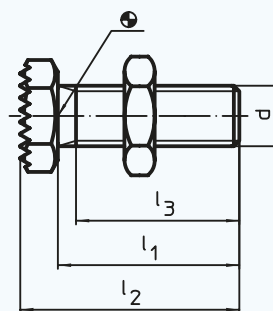
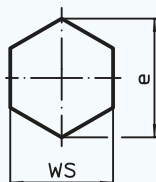
EH 22690.

Locating Pins

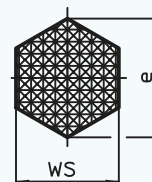
adjustable



picture 1



picture 2



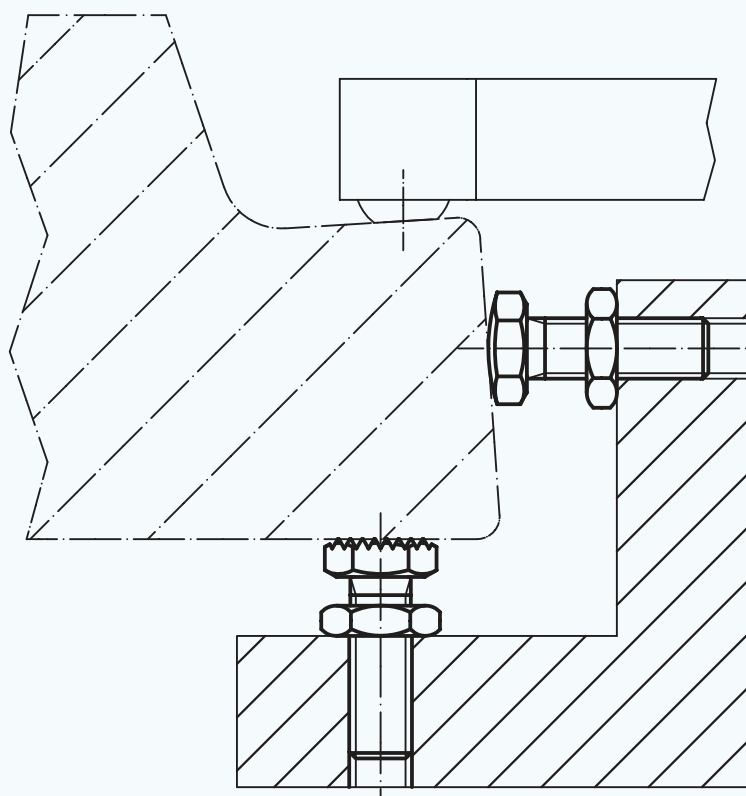
Material:

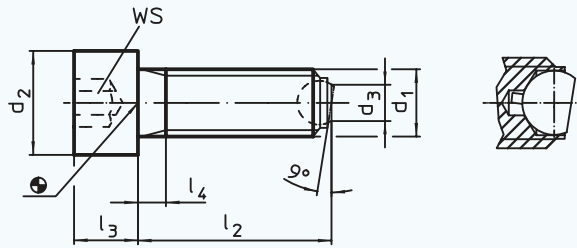
- Bearing pin:** • Heat-treated steel, tempered, quality 10.9, blackened
• Support induction hardened
- Nut:** • Heat-treated steel, tempered, quality 8.8 (ISO 4035), blackened

Note:

To be used as seats and stops.

Ref. No.	Finish	d	l ₁ ± 1,5	l ₂ ± 1,5	l ₃ min.	e	WS	g
22690.0606	spherical surface (picture 1)	M 6	20	23,5	19,0	11,5	10	6,8
22690.0608		M 8	25	30,0	21,0	14,5	13	15,0
22690.0610		M 10	30	36,0	25,5	19,6	17	31,0
22690.0612		M 12	35	42,0	29,7	21,9	19	47,0
22690.0626	ribbed surface (picture 2)	M 6	20	23,5	19,0	11,5	10	6,7
22690.0628		M 8	25	30,0	21,0	14,5	13	15,0
22690.0630		M 10	30	36,0	25,5	19,6	17	32,0
22690.0632		M 12	35	42,0	29,7	21,9	19	49,0





EH 22700.

Ball-Ended Thrust Screws

headed, ball secured against rotating

Ball protected against rotating.

>>> Special types upon request. <<<

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

Material:

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

Ball: • Ball-bearing steel, hardened
• Stainless steel, hardened

Note:

For clamping and supporting of surfaces that are not exactly parallel. Maximized load transmission due to moveable ball.

Note: Thread runout l₄!



Ref. No. Steel, heat-treated	Ref. No. Stainless steel	Finish	d ₁	l ₂	d ₂	d ₃	l ₃	l ₄	Ball	WS	Load capacity for static load max. kN*	± g
22700.0062	22700.0302	flat-faced ball, plain surface	M 6	20	10	3,2	6	3,0	4,0	5	6	6,1
22700.0064	22700.0304		M 6	30	10	3,2	6	3,0	4,0	5	6	7,7
22700.0066	22700.0306		M 6	40	10	3,2	6	16,0	4,0	5	6	10,0
22700.0082	22700.0312		M 8	20	13	4,5	8	3,5	5,5	6	9	13,0
22700.0084	22700.0314		M 8	35	13	4,5	8	3,5	5,5	6	9	17,0
22700.0086	22700.0316		M 8	50	13	4,5	8	22,0	5,5	6	9	23,0
22700.0102	22700.0322		M 10	25	16	6,0	10	4,5	7,0	8	12	24,0
22700.0104	22700.0324		M 10	40	16	6,0	10	4,5	7,0	8	12	31,0
22700.0106	22700.0326		M 10	60	16	6,0	10	28,0	7,0	8	12	44,0
22700.0122	22700.0332		M 12	30	18	7,2	12	5,0	8,5	10	18	38,0
22700.0124	22700.0334		M 12	50	18	7,2	12	5,0	8,5	10	18	52,0
22700.0126	22700.0336		M 12	80	18	7,2	12	44,0	8,5	10	18	80,0
22700.0162	22700.0342		M 16	40	24	10,7	16	6,0	12,0	14	36	92,0
22700.0164	22700.0344		M 16	60	24	10,7	16	6,0	12,0	14	36	118,0
22700.0166	22700.0346		M 16	80	24	10,7	16	36,0	12,0	14	36	153,0
22700.0172	-		M 20	50	30	13,5	20	7,5	15,0	17	60	181,0
22700.0174	-		M 20	80	30	13,5	20	28,0	15,0	17	60	255,0
22700.0176	-		M 20	100	30	13,5	20	48,0	15,0	17	60	304,0
22700.0182	-		M 24	60	36	15,8	24	9,0	18,0	19	80	325,0
22700.0184	-		M 24	90	36	15,8	24	30,0	18,0	19	80	430,0
22700.0186	-		M 24	120	36	15,8	24	60,0	18,0	19	80	535,0
22700.0192	-	flat-faced ball, ribbed surface	M 8	20	13	4,5	8	3,5	5,5	6	9	13,0
22700.0194	-		M 8	35	13	4,5	8	3,5	5,5	6	9	17,0
22700.0196	-		M 8	50	13	4,5	8	22,0	5,5	6	9	23,0
22700.0202	-		M 10	25	16	6,0	10	4,5	7,0	8	12	24,0
22700.0204	-		M 10	40	16	6,0	10	4,5	7,0	8	12	31,0
22700.0206	-		M 10	60	16	6,0	10	28,0	7,0	8	12	43,0
22700.0222	-		M 12	30	18	7,2	12	5,0	8,5	10	18	39,0
22700.0224	-		M 12	50	18	7,2	12	5,0	8,5	10	18	52,0
22700.0226	-		M 12	80	18	7,2	12	44,0	8,5	10	18	80,0
22700.0262	-		M 16	40	24	10,7	16	6,0	12,0	14	36	94,0
22700.0264	-		M 16	60	24	10,7	16	6,0	12,0	14	36	119,0
22700.0266	-		M 16	80	24	10,7	16	36,0	12,0	14	36	154,0
22700.0272	-		M 20	50	30	13,5	20	7,5	15,0	17	60	181,0
22700.0274	-		M 20	80	30	13,5	20	28,0	15,0	17	60	251,0
22700.0276	-		M 20	100	30	13,5	20	48,0	15,0	17	60	298,0
22700.0282	-		M 24	60	36	15,8	24	9,0	18,0	19	80	325,0
22700.0284	-		M 24	90	36	15,8	24	30,0	18,0	19	80	427,0
22700.0286	-		M 24	120	36	15,8	24	60,0	18,0	19	80	535,0

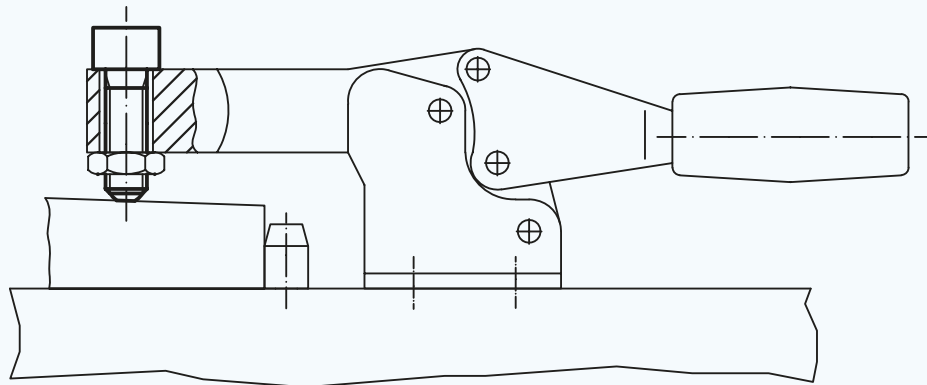
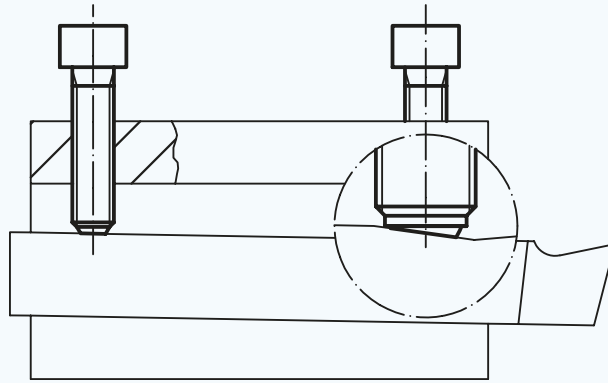
* Statements on load capacity are not valid for the stainless steel type.

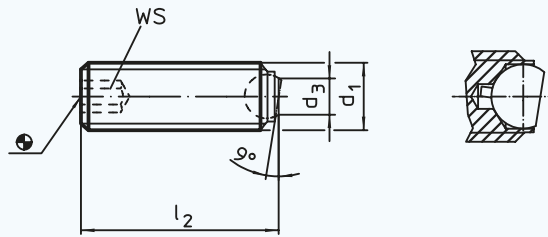
EH 22700.

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**Ball-Ended
Thrust Screws**

headed,
ball secured
against rotating





EH 22700.

Ball-Ended Thrust Screws

headless,
ball secured
against rotating

Ball protected against rotating.
>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -

Material:

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

Ball: • Ball-bearing steel, hardened
• Stainless steel, hardened

Note:

For clamping and supporting of surfaces that are not exactly parallel. Maximized load transmission due to moveable ball.



Ref. No. Steel, heat-treated	Ref. No. Stainless steel	Finish	d ₁	l ₂	d ₃	Ball	WS	Load capacity for static load max. kN*	μ g
22700.0563	22700.0803	flat-faced ball, plain surface	M 6	12	3,2	4,0	3	6	1,6
22700.0564	22700.0804		M 6	16	3,2	4,0	3	6	2,3
22700.0565	22700.0805		M 6	20	3,2	4,0	3	6	2,9
22700.0566	22700.0806		M 6	25	3,2	4,0	3	6	3,8
22700.0583	22700.0813		M 8	16	4,5	5,5	4	9	3,7
22700.0584	22700.0814		M 8	20	4,5	5,5	4	9	5,1
22700.0585	22700.0815		M 8	25	4,5	5,5	4	9	6,5
22700.0586	22700.0816		M 8	30	4,5	5,5	4	9	8,1
22700.0603	22700.0823		M 10	20	6,0	7,0	5	12	7,6
22700.0604	22700.0824		M 10	25	6,0	7,0	5	12	10,0
22700.0606	22700.0826		M 10	35	6,0	7,0	5	12	15,0
22700.0608	22700.0828		M 10	40	6,0	7,0	5	12	17,0
22700.0622	22700.0832		M 12	20	7,2	8,5	6	18	11,0
22700.0624	22700.0834		M 12	30	7,2	8,5	6	18	18,0
22700.0626	22700.0836		M 12	40	7,2	8,5	6	18	24,0
22700.0628	22700.0838		M 12	50	7,2	8,5	6	18	32,0
22700.0664	22700.0844		M 16	35	10,7	12,0	8	36	38,0
22700.0666	22700.0846		M 16	50	10,7	12,0	8	36	60,0
22700.0672	-		M 20	30	13,5	15,0	10	60	52,0
22700.0674	-		M 20	40	13,5	15,0	10	60	70,0
22700.0675	-		M 20	50	13,5	15,0	10	60	90,0
22700.0676	-		M 20	60	13,5	15,0	10	60	111,0
22700.0682	-		M 24	35	15,8	18,0	12	80	86,0
22700.0684	-		M 24	50	15,8	18,0	12	80	125,0
22700.0686	-		M 24	80	15,8	18,0	12	80	216,0
22700.0693	-	flat-faced ball, ribbed surface	M 8	16	4,5	5,5	4	9	3,7
22700.0694	-		M 8	20	4,5	5,5	4	9	4,9
22700.0695	-		M 8	25	4,5	5,5	4	9	6,6
22700.0696	-		M 8	30	4,5	5,5	4	9	8,0
22700.0703	-		M 10	20	6,0	7,0	5	12	7,5
22700.0704	-		M 10	25	6,0	7,0	5	12	9,9
22700.0706	-		M 10	35	6,0	7,0	5	12	15,0
22700.0708	-		M 10	40	6,0	7,0	5	12	17,0
22700.0722	-		M 12	20	7,2	8,5	6	18	11,0
22700.0724	-		M 12	30	7,2	8,5	6	18	18,0
22700.0726	-		M 12	40	7,2	8,5	6	18	24,0
22700.0728	-		M 12	50	7,2	8,5	6	18	32,0

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

EH 22700.

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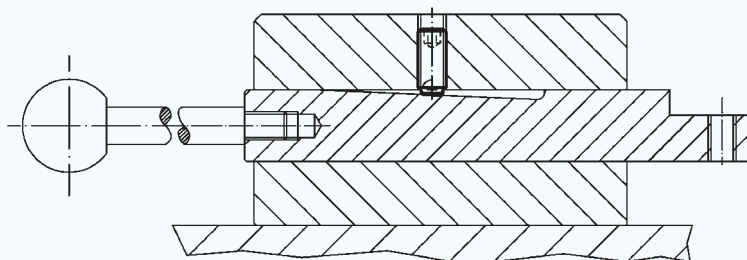
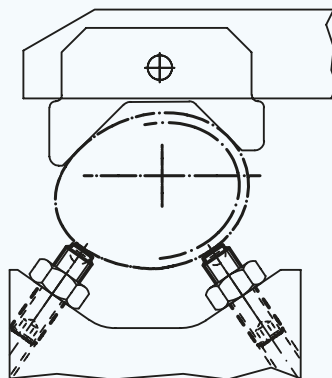
Ball-Ended Thrust Screws

headless,
ball secured
against rotating



Ref. No. Steel, heat-treated	Ref. No. Stainless steel	Finish	d ₁	l ₂	d ₃	Ball	WS	Load capacity for static load max. kN*	g
22700.0764	-	flat-faced ball, ribbed surface	M 16	35	10,7	12,0	8	36	38,0
22700.0766	-		M 16	50	10,7	12,0	8	36	60,0
22700.0772	-		M 20	30	13,5	15,0	10	60	51,0
22700.0774	-		M 20	40	13,5	15,0	10	60	69,0
22700.0775	-		M 20	50	13,5	15,0	10	60	90,0
22700.0776	-		M 20	60	13,5	15,0	10	60	110,0
22700.0782	-		M 24	35	15,8	18,0	12	80	84,0
22700.0784	-		M 24	50	15,8	18,0	12	80	128,0
22700.0786	-		M 24	80	15,8	18,0	12	80	215,0

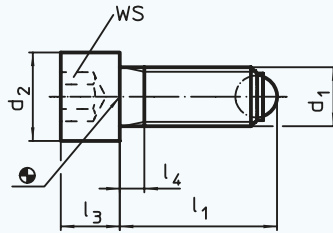
* Statements on load capacity are not valid for the stainless steel type.



EH 22710.

Ball-Ended Thrust Screws

headed,
round ball



Fully rotating ball.

>>> Special types upon request. <<<

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

Material:

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

Ball: • Ball-bearing steel, hardened
• Stainless steel, hardened

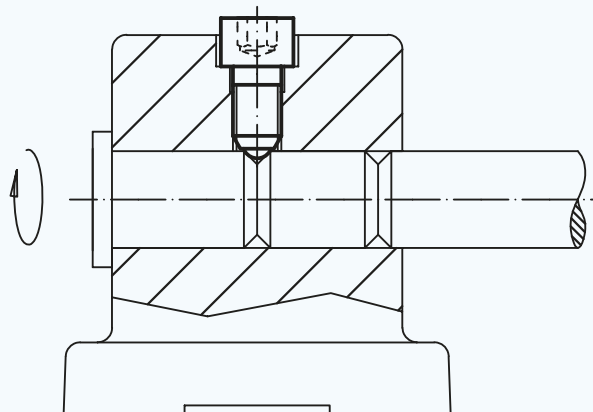
Note:

For clamping and supporting of surfaces that are not exactly parallel.



Ref. No. Steel, heat-treated	Ref. No. Stainless steel	d ₁	l ₁	d ₂	l ₃	l ₄	Ball	WS	Load capacity for static load max. kN*	g
22710.0062	22710.0752	M 6	20,8	10	6	3,0	4,0	5	9	6,2
22710.0064	22710.0754	M 6	30,8	10	6	3,0	4,0	5	9	8,0
22710.0066	22710.0756	M 6	40,8	10	6	16,0	4,0	5	9	10,0
22710.0082	22710.0762	M 8	21,2	13	8	3,5	5,5	6	15	13,0
22710.0084	22710.0764	M 8	36,2	13	8	3,5	5,5	6	15	17,0
22710.0086	22710.0766	M 8	51,2	13	8	22,0	5,5	6	15	24,0
22710.0102	22710.0772	M 10	26,7	16	10	4,5	7,0	8	20	24,0
22710.0104	22710.0774	M 10	41,7	16	10	4,5	7,0	8	20	31,0
22710.0106	22710.0776	M 10	61,7	16	10	28,0	7,0	8	20	44,0
22710.0122	22710.0782	M 12	32,0	18	12	5,0	8,5	10	30	38,0
22710.0124	22710.0784	M 12	52,0	18	12	5,0	8,5	10	30	52,0
22710.0126	22710.0786	M 12	82,0	18	12	44,0	8,5	10	30	79,0
22710.0162	22710.0792	M 16	43,3	24	16	6,0	12,0	14	60	94,0
22710.0164	22710.0794	M 16	63,3	24	16	6,0	12,0	14	60	119,0
22710.0166	22710.0796	M 16	83,3	24	16	36,0	12,0	14	60	156,0
22710.0202	-	M 20	54,2	30	20	7,5	15,0	17	90	183,0
22710.0204	-	M 20	84,2	30	20	28,0	15,0	17	90	254,0
22710.0206	-	M 20	104,2	30	20	48,0	15,0	17	90	307,0
22710.0242	-	M 24	64,7	36	24	9,0	18,0	19	120	331,0
22710.0244	-	M 24	94,7	36	24	30,0	18,0	19	120	430,0
22710.0246	-	M 24	124,7	36	24	60,0	18,0	19	120	537,0

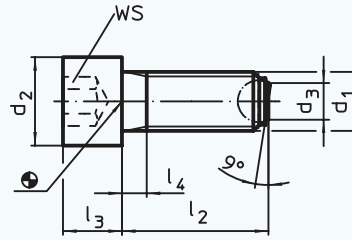
* Statements on load capacity are not valid for the stainless steel type.



EH 22710.

Ball-Ended Thrust Screws

headed,
flat-faced ball



Fully rotating ball.
>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -

Material:

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

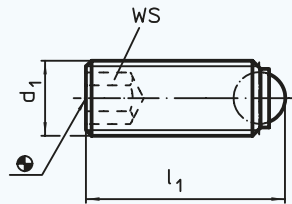
Ball: • Ball-bearing steel, hardened
• Stainless steel, hardened

Note:

For clamping and supporting of surfaces that are not exactly parallel. Maximized load transmission due to moveable ball.

Ref. No. Steel, heat-treated	Ref. No. Stainless steel	Finish	d ₁	l ₂	d ₂	d ₃	l ₃	l ₄	Ball	WS	Load capacity for static load max. kN*	μg
22710.0562	22710.0832	plain surface	M 6	20	10	3,2	6	3,0	4,0	5	9	6,1
22710.0564	22710.0834	surface	M 6	30	10	3,2	6	3,0	4,0	5	9	7,6
22710.0566	22710.0836		M 6	40	10	3,2	6	16,0	4,0	5	9	10,0
22710.0582	22710.0842		M 8	20	13	4,5	8	3,5	5,5	6	15	13,0
22710.0584	22710.0844		M 8	35	13	4,5	8	3,5	5,5	6	15	17,0
22710.0586	22710.0846		M 8	50	13	4,5	8	22,0	5,5	6	15	23,0
22710.0602	22710.0852		M 10	25	16	6,0	10	4,5	7,0	8	20	24,0
22710.0604	22710.0854		M 10	40	16	6,0	10	4,5	7,0	8	20	31,0
22710.0606	22710.0856		M 10	60	16	6,0	10	28,0	7,0	8	20	44,0
22710.0622	22710.0862		M 12	30	18	7,2	12	5,0	8,5	10	30	38,0
22710.0624	22710.0864		M 12	50	18	7,2	12	5,0	8,5	10	30	52,0
22710.0626	22710.0866		M 12	80	18	7,2	12	44,0	8,5	10	30	79,0
22710.0662	22710.0872		M 16	40	24	10,7	16	6,0	12,0	14	60	92,0
22710.0664	22710.0874		M 16	60	24	10,7	16	6,0	12,0	14	60	120,0
22710.0666	22710.0876		M 16	80	24	10,7	16	36,0	12,0	14	60	155,0
22710.0702	-		M 20	50	30	13,5	20	7,5	15,0	17	90	182,0
22710.0704	-		M 20	80	30	13,5	20	28,0	15,0	17	90	255,0
22710.0706	-		M 20	100	30	13,5	20	48,0	15,0	17	90	305,0
22710.0742	-		M 24	60	36	15,8	24	9,0	18,0	19	120	325,0
22710.0744	-		M 24	90	36	15,8	24	30,0	18,0	19	120	422,0
22710.0746	-		M 24	120	36	15,8	24	60,0	18,0	19	120	534,0
22710.0892	-	ribbed surface	M 8	20	13	4,5	8	3,5	5,5	6	15	12,0
22710.0894	-		M 8	35	13	4,5	8	3,5	5,5	6	15	17,0
22710.0896	-		M 8	50	13	4,5	8	22,0	5,5	6	15	23,0
22710.0902	-		M 10	25	16	6,0	10	4,5	7,0	8	20	24,0
22710.0904	-		M 10	40	16	6,0	10	4,5	7,0	8	20	31,0
22710.0906	-		M 10	60	16	6,0	10	28,0	7,0	8	20	44,0
22710.0922	-		M 12	30	18	7,2	12	5,0	8,5	10	30	39,0
22710.0924	-		M 12	50	18	7,2	12	5,0	8,5	10	30	53,0
22710.0926	-		M 12	80	18	7,2	12	44,0	8,5	10	30	79,0
22710.0962	-		M 16	40	24	10,7	16	6,0	12,0	14	60	92,0
22710.0964	-		M 16	60	24	10,7	16	6,0	12,0	14	60	118,0
22710.0966	-		M 16	80	24	10,7	16	36,0	12,0	14	60	155,0
22710.0972	-		M 20	50	30	13,5	20	7,5	15,0	17	90	180,0
22710.0974	-		M 20	80	30	13,5	20	28,0	15,0	17	90	254,0
22710.0976	-		M 20	100	30	13,5	20	48,0	15,0	17	90	303,0
22710.0982	-		M 24	60	36	15,8	24	9,0	18,0	19	120	324,0
22710.0984	-		M 24	90	36	15,8	24	30,0	18,0	19	120	427,0
22710.0986	-		M 24	120	36	15,8	24	60,0	18,0	19	120	536,0

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



EH 22720.

Ball-Ended Thrust Screws

headless,
round ball



Fully rotating ball.

>>> Special types upon request. <<<

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

Material:

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

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

Note:

Ball-ended thrust screws with thermoplastic ball are used for pressure sensitive pieces.

Also for positioning, clamping, tightening or supporting of surfaces that are not exactly parallel.

Also available with flat-faced ball and fine-pitch thread.

Ref. No. Steel, heat-treated	Ref. No. Stainless steel	Finish	d ₁	l ₁	Ball	WS	Load capacity for static load max. kN*	⌀ g
22720.0042	22720.0750	round ball	M 4	6,0	2,5	2,0	3,5	0,54
22720.0043	22720.0752		M 4	8,0	2,5	2,0	3,5	0,61
22720.0044	22720.0754		M 4	10,0	2,5	2,0	3,5	0,80
22720.0045	22720.0756		M 4	12,0	2,5	2,0	3,5	0,69
22720.0046	22720.0758		M 4	16,0	2,5	2,0	3,5	1,20
22720.0052	22720.0760		M 5	8,0	3,0	2,5	4,5	0,80
22720.0053	22720.0761		M 5	10,0	3,0	2,5	4,5	1,06
22720.0054	22720.0762		M 5	12,0	3,0	2,5	4,5	1,30
22720.0055	22720.0763		M 5	16,0	3,0	2,5	4,5	1,53
22720.0056	22720.0764		M 5	20,0	3,0	2,5	4,5	2,20
22720.0058	22720.0765		M 5	25,0	3,0	2,5	4,5	2,80
22720.0062	22720.0770		M 6	10,8	4,0	3,0	9,0	1,53
22720.0063	22720.0772		M 6	12,8	4,0	3,0	9,0	1,86
22720.0064	22720.0774		M 6	16,8	4,0	3,0	9,0	2,50
22720.0065	22720.0775		M 6	20,8	4,0	3,0	9,0	3,30
22720.0066	22720.0776		M 6	25,8	4,0	3,0	9,0	4,00
22720.0081	22720.0780		M 8	11,2	5,5	4,0	15,0	2,60
22720.0082	22720.0782		M 8	13,2	5,5	4,0	15,0	3,00
22720.0083	22720.0783		M 8	17,2	5,5	4,0	15,0	4,20
22720.0084	22720.0784		M 8	21,2	5,5	4,0	15,0	5,40
22720.0085	22720.0785		M 8	26,2	5,5	4,0	15,0	6,90
22720.0086	22720.0786		M 8	31,2	5,5	4,0	15,0	8,40
22720.0101	22720.0790		M 10	13,7	7,0	5,0	20,0	4,80
22720.0102	22720.0792		M 10	17,7	7,0	5,0	20,0	6,20
22720.0103	22720.0793		M 10	21,7	7,0	5,0	20,0	8,10
22720.0104	22720.0794		M 10	26,7	7,0	5,0	20,0	11,00
22720.0105	22720.0795		M 10	31,7	7,0	5,0	20,0	13,00
22720.0106	22720.0796		M 10	36,7	7,0	5,0	20,0	15,00
22720.0108	22720.0798		M 10	41,7	7,0	5,0	20,0	15,00
22720.0121	22720.0800		M 12	18,0	8,5	6,0	30,0	9,30
22720.0122	22720.0802		M 12	22,0	8,5	6,0	30,0	11,00
22720.0123	22720.0803		M 12	27,0	8,5	6,0	30,0	15,00
22720.0124	22720.0804		M 12	32,0	8,5	6,0	30,0	18,00
22720.0126	22720.0806		M 12	42,0	8,5	6,0	30,0	25,00
22720.0128	22720.0808		M 12	52,0	8,5	6,0	30,0	32,50
22720.0161	22720.0810		M 16	23,3	12,0	8,0	60,0	22,00
22720.0162	22720.0812		M 16	28,3	12,0	8,0	60,0	27,00
22720.0164	22720.0814		M 16	38,3	12,0	8,0	60,0	40,00
22720.0166	22720.0816		M 16	53,3	12,0	8,0	60,0	62,00

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

EH 22720.

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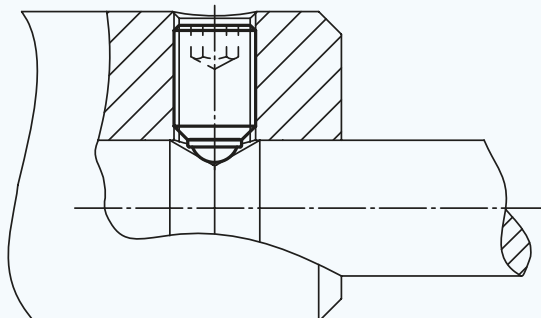
Ball-Ended Thrust Screws

headless,
round ball



Ref. No. Steel, heat-treated	Ref. No. Stainless steel	Finish	d ₁	l ₁	Ball	WS	Load capacity for static load max. kN*	μg
22720.0202	-	round ball	M 20	34,2	15,0	10,0	90,0	52,00
22720.0204	-		M 20	44,2	15,0	10,0	90,0	72,00
22720.0205	-		M 20	54,2	15,0	10,0	90,0	93,00
22720.0206	-		M 20	64,2	15,0	10,0	90,0	115,00
22720.0242	-		M 24	39,7	18,0	12,0	120,0	87,00
22720.0244	-		M 24	54,7	18,0	12,0	120,0	129,00
22720.0246	-		M 24	84,7	18,0	12,0	120,0	222,00
22720.0342	22720.0252	round ball	M 4	6,0	2,5	2,0	0,3	0,23
22720.0343	22720.0253	from thermoplastic	M 4	8,0	2,5	2,0	0,3	0,35
22720.0344	22720.0254		M 4	10,0	2,5	2,0	0,3	0,70
22720.0345	22720.0255		M 4	12,0	2,5	2,0	0,3	0,85
22720.0346	22720.0256		M 4	16,0	2,5	2,0	0,3	1,05
22720.0352	22720.0262		M 5	8,0	3,0	2,5	0,5	0,76
22720.0353	22720.0263		M 5	10,0	3,0	2,5	0,5	0,75
22720.0354	22720.0264		M 5	12,0	3,0	2,5	0,5	1,20
22720.0355	22720.0265		M 5	16,0	3,0	2,5	0,5	1,43
22720.0356	22720.0266		M 5	20,0	3,0	2,5	0,5	1,90
22720.0358	22720.0267		M 5	25,0	3,0	2,5	0,5	2,50
22720.0362	22720.0272		M 6	10,8	4,0	3,0	0,9	1,10
22720.0363	22720.0273		M 6	12,8	4,0	3,0	0,9	1,43
22720.0364	22720.0274		M 6	16,8	4,0	3,0	0,9	2,09
22720.0365	22720.0275		M 6	20,8	4,0	3,0	0,9	2,74
22720.0366	22720.0276		M 6	25,8	4,0	3,0	0,9	3,80
22720.0381	22720.0281		M 8	11,2	5,5	4,0	1,5	1,92
22720.0382	22720.0282		M 8	13,2	5,5	4,0	1,5	2,40
22720.0383	22720.0283		M 8	17,2	5,5	4,0	1,5	3,60
22720.0384	22720.0284		M 8	21,2	5,5	4,0	1,5	4,60
22720.0385	22720.0285		M 8	26,2	5,5	4,0	1,5	6,30
22720.0386	22720.0286		M 8	31,2	5,5	4,0	1,5	7,80
22720.0401	22720.0291		M 10	13,7	7,0	5,0	2,0	3,50
22720.0402	22720.0292		M 10	17,7	7,0	5,0	2,0	4,80
22720.0403	22720.0293		M 10	21,7	7,0	5,0	2,0	6,80
22720.0404	22720.0294		M 10	26,7	7,0	5,0	2,0	9,40
22720.0405	22720.0295		M 10	31,7	7,0	5,0	2,0	12,00
22720.0406	22720.0296		M 10	36,7	7,0	5,0	2,0	14,00
22720.0408	22720.0297		M 10	41,7	7,0	5,0	2,0	17,00
22720.0421	22720.0301		M 12	18,0	8,5	6,0	3,0	6,80
22720.0422	22720.0302		M 12	22,0	8,5	6,0	3,0	9,20
22720.0423	22720.0303		M 12	27,0	8,5	6,0	3,0	12,00
22720.0424	22720.0304		M 12	32,0	8,5	6,0	3,0	16,00
22720.0426	22720.0306		M 12	42,0	8,5	6,0	3,0	23,00
22720.0428	22720.0308		M 12	52,0	8,5	6,0	3,0	30,00

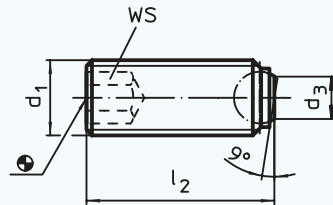
* Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).



EH 22720.

Ball-Ended Thrust Screws

headless,
flat-faced ball



Fully rotating ball.

>>> Special types upon request. <<<

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

Material:

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

Ball: • Ball-bearing steel, hardened
• Stainless steel, hardened
• Thermoplastic POM, red

Note:

Ball-ended thrust screws with thermoplastic ball are used for pressure sensitive pieces.

Also for clamping, tightening or supporting of surfaces that are not exactly parallel. Load transmission maximized due to moveable ball.

Also available with round ball and fine-pitch thread.



Ref. No. Steel, heat-treated	Ref. No. Stainless steel	Finish	d ₁	l ₂	d ₃	Ball	WS	Load capacity for static load max. kN*	g
22720.0542	22720.0827	plain	M 4	5,6	1,8	2,5	2,0	3,5	0,51
22720.0543	22720.0828	surface	M 4	7,6	1,8	2,5	2,0	3,5	0,61
22720.0544	22720.0829		M 4	9,6	1,8	2,5	2,0	3,5	0,54
22720.0545	22720.0830		M 4	11,6	1,8	2,5	2,0	3,5	0,91
22720.0546	22720.0832		M 4	15,6	1,8	2,5	2,0	3,5	0,97
22720.0552	22720.0833		M 5	7,5	2,2	3,0	2,5	4,5	0,62
22720.0553	22720.0834		M 5	9,5	2,2	3,0	2,5	4,5	0,84
22720.0554	22720.0835		M 5	11,5	2,2	3,0	2,5	4,5	1,10
22720.0555	22720.0836		M 5	15,5	2,2	3,0	2,5	4,5	1,70
22720.0556	22720.0837		M 5	19,5	2,2	3,0	2,5	4,5	2,20
22720.0558	22720.0838		M 5	24,5	2,2	3,0	2,5	4,5	2,60
22720.0562	22720.0840		M 6	10,0	3,2	4,0	3,0	9,0	1,50
22720.0563	22720.0842		M 6	12,0	3,2	4,0	3,0	9,0	1,60
22720.0564	22720.0844		M 6	16,0	3,2	4,0	3,0	9,0	2,50
22720.0565	22720.0845		M 6	20,0	3,2	4,0	3,0	9,0	3,20
22720.0566	22720.0846		M 6	25,0	3,2	4,0	3,0	9,0	3,80
22720.0581	22720.0850		M 8	10,0	4,5	5,5	4,0	15,0	2,60
22720.0582	22720.0852		M 8	12,0	4,5	5,5	4,0	15,0	2,90
22720.0583	22720.0853		M 8	16,0	4,5	5,5	4,0	15,0	4,00
22720.0584	22720.0854		M 8	20,0	4,5	5,5	4,0	15,0	5,30
22720.0585	22720.0855		M 8	25,0	4,5	5,5	4,0	15,0	6,80
22720.0586	22720.0856		M 8	30,0	4,5	5,5	4,0	15,0	8,40
22720.0601	22720.0860		M 10	12,0	6,0	7,0	5,0	20,0	4,70
22720.0602	22720.0862		M 10	16,0	6,0	7,0	5,0	20,0	6,10
22720.0603	22720.0863		M 10	20,0	6,0	7,0	5,0	20,0	7,90
22720.0604	22720.0864		M 10	25,0	6,0	7,0	5,0	20,0	10,00
22720.0605	22720.0865		M 10	30,0	6,0	7,0	5,0	20,0	13,00
22720.0606	22720.0866		M 10	35,0	6,0	7,0	5,0	20,0	15,00
22720.0608	22720.0868		M 10	40,0	6,0	7,0	5,0	20,0	18,00
22720.0621	22720.0870		M 12	16,0	7,2	8,5	6,0	30,0	9,10
22720.0622	22720.0872		M 12	20,0	7,2	8,5	6,0	30,0	11,00
22720.0623	22720.0873		M 12	25,0	7,2	8,5	6,0	30,0	14,00
22720.0624	22720.0874		M 12	30,0	7,2	8,5	6,0	30,0	18,00
22720.0626	22720.0876		M 12	40,0	7,2	8,5	6,0	30,0	25,00
22720.0628	22720.0878		M 12	50,0	7,2	8,5	6,0	30,0	32,00
22720.0661	22720.0880		M 16	20,0	10,7	12,0	8,0	60,0	21,00
22720.0662	22720.0882		M 16	25,0	10,7	12,0	8,0	60,0	26,00
22720.0664	22720.0884		M 16	35,0	10,7	12,0	8,0	60,0	39,00
22720.0666	22720.0886		M 16	50,0	10,7	12,0	8,0	60,0	60,00

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

EH 22720.

Continued from previous page

Ball-Ended Thrust Screws

headless,
flat-faced ball



Ref. No. Steel, heat-treated	Ref. No. Stainless steel	Finish	d ₁	l ₂	d ₃	Ball	WS	Load capacity for static load max. kN*	g
22720.0702	—	plain	M 20	30,0	13,5	15,0	10,0	90,0	49,00
22720.0704	—	surface	M 20	40,0	13,5	15,0	10,0	90,0	70,00
22720.0705	—		M 20	50,0	13,5	15,0	10,0	90,0	90,00
22720.0706	—		M 20	60,0	13,5	15,0	10,0	90,0	111,00
22720.0742	—		M 24	35,0	15,8	18,0	12,0	120,0	86,00
22720.0744	—		M 24	50,0	15,8	18,0	12,0	120,0	128,00
22720.0746	—		M 24	80,0	15,8	18,0	12,0	120,0	219,00
22720.0891	—	ribbed	M 8	10,0	4,5	5,5	4,0	15,0	2,80
22720.0892	—	surface	M 8	12,0	4,5	5,5	4,0	15,0	2,70
22720.0893	—		M 8	16,0	4,5	5,5	4,0	15,0	3,90
22720.0894	—		M 8	20,0	4,5	5,5	4,0	15,0	5,10
22720.0895	—		M 8	25,0	4,5	5,5	4,0	15,0	6,60
22720.0896	—		M 8	30,0	4,5	5,5	4,0	15,0	8,10
22720.0901	—		M 10	12,0	6,0	7,0	5,0	20,0	4,70
22720.0902	—		M 10	16,0	6,0	7,0	5,0	20,0	5,80
22720.0903	—		M 10	20,0	6,0	7,0	5,0	20,0	7,70
22720.0904	—		M 10	25,0	6,0	7,0	5,0	20,0	10,00
22720.0905	—		M 10	30,0	6,0	7,0	5,0	20,0	13,00
22720.0906	—		M 10	35,0	6,0	7,0	5,0	20,0	15,00
22720.0908	—		M 10	40,0	6,0	7,0	5,0	20,0	17,00
22720.0921	—		M 12	16,0	7,2	8,5	6,0	30,0	8,60
22720.0922	—		M 12	20,0	7,2	8,5	6,0	30,0	11,00
22720.0923	—		M 12	25,0	7,2	8,5	6,0	30,0	14,00
22720.0924	—		M 12	30,0	7,2	8,5	6,0	30,0	18,00
22720.0926	—		M 12	40,0	7,2	8,5	6,0	30,0	25,00
22720.0928	—		M 12	50,0	7,2	8,5	6,0	30,0	32,00
22720.0961	—		M 16	20,0	10,7	12,0	8,0	60,0	21,00
22720.0962	—		M 16	25,0	10,7	12,0	8,0	60,0	26,00
22720.0964	—		M 16	35,0	10,7	12,0	8,0	60,0	40,00
22720.0966	—		M 16	50,0	10,7	12,0	8,0	60,0	60,00
22720.0972	—		M 20	30,0	13,5	15,0	10,0	90,0	50,00
22720.0974	—		M 20	40,0	13,5	15,0	10,0	90,0	70,00
22720.0975	—		M 20	50,0	13,5	15,0	10,0	90,0	89,00
22720.0976	—		M 20	60,0	13,5	15,0	10,0	90,0	111,00
22720.0982	—		M 24	35,0	15,8	18,0	12,0	120,0	84,00
22720.0984	—		M 24	50,0	15,8	18,0	12,0	120,0	125,00
22720.0986	—		M 24	80,0	15,8	18,0	12,0	120,0	219,00
22720.0452	22720.0492	flat-faced ball	M 4	5,9	1,8	2,5	2,0	0,3	0,24
22720.0453	22720.0493	from thermoplastic,	M 4	7,9	1,8	2,5	2,0	0,3	0,35
22720.0454	22720.0494	plain surface	M 4	9,9	1,8	2,5	2,0	0,3	0,49
22720.0455	22720.0495	(protected against	M 4	11,9	1,8	2,5	2,0	0,3	0,88
22720.0456	22720.0496	twisting)	M 4	15,9	1,8	2,5	2,0	0,3	0,92
22720.0462	22720.0502		M 5	7,8	2,1	3,0	2,5	0,5	0,80
22720.0463	22720.0503		M 5	9,8	2,1	3,0	2,5	0,5	0,74
22720.0464	22720.0504		M 5	11,8	2,1	3,0	2,5	0,5	1,23
22720.0465	22720.0505		M 5	15,8	2,1	3,0	2,5	0,5	1,40
22720.0466	22720.0506		M 5	19,8	2,1	3,0	2,5	0,5	2,00
22720.0467	22720.0507		M 5	24,8	2,1	3,0	2,5	0,5	2,70
22720.0472	22720.0512		M 6	10,3	3,0	4,0	3,0	0,9	1,10
22720.0473	22720.0513		M 6	12,3	3,0	4,0	3,0	0,9	1,70
22720.0474	22720.0514		M 6	16,3	3,0	4,0	3,0	0,9	2,10
22720.0475	22720.0515		M 6	20,3	3,0	4,0	3,0	0,9	2,76
22720.0476	22720.0516		M 6	25,3	3,0	4,0	3,0	0,9	3,60
22720.0482	22720.0522		M 8	10,4	4,2	5,5	4,0	1,5	1,80
22720.0483	22720.0523		M 8	12,4	4,2	5,5	4,0	1,5	2,20
22720.0484	22720.0524		M 8	16,4	4,2	5,5	4,0	1,5	3,40
22720.0485	22720.0525		M 8	20,4	4,2	5,5	4,0	1,5	4,80
22720.0486	22720.0526		M 8	25,4	4,2	5,5	4,0	1,5	6,10
22720.0487	22720.0527		M 8	30,4	4,2	5,5	4,0	1,5	7,60

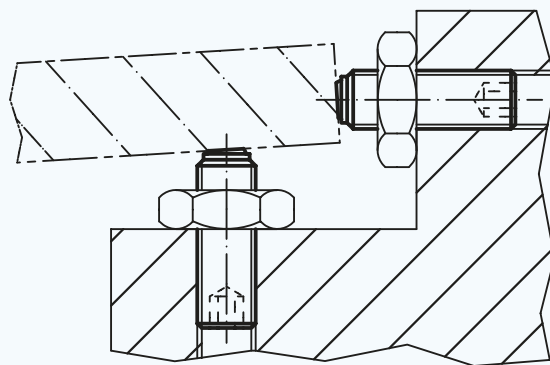
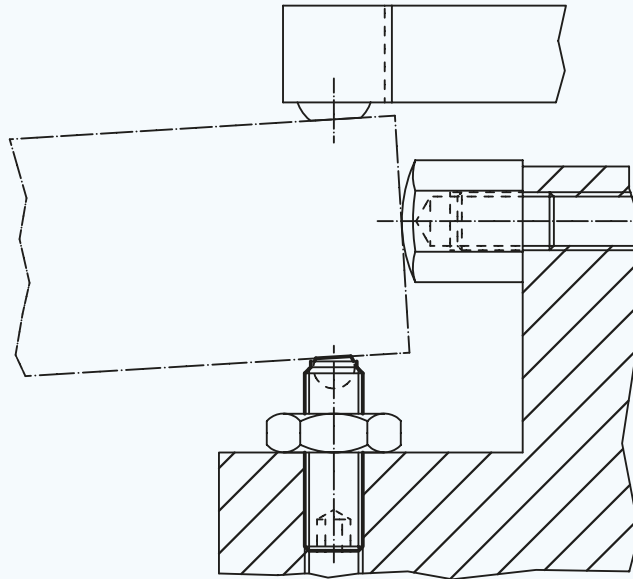
* Statements on load capacity are not valid for the stainless steel type (except the type fitted with thermoplastic balls).

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EH 22720.

Ball-Ended Thrust Screws

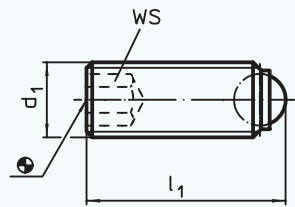
headless,
flat-faced ball



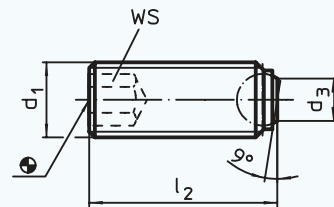
EH 22720.

Ball-Ended Thrust Screws

headless,
with fine-pitch thread



picture 1



picture 2

Fully rotating ball.
>>> Special types upon request. <<<
Thread lock upon request, please refer to appendix - Technical Data -

Material:

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

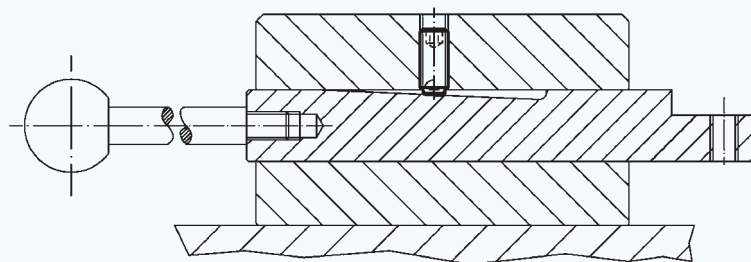
Ball: • Ball-bearing steel, hardened
• Stainless steel, hardened

Note:

For clamping and supporting of surfaces that are not exactly parallel. Type with flattened ball: Maximized load transmission due to moveable ball.
The fine-pitch thread allows a precise adjustment.

Ref. No. Steel, heat-treated	Ref. No. Stainless steel	Finish	d ₁	l ₁	l ₂	d ₃	Ball	WS	Load capacity for static load max. kN*	g
22720.5050	22720.6050	round ball (picture 1)	M 5 x 0,5	8,0	-	-	3,0	2,5	4,5	0,80
22720.5052	22720.6052		M 5 x 0,5	12,0	-	-	3,0	2,5	4,5	1,30
22720.5060	22720.6060		M 6 x 0,5	10,8	-	-	4,0	3,0	9,0	1,30
22720.5061	22720.6061		M 6 x 0,5	12,8	-	-	4,0	3,0	9,0	1,80
22720.5062	22720.6062		M 6 x 0,5	16,8	-	-	4,0	3,0	9,0	2,40
22720.5063	22720.6063		M 6 x 0,5	20,8	-	-	4,0	3,0	9,0	3,00
22720.5064	22720.6064		M 6 x 0,5	25,8	-	-	4,0	3,0	9,0	3,00
22720.5070	22720.6070		M 8 x 1	11,2	-	-	5,5	4,0	15,0	2,60
22720.5073	22720.6073	M 8 x 1	21,2	-	-	5,5	4,0	15,0	5,40	
22720.5250	22720.6250	flat-faced ball, plain surface (picture 2)	M 5 x 0,5	-	7,5	2,2	3,0	2,5	4,5	0,62
22720.5252	22720.6252		M 5 x 0,5	-	11,5	2,2	3,0	2,5	4,5	1,10
22720.5260	22720.6260		M 6 x 0,5	-	10,0	3,2	4,0	3,0	9,0	1,30
22720.5261	22720.6261		M 6 x 0,5	-	12,0	3,2	4,0	3,0	9,0	1,80
22720.5262	22720.6262		M 6 x 0,5	-	16,0	3,2	4,0	3,0	9,0	2,40
22720.5263	22720.6263		M 6 x 0,5	-	20,0	3,2	4,0	3,0	9,0	3,00
22720.5264	22720.6264		M 6 x 0,5	-	25,0	3,2	4,0	3,0	9,0	3,00
22720.5270	22720.6270		M 8 x 1	-	10,0	4,5	5,5	4,0	15,0	2,60
22720.5273	22720.6273		M 8 x 1	-	20,0	4,5	5,5	4,0	15,0	5,30

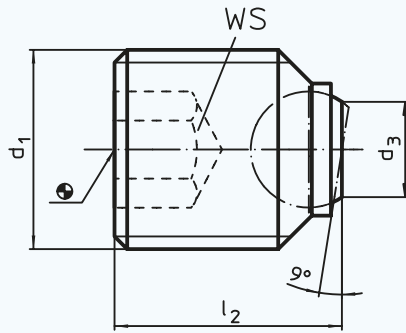
* Statements on load capacity are not valid for the stainless steel type.



EH 22720.

Ball-Ended Thrust Screws

headless, short



Fully rotating ball.

>>> Special types upon request. <<<

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

Material:

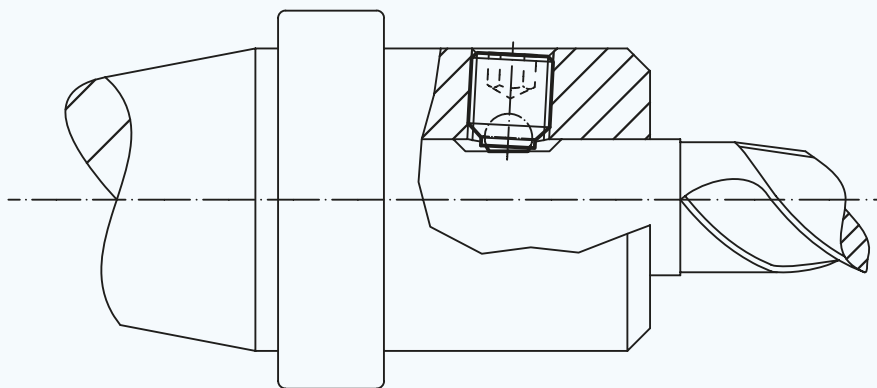
Screw: • Heat-treated steel, $1200 \pm 100 \text{ N/mm}^2$

Ball: • Ball-bearing steel, hardened

Note:

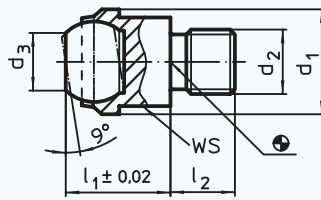
Ball-ended thrust screws, short execution, are particularly suitable for parallel shanks DIN 1835 E in combination, for instance, with Whistle Notch and Weldon Tool Holding Fixtures.
Plane load transmission due to moveable ball.

Ref. No.	Finish	d ₁	l ₂	d ₃	Ball	WS	Load capacity for static load kN max.	μg
22720.0641	flat-faced ball,	M 14	16	7,2	8,5	6	30	13
22720.0660	plain surface,	M 16	16	7,2	8,5	8	30	16
22720.0682	for parallel shanks	M 18 x 2	20	10,7	12,0	10	60	25
22720.0692	DIN 1835 E	M 20 x 2	20	10,7	12,0	10	60	32
22720.0693		M 20 x 2	25	10,7	12,0	10	60	42
22720.0730		M 24 x 2	25	13,5	15,0	12	90	59

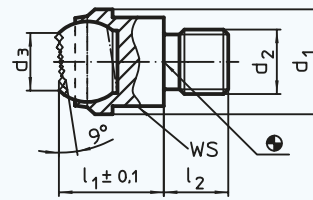


EH 22730.

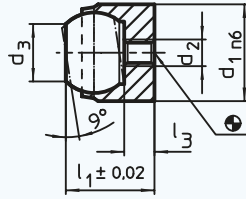
Self-Aligning Pads



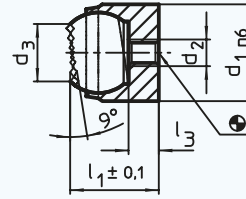
picture 1



picture 2



picture 3



picture 4

Material:

Body: • Heat-treated steel, tempered, phosphated
• Stainless steel 1.4057, heat-treated

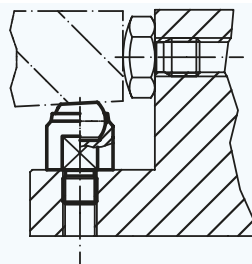
Ball: • Ball-bearing steel, hardened, bright
• Stainless steel 1.3541, nickel-plated

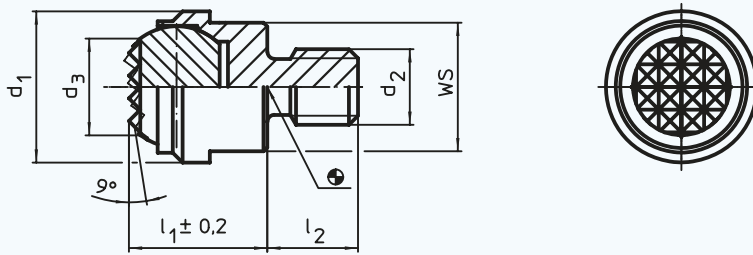
Note:

To be used as stop, support and thrust pad and fitted to clamping elements.
Ball secured against rotating.
Loading capacity valid for steel and stainless steel designs.

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁	d ₂	d ₃	l ₁	l ₂ -0,5	l ₃ max.	Ball	Location hole	WS	Load capacity for static load kN max.	Starting torque max. Nm	g
22730.0012	22730.0112	with male thread,	13	M 6	7,2	13	8	-	10	-	11	10	10,0	12
22730.0013	22730.0113	flat-faced ball,	13	M 8	7,2	13	8	-	10	-	11	10	25,0	13
22730.0018	22730.0118	plain surface	20	M 8	10,5	18	10	-	16	-	17	25	25,0	39
22730.0019	22730.0119	(picture 1)	20	M 10	10,5	18	10	-	16	-	17	25	46,0	41
22730.0020	22730.0120		20	M 12	10,5	18	12	-	16	-	17	25	82,0	44
22730.0030	22730.0130		30	M 16	20,0	27	16	-	25	-	27	90	206,0	151
22730.0050	22730.0150		50	M 20	34,5	35	20	-	40	-	41	165	407,0	489
22730.0312	-	with male thread,	13	M 6	7,2	13	8	-	10	-	11	10	10,0	12
22730.0313	-	flat-faced ball,	13	M 8	7,2	13	8	-	10	-	11	10	25,0	13
22730.0318	-	ribbed surface	20	M 8	10,5	18	10	-	16	-	17	25	25,0	38
22730.0319	-	(picture 2)	20	M 10	10,5	18	10	-	16	-	17	25	46,0	40
22730.0320	-		20	M 12	10,5	18	12	-	16	-	17	25	82,0	43
22730.0330	-		30	M 16	20,0	27	16	-	25	-	27	90	206,0	150
22730.0350	-		50	M 20	34,5	35	20	-	40	-	41	165	407,0	486
22730.0412	22730.0452	with reamed hole,	12	M 3	7,2	11	-	3,2	10	12H7 x 6min.	-	10*	1,3	8
22730.0418	22730.0458	flat-faced ball,	18	M 4	10,5	17	-	4,0	16	18H7 x 8min.	-	25*	2,9	29
22730.0428	22730.0468	plain surface	28	M 5	20,0	25	-	5,5	25	28H7 x 13min.	-	90*	6,0	109
		(picture 3)												
22730.0712	-	with reamed hole,	12	M 3	7,2	11	-	3,2	10	12H7 x 6min.	-	10*	1,3	8
22730.0718	-	flat-faced ball,	18	M 4	10,5	17	-	4,0	16	18H7 x 8min.	-	25*	2,9	29
22730.0728	-	ribbed surface	28	M 5	20,0	25	-	5,5	25	28H7 x 13min.	-	90*	6,0	108
		(picture 4)												

* Applies only when the minimum bore depth is kept to.





EH 22730.

Self-Aligning Pads

with hard metal ball, ribbed

Material:

Body:

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

Ball:

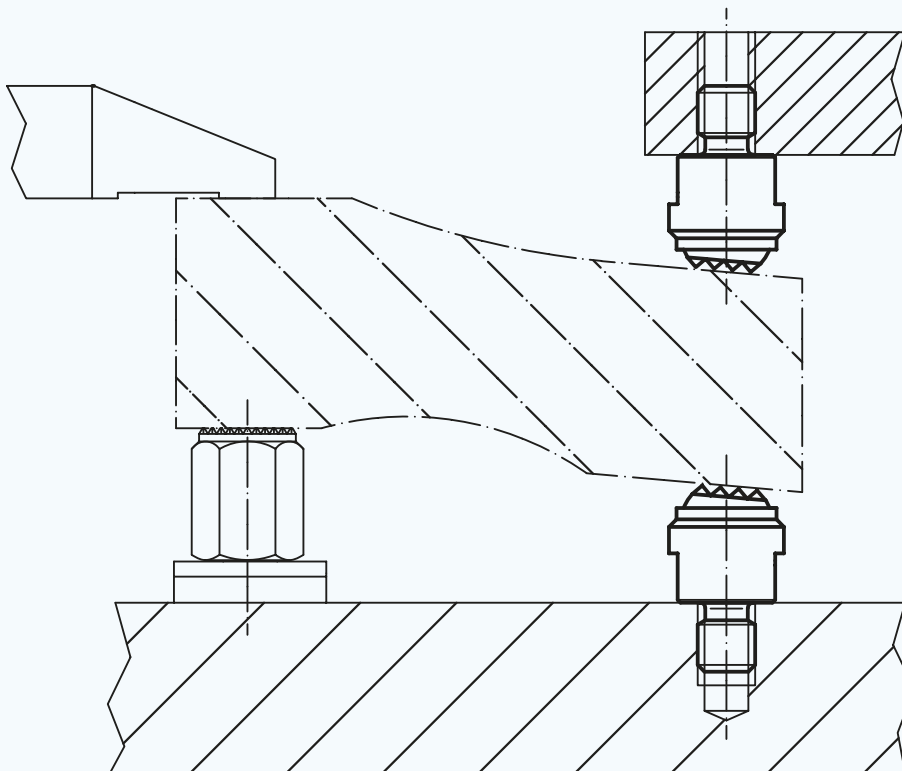
- Hard metal, ribbed, nickel-plated

Note:

Especially designed for cast parts (hard casting crust). To be used as support, thrust pad and for build into clamping elements. Ball protected against rotating. Loading capacity valid for steel and stainless steel designs.



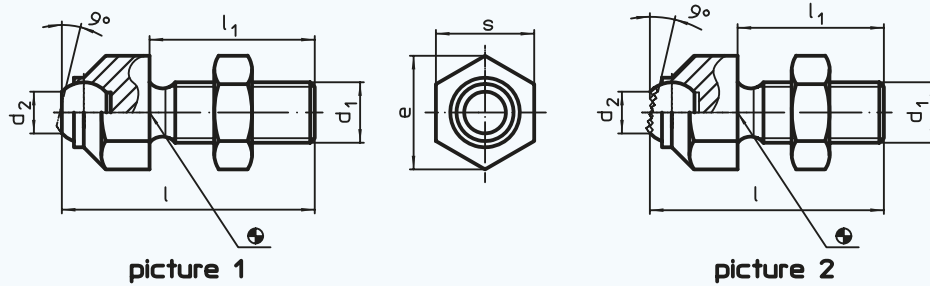
Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁	d ₂	d ₃	l ₁	l ₂ -0,5	Ball	WS	Load capacity for static load kN max.	Starting torque max. Nm	g
22730.0362	22730.0390	with male thread	13	M 6	8,3	13	8	10	11	10	10	14
22730.0363	22730.0392		13	M 8	8,3	13	8	10	11	10	25	16
22730.0378	22730.0394		20	M 8	12,8	18	10	16	17	25	25	49
22730.0379	22730.0396		20	M 10	12,8	18	10	16	17	25	46	51
22730.0380	22730.0398		20	M 12	12,8	18	12	16	17	25	82	54



EH 22740.

Self-Aligning Pads

adjustable



>>> Special types, e.g. with hard metal ball, upon request. <<<

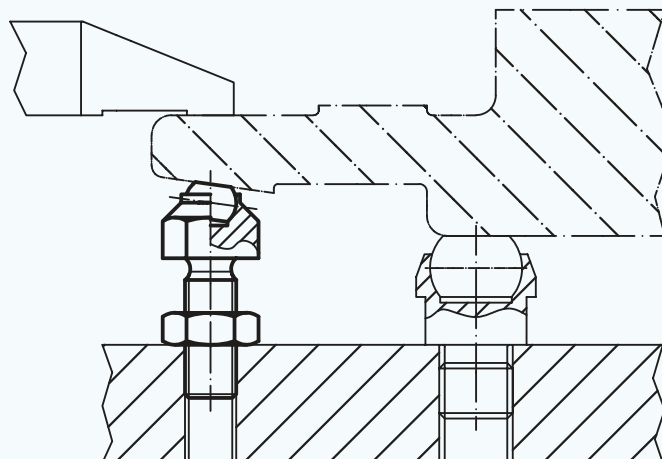
Material:

- Body:** • Heat-treated steel, tempered, phosphated
• Stainless steel 1.4057, heat-treated
- Ball:** • Ball-bearing steel, hardened, bright
• Stainless steel 1.3541, nickel-plated
- Nut:** • Steel, blackened (ISO 4035)
• Stainless steel

Note:

To be used as stop, support and thrust pad and fitted to clamping elements.
Ball secured against rotating.
Loading capacity valid for steel and stainless steel designs.

Ref. No. Steel	Ref. No. Stainless steel	Finish	s	d ₁	l	l ₁	d ₂	e	Ball	Load capacity for static load kN max.	Starting torque max. Nm	μ g
22740.0013	22740.0113	with flat-faced ball,	13	M 8	36,6	25	5,8	14,5	8,5	8	25	20
22740.0016	22740.0116	plain surface	17	M 10	45,7	30	8,6	19,0	12,0	8	46	44
22740.0017	22740.0117	(picture 1)	17	M 12	50,7	35	8,6	19,0	12,0	15	82	56
22740.0024	22740.0124		24	M 16	60,7	40	10,5	27,0	16,0	25	206	128
22740.0030	22740.0130		30	M 20	77,3	50	20,0	33,0	25,0	90	407	275
22740.0036	-		36	M 24	100,0	70	20,0	40,0	25,0	90	698	435
22740.0046	-		46	M 30 x 1,5	100,0	65	34,6	51,0	40,0	165	1355	772
22740.0313	-	with flat-faced ball,	13	M 8	36,6	25	5,8	14,5	8,5	8	25	20
22740.0316	-	ribbed surface	17	M 10	45,7	30	8,6	19,0	12,0	8	46	44
22740.0317	-	(picture 2)	17	M 12	50,7	35	8,6	19,0	12,0	15	82	56
22740.0324	-		24	M 16	60,7	40	10,5	27,0	16,0	25	206	128
22740.0330	-		30	M 20	77,3	50	20,0	33,0	25,0	90	407	274
22740.0336	-		36	M 24	100,0	70	20,0	40,0	25,0	90	698	435
22740.0346	-		46	M 30 x 1,5	100,0	65	34,6	51,0	40,0	165	1355	772



EH 22750.

Ball Transfer Systems

Technical Data



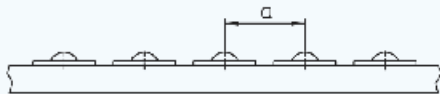
Arrangement of Ball Transfer Units

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:

$$a = \frac{500 \text{ mm}}{2,5} = 200 \text{ mm}$$



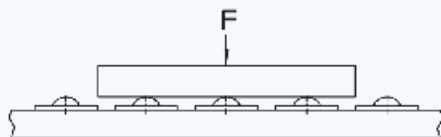
Load Determination of Ball Transfer Units

To determine the load of a ball transfer unit, the weight of the article to be conveyed should be divided by 3. If the height tolerance of the load balls is good and the surface of the workpiece to be conveyed suitable, the calculation can be based on the number of ball transfer units under load.

Example: Weight of the article to be conveyed = 300 kg

Ball transfer unit load:

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



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

$$L = \left(\frac{C}{F} \right)^5 10^6 \text{ rotations}$$

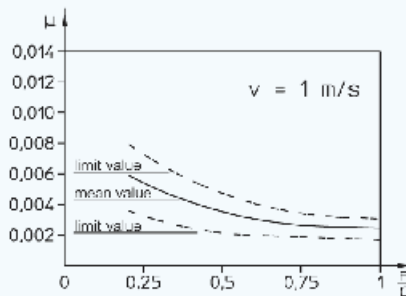
L = Travel life

C = Load capacity (N)

F = Load (N)

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.



Temperature Resistance

Ball transfer units with felt seals are temperature-resistant 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:

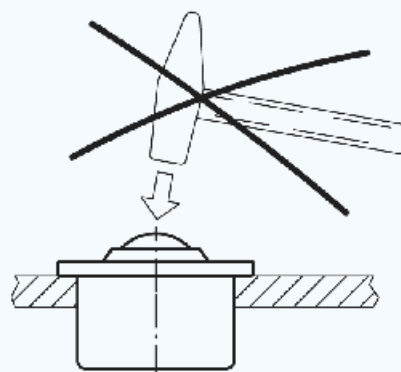
Only use high-temperature lubricants!

Observe the manufacturers' instructions!

If necessary, wash-off any present lubricating oil.

Temperature °C	Temperature Factor fT
125	0,9
150	0,8
175	0,7
200	0,5

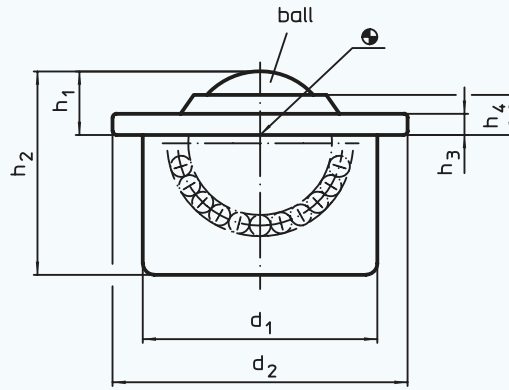
Assembly Instructions:



EH 22750.

Ball Casters

with sheet steel case



Material:

Housing: • Steel, galvanized
• Stainless steel

Cap: • Steel, galvanized
• Stainless steel

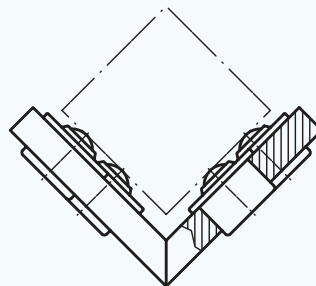
Ball: • Ball-bearing steel
• Stainless steel

Note:

Module for transport systems, conveyances, to working and packing facilities.
For moving, turning and controlling of piece-goods.
As from d₁ = 36 fitted with an oil drenched felt seal to protect against dirt.

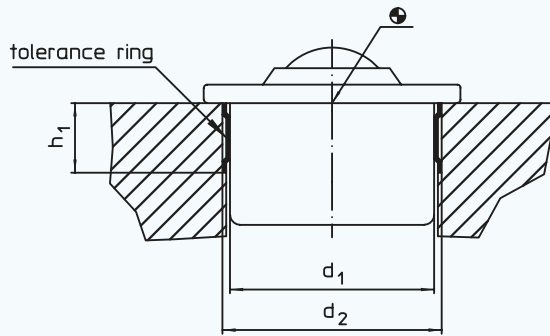
Ref. No.	Finish	d ₁	Ball Ø	d ₂	h ₁	h ₂	h ₃	h ₄	Carrying figure C N	g
22750.0000*	cap and	12,6 ± 0,055	8	17	4,8 ± 0,15	11,2	1,8	3,2	100	7
22750.0002*	case zinc-	18 ± 0,055	12	23	7,4 ± 0,15	15,5	2,0	4,3	250	18
22750.0004*	coated	24 ± 0,065	15	31	9,5 ± 0,20	21,5	2,5	6,1	500	40
22750.0008		36 ± 0,080	22	45	9,8 ± 0,20	29,5	2,9	5,7	1300	134
22750.0012		45 ± 0,080	30	55	13,8 ± 0,30	37,5	3,7	7,9	2500	277
22750.0016		62 ± 0,095	45	75	19,0 ± 0,40	53,7	4,2	10,3	6000	741
22750.0020*	all parts	12,6 ± 0,055	8	17	4,8 ± 0,15	11,2	1,8	3,2	70	7
22750.0022*	zinc-coated,	18 ± 0,055	12	23	7,4 ± 0,15	15,5	2,0	4,3	180	18
22750.0024*	ball from	24 ± 0,065	15	31	9,5 ± 0,20	21,5	2,5	6,1	370	40
22750.0028	stainless steel	36 ± 0,080	22	45	9,8 ± 0,20	29,5	2,9	5,7	970	132
22750.0032		45 ± 0,080	30	55	13,8 ± 0,30	37,5	3,7	7,9	1900	273
22750.0036		62 ± 0,095	45	75	19,0 ± 0,40	53,7	4,2	10,3	4500	739
22750.0040*	all parts	12,6 ± 0,055	8	17	4,8 ± 0,15	11,2	1,8	3,2	70	7
22750.0042*	from	18 ± 0,055	12	23	7,4 ± 0,15	15,5	2,0	4,3	180	18
22750.0044*	stainless steel	24 ± 0,065	15	31	9,5 ± 0,20	21,5	2,5	6,1	370	39
22750.0048		36 ± 0,080	22	45	9,8 ± 0,20	29,5	2,9	5,7	970	133
22750.0052		45 ± 0,080	30	55	13,8 ± 0,30	37,5	3,7	7,9	1900	272

* without felt seal



EH 22750.

Tolerance Rings



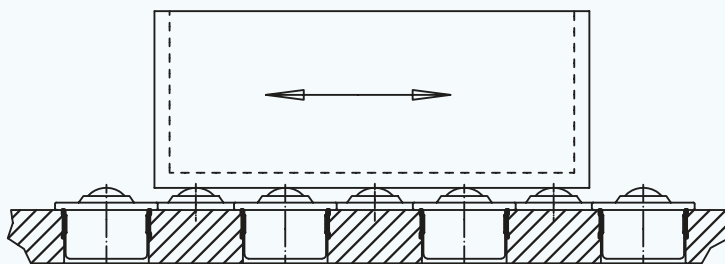
Material:

- Spring steel strip

Note:

The use of tolerance rings (for ball casters with sheet steel case) allows larger tolerances between the parts to be connected.

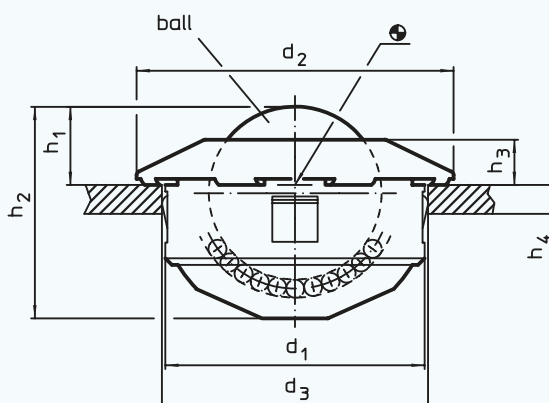
Ref. No.	d ₁	d ₂ Bore Hole	h ₁ +0,2	g
22750.0060	12,6	13,87 +0,15	6,1	0,4
22750.0062	18,0	19,70 +0,20	6,1	0,9
22750.0064	24,0	25,70 +0,20	7,1	1,4
22750.0068	36,0	37,70 +0,20	12,1	4,3
22750.0072	45,0	46,70 +0,20	12,1	5,3
22750.0076	62,0	64,10 +0,30	15,1	12,0



EH 22750.

Ball Casters

with mounting elements



Material:

Housing: • Steel, galvanized

Cap: • Steel, galvanized

Ball: • Ball-bearing steel
• Stainless steel

Note:

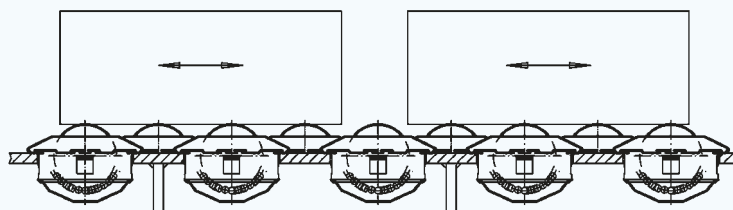
Mounting is carried-out by means of spring-loaded claws allowing big tolerances in the location hole. The ball casters can easily be mounted and disassembled from their functional side. Due to the inclined cap form, the assembly mandrel EH 22750. should be used.

Ref. No.	Finish	d ₁	Ball Ø	d ₂	Location hole d ₃	h ₁	h ₂	h ₃	h ₄	Carrying figure C N	g
22750.0104	ball from	24 -0,13	15	31	24 +0,5	9,5 ±0,2	20,5	5,5	1,5*	500	42
22750.0108	ball-bearing	36 -0,16	22	45	36 +0,8	9,8 ±0,2	28,6	6,0	2,0*	1300	144
22750.0112	steel	45 -0,16	30	55	45 +1,0	13,8 ±0,3	37,5	8,0	2,5*	2500	292
22750.0124	ball from	24 -0,13	15	31	24 +0,5	9,5 ±0,2	20,5	5,5	1,5*	370	42
22750.0128	stainless steel	36 -0,16	22	45	36 +0,8	9,8 ±0,2	28,6	6,0	2,0*	970	143
22750.0132		45 -0,16	30	55	45 +1,0	13,8 ±0,3	37,5	8,0	2,5*	1900	290

Ref. No.	Finish	Suitable for ball caster	g
22750.0144	mandrel	24	451
22750.0148		36	480
22750.0152		45	503



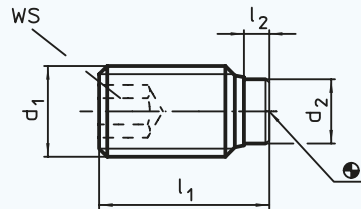
* minimum thickness of location part



EH 22760.

Thrust Screws

with brass pad



Material:

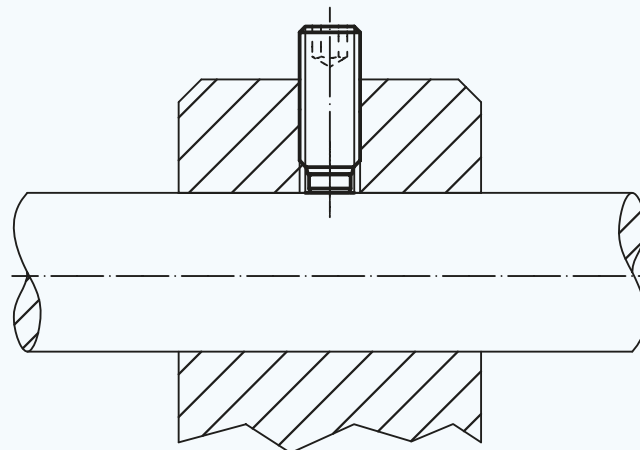
Screw: • Heat-treated steel, 1200 ± 100 N/mm²
• Stainless steel 1.4305

Pin: • Brass

Note:

For gentle clamping or pressing of thread spindles, axes, shafts and surface treated parts.

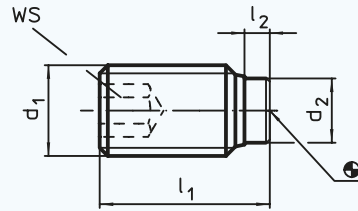
Ref. No. Steel	Ref. No. Stainless steel	d ₁	l ₁	l ₂	d ₂	WS	μg
22760.0042	22760.0442	M 4	6,5	1,2	2,5	2,0	0,3
22760.0044	22760.0444	M 4	10,5	1,2	2,5	2,0	0,8
22760.0046	22760.0446	M 4	16,5	1,2	2,5	2,0	1,2
22760.0052	22760.0452	M 5	8,5	1,3	3,0	2,5	0,9
22760.0054	22760.0454	M 5	12,5	1,3	3,0	2,5	1,4
22760.0056	22760.0456	M 5	20,5	1,3	3,0	2,5	2,1
22760.0062	22760.0462	M 6	11,5	1,9	4,0	3,0	1,7
22760.0064	22760.0464	M 6	17,5	1,9	4,0	3,0	2,7
22760.0066	22760.0466	M 6	26,5	1,9	4,0	3,0	4,2
22760.0082	22760.0482	M 8	12,0	2,5	5,5	4,0	3,0
22760.0086	22760.0486	M 8	22,0	2,5	5,5	4,0	5,8
22760.0088	22760.0488	M 8	32,0	2,5	5,5	4,0	8,9
22760.0102	22760.0502	M 10	14,0	2,7	7,0	5,0	5,6
22760.0104	22760.0504	M 10	18,0	2,7	7,0	5,0	6,7
22760.0106	22760.0506	M 10	27,0	2,7	7,0	5,0	11,0
22760.0108	22760.0508	M 10	37,0	2,7	7,0	5,0	16,0
22760.0122	22760.0522	M 12	18,5	3,4	8,5	6,0	10,0
22760.0124	22760.0524	M 12	22,5	3,4	8,5	6,0	12,0
22760.0126	22760.0526	M 12	32,5	3,4	8,5	6,0	20,0
22760.0128	22760.0528	M 12	42,5	3,4	8,5	6,0	27,0



EH 22760.

Thrust Screws

with plastic pad



Material:

Screw: • Steel, blackened
• Stainless steel 1.4305

Pin: • Thermoplastic POM

Note:

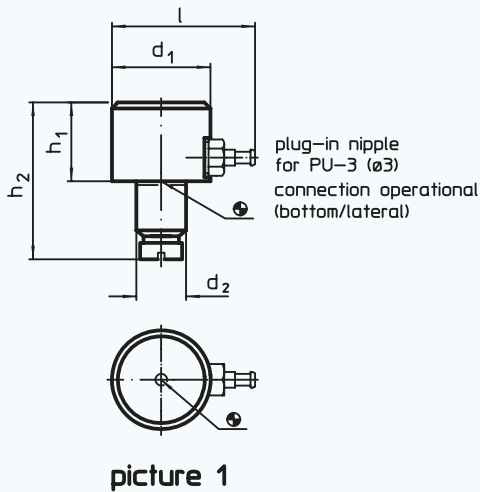
For gentle clamping or pressing of thread spindles, axes, shafts and surface treated parts.

Ref. No. Steel	Ref. No. Stainless steel	d ₁	l ₁	l ₂	d ₂	WS	g
22760.0242	22760.0642	M 4	7,0	1,0	2,0	2,0	0,3
22760.0243	22760.0643	M 4	9,0	1,0	2,0	2,0	0,4
22760.0244	22760.0644	M 4	11,0	1,0	2,0	2,0	0,6
22760.0245	22760.0645	M 4	13,0	1,0	2,0	2,0	0,7
22760.0246	22760.0646	M 4	17,0	1,0	2,0	2,0	1,0
22760.0247	-	M 4	21,0	1,0	2,0	2,0	1,3
22760.0252	22760.0652	M 5	9,0	1,0	3,0	2,5	0,7
22760.0253	22760.0653	M 5	11,0	1,0	3,0	2,5	0,8
22760.0254	22760.0654	M 5	13,0	1,0	3,0	2,5	1,0
22760.0255	22760.0655	M 5	17,0	1,0	3,0	2,5	1,2
22760.0256	22760.0656	M 5	21,0	1,0	3,0	2,5	2,0
22760.0257	-	M 5	26,0	1,0	3,0	2,5	2,6
22760.0262	22760.0662	M 6	11,3	1,3	3,5	3,0	1,2
22760.0263	22760.0663	M 6	13,3	1,3	3,5	3,0	1,5
22760.0264	22760.0664	M 6	17,3	1,3	3,5	3,0	2,2
22760.0265	22760.0665	M 6	21,3	1,3	3,5	3,0	2,8
22760.0266	22760.0666	M 6	26,3	1,3	3,5	3,0	3,8
22760.0267	22760.0667	M 6	33,3	1,3	3,5	3,0	4,9
22760.0268	-	M 6	41,3	1,3	3,5	3,0	6,3
22760.0270	-	M 6	51,3	1,3	3,5	3,0	7,9
22760.0282	22760.0682	M 8	13,6	1,6	5,0	4,0	2,6
22760.0283	22760.0683	M 8	17,6	1,6	5,0	4,0	3,6
22760.0284	22760.0684	M 8	21,6	1,6	5,0	4,0	5,0
22760.0285	22760.0685	M 8	26,6	1,6	5,0	4,0	6,4
22760.0286	22760.0686	M 8	33,6	1,6	5,0	4,0	8,5
22760.0287	22760.0687	M 8	41,6	1,6	5,0	4,0	11,0
22760.0288	-	M 8	51,6	1,6	5,0	4,0	14,0
22760.0290	-	M 8	64,6	1,6	5,0	4,0	18,0
22760.0302	22760.0702	M 10	17,9	1,9	6,5	5,0	5,2
22760.0303	22760.0703	M 10	21,9	1,9	6,5	5,0	7,1
22760.0304	22760.0704	M 10	26,9	1,9	6,5	5,0	9,9
22760.0305	22760.0705	M 10	33,9	1,9	6,5	5,0	13,0
22760.0306	22760.0706	M 10	41,9	1,9	6,5	5,0	17,0
22760.0307	22760.0707	M 10	51,9	1,9	6,5	5,0	22,0
22760.0308	-	M 10	64,9	1,9	6,5	5,0	28,0
22760.0310	-	M 10	81,9	1,9	6,5	5,0	36,0
22760.0322	22760.0722	M 12	22,1	2,1	8,0	6,0	9,0
22760.0323	22760.0723	M 12	27,1	2,1	8,0	6,0	10,0
22760.0324	22760.0724	M 12	34,1	2,1	8,0	6,0	19,0
22760.0325	22760.0725	M 12	42,1	2,1	8,0	6,0	24,0
22760.0326	22760.0726	M 12	52,1	2,1	8,0	6,0	31,0
22760.0327	22760.0727	M 12	65,1	2,1	8,0	6,0	40,0
22760.0330	-	M 12	82,1	2,1	8,0	6,0	51,0
22760.0332	-	M 12	102,1	2,1	8,0	6,0	66,0

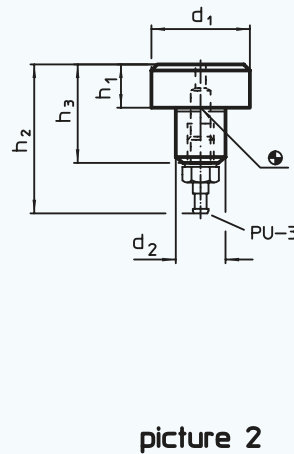
EH 22800.

Positioning Sensors

pneumatic



picture 1



picture 2

Further information upon request.

Material:

Bearing pin: • Tool steel, hardened, ground
Screw: • ISO 1207

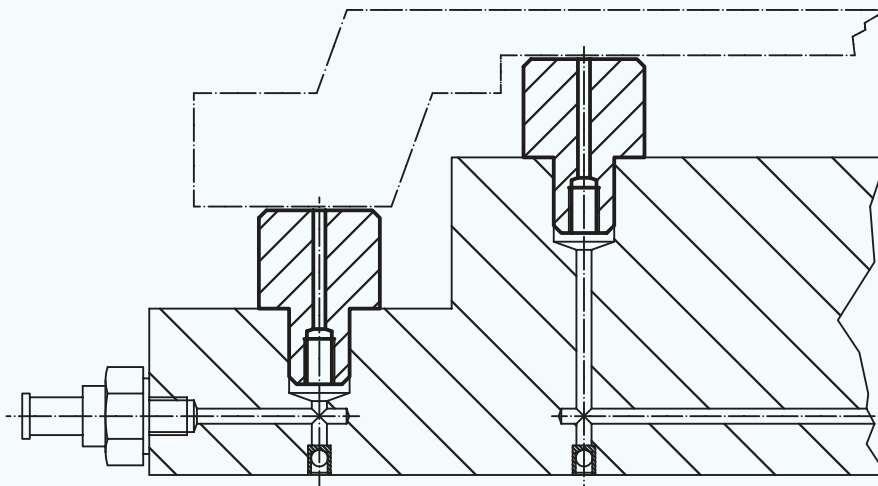
Plug-in nipple: • Brass
Seal: • PVC

Note:

Used in jigs and fixtures as positioning control for pre-machined work pieces. Sensitivity accuracy 0,015 - 0,075 mm depending on the work piece surface. Contact control by the compressed-air backwash, indicated on the monitoring unit (ref. no. 22800.0612).

Ref. No.	Finish	d ₁	h ₁ h9	d ₂ n6	h ₂	l	g
22800.0010	Bottom/side connection	16	13	8	27	28,0	32
22800.0020	(picture 1)	25	20	12	39	36,5	93

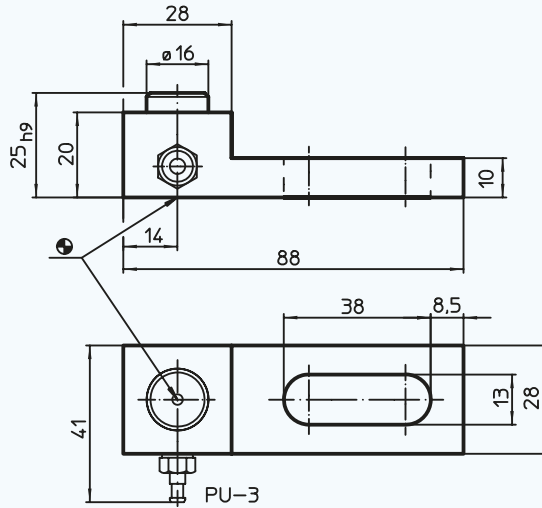
Ref. No.	Finish	d ₁	h ₁ h9	d ₂ n6	h ₂	h ₃	g
22800.0100	Bottom connection (picture 2)	16	5	8	28,5	15	11



EH 22800.

Positioning Sensors

pneumatic



Further information upon request.

Material:

Supporting bar: • Steel, blackened

Bearing pin: • Tool steel, hardened, ground

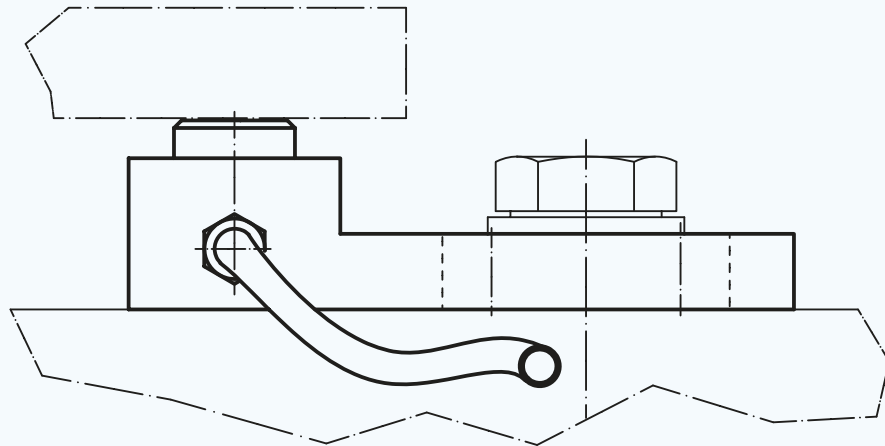
Plug-in nipple: • Brass

Seal: • PVC

Note:

Used in jigs and fixtures as positioning control for pre-machined work pieces. Sensitivity accuracy 0,015 - 0,075 mm depending on the work piece surface. Contact control by the compressed-air backwash, indicated on the monitoring unit (ref. no. 22800.0612).

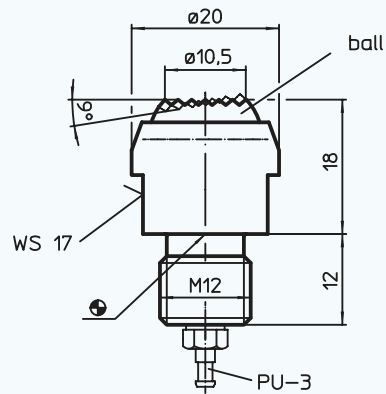
Ref. No.	Finish	g
22800.0400	with holding bar	237



EH 22800.

Positioning Sensors

self-aligning, ribbed, pneumatic



Further information upon request.

Material:

Body: • Heat-treated steel, tempered, phosphated

Ball: • Ball-bearing steel, hardened

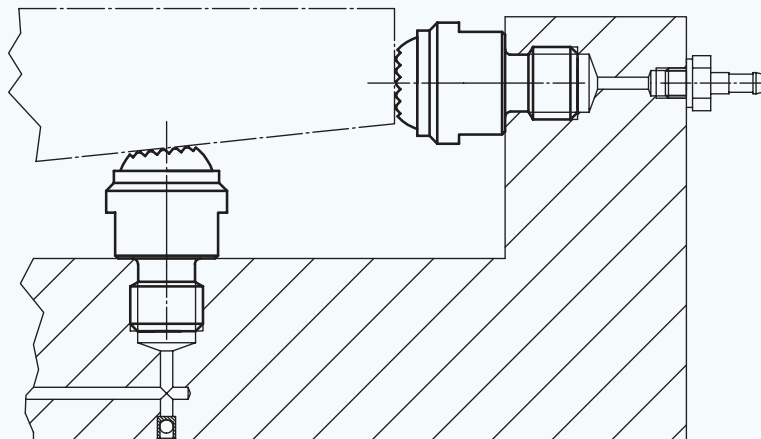
Note:

Used in jigs and fixtures as positioning control for raw work pieces.

Contact control by the compressed-air backwash, indicated on the monitoring unit (ref. no. 22800.0612).

A stable sensitivity constant of 0,005 mm is achieved with a working pressure of 2,5 bar.

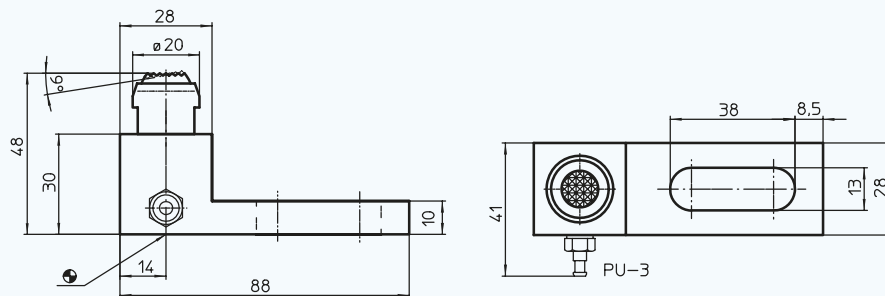
Ref. No.	Finish	Load capacity max. kN (static)	μ g
22800.0220	20 x M 12 with plug-in nipple	15	42



EH 22800.

Positioning Sensors

self-aligning, ribbed, pneumatic



Further information upon request.

Material:

Supporting bar: • Steel, blackened

Ball: • Ball-bearing steel, hardened

Plug-in nipple: • Brass

Body: • Heat-treated steel, tempered, phosphated

Seal: • PVC

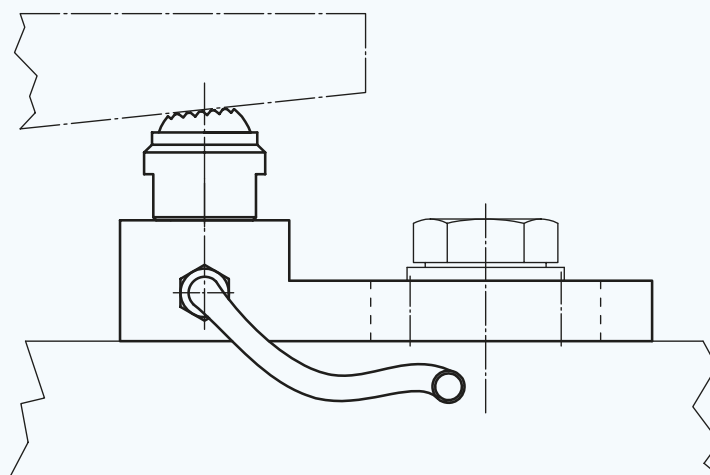
Note:

Used in jigs and fixtures as positioning control for raw work pieces.

Contact control by the compressed-air backwash, indicated on the monitoring unit (ref. no. 22800.0612).

A stable sensitivity constant of 0,005 mm is achieved with a working pressure of 2,5 bar.

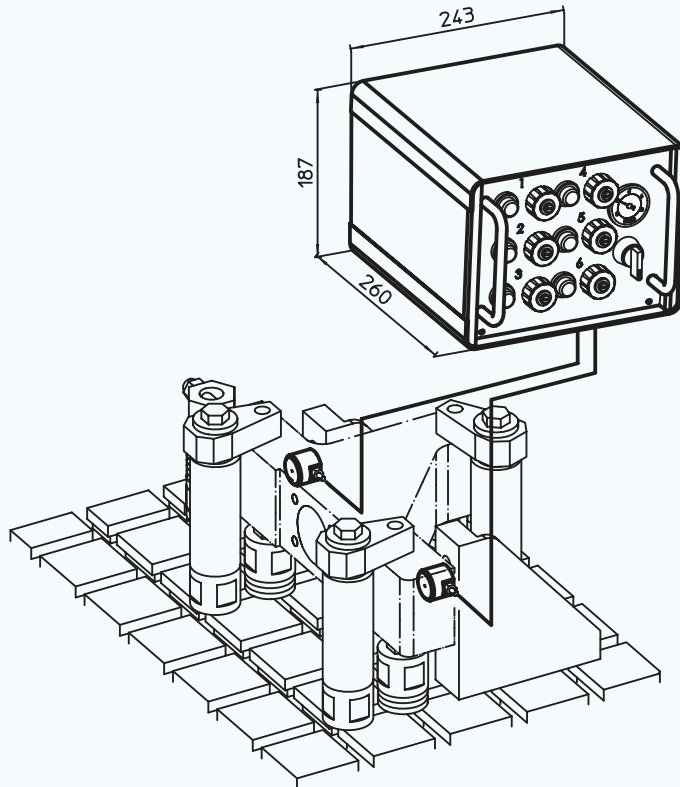
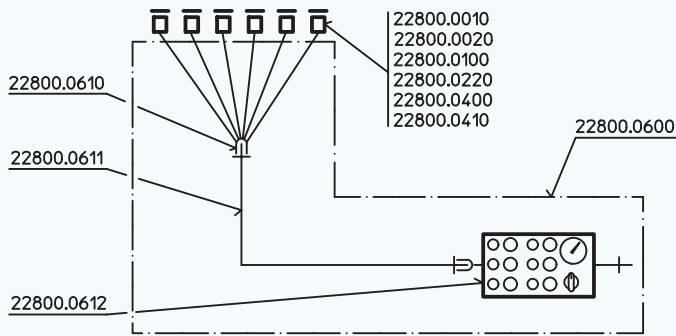
Ref. No.	Finish	Load capacity max. kN (static)	g
22800.0410	with holding bar	15	321



EH 22800.

Monitoring Units for Positioning Sensors

pneumatic



Further information upon request.

Note:

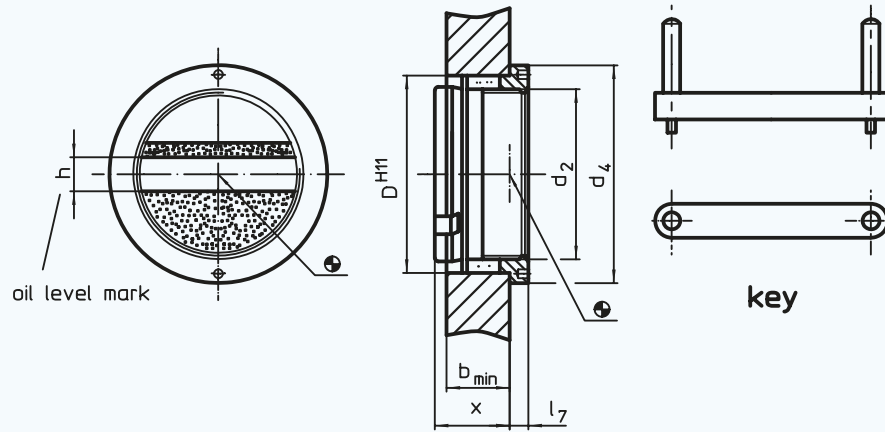
The monitoring unit is used in conjunction with the positioning sensors (ref. no. EH 22800.). Individual monitoring of up to 6 sensors is possible. Indication and operation are exclusively effected by compressed air. Input pressure 3...10 bar.

Each individual sensor can be separately adjusted according to the special needs by means of a precision one-way restrictor. The connection between the indication unit and the sensor is effected by a flexible, metal-sheathed hose system.

Ref. No. Unit	Article description
22800.0600	Complete monitoring unit (without sensors)
Ref. No. Components	Article description
22800.0610	Multiple socket with six PU-3 hoses, metal-sheathed, for connection to the positioning sensor. Hose length 1500 mm.
22800.0611	Sixfold hose line with protective sheathing and two multiple plugs. Length 1500 mm.
22800.0612	Indication unit, sixfold, pressure regulating valve with pressure gauge, multiple hose socket and plug-in nipple connection for PU-6-hose.

EH 22860.

Oil-Sight Glasses



Material:

- Oil-sight glass:** • Plexiglass (PMMA) clear
Ring nut: • Aluminium

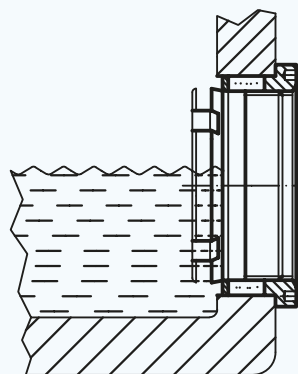
- Seal ring:** • Resistant to oil and gasoline
Reflector: • Plastic, white

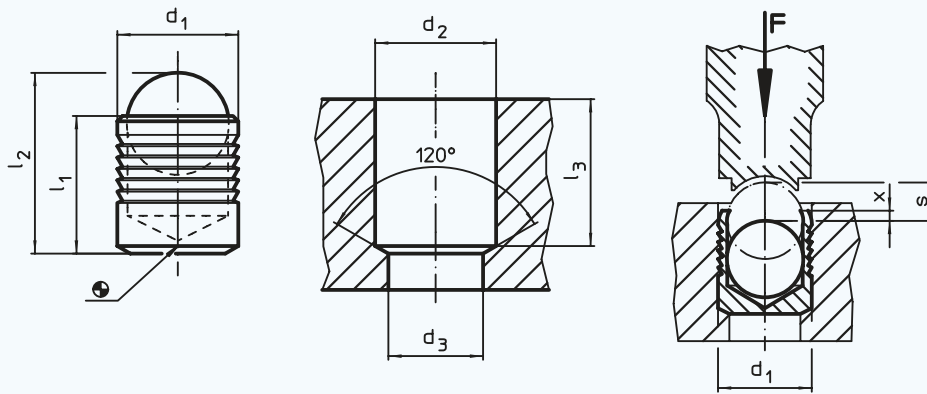
Note:

For tanks without excess pressure. Can be fitted without threads in borehole \varnothing H11.
Sealing by simply tightening the ring nut.
Temperature range from - 20 °C up to + 70 °C.

Ref. No.	Finish	Size (sight opening)	D H11	d ₄	d ₂	x	l ₇	b min.	h	g
22860.0016	without	16	20	25	M 16 x 1	15	3,5	9	-	9,0
22860.0022	oil level mark	22	28	35	M 22 x 1	15	4,5	10	-	18,0
22860.0032		32	38	45	M 33 x 1	18	5,5	12	-	33,0
22860.0050		50	58	64	M 50 x 1	22	5,5	14	-	87,0
22860.0116	with	16	20	25	M 16 x 1	15	3,5	9	5	8,9
22860.0122	oil level mark	22	28	35	M 22 x 1	15	4,5	10	6	18,0
22860.0132		32	38	45	M 33 x 1	18	5,5	12	8	33,0
22860.0150		50	58	64	M 50 x 1	22	5,5	14	10	86,0

Ref. No.	Finish	Size (sight opening)	g
22860.0816	key for the following sizes	16	16
22860.0822		22	30
22860.0832		32	36
22860.0850		50	49





EH 22880.

**Expander®
Sealing Plugs**

body from
case-hardened steel



Material:

Body: • Case-hardened steel, zinc-coated, thick-film passivated **Ball:** • Roller bearing steel, heat-treated, tempered

Note:

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.

Ref. No.	d ₁	l ₁	l ₂ ≈	d ₂ +0,1	d ₃ max.	l ₃ min.	x ±0,2	s	±g
22880.0004	4	4,0	5,2	4,0	3,3	3,8	0,2	1,50	0,46
22880.0005	5	5,5	7,0	5,0	4,3	5,3	0,4	2,00	0,78
22880.0006	6	6,5	8,6	6,0	5,3	6,3	0,4	2,50	1,30
22880.0007	7	7,5	10,1	7,0	6,4	7,3	0,4	3,00	2,00
22880.0008	8	8,5	11,7	8,0	7,4	8,3	0,3	3,50	2,80
22880.0009	9	10,0	13,7	9,0	8,4	9,8	0,4	4,00	4,20
22880.0010	10	11,0	15,2	10,0	9,4	10,8	0,4	4,50	6,10
22880.0012	12	13,0	18,0	12,0	10,6	12,8	0,4	5,50	9,60
22880.0014	14	15,0	20,8	14,0	12,7	14,5	0,4	6,35	15,00
22880.0016	16	17,0	23,7	16,0	14,7	16,5	0,6	7,00	22,00
22880.0018	18	19,0	26,3	18,0	16,7	18,5	0,6	8,00	32,00
22880.0020	20	22,0	30,5	20,0	18,7	21,5	0,8	9,00	44,00
22880.0022	22	25,0	34,2	22,0	20,7	24,5	0,8	10,00	58,00

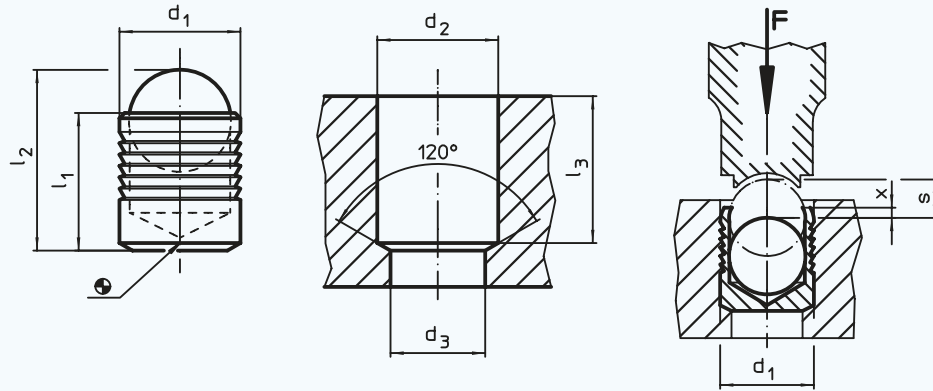
Working and control pressures for Expander® sealing plug, sleeve from case hardened steel 1.0403

basic material	ETG-100 AISI 1144	C15Pb 1.0403	GG-25 DIN 1691	GGG-50 DIN 1693	AlCuMg2 3.1354	AlMgSiPb 3.0615	G-AlSi7Mg 3.2371
d ₁ 4-10 mm	p [bar]						
	350	350	350	350	350	320	320
	p _{Test} [bar]						
	1100	1100	1100	1100	1100	1000	1000
d ₁ 12-22 mm	p [bar]						
	280	280	280	250	280	250	250
	p _{Test} [bar]						
	900	900	900	900	900	800	800

EH 22880.

**Expander®
Sealing Plugs**

body from
stainless steel



Material:

Body: • Stainless steel 1.4305

Ball: • Roller bearing steel, heat-treated, tempered

Note:

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.

Ref. No.	d ₁	l ₁	l ₂ ≈	d ₂ +0,1	d ₃ max.	l ₃ min.	x ±0,2	s	⌀ g
22880.0053	3	3,6	4,6	3	2,2	3,4	0,4	1,20	0,17
22880.0054	4	4,0	5,2	4	3,3	3,8	0,2	1,50	0,34
22880.0055	5	5,5	7,0	5	4,3	5,3	0,4	2,00	0,70
22880.0056	6	6,5	8,6	6	5,3	6,3	0,4	2,50	1,30
22880.0057	7	7,5	10,1	7	6,4	7,3	0,4	3,00	2,40
22880.0058	8	8,5	11,7	8	7,4	8,3	0,3	3,50	3,20
22880.0059	9	10,0	13,7	9	8,4	9,8	0,4	4,00	4,50
22880.0060	10	11,0	15,2	10	9,4	10,8	0,4	4,50	6,10
22880.0062	12	13,0	18,0	12	10,6	12,8	0,4	5,50	9,70
22880.0064	14	15,0	20,8	14	12,7	14,5	0,4	6,35	15,00
22880.0066	16	17,0	23,7	16	14,7	16,5	0,6	7,00	22,00
22880.0068	18	19,0	26,3	18	16,7	18,5	0,6	8,00	31,00
22880.0070	20	22,0	30,5	20	18,7	21,5	0,8	9,00	46,00
22880.0072	22	25,0	34,2	22	20,7	24,5	0,8	10,00	58,00

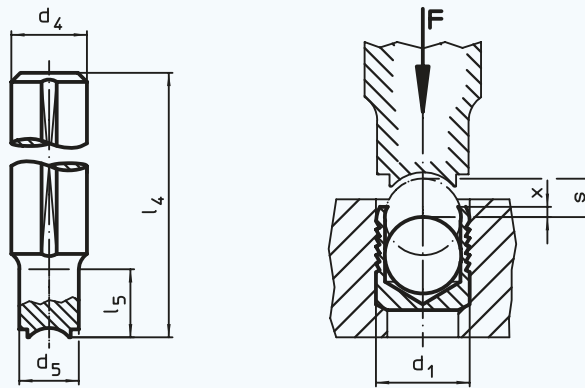
Working and control pressures for Expander® sealing plug, sleeve from stainless steel 1.4305

basic material	ETG-100 AISI 1144	C15Pb 1.0403	GG-25 DIN 1691	GGG-50 DIN 1693	AlCuMg2 3.1354	AlMgSiPb 3.0615	G-AISI7Mg 3.2371
d ₁ 3-10 mm	p [bar]						
	450	450	450	450	450	380	380
	p _{Test} [bar]						
d ₁ 12-22 mm	p [bar]						
	350	350	350	350	350	280	280
	p _{Test} [bar]						
	1150	1150	1150	1150	1150	900	900

EH 22880.

Setting Dies

for Expander® Sealing Plug



Material:

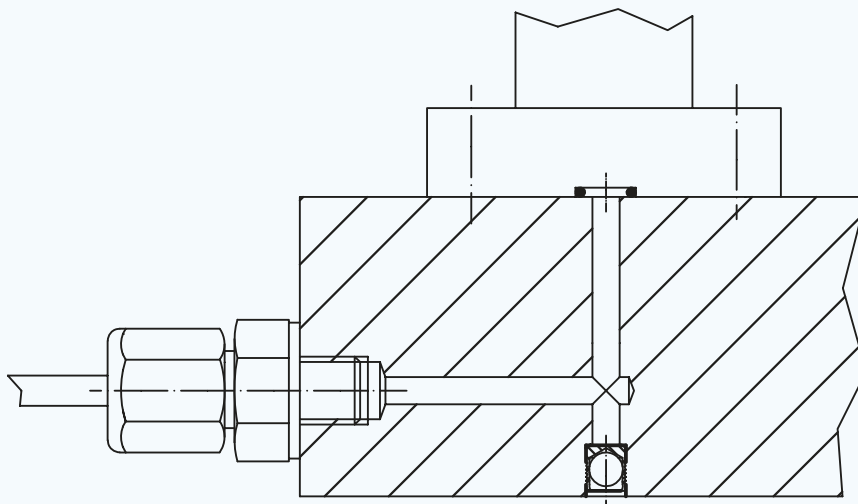
- Tool steel, heat-treated

Note:

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.

Ref. No.	d ₁	d ₄ h9	d ₅	l ₄	l ₅	x ±0,2	s	g
22880.0153	3	10	2,8	100	10	0,4	1,20	53
22880.0154	4	10	3,8	100	10	0,2	1,50	54
22880.0155	5	10	4,8	100	12	0,4	2,00	53
22880.0156	6	10	5,8	100	15	0,4	2,50	53
22880.0157	7	10	6,8	100	18	0,4	3,00	54
22880.0158	8	10	7,8	100	20	0,3	3,50	55
22880.0159	9	14	8,8	100	22	0,4	4,00	101
22880.0160	10	14	9,8	100	25	0,4	4,50	103
22880.0162	12	14	11,7	150	30	0,4	5,50	167
22880.0164	14	20	13,7	150	35	0,4	6,35	316
22880.0166	16	20	15,7	150	40	0,6	7,00	326
22880.0168	18	20	17,7	150	45	0,6	8,00	340
22880.0170	20	25	19,7	150	50	0,8	9,00	495
22880.0172	22	25	21,7	150	55	0,8	10,00	516



EH 22880.

**Expander®
Sealing Plugs**

**Constructional
Guidelines /
Assembly Instructions**

Component Requirements (22880.0004 - 22880.0072)

Drilling Holes

- The counterbore relation d_2/d_3 has to be according to the catalogue specification.
- Roundness tolerances have to be within $t = 0,05$ mm.
- With hard materials (see picture 1) the drilling roughness has to be $R_z = 10$ to $30 \mu\text{m}$.
- 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.**

Roundness Tolerance

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

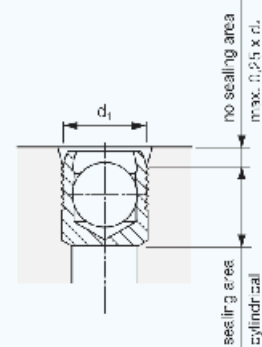


Drilling Tolerance

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

Drilling Concentricity

Within the active sealing area, the drilling hole has to be cylindrical. The drilling hole entrance may be conical up to $0,25 \times d_1$ as this zone does not have any primary influence on the sealing function.



Galvanic Corrosion

An eventual contact corrosion has to be considered.

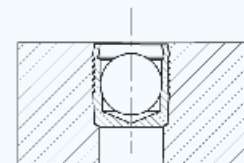
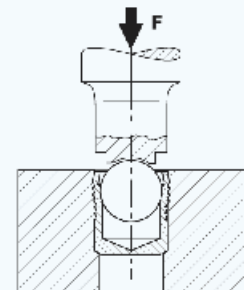
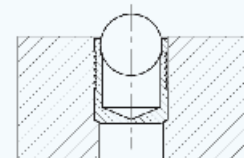
Assembly Instructions

Mounting Procedure

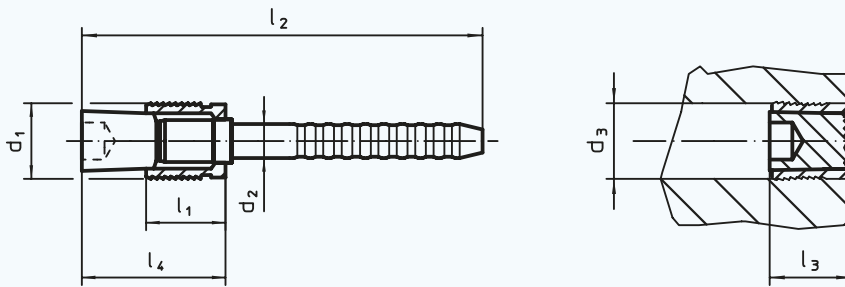
- The Expander® Sealing Plug has to be inserted into the counter-bore hole with the ball facing out. The upper sleeve edge must not protrude the working piece. Mounting dimensions given in the catalogue have to be considered.
- When having only a small or no counterbore hole at all the sleeve bottom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

Attention:

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



Please refer to the technical data following these product information pages.



EH 22880.
Expander[®]
Sealing Plugs
 with pull-anchor



Material:

Body: • Case hardened steel, annealed

Pin: • Steel

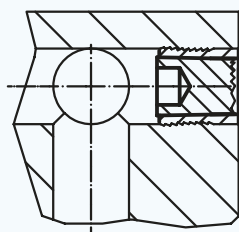
Note:

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.

Ref. No.	d ₁	d ₂	d ₃ +0,12 0,00	l ₁	l ₂	l ₃ max.	l ₄ max.	ϕ _g
22880.0404	4	2,50	4	4,5	39	6,5	9	17
22880.0405	5	3,00	5	5,5	41	7,5	10	26
22880.0406	6	3,40	6	6,5	43	8,0	12	38
22880.0407	7	4,10	7	7,5	38	9,0	14	55
22880.0408	8	4,20	8	8,5	40	10,5	15	64
22880.0409	9	4,50	9	9,5	43	11,0	17	82
22880.0410	10	4,75	10	10,5	45	12,5	19	101



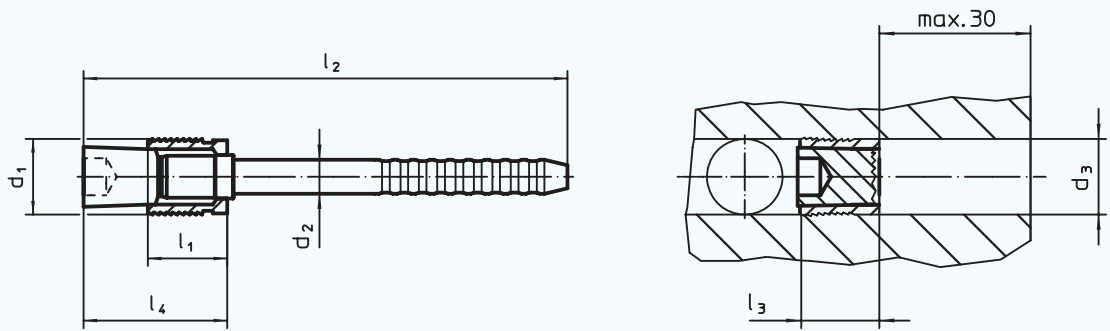
Working and control pressures for Expander[®] sealing plug with pull-anchor

basic material	ETG-100 AISI 1144	C15Pb 1.0403	GG-25 DIN 1691	GGG-50 DIN 1693	AlCuMg2 3.1354	AlMgSiPb 3.0615	G-AISI7Mg 3.2371
d ₁ 4-10 mm	p [bar]						
	500	500	500	500	500	450	450
	pTest [bar]						
	1600	1600	1500	1600	1600	1400	1400

EH 22880.

**Expander®
Sealing Plugs**

with elongated
pull-anchor



Material:

Body: • Case hardened steel, annealed

Pin: • Steel

Note:

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.

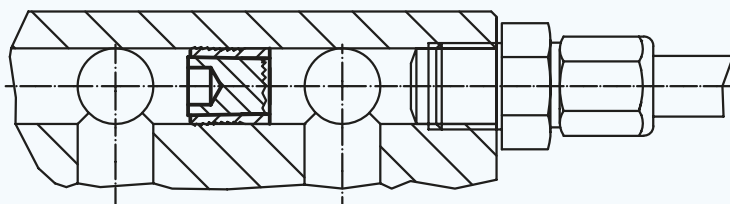
Body and pin are pre-assembled and suitable for automated processing.

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.

Ref. No.	d ₁	d ₂	d ₃ +0,12 0,00	l ₁	l ₂	l ₃ max.	l ₄ max.	g
22880.0414	4	2,50	4	4,5	69	6,5	9	29
22880.0415	5	3,00	5	5,5	71	7,5	10	42
22880.0416	6	3,40	6	6,5	73	8,0	12	58
22880.0417	7	4,10	7	7,5	68	9,0	14	79
22880.0418	8	4,20	8	8,5	70	10,5	15	95
22880.0419	9	4,50	9	9,5	73	11,0	17	123
22880.0420	10	4,75	10	10,5	75	12,5	19	152



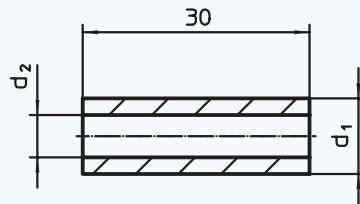
Working and control pressures for Expander® sealing plug with elongated pull-anchor

basic material	ETG-100 AISI 1144	C15Pb 1.0403	GG-25 DIN 1691	GGG-50 DIN 1693	AlCuMg2 3.1354	AlMgSiPb 3.0615	G-AlSi7Mg 3.2371
	p [bar]						
d ₁ 4-10 mm	500	500	500	500	500	450	450
	pTest [bar]						
	1600	1600	1600	1600	1600	1400	1400

EH 22880.

Distance Bushings

for Expander[®]
Sealing Plugs
with elongated
pull-anchor



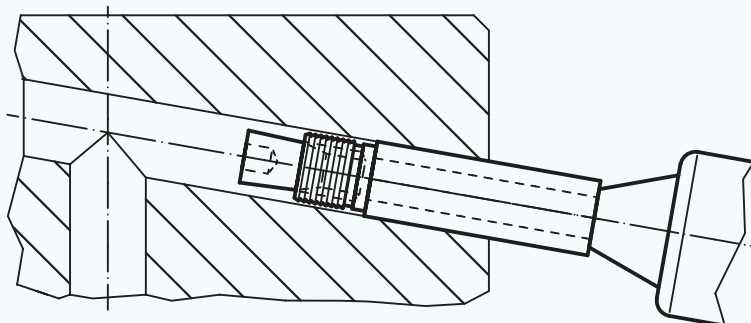
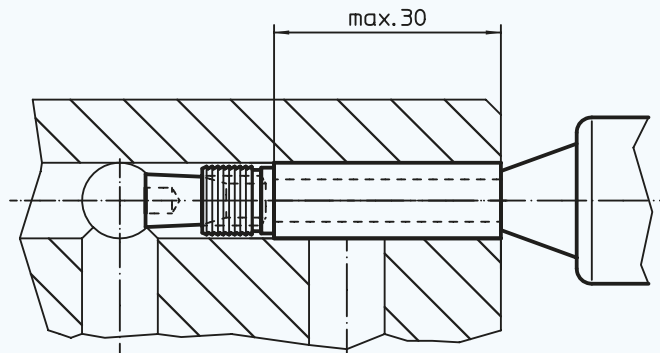
Material:

Body: • Case-hardened steel, case hardened

Note:

To be used for Expander[®] sealing plugs with elongated pull-anchor.

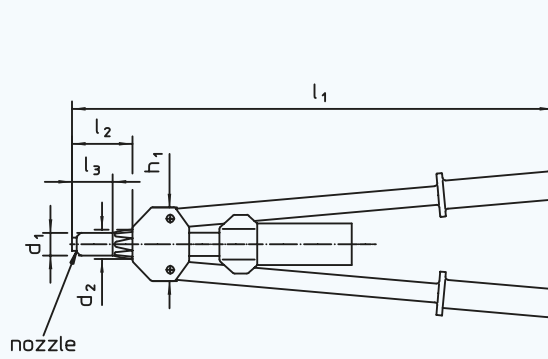
Ref. No.	d ₁	d ₂	g
22880.0424	4	2,7	2
22880.0425	5	3,2	3
22880.0426	6	3,7	5
22880.0427	7	4,6	6
22880.0428	8	4,8	8
22880.0429	9	5,2	11
22880.0430	10	5,6	11



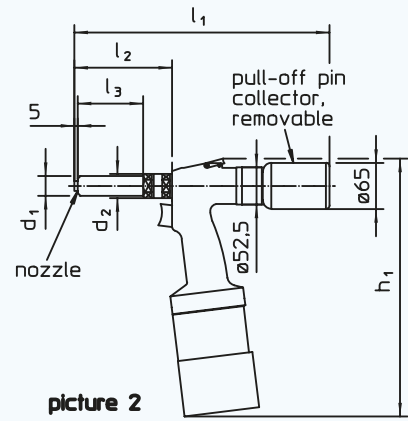
EH 22880.

Assembly Tools

for Expander®
Sealing Plugs
with pull-anchor

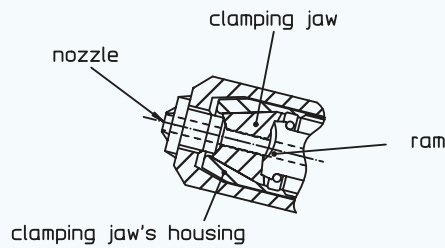


picture 1



picture 2

wearing parts assembly tool



picture 3

Note:

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)
- cycles 2 s.

Attention: The supply volume of the original equipment of both, mechanical and pneumatical, assembly tools includes for the ram, the clamping jaws and the clamping jaws' housing. Mechanical assembly tool: nozzles are also included in the supply volume.

Pneumatic assembly tool: nozzles have to be purchased separately.

Ref. No.	Finish	Tensile force at 7 bar kN	Stroke ≈	d ₁ ≈	d ₂ ≈	l ₁ ≈	l ₂ ≈	l ₃ ≈	h ₁ ≈	g
22880.0500	Assembly tool, mechanically operated for sizes (d ₁) 4 to 6 (picture 1)	–	–	24	31	525	59	38,0	80	1950
22880.0510	Assembly tool, pneumatically operated, (ExTool 030) for sizes (d ₁) 5 to 6 (picture 2)	19	25	23	26	353	133	73,5	356	2500
22880.0520	Assembly tool, pneumatically operated (ExTool 040) for sizes (d ₁) 7 to 10 (picture 2)	24	18	28	34	353	133	92,0	356	2700

Continued from previous page

EH 22880.

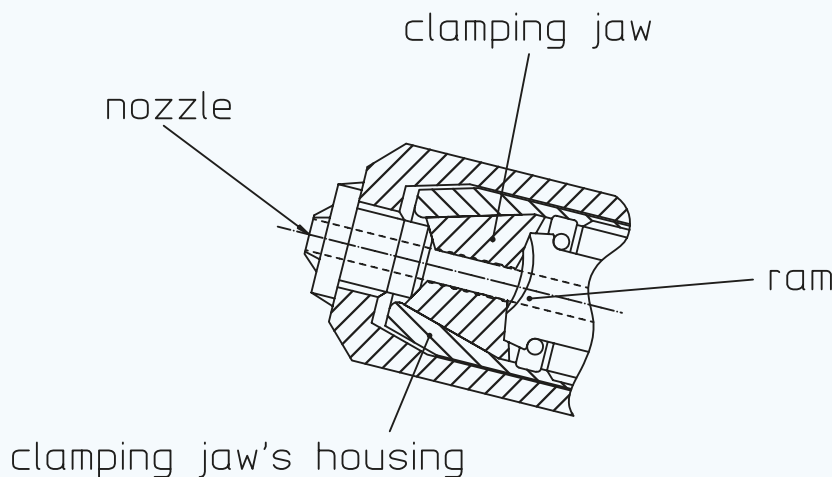
Assembly Tools

for Expander®
Sealing Plugs
with pull-anchor

Ref. No. 22880.0500 mechanical	Ref. No. 22880.0510 ExTool 030	Ref. No. 22880.0520 ExTool 040	Finish	Nominal size d ₁
22880.0502	22880.0512	-	Nozzle	4
22880.0503	22880.0513	-	(picture 3)	5
22880.0504	22880.0514	-		6
-	-	22880.0525		7
-	-	22880.0526		8
-	-	22880.0527		9
-	-	22880.0528		10
-	22880.0560	22880.0570	ram (picture 3)	-
22880.0551	22880.0561	22880.0571	clamping jaw (picture 3)	-
-	22880.0562	22880.0572	clamping jaw's housing (picture 3)	-



wearing parts assembly tool



EH 22880.

**Expander®
Sealing Plugs**

pull-anchor type

**Constructional
Guidelines /
Assembly Instructions**

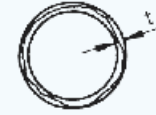
Component Requirements (22880.0404 - 22880.0420):

Drilling Holes

- Roundness tolerances have to be within $t = 0,05$ mm.
- With hard materials the drilling roughness has to be $R_z = 10$ to 30 μm .
- Drilling tolerance $d_1 = +0,12$ mm.
- Longitudinal rifles and spiral grooves have to be avoided as they have a negative influence on the sealing.
- **Drilling holes have to be kept absolutely free from oil, grease and chips.**

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.

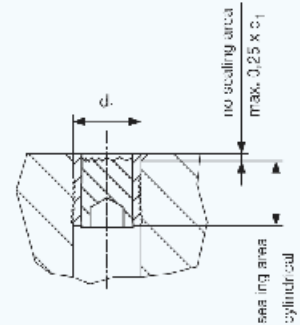


Drilling Tolerance

The drilling tolerance $d_1 = +0,12$ mm.

Drilling Conicity

Within the active sealing area, the drilling hole has to be cylindrical. The drilling hole entrance may be conical up to $0,25 \times d$ as this zone does not have any primary influence on the sealing function.



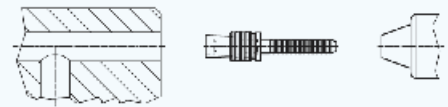
Galvanic Corrosion

An eventual contact corrosion has to be considered.

Assembly Instructions

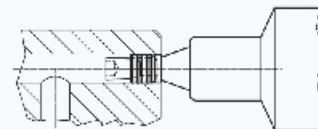
Mounting Procedure

- The Expander® Sealing Plug with pull-anchor has to be flush mounted into the sleeve of the assembling tool.
- The Expander® Sealing Plug has to be mounted into the bore hole to be sealed. The assembly operation has to be activated until the pull-anchor breaks when having achieved the nominal breaking load.



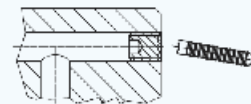
Attention:

- The assembly of the Expander® Sealing Plug has to be effected only in a clean working environment.
- The anchor and sleeve of the Sealing Plug must 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.



Disassembly:

For the Expander® Sealing Plug type with pull-anchor a disassembly is possible.

Disassembly process:

1. Strike back the anchor inside of the sleeve with the help of the punch.
2. Break out the sleeve and remove the struck anchor.
3. Redrill the bore hole to the Expander® Sealing Plug diameter next in size according to the standard sheet.
4. Clean the bore and free it from chips and possible leftovers of the sleeve (without oil and grease).
5. Insert new Expander® Sealing Plug (**take care of point 3.**).

Attention:

After the disassembly always insert the Expander® Sealing Plug diameter next in size!

Please refer to the technical data following these product information pages.

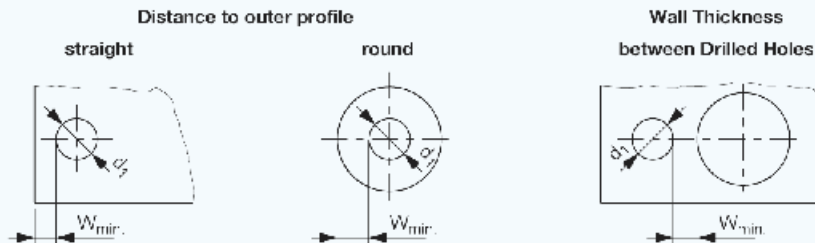
EH 22880.

**Expander®
Sealing Plugs**

**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.



For standard values of minimum wall thicknesses and edge distances (W_{min}) refer to table.

Calculation of standard values:

Diameter of Expander® Sealing Plug

$$d_1 \geq 4 \text{ mm: } W_{min} = f_{min} \times d_1$$

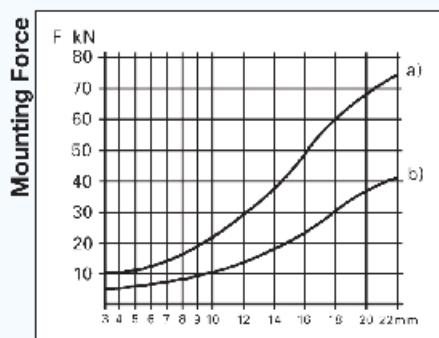
$$d_1 < 4 \text{ mm: } W_{min} = f_{min} \times d_1 + 0,5$$

	Description	ETG -100 AISI 1144	C 15 Pb 1.0403	GG - 25 DIN 1691	GGG - 50 DIN 1693	AlCuMg2 3.1354	AlMgSiPb 3.0615	G-AlSi7Mg 3.2371
Basic material	Average tensile strength R_m N/mm ²	1000	560	250	500	480	340	300
	Min. breaking elongation A_5 / %	6	6	-	7	8	6	4
	Average permanent elongation limit $R_{p0.2}$ N/mm ²	865	300	-	320	380	300	250
		Factor f_{min}						
Sleeve from stainless steel		0,6	0,8	1,0	0,8	0,6	1,0	1,0
Sleeve from steel		0,5	0,5	1,0	0,6	0,6	1,0	1,0
Type with pull-anchor		0,5	0,5	1,0	0,6	0,6	1,0	1,0

Mounting / Assembly Forces

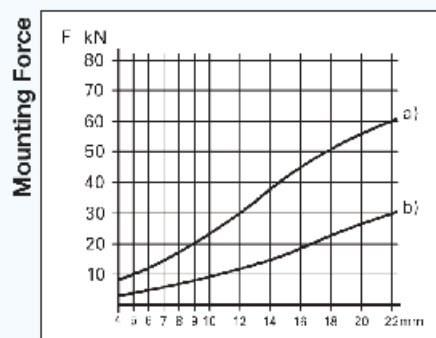
**Expander® Sealing Plug
Sleeve from stainless steel
Ref. No.
22880.0053 to 22880.0072**

**Expander® Sealing Plug
Sleeve from steel
Ref. No.
22880.0004 to 22880.0022**



**Diameter of drilling hole
 d_2**

Measured in steel having a tensile strength of $R_{tr} = 1000$ N/mm². When using basic materials with lower tensile strengths values are lower.



**Diameter of drilling hole
 d_2**

a) Force at min. drilling tolerance
b) Force at max. drilling tolerance.

EH 22880.

**Expander®
Sealing Plugs**

**Constructional
Guidelines /
Assembly Instructions**

Anchorage Principle

There is a direct connection between the necessary drilling roughness required and both: the hardness and the tensile characteristics of the basic material. Depending on the mounting combination of sealing plug and basic material, anchorage can either take place via the rifle profile of the Expander® sleeve (automatic anchorage) or via the surface roughness of the drilling flow.

Attention: Depending on the type of Expander® sealing plug and the hardness of the basic material a bore roughness of Rz = 10-30 µm has to be adhered to.

**Expander® sealing plug
Ref. No. 22880.0004 to 22880.00072**

Requirements to achieve maximum operation reliability

- Drilling tolerance $d_1 = + 0,10$ mm,
- Consideration of counterbore hole relations,
- Roundness tolerance $t = 0,05$ mm,
- Longitudinal rifles and spiral grooves that may have a negative influence on the sealing effectiveness have to be avoided,
- Drilling holes have to be free from oil and grease.

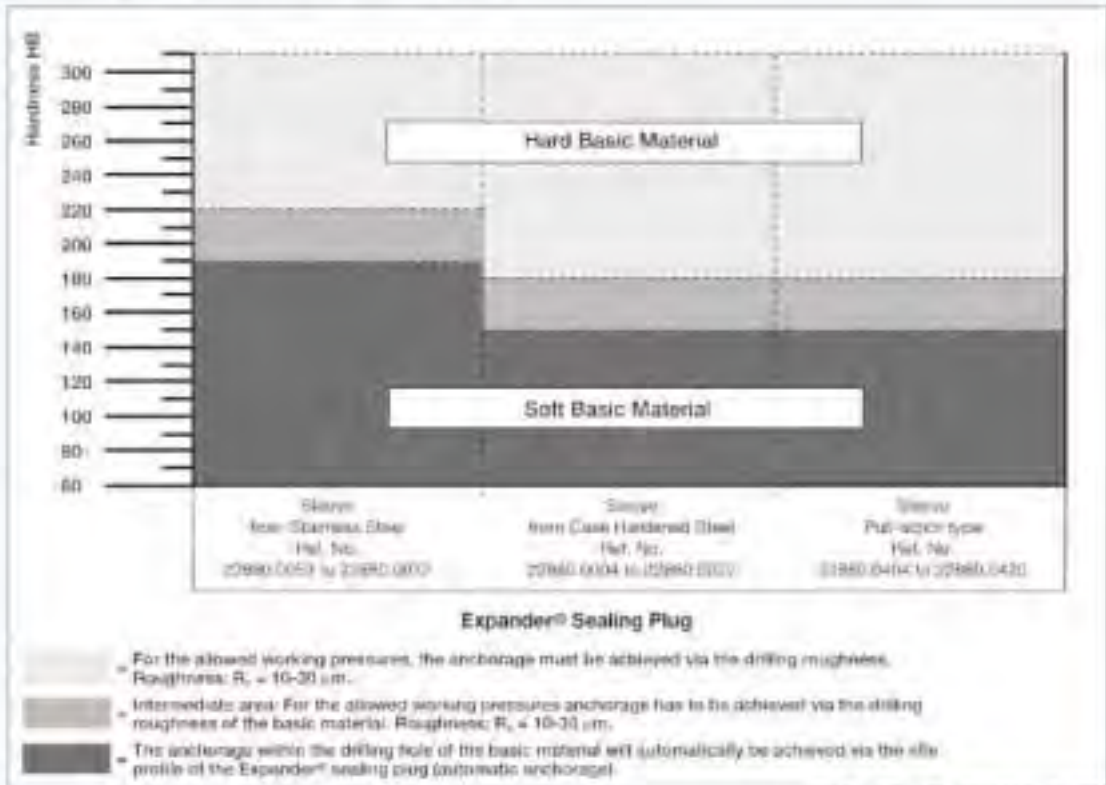
**Expander® sealing, type with pull-anchor
Ref. No. 22880.0404 to 22880.0420**

Requirements to achieve maximum operation reliability

- Drilling tolerance $d_1 = + 0,12$ mm,
- Roundness tolerance $t = 0,05$ mm,
- Longitudinal rifles and spiral grooves that may have a negative influence on the sealing effectiveness have to be avoided,
- Drilling holes have to be free from oil and grease.

Note:

In case where an automatic anchorage is not possible when building in the Expander® sealing plug into a hard basic material a drilling roughness of $> Rz = 10-30$ µm is necessary to achieve the required pressure values. When having roughness $> Rz = 30$ µm, leakages may occur.



Picture 1 Selection Diagram

Anchorage by Rifle Profile (Automatic Anchorage)

Example:
Expander® Sealing Plug made from case hardened steel HB = 180
in aluminium alloy HB = 90

Example:
Expander® Sealing Plug, pull-anchor type from case hardened steel HB = 180



Anchorage by Bore Roughness:

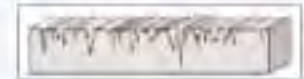
Required Roughness Design

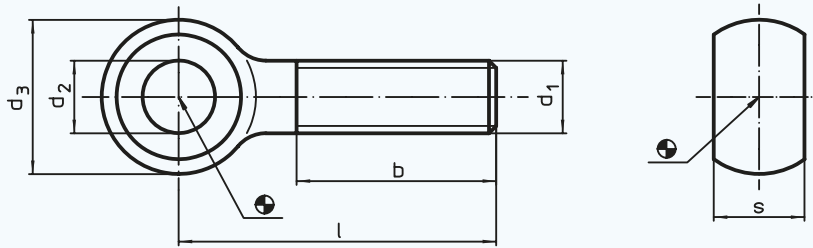
An ideal bore roughness for the anchor can be achieved by using a twist drill or countersink.



Undesirable Roughness Design

Friction will cause a smooth roughness profile that is not desired.





EH 22980.
Swing Bolts
DIN 444, form B

For torques please refer to appendix - Technical Data -

Material:

- Heat-treated steel, tempered, quality 8.8, black
- Stainless steel 1.4301

Note:

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.



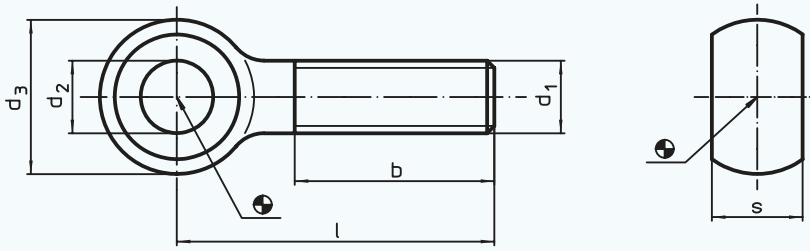
Ref. No. Steel	Ref. No. Stainless steel	d ₁	l	d ₂ H9	d ₃	b	s	ϕ _g
22980.0202	22980.0402	M 5	25	5	12	16	6	5,6
22980.0203	22980.0403	M 5	30	5	12	16	6	6,4
22980.0204	22980.0404	M 5	35	5	12	16	6	7,2
22980.0205	22980.0405	M 5	40	5	12	16	6	7,8
22980.0212	22980.0412	M 6	30	6	14	18	7	9,5
22980.0214	22980.0414	M 6	40	6	14	18	7	12,0
22980.0216	22980.0416	M 6	50	6	14	18	7	14,0
22980.0218	22980.0418	M 6	60	6	14	18	7	16,0
22980.0222	22980.0422	M 6	80	6	14	18	7	20,0
22980.0232	22980.0432	M 8	40	8	18	22	9	22,0
22980.0234	22980.0434	M 8	50	8	18	22	9	25,0
22980.0236	22980.0436	M 8	60	8	18	22	9	29,0
22980.0240	22980.0440	M 8	80	8	18	22	9	37,0
22980.0244	22980.0444	M 8	100	8	18	22	9	44,0
22980.0252	22980.0452	M 10	50	10	20	26	12	37,0
22980.0254	22980.0454	M 10	60	10	20	26	12	43,0
22980.0257	22980.0457	M 10	75	10	20	26	12	52,0
22980.0262	22980.0462	M 10	100	10	20	26	12	67,0
22980.0266	22980.0466	M 10	120	10	20	26	12	72,0
22980.0272	22980.0472	M 12	50	12	25	30	14	60,0
22980.0274	22980.0474	M 12	60	12	25	30	14	68,0
22980.0278	22980.0478	M 12	80	12	25	30	14	85,0
22980.0282	22980.0482	M 12	100	12	25	30	14	102,0
22980.0286	22980.0486	M 12	120	12	25	30	14	119,0
22980.0292	22980.0492	M 16	60	16	32	38	17	128,0
22980.0294	22980.0494	M 16	80	16	32	38	17	158,0
22980.0298	22980.0498	M 16	100	16	32	38	17	190,0
22980.0302	22980.0502	M 16	120	16	32	38	17	220,0
22980.0308	22980.0508	M 16	150	16	32	44	17	265,0
22980.0312	22980.0512	M 20	100	18	40	46	22	329,0
22980.0316	22980.0516	M 20	120	18	40	46	22	371,0
22980.0324	22980.0524	M 20	160	18	40	52	22	466,0
22980.0332	22980.0532	M 20	200	18	40	52	22	562,0
22980.0342	22980.0542	M 24	100	22	45	54	25	442,0
22980.0346	22980.0546	M 24	120	22	45	54	25	512,0
22980.0354	22980.0554	M 24	160	22	45	60	25	649,0
22980.0362	22980.0562	M 24	200	22	45	60	25	787,0



EH 22980.

Swing Bolts

**DIN 444,
form B, quality 8.8
high precision design**



For torques please refer to appendix - Technical Data -

Material:

- Heat-treated steel, tempered, quality 8.8, black

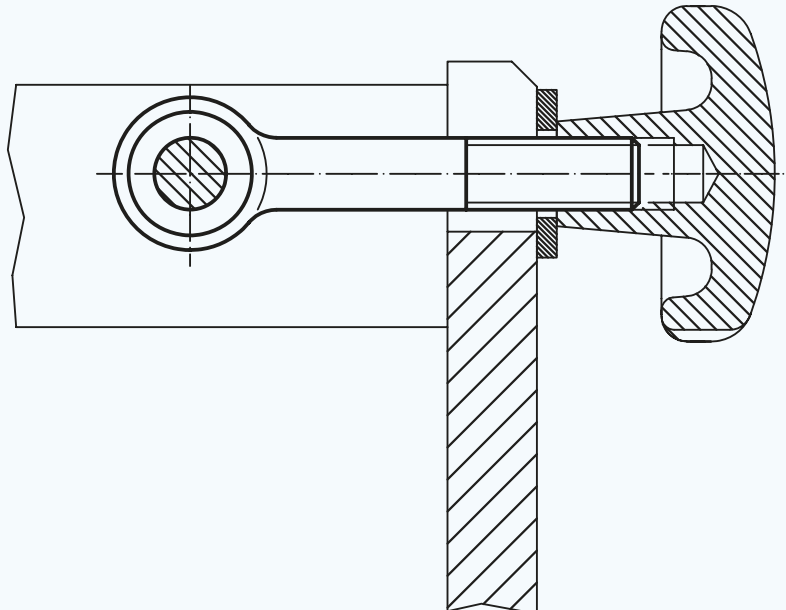
Note:

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 $d_2 = H7$.



Ref. No.	d_1	l	d_2 H7	d_3	b	s -0,2	$\frac{f_7}{g}$
22980.0081	M 8	40	8	18	22	9	22
22980.0084	M 8	60	8	18	22	9	28
22980.0103	M 10	50	10	20	26	12	38
22980.0106	M 10	75	10	20	26	12	50
22980.0108	M 10	100	10	20	26	12	62
22980.0122	M 12	60	12	25	30	14	70
22980.0125	M 12	80	12	25	30	14	84
22980.0128	M 12	120	12	25	30	14	113
22980.0163	M 16	80	16	32	38	17	153
22980.0168	M 16	150	16	32	44	17	245





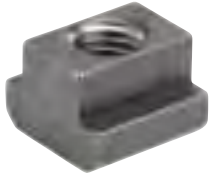
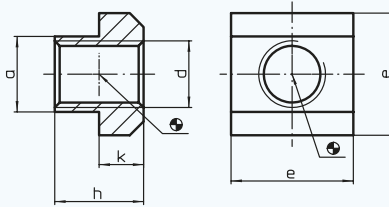
Clamping Elements



EH 23010.

T-Nuts

DIN 508



Material:

- Heat-treated steel, quality 8, bright
- Heat-treated steel, tempered, quality 10, blackened
- Stainless steel 1.4305

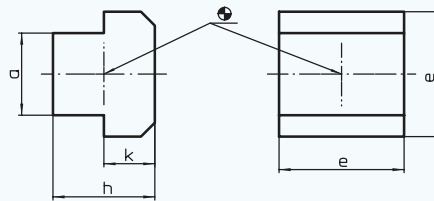
Note:

The entire loading capacity of the T-nut can only be applied if the screwing is guaranteed to be made over the total thread length of the T-nut.

Ref. No. Quality 10	Ref. No. Quality 8	Ref. No. Stainless steel	d	T-slot size	a	e	h	k	For T-nuts DIN 650	Testing force to DIN 508 F min. N x 10 ³	± g
23010.0052	23010.0051	-	M 4	5	4,6	9	6,5	3	5	7,0	2,3
23010.0062	23010.0061	-	M 5	6	5,6	10	8,0	4	6	11,4	3,4
23010.0082	23010.0081	23010.0721	M 6	8	7,6	13	10,0	6	8	16,0	8,3
23010.0104	23010.0103	-	M 6*	10	9,6	15	12,0	6	10	16,0	14,0
23010.0102	23010.0101	23010.0731	M 8	10	9,6	15	12,0	6	10	29,0	13,0
23010.0124	23010.0123	-	M 8*	12	11,6	18	14,0	7	12	29,0	23,0
23010.0122	23010.0121	23010.0741	M 10	12	11,6	18	14,0	7	12	46,0	20,0
23010.0145	-	-	M 8*	14	13,6	22	16,0	8	14	29,0	41,0
23010.0144	23010.0143	-	M 10*	14	13,6	22	16,0	8	14	46,0	37,0
23010.0142	23010.0141	23010.0751	M 12	14	13,6	22	16,0	8	14	67,0	34,0
23010.0166	-	-	M 8*	16	15,6	25	18,0	9	16	29,0	62,0
23010.0165	-	-	M 10*	16	15,6	25	18,0	9	16	46,0	58,0
23010.0164	23010.0163	-	M 12*	16	15,6	25	18,0	9	16	67,0	54,0
23010.0162	23010.0161	23010.0761	M 14*	16	15,6	25	18,0	9	16	-	49,0
23010.0187	-	-	M 8*	18	17,6	28	20,0	10	18	29,0	90,0
23010.0186	-	-	M 10*	18	17,6	28	20,0	10	18	46,0	85,0
23010.0185	-	-	M 12*	18	17,6	28	20,0	10	18	67,0	80,0
23010.0184	23010.0183	-	M 14*	18	17,6	28	20,0	10	18	-	74,0
23010.0182	23010.0181	23010.0781	M 16	18	17,6	28	20,0	10	18	128,0	68,0
23010.0205	-	-	M 12*	20	19,6	32	24,0	12	20	67,0	131,0
23010.0204	23010.0203	-	M 16*	20	19,6	32	24,0	12	20	128,0	116,0
23010.0202	23010.0201	-	M 18*	20	19,6	32	24,0	12	20	-	108,0
23010.0225	-	-	M 12*	22	21,6	35	28,0	14	22	67,0	189,0
23010.0226	-	-	M 16*	22	21,6	35	28,0	14	22	128,0	175,0
23010.0224	23010.0223	-	M 18*	22	21,6	35	28,0	14	22	-	163,0
23010.0222	23010.0221	-	M 20	22	21,6	35	28,0	14	22	196,0	149,0
23010.0246	-	-	M 16*	24	23,6	40	32,0	16	24	128,0	250,0
23010.0244	23010.0243	-	M 20*	24	23,6	40	32,0	16	24	196,0	237,0
23010.0242	23010.0241	-	M 22*	24	23,6	40	32,0	16	24	-	221,0
23010.0286	-	-	M 16*	28	27,6	44	36,0	18	28	128,0	375,0
23010.0284	-	-	M 20*	28	27,6	44	36,0	18	28	196,0	360,0
23010.0283	-	-	M 22*	28	27,6	44	36,0	18	28	-	345,0
23010.0282	23010.0281	-	M 24	28	27,6	44	36,0	18	28	282,0	330,0
23010.0322	-	-	M 27*	32	31,5	50	40,0	20	32	-	460,0
23010.0364	-	-	M 24*	36	35,5	54	44,0	22	36	282,0	600,0
23010.0362	23010.0361	-	M 30	36	35,5	54	44,0	22	36	448,0	585,0
23010.0422	23010.0421	-	M 36	42	41,5	65	52,0	26	42	653,0	1000,0
23010.0482	23010.0481	-	M 42	48	47,5	75	60,0	30	48	653,0	1500,0
23010.0542	23010.0541	-	M 48	54	53,4	85	70,0	34	54	653,0	2100,0

* DIN standards do not include these dimensions.





EH 23010.

**T-Nuts
>semi-
finished<**

DIN 508

Material:

- Heat-treated steel, bright
- Stainless steel 1.4305

Ref. No. Heat-treated steel	Ref. No. Stainless steel	T-slot size	a	e	h	k	g
23010.0060	-	6	5,6	10	8	4	4
23010.0080	23010.0720	8	7,6	13	10	6	10
23010.0100	23010.0730	10	9,6	15	12	6	17
23010.0120	23010.0740	12	11,6	18	14	7	27
23010.0140	23010.0750	14	13,6	22	16	8	46
23010.0160	23010.0760	16*	15,6	25	18	9	68
23010.0180	23010.0780	18	17,6	28	20	10	95
23010.0200	-	20*	19,6	32	24	12	149
23010.0220	-	22	21,6	35	28	14	210
23010.0240	-	24*	23,6	40	32	16	300
23010.0280	-	28	27,6	44	36	18	430
23010.0320	-	32*	31,5	50	40	20	580
23010.0360	-	36	35,5	54	44	22	800
23010.0420	-	42	41,5	65	52	26	1250
23010.0480	-	48	47,5	75	60	30	1900
23010.0540	-	54	53,4	85	70	34	2600

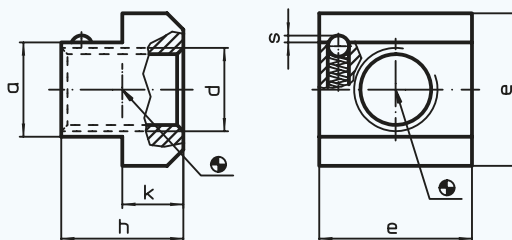
* DIN standards do not include these dimensions.



EH 23010.

T-Nuts

DIN 508
with antislipping device



Material:

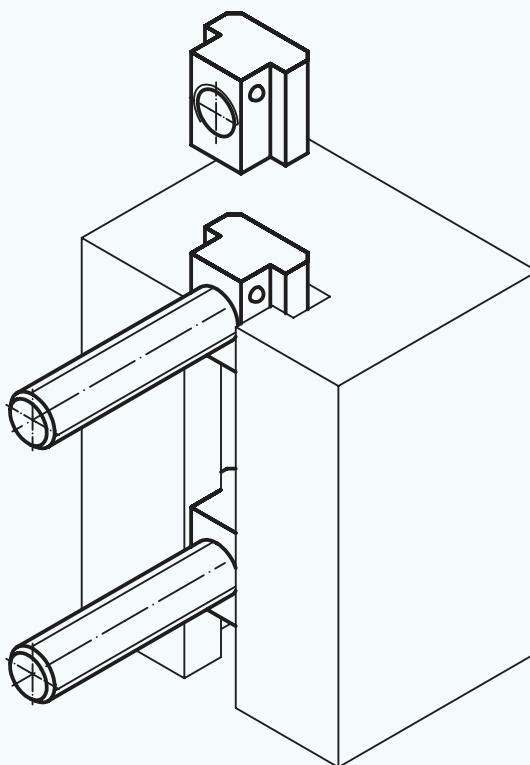
T-nut: • Heat-treated steel, tempered, quality 10, blackened

Spring element: • Ball-bearing steel, hardened

Note:

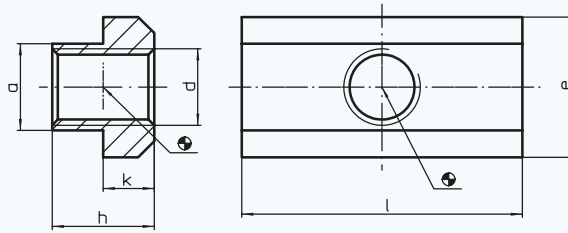
The spring element avoids vertical and horizontal slipping of T-nut.

Ref. No.	d	T-slot size	a	e	h	k	s	g
23010.0811	M 8	10	9,6	15	12	6	0,65	12
23010.0813	M 10	12	11,6	18	14	7	0,80	20
23010.0815	M 12	14	13,6	22	16	8	0,90	33
23010.0819	M 16	18	17,6	28	20	10	1,00	67
23010.0823	M 20	22	21,6	35	28	14	1,60	148



EH 23020.

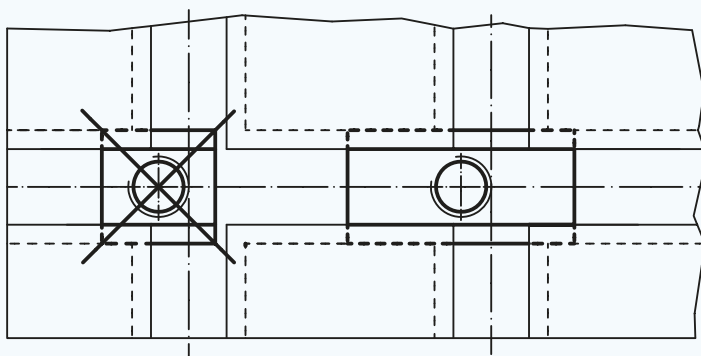
**T-Nuts
>extended<**



Material:

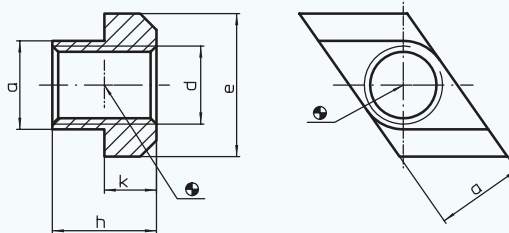
- Heat-treated steel, tempered, quality 10, blackened

Ref. No.	d	T-slot size	a	e	l	h	k	g
23020.0060	M 5	6	5,6	10	20	8	4	8
23020.0080	M 6	8	7,6	13	26	10	6	19
23020.0100	M 8	10	9,6	15	30	12	6	29
23020.0120	M 10	12	11,6	18	36	14	7	48
23020.0140	M 12	14	13,6	22	44	16	8	81
23020.0160	M 14	16	15,6	25	50	18	9	118
23020.0180	M 16	18	17,6	28	56	20	10	164
23020.0200	M 18	20	19,6	32	64	24	12	257
23020.0220	M 20	22	21,6	35	70	28	14	359
23020.0280	M 24	28	27,6	44	88	36	18	741
23020.0360	M 30	36	35,5	54	108	44	22	1394



EH 23020.

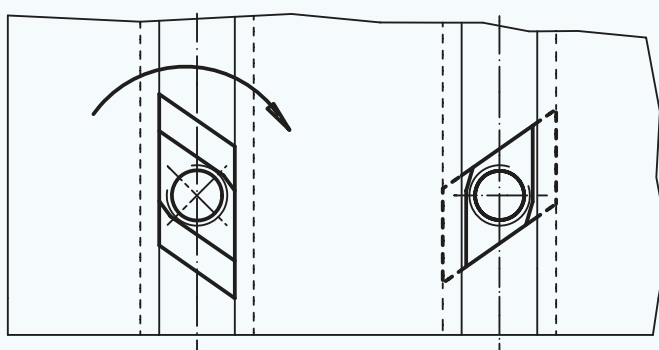
**T-Nuts
>Rhombus<**

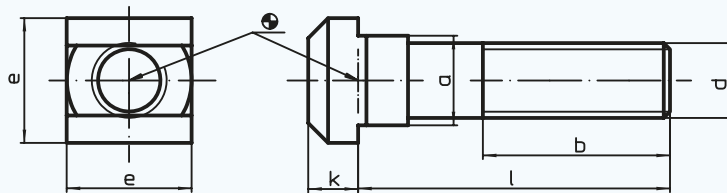


Material:

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

Ref. No.	d	T-slot size	a	e	h	k	±g
23020.0560	M 5	6	5,9	10	8	4	2,1
23020.0580	M 6	8	7,6	13	10	6	5,4
23020.0600	M 8	10	9,6	15	12	6	8,8
23020.0620	M 10	12	11,6	18	14	7	14,0
23020.0640	M 12	14	13,6	22	16	8	23,0
23020.0660	M 14	16	15,6	25	18	9	33,0
23020.0680	M 16	18	17,6	28	20	10	46,0
23020.0700	M 18	20	19,6	32	24	12	69,0
23020.0720	M 20	22	21,6	35	28	14	98,0
23020.0780	M 24	28	27,6	44	36	18	213,0
23020.0860	M 30	36	35,5	54	44	22	423,0
23020.0920	M 36	42	41,5	65	52	26	676,0





EH 23030.

T-Bolts

DIN 787

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

Material:

- M 6 - M 12: Heat-treated steel, quality 10,9, forged, black, T-slot guidance milled, as from M 14: Heat-treated steel, quality 8.8, forged, black, T-slot guidance milled.

Note:

T-bolts when combined with DIN 6330 nuts (EH 23070.) and DIN 6340 washers (EH 23060.) become complete clamping bolts. Other qualities upon request.



Ref. No.	d	T-slot size	l	a	b	e	k	g
23030.0061	M 6	6	25	5,6	15	10	4	8
23030.0062	M 6	6	40	5,6	28	10	4	10
23030.0063	M 6	6	63	5,6	40	10	4	14
23030.0081	M 8	8	32	7,6	22	13	6	19
23030.0082	M 8	8	50	7,6	35	13	6	25
23030.0083	M 8	8	80	7,6	50	13	6	34
23030.0101	M 10	10	40	9,6	30	15	6	32
23030.0102	M 10	10	63	9,6	45	15	6	44
23030.0103	M 10	10	100	9,6	60	15	6	62
23030.0121	M 12	12	50	11,6	35	18	7	57
23030.0125	M 12	12	63*	11,6	45	18	7	66
23030.0122	M 12	12	80	11,6	55	18	7	79
23030.0123	M 12	12	125	11,6	75	18	7	111
23030.0124	M 12	12	200	11,6	120	18	7	164
23030.0141	M 12	14	50	13,6	35	22	8	76
23030.0145	M 12	14	63*	13,6	45	22	8	85
23030.0142	M 12	14	80	13,6	55	22	8	97
23030.0143	M 12	14	125	13,6	75	22	8	129
23030.0144	M 12	14	200	13,6	120	22	8	182
23030.0150	M 14	16	63*	15,6	45	25	9	118
23030.0152	M 14	16	100*	15,6	65	25	9	154
23030.0154	M 14	16	160*	15,6	100	25	9	213
23030.0156	M 14	16	250*	15,6	150	25	9	301
23030.0161	M 16	16	63*	15,6	45	25	9	136
23030.0165	M 16	16	80*	15,6	55	25	9	158
23030.0162	M 16	16	100*	15,6	63	25	9	185
23030.0163	M 16	16	160*	15,6	100	25	9	263
23030.0166	M 16	16	200*	15,6	125	25	9	315
23030.0164	M 16	16	250*	15,6	150	25	9	381
23030.0181	M 16	18	63	17,6	45	28	10	162
23030.0185	M 16	18	80*	17,6	55	28	10	184
23030.0182	M 16	18	100	17,6	63	28	10	210
23030.0183	M 16	18	160	17,6	100	28	10	289
23030.0186	M 16	18	200*	17,6	125	28	10	340
23030.0184	M 16	18	250	17,6	150	28	10	407

* DIN standards do not include these dimensions.

EH 23030.

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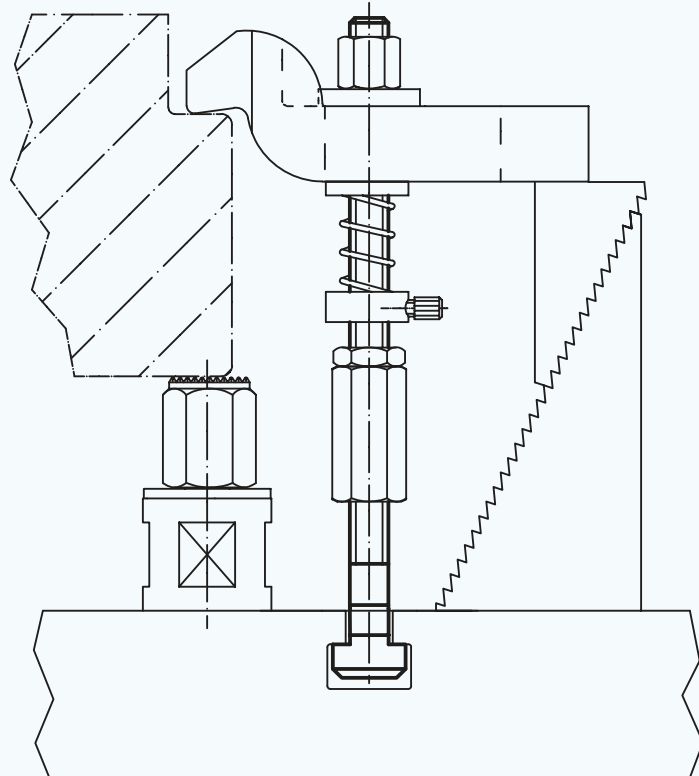
T-Bolts

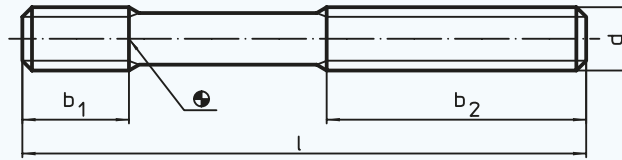
DIN 787



Ref. No.	d	T-slot size	l	a	b	e	k	g
23030.0201	M 20	20	80*	19,6	55	32	12	278
23030.0205	M 20	20	100*	19,6	65	32	12	320
23030.0202	M 20	20	125*	19,6	85	32	12	370
23030.0206	M 20	20	160*	19,6	100	32	12	442
23030.0203	M 20	20	200*	19,6	125	32	12	523
23030.0207	M 20	20	250*	19,6	150	32	12	624
23030.0204	M 20	20	315*	19,6	190	32	12	758
23030.0221	M 20	22	80	21,6	55	35	14	330
23030.0225	M 20	22	100*	21,6	65	35	14	371
23030.0222	M 20	22	125	21,6	85	35	14	422
23030.0226	M 20	22	160*	21,6	100	35	14	494
23030.0223	M 20	22	200	21,6	125	35	14	576
23030.0227	M 20	22	250*	21,6	150	35	14	678
23030.0224	M 20	22	315	21,6	190	35	14	800
23030.0281	M 24	28	100	27,6	70	44	18	639
23030.0285	M 24	28	125*	27,6	85	44	18	713
23030.0282	M 24	28	160	27,6	110	44	18	814
23030.0286	M 24	28	200*	27,6	125	44	18	936
23030.0283	M 24	28	250	27,6	150	44	18	1082
23030.0287	M 24	28	315	27,6	190	44	18	1275
23030.0284	M 24	28	400*	27,6	240	44	18	1496
23030.0361	M 30	36	125	35,5	80	54	22	1203
23030.0362	M 30	36	200	35,5	135	54	22	1562
23030.0363	M 30	36	315	35,5	200	54	22	2061
23030.0364	M 30	36	500	35,5	300	54	22	2959
23030.0421	M 36	42	160	41,5	100	65	26	2167
23030.0422	M 36	42	250	41,5	175	65	26	2779
23030.0423	M 36	42	400	41,5	250	65	26	3789
23030.0424	M 36	42	600*	41,5	340	65	26	5500

* DIN standards do not include these dimensions.





EH 23040.

Studs

DIN 6379
for T-Nuts

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

Material:

- M 6 - M 12: Heat-treated steel, quality 10.9, black
as from M 14: heat-treated steel, quality 8.8, black

Note:

Studs combined with T-nuts DIN 508 (EH 23010./23020.), nuts DIN 6330 (EH 23070.) and washers DIN 6340 (EH 23060.) become complete clamping studs.

Studs for T-nuts with elongated dimension b_1 also available.



Ref. No.	d	l	b_1	b_2	$\frac{g}{g}$
23040.0061	M 6	32*	9	16	5
23040.0062	M 6	50	9	30	8
23040.0064	M 6	63*	9	40	11
23040.0063	M 6	80	9	50	13
23040.0081	M 8	40	11	20	12
23040.0082	M 8	63	11	40	19
23040.0083	M 8	100	11	63	31
23040.0084	M 8	160*	11	100	49
23040.0101	M 10	50	13	25	24
23040.0102	M 10	80	13	50	39
23040.0106	M 10	100*	13	75	50
23040.0103	M 10	125	13	75	61
23040.0105	M 10	160*	13	100	78
23040.0104	M 10	200	13	125	98
23040.0121	M 12	50	15	25	35
23040.0122	M 12	63*	15	32	44
23040.0123	M 12	80	15	50	56
23040.0124	M 12	100*	15	63	70
23040.0125	M 12	125	15	75	88
23040.0127	M 12	160*	15	100	112
23040.0126	M 12	200	15	125	141
23040.0141	M 14	63*	17	32	60
23040.0142	M 14	100*	17	63	96
23040.0143	M 14	160*	17	100	154
23040.0144	M 14	250*	17	160	241
23040.0161	M 16	63	19	32	80
23040.0162	M 16	80*	19	50	103
23040.0163	M 16	100	19	63	129
23040.0164	M 16	125*	19	75	162
23040.0165	M 16	160	19	100	207

* DIN standards do not include these dimensions.

EH 23040.

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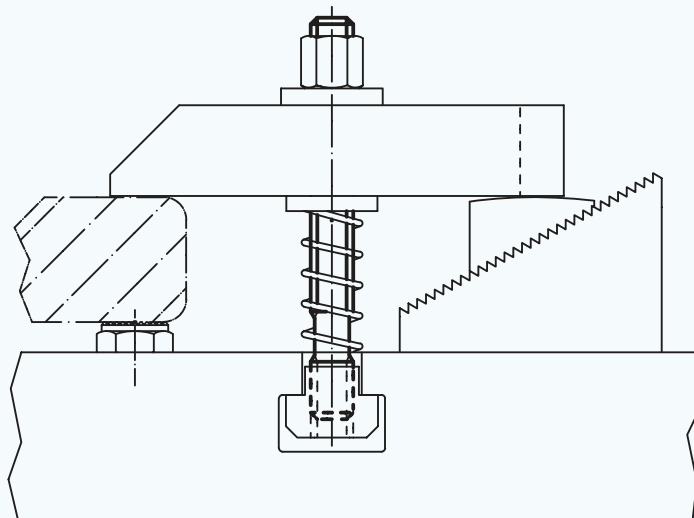
Studs

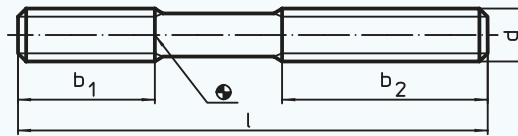
DIN 6379
for T-Nuts



Ref. No.	d	l	b ₁	b ₂	g
23040.0167	M 16	200*	19	125	260
23040.0166	M 16	250	19	160	325
23040.0168	M 16	315*	19	180	409
23040.0169	M 16	500*	19	315	652
23040.0201	M 20	80	27	32	160
23040.0202	M 20	125	27	70	252
23040.0207	M 20	160*	27	100	323
23040.0203	M 20	200	27	125	405
23040.0204	M 20	250*	27	160	508
23040.0205	M 20	315	27	190	639
23040.0208	M 20	400*	27	250	813
23040.0206	M 20	500*	27	315	1019
23040.0241	M 24	100	35	45	289
23040.0246	M 24	125*	35	63	380
23040.0242	M 24	160	35	100	466
23040.0247	M 24	200*	35	125	585
23040.0243	M 24	250	35	160	730
23040.0248	M 24	315*	35	200	924
23040.0244	M 24	400	35	250	1171
23040.0249	M 24	500*	35	315	1466
23040.0245	M 24	630*	35	315	1860
23040.0301	M 30	125	43	56	573
23040.0302	M 30	200	43	125	923
23040.0303	M 30	315	43	190	1461
23040.0304	M 30	500	43	315	2323
23040.0305	M 30	700*	43	400	3261
23040.0361	M 36	160	51	80	1065
23040.0362	M 36	250	51	160	1674
23040.0363	M 36	400	51	250	2687
23040.0364	M 36	700*	51	400	5130

* DIN standards do not include these dimensions.





EH 23040.

Studs

DIN 6379 b_1 long for T-Nuts

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

Material:

- M 6 - M 12: Heat-treated steel, quality 10.9, black
as from M 16: Heat-treated steel, quality 8.8, black

Note:

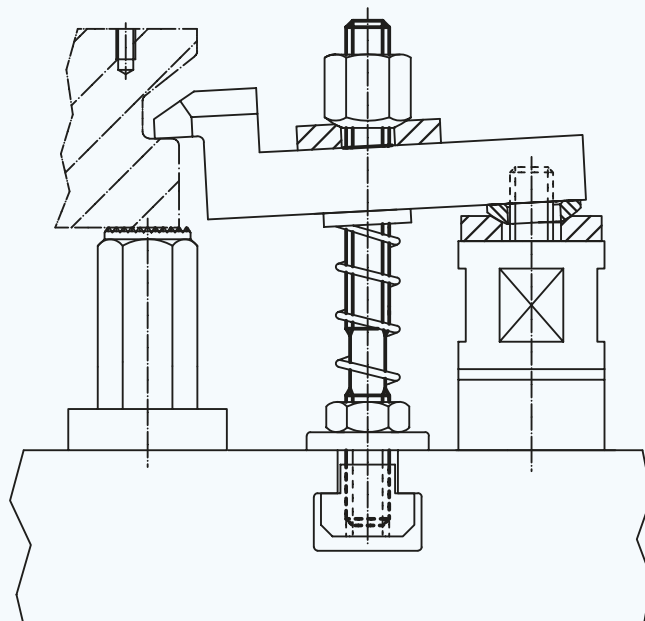
Studs combined with T-nuts DIN 508 (EH 23010./23020.), nuts DIN 6330 (EH 23070.) and washers DIN 6340 (EH 23060.) become complete clamping studs.



Ref. No.	d	l	b_1	b_2	$\frac{g}{g}$
23040.0562	M 6	50	15	30	8
23040.0563	M 6	63	15	40	11
23040.0564	M 6	80	15	50	14
23040.0582	M 8	63	20	40	19
23040.0583	M 8	100	20	63	31
23040.0584	M 8	160	20	100	49
23040.0602	M 10	80	25	50	39
23040.0603	M 10	100	25	75	49
23040.0604	M 10	125	25	75	61
23040.0605*	M 10	160	25	100	78
23040.0606	M 10	200	25	125	98
23040.0622	M 12	63**	-	-	44
23040.0623	M 12	80**	-	-	56
23040.0624*	M 12	100	30	63	70
23040.0625	M 12	125	30	75	88
23040.0626	M 12	160	30	100	112
23040.0627	M 12	200	30	125	140
23040.0662	M 16	80**	-	-	103
23040.0664	M 16	125	40	63	161
23040.0665	M 16	160	40	75	207
23040.0666*	M 16	200	40	100	260
23040.0667	M 16	250	40	125	325

* DIN standards do not include these dimensions.

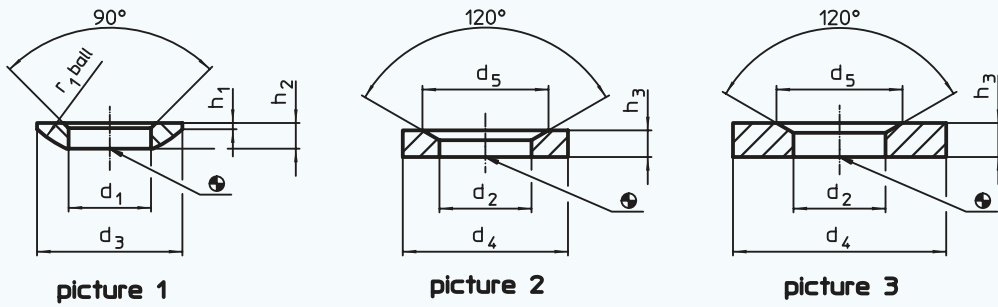
** Throughgoing thread



EH 23050.

**Spherical Washers
Conical Seats**

DIN 6319



picture 1

picture 2

picture 3



Material:

Spherical washer: • Case-hardened steel, case hardened

Conical seat: • Case-hardened steel, case hardened
• form G: Heat-treated steel, heat treated,

Note:

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

Ref. No.	Finish	d ₁ H13	d ₃	h ₁	h ₂	h ₄ ≈ with conical- seat form D	h ₄ ≈ with conical- seat form G	r ₁	For stud d ₆	Load capacity for static load max. kN	Torque for screwed connections max. Nm*	μ _g
23050.0006	spherical	6,4	12	0,7	2,3	4,2	5,4	9,0	6	9	10	1,0
23050.0008	washers	8,4	17	0,6	3,2	5,6	7,1	12,0	8	17	25	2,8
23050.0010	from case-	10,5	21	0,8	4,0	6,5	7,3	15,0	10	26	46	5,3
23050.0012	hardened	13,0	24	1,1	4,6	8,0	9,0	17,0	12	38	82	7,6
23050.0014	steel, form C	15,0	28	1,4	5,0	8,5	9,5	22,0	14	53	130	12,0
23050.0016	(picture 1)	17,0	30	1,3	5,3	9,6	10,4	22,0	16	73	206	13,0
23050.0020		21,0	36	2,0	6,3	11,7	12,2	27,0	20	117	407	23,0
23050.0022		23,0**	40	2,5	7,6	13,5	-	29,5	22	146	542	34,0
23050.0024		25,0	44	2,4	8,2	15,2	15,7	32,0	24	168	698	45,0
23050.0027		28,0**	50	3,3	10,2	17,0	-	36,0	27	221	1021	74,0
23050.0030		31,0	56	3,6	11,2	19,2	19,7	41,0	30	269	1355	101,0
23050.0033		34,0**	62	4,4	13,0	21,8	-	45,0	33	326***	1969***	149,0
23050.0036		37,0	68	4,6	14,0	23,5	-	50,0	36	394	2372	190,0
23050.0039		40,0**	75	5,6	16,0	26,8	-	54,0	39	460***	3276***	218,0
23050.0042		43,0	78	6,5	17,0	29,0	-	58,0	42	542	3802	310,0
23050.0048		50,0	92	8,0	21,0	35,5	-	67,0	48	714	5730	540,0
23050.0052		54,0**	96	9,3	22,0	38,3	-	72,0	52	832***	7876***	620,0
23050.0056		58,0**	103	9,8	23,0	39,3	-	79,0	56	960***	9793***	760,0
23050.0060		62,0**	112	11,0	25,0	43,6	-	86,0	60	1122***	12219***	990,0
23050.0064		66,0**	120	12,0	27,0	46,6	-	93,0	64	1269***	14762***	1220,0

* Torques of screws 8.8, eventual pre-loads to be considered, coefficient of friction μ_{total} 0,14

** DIN standards do not include these dimensions.

*** Figures theoretically determined

Continued from previous page

EH 23050.

**Spherical Washers
Conical Seats**

DIN 6319

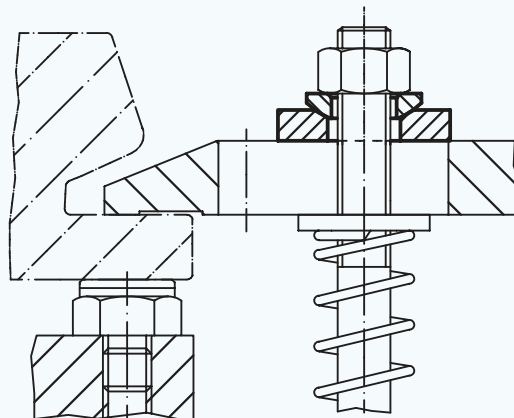
Ref. No.	Finish	d ₂ H13	d ₄	d ₅	h ₃	For stud d ₆	Load capacity for static load max. kN	Torque for screwed connections max. Nm*	μ _g
23050.0106	conical seats	7,1	12	11,0	2,8	6	9	10	1,4
23050.0108	from case-	9,6	17	14,5	3,5	8	17	25	3,7
23050.0110	hardened	12,0	21	18,5	4,2	10	26	46	6,5
23050.0112	steel, form D	14,2	24	20,0	5,0	12	38	82	10,0
23050.0114	(picture 2)	16,5	28	24,8	5,6	14	53	130	15,0
23050.0116		19,0	30	26,0	6,2	16	73	206	18,0
23050.0120		23,2	36	31,0	7,5	20	117	407	30,0
23050.0122		26,0**	40	34,0	8,5	22	146	542	44,0
23050.0124		28,0	44	37,0	9,5	24	168	698	61,0
23050.0127		31,5**	50	43,0	10,5	27	221	1021	90,0
23050.0130		35,0	56	49,0	12,0	30	269	1355	124,0
23050.0133		38,5**	62	55,0	14,0	33	326***	1969***	180,0
23050.0136		42,0	68	60,0	15,0	36	394	2372	230,0
23050.0139		45,0**	75	67,0	17,0	39	460***	3276***	339,0
23050.0142		49,0	78	70,0	18,0	42	542	3802	360,0
23050.0148		56,0	92	82,0	22,0	48	714	5730	640,0
23050.0152		60,0**	96	85,0	24,0	52	832***	7876***	740,0
23050.0156		65,0**	103	93,0	25,0	56	960***	9793***	900,0
23050.0160		70,0**	112	102,0	28,0	60	1122***	12219***	1165,0
23050.0164		75,0**	120	110,0	30,0	64	1269***	14762***	1430,0
23050.0206	conical seats	7,1	17	11,0	4,0	6	9	10	5,6
23050.0208	from heat-	9,6	24	14,5	5,0	8	17	25	14,0
23050.0210	treated	12,0	30	18,5	5,0	10	26	46	22,0
23050.0212	steel, form G	14,2	36	20,0	6,0	12	38	82	39,0
23050.0214	(picture 3)	16,5	40	24,8	6,0	14	53	130	47,0
23050.0216		19,0	44	26,0	7,0	16	73	206	65,0
23050.0220		23,2	50	31,0	8,0	20	117	407	93,0
23050.0224		28,0	60	37,0	10,0	24	168	698	165,0
23050.0230		35,0	68	49,0	12,0	30	269	1355	235,0



* Torques of screws 8.8, eventual pre-loads to be considered, coefficient of friction μ_{total} 0,14

** DIN standards do not include these dimensions.

*** Figures theoretically determined

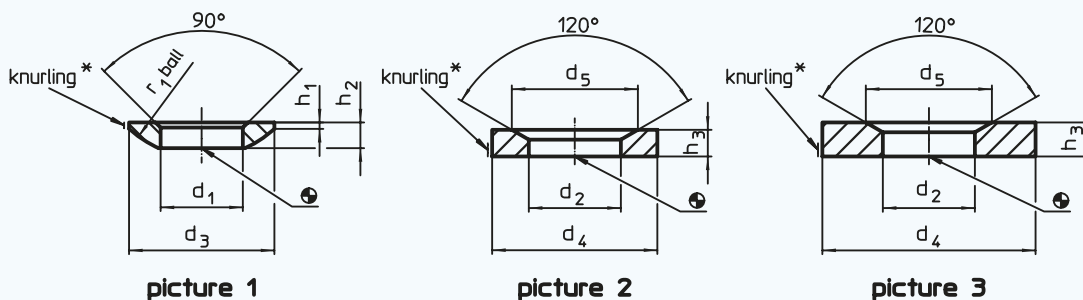


EH 23050.

Spherical Washers Conical Seats

stainless steel

similar to DIN 6319



* Knurling = material identification for stainless steel A4 type

Material:

Spherical washer: • Stainless steel 1.4305
• Stainless steel A4

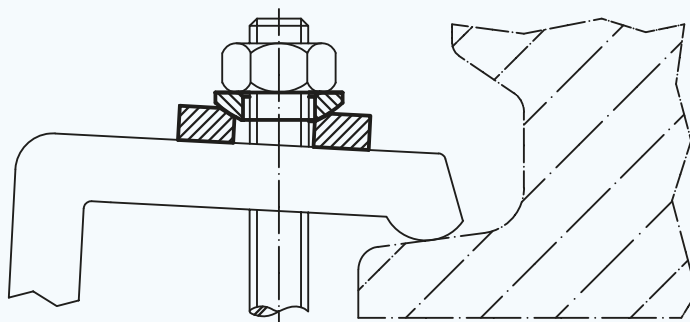
Conical seat: • Stainless steel 1.4305
• Stainless steel A4

Note:

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

Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel A4	Finish	d ₁ H13	d ₃	h ₁	h ₂	h ₄ ≈ with conical-seat form D	h ₄ ≈ with conical-seat form G	r ₁	For stud	Load capacity for static load max. kN	Torque for screwed connections max. Nm*	μ g
23050.0306	23050.0606	spherical washers	6,4	12	0,7	2,3	4,0	5,2	9	6	6	6	1,1
23050.0308	23050.0608	from stainless steel,	8,4	17	0,6	3,2	5,3	6,8	12	8	12	16	2,8
23050.0310	23050.0610	form C	10,5	21	0,8	4,0	6,3	7,1	15	10	16	32	5,2
23050.0312	23050.0612	(picture 1)	13,0	24	1,1	4,6	7,9	8,9	17	12	24	56	7,7
23050.0316	23050.0616		17,0	30	1,3	5,3	9,3	10,1	22	16	45	135	13,0
23050.0320	23050.0620		21,0	36	2,0	6,3	11,6	12,1	27	20	71	280	23,0
23050.0324	23050.0624		25,0	44	2,4	8,2	14,9	15,4	32	24	105	455	46,0
23050.0330	23050.0630		31,0	56	3,6	11,2	18,8	18,8	41	30	191	1050	104,0
23050.0336	23050.0636		37,0	68	4,6	14,0	23,4	-	50	36	-	-	193,0
23050.0342	23050.0642		43,0	78	6,5	17,0	28,3	-	58	42	-	-	313,0
23050.0348	23050.0648		50,0	92	8,0	21,0	35,0	-	67	48	-	-	545,0

* Torques of screws A2-70 to be seen as very rough values only having information character; eventual pre-loads to be considered, coefficient of friction μ_{total} 0,12.



Continued from previous page

EH 23050.

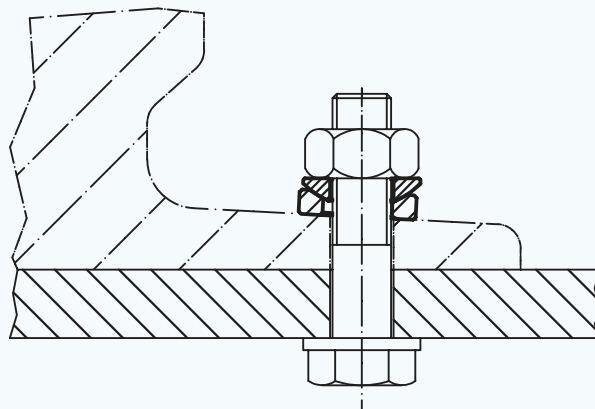
**Spherical Washers
Conical Seats**

stainless steel
similar to DIN 6319



Ref. No. Stainless steel 1.4305	Ref. No. Stainless steel A4	Finish	d ₂ H13	d ₄	d ₅	h ₃	For stud	Load capacity for static load max. kN	Torque for screwed connections max. Nm*	g
23050.0406	23050.0666	conical seats	7,1	12	11,0	2,8	6	6	6	1,4
23050.0408	23050.0668	from	9,6	17	14,5	3,5	8	12	16	3,8
23050.0410	23050.0670	stainless steel,	12,0	21	18,5	4,2	10	16	32	6,5
23050.0412	23050.0672	form D	14,2	24	20,0	5,0	12	24	56	11,0
23050.0416	23050.0676	(picture 2)	19,0	30	26,0	6,2	16	45	135	19,0
23050.0420	23050.0680		23,2	36	31,0	7,5	20	71	280	32,0
23050.0424	23050.0684		28,0	44	37,0	9,5	24	105	455	63,0
23050.0430	23050.0686		35,0	56	49,0	12,0	30	191	1050	127,0
23050.0436	23050.0688		42,0	68	60,0	15,0	36	-	-	234,0
23050.0442	23050.0692		49,0	78	70,0	18,0	42	-	-	362,0
23050.0448	23050.0694		56,0	92	82,0	22,0	48	-	-	642,0
23050.0466	23050.0706	conical seats	7,1	17	11,0	4,0	6	6	6	5,8
23050.0468	23050.0708	from	9,6	24	14,5	5,0	8	12	16	15,0
23050.0470	23050.0710	stainless steel,	12,0	30	18,5	5,0	10	16	32	22,0
23050.0472	23050.0712	form G	14,2	36	20,0	6,0	12	24	56	40,0
23050.0476	23050.0716	(picture 3)	19,0	44	26,0	7,0	16	45	135	66,0
23050.0480	23050.0720		23,2	50	31,0	8,0	20	71	280	95,0
23050.0484	23050.0724		28,0	60	37,0	10,0	24	105	455	171,0
23050.0490	23050.0730		35,0	68	49,0	12,0	30	191	1050	236,0

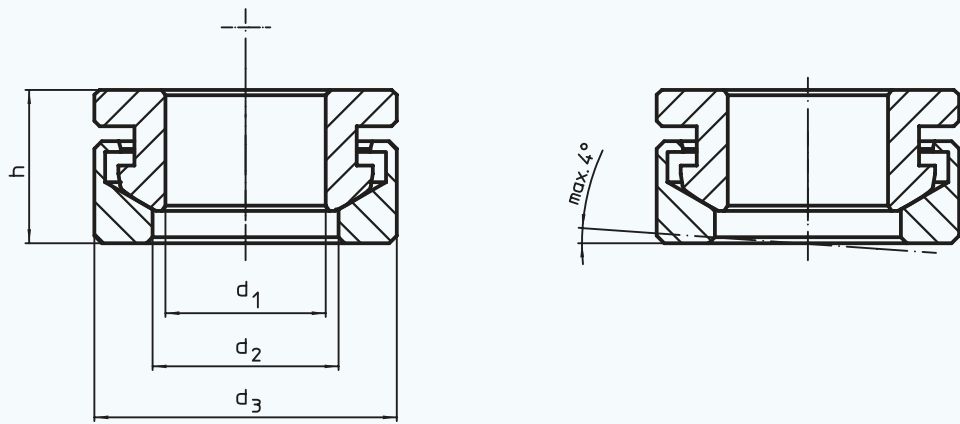
* Torques of screws A2-70 to be seen as very rough values only having information character; eventual pre-loads to be considered, coefficient of friction μ_{total} 0,12.



EH 23050.

Compact Spherical Washers Conical Seats

similar to DIN 6319



Material:

- Spherical washer:**
- Case-hardened steel, case hardened
 - Stainless steel 1.4305

- Conical seat:**
- Heat-treated steel, tempered
 - Stainless steel 1.4305

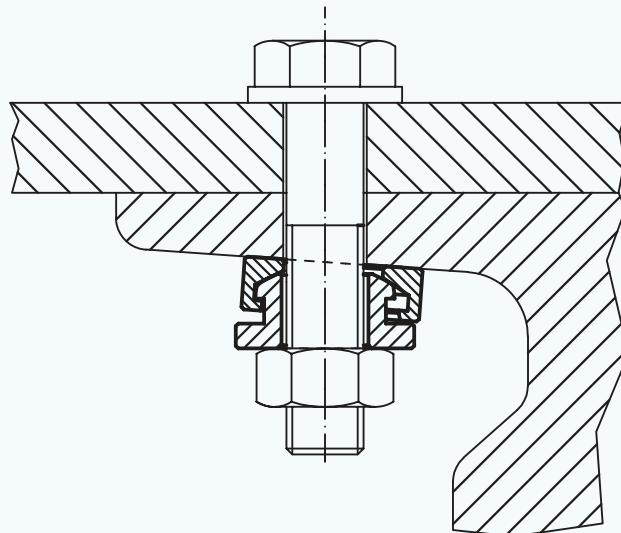
Note:

The compact spherical washer conical seat is a permanently fastened component of spherical washer and conical seat offering the following benefits:

- function-safety
- secured against loss
- quick and rational assembly
- simplified stock holding
- swiveling range max. 4°.

Ref. No. Steel	Ref. No. Stainless steel	d ₁ H13	d ₂	d ₃	h	For stud	Load capacity for static load max. kN*	g
23050.0506	23050.0556	6,4	7,4	13	7,0	M 6	9	4
23050.0508	23050.0558	8,4	9,7	17	8,5	M 8	17	9
23050.0510	23050.0560	10,5	12,0	21	10,5	M 10	26	17
23050.0512	23050.0562	13,0	14,8	25	13,0	M 12	38	34
23050.0516	23050.0566	17,0	19,7	32	17,0	M 16	73	61
23050.0520	23050.0570	21,0	24,6	40	20,3	M 20	117	113

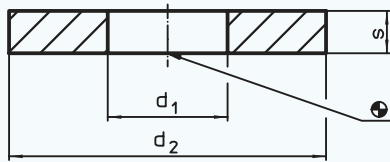
* Statements on load capacity are not valid for the stainless steel type.



EH 23060.

Plain Washers

DIN 6340 heat-treated

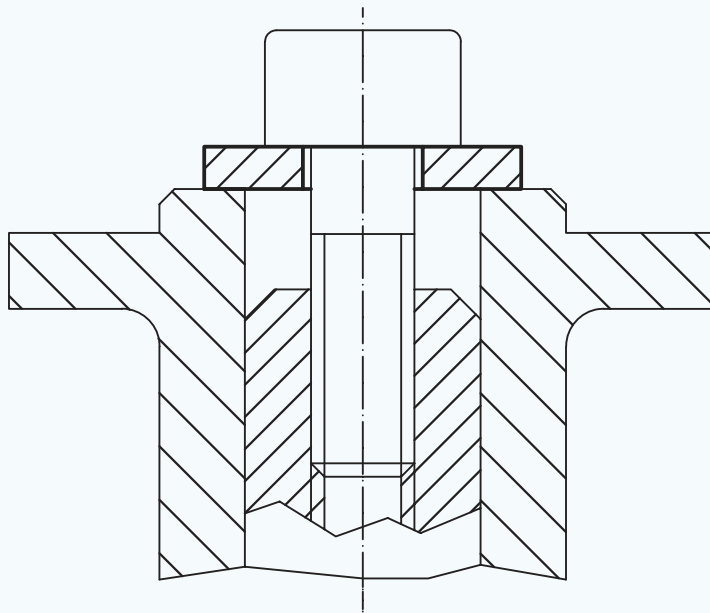


Material:

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

Ref. No.	d_1	d_2	s	For bolts with thread	$\frac{M}{g}$
23060.0006	6,4	17	3	M 6	3,8
23060.0008	8,4	23	4	M 8	9,8
23060.0010	10,5	28	4	M 10	14,0
23060.0012	13,0	35	5	M 12	28,0
23060.0014	15,0*	40	5	M 14	40,0
23060.0016	17,0	45	6	M 16	55,0
23060.0018	19,0*	45	6	M 18	53,0
23060.0020	21,0	50	6	M 20	71,0
23060.0022	23,0*	50	8	M 22	86,0
23060.0024	25,0	60	8	M 24	122,0
23060.0030	31,0	68	10	M 30	214,0
23060.0036	38,0*	80	12	M 36	360,0

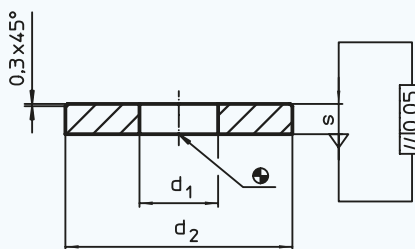
* DIN standards do not include these dimensions.



EH 23060.

Plain Washers

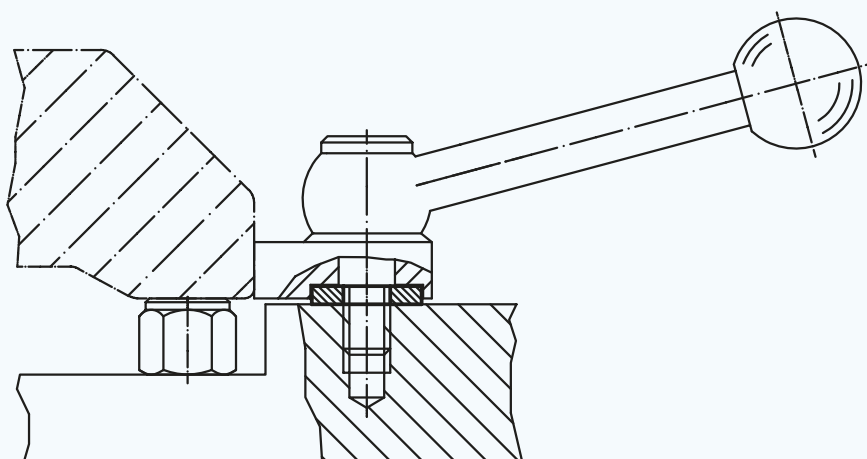
high precision design



Material:

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

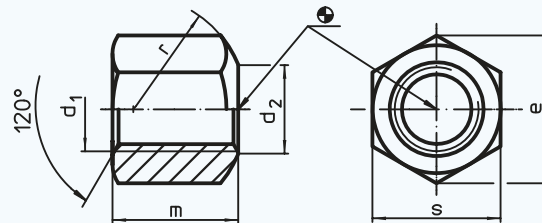
Ref. No. Steel	Ref. No. Stainless steel	d ₁	d ₂	s	For screw	g
23060.0105	23060.0155	5,3	13	3	M 5	2,5
23060.0106	23060.0156	6,4	17	3	M 6	4,5
23060.0108	23060.0158	8,4	24	4	M 8	12,0
23060.0110	23060.0160	10,5	30	4	M 10	19,0
23060.0113	23060.0163	13,0	36	5	M 12	34,0
23060.0117	23060.0167	17,0	45	5	M 16	53,0



EH 23070.

Fixture Nuts

DIN 6330
(height 1,5 d)



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

Material:

- Heat-treated steel, tempered, quality 10, phosphated
- Stainless steel 1.4305

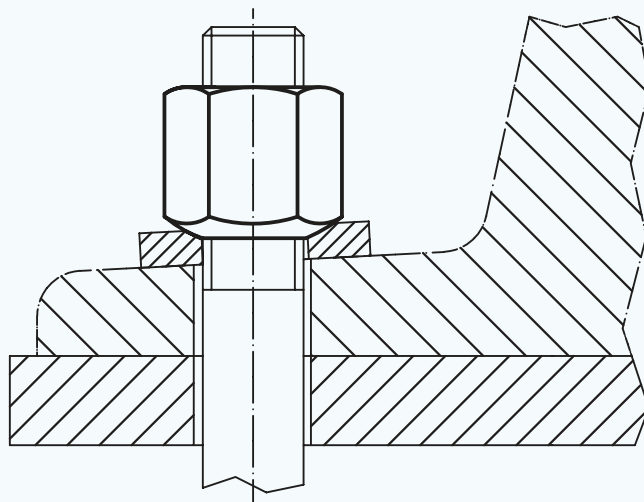
Note:

The spherical face matches DIN 6319 conical seats (EH 23050.).
This combination enables compensating for uneven surfaces.



Ref. No. Heat-treated steel	Ref. No. Stainless steel*	Finish	d ₁	d ₂	e	m	r	s	g
23070.0006	-	with lateral spherical bearing surface, form B	M 6	7,0	11,5	9	9,0	10	3,8
23070.0008	23070.0108		M 8	9,0	15,0	12	11,0	13	8,4
23070.0010	23070.0110		M 10	11,5	18,5	15	15,0	16	17,0
23070.0012	23070.0112		M 12	14,0	20,8	18	17,0	18	24,0
23070.0014*	-		M 14	16,0	24,2	21	20,0	21	39,0
23070.0016	23070.0116		M 16	18,0	27,7	24	22,0	24	55,0
23070.0018*	-		M 18	20,0	31,2	27	24,5	27	82,0
23070.0020	23070.0120		M 20	22,0	34,6	30	27,0	30	110,0
23070.0022*	-		M 22	24,0	39,3	33	29,0	34	162,0
23070.0024	-		M 24	26,0	41,6	36	32,0	36	192,0
23070.0030	-		M 30	32,0	53,1	45	41,0	46	400,0
23070.0036	-		M 36	38,0	63,5	54	50,0	55	684,0

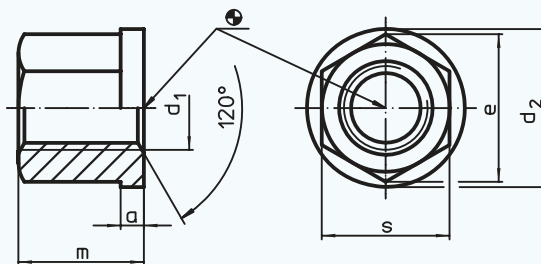
* DIN standards do not include these dimensions.



EH 23080.

Collar Nuts

DIN 6331
(height 1,5 d)



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

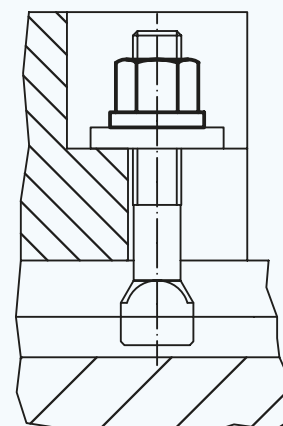
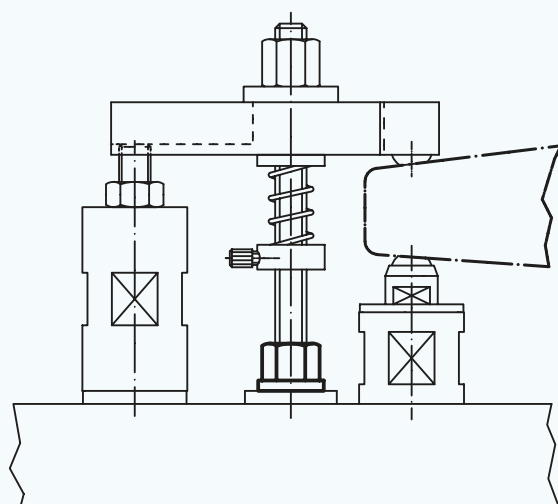
Material:

- Heat-treated steel, tempered, quality 10, phosphated
- Stainless steel 1.4305



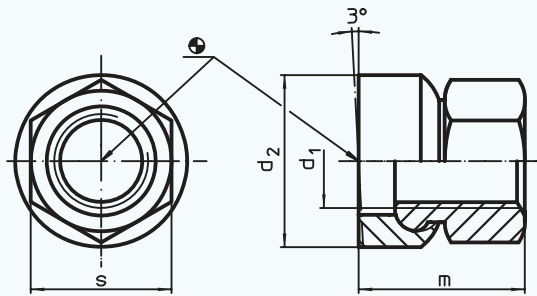
Ref. No. Heat-treated steel	Ref. No. Stainless steel*	d ₁	a	d ₂	e	m	s	g
23080.0006	-	M 6	3,0	14	11,5	9	10	5
23080.0008	23080.0108	M 8	3,5	18	15,0	12	13	12
23080.0010	23080.0110	M 10	4,0	22	18,5	15	16	22
23080.0012	23080.0112	M 12	4,0	25	20,8	18	18	30
23080.0014*	-	M 14	4,0	28	24,2	21	21	47
23080.0016	23080.0116	M 16	5,0	31	27,7	24	24	67
23080.0018*	-	M 18	5,0	34	31,2	27	27	97
23080.0020	23080.0120	M 20	6,0	37	34,6	30	30	129
23080.0022*	-	M 22	6,0	40	39,3	33	34	179
23080.0024	-	M 24	6,0	45	41,6	36	36	221
23080.0030	-	M 30	8,0	58	53,1	45	46	468
23080.0036	-	M 36	10,0	68	63,5	54	55	783

* DIN standards do not include these dimensions.



EH 23080.

Collar Nuts with Spherical Seat



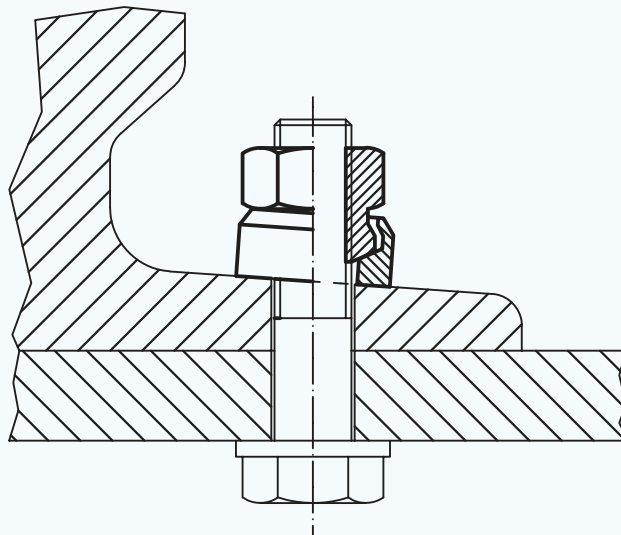
For torques and strengths please refer to appendix - Technical Data -

Material:

- Heat-treated steel, tempered, blackened



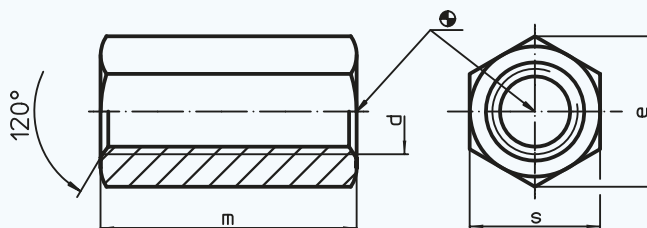
Ref. No.	d ₁	d ₂	m ≈	s	g
23080.0508	M 8	17	14,0	13	13
23080.0510	M 10	21	17,5	16	24
23080.0512	M 12	24	21,5	18	38
23080.0516	M 16	30	28,0	24	75
23080.0520	M 20	36	35,0	30	143
23080.0524	M 24	44	42,5	36	261
23080.0530	M 30	55	56,0	46	557



EH 23090.

Extension Nuts

(height 3 d)

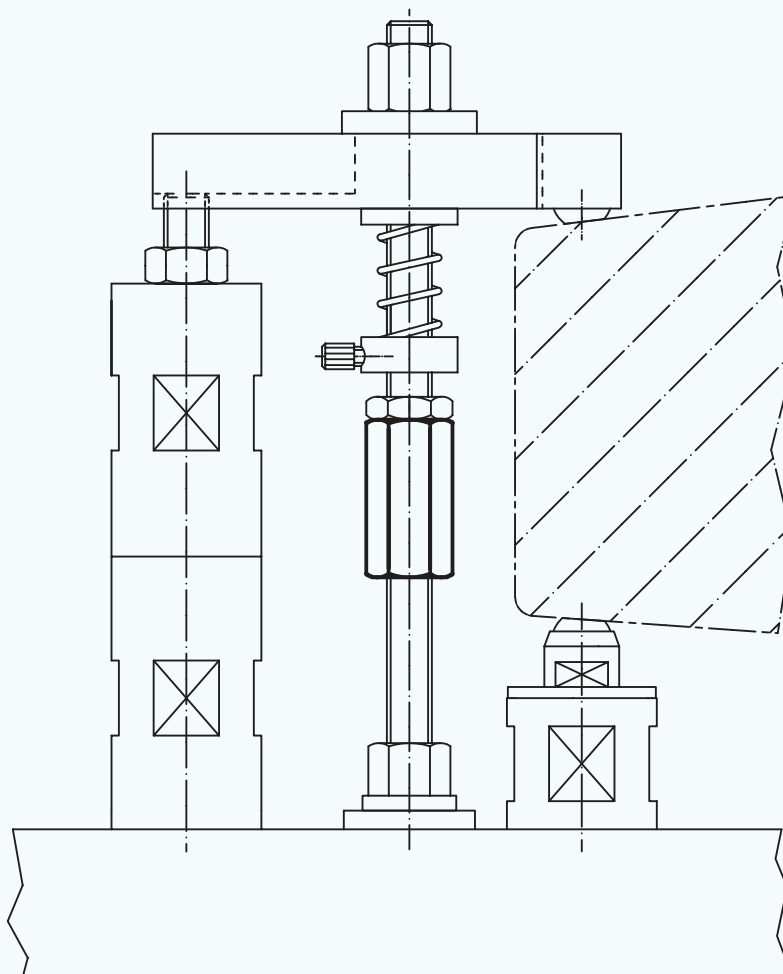


For torques and strengths please refer to appendix - Technical Data -

Material:

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

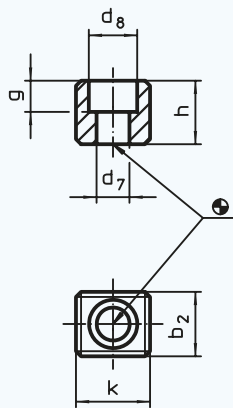
Ref. No.	d	e	m	s	g
23090.0006	M 6	11,5	18	10	9
23090.0008	M 8	15,0	24	13	19
23090.0010	M 10	18,5	30	16	35
23090.0012	M 12	20,8	36	18	49
23090.0014	M 14	24,2	42	21	79
23090.0016	M 16	27,7	48	24	119
23090.0020	M 20	34,6	60	30	229
23090.0024	M 24	41,6	72	36	403
23090.0030	M 30	53,1	90	46	819
23090.0036	M 36	63,5	108	55	1386



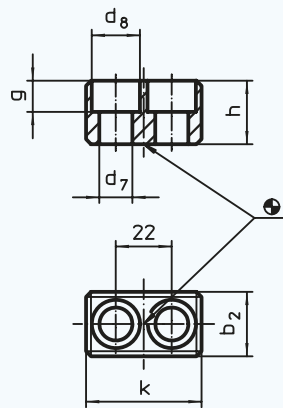
EH 23100.

Drive Blocks

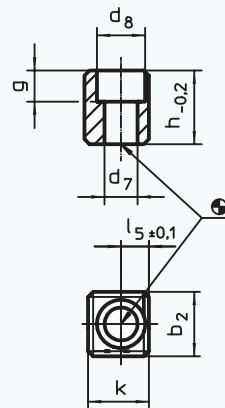
DIN 2079



picture 1



picture 2



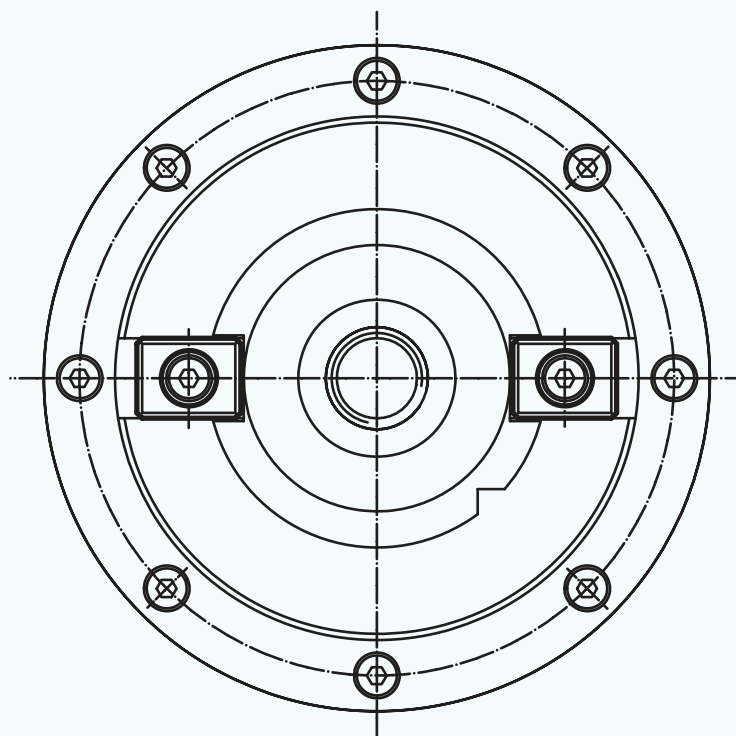
picture 3



Material:

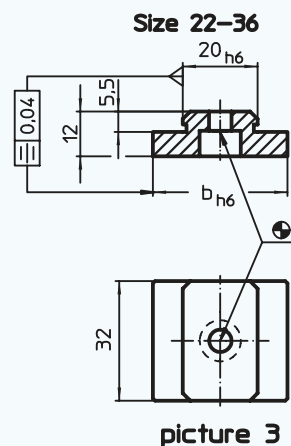
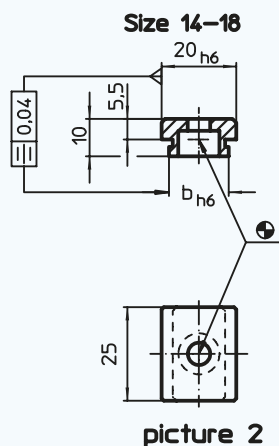
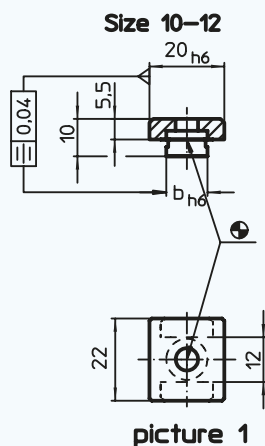
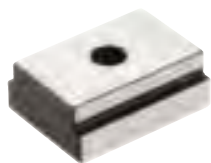
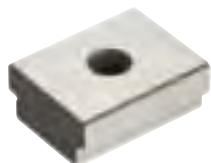
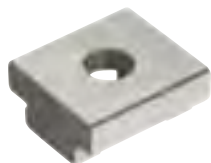
- Alloyed case-hardened steel, case hardened, blackened, ground

Ref. No.	Finish	Spindle head No.	k	b ₂ h5	d ₇	d ₈	g	h	l ₅	Correspond. screw ISO 4762	g
23100.0030	for spindle heads	30	16,5	15,9	6,4	10,4	6,2	16,0	-	M 6 x 16	25
23100.0040	nos. 30 to 60,	40	19,5	15,9	6,4	10,4	6,2	16,0	-	M 6 x 16	31
23100.0045	form A	45	19,5	19,0	8,4	13,5	8,3	19,0	-	M 8 x 20	38
23100.0050	(picture 1)	50-55	26,5	25,4	13,0	19,0	12,3	25,0	-	M 12 x 25	85
23100.0060		60	45,5	25,4	13,0	19,0	12,3	25,0	-	M 12 x 25	179
23100.0160	for spindle heads no. 60 form B (picture 2)	60	45,5	25,4	13,0	19,0	12,3	25,0	-	M 12 x 25	140
23100.0230	for spindle heads	30	13,5	15,9	6,4	10,4	6,2	24,5	5,5	M 6 x 25	30
23100.0240	nos. 30 to 50,	40	16,5	15,9	6,4	10,4	6,2	24,5	7,0	M 6 x 25	39
23100.0245	form C	45	17,5	19,0	8,4	13,5	10,0	26,0	7,5	M 8 x 25	47
23100.0250	(picture 3)	50	24,0	25,4	13,0	19,0	12,3	29,0	11,0	M 12 x 30	89



EH 23110.

**Fixed Slot
Tenons**



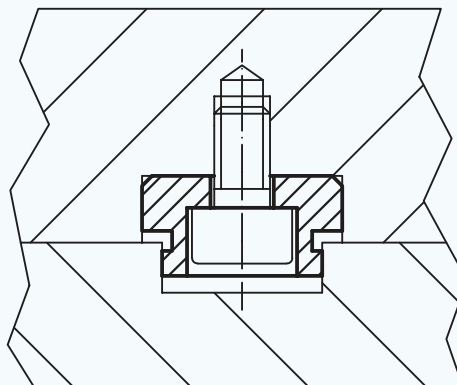
Material:

- Steel, case-hardened, blackened, ground

Note:

To be used for locating fixtures and clamping elements onto machine tables with T-slots to DIN 650.

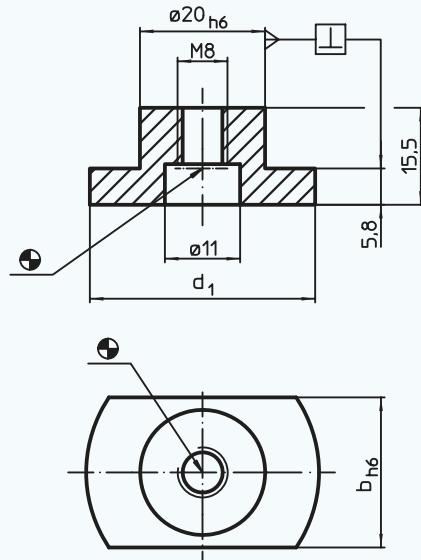
Ref. No.	Finish	T-slot size machine b h6	For screws ISO 1207 ISO 4762	μg
23110.0010	size 10-12	10	M 6 x 10	17
23110.0012	(picture 1)	12	M 6 x 10	18
23110.0014	size 14-18	14	M 6 x 10	26
23110.0016	(picture 2)	16	M 6 x 10	28
23110.0018	for size 20 refer to 23130.0020	18	M 6 x 10	29
23110.0022	size 22-36	22	M 6 x 16	53
23110.0024	(picture 3)	24	M 6 x 16	60
23110.0028		28	M 6 x 16	62
23110.0036		36	M 6 x 16	80



EH 23110.

Fixed Slot Tenons

with cylindrical fastening



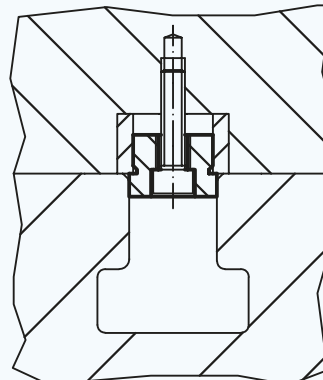
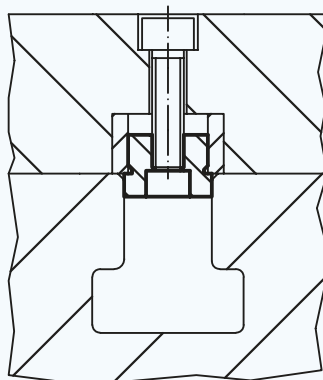
Material:

- Steel, case-hardened, blackened, ground

Note:

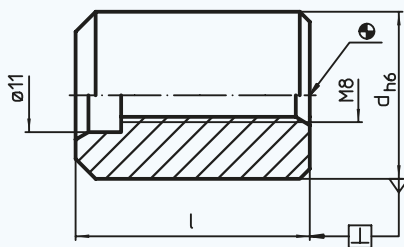
To be used for locating fixtures and clamping elements onto mounting pallets or pallets with cylindrical location holes. They can be inserted in holes as well as in slots.

Ref. No.	T-slot size machine b h6	d_1	For screws ISO 1207 ISO 4762	$\frac{g}{g}$
23110.0110	10	30	M 8 x 10	28
23110.0112	12	30	M 8 x 10	39
23110.0114	14	30	M 8 x 16	41
23110.0116	16	30	M 8 x 16	36
23110.0118	18	30	M 8 x 16	45
23110.0120	20	36	M 8 x 16	48
23110.0122	22	40	M 8 x 16	54
23110.0128	28	42	M 8 x 16	65
23110.0136	36	48	M 8 x 16	86



EH 23110.

Centering Pins



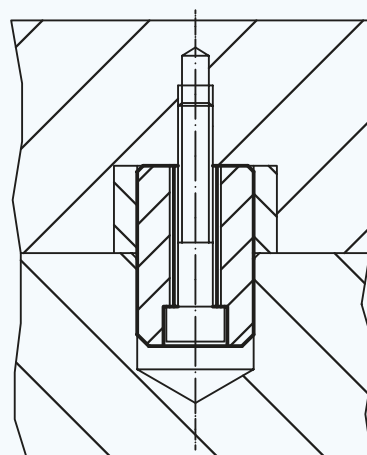
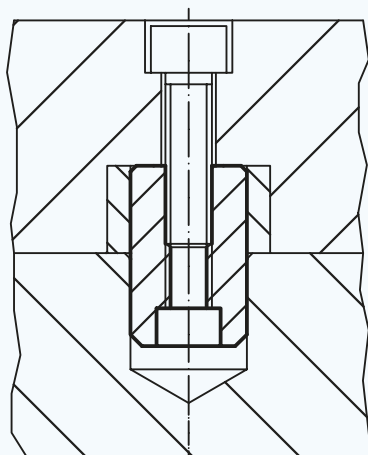
Material:

- Alloyed case-hardened steel, case hardened, ground

Note:

To be used for centering fixtures on pallets.

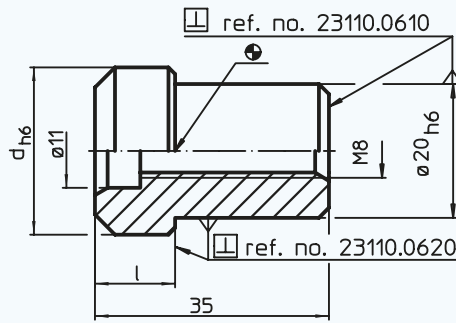
Ref. No.	d h6	l	g
23110.0510	20	31	70
23110.0520	25	35	126
23110.0530	50	31	473
23110.0540	50	45	672



EH 23110.

Centering Pins

recessed



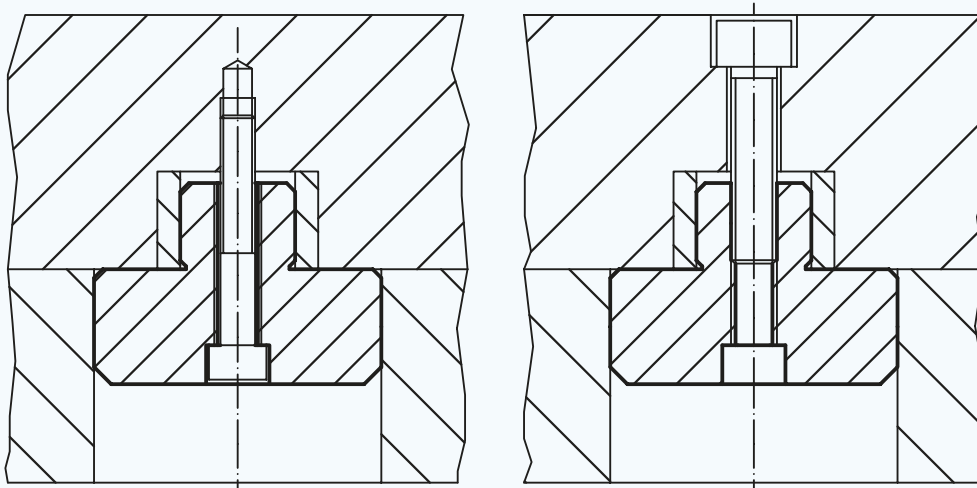
Material:

- Alloyed case-hardened steel, case hardened, ground

Note:

To be used for centering fixtures on pallets.

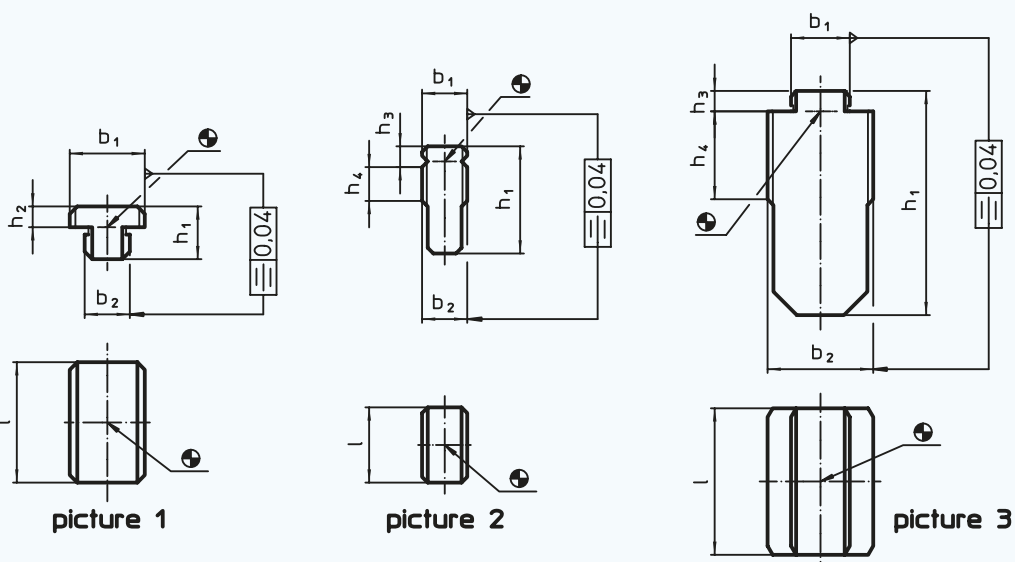
Ref. No.	d h6	l	$\frac{g}{g}$
23110.0610	25	12	87
23110.0620	50	20	330



EH 23120.

Loose Slot Tenons

DIN 6323



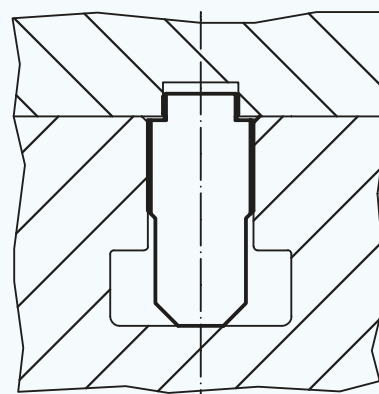
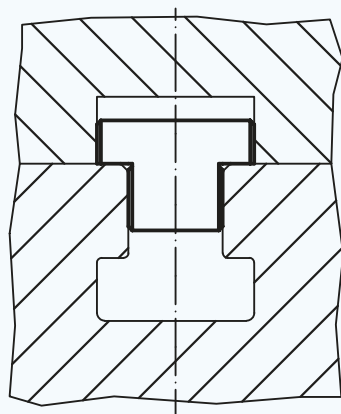
Material:

- Steel, case-hardened, blackened, ground

Note:

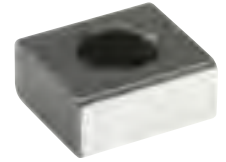
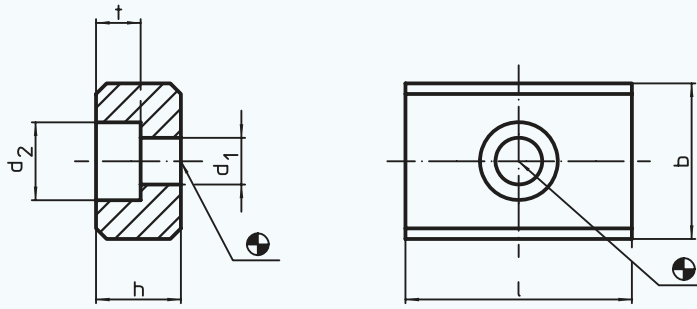
To be used for locating fixtures and clamping elements onto machine tables with T-slots to DIN 650. Being simply pushed into position after fixture or clamping element has been roughly positioned, they cannot cause damage to the machine as could protruding fixed slot tenons or low slot tenons.

Ref. No.	Finish	T-slot size	T-slot size	h ₁	h ₂	h ₃	h ₄	l	g
		fixture b ₁ h ₆	machine b ₂ h ₆						
23120.0010	form A, b ₁ > b ₂	12	10	12,0	3,6	–	–	20	20
23120.0012	(picture 1)	20	12	14,0	5,5	–	–	32	52
23120.0014		20	14	14,0	5,5	–	–	32	56
23120.0016		20	16	14,0	5,5	–	–	32	60
23120.0018		20	18	14,0	5,5	–	–	32	65
23120.0011	form B, b ₁ = b ₂	12	12	28,6	–	5,5	9	20	46
23120.0020	(picture 2)	20	20	45,5	–	7,0	16	32	202
23120.0022	form C, b ₁ < b ₂	20	22	50,5	–	7,0	18	40	302
23120.0028	(picture 3)	20	28	61,5	–	7,0	24	40	469
23120.0036		20	36	76,5	–	7,0	30	50	951



EH 23130.

**Low Slot
Tenons**



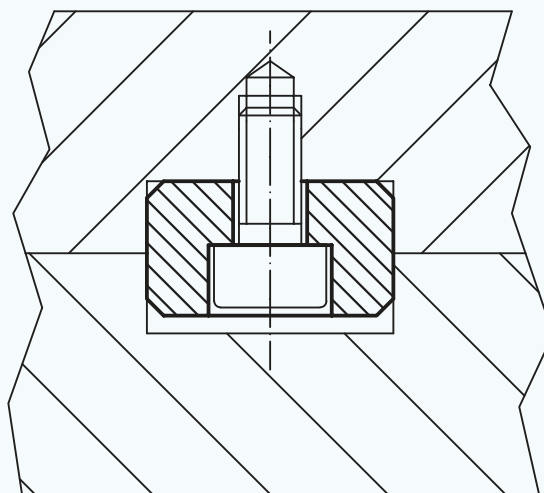
Material:

- Steel, case-hardened, blackened, ground

Note:

Used for locating fixtures and clamping elements onto machine tables with T-slots to DIN 650. They are bolted into the alignment slots of the fixture. Low slot tenons are suitable for use where a fixture will only be used on machines having an identical slot width.

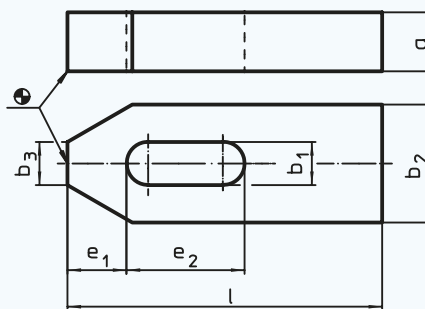
Ref. No.	b h6	h	l	d ₁	d ₂	t	For screws ISO 1207, ISO 4762	g
23130.0010	10	8	20	4,5	8	4,3	M 4 x 10	10
23130.0012	12	8	20	5,5	10	5,3	M 5 x 12	11
23130.0014	14	10	22	6,6	11	6,3	M 6 x 16	18
23130.0016	16	10	22	6,6	11	6,3	M 6 x 16	22
23130.0018	18	10	22	6,6	11	6,3	M 6 x 16	25
23130.0020	20	10	22	6,6	11	6,3	M 6 x 16	28
23130.0022	22	12	32	6,6	11	6,3	M 6 x 16	59
23130.0024	24	12	32	6,6	11	6,6	M 6 x 16	65



EH 23140.

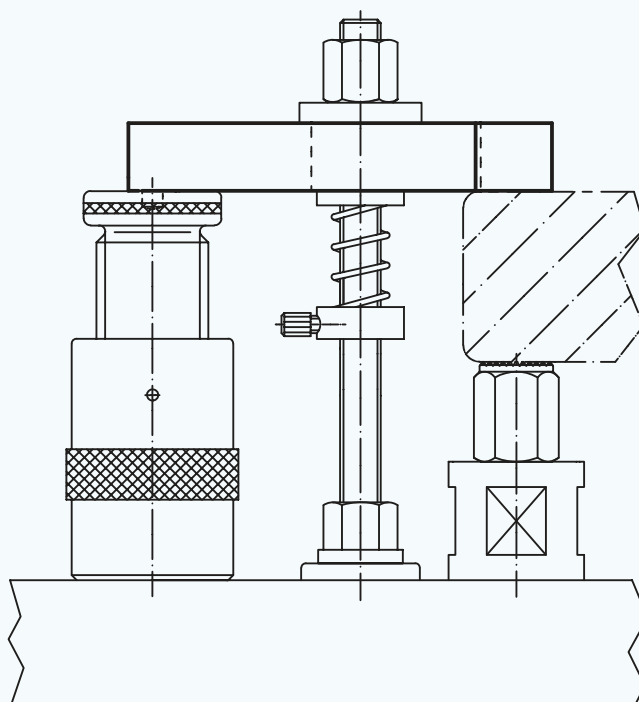
Plain Clamps

DIN 6314
flat



Material:
• Heat-treated steel, varnished

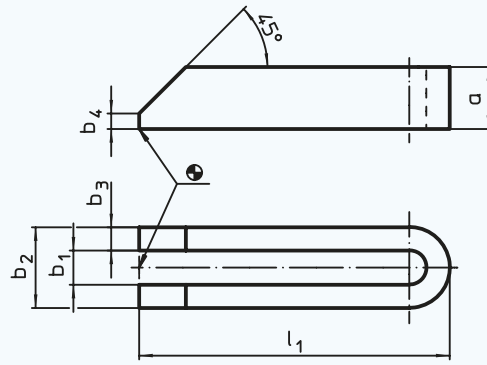
Ref. No.	Nominal dim. b ₁	l	a	b ₂	b ₃	e ₁	e ₂	For screws metric	For screws inch	g
23140.0007	6,6	50	10	20	8	10	20	M 6	1/4"	61
23140.0009	9,0	60	12	25	10	13	22	M 8	5/16"	112
23140.0011	11,0	80	15	30	12	15	30	M 10	3/8"	228
23140.0014	14,0	100	20	40	14	21	40	M 12, M 14	1/2"	492
23140.0015	14,0	125	20	40	14	21	50	M 12, M 14	1/2"	623
23140.0018	18,0	125	25	50	18	26	45	M 16, M 18	5/8"	980
23140.0019	18,0	160	25	50	18	26	65	M 16, M 18	5/8"	1246
23140.0022	22,0	160	30	60	22	30	60	M 20, M 22	3/4"	1793
23140.0023	22,0	200	30	60	22	30	80	M 20, M 22	3/4"	2244
23140.0026	26,0	200	30	70	26	35	80	M 24	1"	2617
23140.0027	26,0	250	30	70	26	35	105	M 24	1"	3823
23140.0034	33,0	250	40	80	34	45	100	M 30	1 1/4"	4980
23140.0035	33,0	315	50	80	34	45	130	M 30	1 1/4"	7840



EH 23150.

Clamps

DIN 6315 B
forked

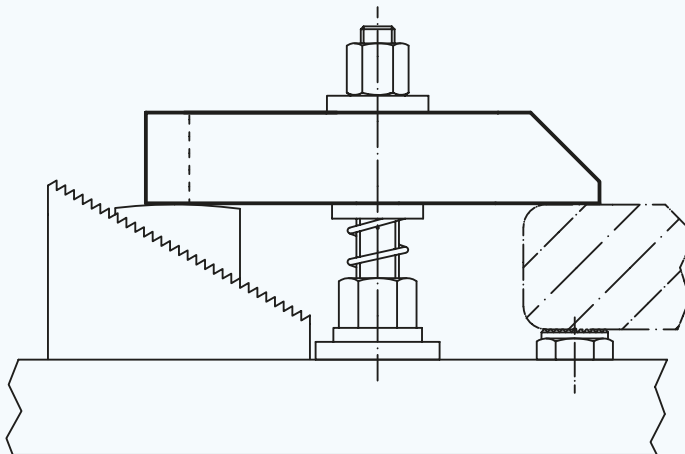


Material:

- Heat-treated steel, varnished

Ref. No.	Nominal dim. b ₁	l ₁	a	b ₂	b ₃	b ₄	For screws metric	For screws inch	g
23150.0007	6,6	60	12	19	6	3	M 6	1/4"	65
23150.0009	9,0	80	15	25	8	4	M 8	5/16"	141
23150.0011	11,0	100	20	31	10	5	M 10	3/8"	299
23150.0014	14,0	125	25	38	12	6	M 12, M 14	1/2"	578
23150.0015	14,0	160	25	38	12	6	M 12, M 14	1/2"	715
23150.0016	14,0	200	25	38	12	6	M 12, M 14	1/2"	905
23150.0018	18,0	160	30	48	15	8	M 16, M 18	5/8"	1077
23150.0019	18,0	200	30	48	15	8	M 16, M 18	5/8"	1346
23150.0020	18,0	250	40	48	15	10	M 16, M 18	5/8"	2300
23150.0022	22,0	200	40	52	15	10	M 20, M 22	3/4"	1809
23150.0023	22,0	250	40	62	20	10	M 20, M 22	3/4"	3021
23150.0024	22,0	315	40	62	20	10	M 20, M 22	3/4"	3800
23150.0026	26,0	200	40	66	20	10	M 24	1"	2377
23150.0027	26,0	250	40	66	20	10	M 24	1"	3031
23150.0028	26,0	315	40	66	20	10	M 24	1"	3802
23150.0034	33,0	250	50	74	20	12	M 30	1 1/4"	3720
23150.0035	33,0	315	50	74	20	12	M 30	1 1/4"	4743
23150.0036	33,0	400	50	74	20	12	M 30	1 1/4"	6080
23150.0040	40,0*	400	60	100	30	12	M 36	1 1/2"	10920
23150.0041	40,0*	600	60	100	30	12	M 36	1 1/2"	16500

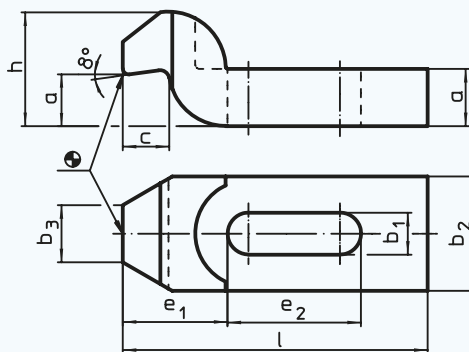
* DIN standards do not include these dimensions.



EH 23160.

Clamps

DIN 6316
with goose-neck

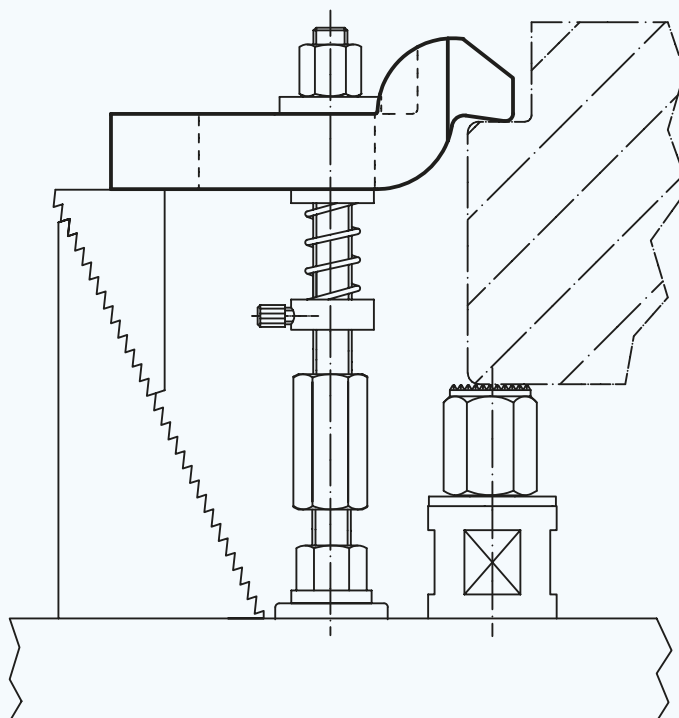


Material:

- Heat-treated steel, varnished

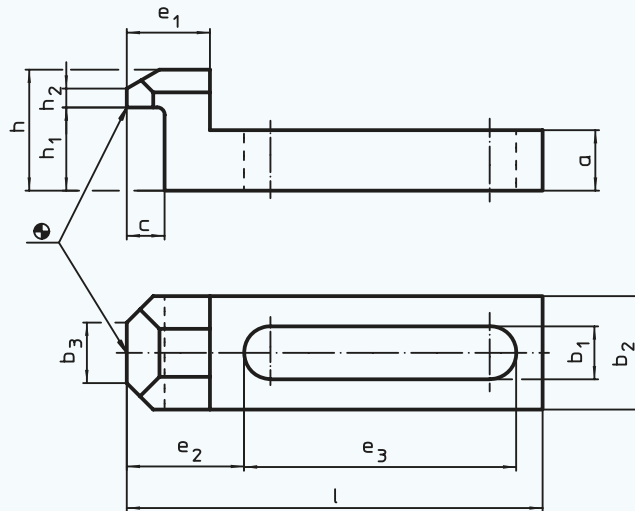
Ref. No.	Nominal dim. b ₁	l	a	b ₂	b ₃	c	e ₁	e ₂	h	For screws metric	For screws inch	g
23160.0007	6,6	60	10	20	10	8	20	20	20	M 6	1/4"	81
23160.0009	9,0	80	12	25	12	9	25	25	24	M 8	5/16"	165
23160.0011	11,0	100	15	30	15	12	32	32	30	M 10	3/8"	301
23160.0014	14,0	125	20	40	20	16	40	40	40	M 12, M 14	1/2"	679
23160.0018	18,0*	125	25	50	25	20	49	40	50	M 16, M 18	5/8"	1059
23160.0019	18,0	160	25	50	25	20	49	50	50	M 16, M 18	5/8"	1356
23160.0022	22,0*	160	30	60	30	24	55	55	60	M 20	3/4"	1898
23160.0023	22,0	200	30	60	30	24	55	70	60	M 20	3/4"	2383
23160.0026	26,0*	200	35	70	35	28	72	60	70	M 24	1"	3303
23160.0027	26,0	250	35	70	35	28	72	80	70	M 24	1"	4115
23160.0034	33,0*	250	40	80	40	40	91	80	80	M 30	1 1/4"	4500
23160.0035	33,0	315	50	80	40	40	91	100	100	M 30	1 1/4"	8340

* DIN standards do not include these dimensions.



EH 23160.

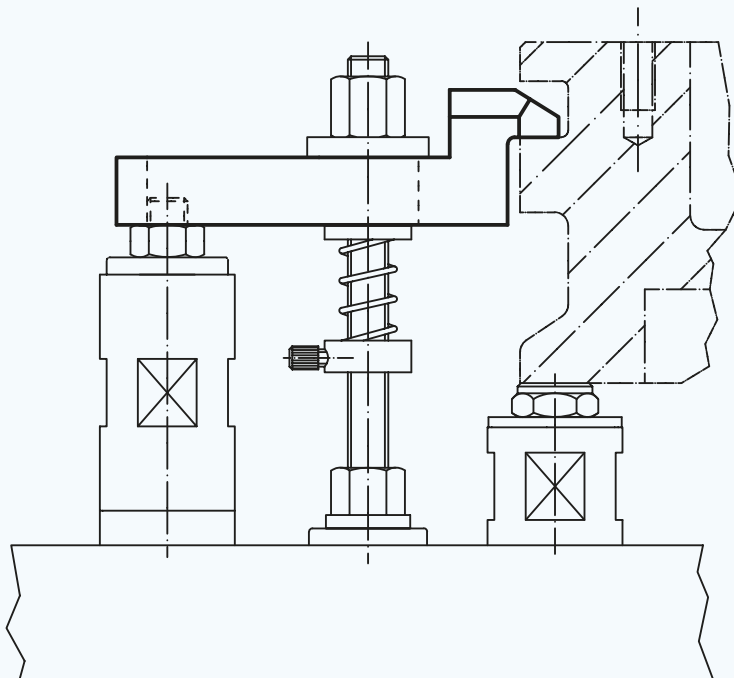
Clamps
stepped



Material:

- Heat-treated steel, tempered, blackened

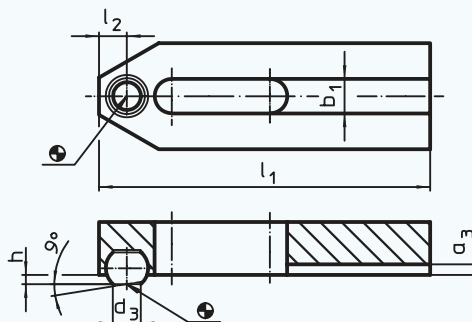
Ref. No.	Nominal dim. b ₁	l	a	b ₂	b ₃	c	e ₁	e ₂	e ₃	h	h ₁	h ₂	For screws metric	For screws inch	g
23160.0107	6,6	55	8	15	8	5	11	15,5	36	16	11	2	M 6	1/4"	39
23160.0109	9,0	70	10	20	10	8	15	19,5	46	20	14	3	M 8	5/16"	80
23160.0111	11,0	90	13	25	12	10	19	26,5	58	25	18	4	M 10	3/8"	170
23160.0113	13,0	115	16	30	15	12	24	32,5	75	32	23	5	M 12	1/2"	328
23160.0117	17,0	145	20	40	20	14	29	38,5	99	40	28	6	M 16	5/8"	685



EH 23180.

Clamps

with flat-faced ball



Remaining dimensions as DIN 6314, EH 23140.

Material:

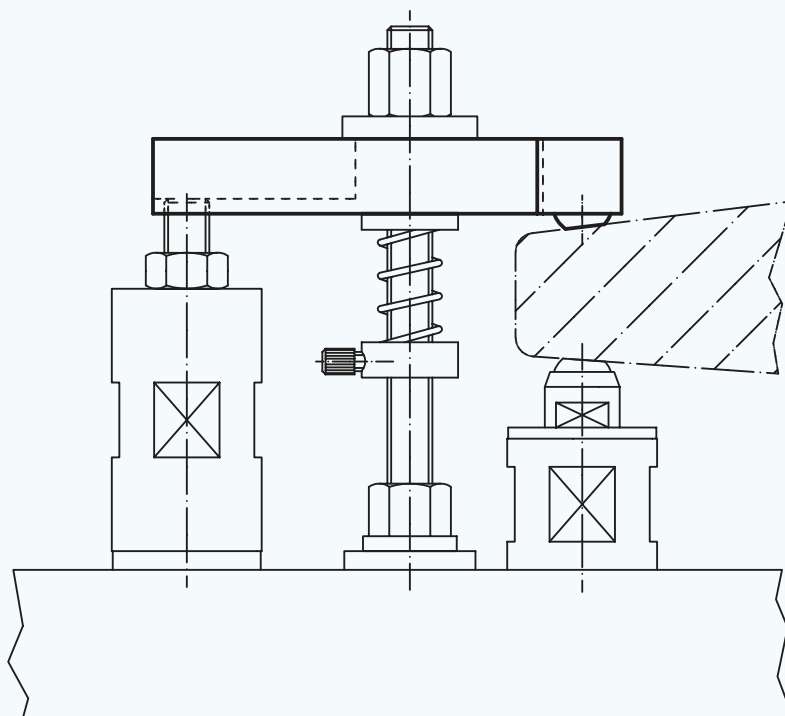
Clamp: • Heat-treated steel, blackened

Ball: • Ball-bearing steel, hardened, bright

Note:

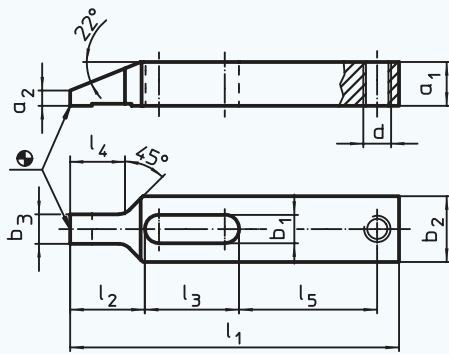
Ball secured against rotating.

Ref. No.	Nominal dim. b_1	l_1	d_3	a_3	h	l_2	Ball \varnothing	g
23180.0007	6,6	50	5,8	2,5	1,6	5,0	8,5	61
23180.0009	9,0	60	7,2	3,0	2,0	6,5	10,0	109
23180.0011	11,0	80	8,6	3,5	2,7	7,5	12,0	219
23180.0014	13,0	125	10,5	4,0	3,5	10,5	16,0	615

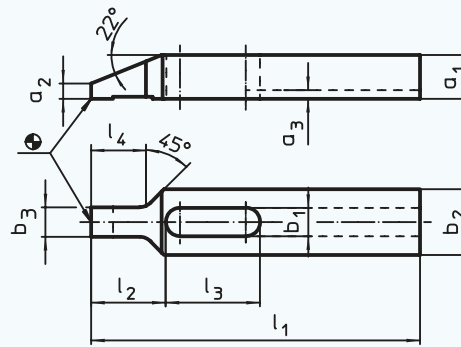


EH 23180.

**Clamps
with nose**



picture 1

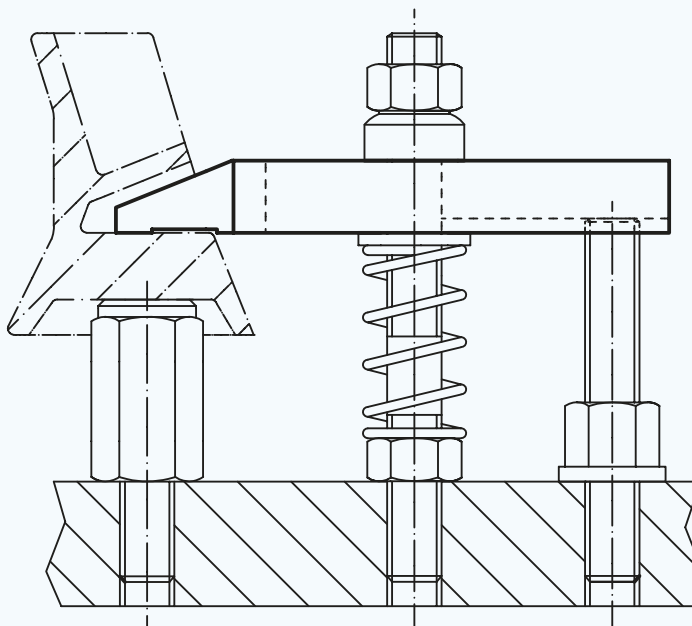


picture 2

Material:

- Heat-treated steel, tempered, blackened

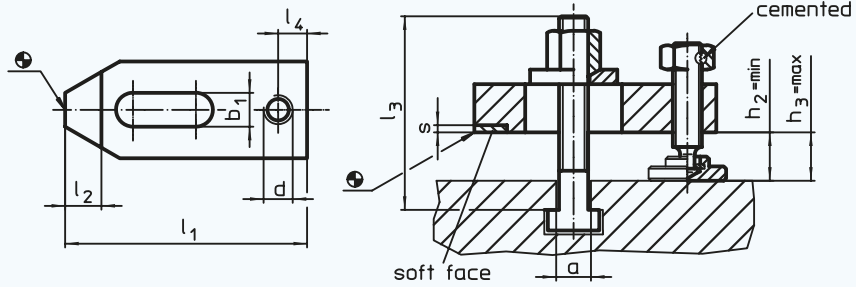
Ref. No.	Finish	Nominal dim. b ₁	l ₁	a ₁	a ₂	a ₃	b ₂	b ₃	d	l ₂	l ₃	l ₄	l ₅	Max. starting torque Nm	⌀ g
23180.0107	with thread	6,6	80	8	2,5	-	15	7,5	M 6	17	23	13	34	5	54
23180.0109	for adjusting screw	9,0	100	12	4,0	-	20	9,5	M 8	22	29	17	42	12	134
23180.0111	(picture 1)	11,0	125	15	5,0	-	25	11,5	M 10	28	36	21	52	30	263
23180.0113	(picture 1)	13,0	150	20	7,0	-	30	13,5	M 12	34	43	25	63	55	504
23180.0117	(picture 1)	17,0	175	25	9,0	-	35	15,5	M 16	40	52	29	70	80	828
23180.0207	with keyway	6,6	80	8	2,5	2,5	15	7,5	-	17	23	13	34	5	50
23180.0209	(picture 2)	9,0	100	12	4,0	3,0	20	9,5	-	22	29	17	42	12	127
23180.0211	(picture 2)	11,0	125	15	5,0	3,5	25	11,5	-	28	36	21	52	30	251
23180.0213	(picture 2)	13,0	150	20	7,0	4,0	30	13,5	-	34	43	25	63	55	488
23180.0217	(picture 2)	17,0	175	25	9,0	4,5	35	15,5	-	40	52	29	70	80	812



EH 23190.

Plain Clamps

with soft face



Remaining dimensions as DIN 6314, EH 23140.




Material:

Clamp: • Heat-treated steel, blackened

Soft face: • Brass, brazed

Note:

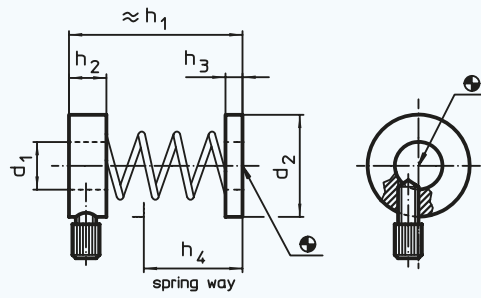
The brass plate protects the work piece from damage. The combination of nut DIN 6330 B (EH 23070.) / conical seat DIN 6319 G (EH 23050.) on the clamping bolt and thrust pad DIN 6311 (EH 22560. removable) on the adjusting screw compensates for the lack of parallelity. The clamp can be used either way (soft or hard clamping surface).

Ref. No.	Finish	a	l ₃	Nominal dim. b ₁	Clamping height min. h ₂	Clamping height max. h ₃	l ₁	d	l ₂	l ₄	s	g
23190.0010	without accessories	-	-	9	-	-	60 M	8	10	8	2	104
23190.0020		-	-	11	-	-	80 M	10	12	10	2	211
23190.0030		-	-	14	-	-	100 M	12	15	12	3	461
23190.0040		-	-	18	-	-	125 M	16	20	16	3	917
23190.0011	only with	-	-	9	8	15	60 M	8	10	8	2	150
23190.0012	adjusting screw	-	-	9	8	45	60 M	8	10	8	2	160
23190.0021		-	-	11	10	22	80 M	10	12	10	2	295
23190.0022		-	-	11	10	57	80 M	10	12	10	2	310
23190.0031		-	-	14	10	26	100 M	12	15	12	3	590
23190.0032		-	-	14	10	71	100 M	12	15	12	3	620
23190.0033		-	-	14	10	24	100 M	12	15	12	3	590
23190.0034		-	-	14	10	69	100 M	12	15	12	3	620
23190.0041		-	-	18	12	30	125 M	16	20	16	3	1150
23190.0042		-	-	18	12	90	125 M	16	20	16	3	1220
23190.0043		-	-	18	12	28	125 M	16	20	16	3	1150
23190.0044		-	-	18	12	88	125 M	16	20	16	3	1220
23190.0015	with adjusting screw	8	50	9	8	15	60 M	8	10	8	2	200
23190.0016	and clamping bolt	8	80	9	8	45	60 M	8	10	8	2	220
23190.0025		10	65	11	10	22	80 M	10	12	10	2	385
23190.0026		10	100	11	10	57	80 M	10	12	10	2	420
23190.0035		12	80	14	10	26	100 M	12	15	12	3	740
23190.0036		12	125	14	10	71	100 M	12	15	12	3	805
23190.0037		14	80	14	10	24	100 M	12	15	12	3	755
23190.0038		14	125	14	10	69	100 M	12	15	12	3	820
23190.0045		16	100	18	12	30	125 M	16	20	16	3	1470
23190.0046		16	160	18	12	90	125 M	16	20	16	3	1630
23190.0047		18	100	18	12	28	125 M	16	20	16	3	1490
23190.0048		18	160	18	12	88	125 M	16	20	16	3	1650

EH 23200.

Support Elements

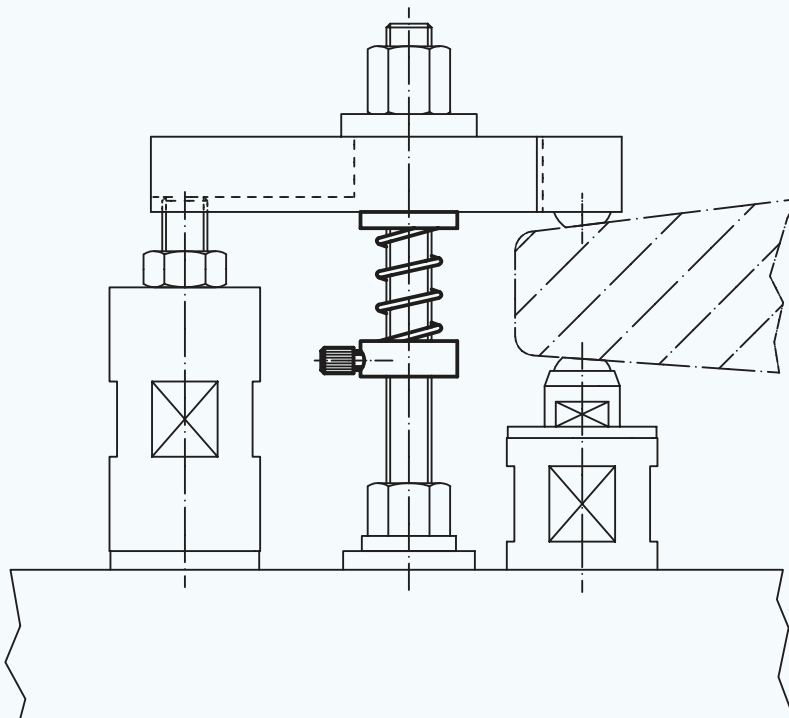
for clamps



Material:

Ring: • Aluminium, highly refractory **Knurled screw:** • Brass **Spring:** • Stainless steel

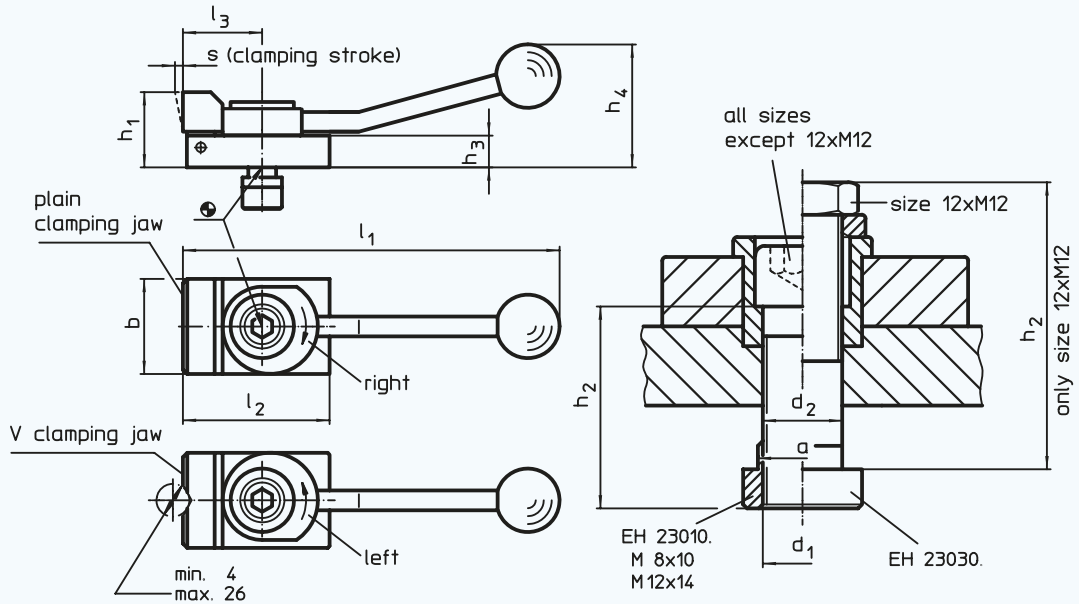
Ref. No.	d ₁	d ₂	h ₁	h ₂	h ₃	h ₄	For screw	g
23200.0010	8,5	24	35	11	5	14	M 6-M 8	24
23200.0020	14,0	28	51	11	5	29	M 10-M 12	28
23200.0030	16,5	35	60	12	5	35	M 16	44



EH 23210.

Down-Hold Clamps

with cranked clamping lever



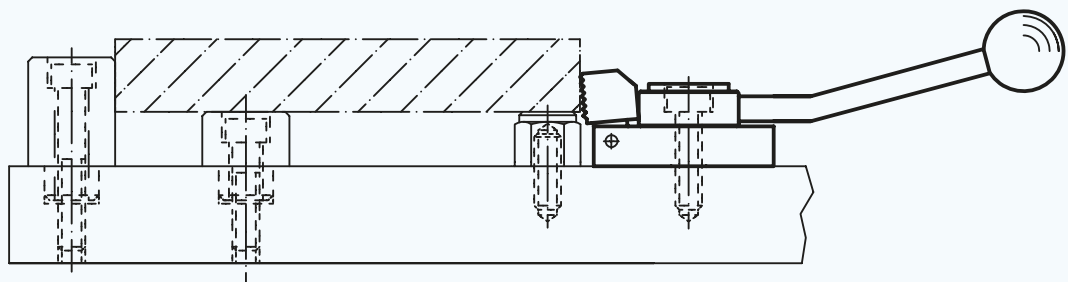
Material:

- Steel, case-hardened, blackened

Note:

The quick-acting clamping element simultaneously presses the work pieces towards both, the stops and fixture plate. The low profile construction enables the entire surface to be machined. In conjunction with cylindrical stops EH 23280., a special fixture can be replaced.

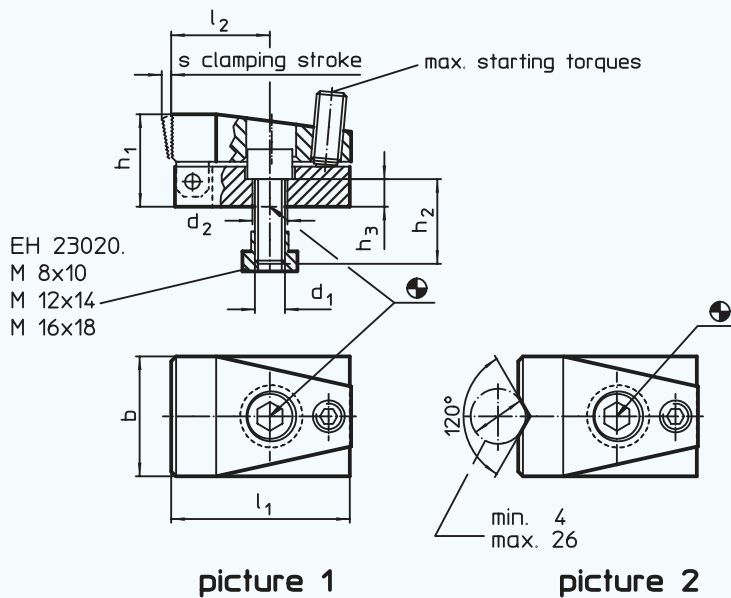
Ref. No.	Finish	a T-slot size	d ₁	d ₂	b	h ₁	h ₂	h ₃	h ₄	l ₁	l ₂	l ₃	s	Clamping horizontal kN max.	g
23210.0101	with flat	10	M 8	8,4	32	20	30	8	40	132	50	32	3	3,5	262
23210.0321	clamping jaw, clamping to the right	12	M 12	12,5	48	38	60	16	62	190	72	40	4	7,0	870
23210.0341		14	M 12	12,5	48	38	40	16	62	190	72	40	4	7,0	845
23210.0105	with flat	10	M 8	8,4	32	20	30	8	40	132	50	32	3	3,5	262
23210.0325	clamping jaw, clamping to the left	12	M 12	12,5	48	38	60	16	62	190	72	40	4	7,0	868
23210.0345		14	M 12	12,5	48	38	40	16	62	190	72	40	4	7,0	847
23210.0102	with	10	M 8	8,4	32	20	30	8	40	132	50	32	3	3,5	263
23210.0322	V-clamping jaw, clamping to the right	12	M 12	12,5	48	38	60	16	62	190	72	40	4	7,0	893
23210.0342		14	M 12	12,5	48	38	40	16	62	190	72	40	4	7,0	838
23210.0106	with	10	M 8	8,4	32	20	30	8	40	132	50	32	3	3,5	264
23210.0326	V-clamping jaw, clamping to the left	12	M 12	12,5	48	38	60	16	62	190	72	40	4	7,0	900
23210.0346		14	M 12	12,5	48	38	40	16	62	190	72	40	4	7,0	841



EH 23210.

Down-Hold Clamps

without clamping lever



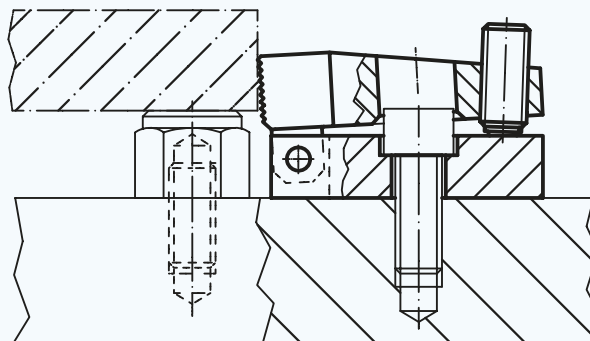
Material:

- Steel, case-hardened, blackened, ground

Note:

By tightening the ball-ended thrust screws, the work piece is simultaneously pressed towards the stops and fixture plate. The favourable leverage enables high horizontal clamping forces. When using T-nuts EH 23010. (DIN 508) they can also be applied to other slot sizes.

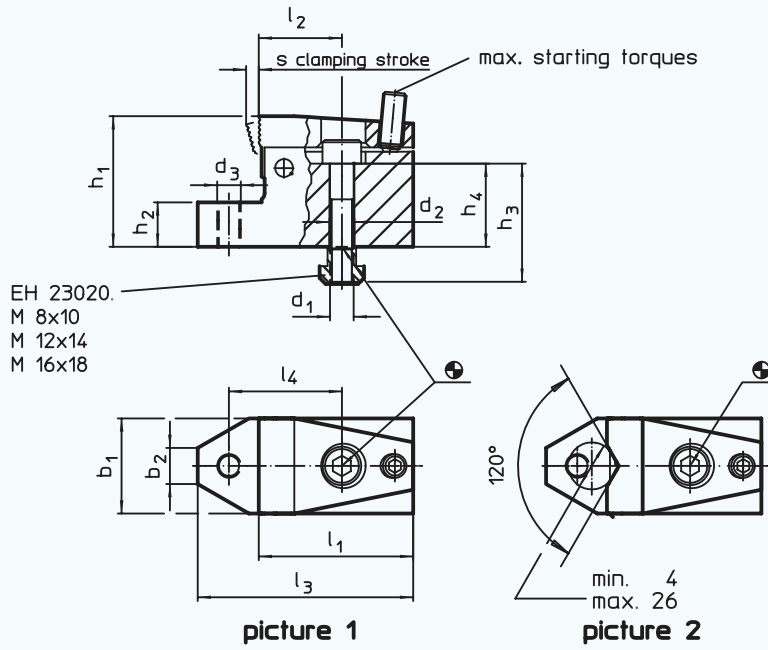
Ref. No.	Finish	T-slot size	d ₁	d ₂	b	h ₁	h ₂	h ₃	l ₁	l ₂	s	Clamping horizontal kN max.	Starting torque max. Nm	g
23210.0501	with flat	10	M 8	8,4	32	24	20	8	52	28	3	7,0	3	276
23210.0521	clamping jaw	14	M 12	12,5	48	37	30	11	72	40	4	15,0	9	831
23210.0541	(picture 1)	18	M 16	16,5	68	47	35	13	86	41	7	21,5	20	1749
23210.0502	with	10	M 8	8,4	32	24	20	8	52	28	3	7,0	3	266
23210.0522	V-clamping	14	M 12	12,5	48	37	30	11	72	40	4	15,0	9	833
23210.0542	jaw (picture 2)	18	M 16	16,5	68	47	35	13	86	41	7	21,5	20	1730



EH 23210.

Down-Hold Clamps

without clamping lever,
with bearing



Material:

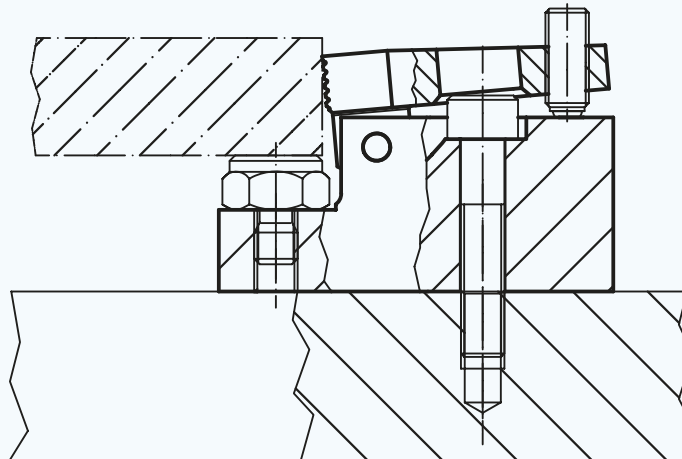
- Steel, case-hardened, blackened, ground

Note:

By tightening the ball-ended thrust screw the work piece is simultaneously pressed towards the stops and fixture plate. The favourable leverage enables high horizontal clamping forces. When using T-nuts EH 23010. / EH 23020. (DIN 508) they can also be applied to other slot sizes.

The integrated bearing is equipped with a location thread to fit for example screwed rest buttons EH 22690., self-aligning pads EH 22730. / EH 22740.

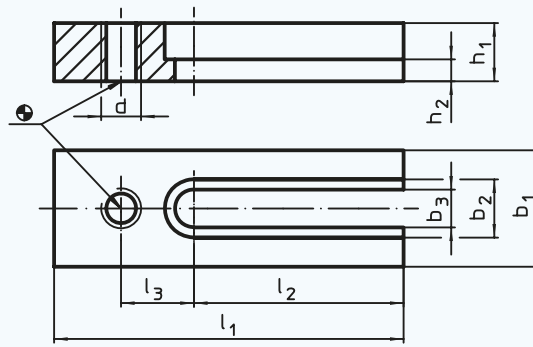
Ref. No.	Finish	T-slot size	d ₁	d ₂	d ₃	b ₁	b ₂	h ₁	h ₂ ±0,01	h ₃ ≈	h ₄ ≈	l ₁	l ₂	l ₃	l ₄	s	Clamping horizontal kN max.	Starting torque max. Nm	g
23210.0551	with flat	10	M 8	8,4	M 8	32	12,1	44	15	40	28	52	28	72,5	38	3	7,0	3	556
23210.0561	clamping jaw	14	M 12	13,0	M 12	48	16,0	53	15	45	27	72	40	100,0	55	4	15,0	9	1330
23210.0571	(picture 1)	18	M 16	17,0	M 16	68	18,8	72	20	60	38	86	41	126,0	63	7	21,5	20	3149
23210.0552	with	10	M 8	8,4	M 8	32	12,1	44	15	40	28	52	28	72,5	38	3	7,0	3	553
23210.0562	V-clamping	14	M 12	13,0	M 12	48	16,0	53	15	45	27	72	40	100,0	55	4	15,0	9	1324
23210.0572	jaw (picture 2)	18	M 16	17,0	M 16	68	18,8	72	20	60	38	86	41	126,0	63	7	21,5	20	3134



EH 23210.

Holding Plates

for down-hold clamps



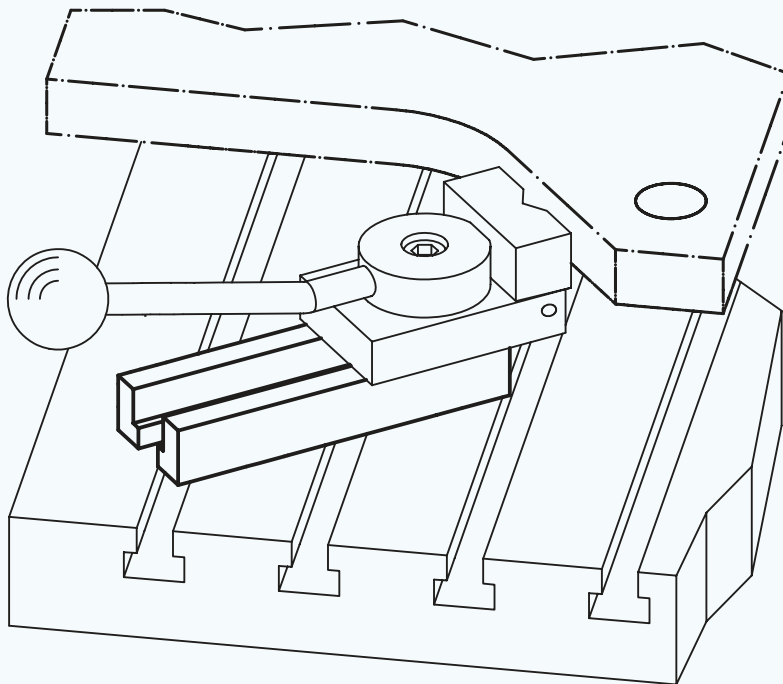
Material:

- Heat-treated steel, tempered, blackened

Note:

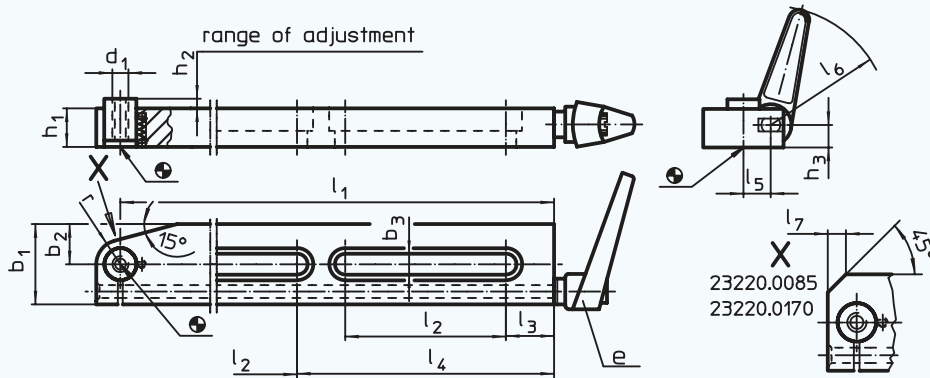
By using the holding plates, the down-hold clamps can also be placed in any desired position across the T-slots.

Ref. No.	b ₁	b ₂	b ₃	d	h ₁ -0,4	h ₂	l ₁	l ₂	l ₃	For down-hold clamps	g
23210.0730	30	15	9	M 8	15	6,5	100	63	20	M 8	246
23210.0740	40	20	13	M 12	20	7,5	120	72	25	M 12	515
23210.0760	60	26	17	M 16	30	13,0	140	80	30	M 16	1456



EH 23220.

Bedding Supports



Sizes 8,5 x 75, 13 x 150 and 17 x 170 have only one slot.

Material:

Clamp: • Steel, case-hardened, blackened, ground

Handle: • Zinc die-cast

Note:

The bedding support is used to **support** additional clamping points on components.

The benefits of the bedding support are:

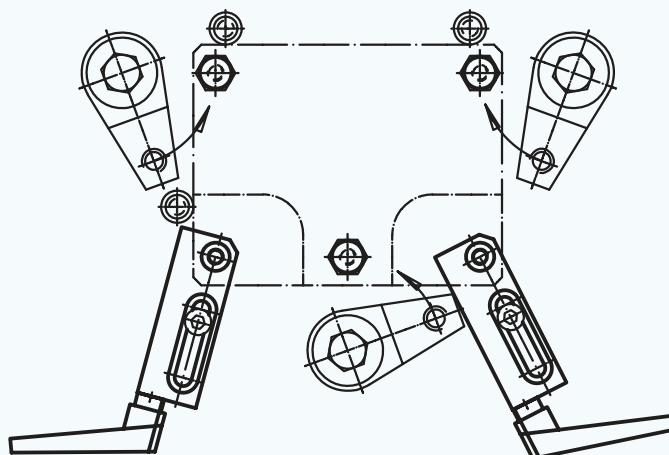
- provides additional support without distortion
- helps to eliminate tool vibration
- compact, low construction
- supports ribs, beads and shackles to reinforce clamped components
- distortion-free support of raw parts
- easy handling - clamping outside of work piece is also possible by means of adjustable clamping levers.

Clamping process:

1. By releasing the clamping lever the support bolt contacts the work piece with a slight spring load.
2. By clamping the lever the support bolt will be locked in position.
3. After taking out the work piece, release the clamping lever; reset support bolt and clamp via lever.

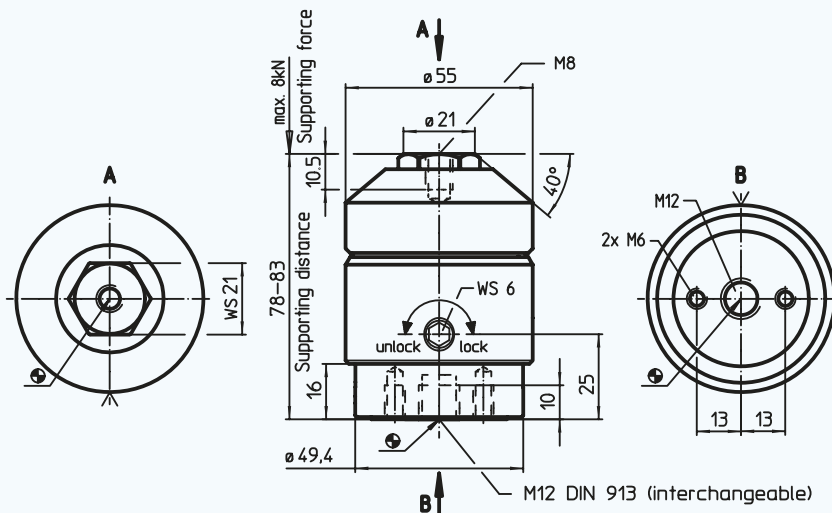
The supporting height can be adjusted by screwing threaded pins or supports into the female thread of the support bolt.

Ref. No.	b ₃	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	b ₁	b ₂	d ₁	h ₁	h ₂	h ₃	r	Thread stud diam.	Load capacity kN max.	e EH 24400.	g
23220.0085	8,5	75	35	13	-	13	62	5	30	10	M 8	19,5	3	11,5	-	13	0,5	18 x M 6	342
23220.0150	13,0	150	90	20	-	17	74	-	50	25	M 10	24,0	6	14,0	R15	20	2,5	22 x M 8	1159
23220.0170	17,0	170	100	25	-	27	108	11	60	20	M 16	34,0	11	21,5	-	26	5,0	30 x M 12	2534
23220.0300	13,0	300	100	30	160	17	74	-	50	25	M 10	24,0	6	14,0	R15	20	2,5	22 x M 8	2153



EH 23220.

Supporting Elements



Material:

Body: • Case hardened steel, nitrided, manganese phosphate treated and ground

Housing: • Aluminium

Note:

The support element is used to **support** additional clamping points on components.

The benefits of the support element are:

- provides additional support without distortion,
- helps to eliminate tool vibration,
- supports ribs, beads and shackles to reinforce clamped components,
- distortion-free support of raw parts.

Clamping process:

1. By turning the clamping cam (WS 6 hexagon socket) on the outer surface of the red protective sleeve, the support pin contacts the workpiece with a slight spring load.
2. By turning on as far as possible (lock), i.e. total of 180°, the clamping mechanism locks the support pin without moving. The support element has been placed onto the workpiece and locked.
3. If turned in the opposite direction (unlock), the clamping is released. If turned back as far as possible, i.e. total of 180° the support pin moves to the end position.

Assembly and Set-Up:

Fix the support element (2 x M 6 thread) onto the device. Pay attention to the operator's side!

Alternative: Dismantle the M 12 x 10 threaded pin and replace it by an M 12 x 30 threaded pin and assemble the support element with a wrench (WS 21), e.g. for T-slot mounting (no defined operator's side ensured). Threaded pin M 12 x 30 and T-nut DIN 508 M 12 x 14, quality 10, are part of the standard supply volume.

Lowering of the support element by 16 mm is possible.

Additional flexible possibility of fitting with holder 23470.0250 or holding plate 23210.0740.

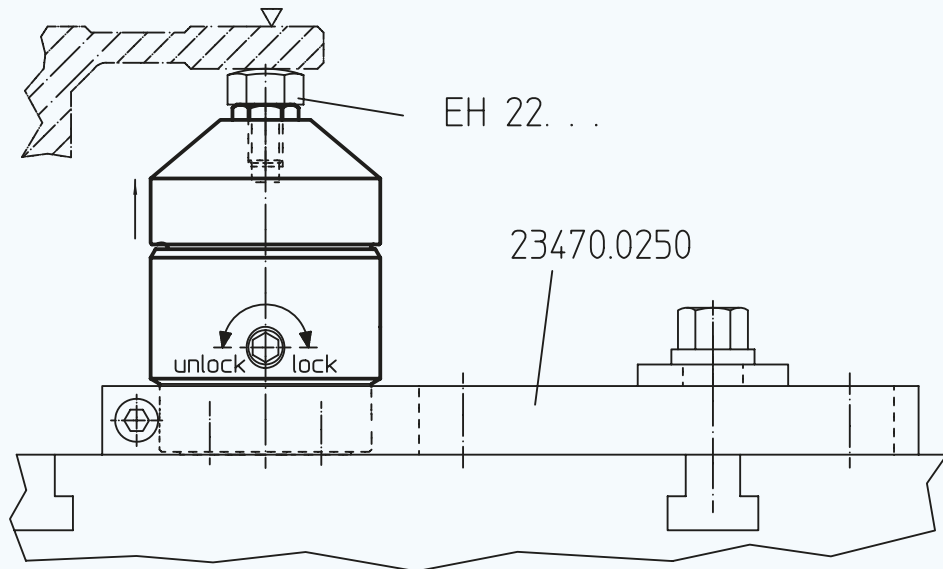
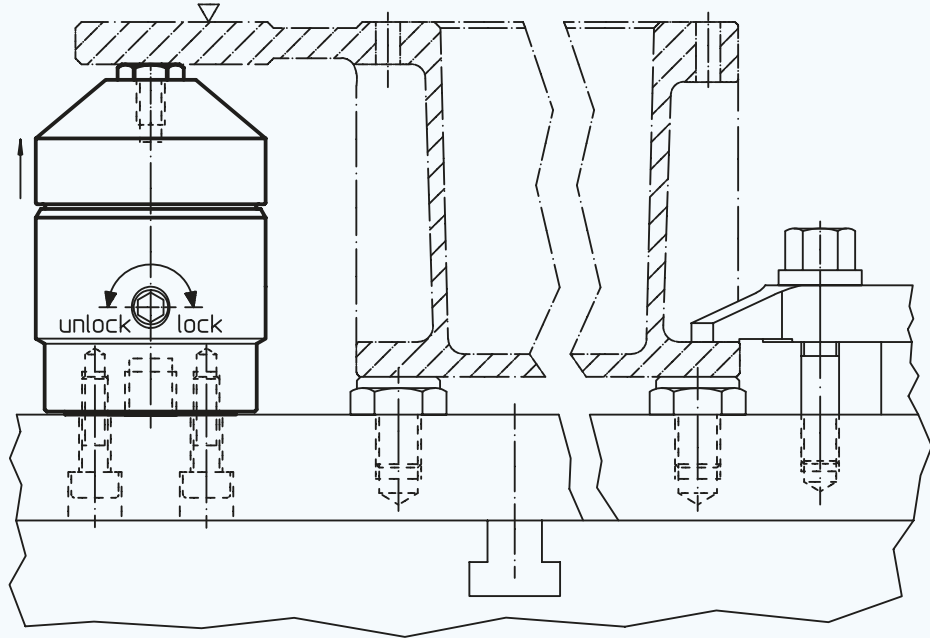
The M 8 threaded pin on the support bolt can be replaced by various locating and seating pins (EH 22...). Customer-made extensions can also be fitted. For safe functioning, the thread bore M 12 must always be closed.

Ref. No.	g
23220.0400	939

EH 23220.

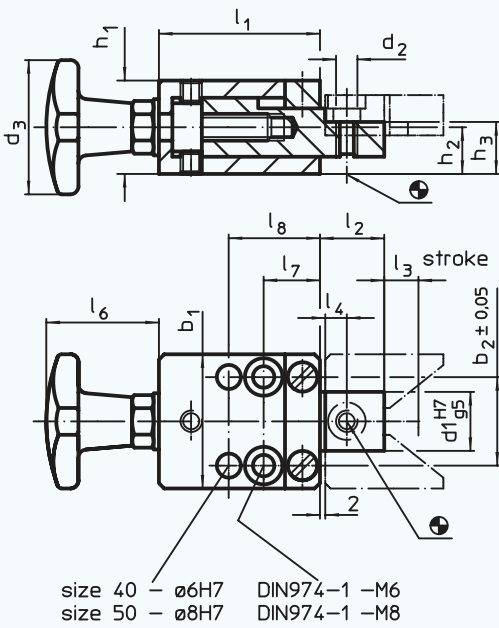
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Supporting Elements

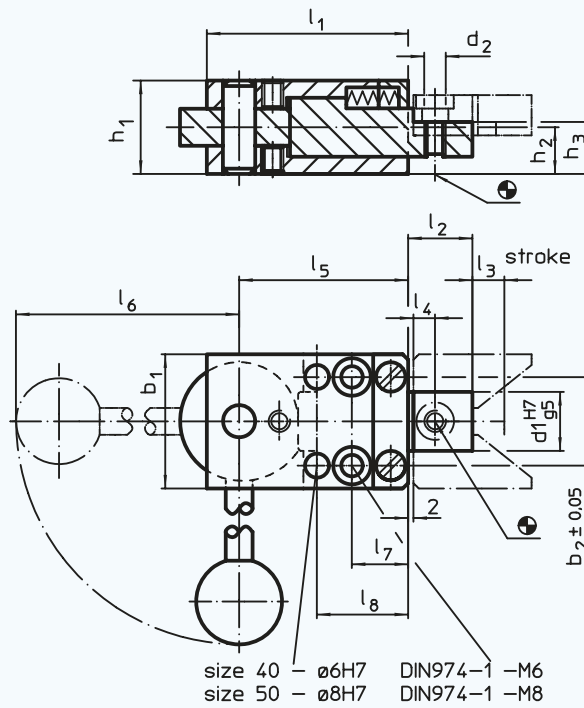


EH 23230.

Locating Clamps



with palm grip



with spiral eccentric clamping lever



Material:

Clamp: • Steel, case-hardened, blackened, ground

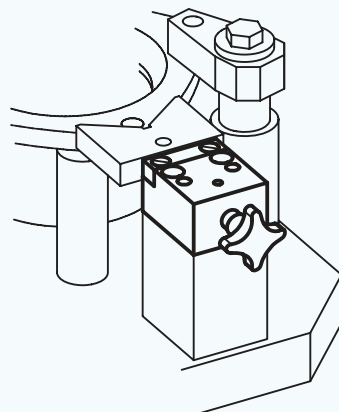
Handle: • DIN 6335 cast iron, orange plastic-coated
• DIN 319 plastic (PF 31), black

Note:

Suitable for a simultaneous "positioning" and "clamping" of workpieces. The locating element is a precision element which can be assembled from either side. The clamping and locating part adapted to the work piece is screwed to the cylindrical support. Clamping and locating parts are manufactured by the user according to the individual requirements.

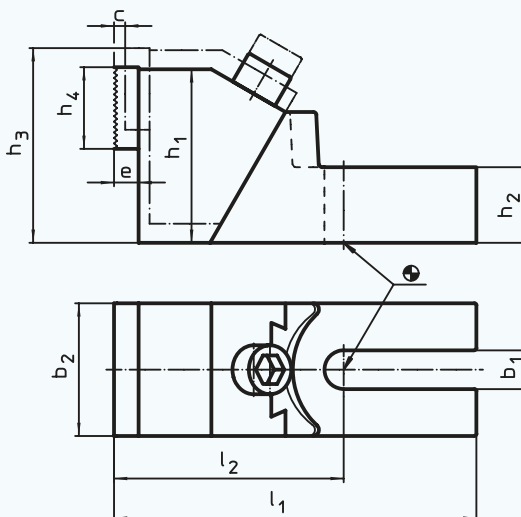
Ref. No. With palm grip	b ₁	b ₂	d ₁	d ₂	d ₃	h ₁	h ₂	h ₃	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	g
23230.0040	40	27	18	M 6	40	29,8	14,9	16,9	50	19	9	8	-	33	17	28	505
23230.0050	50	33	22	M 8	50	34,8	17,4	19,4	60	24	10	10	-	42	21	34	862

Ref. No. With spiral eccentric clamping lever	b ₁	b ₂	d ₁	d ₂	d ₃	h ₁	h ₂	h ₃	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	g
23230.0440	40	27	18	M 6	-	29,8	14,9	16,9	60	19	3	8	50	96	17	28	566
23230.0450	50	33	22	M 8	-	34,8	17,4	19,4	75	24	4	10	63	145	21	34	1071



EH 23240.

**Stabilizing
Clamping
Jaws**



Material:

Body: • Cast iron

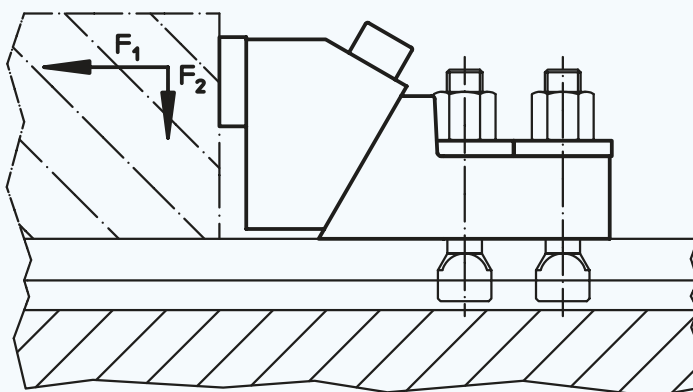
Clamping jaws: • Steel, case-hardened

Note:

Due to the big clamping jaw, this clamping element is suitable for lateral clamping of high work pieces. The clamping force acts forwards and downwards. Clamping plate is turnable, i.e. to the ground or ribbed side.

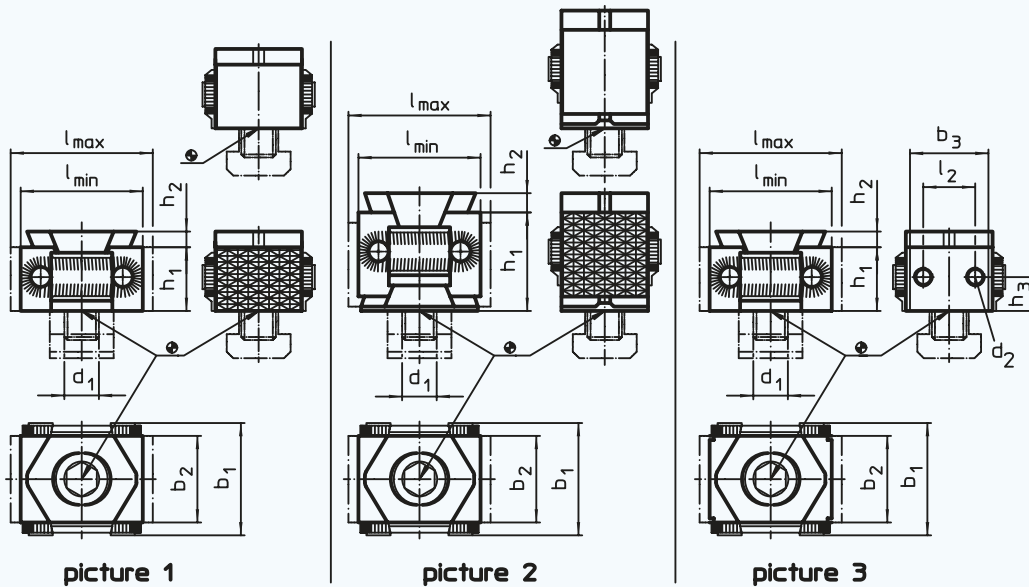
Ref. No.	b ₁	c	h ₁	h ₂	h ₃	h ₄	b ₂	l ₁	l ₂	e	g
23240.0012	19	8	85	37	99	40	65	177,5	112,5	12	4013
23240.0020	26	11	100	45	118	40	75	226,5	136,5	12	6760

b ₁	a T-slot size	F ₁ kN	F ₂ kN
19	12	8	1,2
19	14	15	2,2
19	16	20	3,0
19	18	28	4,2
26	20	30	4,5
26	22	30	4,5
26	24	32	4,8
26	28	32	4,8
26	30	36	5,4



EH 23250.

Taper Clamping Units



Material:

- Body:** • Tool steel, hardened, bright
Spring: • Spring steel wire

- Clamping jaws:** • Tool steel, hardened, blackened and ground
Screw: • Heat-treated steel, tempered, quality 12.9

Note:

Inserting the socket head screw moves the two clamping chucks outwards and presses the work pieces against a stop. Using the double taper, an additional vertical clamping force will be achieved. Stroke of taper clamping units with M 5 = ±0,5, M 8 = ±0,5, M 12 = ±1 and M 16 = ±1,5. Can be mounted in a threaded hole or with T-nuts for horizontal or vertical multiple chucking. T-nuts EH 23010. have to be purchased separately.

Taper clamping units can be applied in combination with the multiple clamping system EH 1582. - EH 1584. from the Halder Workholding Technique.

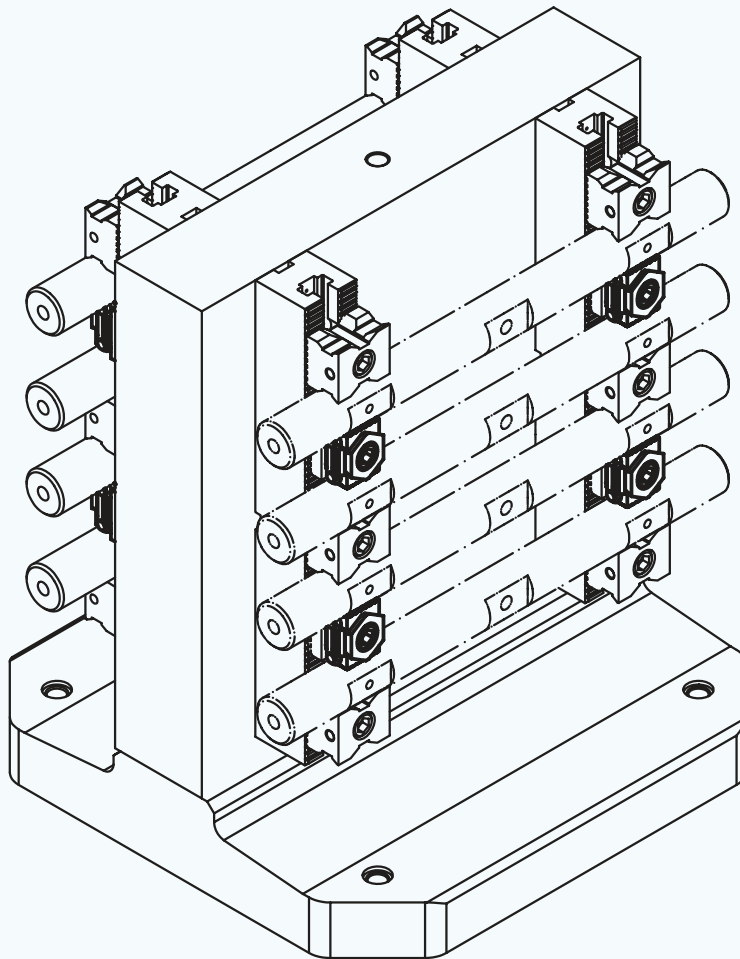
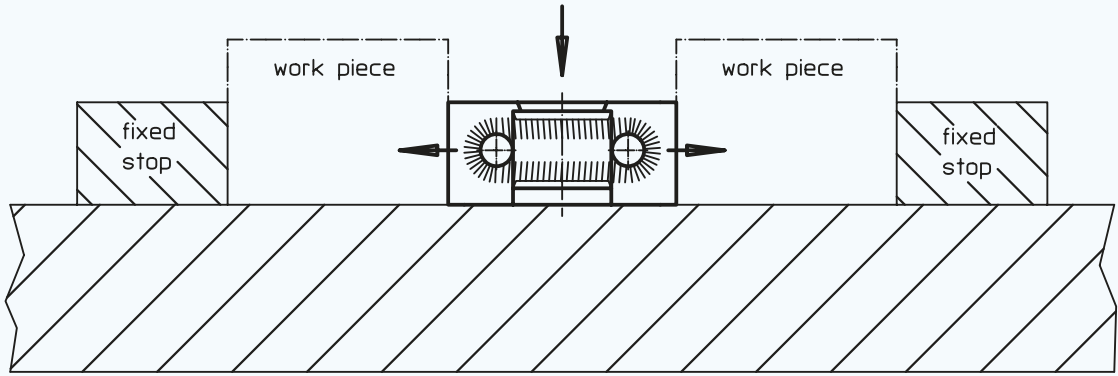
Ref. No.	Finish	d ₁	l min.	l max.	l ₂	b ₁	b ₂	b ₃	d ₂	h ₁	h ₂	h ₃	Clamping force kN	Torque moment Nm	±g
23250.0008	single taper,	M 8	27	31	-	29	21	-	-	15	2,5	-	20	43	73
23250.0012	ribbed clamping jaw	M 12	42	49	-	41	30	-	-	22	4,0	-	30	85	231
23250.0016	(picture 1)	M 16	57	65	-	56	42	-	-	29	5,0	-	50	210	587
23250.0065*	single taper,	M 5	20	25	-	22	15	-	-	11	4,2	-	7	10	30
23250.0048	flat clamping jaw	M 8	27	31	-	29	21	-	-	15	2,5	-	20	43	73
23250.0052	(picture 1)	M 12	42	49	-	41	30	-	-	22	4,0	-	30	85	233
23250.0056		M 16	57	64	-	56	42	-	-	29	5,0	-	50	210	587
23250.0112	double taper,	M 12	42	49	-	41	30	-	-	36	5,0	-	50	85	343
23250.0116	ribbed clamping jaw	M 16	58	66	-	56	42	-	-	50	5,0	-	80	210	896
23250.0142	double taper,	M 12	41	48	-	41	30	-	-	36	5,0	-	50	85	339
23250.0146	flat clamping jaw	M 16	58	66	-	56	42	-	-	50	5,0	-	80	210	895
23250.0158	single taper,	M 8	33	37	12	29	21	-	M 5	15	2,5	7,5	20	43	75
23250.0162	clamping jaw with	M 12	46	53	18	41	30	28	M 5	22	4,0	11,0	30	85	247
23250.0166	screw fastened thread	M 16	61	70	26	56	42	40	M 5	29	5,0	14,5	60	210	618
	(picture 3)														

* Taper surfaces not ground, spring: O-ring (NBR)

EH 23250.

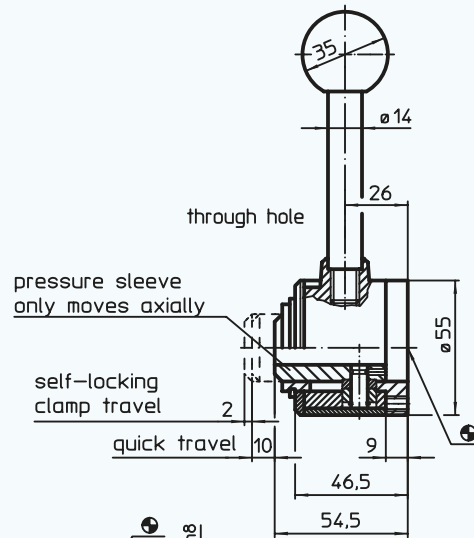
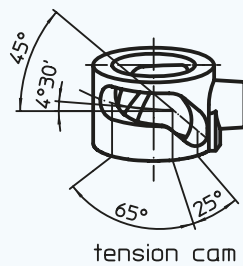
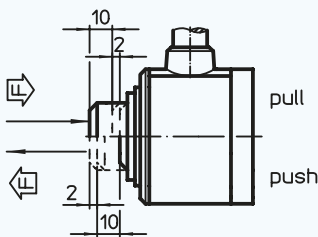
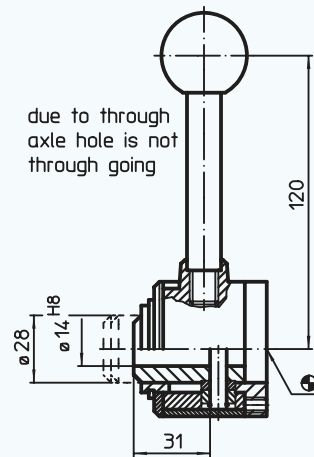
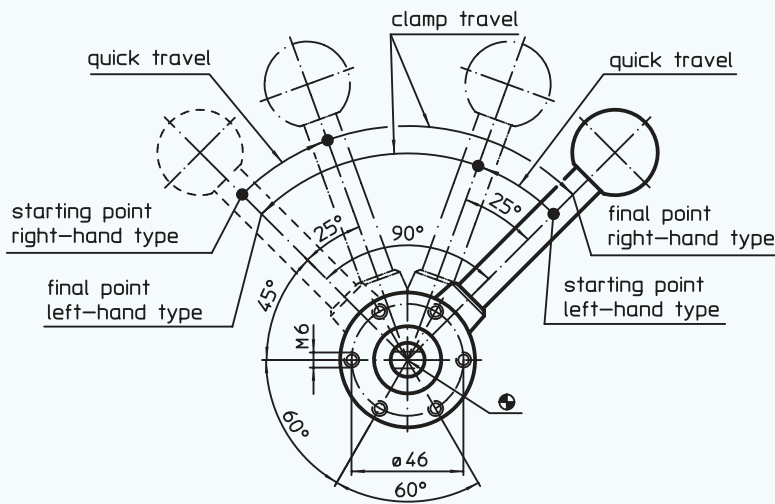
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**Taper
Clamping
Units**

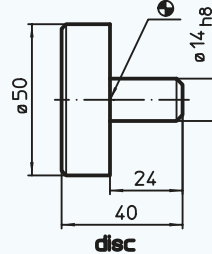
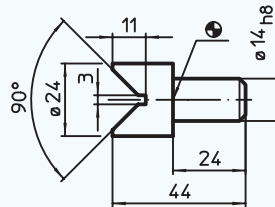
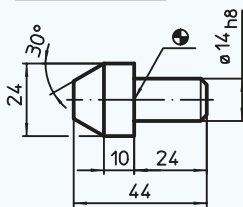


EH 23260.

**Clamping Devices
"actima"**



accessories



Material:

Individual parts: • Steel, blackened

Ball knob: • Plastic (PF 31), DIN 7708, red similar to RAL 3003

Note:

Compact clamping element for pull and push clamping strain which can be converted by turning the pressure sleeve. The travel path is 10 mm. Within the short clamp travel of 2 mm, self-locking occurs in any position. The maximum clamping force allowed is 4,9 kN.

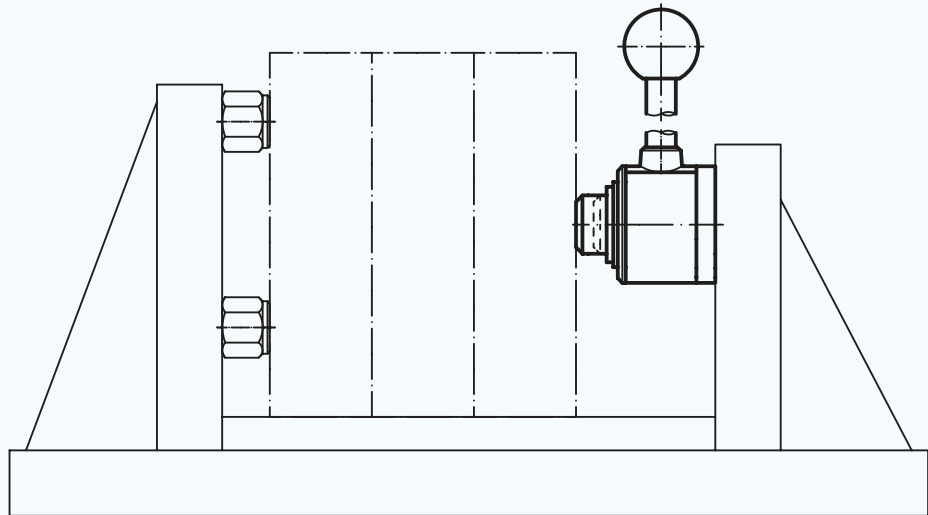
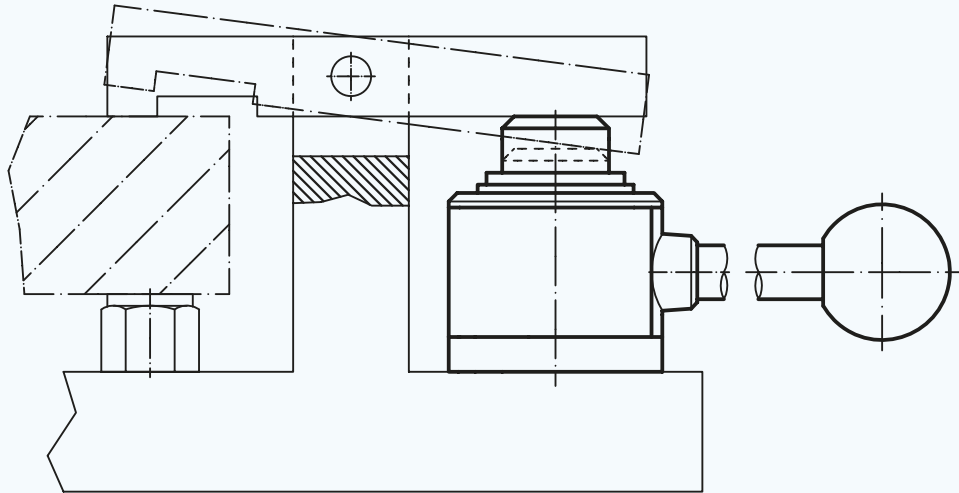
Ref. No. With diagonal axis within hole	Finish	g
23260.0002	right push / left pull	751
23260.0004	left push / right pull	749
Ref. No. With throughgoing hole	Finish	g
23260.0012	right push / left pull	745
23260.0014	left push / right pull	750

EH 23260.

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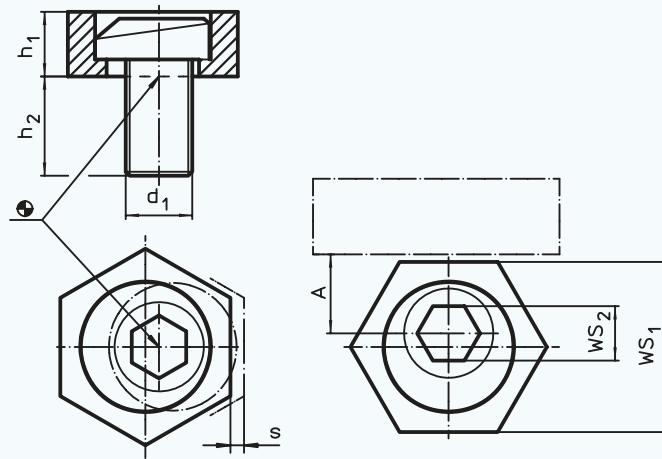
**Clamping Devices
"actima"**

Ref. No. Accessories	Finish	g
23260.0042	disc	270
23260.0044	taper	85
23260.0046	V-block	82



EH 23270.

Eccentric Clamping Clamps



Material:

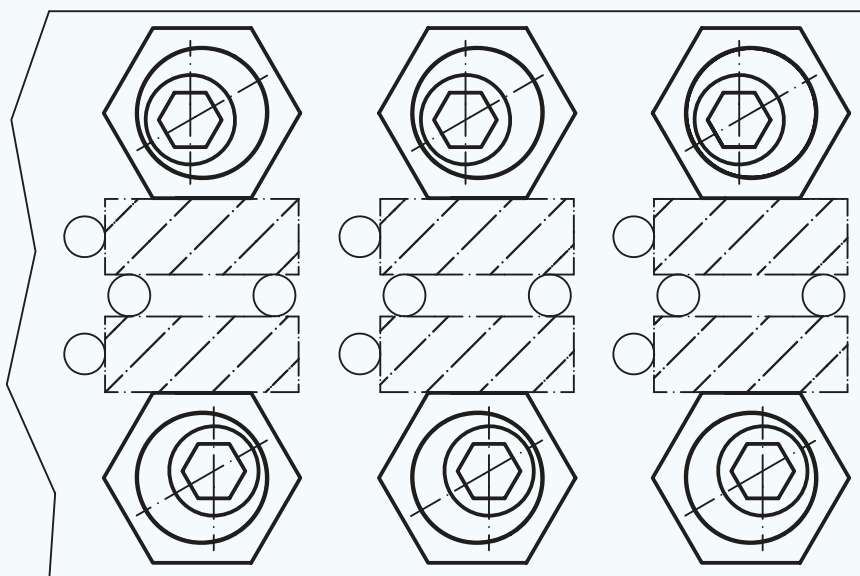
Eccentric screw: • Steel

Body: • Brass

Note:

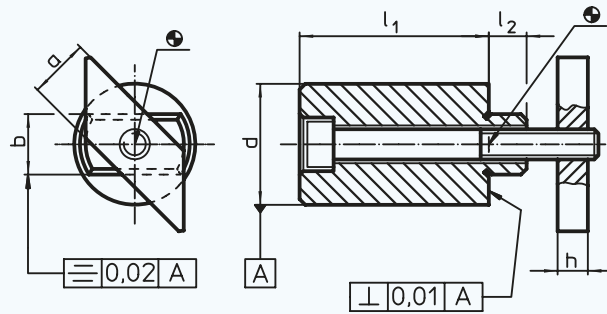
These clamps have a high clamping force for low clamping heights. The body from brass provides a gentle but safe clamping.

Ref. No.	d ₁	h ₁	h ₂	WS ₁	WS ₂	s	A	Clamping force kN	Starting torque Nm	μg
23270.0104	M 4	2,8	9,6	7,93	3	0,75	3,8	0,9	2,5	2
23270.0106	M 6	4,8	11,2	15,86	4	1,00	7,8	3,4	10,0	10
23270.0108	M 8	4,8	15,0	20,60	5	1,00	10,2	3,9	18,0	18
23270.0110	M 10	6,3	19,0	20,60	7	1,30	10,2	7,0	26,0	27
23270.0112	M 12	9,5	22,8	25,40	8	2,00	12,7	9,0	75,0	53
23270.0116	M 16	12,7	28,5	30,13	12	2,50	15,0	12,0	120,0	108



EH 23280.

Cylindrical Stops



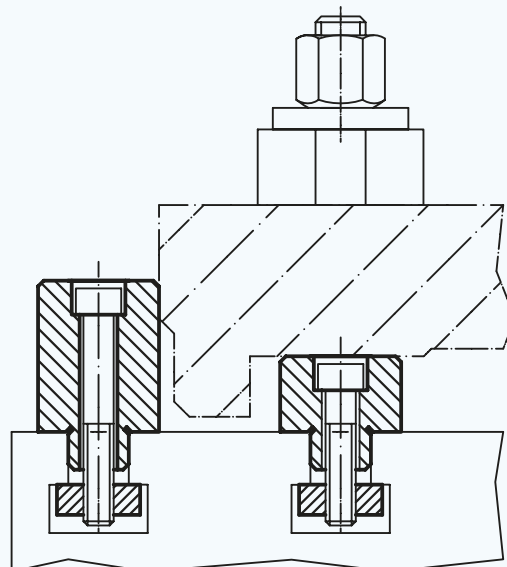
Material:

Cylindrical stop: • Steel, case-hardened, ground **Holding plate:** • Steel, blackened **Screw:** • ISO 4762, quality 8.8

Note:

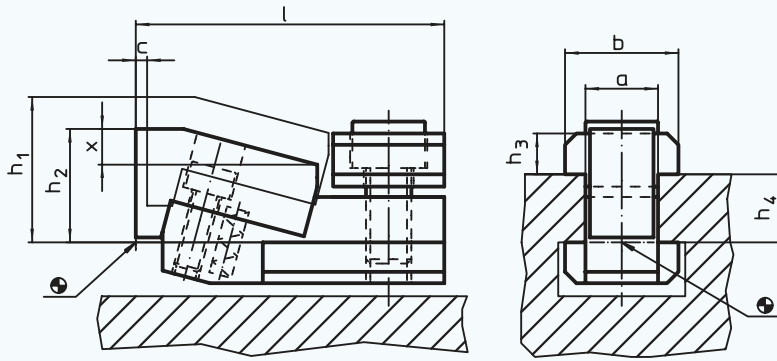
The T-slot guide enables a quick and precise location of the work piece. The cylindrical form of the stop facilitates to determine the 0-point coordinate. The short form, which is ground to a height tolerance of ±0,01 mm, can also be used for locating.

Ref. No.	b h6 T-slot size	l ₁ short finish ±0,01	l ₁ long finish ±0,2	a -0,6	d ±0,01	h	l ₂	Screw ISO 4762	g
23280.0110	10	15	–	10	20	6	8	M 6 x 25	53
23280.0210	10	–	25	10	20	6	8	M 6 x 35	76
23280.0112	12	15	–	12	20	6	8	M 6 x 25	58
23280.0212	12	–	25	12	20	6	8	M 6 x 35	83
23280.0114	14	25	–	14	32	8	9	M 8 x 35	202
23280.0214	14	–	50	14	32	8	9	M 8 x 60	357
23280.0116	16	25	–	16	32	8	10	M 8 x 45	221
23280.0216	16	–	50	16	32	8	10	M 8 x 70	371
23280.0118	18	25	–	18	40	10	15	M 10 x 50	371
23280.0218	18	–	50	18	40	10	15	M 10 x 75	613
23280.0122	22	25	–	20	40	14	15	M 10 x 55	435
23280.0222	22	–	50	20	40	14	15	M 10 x 80	679
23280.0128	28	25	–	22	46	16	20	M 12 x 60	661
23280.0228	28	–	50	22	46	16	20	M 12 x 90	985



EH 23290.

T-Slot Clamps



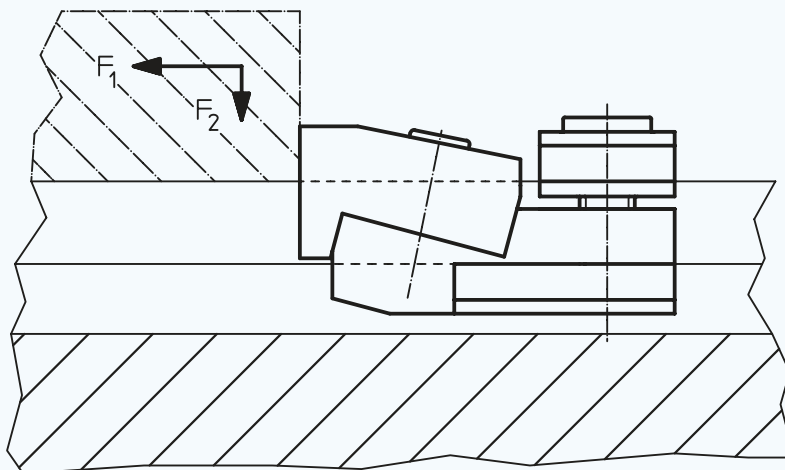
Material:

- Heat-treated steel, tempered, black

Note:

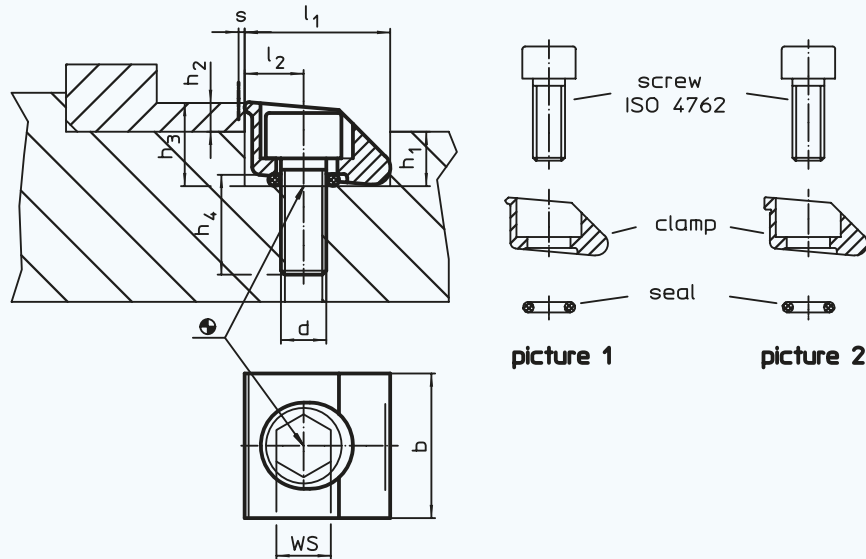
For clamping flat work pieces by means of a wedge action. In order to obtain low clamping heights where slot depths are small, the clamps can be reduced in height up to dimension »x«.

Ref. No.	a T-slot size	b	c	h ₁	h ₂	h ₃	h ₄ min.	l ≈	x	F ₁ kN	F ₂ kN	g
23290.0012	12	18	1,8	25,5	20,5	7	11	52	5	5,0	0,6	148
23290.0014	14	22	1,8	26,5	21,5	8	13	55	5	5,5	0,7	171
23290.0016	16	25	2,5	32,0	25,0	9	15	68	6	8,0	0,9	246
23290.0018	18	28	2,5	33,0	26,0	10	16	71	6	9,0	1,0	416
23290.0022	22	35	3,0	43,0	34,0	14	20	89	9	16,0	1,9	702



EH 23290.

**Pitbull®
Clamps**



Material:

Screw: • Heat-treated steel, tempered

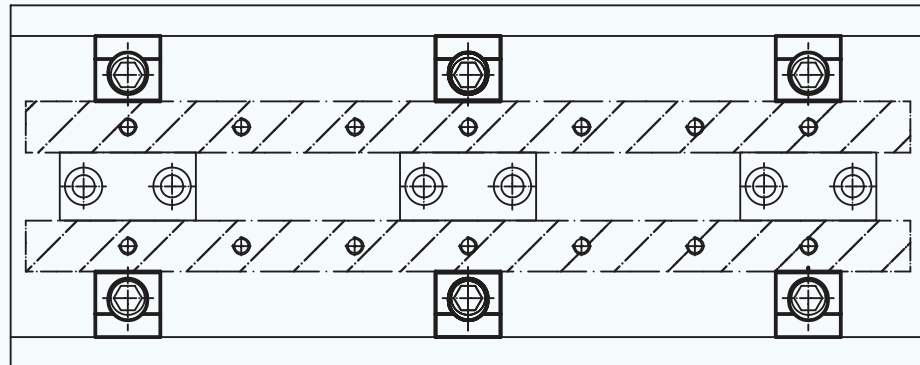
Body: • Steel, hardened

O-ring: • NBR plastic

Note:

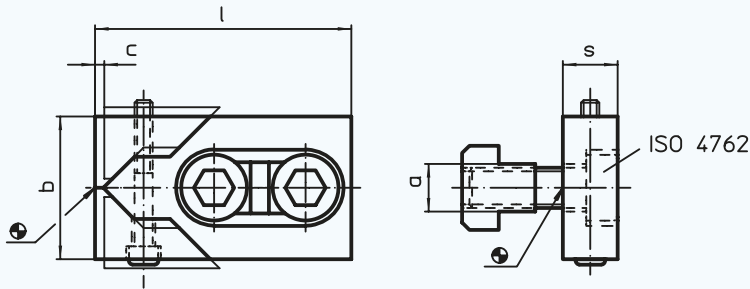
Pitbull® clamps for low mounting height with a high clamping force and down hold effect. The O-ring serves to lift the clamp off when releasing.
Temperature range from - 30 °C up to + 80 °C.

Ref. No.	Finish	d	b	l ₁ H9	l ₂	h ₁	h ₂ min.	h ₃ ≈	h ₄ ≈	Clamping way s	WS	Clamping force max. kN	Starting torque max. Nm	μg
23290.0052	with knife edge (picture 1)	M 4	12,7	12,70	5,1	4,8	2,6	7,4	8	0,4	3	2,6	6	6
23290.0054		M 6	19,1	19,05	7,6	7,1	3,8	10,9	11	0,6	5	3,8	17	20
23290.0056		M 10	25,4	25,40	10,2	11,4	6,4	17,8	17	1,2	8	15,0	80	63
23290.0058		M 12	38,1	38,10	15,2	16,3	9,5	25,8	21	1,9	10	20,8	140	206
23290.0062	blunt edged (picture 2)	M 4	12,7	12,70	5,1	4,8	2,6	7,4	8	0,4	3	2,6	6	6
23290.0064		M 6	19,1	19,05	7,6	7,1	3,8	10,9	11	0,6	5	5,7	17	20
23290.0066		M 10	25,4	25,40	10,2	11,4	6,4	17,8	17	1,2	8	15,1	80	65
23290.0068		M 12	38,1	38,10	15,2	16,3	9,5	25,8	21	1,9	10	22,0	140	201



EH 23300.

Low Height Clamps



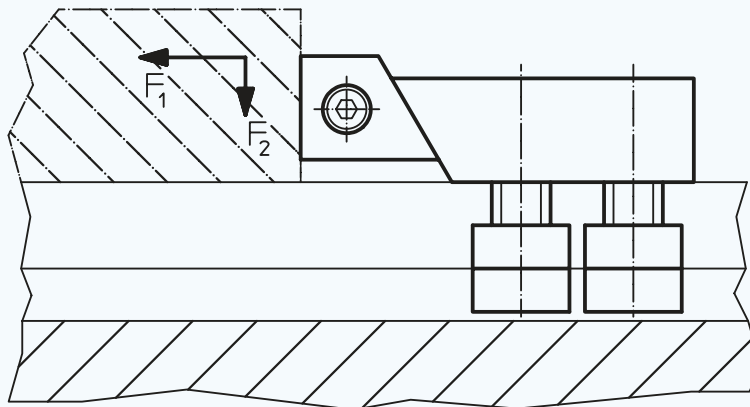
Material:

- Heat-treated steel, tempered, black

Note:

For clamping flat work pieces by means of a wedge action. Simple operation.
Horizontal clamping screws.
Maximum possible horizontal and vertical clamping force.

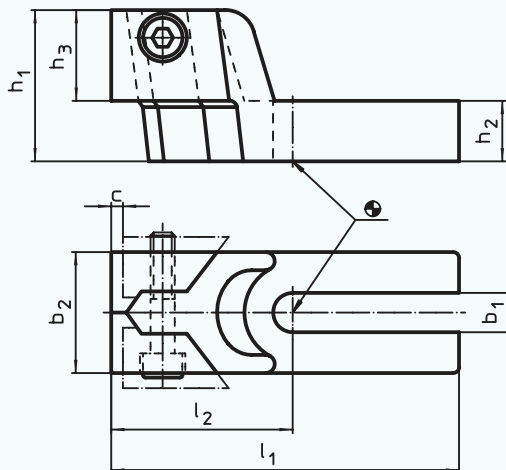
Ref. No.	a T-slot size	b	c	l	s	F ₁ kN	F ₂ kN	Screw ISO 4762	g
23300.0012	12	40	3	80	20	16	0,6	M 10 x 30	456
23300.0014	14	40	3	80	20	22	0,9	M 12 x 30	460
23300.0016	16	50	4	100	25	32	1,2	M 14 x 35	1124
23300.0018	18	50	4	100	25	36	1,4	M 16 x 40	1237
23300.0020	20	50	4	100	25	36	1,4	M 16 x 40	1332
23300.0022	22	78	5	140	30	36	1,4	M 20 x 45	2674
23300.0024	24	78	5	140	30	36	1,4	M 20 x 45	2861
23300.0028	28	78	5	140	30	40	1,6	M 24 x 50	3500



EH 23300.

Low Height Clamps

high



Material:

Body: • Nodular cast iron

Clamping jaws: • Heat-treated steel, tempered

Note:

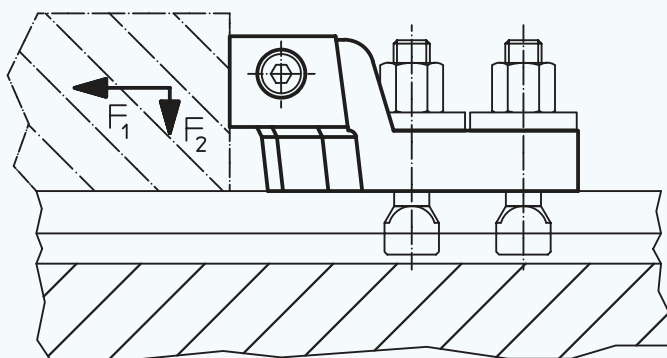
For clamping flat work pieces by means of a wedge action. Simple operation.

Horizontal clamping screws.

Maximum possible horizontal and vertical clamping force.

Ref. No.	b ₁	c	h ₁	h ₂	h ₃	b ₂	l ₁	l ₂	⌀ g
23300.0110	13	3	50	20	30	40	115	60	784
23300.0116	19	4	60	25	35	50	150	72	1507

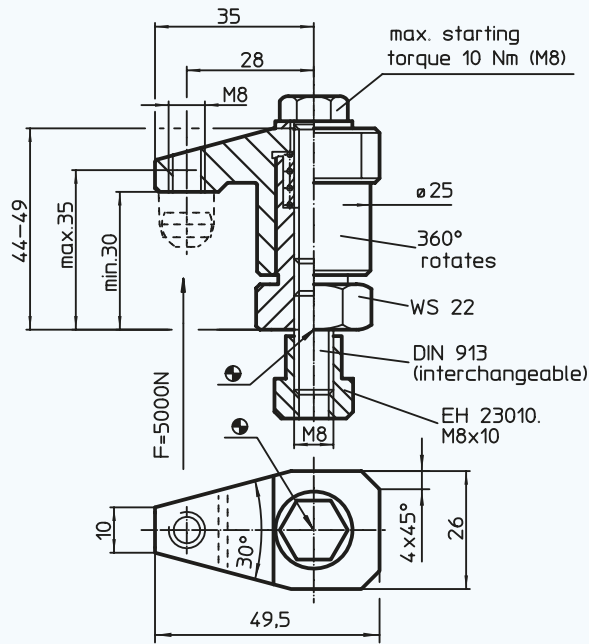
b ₁	a T-slot size	F ₁ kN	F ₂ kN
13	10	6	0,2
13	12	10	0,4
13	14	15	0,6
19	16	20	0,8
19	18	28	1,1
19	20	36	1,4



EH 23310.

Down-Thrust Clamps

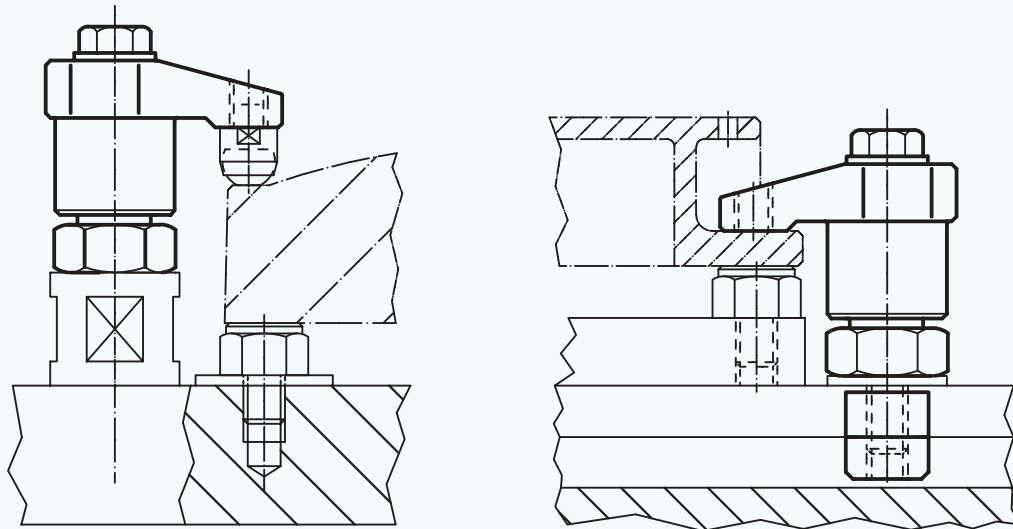
size 25



Material:

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

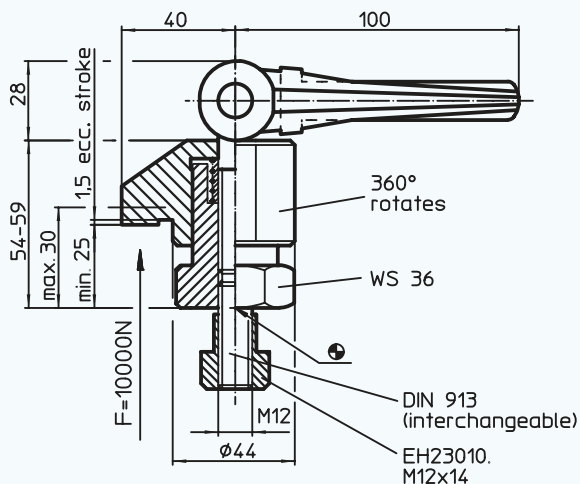
Ref. No.	Finish	↕ g
23310.0025	with clamping screw size 25 x 35	234



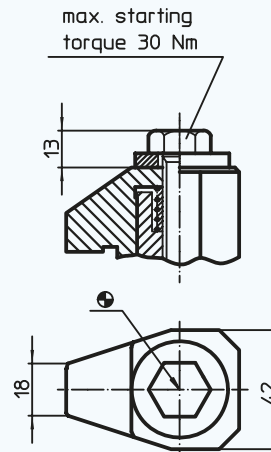
EH 23310.

Down-Thrust Clamps

basic type,
size 44



picture 1

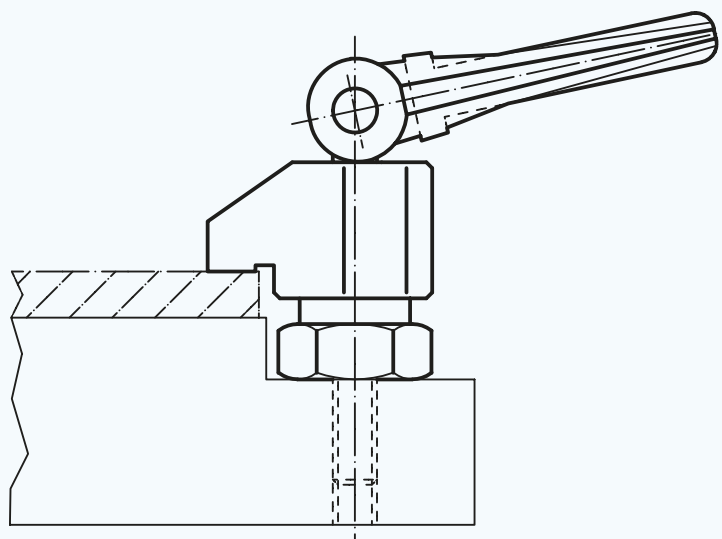


picture 2

Material:

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

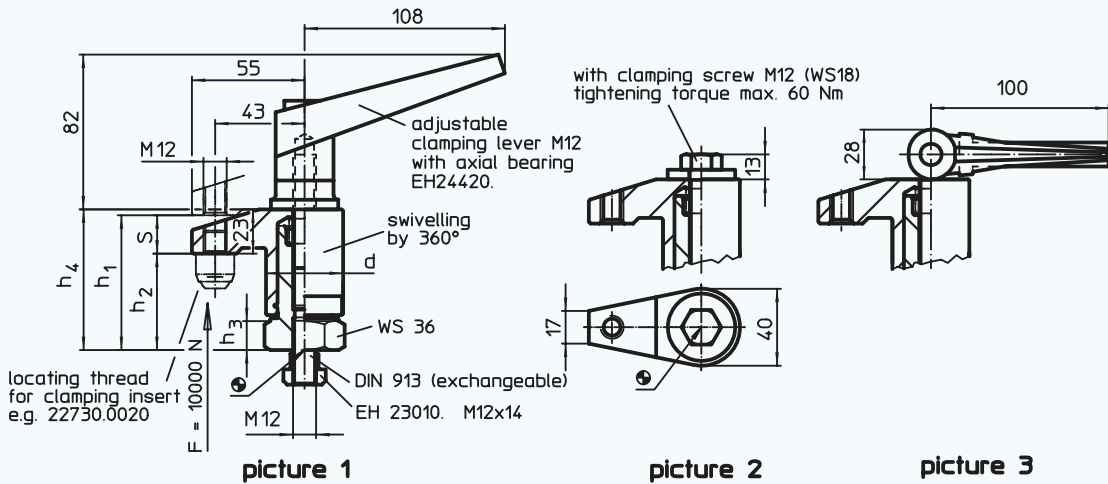
Ref. No.	Finish	g
23310.0034	with eccentric clamping lever, size 44 x 30 (picture 1)	1022
23310.0035	with clamping screw, size 44 x 30 (picture 2)	708



EH 23310.

Down-Thrust Clamps

size 40



Material:

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

Note:

The clamping height can be increased by using height adjusting cylinders EH 23310. and disks EH 1107. and EH 1108. from the Halder Modular Jig and Fixture System. It can be reduced by employing clamping inserts, e.g. EH 22730.

The down-thrust clamps provide the following advantages:

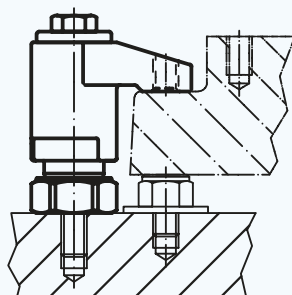
- rapid manual clamping, by means of clamping screw, adjustable clamping lever or double eccentric lever,
- easy and quick changing of the work piece by swinging the clamping head to the left or right; continuously variable setting by means of positioning ring 23310.0350,
- when using a positioning ring 23310.0350 a repeatable precise clamping is ensured; h_2 will then be increased by 7 mm (s minus 7 mm),
- reduced space requirements due to compact design,
- easy adaptation even to large clamping heights by means of height adjusting cylinders.

Down-thrust clamps can be secured in two different ways:

- 1.) in a T-slot,
- 2.) directly to the mounting plate, e.g. of a fixture, by means of a set screw.

The cylinder has to rest on the entire surface. Exceeding of the clamping height is inhibited by the height limitation.

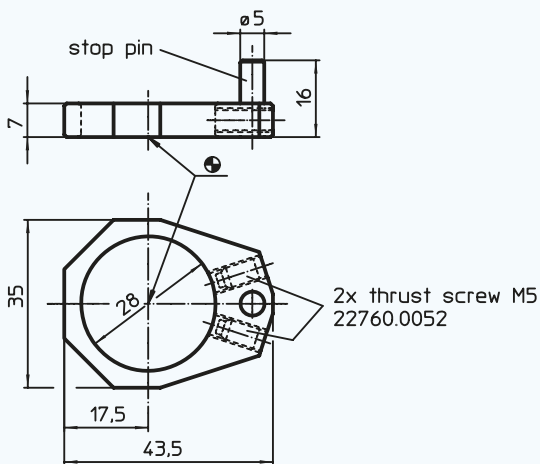
Ref. No.	Finish	d	h_1 max.	h_2 min.	s stroke	h_3	h_4	$\frac{m}{g}$
23310.0050	with adjustable clamping lever	40	70	50	20	15	73-93	1194
23310.0053	(picture 1)	40	98	68	30	15	91-121	1359
23310.0056		40	135	95	40	22	118-158	1639
23310.0051	with clamping screw	40	70	50	20	15	73-93	876
23310.0054	(picture 2)	40	98	68	30	15	91-121	964
23310.0057		40	135	95	40	22	118-158	1300
23310.0052	with eccentric clamping lever	40	70	50	20	15	73-93	1213
23310.0055	(picture 3)	40	98	68	30	15	91-121	1370
23310.0058		40	135	95	40	22	118-158	1585



EH 23310.

Positioning Rings

for down-thrust clamp, size 40



Material:

- Steel, blackened

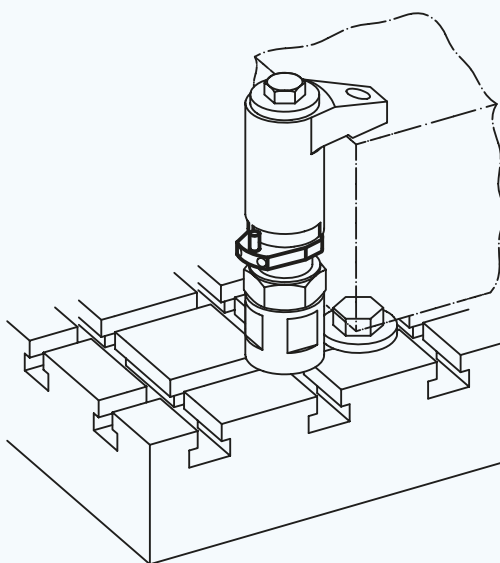
Note:

The positioning ring is an accessory to down-thrust clamps 23310.0050-0058.

After aligning the clamp positioning rings are fitted on the spindle with the effect that repeated clamping is always exactly on the same point. Positioning ring is rotating by 360° on down-thrust clamps. After mounting the clamp can swing 110° to the left or right.

Before mounting the positioning ring, pull-off top portion of down-thrust clamp.

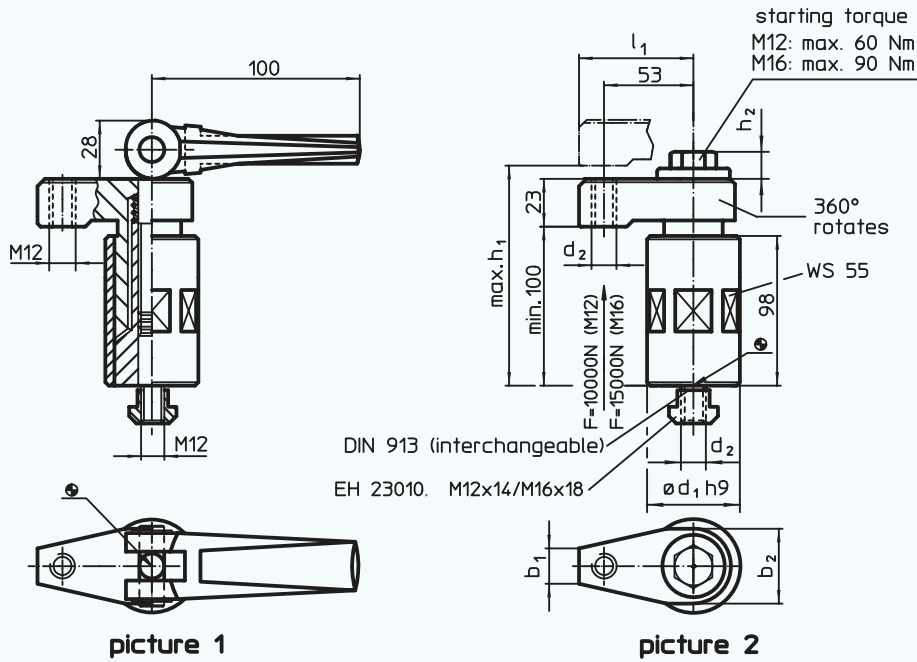
Ref. No.	Nominal size	g
23310.0350	40	32



EH 23310.

Down-Thrust Clamps

size 60



Material:

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

Note:

The height can be increased by using height adjusting cylinders EH 23310. and disks EH 1107., EH 1108. and EH 1617. from the Halder Modular Jig and Fixture System. It can be reduced by using clamping inserts.

Clamps provide the following advantages:

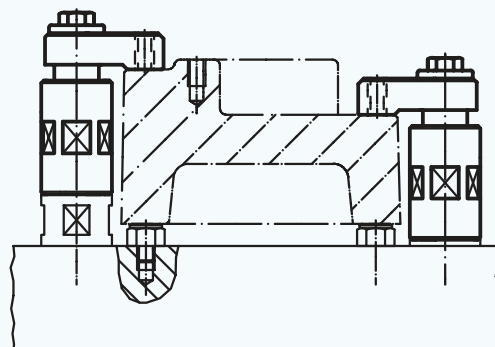
- rapid manual clamping by means of a threaded spindle and eccentric
- easy and rapid changing of work pieces by swinging away the clamping head
- compact construction, thus little space taken-up for clamping
- simple adaption even to extreme clamping height, using height adjusting cylinders

Down-thrust clamps can be secured in two different ways:

- 1.) in a T-slot
- 2.) directly to the mounting plate, e.g. of a fixture by means of a threaded stud

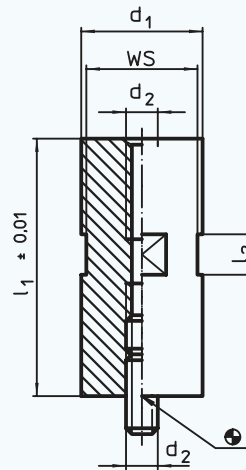
The cylinder has to rest on the entire surface. The clamping height h_1 must not be exceeded.

Ref. No.	Finish	d_1 h9	h_1 max.	d_2	l_1	h_2	b_1	b_2	$\frac{g}{g}$
23310.0060	with eccentric clamping lever (picture 1)	60	135	–	65	–	17	44	3015
23310.0061	with clamping screw	60	135	M 12	65	13	17	44	2695
23310.0063	(picture 2)	60	135	M 16	69	16	24	53	2939



EH 23310.

**Height
Adjusting
Cylinders**



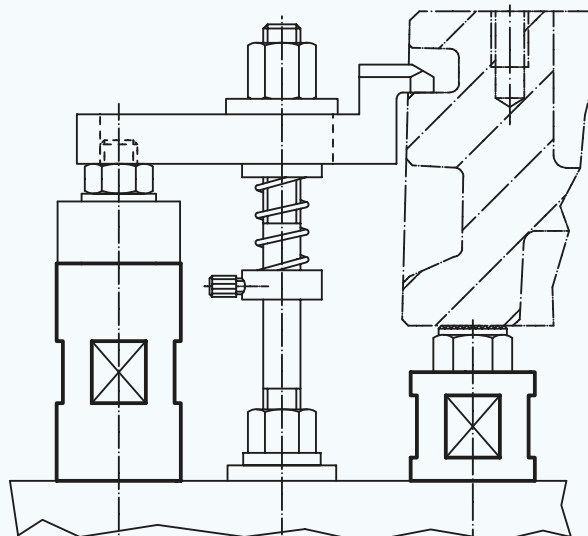
Material:

- Steel, case-hardened, blackened, ground

Note:

For increasing the clamping height of down-thrust clamps EH 23310.

Ref. No.	d ₁ h9	l ₁ ±0,01	d ₂	WS	l ₂	⌀ g
23310.0125	25	20	M 8	22	10	71
23310.0126	25	40	M 8	22	20	139
23310.0127	25	80	M 8	22	20	292
23310.0140	40	35	M 12	36	20	319
23310.0141	40	70	M 12	36	20	644
23310.0142	40	140	M 12	36	20	1325
23310.0145	40	35	M 16	36	20	318
23310.0146	40	70	M 16	36	20	634
23310.0147	40	140	M 16	36	20	1307
23310.0160	60	35	M 12	55	20	755
23310.0161	60	70	M 12	55	20	1460
23310.0162	60	140	M 12	55	20	3034
23310.0165	60	35	M 16	55	20	438
23310.0166	60	70	M 16	55	20	1493
23310.0167	60	140	M 16	55	20	3016



EH 23320.

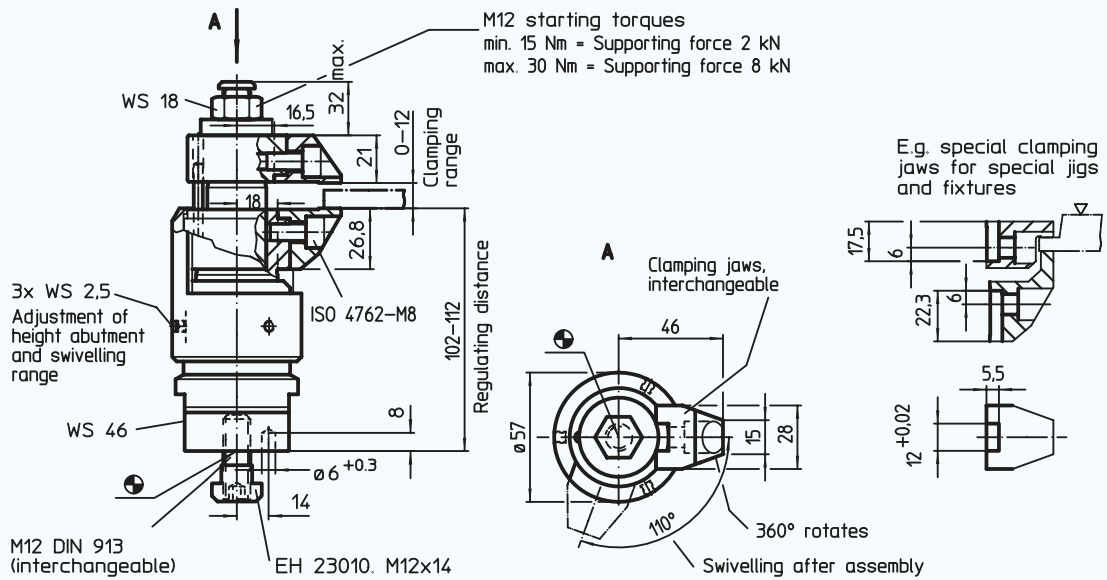
Floating
clamps



EH 23320.

Floating Clamps

combined clamping and locking M 12



Material:

Body:

- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaws:

- Case hardened steel, nitrided, manganese phosphate treated

Housing:

- Aluminium, red anodised

Note:

The floating clamp is used to **clamp and support** additional clamping points on components.

The benefits of the floating clamp are:

- no distortion in the clamping of unstable components,
- avoids vibration during the processing,
- clamps ribs, beads and shackles to reinforce clamped components,
- distortion-free clamping of raw parts.

Clamping Process:

1. Push the floating clamp downwards.
2. Pivot the clamping jaws in as far as possible.
The floating clamp contacts the bottom of the work piece with a slight spring load.
3. Tighten the floating clamp with a hexagonal nut (WS 18) having a min. torque of 15 Nm and a maximum torque of 30 Nm.
In the clamping process, the workpiece is clamped and simultaneously supported.
4. Releasing is done in reverse order.

Assembly and Set-Up:

1. Mount the floating clamp (M 12 connection thread) onto the device with a wrench (WS 46).
2. Adjust the height limit stop and the rotating area with the red sleeve and clamp with a set screw (3 x WS 2.5). When setting the height limit, consider tolerance of workpiece.

Additional flexible possibility of fitting with holder 23470.0250 - for safe functioning, the thread bore must always be closed, e.g. set screw M 12 x 10 - or holding plate for down-hold clamps 23210.0740.

For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalogue diagram; screw ISO 4762-M8-12.9, M max. = 43 Nm).

Clamping jaws with an increased clamping range, refer to 23320.0050-0058, are available.

Ref. No.

23320.0012



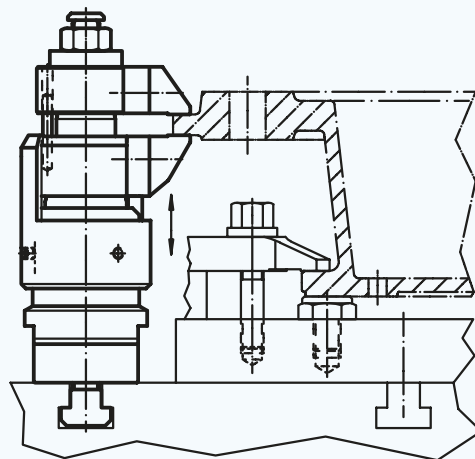
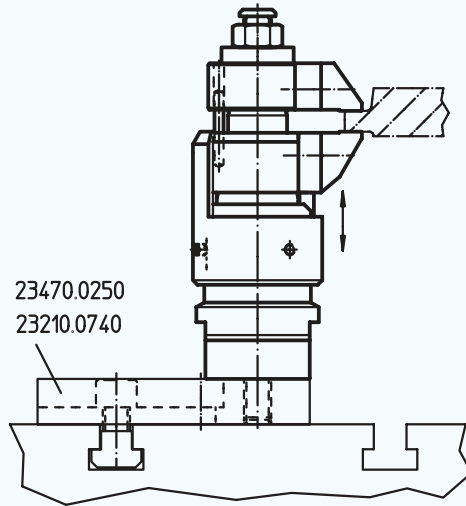
2076

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EH 23320.

Floating Clamps

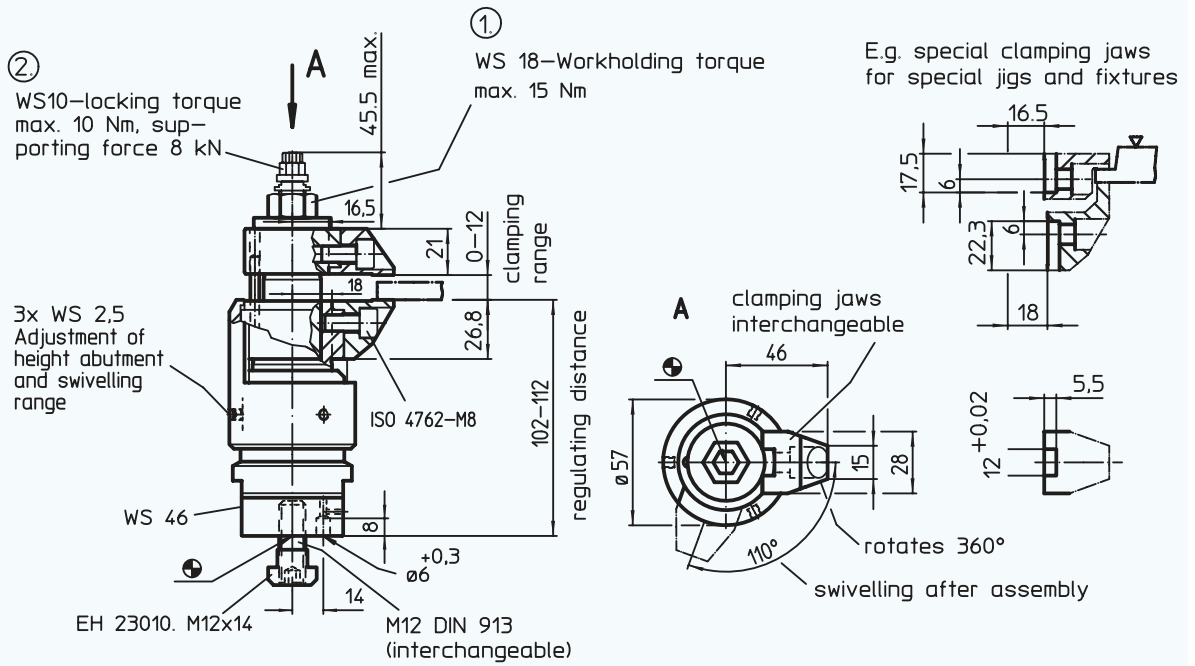
combined clamping and locking
M 12



EH 23320.

Floating Clamps

separate clamping and locking
M 12



Material:

Body:

- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaws:

- Case hardened steel, nitrided, manganese phosphate treated

Housing:

- Aluminium, blue anodised

Note:

Floating clamps with separate clamp and locking are used to clamp and support additional clamping points on **extremely pliable** work pieces. Both, clamping and supporting force can individually be designated.

The benefits of the floating clamps are:

- no distortion in the clamping of unstable components
- avoids vibration during the processing
- clamps ribs, beads and shackles to reinforce clamped components
- distortion-free clamping of raw parts.

Clamping Process:

1. Push the floating clamp downward.
2. Pivot the clamping jaws in.
3. Release floating clamp. The bottom jaw contacts the work piece with a low spring force.
4. Tighten the fixture nut (WS 18) having a maximum torque of 15 Nm. **The jaws are clamping the work piece, the clamp is still floating.**
5. Thereafter tighten the hexagon collar nut (WS 10) as far as possible (max. torque 10 Nm).
6. The clamping process is finished.
7. Releasing is done in reverse order: release hexagon collar nut (WS 10) - release fixture nut (WS 18) - pivot the clamping jaws out.
8. Floating clamp is in end position.

Assembly and Set-Up:

1. Mount the floating clamp (M 12 connection thread) onto the device with a wrench (WS 46).
2. Adjust the height limit stop and the rotating area with the blue sleeve and clamp with a set screw (3 x WS 2,5). When setting the height limit, consider tolerance of workpiece.

Additional flexible possibility of fitting with holder 23470.0250 (for safe functioning, the thread bore must always be closed, e.g. threaded screw M 12 x 10) or holding plate for down-hold clamps 23210.0740.

For specific clamping situations, the standard clamping jaws supplied can be exchanged or replaced (see catalog diagram; screw ISO 4762-M8-12.9, M max. = 43 Nm).

Exchange jaws with an increased clamping range can be obtained as an accessory - refer to 23320.0050-0058.

Ref. No.

23320.0014



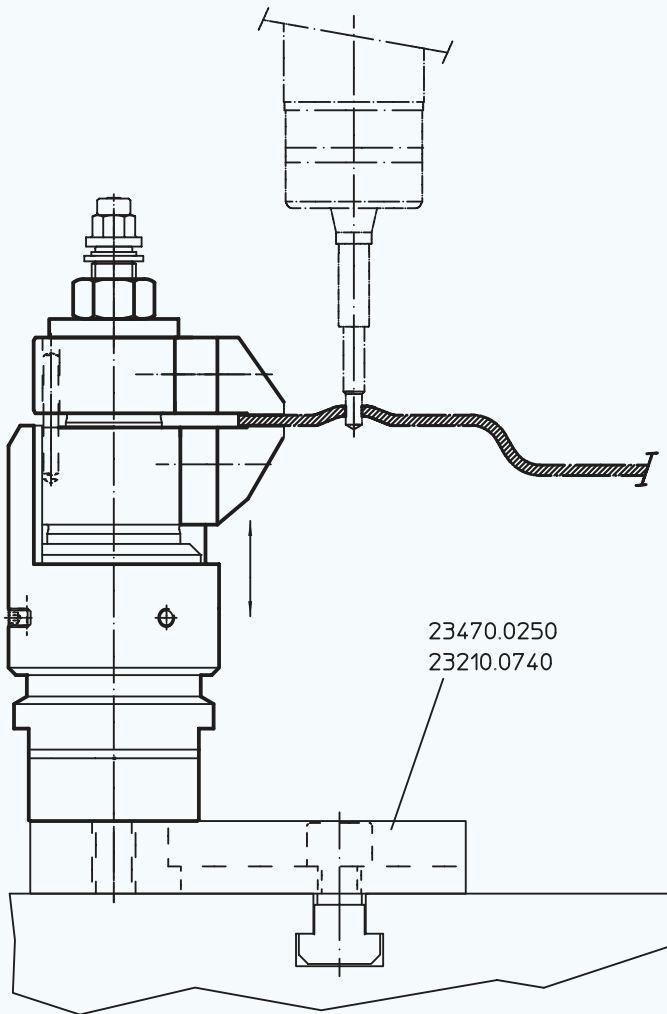
1890

Continued from previous page

EH 23320.

**Floating
Clamps**

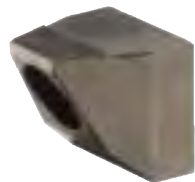
separate clamping
and locking
M 12



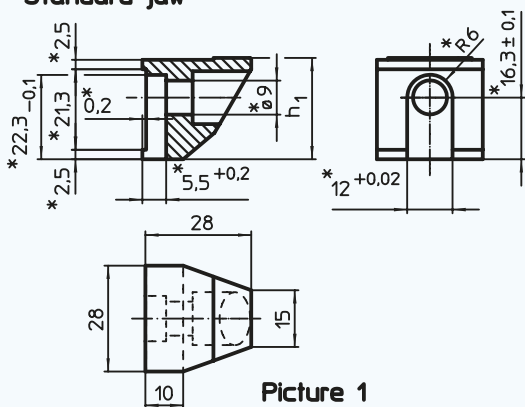
EH 23320.

Clamping Jaws

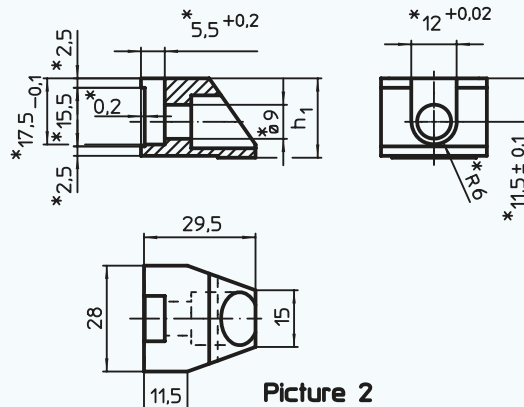
for floating clamp M 12



Standard jaw

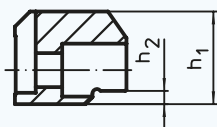


Picture 1
lower jaw

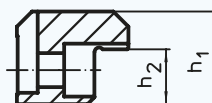


Picture 2
upper jaw

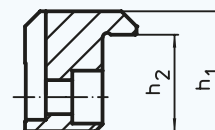
upper Exchange jaws



Picture 3



Picture 4



Picture 5

* Specifications and material of especially designed jaws have to be taken into consideration.

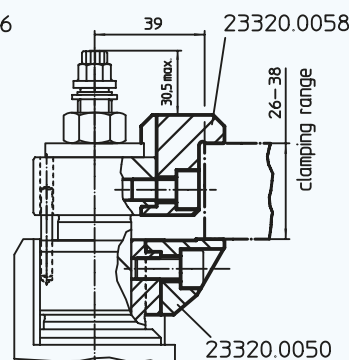
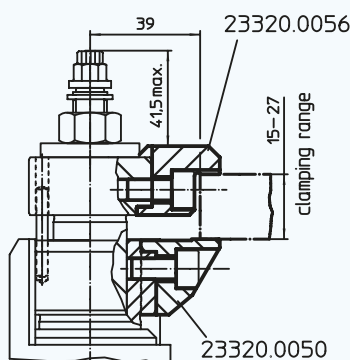
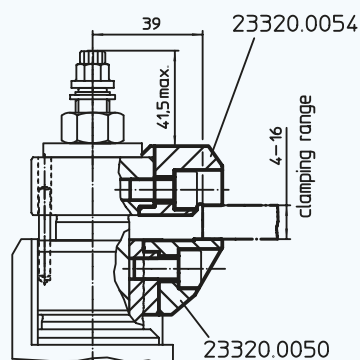
Material:

- Case hardened steel, nitrided, manganese phosphate treated

Note:

The clamping jaws can be used for floating clamps 23320.0012 and 23320.0014 to increase the clamping range. When using custom-made jaws, it is important to insert the tightening screw (M 8-12.9, 43 Nm) 10 mm deep into the clamp housing on the upper clamping jaw and 9 mm deep into the clamp housing on the lower clamping jaw.

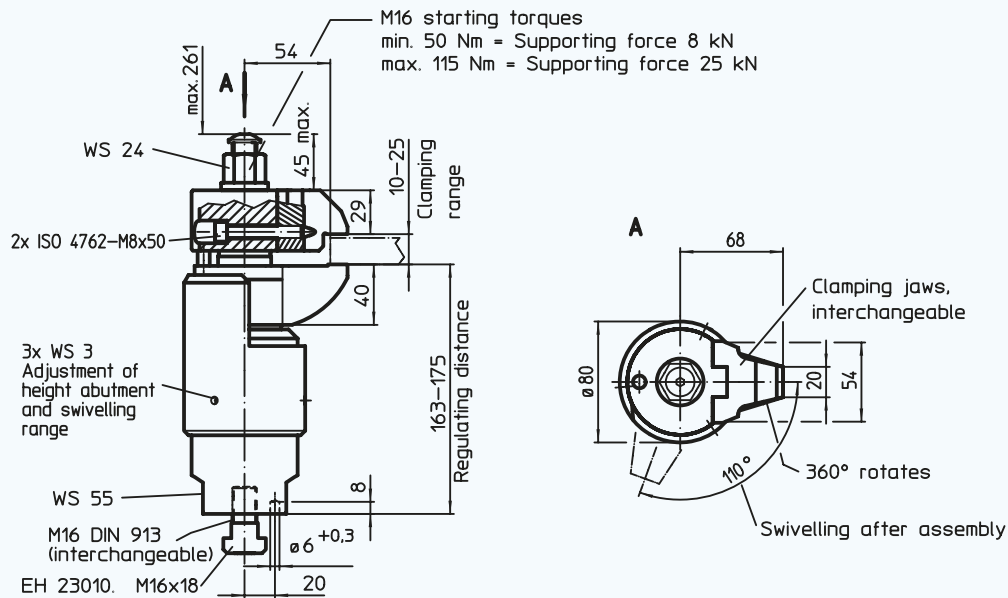
Ref. No.	Finish	Clamping range	h ₁ - 0,1	h ₂	g
23320.0050	lower standard clamping jaw (picture 1)	-	26,8	-	83
23320.0052	upper standard clamping jaw (picture 2)	0 - 12	21,0	-	69
23320.0054	upper exchange clamping jaw (picture 3)	4 - 16	24,5	3,5	91
23320.0056	upper exchange clamping jaw (picture 4)	15 - 27	24,5	14,5	88
23320.0058	upper exchange clamping jaw (picture 5)	26 - 38	35,5	25,5	130



EH 23320.

Floating Clamps

combined clamping and locking
M 16



Material:

Body:

- Case hardened steel, nitrided, manganese phosphate treated and ground

Clamping jaws:

- Case hardened steel, nitrided, manganese phosphate treated

Housing:

- Aluminium, red anodised

Note:

The floating clamp is used to **clamp and support** additional clamping points on components.

The benefits of the floating clamp are:

- especially suitable for large work pieces,
- no distortion in the clamping of unstable components
- avoids vibration during the processing,
- clamps ribs, beads and shackles to reinforce clamped components,
- distortion-free clamping of raw parts.

Clamping process:

1. Push the floating clamp downward.
2. Pivot the clamping jaws in as far as possible.
The floating clamp contacts the bottom of the work piece with a low spring load.
3. Tighten the floating clamp with a hexagonal nut (WS 24) having a min. torque of 50 Nm and a maximum torque of 115 Nm.
In the clamping process, the work piece is clamped and simultaneously supported.
4. Releasing is done in reverse order.

Assembly and Set-Up:

1. Mount the floating clamp (M 16 connection thread) onto the device with a wrench (WS 55).
2. Adjust the height limit stop and the rotating area with the red sleeve and clamp with a set screw (3 x WS 3). When setting the height limit, consider tolerance of workpiece.

For custom clamping situation, the standard upper clamping jaw supplied can be replaced by the exchange clamping jaws (23320.0062 / .0064 / .0066).

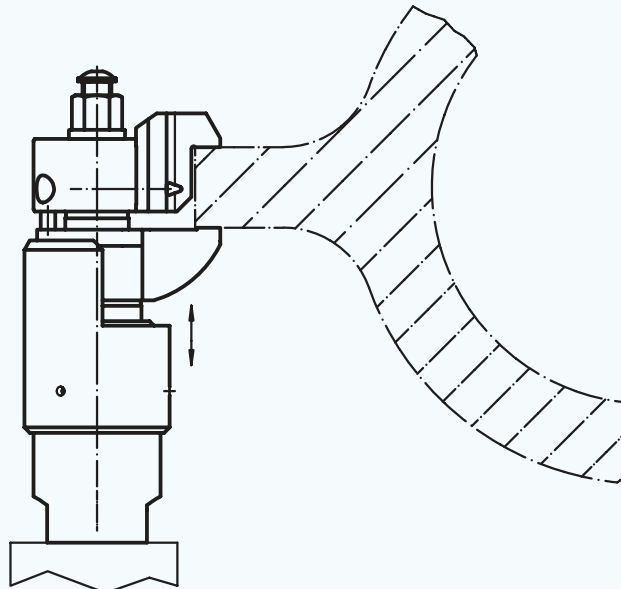
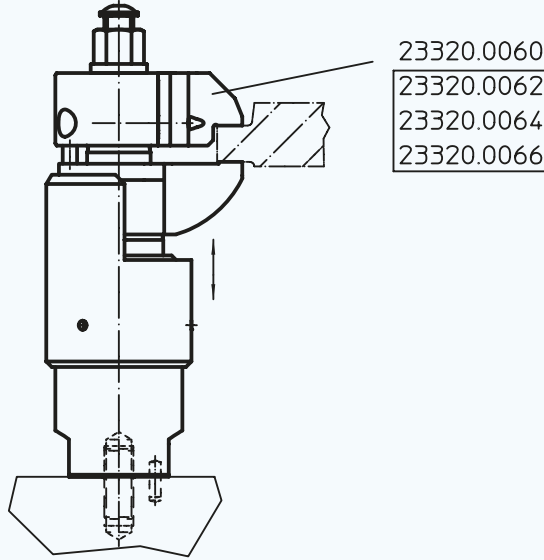
Ref. No.	g
23320.0016	6250

EH 23320.

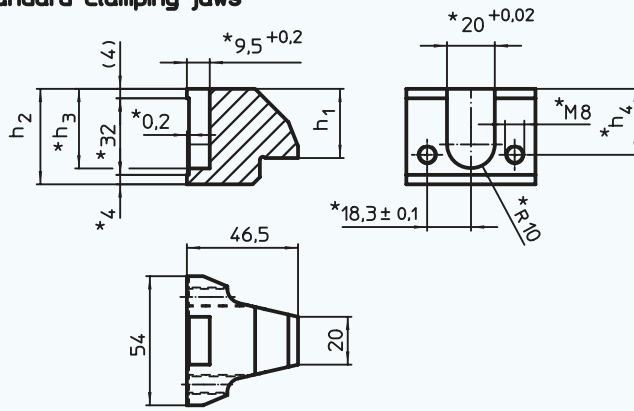
Continued from previous page

**Floating
Clamps**

combined clamping
and locking
M 16

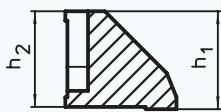


Standard clamping jaws

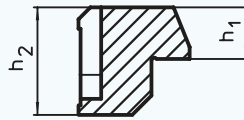


picture 1

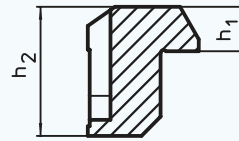
Exchange clamping jaws



picture 2



picture 3



picture 4

* Specifications and material of especially designed jaws have to be taken into consideration.

Material:

- Case hardened steel, nitrided, manganese phosphate treated

Note:

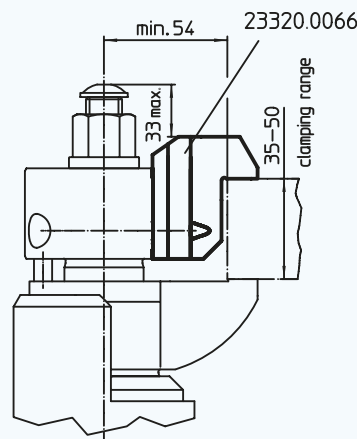
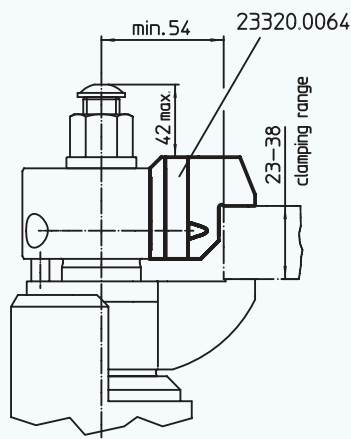
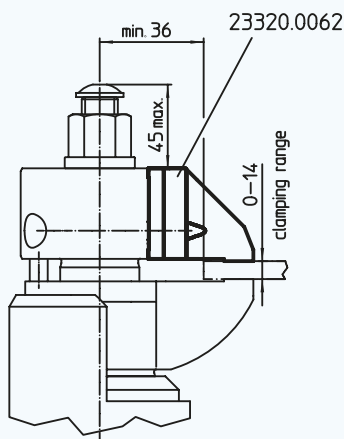
The clamping jaws can be used for the floating clamp 23320.0016 to increase or decrease the clamping range.

Ref. No.	Finish	Clamping range	h ₁	h ₂	h ₃	h ₄	g
23320.0060	upper standard clamping jaw (picture 1)	10 - 25	29,0	40	33,3	27,6	402
23320.0062	upper exchange clamping jaw (picture 2)	0 - 14	41,0	40	33,3	27,6	380
23320.0064	upper exchange clamping jaw (picture 3)	23 - 38	21,6	45	38,3	32,6	435
23320.0066	upper exchange clamping jaw (picture 4)	35 - 50	18,6	54	47,3	41,6	490

EH 23320.

Clamping Jaws

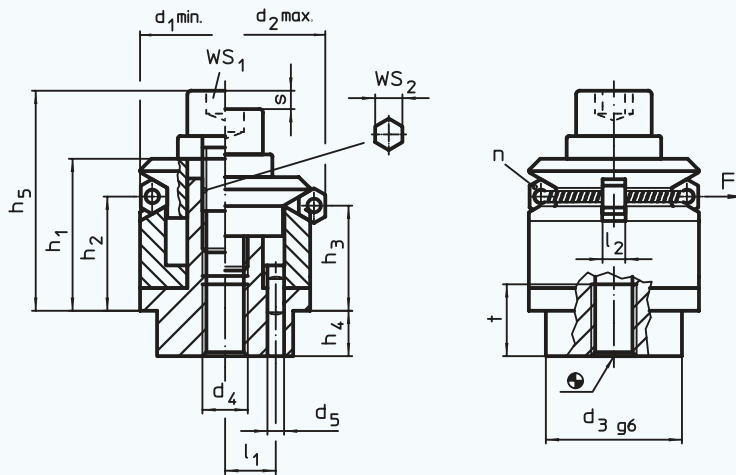
for floating clamp
M 16



EH 23340.

**Centering
Clamping
Elements**

with clamping
segments



>>> Special types, e.g. pulling or tandem function, upon request. <<<

Material:

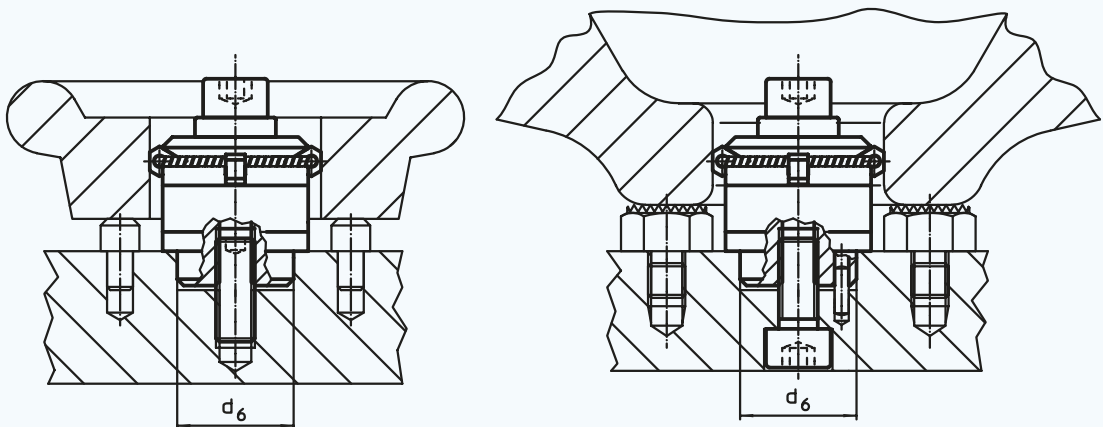
Body: • Tool steel, blackened **Clamping segments:** • Steel 1.4112, hardened and ground **Spring:** • Stainless steel

Note:

For clamping and centering of work pieces with internal bore. Exact self centering with a precision of $\pm 0,025$ mm. Due to the clamping segments being ground, work pieces with raw and/or machined surfaces can be frictionally connected, centered and held down at the seats. Large adjustment stroke and a low building height are a feature of the centering clamping element. **Activate from either top or bottom.**

Advice for activating from the top mounting: Take off clamping disc and screw. Fasten body with threaded bolt via WS₂.

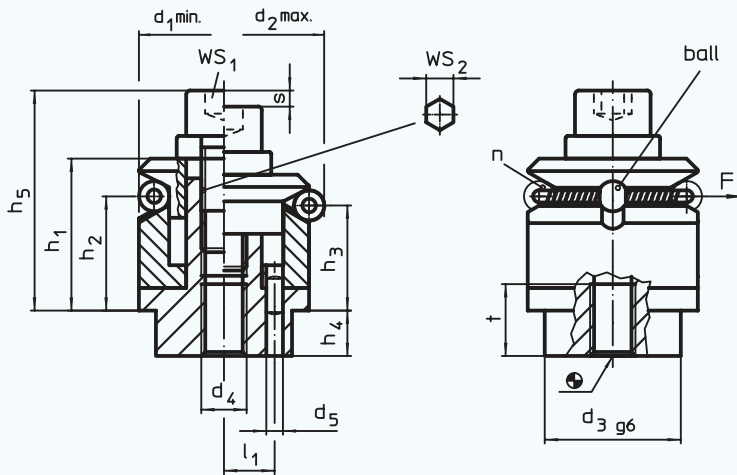
Ref. No.	d ₁ min.	d ₂ max.	d ₃ g6	d ₄	d ₅ +0,3	Location hole d ₆ H7	h ₁	h ₂	h ₃	h ₄	h ₅	l ₁ ±0,1	l ₂	Number of segments n	t	stroke s	WS ₁	WS ₂	Clamping force F max. kN	g
23340.0014	14,5	18,5	12	M 4	2,0	12	14,1	9,1	7,9	5,5	19,7	4,5	3	3	6	2,3	3	4	3,5	19
23340.0018	18,5	22,5	15	M 5	2,5	15	16,6	11,6	10,4	7,5	23,6	5,5	3	3	7	2,3	4	5	4,5	38
23340.0022	22,5	26,5	15	M 6	3,0	15	20,1	15,1	13,9	6,0	29,1	7,0	3	3	8	2,3	5	6	5,0	62
23340.0026	26,5	30,5	20	M 6	3,0	20	20,1	15,1	13,9	6,0	29,1	7,0	3	3	8	2,3	5	6	5,0	87
23340.0030	30,5	38,5	25	M 6	4,0	25	24,2	15,2	12,8	7,0	33,4	9,0	6	3	8	4,6	5	6	5,0	133
23340.0038	38,5	46,5	30	M 8	4,0	30	27,1	18,1	15,7	7,5	37,6	11,0	6	6	10	4,6	6	8	6,5	238
23340.0046	46,5	54,5	30	M 8	4,0	30	27,1	18,1	15,7	7,5	37,6	11,0	6	6	10	4,6	6	8	6,5	327
23340.0054	54,5	70,5	45	M 10	5,0	45	40,7	23,7	19,0	9,0	54,2	15,0	12	6	12	9,3	8	10	8,0	658
23340.0070	70,5	86,5	60	M 12	5,0	60	45,0	28,3	23,6	10,0	61,6	17,0	12	6	15	9,3	10	12	10,0	1286
23340.0086	86,5	102,5	60	M 12	5,0	60	45,0	28,3	23,6	10,0	61,6	17,0	12	6	15	9,3	10	12	10,0	1778



EH 23340.

Centering Clamping Elements

with spherical clamping segments



>>> Special types, e.g. pulling or tandem function, upon request. <<<

Material:

Body: • Tool steel, blackened **Clamping balls:** • Steel 1.4112, hardened and ground **Spring:** • Stainless steel

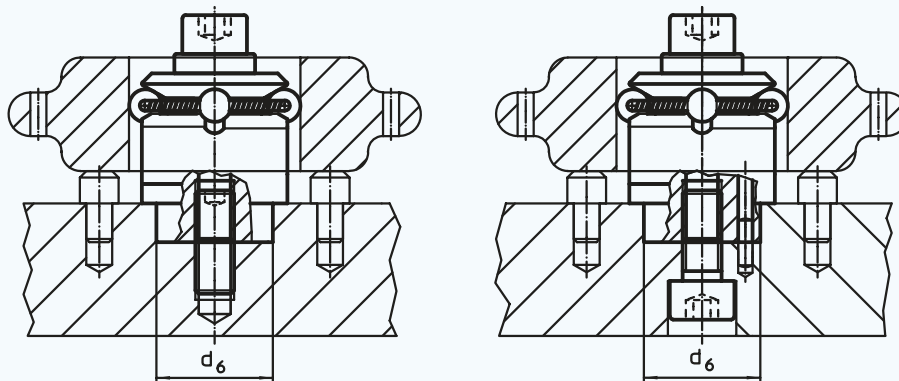
Note:

To be used for accurate centering and clamping of workpieces on which light spherical marks are acceptable. Exact self-centering with a precision of $\pm 0,025$ mm. The clamping balls frictionally center and hold work pieces with raw or pre-machined surfaces down to the bearing points. Large adjustment stroke and a small building height are a feature of this center clamping element. **Activate from either top or bottom.**

Advice for activating from the top mounting: Take-off clamping plate and screw. Fasten body by means of threaded pin via WS_2

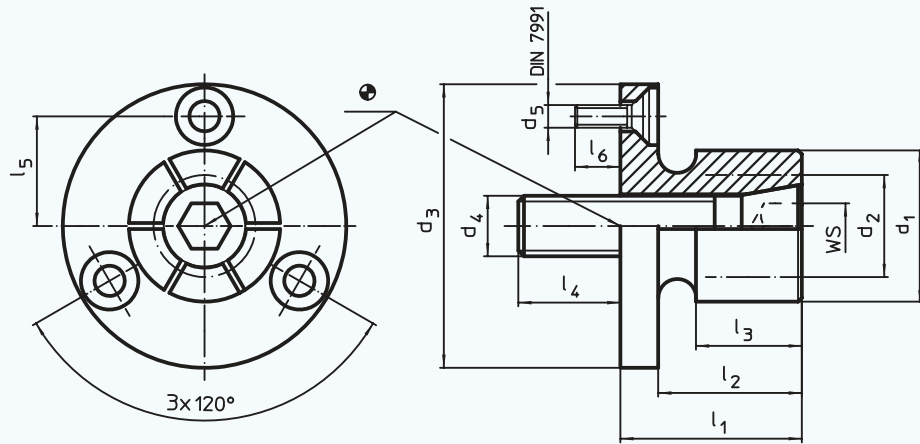
Ref. No.	d ₁ min.	d ₂ max.	d ₃ g6	d ₄	d ₅ +0,3	Location hole d ₆ H7	h ₁	h ₂	h ₃	h ₄	h ₅	l ₁ ±0,1	Ball Ø	Number of balls n	t	stroke s	WS ₁	WS ₂	Clamping force F max. kN	g
23340.0214*	14,5	18,5	12 M	4	2,0	12	14,1	9,1	7,9	5,5	19,7	4,5	4	3	6	2,3	3	-	3,5	20
23340.0218	18,5	22,5	15 M	5	2,5	15	16,6	11,6	10,4	7,5	23,6	5,5	4	3	7	2,3	4	5	4,5	39
23340.0222	22,5	26,5	15 M	6	3,0	15	20,1	15,1	13,9	6,0	29,1	7,0	4	3	8	2,3	5	6	5,0	60
23340.0226	26,5	30,5	20 M	6	3,0	20	20,1	15,1	13,9	6,0	29,1	7,0	4	3	8	2,3	5	6	5,0	86
23340.0230	30,5	38,5	25 M	6	4,0	25	24,2	15,2	12,8	7,0	33,4	9,0	8	3	8	4,6	5	6	5,0	125
23340.0238	38,5	46,5	30 M	8	4,0	30	27,1	18,1	15,7	7,5	37,6	11,0	8	6	10	4,6	6	8	6,5	233
23340.0246	46,5	54,5	30 M	8	4,0	30	27,1	18,1	15,7	7,5	37,6	11,0	8	6	10	4,6	6	8	6,5	323
23340.0254	54,5	70,5	45 M	10	5,0	45	40,7	23,7	19,0	9,0	54,2	15,0	16	6	12	9,3	8	10	8,0	653
23340.0270	70,5	86,5	60 M	12	5,0	60	45,0	28,3	23,6	10,0	61,6	17,0	16	6	15	9,3	10	12	10,0	1271
23340.0286	86,5	102,5	60 M	12	5,0	60	45,0	28,3	23,6	10,0	61,6	17,0	16	6	15	9,3	10	12	10,0	1783

* no WS_2 clamping screw and threaded pin to be mounted from top



EH 23340.

**Centering
Clamping
Mandrels**



>>> Special types upon request. <<<

Material:

Body: • Steel, blackened

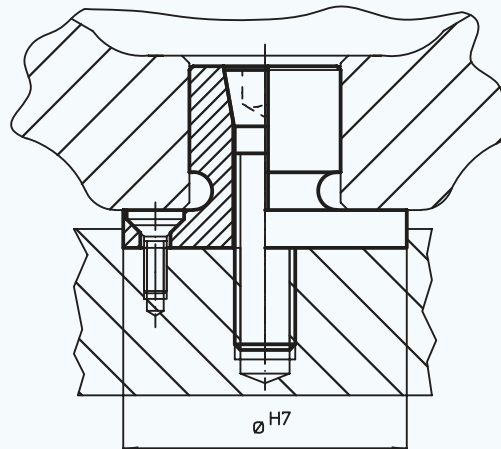
Clamping screw: • Case-hardened steel, case hardened

Note:

For clamping and centering of work pieces. The centering clamping mandrel can be machined to the required seating diameter (e.g. by turning/milling). It must be noticed that before machining the centering clamping mandrel, it will be expanded approx. 0,1 mm over the clamping diameter. To machine the mandrel, a nut will be provided.

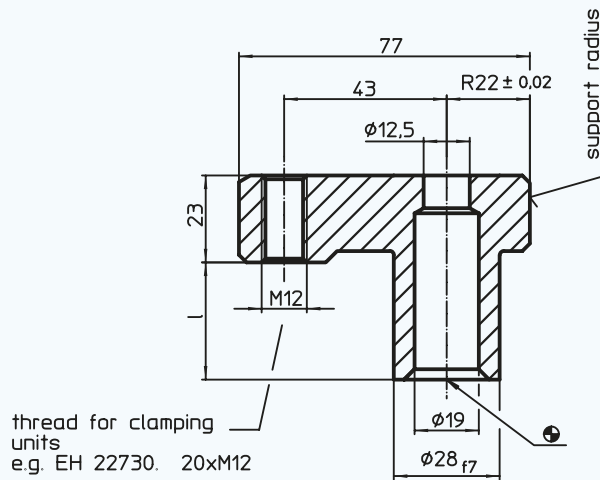
Ref. No.	d ₁	d ₂ min.	d ₃ h9	d ₄	d ₅	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆ ≈	WS	Starting torque max. Nm	Clamping force kN	μ g
23340.0104	12,4	8,0	29,72	M 4	M 3	21,8	16,0	15,0	8	10,50	6	3	3,5	3	55
23340.0106	14,2	12,2	31,50	M 6	M 3	24,9	19,0	15,0	12	11,55	6	5	12,0	6	68
23340.0108	20,0	13,5	37,50	M 8	M 3	24,9	19,0	15,0	14	14,50	6	6	24,0	8	104
23340.0111	27,0	18,0	50,00	M 10	M 4	28,6	22,2	17,5	17	19,70	7	8	42,0	13	197
23340.0112	35,3	25,4	56,00	M 12	M 4	31,8	25,4	20,6	21	22,75	7	10	105,0	15	322
23340.0116	51,0	30,0	75,50	M 16	M 5	39,6	31,8	27,0	22	31,95	11	14	200,0	26	809
23340.0118*	77,0	30,0	107,50	M 16	M 6	45,5	37,6	32,3	20	46,25	12	14	200,0	26	1832

* Including clamping nut and clamping ring to enable machining as described in note.



EH 23370.

Clamping Elements



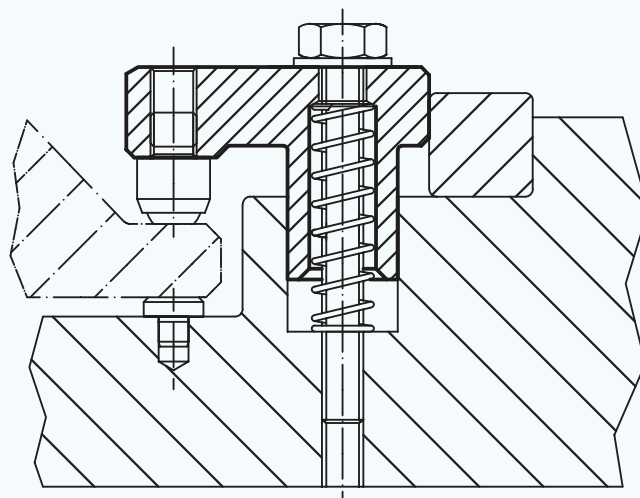
Material:

- Steel, case-hardened, blackened, ground

Note:

Used as clamps in conventional fixtures. A reamed hole is provided in the body of the fixture. The hole depth has to be adapted to the desired clamping height. To provide a counter force, a support can be placed against the rounded end of the clamp (radius 22). This support can be flat, half-rounded or V-shaped. Clamping is achieved by means of a DIN 933 hexagon screw.

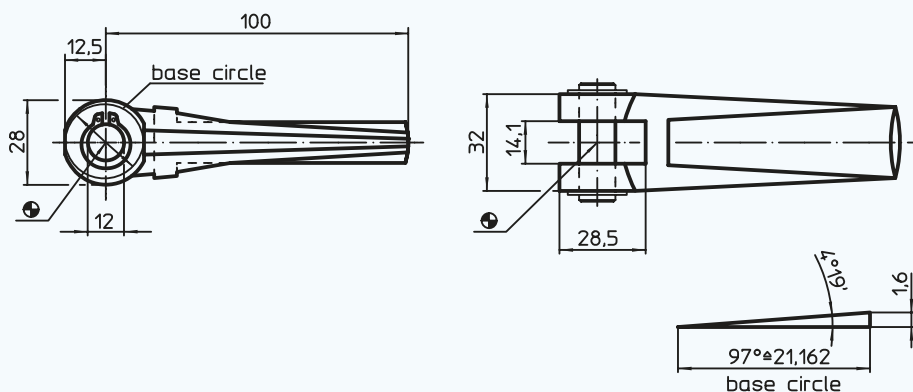
Ref. No.	l	Location hole H7	Clamp length	g
23370.0031	31	28	77	433
23370.0053	53	28	77	462
23370.0083	83	28	77	577



EH 23380.

**Double
Eccentric
Levers**

with fulcrum pin



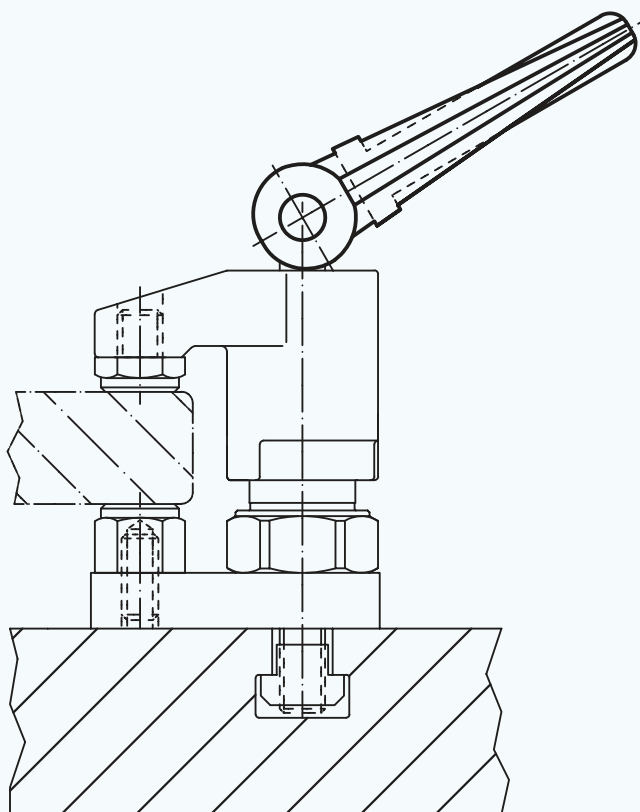
Material:

Lever: • Alloyed case-hardened steel, case hardened, blackened
Fulcrum pin: • Steel, case-hardened
Safety ring: • Spring steel

Note:

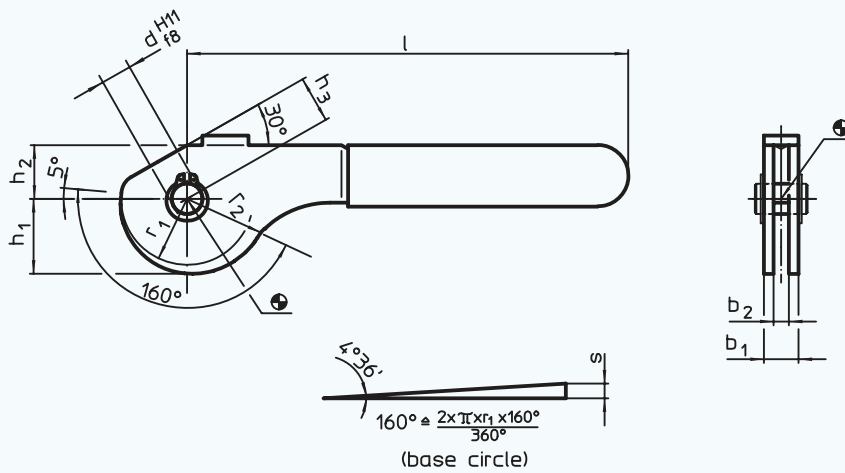
Clamping on both sides. Can be used in combination with swing bolts DIN 444, M12 (EH 22980.).

Ref. No.	Bore Hole	g
23380.0012	12	334



EH 23390.

Eccentric Levers with fulcrum pin



Material:

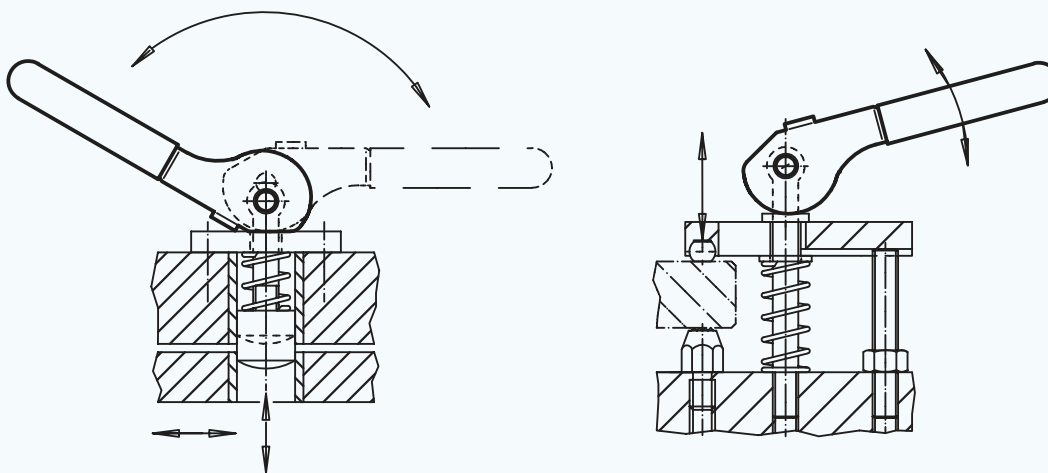
- Eccentric part:**
- Steel St. 52-3, zinc phosphated
 - Stainless steel 1.4301
- Fulcrum pin:**
- Stainless steel 1.4021, heat-treated

- Plastic grip:**
- PVC, red
- Safety ring:**
- Stainless steel 1.4310

Note:

Temperature range: Plastic grip up to + 60 °C.

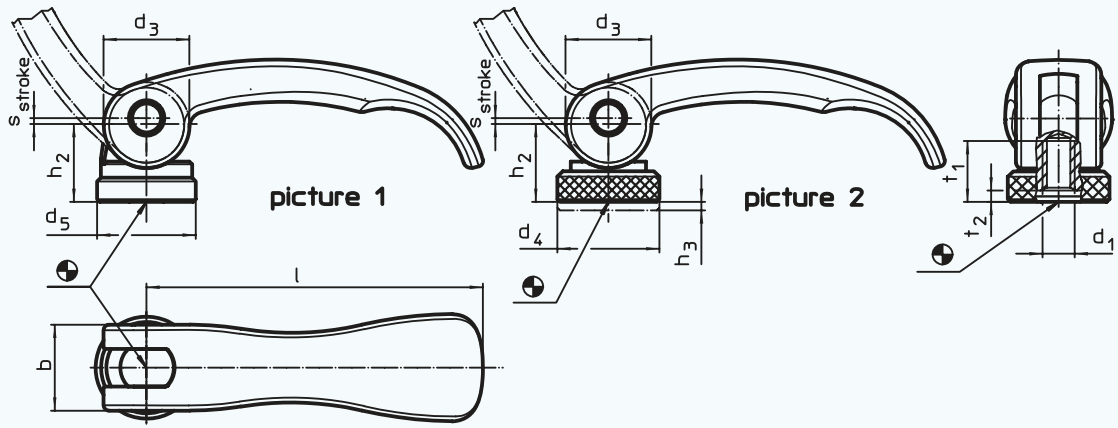
Ref. No.	Finish	b ₁	d H11 f8	l ≈	r ₁	r ₂	b ₂	h ₁	h ₂	h ₃	s Eccentric stroke	r ₂ -h ₃ Total stroke	μ g
23390.0408	steel	13	8	114	17,2	21,07	9	19,54	14	12	3,87	9,07	93
23390.0410		17	10	138	21,6	26,45	12	24,54	17	15	4,85	11,45	178
23390.0412		20	12	157	28,0	34,29	14	31,81	21	18	6,29	16,29	290
23390.0508	stainless steel	13	8	114	17,2	21,07	9	19,54	14	12	3,87	9,07	94
23390.0510		17	10	138	21,6	26,45	12	24,54	17	15	4,85	11,45	175
23390.0512		20	12	157	28,0	34,29	14	31,81	21	18	6,29	16,29	288



EH 23390.

Eccentric Quick Clamps

with female thread



Material:

Lever:

- Zinc die-cast, plastic coated, black

Inner parts:

- Steel, galvanized

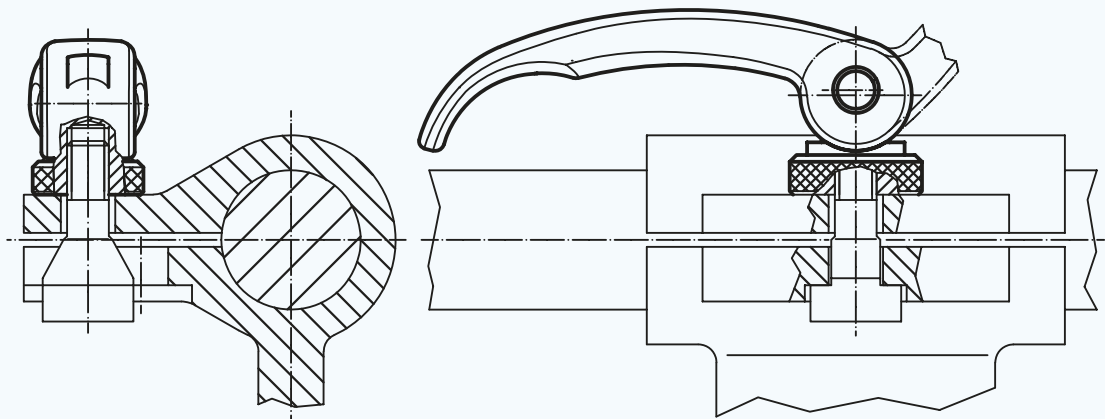
Bearing washer:

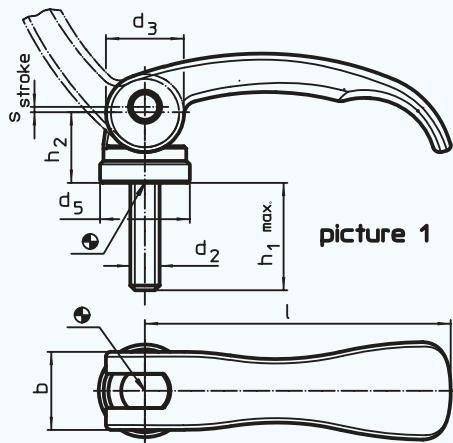
- Thermoplastic PA, glass-fiber reinforced (picture 1)
- Thermoplastic POM, glass-fiber reinforced (picture 2)

Note:

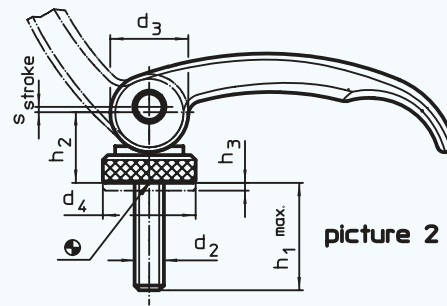
For quick and easy clamping and releasing of work pieces.
When using the "adjustable" design (picture 2) the lever position can be moved.
Temperature range up to 80 °C.

Ref. No.	Finish	l	d ₁	d ₃	d ₄	d ₅	h ₂ max.	h ₃ Regulating-range	b	s Stroke at 90° lever position	t ₁	t ₂ min. in clamping position	g
23390.0001	with female thread	63	M 6	16	-	18,5	16,4	-	16	0,75	13	3,0	58
23390.0002	(picture 1)	82	M 8	20	-	22,5	19,5	-	20	1,00	15	3,7	116
23390.0101	with female thread,	63	M 6	16	19	-	16,4	1,5	16	0,75	13	3,0	64
23390.0102	adjustable (picture 2)	82	M 8	20	25	-	19,5	2,5	20	1,00	15	3,7	130





picture 1



picture 2

EH 23390.

Eccentric Quick Clamps

with screw



Material:

Lever:

- Zinc die-cast, plastic coated, black

Inner parts:

- Steel, galvanized

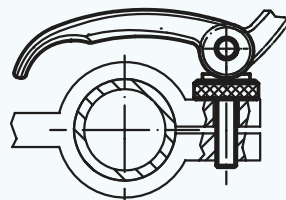
Bearing washer:

- Thermoplastic PA, glass-fiber reinforced (picture 1)
- Thermoplastic POM, glass-fiber reinforced (picture 2)

Note:

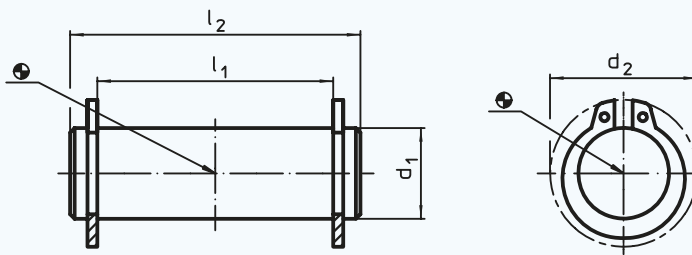
For quick and easy clamping and releasing of work pieces.
When using the "adjustable" design (picture 2) the lever position can be moved.
Temperature range up to 80 °C.

Ref. No.	Finish	l	d ₂	h ₁ max. in clamping position	d ₃	d ₄	d ₅	h ₂ max.	h ₃ Regulating-range	b	s Stroke at 90° lever position	μg
23390.0010	with screw	63	M 6	20	16	-	18,5	16,4	-	16	0,75	62
23390.0011	(picture 1)	63	M 6	25	16	-	18,5	16,4	-	16	0,75	63
23390.0012		63	M 6	30	16	-	18,5	16,4	-	16	0,75	64
23390.0013		63	M 6	35	16	-	18,5	16,4	-	16	0,75	64
23390.0014		63	M 6	40	16	-	18,5	16,4	-	16	0,75	65
23390.0016		63	M 6	50	16	-	18,5	16,4	-	16	0,75	67
23390.0020		82	M 8	25	20	-	19,5	19,5	-	20	1,00	129
23390.0021		82	M 8	30	20	-	19,5	19,5	-	20	1,00	131
23390.0022		82	M 8	35	20	-	19,5	19,5	-	20	1,00	133
23390.0023		82	M 8	40	20	-	19,5	19,5	-	20	1,00	135
23390.0025		82	M 8	50	20	-	19,5	19,5	-	20	1,00	139
23390.0027		82	M 8	60	20	-	19,5	19,5	-	20	1,00	143
23390.0110	with screw,	63	M 6	20	16	19	-	16,4	1,5	16	0,75	68
23390.0111	adjustable	63	M 6	25	16	19	-	16,4	1,5	16	0,75	69
23390.0112	(picture 2)	63	M 6	30	16	19	-	16,4	1,5	16	0,75	70
23390.0113		63	M 6	35	16	19	-	16,4	1,5	16	0,75	70
23390.0114		63	M 6	40	16	19	-	16,4	1,5	16	0,75	71
23390.0116		63	M 6	50	16	19	-	16,4	1,5	16	0,75	73
23390.0120		82	M 8	25	20	25	-	19,5	2,5	20	1,00	142
23390.0121		82	M 8	30	20	25	-	19,5	2,5	20	1,00	144
23390.0122		82	M 8	35	20	25	-	19,5	2,5	20	1,00	146
23390.0123		82	M 8	40	20	25	-	19,5	2,5	20	1,00	148
23390.0125		82	M 8	50	20	25	-	19,5	2,5	20	1,00	152
23390.0127		82	M 8	60	20	25	-	19,5	2,5	20	1,00	156



EH 23400.

Fulcrum Pins



Material:

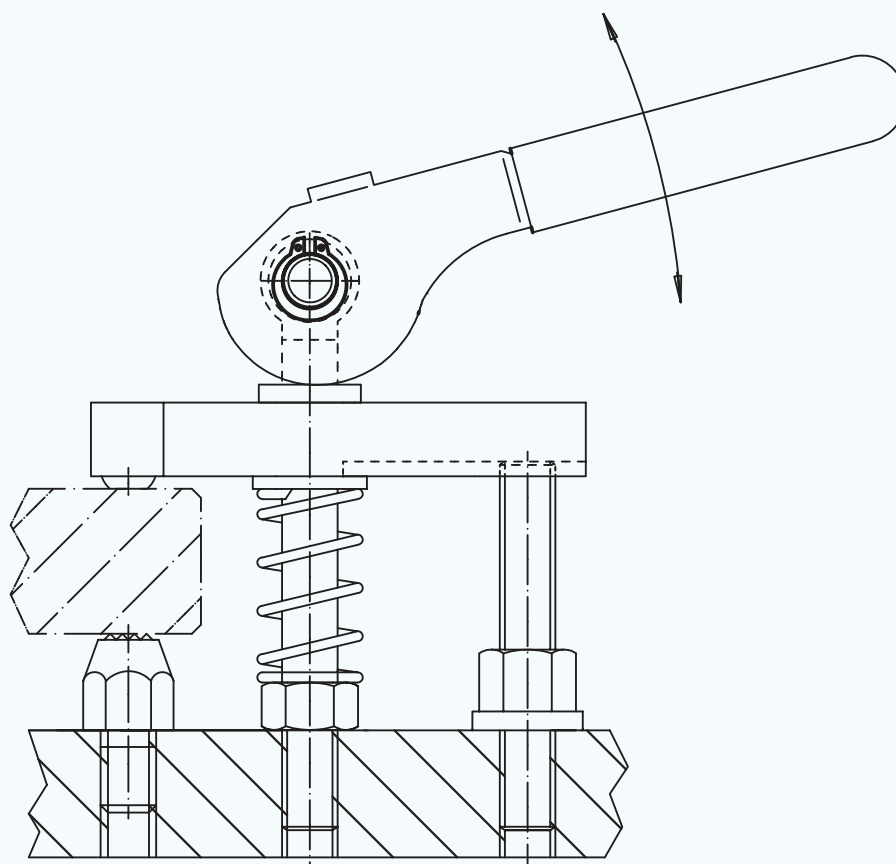
Fulcrum pin: • Stainless steel 1.4021, heat-treated

Safety ring: • Stainless steel 1.4310

Note:

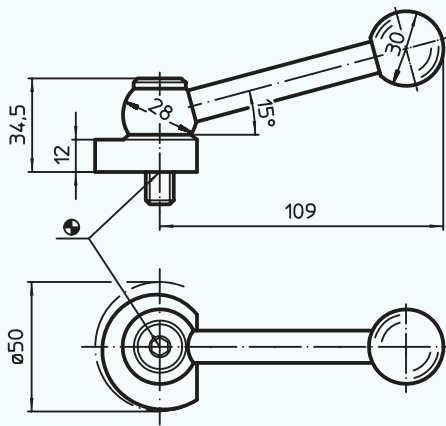
Suitable for eccentric levers EH 23390. and similar applications.

Ref. No.	d_1 f8	l_1 -0,5	d_2	l_2	$\frac{g}{g}$
23400.0082	8	14	14,7	18	7,7
23400.0085	8	21	14,7	27	10,0
23400.0102	10	18	17,0	24	14,0
23400.0105	10	29	17,0	35	21,0
23400.0122	12	21	19,0	27	23,0
23400.0125	12	31	19,0	37	32,0

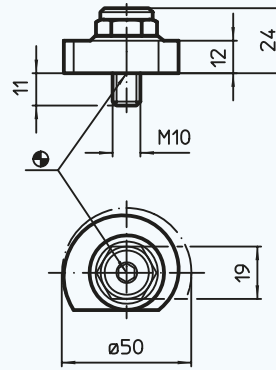


EH 23410.

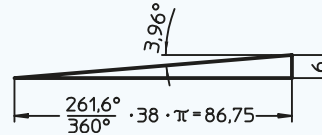
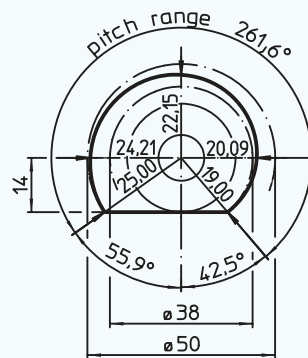
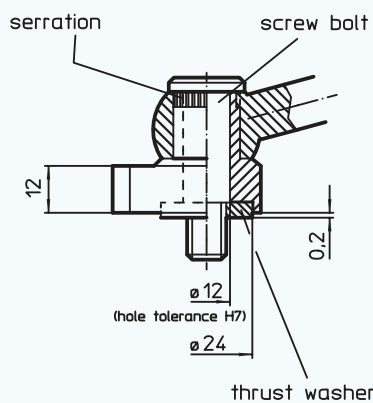
Eccentric Clamps



picture 1



picture 2



Material:

Body:

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

Ball knob:

- DIN 319 plastic (PF 31), black

Screw:

- Steel, hardened, blackened
- Stainless steel 1.4021, heat-treated, nickel-plated

Note:

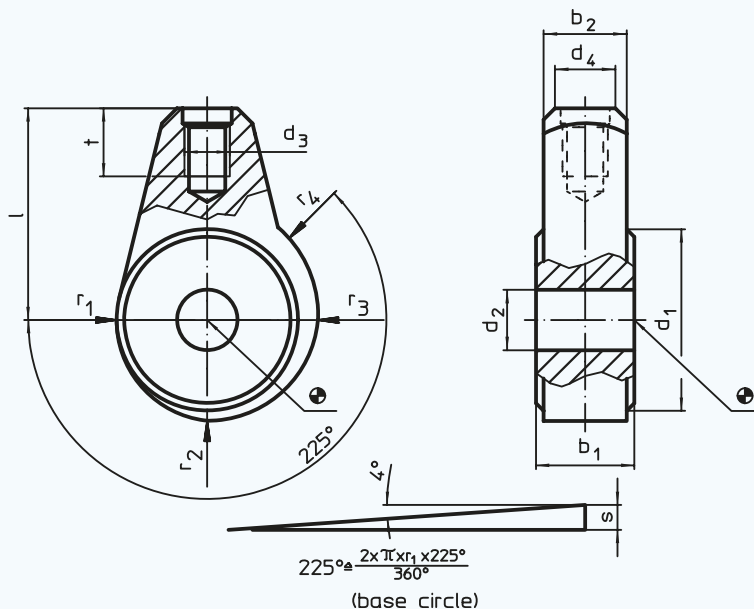
The eccentric lever can be adjusted to the best position by means of the serration.
By removing the washer the eccentric clamp can also be used as an infinitely adjustable stop.
Left turn design can be supplied upon request.

Ref. No. Steel	Ref. No. Stainless steel	Finish	g
23410.0050	23410.0051	with clamping lever (picture 1)	317
23410.0150	23410.0151	with clamping screw (picture 2)	159

EH 23410.

Eccentric Clamping Modules

with shaft location



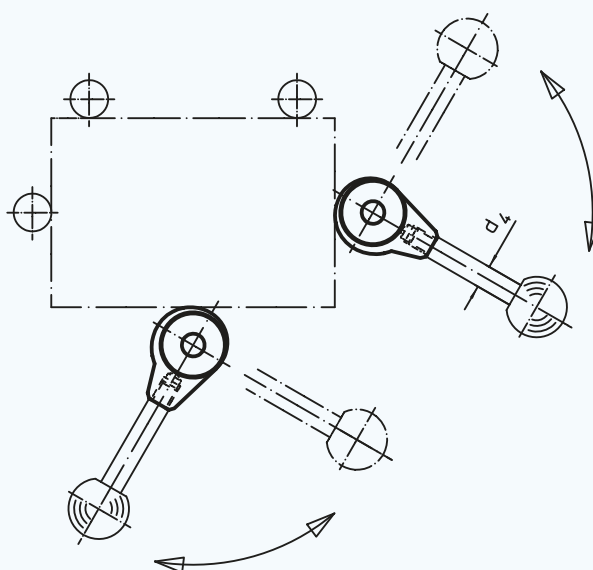
Material:

- Sintered steel, case-hardened

Note:

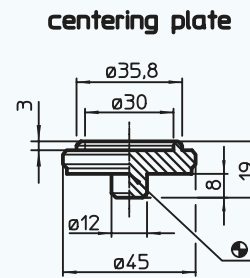
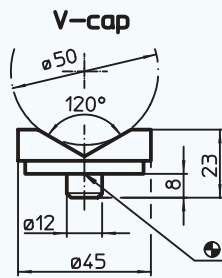
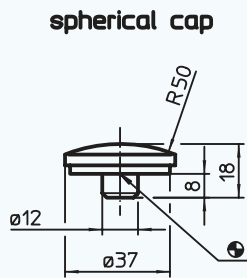
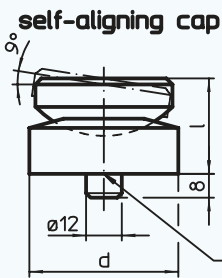
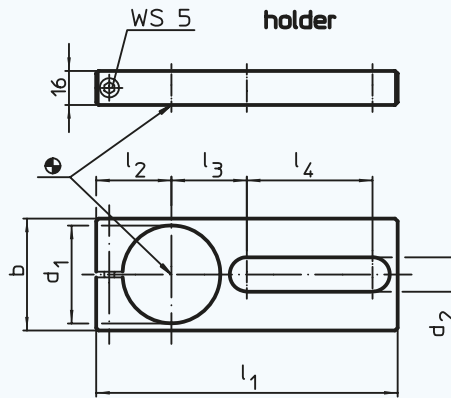
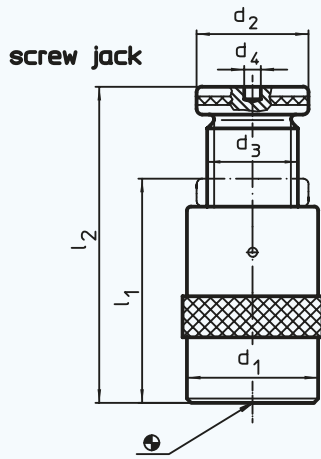
The clamping effect remains unchanged and is self-locking in any angle position. Possible applications in combination with e.g. gear lever handles EH 24530.

Ref. No.	d ₁	d ₂ H9	b ₁ -0,05 -0,15	b ₂	d ₃	d ₄ Handle bar EH 24530. Ø	l	r ₁	r ₂	r ₃	r ₄	s	t	g
23410.0210	24	8	13	11	M 6	8	28	12,0	13,32	14,64	15,30	3,3	9	50
23410.0220	30	10	15	13	M 8	10	32	15,0	16,65	18,30	19,12	4,1	12	100
23410.0230	35	12	17	15	M 10	12	36	17,5	19,42	21,34	22,31	4,8	15	150



EH 23470.

Screw Jacks Holders Caps



Material:

Screw jack: • Steel 1.0503 varnished

Holder: • Steel, blackened

Caps: • Steel, case-hardened, blackened

Note:

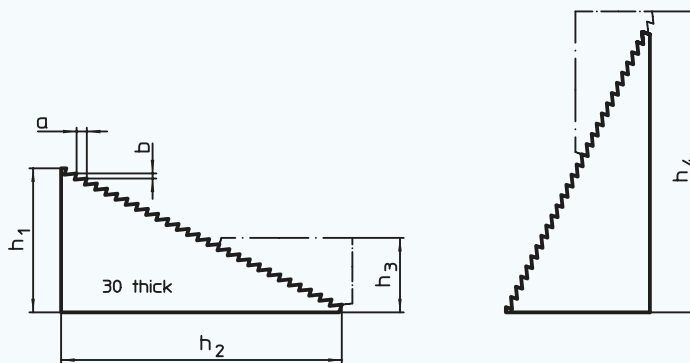
Trapezoidal self-locking thread, spindle with final safety device. The holders, which can be secured by means of the T-slots, make it possible to tighten the jacks so that they will not slip out of position when a workpiece is changed. They also allow to fit screw jacks to vertical clamping surfaces. Screw jacks are frequently used for supporting work pieces. Use of the self-aligning cap ensures a correctly aligned bearing surface. Using the centering plate as an intermediate element, it is possible to fit a number of screw jacks sizes 52, 70 and 100 together one above the other.

Ref. No.	Finish	l ₂ Clamping height max.	l ₁ min.	d ₁	d ₂	d ₃ TR	d ₄	Carrying force kN	g
23470.0005	screw jacks	50	38	31	31	20 x 4	-	15	191
23470.0006		52	42	50	50	30 x 4	12	60	539
23470.0007		70	50	50	50	30 x 4	12	60	645
23470.0010		100	70	50	50	30 x 4	12	60	900
23470.0014		140	100	69	69	40 x 7	12	100	2614
23470.0021		210	140	80	70	50 x 8	12	170	4336
23470.0030		300	190	100	80	65 x 10	12	350	9680

Ref. No.	Finish	d	d ₁	b	d ₂	l	l ₁	l ₂	l ₃	l ₄	For screw jacks	g
23470.0232	holder	-	31	40	18,5	-	175	30	35	90	Size 50	518
23470.0250		-	50	60	20,5	-	190	38	46	90	Sizes 52, 70, 100	891
23470.0270		-	69	80	24,5	-	210	48	54	90	Size 140	1300
23470.0350	self-aligning cap	50	-	-	-	32	-	-	-	-	Sizes 52, 70, 100	399
23470.0365		65	-	-	-	35	-	-	-	-	Sizes 140, 210	715
23470.0170	centering plate	-	-	-	-	-	-	-	-	-	Sizes 52, 70, 100	107
23470.0171	spherical cap	-	-	-	-	-	-	-	-	-	Size 52-300	74
23470.0172	V-cap	-	-	-	-	-	-	-	-	-	Size 52-300	138

EH 23480.

Universal Step Blocks



Material:

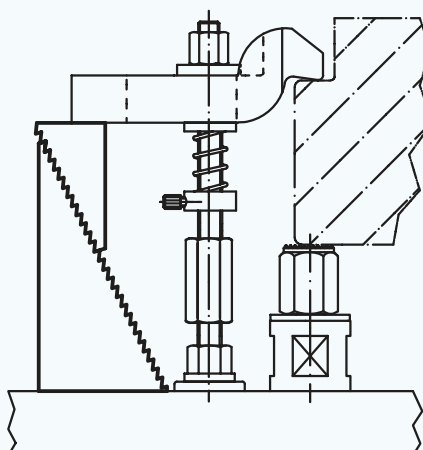
- Heat-treated steel, varnished

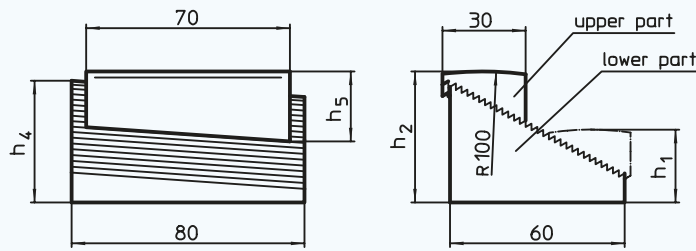
Note:

All three sizes can be combined with one another.

Ref. No.	Size	h ₁	h ₂	a	b	g
23480.0001	1	20	32	4,6	2,3	89
23480.0002	2	35	64	4,6	2,3	299
23480.0003	3	68	128	4,6	2,3	1034
23480.0010	Step block sets in wooden case available in the combinations:					7800
	8 x size 1					
	8 x size 2					
	4 x size 3					

Size-size	Clamping height h ₃ min.	Clamping height h ₄ max.
1 - 1	22	51
1 - 2	22	79
1 - 3	22	144
2 - 2	38	107
2 - 3	38	168
3 - 3	69	208

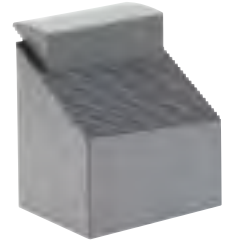




EH 23500.

Step Blocks

**DIN 6326, adjustable,
with spiral gearing**



Material:

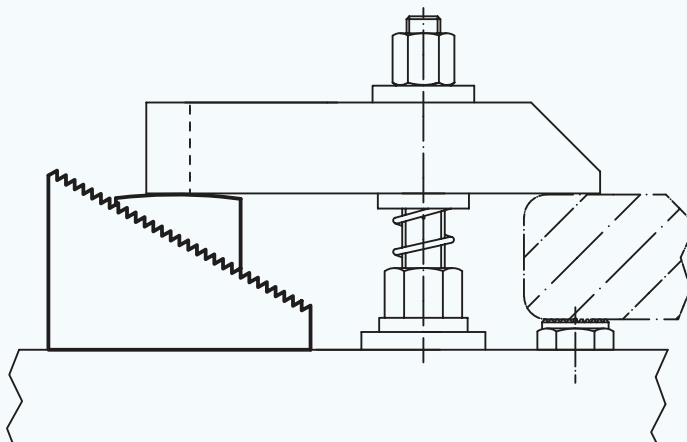
- Heat-treated steel, varnished

Note:

Upper and lower parts of any size can be used together in any desired combination.

The tooth form is a metric profile according to DIN 13, sheet 1, with a pitch of 2,5 mm; it lies in the normal section of the setting level.

Ref. No.	Finish	form	h ₄	h ₅	Clamping height min. h ₁	Clamping height max. h ₂	g
23500.0001	lower part	A	42	-	-	-	850
23500.0002		B	82	-	-	-	2300
23500.0003		C	122	-	-	-	3900
23500.0004	upper part	K	-	24	-	-	200
23500.0005		G	-	44	-	-	526
23500.0014	set	AK	-	-	25	45	1050
23500.0015		AG	-	-	45	65	1350
23500.0017		AKG	-	-	25	65	1550
23500.0023		BK	-	-	65	85	2500
23500.0025		BG	-	-	85	105	2800
23500.0026		BKG	-	-	65	105	3000
23500.0034		CK	-	-	105	125	4000
23500.0035		CG	-	-	125	145	4300
23500.0036		CKG	-	-	105	145	4500



EH 23690.

Compact clamps

are used for universal application - in either horizontal or vertical position - in machined and raw work pieces.

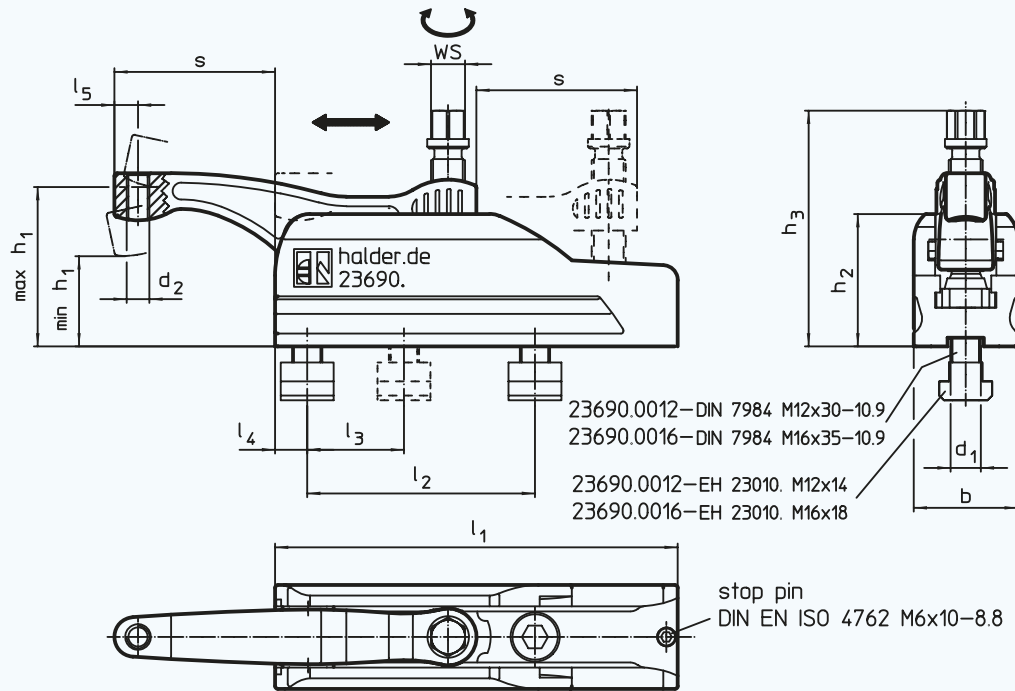
Features:

- exact and position precise clamping
- ease of operation
- high clamping force at low torques, abrasion-resistant due to clamping lever with bearing
- continuous, large clamping area
- clamping lever entirely retractable for hindrance-free exchange of work pieces
- clamping lever with locating thread for diverse clamping elements, e.g. ball-ended thrust screws (EH 22700. - EH 22720.), self-aligning pads (EH 22730./EH 22740.), thrust screws (EH 22760.) etc.
- large adjusting range at constant clamping force
- continuous height adjustment by height adaptors 23690.0112/.0116
- easy and flexible fastening possibilities
- corrosion-resistant
- insensitive to dirt and chips



EH 23690.

Compact Clamps



Material:

Body: • Heat-treated steel, black coated

Clamping lever: • Heat-treated steel, tempered, silver coated

Note:

The compact clamps are all purpose clamping elements. Due to the self-locking clamping lever application can either take place in horizontal or vertical position in both, machined and raw work pieces.

Features:

- exact and position precise clamping
- ease of operation
- high clamping force at low torques, abrasion-resistant due to clamping lever with bearings
- continuous, large clamping area
- clamping lever entirely retractable for hindrance-free exchange of work pieces
- threaded clamping lever can be used with many clamping elements, e.g. ball-ended thrust screws (EH 22700. -EH 22720.), self-aligning pads (EH 22730./EH 22740.) etc.
- large adjusting range at constant clamping force
- continuous height adjustment by height adaptors 23690.0112/.0116
- easy and flexible set up
- corrosion-resistant
- resistant to dirt and chips.

Clamping Process:

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

Assembly and Set-Up:

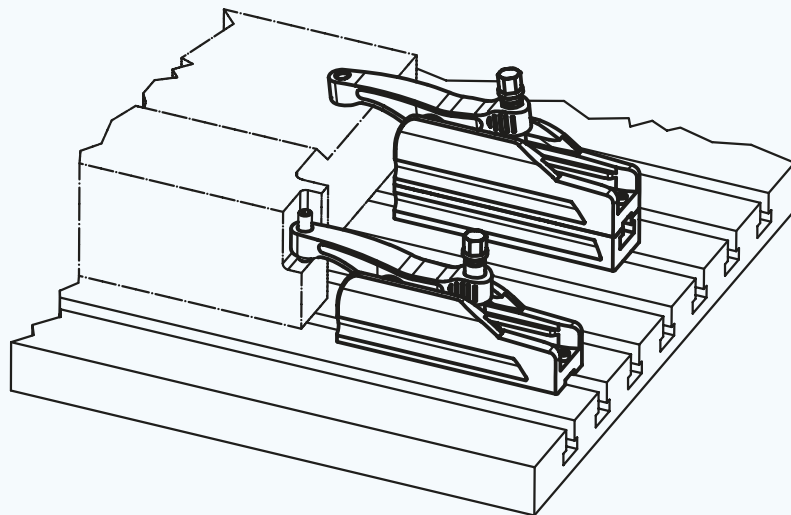
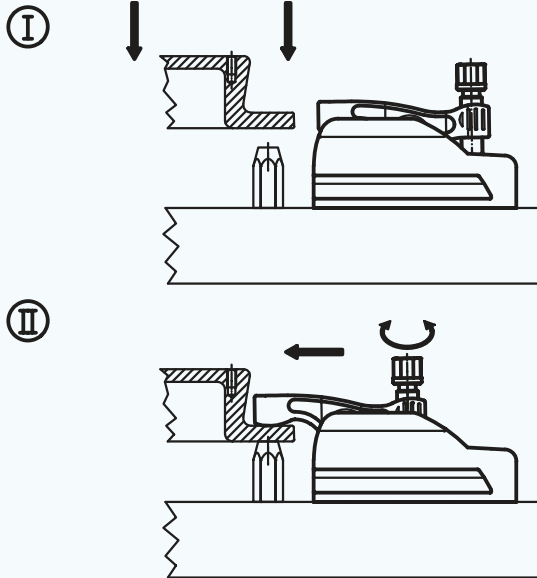
1. Take out stop pin ISO 4762-M 6 x 10.
2. Move back and take out clamping lever.
3. Tightening by 2 screws with internal hexagon (included in supply volume).
4. Place clamping lever in sliding rail and then insert.
5. Tighten stop pin ISO 4762 - M 6 x 10.

Ref. No.	d ₁	d ₂	WS	h ₁ min.	h ₁ max.	h ₂	h ₃	s max.	l ₁	l ₂ +1	l ₃	l ₄	l ₅	b	Starting torque max. Nm	Clamping force max. kN	g
23690.0012	M 12	M 8	16	40	60	59	95	43	134	70	50	13	10,0	45	45	15	1813
23690.0016	M 16	M 12	18	47	85	70	126	85	213	120	50	17	12,5	55	75	25	4274

EH 23690.

Continued from previous page

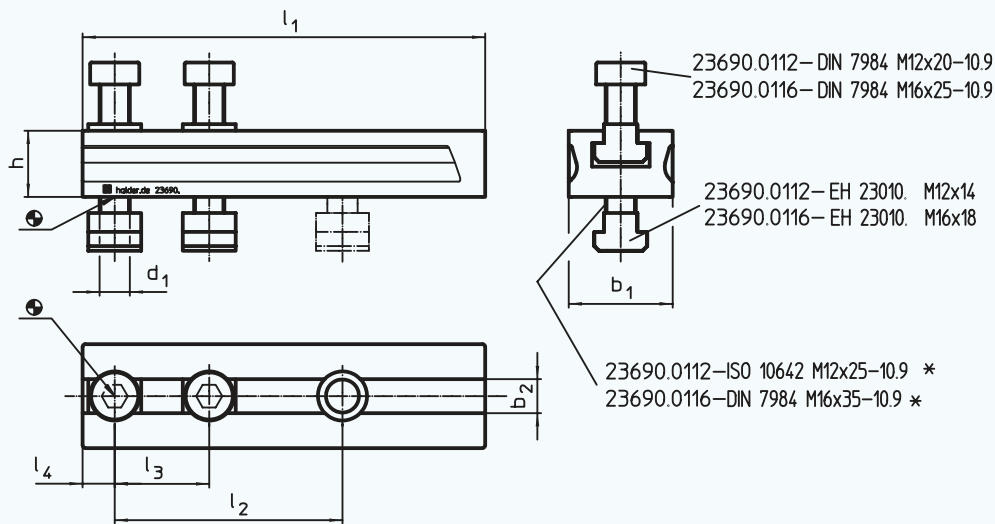
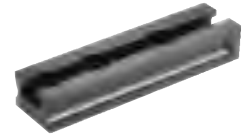
**Compact
Clamps**



EH 23690.

Height Adaptors

for compact clamp



* When using more height adaptors the screws ISO 10642 or DIN 7984 have to be replaced by screws extended by the dimension h.

Material:

- Heat-treated steel, black coated

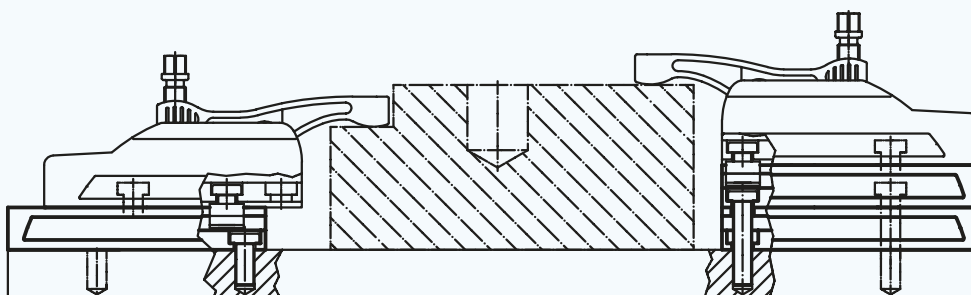
Note:

The height adaptors for compact clamps allow for a clamping height increase.

Features:

- continuous covering of clamping height
- height adaptor allows an exact positioning of compact clamp at designated slot distances
- height can optionally be expanded.

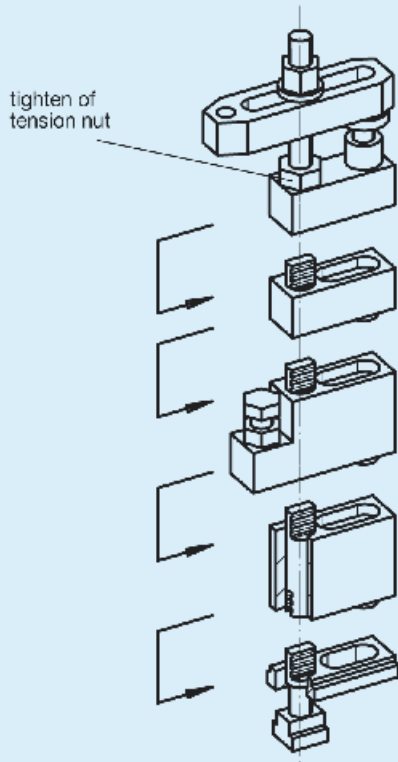
Ref. No.	d ₁	l ₁	l ₂ +1	l ₃	l ₄	h	b ₁	b ₂ H12	g
23690.0112	M 12	134	70	50	13	20	45	14	874
23690.0116	M 16	213	120	50	17	35	55	18	2534



EH 23700.

Clamping Element Systems

Assembly Instructions:



Finish:

Steel blackened,
Pull rod: special steel;
Wearing parts heat treated.

Note:

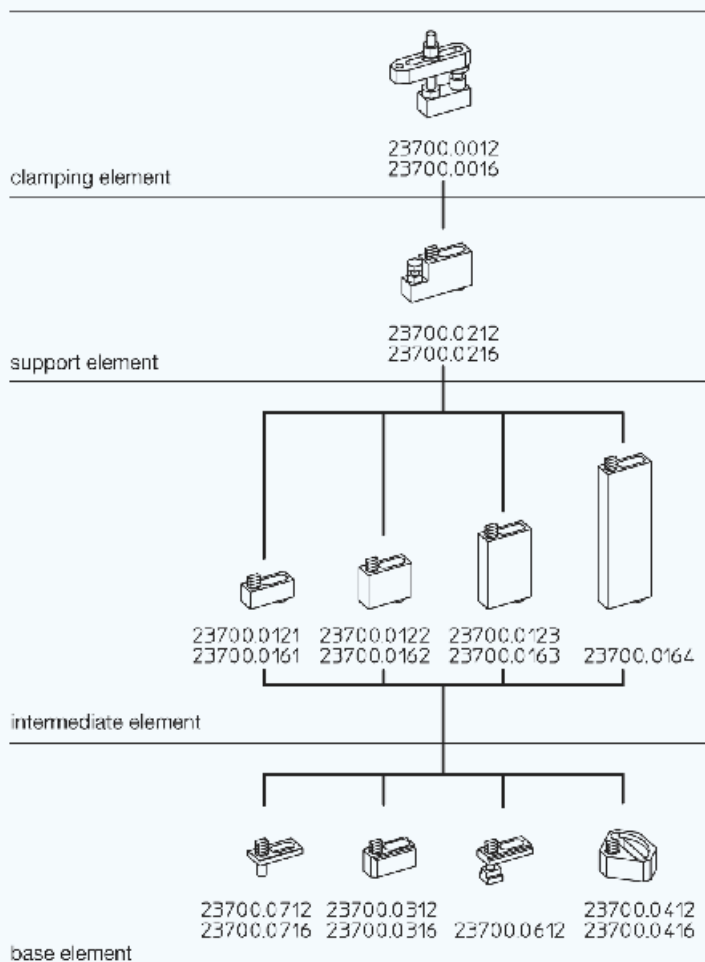
All clamping elements are tightly and safely clamped on the machine table or onto the fixture via the pull rod by simply tightening the nut.

Advantages:

- rapid, safe, simple, compact
- stepless height adjusting by intermediate elements
- Fastening of the foot elements by using grub screws, slot tenons or socket-head cap screws.

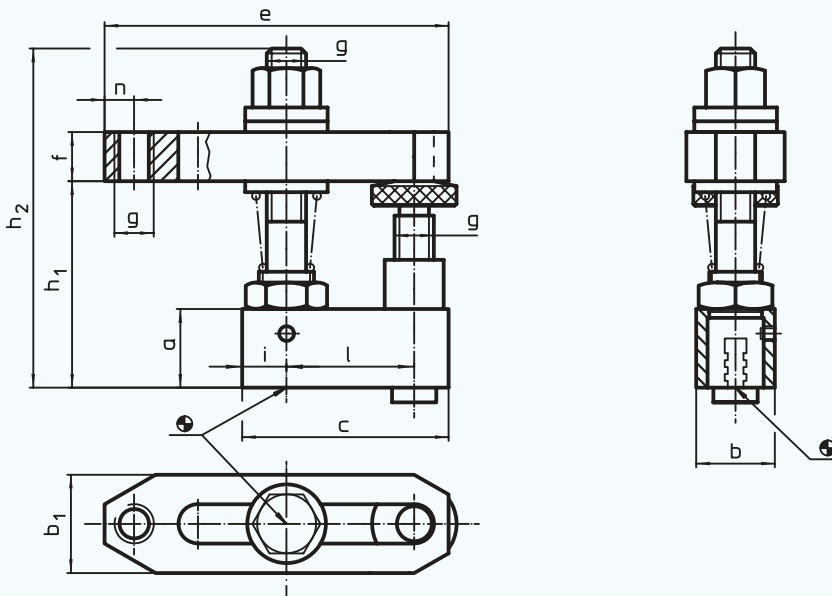


Assembly:



EH 23700.

Clamping Element Systems



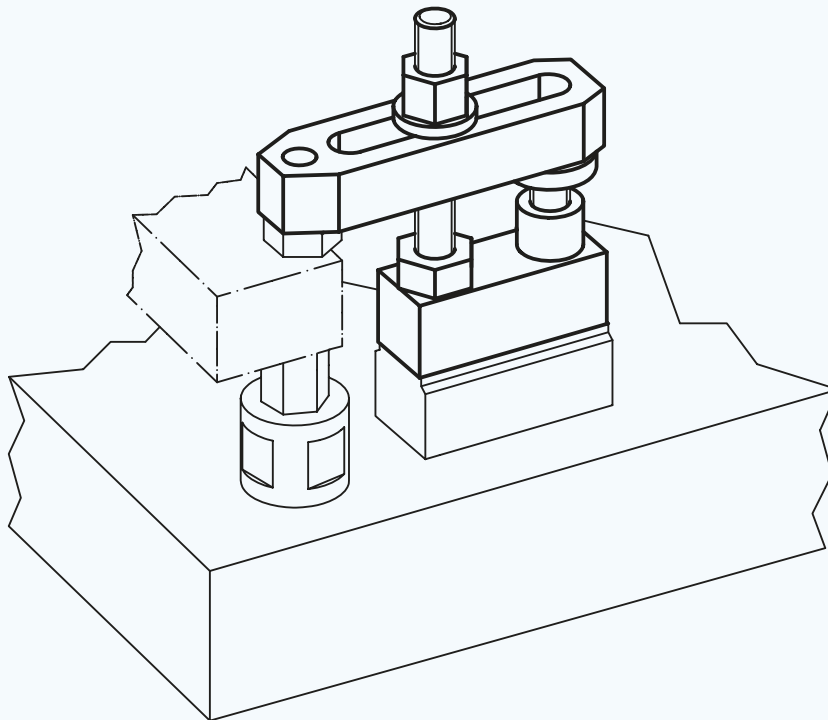
Material:

Body: • Steel, blackened

Pull-rod: • Special steel

Wearing parts: • Heat-treated steel

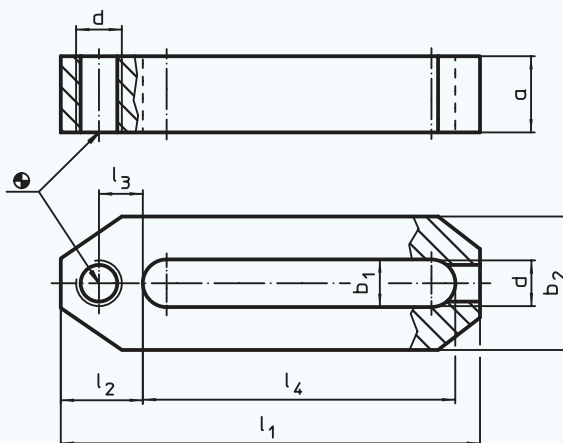
Ref. No.	a	b	c	b ₁	e	f	g	h ₁	h ₂	i	l	n	⌀ g
23700.0012	25	25	65	35	110	20	M 12	48-78	112	12,5	40	10	860
23700.0016	30	30	78	40	142	30	M 16	60-96	145	14,0	50	13	1698



EH 23700.

**Straight
Clamps**

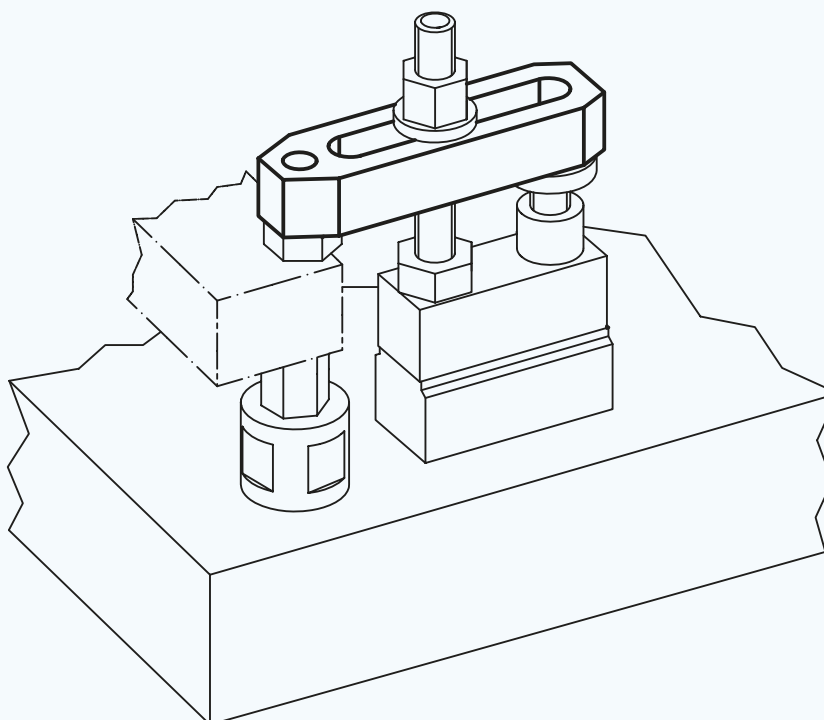
short



Material:

- Heat-treated steel, tempered, blackened

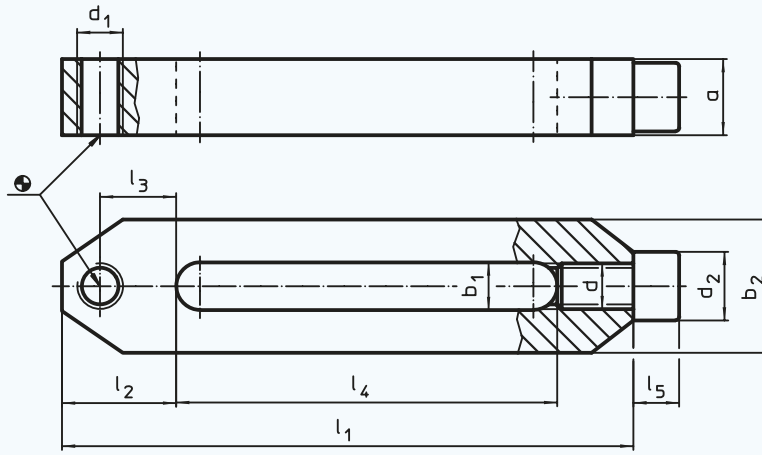
Ref. No.	b ₁	l ₁	a	b ₂	d	l ₂	l ₃	l ₄	g
23700.0022	12,5	110	20	35	M 12	21,5	11,5	82	370
23700.0026	17,0	142	30	40	M 16	28,0	15,0	107	788



EH 23700.

**Straight
Clamps**

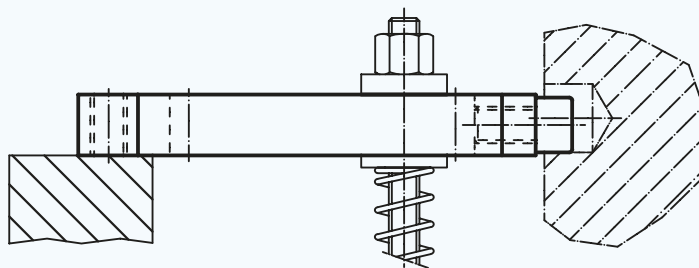
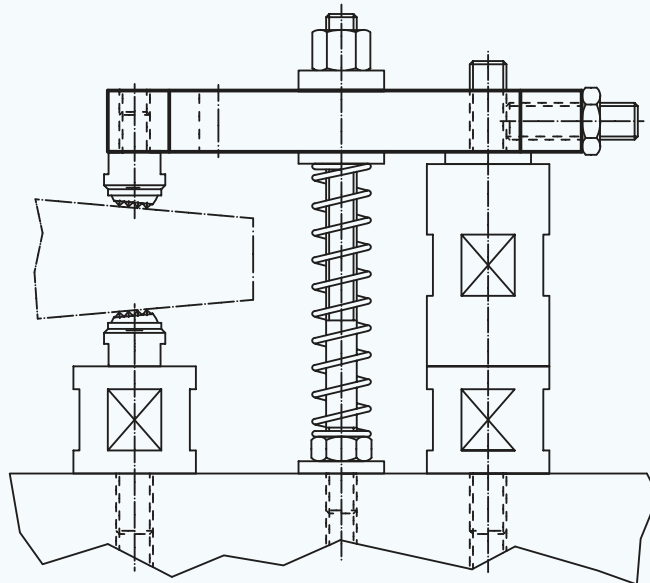
long



Material:

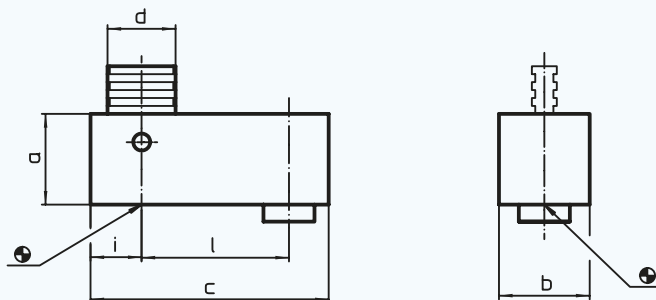
- Heat-treated steel, tempered, blackened

Ref. No.	b ₁	l ₁	a	b ₂	d ₁	l ₂	l ₃	l ₄	l ₅	d ₂	g
23700.0042	12,5	156	20	35,0	M 12	30	20	106	12	18	595
23700.0046	17,0	196	30	45,5	M 16	35	22	136	16	24	1422



EH 23700.

Intermediate Elements



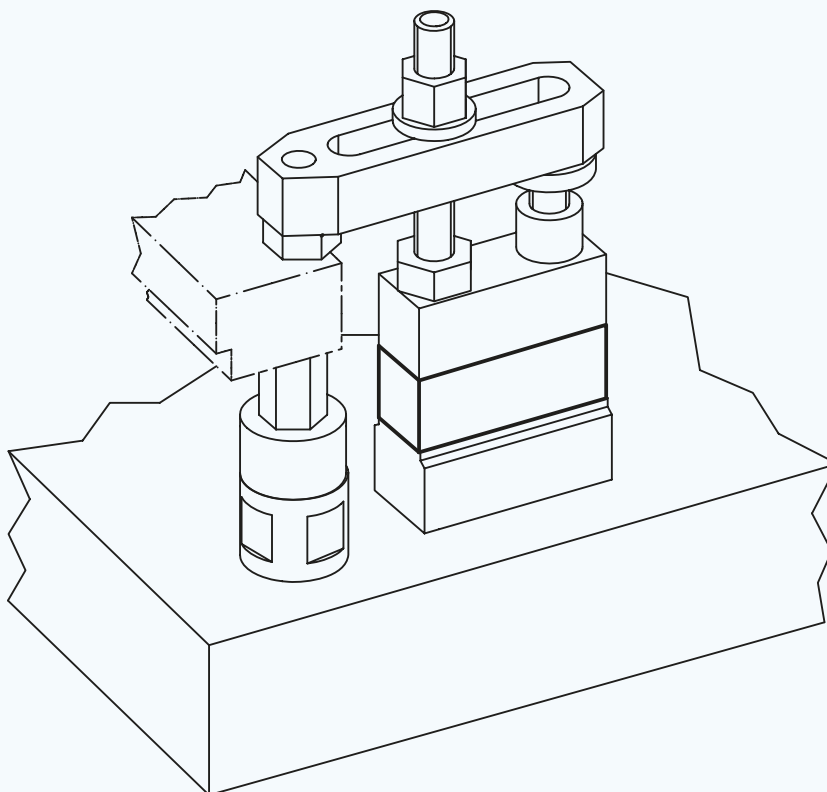
Material:

Body: • Steel, blackened

Pull-rod: • Special steel

Wearing parts: • Heat-treated steel

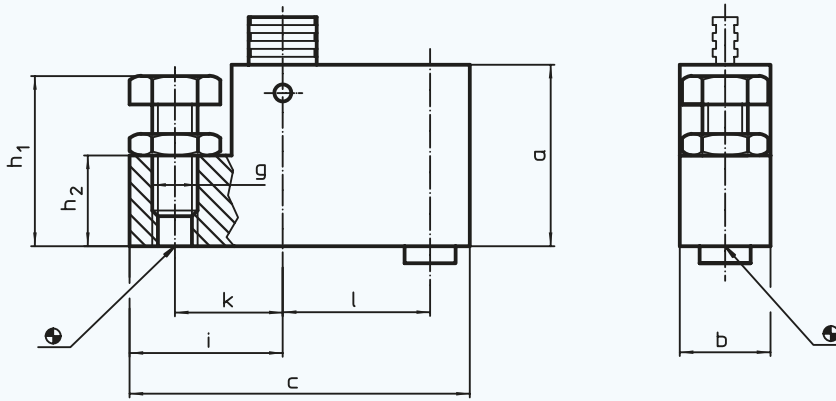
Ref. No.	a	b	c	d	i	l	g
23700.0121	25	25	65	16	12,5	40	261
23700.0122	50	25	65	16	12,5	40	574
23700.0123	100	25	65	16	12,5	40	1201
23700.0161	30	30	78	22	14,0	50	468
23700.0162	60	30	78	22	14,0	50	1032
23700.0163	120	30	78	22	14,0	50	2100
23700.0164	240	30	78	22	14,0	50	4340



EH 23700.

Intermediate Elements

with support



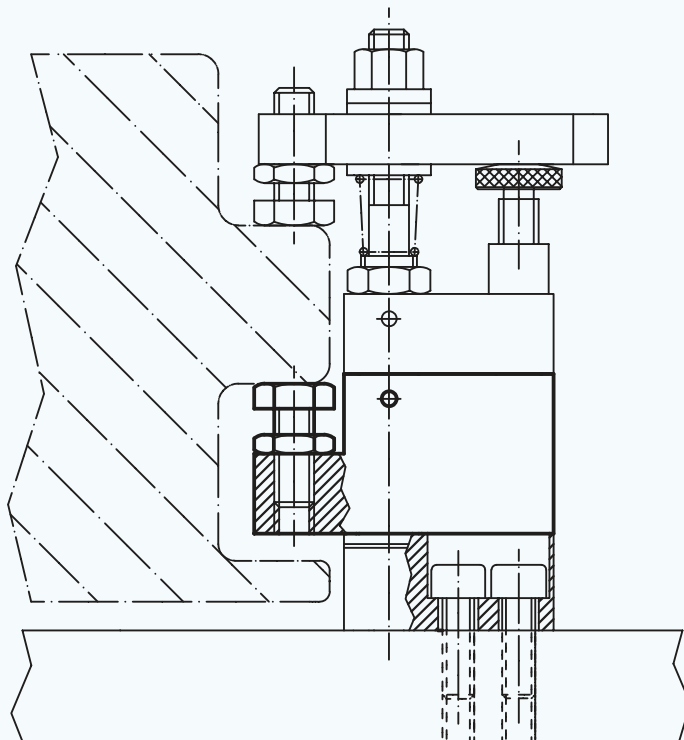
Material:

Body: • Steel, blackened

Pull-rod: • Special steel

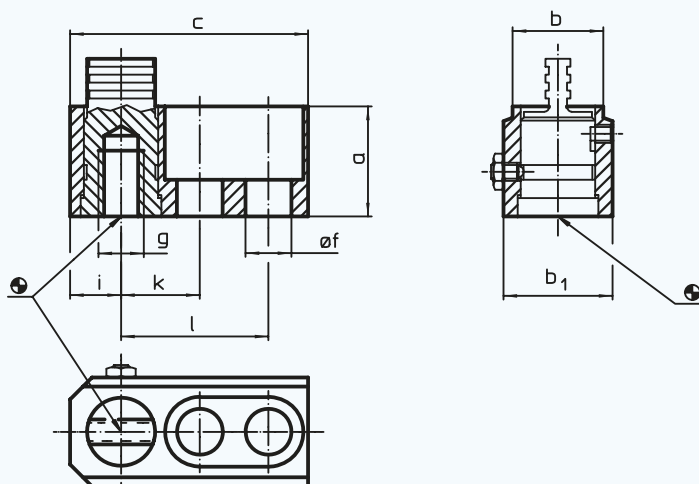
Wearing parts: • Heat-treated steel

Ref. No.	a	b	c	g	h ₁	h ₂	i	k	l	g
23700.0212	50	25	92	M 12	35-53	25	39,5	28	40	550
23700.0216	60	30	112	M 16	42-68	30	48,0	34	50	1140



EH 23700.

Position Base Elements



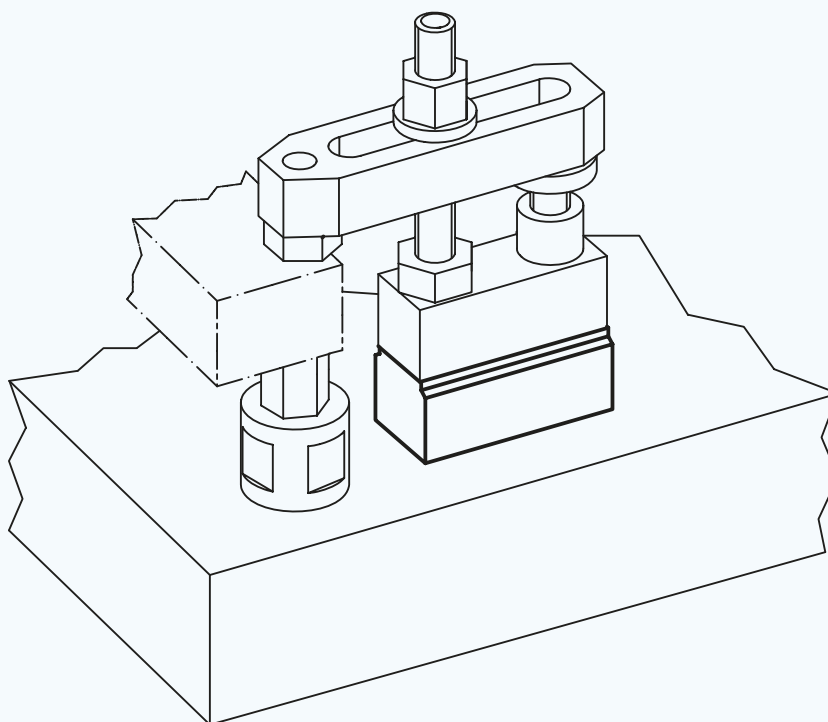
Material:

Body: • Steel, blackened

Pull-rod: • Special steel

Wearing parts: • Heat-treated steel

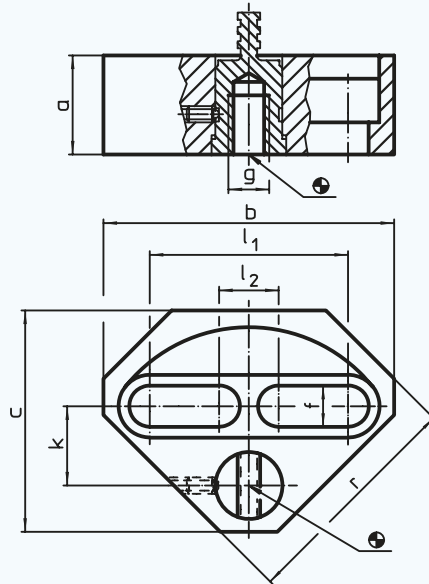
Ref. No.	a	b	c	b ₁	f	g	i	k	l	⌀g
23700.0312	30	25	65	30	12,5	M 12	12,5	20	40	297
23700.0316	40	30	80	40	17,0	M 16	16,0	25	50	641



EH 23700.

Base Elements

swivelling



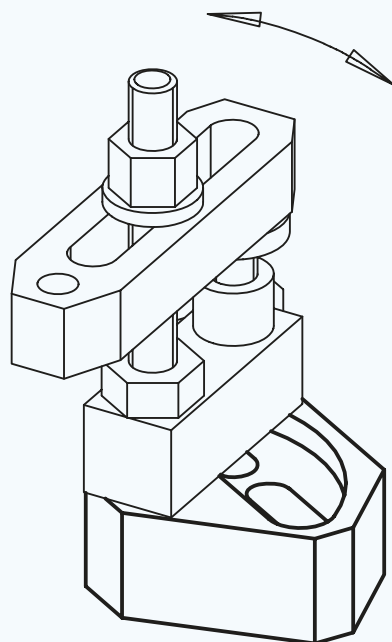
Material:

Body: • Steel, blackened

Pull-rod: • Special steel

Wearing parts: • Heat-treated steel

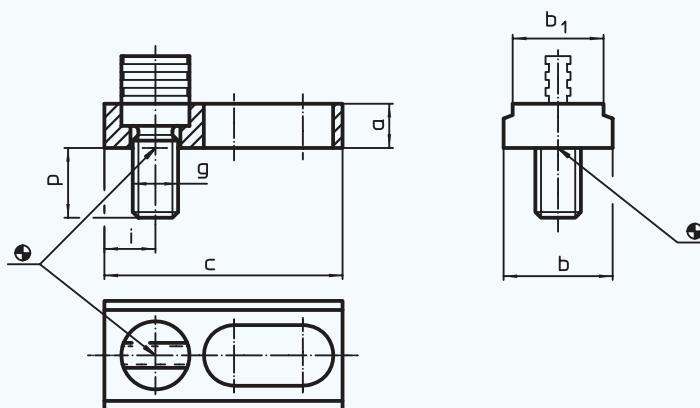
Ref. No.	a	b	c	f	g	k	l ₁	l ₂	r	g
23700.0412	29,7	88	67	12,7	M 12	24	61,5	18	70	758
23700.0416	39,7	105	85	17,0	M 16	32	74,8	22	85	1300



EH 23700.

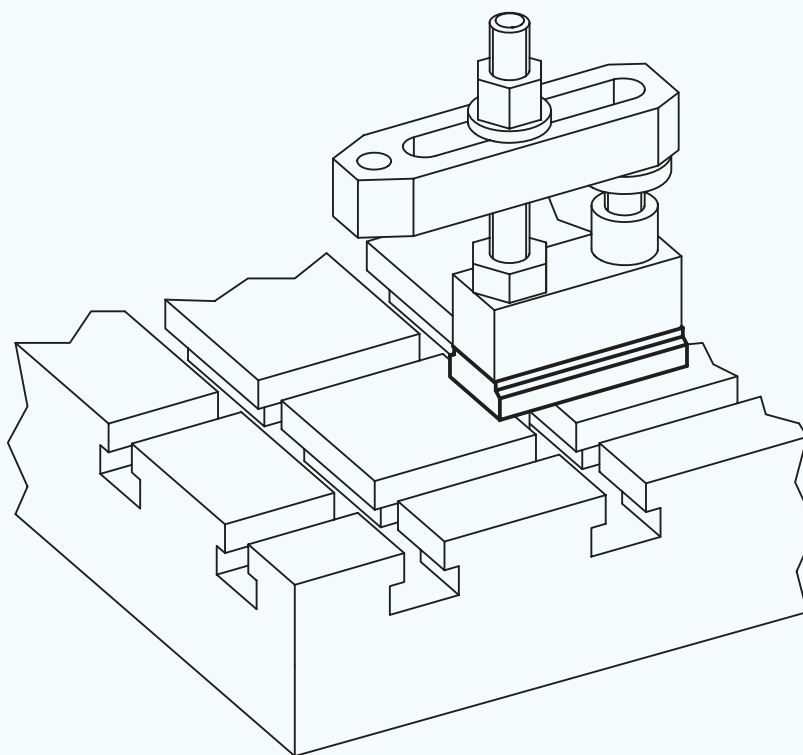
Low Base Elements

basic type



Material:
Body: • Steel, blackened **Pull-rod:** • Special steel **Wearing parts:** • Heat-treated steel

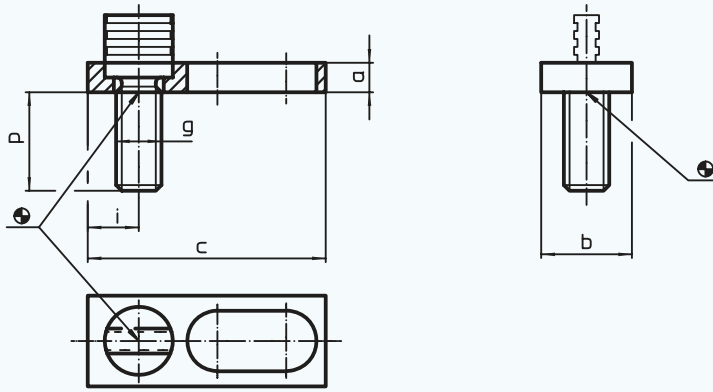
Ref. No.	a	b	c	b ₁	g	i	p	g
23700.0612	12	30	65	25	M 12	12,5	23	146



EH 23700.

Base Elements

for location hole



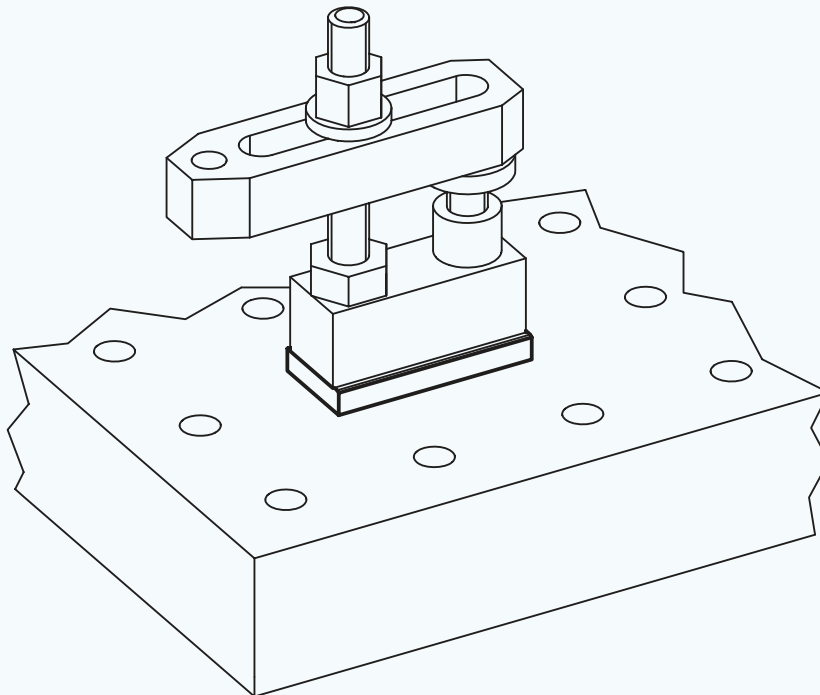
Material:

Body: • Steel, blackened

Pull-rod: • Special steel

Wearing parts: • Heat-treated steel

Ref. No.	a	b	c	g	i	p	$\frac{r}{g}$
23700.0712	8	25	65	M 12	12,5	27	95
23700.0716	12	30	78	M 16	14,0	33	190

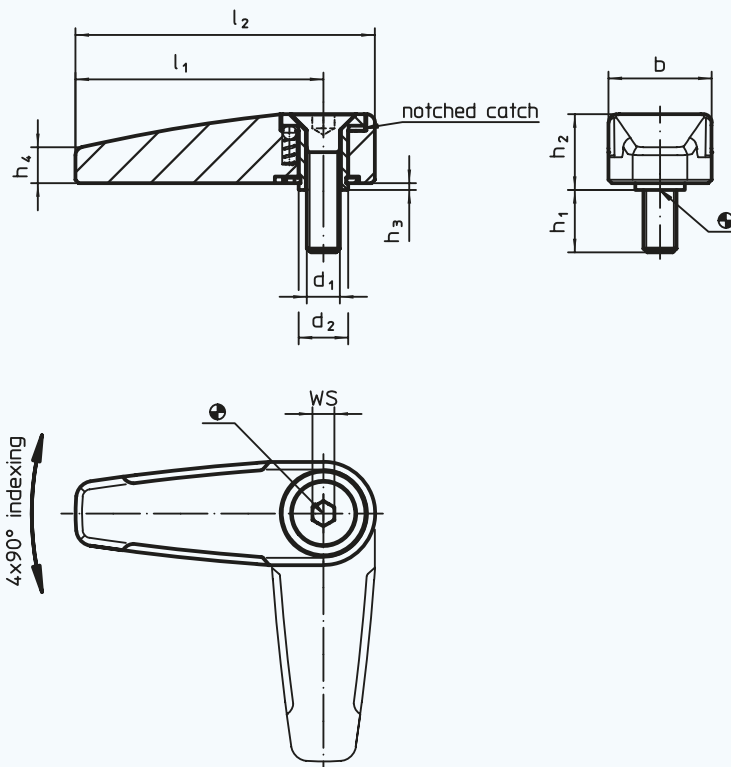




EH 24100.

Retaining Catches

one-sided



Material:

Lever: • Zinc die-cast, black, similar to RAL 9005
• Zinc die-cast, silver, similar to RAL 9006

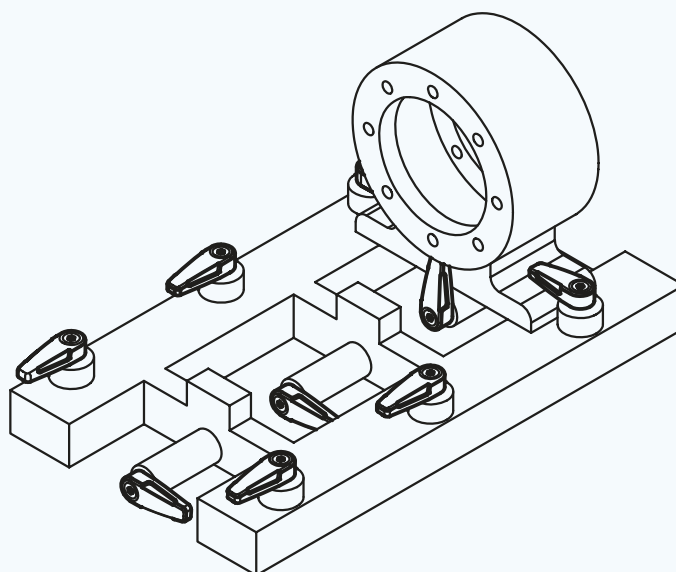
Inner parts: • Dry powdered metal

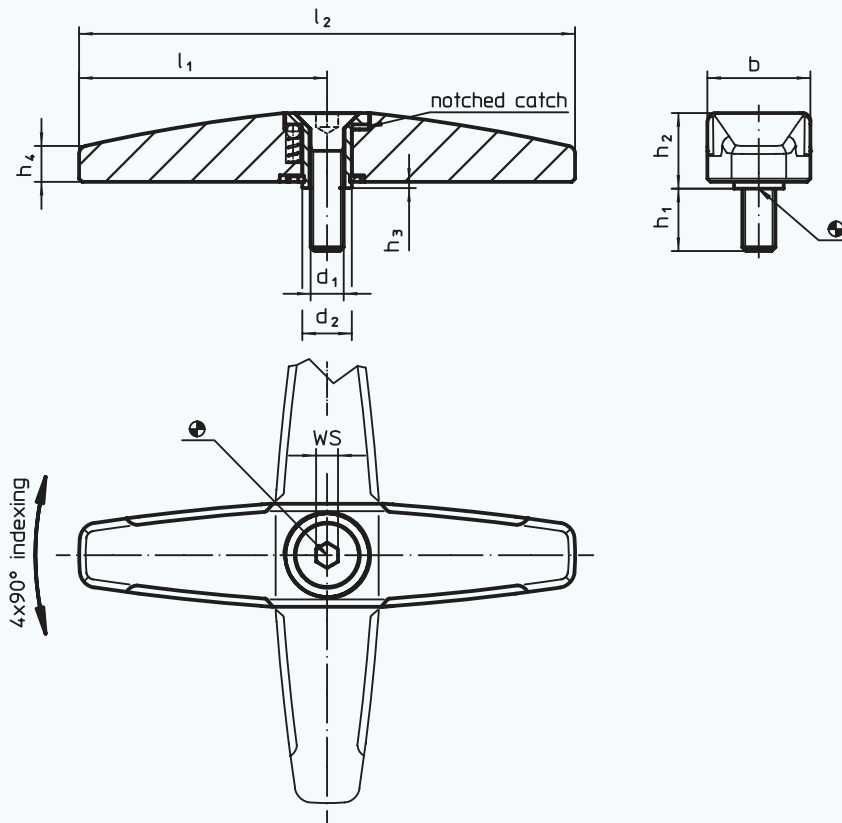
Screw: • Stainless steel A2 (ISO 10642)

Note:

To be used for locking of doors, drawers and as a support doing transports etc. This retaining catch is indexing 4 x 90°.

Ref. No. silver	Ref. No. black	d ₁	d ₂	l ₁	l ₂	b	h ₁	h ₂	h ₃	h ₄	WS	g
24100.0101	24100.0102	M 6	9	45	55	19,0	12	13,3	0,8	6,5	4	59
24100.0151	24100.0152	M 8	14	65	78	25,2	14	15,8	0,8	9,0	5	136





EH 24100.

Retaining Catches

double-sided



Material:

Lever:

- Zinc die-cast, black, similar to RAL 9005
- Zinc die-cast, silver, similar to RAL 9006

Inner parts:

- Dry powdered metal

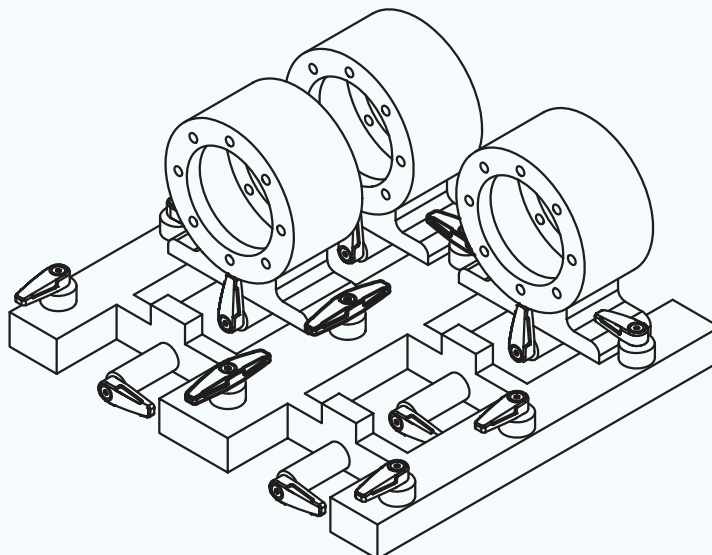
Screw:

- Stainless steel A2 (ISO 10642)

Note:

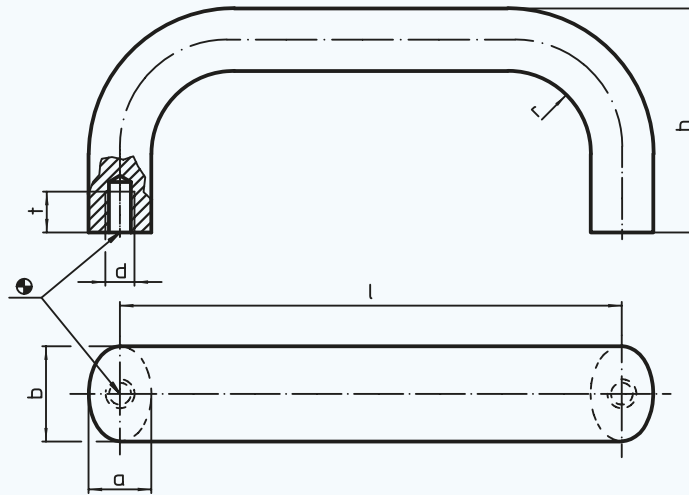
To be used for locking of doors, drawers and as a support doing transports etc. This retaining catch is indexing 4 x 90°.

Ref. No. silver	Ref. No. black	d ₁	d ₂	l ₁	l ₂	b	h ₁	h ₂	h ₃	h ₄	WS	g
24100.0601	24100.0602	M 6	9	45	90	19,0	12	13,3	0,8	6,5	4	93
24100.0651	24100.0652	M 8	14	65	130	25,2	14	15,8	0,8	9,0	5	220



EH 24300.

U-Handles



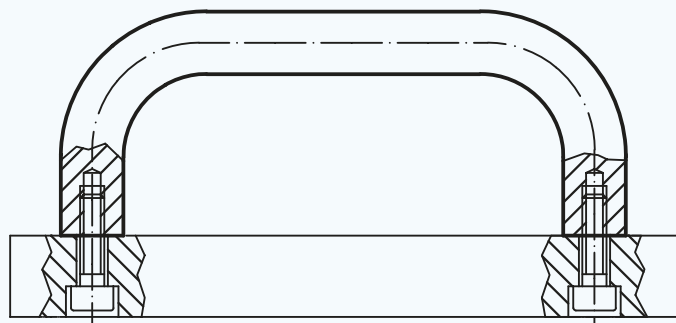
Material:

- Aluminium, drawn, bright, vibratory grinded
- Aluminium, plastic-coated, black, similar to RAL 9005
- Stainless steel 1.4301, dull blasted

Note:

Ergonomic design offering high stability and smooth surfaces.

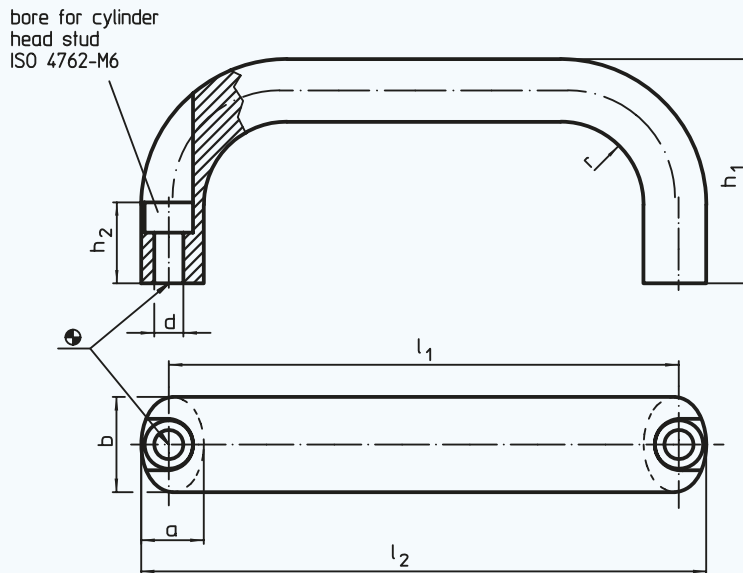
Ref. No.	Finish	b	l	a	d	h	r	t min.	g
24300.0100	aluminium, bright	20	100	13	M 6	47	13	10	90
24300.0110		20	112	13	M 6	49	13	10	97
24300.0120		20	128	13	M 6	51	13	10	107
24300.0130		20	160	13	M 6	51	13	10	122
24300.0140		26	112	17	M 8	53	17	12	163
24300.0150		26	128	17	M 8	55	17	12	179
24300.0160		26	160	17	M 8	57	17	12	211
24300.0170		26	192	17	M 8	57	17	12	236
24300.0180		26	300	17	M 8	57	17	12	344
24300.0190		26	400	17	M 8	57	17	12	463
24300.0300	aluminium, black	20	100	13	M 6	47	13	10	92
24300.0310		20	112	13	M 6	49	13	10	97
24300.0320		20	128	13	M 6	51	13	10	110
24300.0330		20	160	13	M 6	51	13	10	126
24300.0340		26	112	17	M 8	53	17	12	165
24300.0350		26	128	17	M 8	55	17	12	181
24300.0360		26	160	17	M 8	57	17	12	219
24300.0370		26	192	17	M 8	57	17	12	250
24300.0380		26	300	17	M 8	57	17	12	347
24300.0390		26	400	17	M 8	57	17	12	445
24300.0510	stainless steel	20	112	13	M 6	49	13	10	270
24300.0520		20	128	13	M 6	51	13	10	305



EH 24300.

U-Handles

front mounting



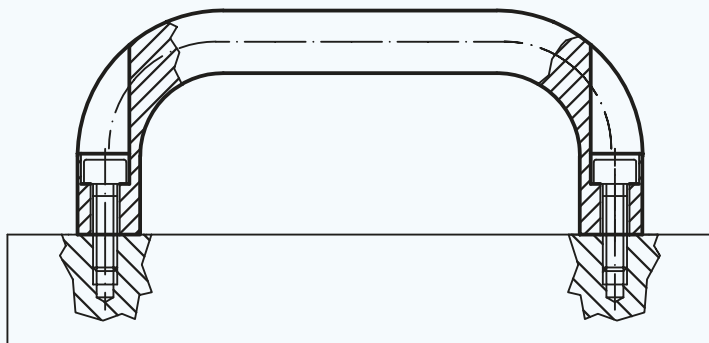
Material:

- Aluminium, drawn, bright, vibratory grinded
- Aluminium, plastic-coated, black, similar to RAL 9005

Note:

Ergonomic design offering high stability and smooth surfaces.
Mounting from the working side.

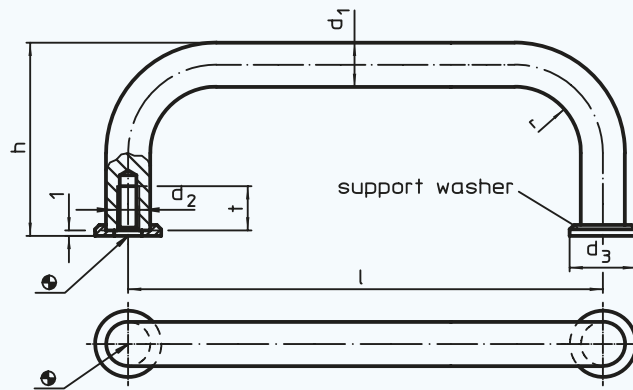
Ref. No.	Finish	b	l ₁	l ₂	a	d	h ₁	h ₂	r	g
24300.0141	aluminium, bright	26	116	130	17	6,4	55	17	17	146
24300.0151		26	132	146	17	6,4	55	17	17	161
24300.0161		26	164	178	17	6,4	57	17	17	196
24300.0171		26	196	210	17	6,4	57	17	17	229
24300.0341	aluminium, black	26	116	130	17	6,4	55	17	17	132
24300.0351		26	132	146	17	6,4	55	17	17	164
24300.0361		26	164	178	17	6,4	57	17	17	206
24300.0371		26	196	210	17	6,4	57	17	17	232



EH 24310.

U-Handles

with support washer



Material:

- Handle:**
- Steel, chromium-plated
 - Steel, plastic coated, black
 - Stainless steel 1.4305

- Bearing washer:**
- Zinc die-cast, nickel-plated
 - Stainless steel

Note:

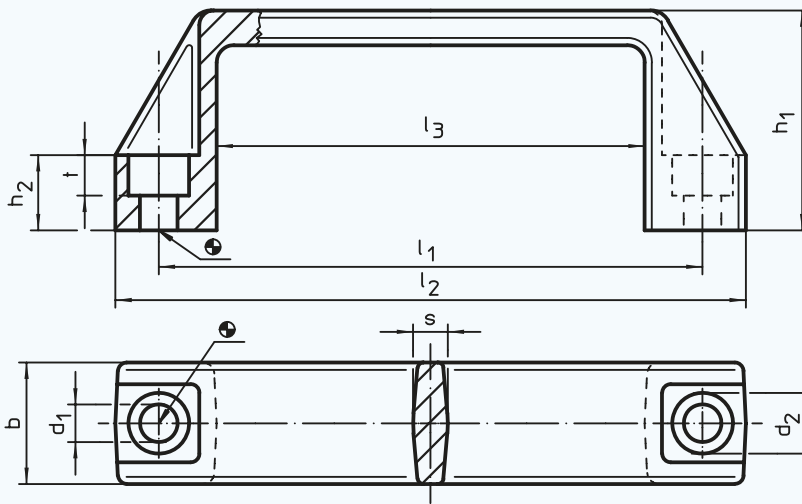
The supporting washer provides a good surface. Suitable washers are joined in loose form.

Ref. No.	Finish	d ₁	l	d ₂	d ₃	h	r	t min.	g
24310.0010	steel, chromium-plated	8	55	M 4	12	35	12	8	40
24310.0020		8	64	M 4	12	35	12	8	44
24310.0030		8	88	M 4	12	35	12	8	53
24310.0040		8	96	M 4	12	35	12	8	57
24310.0050		8	100	M 4	12	35	12	8	60
24310.0060		8	120	M 4	12	35	12	8	66
24310.0110		8	128	M 4	12	35	12	8	69
24310.0120		10	88	M 5	15	43	12	12	91
24310.0130		10	100	M 5	15	43	12	12	98
24310.0140		10	120	M 5	15	43	12	12	109
24310.0150		10	180	M 5	15	43	12	12	146
24310.0160		10	200	M 5	15	43	12	12	161
24310.0170		10	235	M 5	15	43	12	12	183
24310.0310	steel, plastic coated, black	8	55	M 4	12	35	12	8	40
24310.0320		8	64	M 4	12	35	12	8	44
24310.0330		8	88	M 4	12	35	12	8	50
24310.0340		8	96	M 4	12	35	12	8	57
24310.0350		8	100	M 4	12	35	12	8	60
24310.0360		8	120	M 4	12	35	12	8	65
24310.0410		8	128	M 4	12	35	12	8	69
24310.0420		10	88	M 5	15	43	12	12	91
24310.0430		10	100	M 5	15	43	12	12	98
24310.0440		10	120	M 5	15	43	12	12	109
24310.0450		10	180	M 5	15	43	12	12	143
24310.0460		10	200	M 5	15	43	12	12	161
24310.0470		10	235	M 5	15	43	12	12	175
24310.0520	stainless steel	8	64	M 4	12	35	10	8	40
24310.0530		8	88	M 4	12	35	10	8	53
24310.0540		8	96	M 4	12	35	10	8	57
24310.0550		8	100	M 4	12	35	10	8	58
24310.0560		8	120	M 4	12	35	10	8	66
24310.0610		8	128	M 4	12	35	10	8	70
24310.0620		10	88	M 5	15	43	12	12	91
24310.0630		10	100	M 5	15	43	12	12	98
24310.0640		10	120	M 5	15	43	12	12	100
24310.0650		10	180	M 5	15	43	12	12	146
24310.0660		10	200	M 5	15	43	12	12	161
24310.0670		10	235	M 5	15	43	12	12	183

EH 24320.

U-Handles

plastic,
front mounting



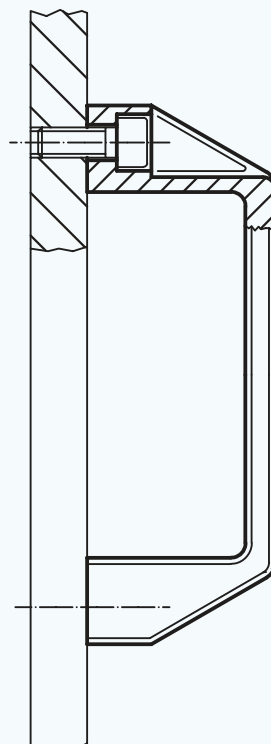
Material:

Handle: • Thermoplastic PA, glass-fibre reinforced, black

Note:

Front mount handle
Temperature range up to 100 °C.

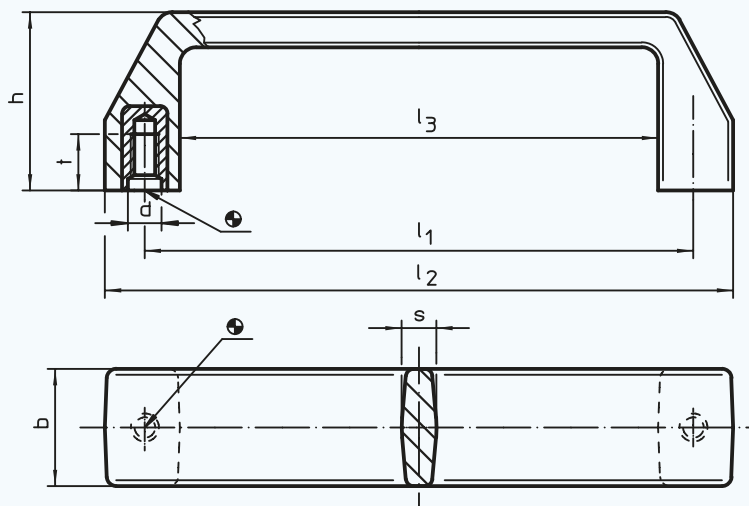
Ref. No.	l_1 $\pm 0,5$	d_1	b	l_2	d_2	h_1	h_2	l_3	s	t	$\frac{r}{g}$
24320.0010	93,5	6,5	21	109	10,5	38	13	74	6,0	7,0	26
24320.0020	117,0	8,5	26	137	13,5	41	15	93	7,0	8,5	44
24320.0030	132,0	8,5	27	150	13,5	45	16	108	7,0	8,5	47
24320.0040	179,0	8,5	28	196	13,5	50	17	151	7,5	8,5	70
24320.0050	235,0	10,5	30	260	16,5	54	20	201	8,5	10,5	118



EH 24320.

U-Handles

plastic



Material:

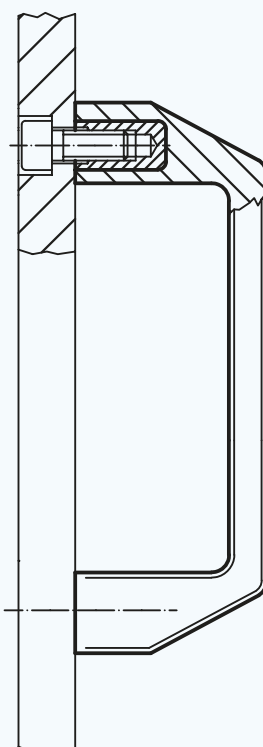
Handle: • Thermoplastic PA, glass-fibre reinforced, black

Bushing: • Brass

Note:

Back mount handle.
Temperature range up to 100 °C.

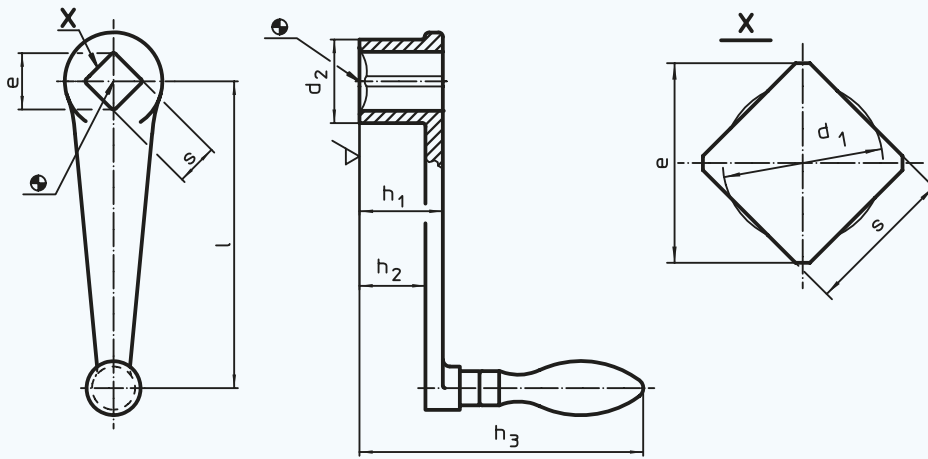
Ref. No.	l_1 $\pm 0,5$	d	b	h	l_2	l_3	s	t	$\frac{r}{g}$
24320.0210	93,5	M 6	21	36	107	79	6,0	10	31
24320.0220	117,0	M 6	25	38	134	102	7,5	12	57
24320.0230	117,0	M 8	25	38	134	102	7,5	12	50
24320.0240	132,0	M 8	26	45	150	116	8,0	13	59



EH 24330.

Crank Handles

DIN 469 straight,
with square end
DIN 79



Material:

Handle body:

- Size 63: Malleable cast iron
- Sizes 80-250: Nodular cast iron
- Plastic coated, black

Machine handle:

- Steel, turned, zinc-coated by galvanization, passivated

Note:

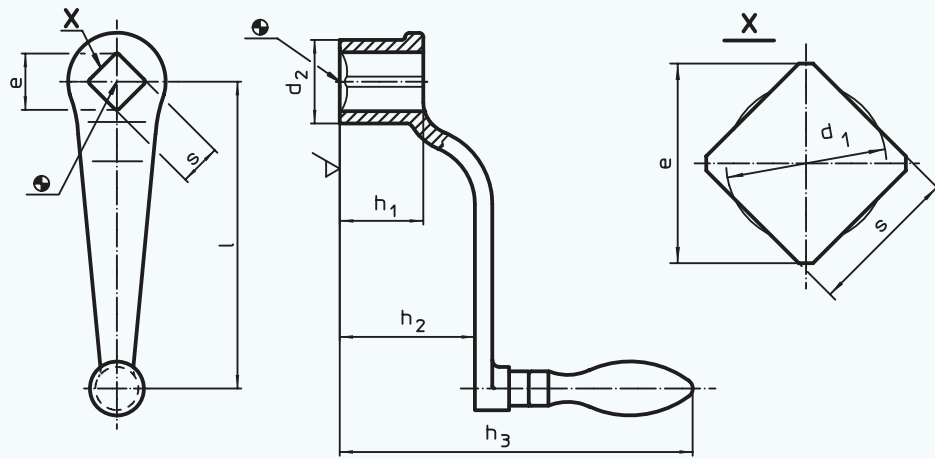
Seam ground, blasted.
Hub machined.

Ref. No.	Finish	l	s H11	e min.	d ₁	d ₂	h ₁	h ₂ ≈	h ₃	∅ machine handle	g
24330.0010	with rotating	63	10	13,1	10,5	20	20	15	79	16	118
24330.0020	machine handle	80	10	13,1	10,5	24	24	18	97	18	194
24330.0021	EH 24460.,	80	12	16,1	12,6	24	24	18	97	18	197
24330.0030	DIN 98,	100	12	16,1	12,6	28	28	21	100	20	272
24330.0031	form D	100	14	18,1	14,7	28	28	21	100	20	280
24330.0040		125	14	18,1	14,7	34	34	26	122	22	468
24330.0041		125	17	22,2	17,9	34	34	26	122	22	433
24330.0050		160	17	22,2	17,9	38	38	29	126	25	667
24330.0051		160	19	25,2	20,0	38	38	29	126	25	651
24330.0060		200	19	25,2	20,0	44	44	34	160	28	1054
24330.0061		200	22	28,2	23,1	44	44	34	160	28	992
24330.0070		250	22	28,2	23,1	48	48	36	162	32	1441
24330.0071		250	24	32,2	25,3	48	48	36	162	32	1409
24330.0110	with mounted	63	10	13,1	10,5	20	20	15	74	16	109
24330.0120	machine handle	80	10	13,1	10,5	24	24	18	94	18	183
24330.0121	EH 24450.,	80	12	16,1	12,6	24	24	18	94	18	186
24330.0130	DIN 39	100	12	16,1	12,6	28	28	21	98	20	278
24330.0131	form F	100	14	18,1	14,7	28	28	21	98	20	259
24330.0140		125	14	18,1	14,7	34	34	26	120	22	444
24330.0141		125	17	22,2	17,9	34	34	26	120	22	433
24330.0150		160	17	22,2	17,9	38	38	29	122	25	649
24330.0151		160	19	25,2	20,0	38	38	29	122	25	633
24330.0160		200	19	25,2	20,0	44	44	34	154	28	962
24330.0161		200	22	28,2	23,1	44	44	34	154	28	983
24330.0170		250	22	28,2	23,1	48	48	36	157	32	1360
24330.0171		250	24	32,2	25,3	48	48	36	157	32	1351

EH 24330.

Crank Handles

DIN 468 goose-neck form with square end DIN 79



Material:

- Handle body:**
- Size 63: Malleable cast iron
 - Sizes 80-250: Nodular cast iron
 - Plastic coated, black

- Machine handle:**
- Steel, turned, zinc-coated by galvanization, passivated

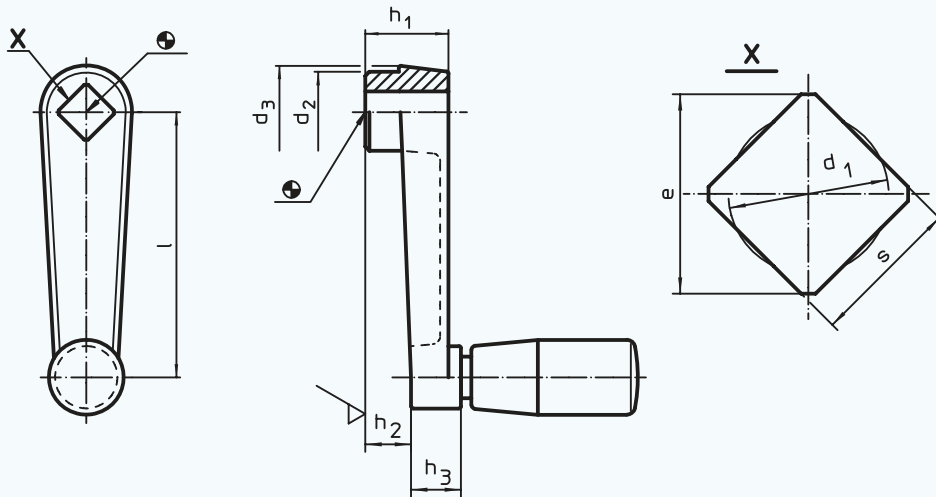
Note:

Seam ground, blasted.
Hub machined.

Ref. No.	Finish	l	s H11	e min.	d ₁	d ₂	h ₁	h ₂ ≈	h ₃	∅ machine handle	g
24330.0210	with rotating	63	10	13,1	10,5	20	20	32	96	16	118
24330.0220	machine handle	80	10	13,1	10,5	24	24	38	116	18	201
24330.0221	EH 24460.,	80	12	16,1	12,6	24	24	38	116	18	200
24330.0230	DIN 98,	100	12	16,1	12,6	28	28	48	126	20	310
24330.0231	form D	100	14	18,1	14,7	28	28	48	126	20	291
24330.0240		125	14	18,1	14,7	34	34	55	150	22	464
24330.0241		125	17	22,2	17,9	34	34	55	150	22	455
24330.0250		160	17	22,2	17,9	38	38	65	160	25	674
24330.0251		160	19	25,2	20,0	38	38	65	160	25	664
24330.0260		200	19	25,2	20,0	44	44	78	202	28	1083
24330.0261		200	22	28,2	23,1	44	44	78	202	28	1034
24330.0270		250	22	28,2	23,1	48	48	90	214	32	1497
24330.0271		250	24	32,2	25,3	48	48	90	214	32	1478
24330.0310	with mounted	63	10	13,1	10,5	20	20	32	92	16	112
24330.0320	machine handle	80	10	13,1	10,5	24	24	38	114	18	187
24330.0321	EH 24450.,	80	12	16,1	12,6	24	24	38	114	18	183
24330.0330	DIN 39	100	12	16,1	12,6	28	28	48	124	20	288
24330.0331	form F	100	14	18,1	14,7	28	28	48	124	20	292
24330.0340		125	14	18,1	14,7	34	34	55	148	22	460
24330.0341		125	17	22,2	17,9	34	34	55	148	22	439
24330.0350		160	17	22,2	17,9	38	38	65	158	25	661
24330.0351		160	19	25,2	20,0	38	38	65	158	25	627
24330.0360		200	19	25,2	20,0	44	44	78	197	28	1020
24330.0361		200	22	28,2	23,1	44	44	78	197	28	1004
24330.0370		250	22	28,2	23,1	48	48	90	209	32	1438
24330.0371		250	24	32,2	25,3	48	48	90	209	32	1415

EH 24330.

Crank Handles



Material:

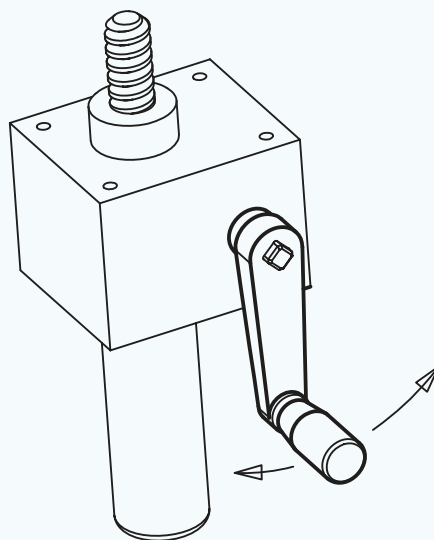
Handle body: • Zinc die-cast, plastic coated, black, matt structure
• Aluminium, plastic coated, black, matt structure

Cylindrical handle: • Plastic (PF 31), black

Note:

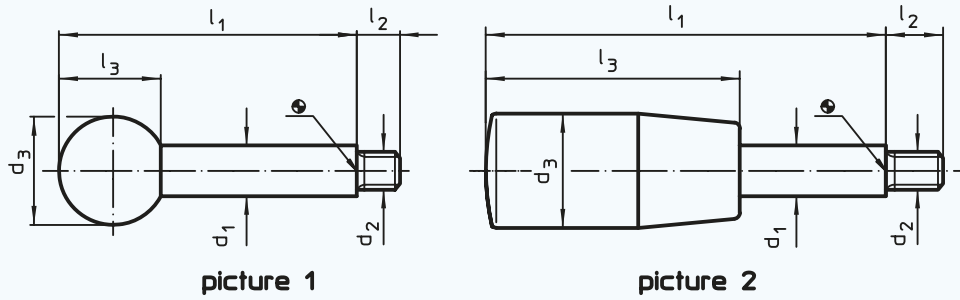
Alternative to crank handles DIN 469.
Temperature range up to 80 °C.

Ref. No.	Finish	l	s H11	e min.	d ₁ max.	d ₂	d ₃	h ₁	h ₂ ≈	h ₃	Diam. of cylinder grip EH 24530.	g
24330.0420	zinc die-cast	50	8	10,1	8,4	16	18	18	10	10	14	58
24330.0422		64	10	13,1	10,5	19	22	20	11	12	18	97
24330.0424		80	10	13,1	10,5	23	26	24	14	14	21	166
24330.0436		100	12	16,1	12,6	27	30	28	17	15	23	270
24330.0414	aluminium	125	14	18,1	14,7	32	35	34	22	18	26	251
24330.0416		160	17	22,2	17,9	35	39	38	26	18	26	280



EH 24350.

Gear Lever Handles



Material:

Gear lever:

- Steel, ground, blackened
- Stainless steel 1.4305, dull blasted

Ball knob:

- Plastic (PF 31) DIN 319, black

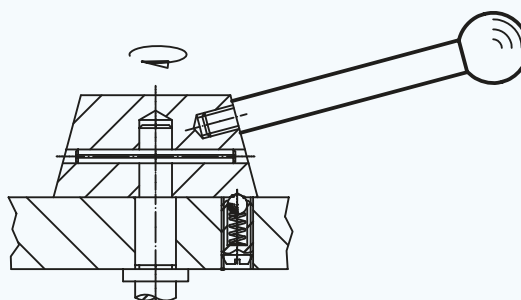
Cylindrical handle:

- Plastic (PF 31), black

Note:

Temperature range up to 80 °C.

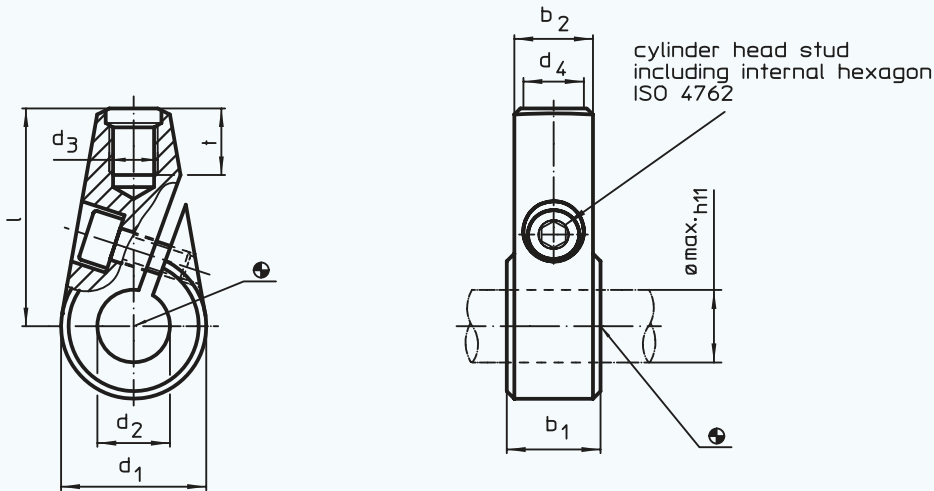
Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁	l ₁	d ₂	d ₃	l ₂	l ₃	g
24350.0020	24350.0520	with spherical knob (picture 1)	8	63	M 6	20	9	18,0	30
24350.0022	24350.0522		8	80	M 6	20	9	18,0	34
24350.0024	24350.0524		8	100	M 6	20	9	18,0	39
24350.0030	24350.0530		10	80	M 8	25	11	22,5	50
24350.0032	24350.0532		10	100	M 8	25	11	22,5	62
24350.0034	24350.0534		10	125	M 8	25	11	22,5	76
24350.0040	24350.0540		12	100	M 10	32	14	29,0	96
24350.0042	24350.0542		12	125	M 10	32	14	29,0	116
24350.0044	24350.0544		12	160	M 10	32	14	29,0	146
24350.0050	24350.0550		14	125	M 12	35	16	32,5	157
24350.0052	24350.0552		14	160	M 12	35	16	32,5	201
24350.0054	24350.0554		14	200	M 12	35	16	32,5	251
24350.0060	-		16	160	M 14	40	18	37,0	255
24350.0062	-		16	200	M 14	40	18	37,0	326
24350.0064	-	16	250	M 14	40	18	37,0	397	
24350.0120	24350.0620	with cylindrical handle (picture 2)	8	63	M 6	18	9	40,0	26
24350.0122	24350.0622		8	80	M 6	18	9	40,0	33
24350.0124	24350.0624		8	100	M 6	18	9	40,0	41
24350.0130	24350.0630		10	80	M 8	21	11	50,0	50
24350.0132	24350.0632		10	100	M 8	21	11	50,0	62
24350.0134	24350.0634		10	125	M 8	21	11	50,0	78
24350.0140	24350.0640		12	100	M 10	23	14	65,0	81
24350.0142	24350.0642		12	125	M 10	23	14	65,0	103
24350.0144	24350.0644		12	160	M 10	23	14	65,0	133
24350.0150	24350.0650		14	125	M 12	26	16	80,0	125
24350.0152	24350.0652		14	160	M 12	26	16	80,0	168
24350.0154	24350.0654		14	200	M 12	26	16	80,0	216
24350.0160	-		16	160	M 14	28	18	90,0	214
24350.0162	-		16	200	M 14	28	18	90,0	273
24350.0164	-	16	250	M 14	28	18	90,0	352	



EH 24360.

Clamping Hubs

with shaft location



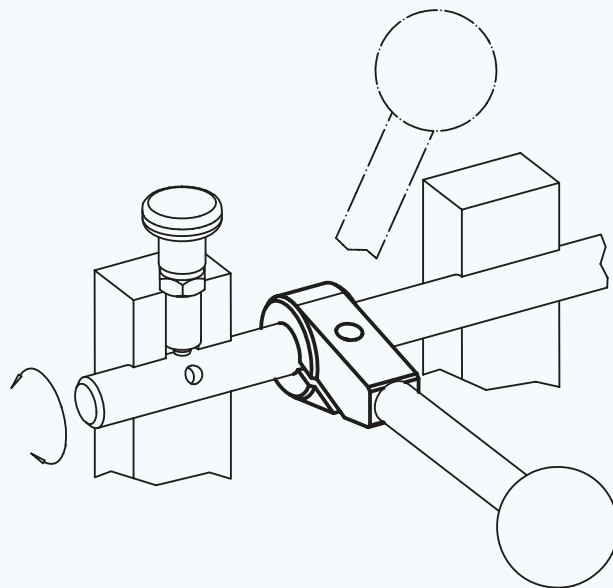
Material:

- Sintered steel, blackened

Note:

To be used for turning shafts and/or cams. Easy and quick assembly, e.g. with handle bars.
Can be applied in combination with gear lever handles EH 24350.

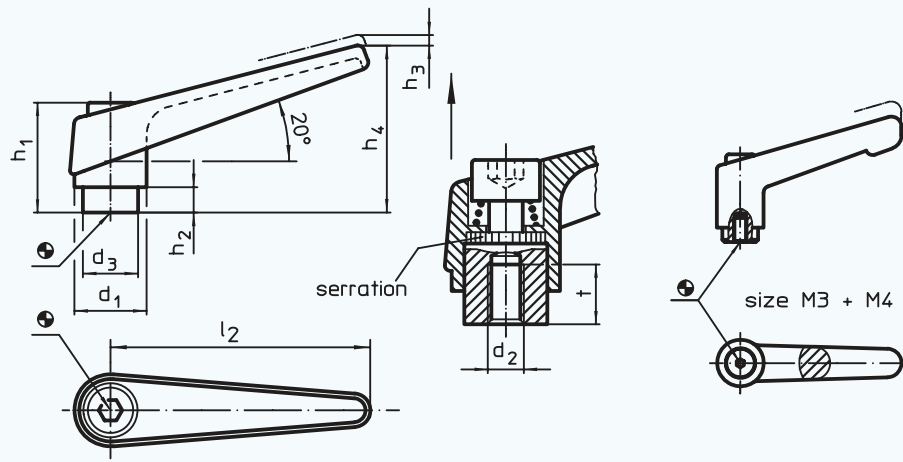
Ref. No.	d ₁	d ₂	b ₁ ±0,2	b ₂	d ₃	d ₄ EH 24350. Handle bar Ø	l	t min.	g
24360.0010	24	10	15,5	13	M 8	10	36	11	64
24360.0020	24	12	15,5	13	M 8	10	36	11	64
24360.0030	28	12	17,5	15	M 10	12	41	14	108
24360.0040	28	14	17,5	15	M 10	12	41	14	94
24360.0050	32	14	19,5	17	M 12	14	45	16	140
24360.0060	32	16	19,5	17	M 12	14	45	16	137



EH 24390.

Adjustable Clamping Levers

inner parts from stainless steel, female thread



Material:

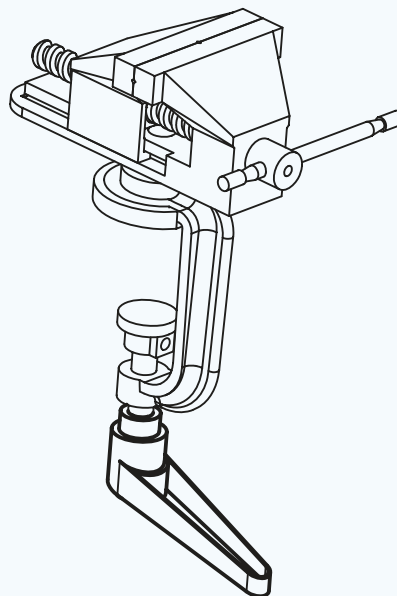
- Lever:** • Zinc die-cast, orange similar to RAL 2004
• Zinc die-cast, black similar to RAL 9005
- Inner parts:** • Stainless steel 1.4305
- Threaded part:** • Stainless steel 1.4305

Note:

Adjustable clamping levers with rust-proof inner parts. Suitable for multiple applications, e.g. medical technique, chemical industry and so forth.

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations, and the threaded insert can be exchanged. On releasing the lever, the serrations are automatically re-engaged.

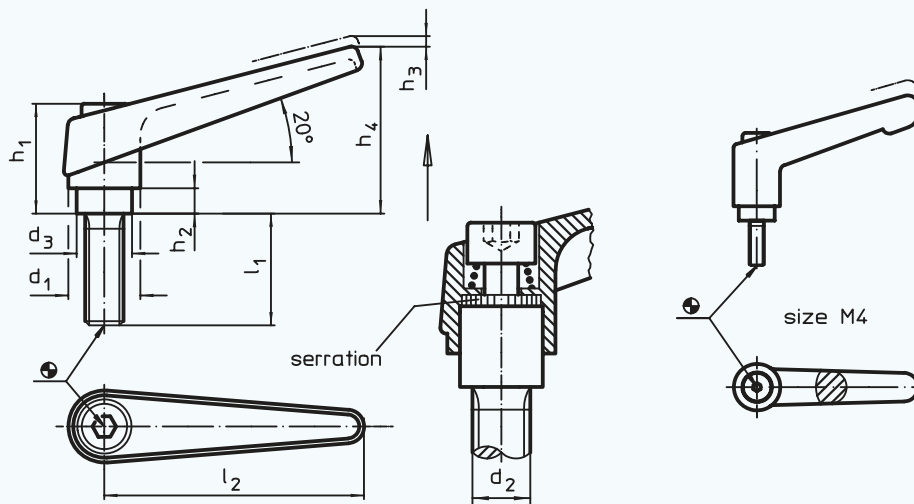
Ref. No. orange	Ref. No. black	d ₁	d ₂	d ₃	h ₁	h ₂	h ₃	h ₄	l ₂	t => g	g
24390.0032	24390.0034	13	M 3	10,0	24,5	4,0	3,5	30,5	30	7	25
24390.0036	24390.0038	13	M 4	10,0	24,5	4,0	3,5	30,5	30	9	25
24390.0111	24390.0114	14	M 5	10,0	24,5	4,0	3,0	35,0	45	8	33
24390.0121	24390.0124	14	M 6	10,0	24,5	4,0	3,0	35,0	45	8	33
24390.0321	24390.0324	18	M 8	13,5	31,0	6,5	3,0	45,0	62	10	67
24390.0411	24390.0414	22	M 8	16,0	36,0	8,0	3,5	52,0	74	14	112
24390.0421	24390.0424	22	M 10	16,0	36,0	8,0	3,5	52,0	74	14	109
24390.0511	24390.0514	25	M 10	19,0	43,0	11,0	4,0	63,0	89	17	175
24390.0521	24390.0524	25	M 12	19,0	43,0	11,0	4,0	63,0	89	17	171
24390.0611	24390.0614	30	M 12	23,0	50,5	12,0	5,0	76,0	108	22	286
24390.0621	24390.0624	30	M 16	23,0	50,5	12,0	5,0	76,0	108	22	269



EH 24390.

Adjustable Clamping Levers

inner parts from stainless steel, including screw



Material:

Lever: • Zinc die-cast, orange similar to RAL 2004
 • Zinc die-cast, black similar to RAL 9005
Inner parts: • Stainless steel 1.4305
Screw: • Stainless steel 1.4305

Note:

Adjustable clamping levers with rust-proof inner parts. Suitable for multiple applications, e.g. medical technique, chemical industry and so forth.

By lifting the lever the serrations are disengaged. The lever can be positioned by the serrations, and the threaded insert can be exchanged. On releasing the lever, the serrations are automatically re-engaged.

Ref. No. orange	Ref. No. black	d ₁	d ₂	l ₁	d ₃	h ₁	h ₂	h ₃	h ₄	l ₂	g
24390.0010	24390.0012	13	M 4	12	10,0	24,5	4,0	3,5	30,5	30	27
24390.0014	24390.0016	13	M 4	16	10,0	24,5	4,0	3,5	30,5	30	27
24390.0018	24390.0020	13	M 4	20	10,0	24,5	4,0	3,5	30,5	30	27
24390.0022	24390.0024	13	M 4	25	10,0	24,5	4,0	3,5	30,5	30	28
24390.0026	24390.0028	13	M 4	32	10,0	24,5	4,0	3,5	30,5	30	28
24390.0041	24390.0044	14	M 5	12	10,0	24,5	4,0	3,0	35,0	45	36
24390.0051	24390.0054	14	M 5	16	10,0	24,5	4,0	3,0	35,0	45	36
24390.0061	24390.0064	14	M 5	20	10,0	24,5	4,0	3,0	35,0	45	37
24390.0071	24390.0074	14	M 5	25	10,0	24,5	4,0	3,0	35,0	45	38
24390.0081	24390.0084	14	M 5	32	10,0	24,5	4,0	3,0	35,0	45	38
24390.0086	24390.0089	14	M 5	40	10,0	24,5	4,0	3,0	35,0	45	39
24390.0131	24390.0134	14	M 6	12	10,0	24,5	4,0	3,0	35,0	45	37
24390.0141	24390.0144	14	M 6	16	10,0	24,5	4,0	3,0	35,0	45	37
24390.0151	24390.0154	14	M 6	20	10,0	24,5	4,0	3,0	35,0	45	38
24390.0161	24390.0164	14	M 6	25	10,0	24,5	4,0	3,0	35,0	45	39
24390.0171	24390.0174	14	M 6	32	10,0	24,5	4,0	3,0	35,0	45	40
24390.0181	24390.0184	14	M 6	40	10,0	24,5	4,0	3,0	35,0	45	41
24390.0191	24390.0194	14	M 6	50	10,0	24,5	4,0	3,0	35,0	45	43
24390.0331	24390.0334	18	M 8	16	13,5	31,0	6,5	3,0	45,0	62	74
24390.0341	24390.0344	18	M 8	20	13,5	31,0	6,5	3,0	45,0	62	76
24390.0351	24390.0354	18	M 8	25	13,5	31,0	6,5	3,0	45,0	62	77
24390.0361	24390.0364	18	M 8	32	13,5	31,0	6,5	3,0	45,0	62	79
24390.0371	24390.0374	18	M 8	40	13,5	31,0	6,5	3,0	45,0	62	81
24390.0381	24390.0384	18	M 8	50	13,5	31,0	6,5	3,0	45,0	62	84
24390.0391	24390.0394	18	M 8	63	13,5	31,0	6,5	3,0	45,0	62	89

EH 24390.

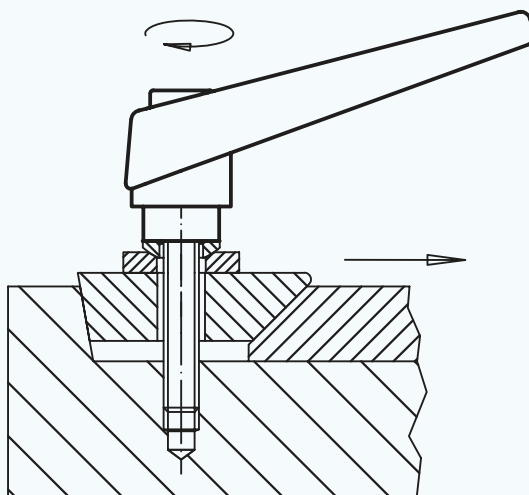
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Adjustable Clamping Levers

inner parts from stainless steel, including screw



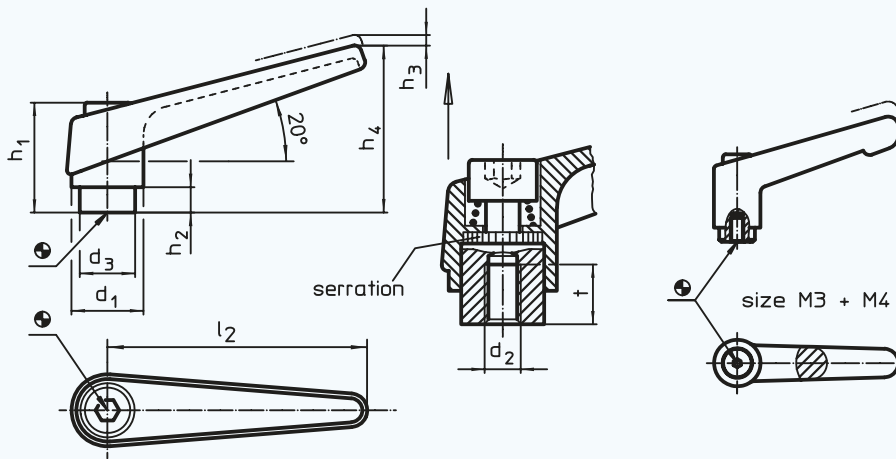
Ref. No. orange	Ref. No. black	d ₁	d ₂	l ₁	d ₃	h ₁	h ₂	h ₃	h ₄	l ₂	g
24390.0441	24390.0444	22	M 10	20	16,0	36,0	8,0	3,5	52,0	74	128
24390.0451	24390.0454	22	M 10	25	16,0	36,0	8,0	3,5	52,0	74	130
24390.0461	24390.0464	22	M 10	32	16,0	36,0	8,0	3,5	52,0	74	134
24390.0471	24390.0474	22	M 10	40	16,0	36,0	8,0	3,5	52,0	74	138
24390.0481	24390.0484	22	M 10	50	16,0	36,0	8,0	3,5	52,0	74	143
24390.0486	24390.0489	22	M 10	63	16,0	36,0	8,0	3,5	52,0	74	148
24390.0491	24390.0494	22	M 10	80	16,0	36,0	8,0	3,5	52,0	74	157
24390.0541	24390.0544	25	M 12	25	19,0	43,0	11,0	4,0	63,0	89	205
24390.0551	24390.0554	25	M 12	32	19,0	43,0	11,0	4,0	63,0	89	209
24390.0561	24390.0564	25	M 12	40	19,0	43,0	11,0	4,0	63,0	89	215
24390.0571	24390.0574	25	M 12	50	19,0	43,0	11,0	4,0	63,0	89	222
24390.0581	24390.0584	25	M 12	63	19,0	43,0	11,0	4,0	63,0	89	232
24390.0591	24390.0594	25	M 12	80	19,0	43,0	11,0	4,0	63,0	89	244
24390.0641	24390.0644	30	M 16	32	23,0	50,5	12,0	5,0	76,0	108	348
24390.0651	24390.0654	30	M 16	40	23,0	50,5	12,0	5,0	76,0	108	357
24390.0661	24390.0664	30	M 16	50	23,0	50,5	12,0	5,0	76,0	108	370
24390.0671	24390.0674	30	M 16	63	23,0	50,5	12,0	5,0	76,0	108	386
24390.0681	24390.0684	30	M 16	80	23,0	50,5	12,0	5,0	76,0	108	407



EH 24400.

Adjustable Clamping Levers

with female thread



Material:

Lever: • Zinc die-cast,
orange similar to RAL 2004
black similar to RAL 9005
grey similar to RAL 7031

Inner parts: • Steel, quality 5.8,
blackened

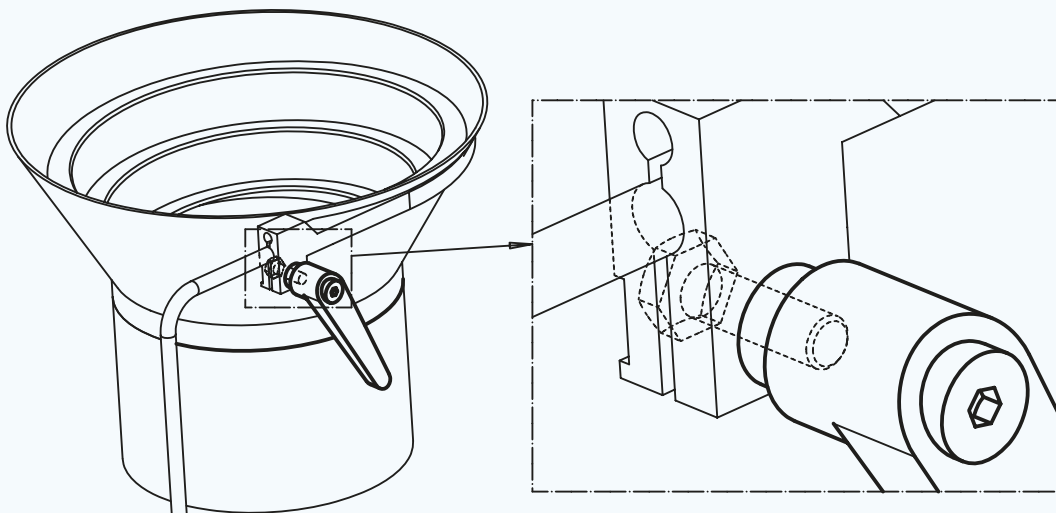
Threaded part: • Steel, quality 5,
blackened

Note:

By lifting the lever, the serrations are disengaged.

The lever can be positioned by the serrations and the threaded insert can be exchanged. On releasing the lever, the serrations are automatically re-engaged.

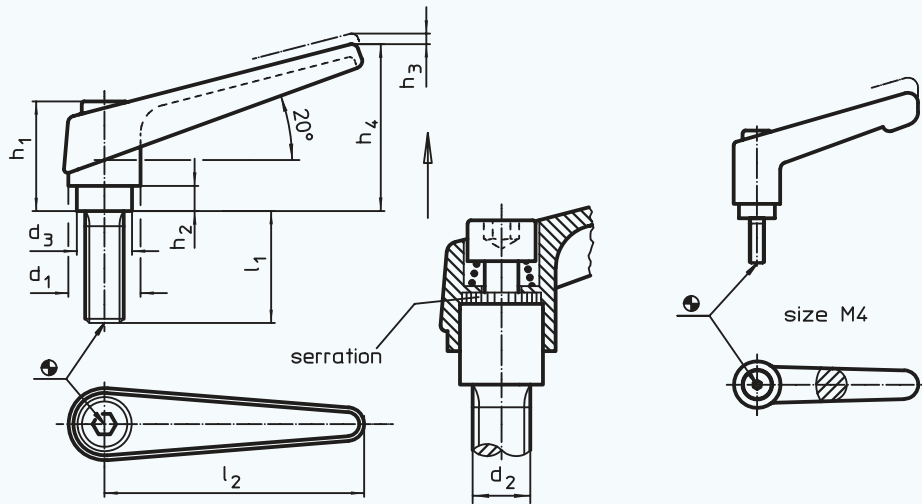
Ref. No. orange	Ref. No. grey	Ref. No. black	d ₁	d ₂	d ₃	h ₁	h ₂	h ₃	h ₄	l ₂	t > =	g
24400.0032	-	24400.0034	13	M 3	10,0	24,5	4,0	3,5	30,5	30	7	25
24400.0036	-	24400.0038	13	M 4	10,0	24,5	4,0	3,5	30,5	30	9	25
24400.0111	24400.0113	24400.0114	14	M 5	10,0	24,5	4,0	3,0	35,0	45	8	33
24400.0121	24400.0123	24400.0124	14	M 6	10,0	24,5	4,0	3,0	35,0	45	8	33
24400.0311	24400.0313	24400.0314	18	M 6	13,5	31,0	6,5	3,0	45,0	62	10	67
24400.0321	24400.0323	24400.0324	18	M 8	13,5	31,0	6,5	3,0	45,0	62	10	67
24400.0411	24400.0413	24400.0414	22	M 8	16,0	36,0	8,0	3,5	52,0	74	14	112
24400.0421	24400.0423	24400.0424	22	M 10	16,0	36,0	8,0	3,5	52,0	74	14	109
24400.0511	24400.0513	24400.0514	25	M 10	19,0	43,0	11,0	4,0	63,0	89	17	176
24400.0521	24400.0523	24400.0524	25	M 12	19,0	43,0	11,0	4,0	63,0	89	17	171
24400.0611	24400.0613	24400.0614	30	M 12	23,0	50,5	12,0	5,0	76,0	108	22	286
24400.0621	24400.0623	24400.0624	30	M 16	23,0	50,5	12,0	5,0	76,0	108	22	269



EH 24400.

Adjustable Clamping Levers

with screw



Material:

Lever: • Zinc die-cast, orange similar to RAL 2004 black similar to RAL 9005 grey similar to RAL 7031

Inner parts: • Steel, blackened

Screw: • Steel, quality 5.8, blackened

Note:

By lifting the lever, the serrations are disengaged. The lever can be positioned by the serrations and the threaded insert can be exchanged. On releasing the lever, the serrations are automatically re-engaged.

Ref. No. orange	Ref. No. grey	Ref. No. black	d ₁	d ₂	l ₁	d ₃	h ₁	h ₂	h ₃	h ₄	l ₂	g
24400.0010	-	24400.0012	13	M 4	12	10,0	24,5	4,0	3,5	30,5	30	27
24400.0014	-	24400.0016	13	M 4	16	10,0	24,5	4,0	3,5	30,5	30	27
24400.0018	-	24400.0020	13	M 4	20	10,0	24,5	4,0	3,5	30,5	30	27
24400.0022	-	24400.0024	13	M 4	25	10,0	24,5	4,0	3,5	30,5	30	28
24400.0026	-	24400.0028	13	M 4	32	10,0	24,5	4,0	3,5	30,5	30	28
24400.0041	24400.0043	24400.0044	14	M 5	12	10,0	24,5	4,0	3,0	35,0	45	36
24400.0051	24400.0053	24400.0054	14	M 5	16	10,0	24,5	4,0	3,0	35,0	45	36
24400.0061	24400.0063	24400.0064	14	M 5	20	10,0	24,5	4,0	3,0	35,0	45	37
24400.0071	24400.0073	24400.0074	14	M 5	25	10,0	24,5	4,0	3,0	35,0	45	38
24400.0081	24400.0083	24400.0084	14	M 5	32	10,0	24,5	4,0	3,0	35,0	45	38
24400.0086	24400.0088	24400.0089	14	M 5	40	10,0	24,5	4,0	3,0	35,0	45	39
24400.0131	24400.0133	24400.0134	14	M 6	12	10,0	24,5	4,0	3,0	35,0	45	37
24400.0141	24400.0143	24400.0144	14	M 6	16	10,0	24,5	4,0	3,0	35,0	45	37
24400.0151	24400.0153	24400.0154	14	M 6	20	10,0	24,5	4,0	3,0	35,0	45	38
24400.0161	24400.0163	24400.0164	14	M 6	25	10,0	24,5	4,0	3,0	35,0	45	39
24400.0171	24400.0173	24400.0174	14	M 6	32	10,0	24,5	4,0	3,0	35,0	45	40
24400.0181	24400.0183	24400.0184	14	M 6	40	10,0	24,5	4,0	3,0	35,0	45	41
24400.0191	24400.0193	24400.0194	14	M 6	50	10,0	24,5	4,0	3,0	35,0	45	43
24400.0221	24400.0223	24400.0224	18	M 6	16	13,5	31,0	6,5	3,0	45,0	62	72
24400.0231	24400.0233	24400.0234	18	M 6	20	13,5	31,0	6,5	3,0	45,0	62	72
24400.0241	24400.0243	24400.0244	18	M 6	25	13,5	31,0	6,5	3,0	45,0	62	74
24400.0251	24400.0253	24400.0254	18	M 6	32	13,5	31,0	6,5	3,0	45,0	62	74
24400.0261	24400.0263	24400.0264	18	M 6	40	13,5	31,0	6,5	3,0	45,0	62	76
24400.0271	24400.0273	24400.0274	18	M 6	50	13,5	31,0	6,5	3,0	45,0	62	76
24400.0281	24400.0283	24400.0284	18	M 6	63	13,5	31,0	6,5	3,0	45,0	62	80
24400.0331	24400.0333	24400.0334	18	M 8	16	13,5	31,0	6,5	3,0	45,0	62	74
24400.0341	24400.0343	24400.0344	18	M 8	20	13,5	31,0	6,5	3,0	45,0	62	76
24400.0351	24400.0353	24400.0354	18	M 8	25	13,5	31,0	6,5	3,0	45,0	62	77
24400.0361	24400.0363	24400.0364	18	M 8	32	13,5	31,0	6,5	3,0	45,0	62	79
24400.0371	24400.0373	24400.0374	18	M 8	40	13,5	31,0	6,5	3,0	45,0	62	81
24400.0381	24400.0383	24400.0384	18	M 8	50	13,5	31,0	6,5	3,0	45,0	62	84
24400.0391	24400.0393	24400.0394	18	M 8	63	13,5	31,0	6,5	3,0	45,0	62	89

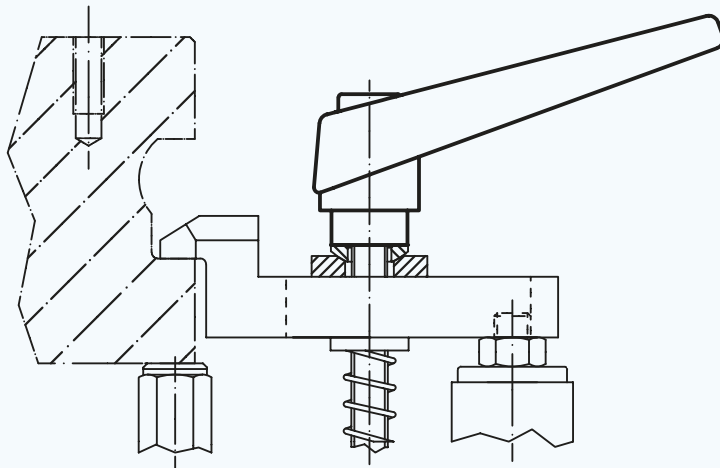
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EH 24400.

Adjustable Clamping Levers

with screw

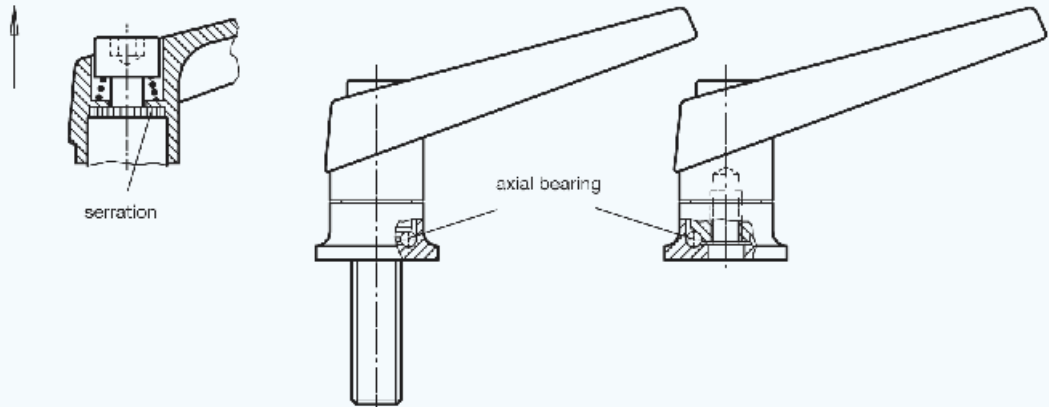
Ref. No. orange	Ref. No. grey	Ref. No. black	d ₁	d ₂	l ₁	d ₃	h ₁	h ₂	h ₃	h ₄	l ₂	g
24400.0441	24400.0443	24400.0444	22	M 10	20	16,0	36,0	8,0	3,5	52,0	74	128
24400.0451	24400.0453	24400.0454	22	M 10	25	16,0	36,0	8,0	3,5	52,0	74	130
24400.0461	24400.0463	24400.0464	22	M 10	32	16,0	36,0	8,0	3,5	52,0	74	134
24400.0471	24400.0473	24400.0474	22	M 10	40	16,0	36,0	8,0	3,5	52,0	74	138
24400.0481	24400.0483	24400.0484	22	M 10	50	16,0	36,0	8,0	3,5	52,0	74	143
24400.0486	24400.0488	24400.0489	22	M 10	63	16,0	36,0	8,0	3,5	52,0	74	148
24400.0491	24400.0493	24400.0494	22	M 10	80	16,0	36,0	8,0	3,5	52,0	74	157
24400.0541	24400.0543	24400.0544	25	M 12	25	19,0	43,0	11,0	4,0	63,0	89	205
24400.0551	24400.0553	24400.0554	25	M 12	32	19,0	43,0	11,0	4,0	63,0	89	209
24400.0561	24400.0563	24400.0564	25	M 12	40	19,0	43,0	11,0	4,0	63,0	89	215
24400.0571	24400.0573	24400.0574	25	M 12	50	19,0	43,0	11,0	4,0	63,0	89	222
24400.0581	24400.0583	24400.0584	25	M 12	63	19,0	43,0	11,0	4,0	63,0	89	232
24400.0591	24400.0593	24400.0594	25	M 12	80	19,0	43,0	11,0	4,0	63,0	89	244
24400.0641	24400.0643	24400.0644	30	M 16	32	23,0	50,5	12,0	5,0	76,0	108	348
24400.0651	24400.0653	24400.0654	30	M 16	40	23,0	50,5	12,0	5,0	76,0	108	357
24400.0661	24400.0663	24400.0664	30	M 16	50	23,0	50,5	12,0	5,0	76,0	108	370
24400.0671	24400.0673	24400.0674	30	M 16	63	23,0	50,5	12,0	5,0	76,0	108	386
24400.0681	24400.0683	24400.0684	30	M 16	80	23,0	50,5	12,0	5,0	76,0	108	407



EH 24420.

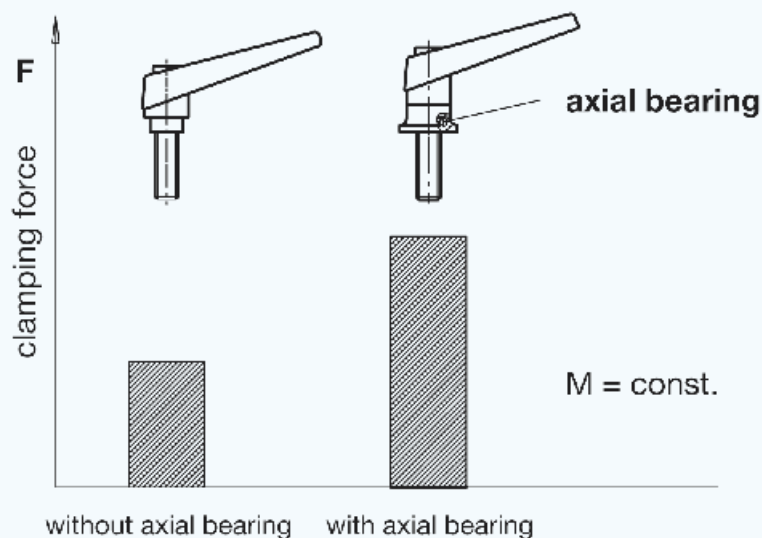
Adjustable Clamping Levers

with axial bearing



Tests have proven that vital advantages can be achieved when using clamping levers with integrated axial thrust bearing:

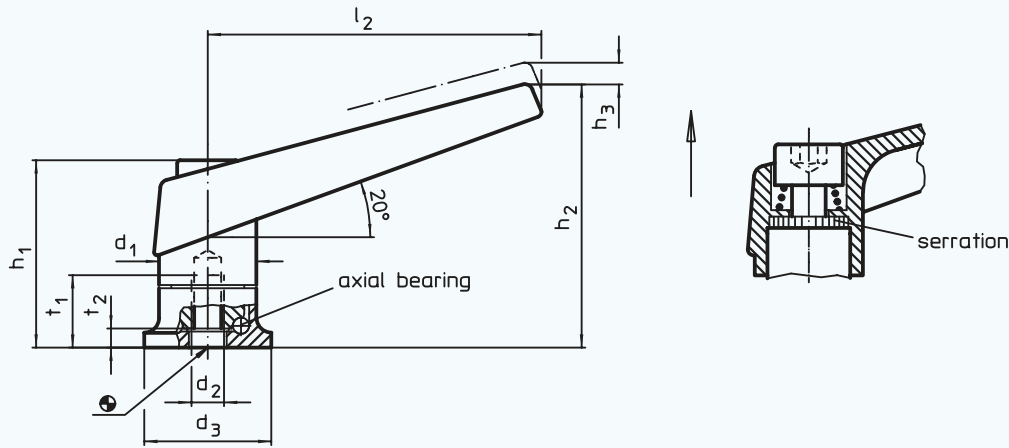
- The clamping force is greater in comparison to the clamping levers, by up to 100 % (please refer to diagram) using the same amount of strength.
- Screwed connections can be replaced with clamping connections for technical applications.
- Smaller clamping levers can be used because of the improved clamping force, thus reducing the necessary construction space.
- Considerably less force loss due to settling; no releasing due to vibrations.
- Non-damaging to clamped parts due to the rotating bearing surface.



EH 24420.

Adjustable Clamping Levers

with axial bearing and female thread



Material:

Lever:

- Zinc die-cast, orange similar to RAL 2004
- Zinc die-cast, black similar to RAL 9005

Inner parts:

- Steel, nitrided, blackened

Threaded part:

- Steel, nitrided, blackened

Note:

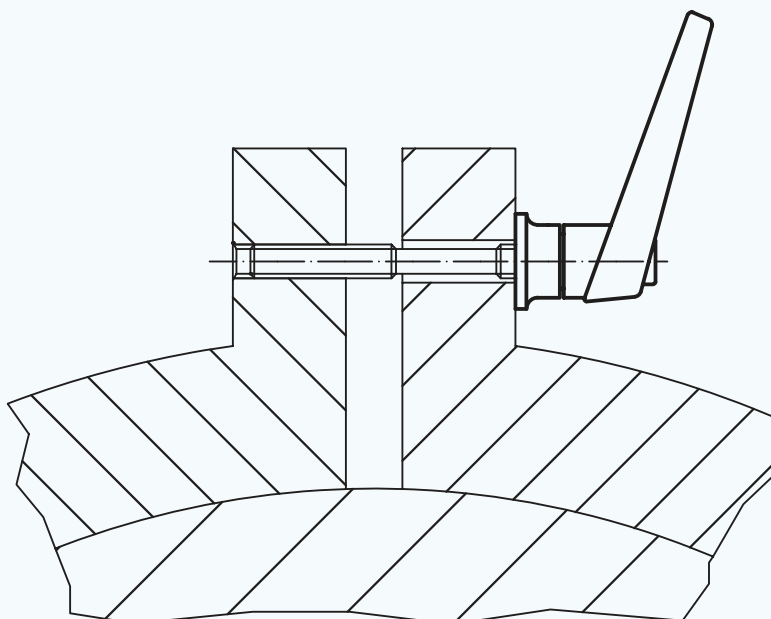
By lifting the lever, the serrations are disengaged.

The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged. The threaded insert can be exchanged.

Advantages of axial bearing:

- Double clamping force with same lever size, by reducing the surface friction.
- Protection of work piece by a fixed locating surface.
- Little setting due to higher pre-clamping force of bolt, e.g. thread.

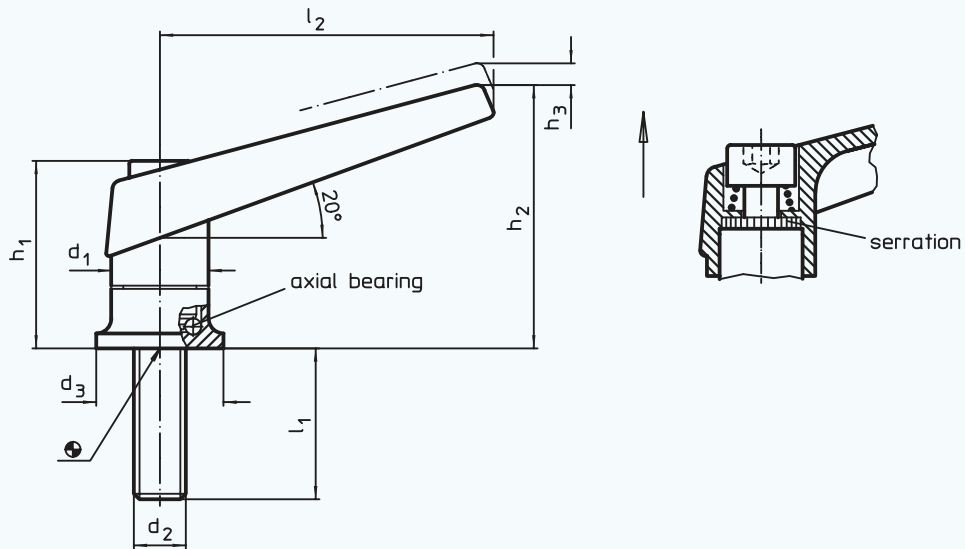
Ref. No. orange	Ref. No. black	d ₁	d ₂	d ₃	h ₁	h ₂	h ₃	l ₂	t ₁ min.	t ₂	g
24420.0010	24420.0012	18	M 6	24	34,5	50	3,0	62	12,5	5,0	99
24420.0110	24420.0112	22	M 8	25	39,5	56	3,5	74	14,0	4,2	140
24420.0210	24420.0212	25	M 10	30	46,5	66	4,0	89	18,0	5,4	207
24420.0310	24420.0312	30	M 12	35	56,5	82	5,0	108	26,5	6,6	359



EH 24420.

Adjustable Clamping Levers

axial bearing, with screw



Material:

Lever: • Zinc die-cast, orange similar to RAL 2004
• Zinc die-cast, black similar to RAL 9005

Inner parts: • Steel, nitrided, blackened

Screw: • Steel, nitrided, blackened

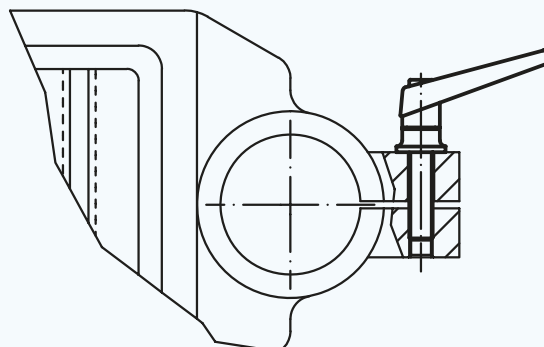
Note:

By lifting the lever, the serrations are disengaged. The lever can be positioned by the serrations. On releasing the lever, the serrations are automatically re-engaged. The threaded insert can be exchanged.

Advantages of axial bearing:

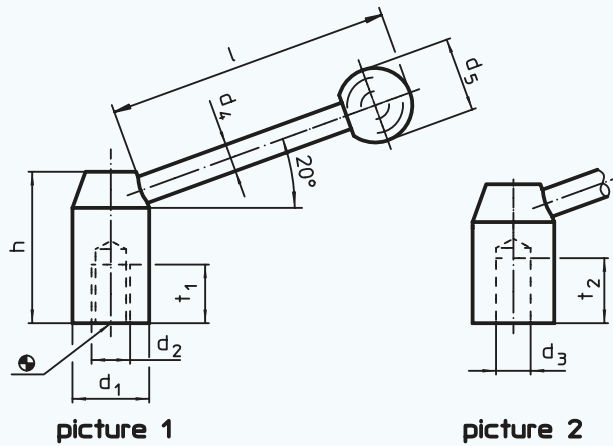
- Double clamping force with same lever size, by reducing the surface friction.
- Protection of work piece by a fixed locating surface.
- Little setting due to higher pre-clamping force of bolt, e.g. thread.

Ref. No. orange	Ref. No. black	d ₁	d ₂	l ₁	d ₃	h ₁	h ₂	h ₃	l ₂	g
24420.0030	24420.0032	18	M 6	20	24	34,5	50	3,0	62	97
24420.0050	24420.0052	18	M 6	27	24	34,5	50	3,0	62	98
24420.0130	24420.0132	22	M 8	21	25	39,5	56	3,5	74	151
24420.0150	24420.0152	22	M 8	36	25	39,5	56	3,5	74	157
24420.0230	24420.0232	25	M 10	29	30	46,5	66	4,0	89	232
24420.0250	24420.0252	25	M 10	47	30	46,5	66	4,0	89	242
24420.0330	24420.0332	30	M 12	34	35	56,5	82	5,0	108	412
24420.0346	24420.0348	30	M 12	50	35	56,5	82	5,0	108	420
24420.0350	24420.0352	30	M 12	57	35	56,5	82	5,0	108	426
24420.0364	24420.0366	30	M 12	65	35	56,5	82	5,0	108	431
24420.0384	24420.0386	30	M 12	85	35	56,5	82	5,0	108	449



EH 24430.

Clamping Levers

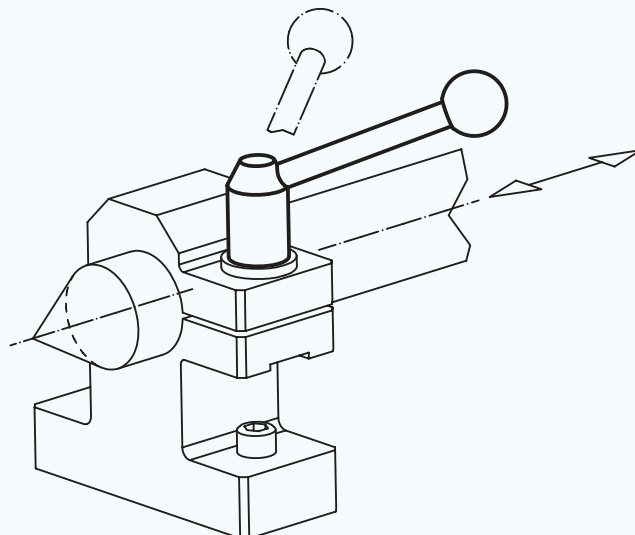


Material:

Lever: • Free cutting steel, finish-turned or ground, blackened
• Stainless steel 1.4305, dull blasted

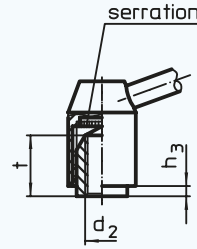
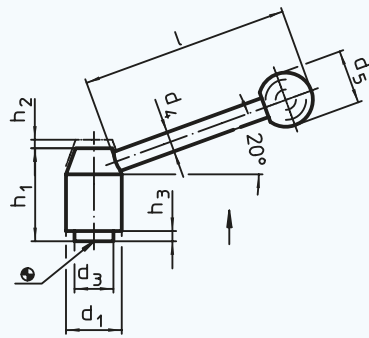
Ball knob: • Plastic (PF 31) DIN 319, black

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁	d ₂	d ₃ H7	d ₄	d ₅	h	l ≈	t ₁	t ₂	⌀ g
24430.0022	-	with female thread (picture 1)	20	M 8	-	8	20	33	67	15	-	97
-	24430.0230		22	M 8	-	8	20	37	70	15	-	121
24430.0032	-		22	M 10	-	8	20	37	82	15	-	113
-	24430.0236		25	M 10	-	10	25	42	96	15	-	186
24430.0038	-		25	M 12	-	10	25	42	96	18	-	165
24430.0042	24430.0242		28	M 12	-	12	30	47	110	18	-	262
24430.0048	24430.0248		32	M 16	-	12	32	52	124	23	-	354
24430.0052	-		36	M 16	-	14	35	58	138	24	-	519
24430.0058	-		40	M 20	-	16	40	64	152	27	-	715
24430.0062	-		45	M 20	-	16	40	71	170	30	-	967
24430.0020	-	with smooth bore (picture 2)	20	-	10	8	20	33	67	-	16	91
24430.0030	-		22	-	10	8	20	37	82	-	18	117
24430.0035	-		25	-	12	10	25	42	96	-	21	170
24430.0040	-		28	-	12	12	30	47	110	-	22	268
24430.0045	-		32	-	16	12	32	52	124	-	25	351
24430.0050	-		36	-	16	14	35	58	138	-	26	524
24430.0055	-		40	-	20	16	40	64	152	-	29	700

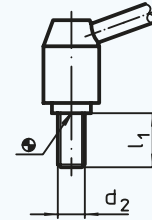


EH 24440.

Adjustable Clamping Levers



picture 1



picture 2

Material:

Lever: • Free cutting steel, finish-turned or ground, blackened
• Stainless steel 1.4305, dull blasted

Screw: • Steel, quality 5.8, blackened
• Stainless steel 1.4305

Inner parts: • Steel, quality 5.8, blackened
• Stainless steel 1.4305, dull blasted

Ball knob: • Plastic (PF 31) DIN 319, black

Note:

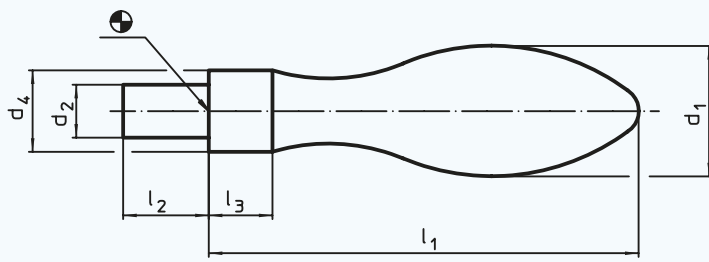
By lifting the lever, the serrations are disengaged. The lever can be positioned by the serrations and the threaded insert can be exchanged. On releasing the lever, the serrations are automatically re-engaged.

Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁	d ₂	l ₁	d ₃	d ₄	d ₅	h ₁	h ₂	h ₃	l ≈	t min.	g
24440.0101	24440.0601	with female thread (picture 1)	21	M 6	-	13,5	8	20	33,5	4,0	1,0	70	11	91
24440.0102	24440.0602		21	M 8	-	13,5	8	20	33,5	4,0	1,0	70	11	89
24440.0201	24440.0611		24	M 8	-	16,0	10	25	40,0	4,5	2,5	96	14	159
24440.0202	24440.0612		24	M 10	-	16,0	10	25	40,0	4,5	2,5	96	14	153
24440.0301	24440.0621		28	M 10	-	19,0	12	30	48,5	4,5	4,5	110	17	255
24440.0302	24440.0622		28	M 12	-	19,0	12	30	48,5	4,5	4,5	110	17	248
24440.0401	-		33	M 12	-	23,0	12	32	55,0	5,5	6,0	124	23	361
24440.0402	-		33	M 16	-	23,0	12	32	55,0	5,5	6,0	124	23	347
24440.0501	-		40	M 16	-	30,0	14	35	68,0	5,5	6,0	138	36	622
24440.0502	-		40	M 20	-	30,0	14	35	68,0	5,5	6,0	138	36	599
24440.0122	24440.0702	with screw (picture 2)	21	M 8 16		13,5	8	20	33,5	4,0	1,0	70	-	99
24440.0124	24440.0704		21	M 8 20		13,5	8	20	33,5	4,0	1,0	70	-	103
24440.0126	24440.0706		21	M 8 25		13,5	8	20	33,5	4,0	1,0	70	-	102
24440.0128	24440.0708		21	M 8 32		13,5	8	20	33,5	4,0	1,0	70	-	105
24440.0130	24440.0710		21	M 8 40		13,5	8	20	33,5	4,0	1,0	70	-	112
24440.0132	24440.0712		21	M 8 50		13,5	8	20	33,5	4,0	1,0	70	-	109
24440.0134	24440.0714		21	M 8 63		13,5	8	20	33,5	4,0	1,0	70	-	114
24440.0222	24440.0722		24	M 10 20		16,0	10	25	40,0	4,5	2,5	96	-	173
24440.0224	24440.0724		24	M 10 25		16,0	10	25	40,0	4,5	2,5	96	-	174
24440.0226	24440.0726		24	M 10 32		16,0	10	25	40,0	4,5	2,5	96	-	177
24440.0228	24440.0728		24	M 10 40		16,0	10	25	40,0	4,5	2,5	96	-	184
24440.0230	24440.0730		24	M 10 50		16,0	10	25	40,0	4,5	2,5	96	-	185
24440.0232	24440.0732		24	M 10 63		16,0	10	25	40,0	4,5	2,5	96	-	195
24440.0234	24440.0734		24	M 10 80		16,0	10	25	40,0	4,5	2,5	96	-	205
24440.0322	24440.0742		28	M 12 25		19,0	12	30	48,5	4,5	4,5	110	-	283
24440.0324	24440.0744		28	M 12 32		19,0	12	30	48,5	4,5	4,5	110	-	287
24440.0326	24440.0746		28	M 12 40		19,0	12	30	48,5	4,5	4,5	110	-	298
24440.0328	24440.0748		28	M 12 50		19,0	12	30	48,5	4,5	4,5	110	-	302
24440.0330	24440.0750		28	M 12 63		19,0	12	30	48,5	4,5	4,5	110	-	312
24440.0332	24440.0752		28	M 12 80		19,0	12	30	48,5	4,5	4,5	110	-	320
24440.0422	-	33	M 16 32		23,0	12	32	55,0	5,5	6,0	124	-	422	
24440.0424	-	33	M 16 40		23,0	12	32	55,0	5,5	6,0	124	-	439	
24440.0426	-	33	M 16 50		23,0	12	32	55,0	5,5	6,0	124	-	446	
24440.0428	-	33	M 16 63		23,0	12	32	55,0	5,5	6,0	124	-	461	
24440.0430	-	33	M 16 80		23,0	12	32	55,0	5,5	6,0	124	-	486	
24440.0522	-	40	M 20 50		30,0	14	35	68,0	5,5	6,0	138	-	792	
24440.0524	-	40	M 20 63		30,0	14	35	68,0	5,5	6,0	138	-	826	
24440.0526	-	40	M 20 80		30,0	14	35	68,0	5,5	6,0	138	-	859	

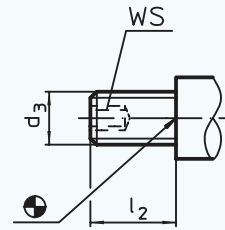
EH 24450.

Machine Handles

DIN 39



picture 1



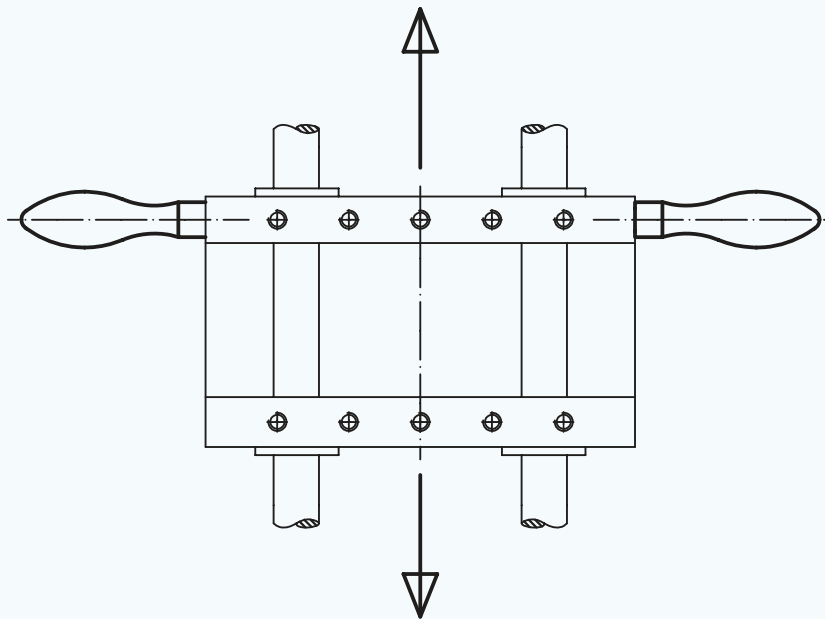
picture 2



Material:

- Steel, turned, zinc-coated by galvanization, passivated

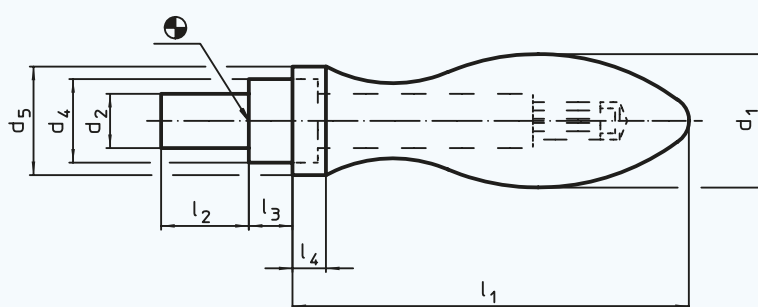
Ref. No.	Finish	d ₁	d ₂ h8	d ₃	d ₄ h13	l ₁ ≈	l ₂	l ₃	WS	g
24450.0016	with smooth lug,	16	7	-	10	50	11	7	-	45
24450.0020	form D	20	8	-	13	64	13	8	-	92
24450.0025	(picture 1)	25	10	-	16	80	14	10	-	177
24450.0032		32	13	-	20	100	21	13	-	359
24450.0036		36	16	-	22	112	26	14	-	519
24450.0116	with male thread lug,	16	-	M 6	10	50	11	7	3	43
24450.0120	form E	20	-	M 8	13	64	13	8	4	88
24450.0125	(picture 2)	25	-	M 10	16	80	14	10	5	175
24450.0132		32	-	M 12	20	100	21	13	6	346
24450.0136		36	-	M 16	22	112	26	14	8	509



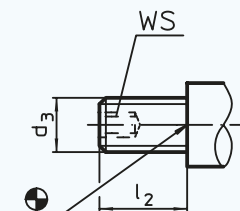
EH 24460.

**Rotating
Machine
Handles**

DIN 98



picture 1

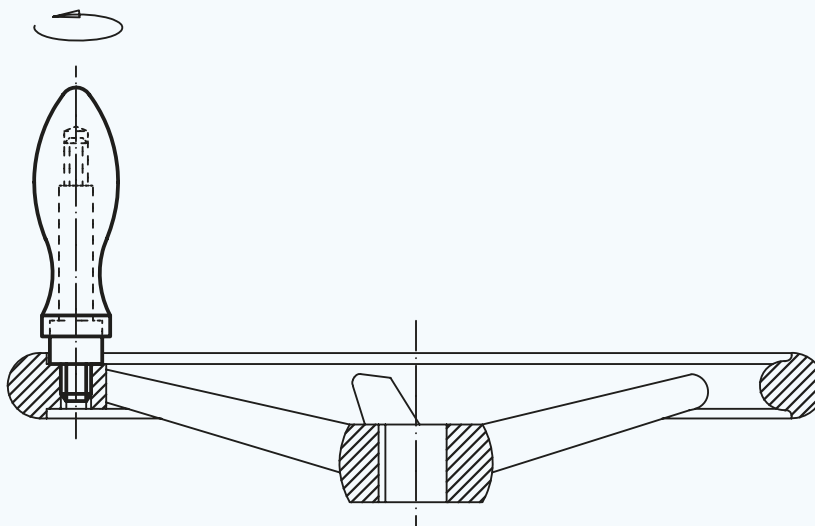


picture 2

Material:

- Steel, turned, zinc-coated by galvanization, passivated

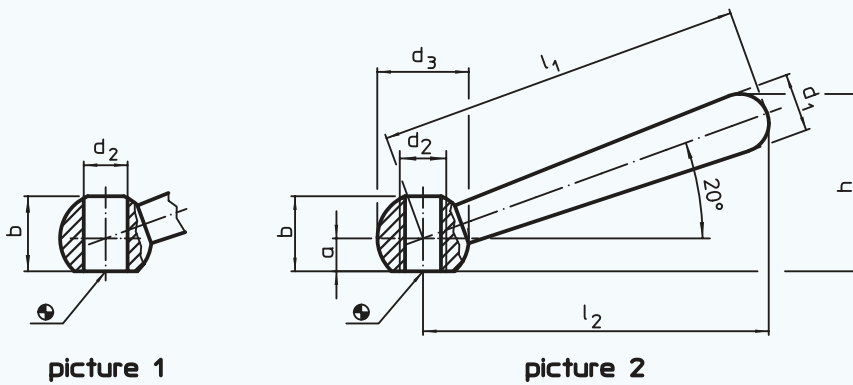
Ref. No.	Finish	d ₁	d ₂ h8	d ₃	d ₄ h13	d ₅	l ₁ ≈	l ₂	l ₃	l ₄	WS	g
24460.0016	with smooth lug, form D (picture 1)	16	7	–	10	14	49	11	5,5	5,0	–	53
24460.0020		20	8	–	13	18	61	13	6,0	6,0	–	109
24460.0025		25	10	–	16	21	75	14	8,0	6,5	–	200
24460.0032		32	13	–	20	26	95	21	10,5	8,0	–	395
24460.0036		36	16	–	22	29	106	26	11,0	9,0	–	569
24460.0116	with male thread lug, form E (picture 2)	16	–	M 6	10	14	49	11	5,5	5,0	3	51
24460.0120		20	–	M 8	13	18	61	13	6,0	6,0	4	101
24460.0125		25	–	M 10	16	21	75	14	8,0	6,5	5	193
24460.0132		32	–	M 12	20	26	95	21	10,5	8,0	6	387
24460.0136		36	–	M 16	22	29	106	26	11,0	9,0	8	566



EH 24470.

Clamping Levers

DIN 99



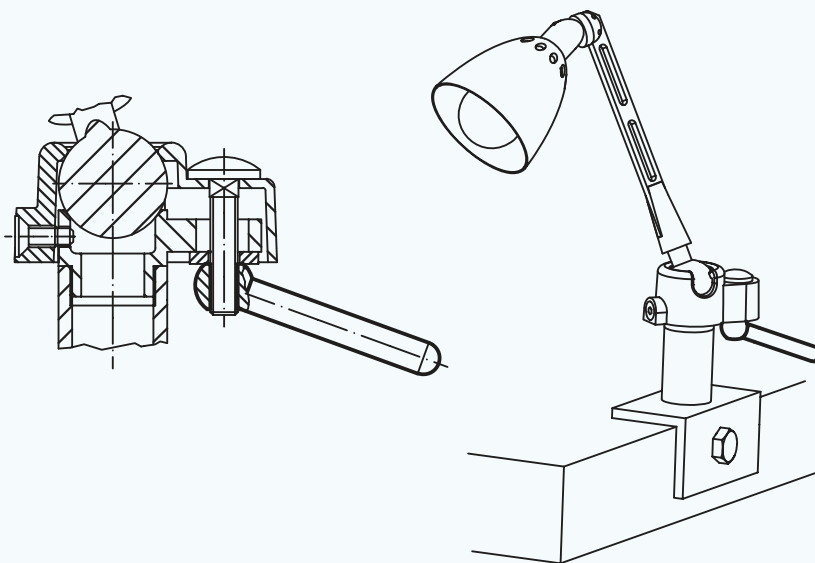
picture 1

picture 2

Material:

- Steel, blackened
- Stainless steel 1.4305, dull blasted

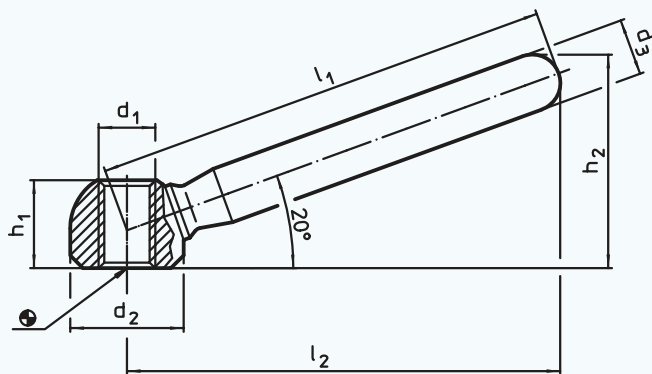
Ref. No. Steel	Ref. No. Stainless steel	Finish	l_1	$l_2 \approx$	a	$b \approx$	d_1	d_2 H7	d_2	d_3	$h \approx$	ρ_g
24470.0105	-	slanted, with smooth bore, form L (picture 1)	50	48	4,0	9,5	8	6	-	12	24,0	16
24470.0106	24470.0206		63	60	5,0	12,0	10	8	-	16	30,5	37
24470.0108	24470.0208		80	76	6,0	14,5	13	10	-	20	38,0	73
24470.0110	24470.0210		100	95	7,5	18,5	16	12	-	25	47,0	140
24470.0112	-		125	119	10,0	24,0	20	16	-	32	59,5	282
24470.0116	-		160	152	12,5	30,0	25	20	-	40	75,7	553
24470.0120	-		200	190	18,0	40,0	32	24	-	50	97,0	1096
24470.0305	24470.0405	slanted, with threaded bore, form N (picture 2)	50	48	4,0	9,5	8	-	M 6	12	24,0	17
24470.0306	24470.0406		63	60	5,0	12,5	10	-	M 8	16	30,5	38
24470.0308	24470.0408		80	76	6,0	15,0	13	-	M 10	20	38,0	74
24470.0310	24470.0410		100	95	7,5	19,0	16	-	M 12	25	47,0	142
24470.0312	24470.0412		125	119	10,0	25,0	20	-	M 16	32	59,5	297
24470.0316	-		160	152	12,5	31,0	25	-	M 20	40	75,7	566
24470.0320	-		200	190	18,0	41,0	32	-	M 24	50	97,0	1140



EH 24470.

Clamping Nuts

welded



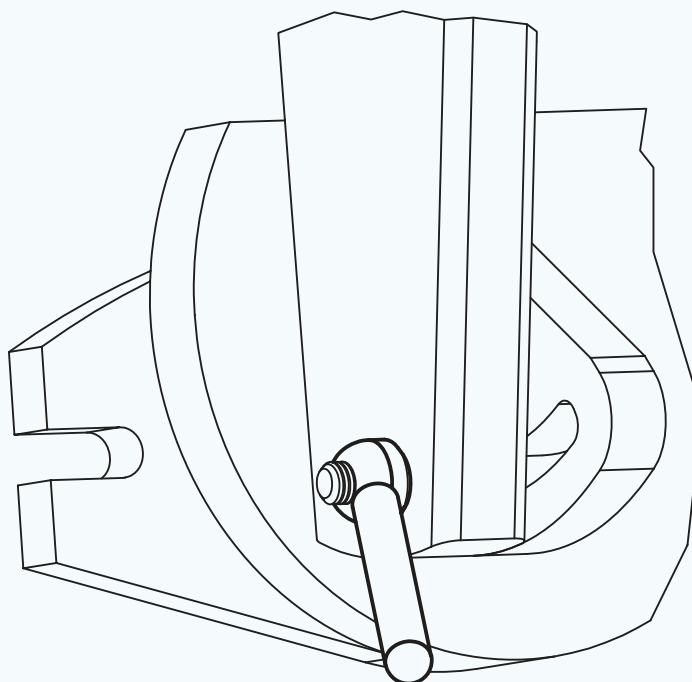
Material:

- Steel
- Stainless steel 1.4301

Note:

Low-price version to DIN 99

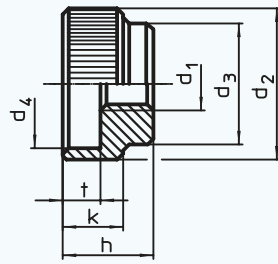
Ref. No.	Finish	l_1	$l_2 \approx$	d_1	d_2	d_3	h_1	$h_2 \approx$	\ddot{u}_g
24470.0506	from steel	63	60	M 8	16	9	12,5	30,5	39
24470.0508		80	76	M 10	20	11	15,0	37,0	74
24470.0510		100	95	M 12	25	14	19,0	46,0	149
24470.0512		125	119	M 16	32	18	25,0	58,5	316
24470.0516		160	152	M 20	40	20	31,0	73,0	533
24470.0606	from stainless steel	63	60	M 8	16	9	12,5	30,5	39
24470.0608		80	76	M 10	20	11	15,0	37,0	73
24470.0610		100	95	M 12	25	14	19,0	46,0	153
24470.0612		125	119	M 16	32	18	25,0	58,5	314
24470.0616		160	152	M 20	40	20	31,0	73,0	533



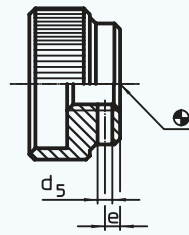
EH 24480.

Knurled Nuts

DIN 6303



picture 1



picture 2



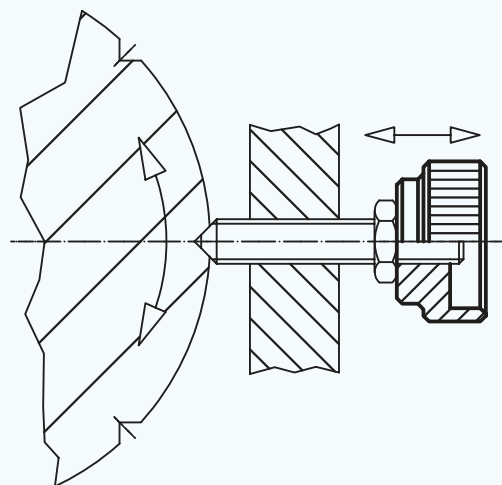
Material:

- Free cutting steel, blackened
- Stainless steel 1.4305

Note:

Form B: after being bored through the pin hole is to be situated within the tolerance field H7.

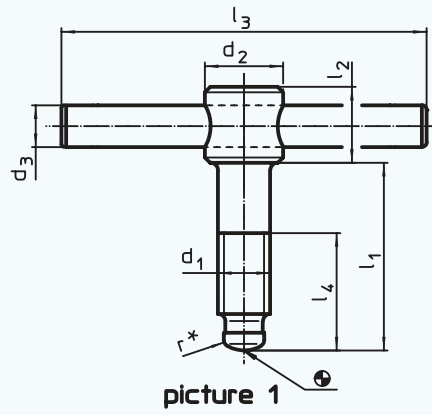
Ref. No. Steel	Ref. No. Stainless steel	Finish	d ₁	d ₂	d ₃	d ₄	d ₅ Pre-drilled	e	h	k	t	Suitable straight pin DIN 7	g
24480.0005	24480.0205	without pin hole, form A (picture 1)	M 5	20	14	15	-	-	12	8	5	-	16
24480.0006	24480.0206		M 6	24	16	18	-	-	14	10	6	-	27
24480.0008	24480.0208		M 8	30	20	24	-	-	17	12	7	-	46
24480.0010	24480.0210		M 10	36	28	30	-	-	20	14	8	-	82
24480.0012	24480.0212		M 12	40	32	34	-	-	24	16	10	-	123
24480.0105	24480.0305	with pin hole, form B (picture 2)	M 5	20	14	15	1,4	2,5	12	8	5	1,5 m 6 x 14	15
24480.0106	24480.0306		M 6	24	16	18	1,4	2,5	14	10	6	1,5 m 6 x 16	25
24480.0108	24480.0308		M 8	30	20	24	1,9	3,0	17	12	7	2,0 m 6 x 20	45
24480.0110	24480.0310		M 10	36	28	30	2,9	4,0	20	14	8	3,0 m 6 x 28	86
24480.0112	24480.0312		M 12	40	32	34	3,9	4,0	24	16	10	4,0 m 6 x 32	121



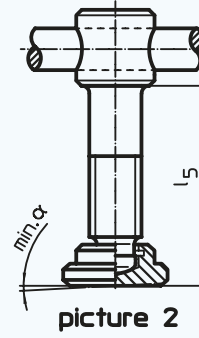
EH 24490.

**Tommy
Screws**

DIN 6304
with fixed pin



picture 1



picture 2

* to ease assembly the DIN 6304 specification has been completed by r

Material:

- Free cutting steel, blackened. Pressure lug hardened.

Note:

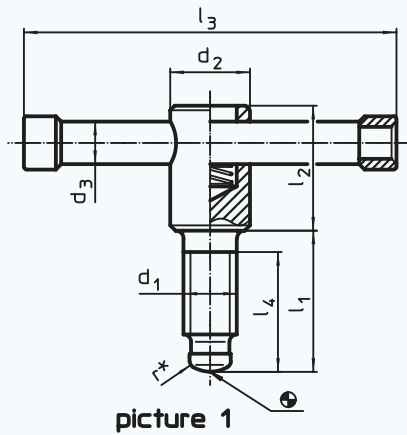
Pressure lug for thrust pad to DIN 6311 form S, EH 22560.
Pin pressed-in.

Ref. No.	Finish	d ₁	l ₁	d ₂	d ₃	l ₂	l ₃	l ₄	l ₅ ≈	min. α	g
24490.0006	without thrust pad, form E (picture 1)	M 6	40	12	5	10	50	30	—	—	21
24490.0007		M 6	50	12	5	10	50	40	—	—	23
24490.0008		M 8	50	14	6	12	60	35	—	—	39
24490.0009		M 8	60	14	6	12	60	45	—	—	43
24490.0010		M 10	60	18	8	14	80	40	—	—	82
24490.0011		M 10	70	18	8	14	80	50	—	—	86
24490.0012		M 12	70	20	10	18	100	50	—	—	140
24490.0013		M 12	80	20	10	18	100	60	—	—	149
24490.0016		M 16	75	24	12	20	120	55	—	—	248
24490.0017		M 16	90	24	12	20	120	70	—	—	267
24490.0018	M 16	110	24	12	20	120	90	—	—	294	
24490.0020	M 20	75	30	16	28	140	55	—	—	475	
24490.0021	M 20	90	30	16	28	140	70	—	—	506	
24490.0022	M 20	110	30	16	28	140	90	—	—	548	
24490.0106	with thrust pad, form F (picture 2)	M 6	40	12	5	10	50	30	42,1	7°	24
24490.0107		M 6	50	12	5	10	50	40	52,1	7°	28
24490.0108		M 8	50	14	6	12	60	35	53,0	4°	49
24490.0109		M 8	60	14	6	12	60	45	63,0	4°	54
24490.0110		M 10	60	18	8	14	80	40	63,6	3°	97
24490.0111		M 10	70	18	8	14	80	50	73,6	3°	102
24490.0112		M 12	70	20	10	18	100	50	74,6	3°	173
24490.0113		M 12	80	20	10	18	100	60	84,6	3°	178
24490.0116		M 16	75	24	12	20	120	55	80,4	5°	317
24490.0117		M 16	90	24	12	20	120	70	95,4	5°	342
24490.0118		M 16	110	24	12	20	120	90	115,4	5°	367
24490.0120		M 20	75	30	16	28	140	55	80,5	4°	573
24490.0121	M 20	90	30	16	28	140	70	95,5	4°	603	
24490.0122	M 20	110	30	16	28	140	90	115,5	4°	643	

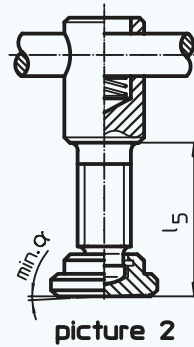
EH 24500.

Tommy Screws

DIN 6306
with moveable pin



picture 1



picture 2

* to ease assembly the DIN 6306 specification has been completed by r

Material:

- Free cutting steel, blackened. Pressure lug hardened.

Note:

Pressure lug for thrust pad to DIN 6311 form S, EH 22560.
Moveable pin held by spring load.

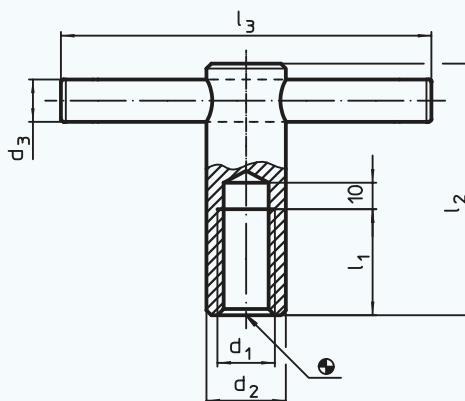


Ref. No.	Finish	d ₁	l ₁	d ₂	d ₃	l ₂	l ₃	l ₄	l ₅ ≈	min. α	g
24500.0010	without thrust pad, form D (picture 1)	M 10	40	18	8	32	80	30	—	—	91
24500.0011		M 10	50	18	8	32	80	40	—	—	95
24500.0012		M 12	50	20	10	35	100	40	—	—	154
24500.0013		M 12	60	20	10	35	100	50	—	—	161
24500.0016		M 16	55	24	13	40	120	45	—	—	330
24500.0017		M 16	70	24	13	40	120	60	—	—	318
24500.0018		M 16	90	24	13	40	120	80	—	—	345
24500.0020		M 20	55	30	16	45	140	45	—	—	522
24500.0021		M 20	70	30	16	45	140	60	—	—	551
24500.0022		M 20	90	30	16	45	140	80	—	—	593
24500.0110	with thrust pad, form E (picture 2)	M 10	40	18	8	32	80	30	43,6	3°	110
24500.0111		M 10	50	18	8	32	80	40	53,6	3°	114
24500.0112		M 12	50	20	10	35	100	40	54,6	3°	193
24500.0113		M 12	60	20	10	35	100	50	64,6	3°	198
24500.0116		M 16	55	24	13	40	120	45	60,4	5°	357
24500.0117		M 16	70	24	13	40	120	60	75,4	5°	377
24500.0118		M 16	90	24	13	40	120	80	95,4	5°	407
24500.0120		M 20	55	30	16	45	140	45	60,5	4°	623
24500.0121		M 20	70	30	16	45	140	60	75,5	4°	653
24500.0122		M 20	90	30	16	45	140	80	95,5	4°	693

EH 24510.

Tommy Nuts

DIN 6305,
pin pressed in



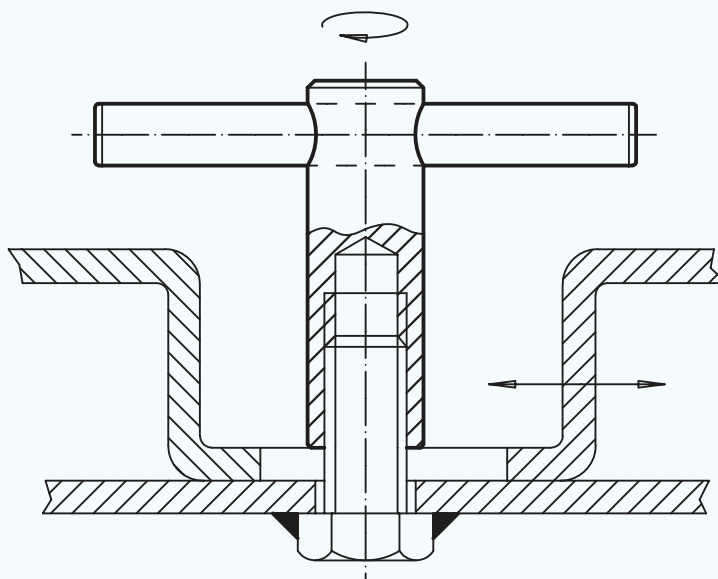
Material:

- Free cutting steel, blackened

Note:

Pin pressed-in.

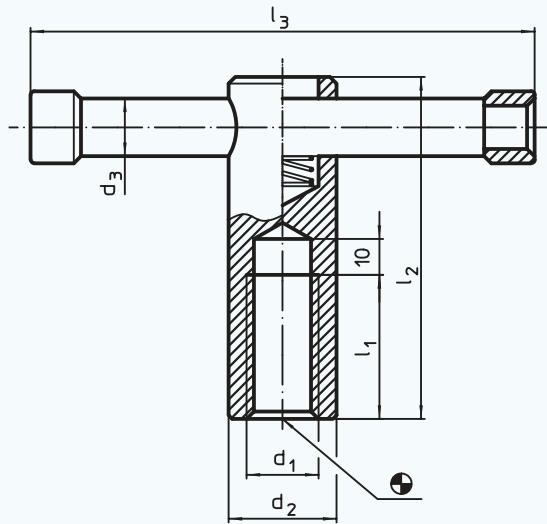
Ref. No.	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	g
24510.0510	M 10	18	8	20	60	80	127
24510.0512	M 12	20	10	25	70	100	192
24510.0516	M 16	24	12	35	85	120	318
24510.0520	M 20	30	16	40	95	140	590



EH 24510.

Tommy Nuts

DIN 6307
with moveable pin



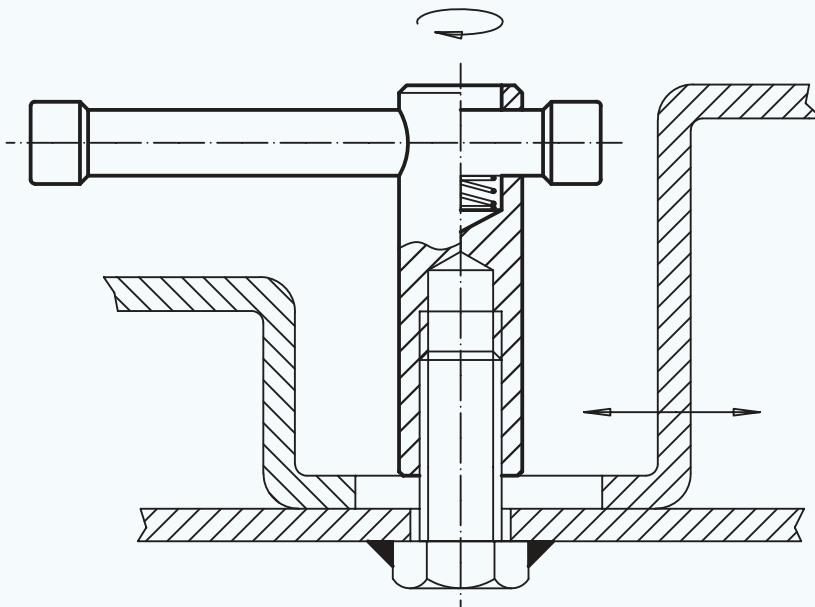
Material:

- Free cutting steel, blackened

Note:

Moveable pin held spring load.

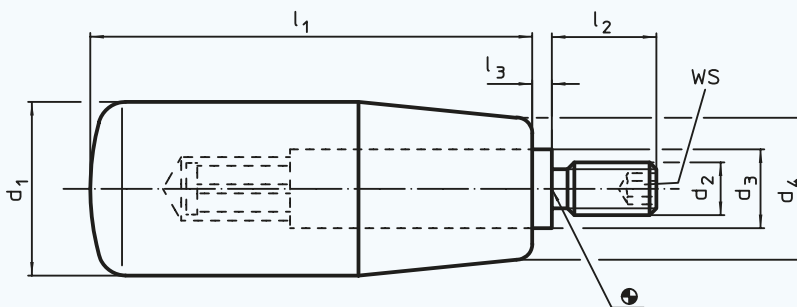
Ref. No.	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	g
24510.0710	M 10	18	8	20	60	80	112
24510.0712	M 12	20	10	25	70	100	179
24510.0716	M 16	24	13	35	85	120	327
24510.0720	M 20	30	16	40	95	140	581



EH 24530.

Cylindrical Handles

rotating



Material:

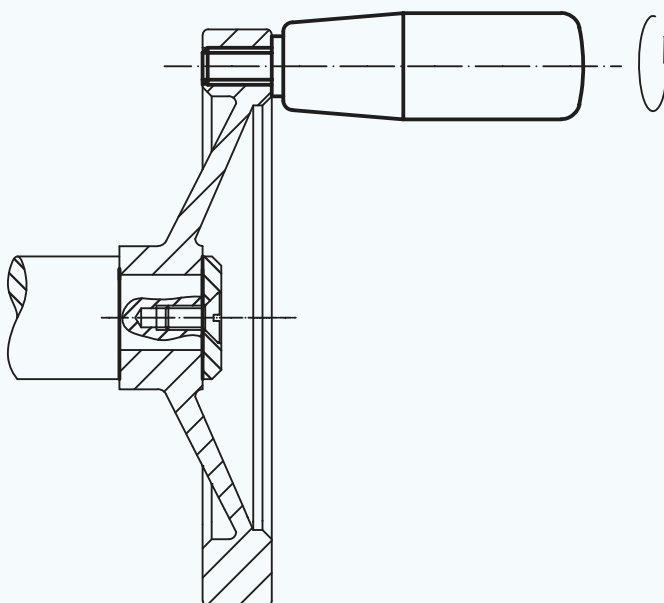
Cylindrical handle: • Plastic (PF 31), black
• 24530.0008 - Thermoplastic (PA), black, dull

Axe Part: • Steel, galvanized
• Stainless steel 1.4305

Note:

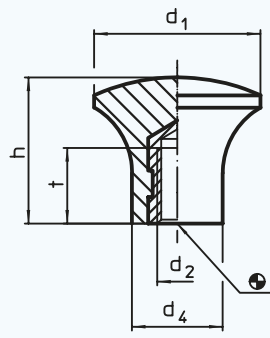
Temperature range up to 110 °C; Thermoplastic PA up to 80 °C.

Ref. No. Steel	Ref. No. Stainless steel	d ₁	d ₂	d ₃	d ₄	l ₁	l ₂	l ₃	WS	g
24530.0008	-	14	M 6	8	11	28	10	0,5	3	13
24530.0010	24530.0210	18	M 6	10	15	40	12	2,5	3	29
24530.0020	24530.0220	21	M 6	10	17	50	13	2,5	3	42
24530.0021	-	21	M 8	10	17	50	13	2,5	4	43
24530.0030	-	22	M 6	10	18	56	13	2,5	3	47
24530.0031	-	22	M 8	10	18	56	13	2,5	4	48
24530.0040	24530.0240	23	M 8	13	19	65	14	2,5	4	79
24530.0041	-	23	M 10	13	19	65	14	2,5	5	80
24530.0050	-	26	M 8	13	21	80	16	2,5	4	106
24530.0051	24530.0251	26	M 10	13	21	80	16	2,5	5	108
24530.0060	24530.0260	28	M 10	13	22	90	16	2,5	5	126
24530.0071	24530.0271	31	M 12	14	25	102	20	2,5	6	178

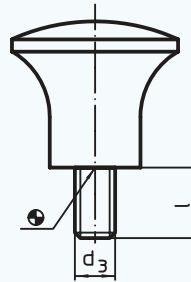


EH 24540.

Mushroom-Type Knobs



picture 1



picture 2



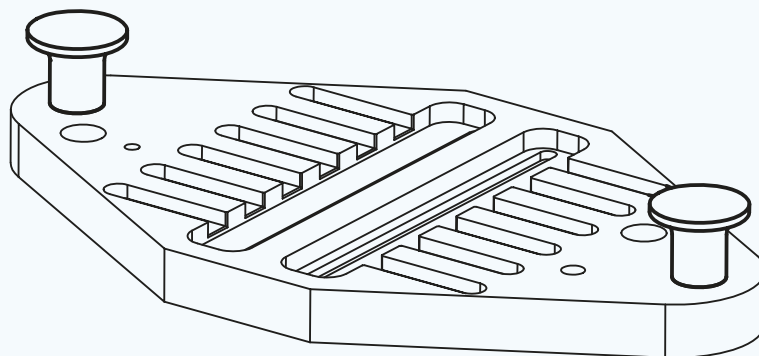
Material:

Mushroom-type knob: • Plastic (PF 31), black **Bushing:** • Brass **Screw:** • Steel, galvanized

Note:

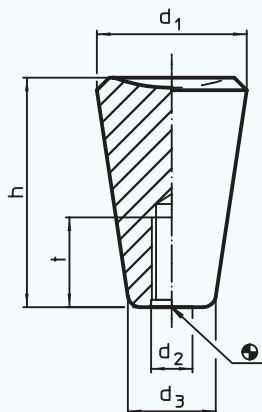
Temperature range up to 110 °C.

Ref. No.	Finish	d ₁	d ₂	d ₃	l	d ₄	h	t	g
24540.0017	with female thread (picture 1)	17	M 5	–	–	10	14	7	4,8
24540.0021		21	M 6	–	–	12	17	11	8,2
24540.0025		25	M 6	–	–	14	21	11	11,0
24540.0033		33	M 8	–	–	18	29	12	19,0
24540.0117	with screw (picture 2)	17	–	M 5	9	10	14	–	4,2
24540.0121		21	–	M 6	10	12	17	–	7,1
24540.0125		25	–	M 6	10	14	21	–	10,0
24540.0133		33	–	M 8	14	18	29	–	23,0



EH 24550.

Conical Knobs



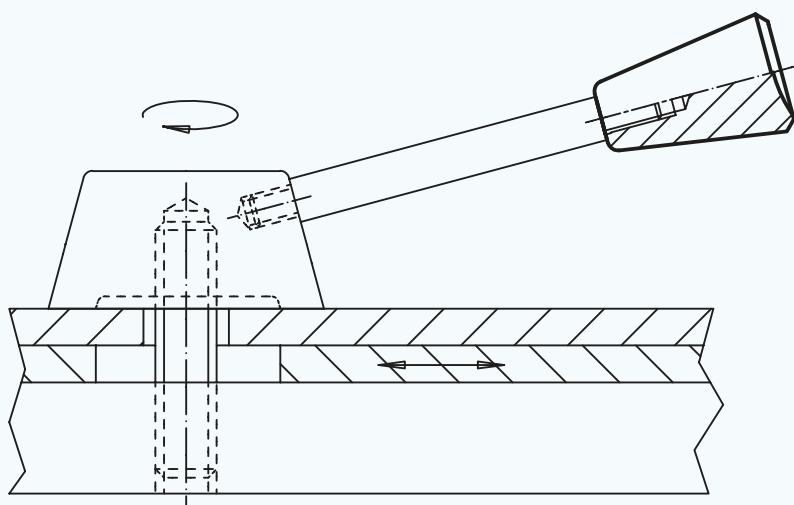
Material:

- Plastic (PF 31), black

Note:

Temperature range up to 110 °C.

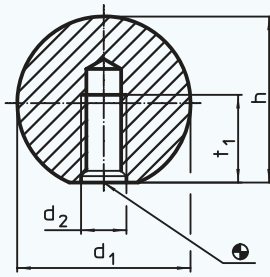
Ref. No.	d ₁	d ₂	d ₃ ≈	h	t min.	g
24550.0010	20	M 5	12	30	18	7,8
24550.0011	20	M 6	12	30	18	7,4
24550.0020	25	M 6	15	38	18	14,0
24550.0021	25	M 8	15	38	18	13,0
24550.0030	30	M 8	18	46	18	26,0
24550.0031	30	M 10	18	46	18	25,0
24550.0040	35	M 10	21	53	21	46,0
24550.0041	35	M 12	21	53	21	43,0



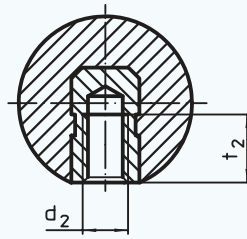
EH 24560.

Ball Knobs

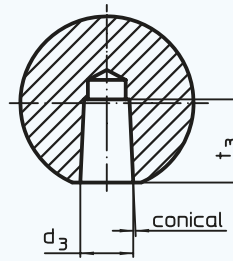
DIN 319



picture 1



picture 2



picture 3



Material:

Ball: • Plastic (PF 31) DIN 7708, black

• Plastic (PF 31) DIN 7708, red similar to RAL 3003

Bushing: • Steel, galvanized

• 24560.0116 / 24560.0616 - brass

Note:

Jointless, polished.

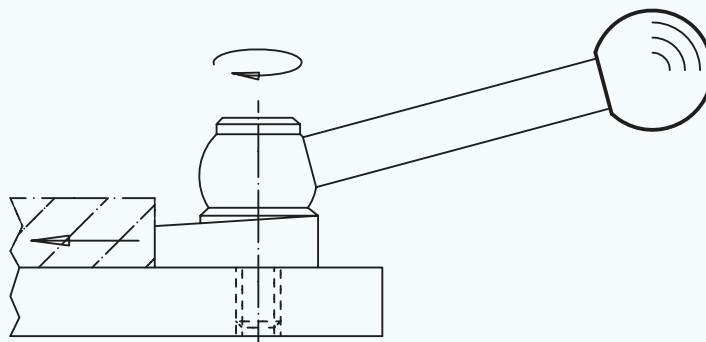
Assembly instruction for form M:

Fitted by lightly tapping with a hammer, holds in position without being cemented.

For the counter element a h9-fit is sufficient.

Temperature range up to 110 °C.

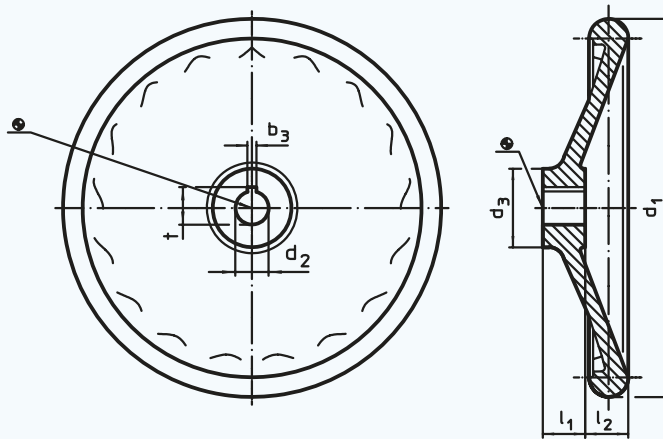
Ref. No. black	Ref. No. red	Finish	d ₁	d ₂	d ₃	h	t ₁ > =	t ₂ > =	t ₃ > =	±g
24560.0016	24560.0516	with moulded	16	M 4	-	15,0	7	-	-	3,2
24560.0020	24560.0520	material thread,	20	M 5	-	18,0	9	-	-	5,2
24560.0025	24560.0525	form C	25	M 6	-	22,5	11	-	-	10,0
24560.0032	24560.0532	(picture 1)	32	M 8	-	29,0	14	-	-	22,0
24560.0040	24560.0540		40	M 10	-	37,0	18	-	-	43,0
24560.0050	24560.0550		50	M 12	-	46,0	21	-	-	86,0
24560.0116	24560.0616	with	16	M 4	-	15,0	-	6,0	-	5,1
24560.0120	24560.0620	threaded bushing,	20	M 5	-	18,0	-	7,5	-	6,6
24560.0125	24560.0625	form E	25	M 6	-	22,5	-	9,0	-	13,0
24560.0132	24560.0632	(picture 2)	32	M 8	-	29,0	-	12,0	-	26,0
24560.0140	24560.0640		40	M 10	-	37,0	-	15,0	-	56,0
24560.0150	24560.0650		50	M 12	-	46,0	-	18,0	-	108,0
24560.0216	-	with taper bore	16	-	4	15,0	-	-	9	2,7
24560.0220	-	form M	20	-	5	18,0	-	-	12	5,1
24560.0225	-	(picture 3)	25	-	6	22,5	-	-	15	9,3
24560.0232	-		32	-	8	29,0	-	-	15	19,0
24560.0240	-		40	-	10	37,0	-	-	20	39,0
24560.0250	-		50	-	12	46,0	-	-	22	84,0



EH 24570.

Disc-Type Handwheels

DIN 3670



Material:

- Aluminium permanent-mould casting

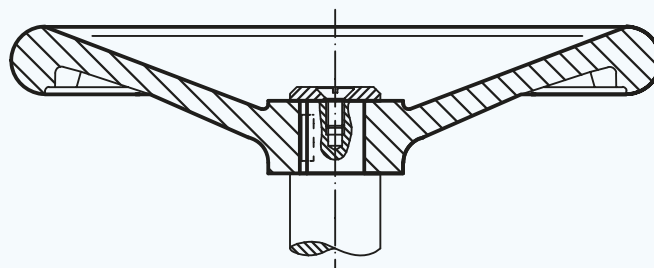
Note:

Turned, rim polished.

Ref. No. d ₂ small	Ref. No. d ₂ large	Finish	d ₁	d ₂ H7 small	d ₂ H7 large	d ₃	l ₁	l ₂	g
24570.0105	24570.0106	without	100	10	12	28	17	16	194
24570.0110	24570.0111	steel bushing, form B, without keyway	125	12	14	31	18	18	288
24570.0120	24570.0121		160	14	16	36	20	20	477
24570.0130	24570.0131		200	18	22	42	24	21	955
24570.0140	24570.0141		250	22	26	48	28	22	1685
24570.0305	24570.0306	without	100	10	12	28	17	16	190
24570.0310	24570.0311	steel bushing, form B, with keyway (K)	125	12	14	31	18	18	250
24570.0320	24570.0321		160	14	16	36	20	20	491
24570.0330	24570.0331		200	18	22	42	24	21	933
24570.0340	24570.0341		250	22	26	48	28	22	1662

Keyways DIN 6885 sheet 1

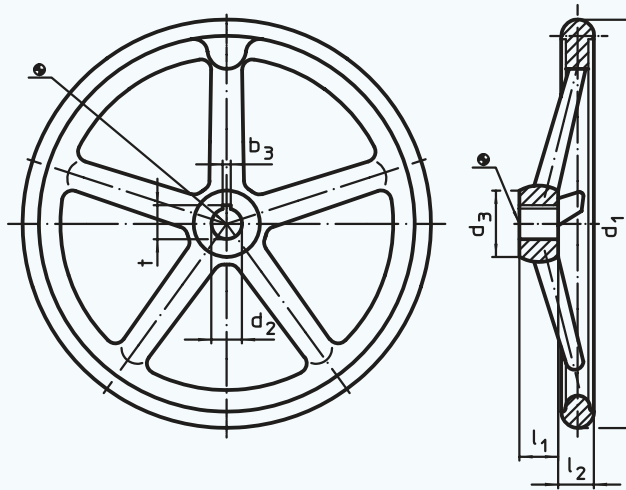
d ₂	10,0	12,0	14,0	16,0	18,0	22,0	26,0
b ₃	3,0	4,0	5,0	5,0	6,0	6,0	8,0
t	11,4	13,8	16,3	18,3	20,8	24,8	29,3



EH 24580.

Handwheels

DIN 950
cast-iron



Material:

Handwheel:

- Grey cast iron
- clearly deburred
- Hub machined

Machine handle DIN 39 (EH 24450.):

- Steel, turned, zinc-coated by galvanization, passivated

Machine handle DIN 98 (EH 24460., rotating):

- Steel, turned, zinc-coated by galvanization, passivated

Ref. No. d _g small	Ref. No. d _g large	Finish	d ₁	d ₂ H7 small	d ₂ H7 large	d ₃	l ₁	l ₂	Number of spokes	Correspond. mach. Handle DIN 39/ DIN 98	g
24580.0000	24580.0001	without	80	10	12	24	16	13	3	-	311
24580.0005	24580.0006	keyway,	100	10	12	26	17	16	3	-	486
24580.0010	24580.0011	without	125	12	14	28	18	18	3	-	720
24580.0015	24580.0016	handle	140	14	16	30	19	20	3	-	879
24580.0020	24580.0021	form B-F/A	160	14	16	32	20	20	3	-	1151
24580.0030	24580.0031	(formerly A 4)	200	18	22	38	24	21	3	-	2218
24580.0040	24580.0041		250	22	26	45	28	22	5	-	3735
24580.0045	24580.0046		315	26	30	53	33	23	5	-	6180
24580.0050	24580.0051		400	30	34	65	38	25	5	-	9500
24580.0100	24580.0101	with	80	10	12	24	16	13	3	-	360
24580.0105	24580.0106	keyway,	100	10	12	26	17	16	3	-	500
24580.0110	24580.0111	without	125	12	14	28	18	18	3	-	750
24580.0115	24580.0116	handle	140	14	16	30	19	20	3	-	902
24580.0120	24580.0121	form N-F/A	160	14	16	32	20	20	3	-	1139
24580.0130	24580.0131	(formerly A 3)	200	18	22	38	24	21	3	-	2142
24580.0140	24580.0141		250	22	26	45	28	22	5	-	3652
24580.0145	24580.0146		315	26	30	53	33	23	5	-	5800
24580.0150	24580.0151		400	30	34	65	38	25	5	-	9500
24580.0200	24580.0201	without	80	10	12	24	16	13	3	16	410
24580.0205	24580.0206	keyway,	100	10	12	26	17	16	3	16	550
24580.0210	24580.0211	with rotating	125	12	14	28	18	18	3	20	850
24580.0215	24580.0216	handle	140	14	16	30	19	20	3	20	1040
24580.0220	24580.0221	EH 24460.,	160	14	16	32	20	20	3	25	1390
24580.0230	24580.0231	assembled	200	18	22	38	24	21	3	25	2190
24580.0240	24580.0241	form B-F/G	250	22	26	45	28	22	5	32	4185
24580.0245	24580.0246	(formerly D 4)	315	26	30	53	33	23	5	32	6185
24580.0250	24580.0251		400	30	34	65	38	25	5	36	10500
24580.0300	24580.0301	with	80	10	12	24	16	13	3	16	410
24580.0305	24580.0306	keyway,	100	10	12	26	17	16	3	16	550
24580.0310	24580.0311	with rotating	125	12	14	28	18	18	3	20	850
24580.0315	24580.0316	handle	140	14	16	30	19	20	3	20	1040
24580.0320	24580.0321	EH 24460.	160	14	16	32	20	20	3	25	1390
24580.0330	24580.0331	assembled,	200	18	22	38	24	21	3	25	2190
24580.0340	24580.0341	form N-F/G	250	22	26	45	28	22	5	32	4185
24580.0345	24580.0346	(formerly D 3)	315	26	30	53	33	23	5	32	6185
24580.0350	24580.0351		400	30	34	65	38	25	5	36	10500

EH 24580.

Continued from previous page

Handwheels

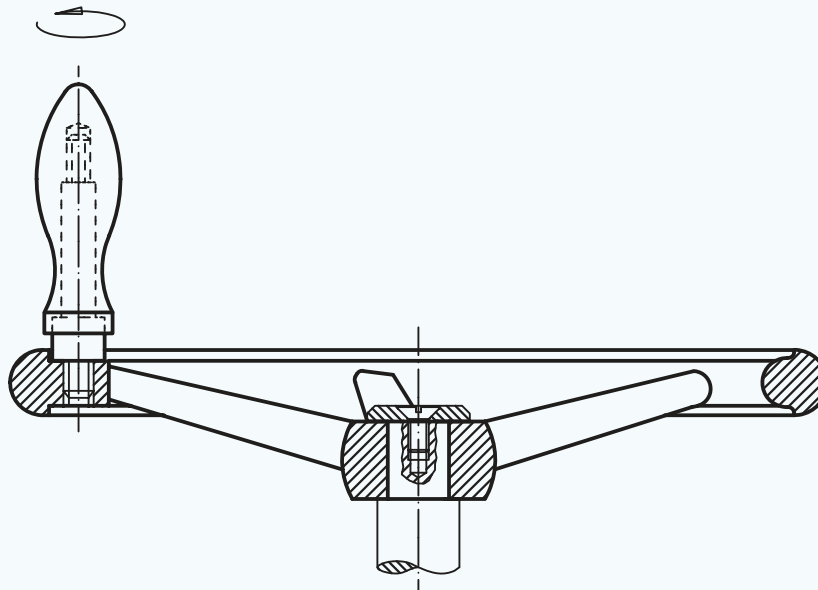
DIN 950
cast-iron



Ref. No. d ₂ small	Ref. No. d ₂ large	Finish	d ₁	d ₂ H7 small	d ₂ H7 large	d ₃	l ₁	l ₂	Number of spokes	Correspond. mach. Handle DIN 39/ DIN 98	r _g
24580.0400	24580.0401	without	80	10	12	24	16	13	3	16	410
24580.0405	24580.0406	keyway,	100	10	12	26	17	16	3	16	550
24580.0410	24580.0411	with solid	125	12	14	28	18	18	3	20	835
24580.0415	24580.0416	handle	140	14	16	30	19	20	3	20	1025
24580.0420	24580.0421	EH 24450.,	160	14	16	32	20	20	3	25	1380
24580.0430	24580.0431	assembled,	200	18	22	38	24	21	3	25	2180
24580.0440	24580.0441	form B-F/G	250	22	26	45	28	22	5	32	4160
24580.0445	24580.0446	(formerly F 4)	315	26	30	53	33	23	5	32	6160
24580.0450	24580.0451		400	30	34	65	38	25	5	36	10460
24580.0500	24580.0501	with	80	10	12	24	16	13	3	16	410
24580.0505	24580.0506	keyway,	100	10	12	26	17	16	3	16	550
24580.0510	24580.0511	with solid	125	12	14	28	18	18	3	20	835
24580.0515	24580.0516	handle	140	14	16	30	19	20	3	20	1025
24580.0520	24580.0521	EH 24450.	160	14	16	32	20	20	3	25	1380
24580.0530	24580.0531	assembled,	200	18	22	38	24	21	3	25	2180
24580.0540	24580.0541	form N-F/G	250	22	26	45	28	22	5	32	4160
24580.0545	24580.0546	(formerly F 3)	315	26	30	53	33	23	5	32	6160
24580.0550	24580.0551		400	30	34	65	38	25	5	36	10460

Keyways DIN 6885 sheet 1

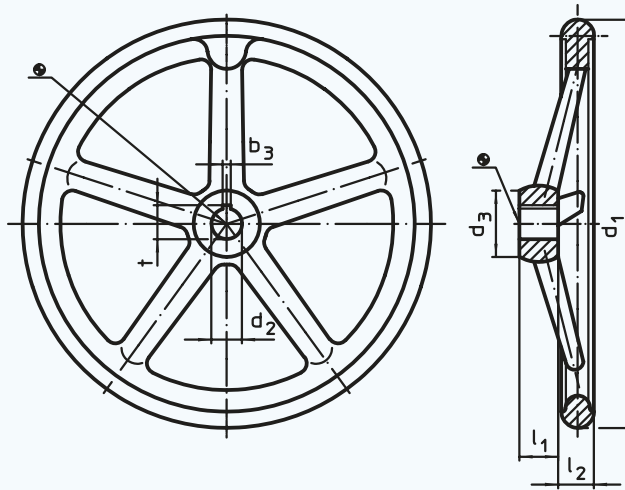
d ₂	10,0	12,0	14,0	16,0	18,0	22,0	26,0	30,0	34,0
b ₃	3,0	4,0	5,0	5,0	6,0	6,0	8,0	8,0	10,0
t	11,4	13,8	16,3	18,3	20,8	24,8	29,3	33,3	37,3



EH 24590.

Handwheels

DIN 950
light metal



Material:

Handwheel:

- Light metal (aluminium)
- clearly deburred
- Hub machined
- Rim polished

Machine handle DIN 39 (EH 24450.):

- Steel, turned, zinc-coated by galvanization, passivated

Machine handle DIN 98 (EH 24460., rotating):

- Steel, turned, zinc-coated by galvanization, passivated

Ref. No. d _g small	Ref. No. d _g large	Finish	d ₁	d ₂ H7 small	d ₂ H7 large	d ₃	l ₁	l ₂	Number of spokes	Correspond. mach. Handle DIN 39/ DIN 98	μ g
24590.0000	24590.0001	without	80	10	12	24	16	13	3	–	92
24590.0005	24590.0006	keyway,	100	10	12	26	17	16	3	–	160
24590.0010	24590.0011	without	125	12	14	28	18	18	3	–	237
24590.0015	24590.0016	handle	140	14	16	30	19	20	3	–	295
24590.0020	24590.0021	form B-F/A	160	14	16	32	20	20	3	–	435
24590.0030	24590.0031	(formerly A 4)	200	18	22	38	24	21	3	–	783
24590.0040	24590.0041		250	22	26	45	28	22	5	–	1509
24590.0045	24590.0046		315	26	30	53	33	23	5	–	2440
24590.0050	24590.0051		400	30	34	65	38	25	5	–	3740
24590.0100	24590.0101	with	80	10	12	24	16	13	3	–	99
24590.0105	24590.0106	keyway,	100	10	12	26	17	16	3	–	171
24590.0110	24590.0111	without	125	12	14	28	18	18	3	–	232
24590.0115	24590.0116	handle	140	14	16	30	19	20	3	–	309
24590.0120	24590.0121	form N-F/A	160	14	16	32	20	20	3	–	422
24590.0130	24590.0131	(formerly A 3)	200	18	22	38	24	21	3	–	779
24590.0140	24590.0141		250	22	26	45	28	22	5	–	1511
24590.0145	24590.0146		315	26	30	53	33	23	5	–	2500
24590.0150	24590.0151		400	30	34	65	38	25	5	–	3600
24590.0200	24590.0201	without	80	10	12	24	16	13	3	16	150
24590.0205	24590.0206	keyway,	100	10	12	26	17	16	3	16	210
24590.0210	24590.0211	with rotating	125	12	14	28	18	18	3	20	340
24590.0215	24590.0216	handle	140	14	16	30	19	20	3	20	430
24590.0220	24590.0221	EH 24460.,	160	14	16	32	20	20	3	25	615
24590.0230	24590.0231	assembled	200	18	22	38	24	21	3	25	970
24590.0240	24590.0241	form B-F/G	250	22	26	45	28	22	5	32	1885
24590.0245	24590.0246	(formerly D 4)	315	26	30	53	33	23	5	32	2885
24590.0250	24590.0251		400	30	34	65	38	25	5	36	4250
24590.0300	24590.0301	with	80	10	12	24	16	13	3	16	150
24590.0305	24590.0306	keyway,	100	10	12	26	17	16	3	16	210
24590.0310	24590.0311	with rotating	125	12	14	28	18	18	3	20	340
24590.0315	24590.0316	handle	140	14	16	30	19	20	3	20	430
24590.0320	24590.0321	EH 24460.	160	14	16	32	20	20	3	25	615
24590.0330	24590.0331	assembled,	200	18	22	38	24	21	3	25	970
24590.0340	24590.0341	form N-F/G	250	22	26	45	28	22	5	32	1885
24590.0345	24590.0346	(formerly D 3)	315	26	30	53	33	23	5	32	2885
24590.0350	24590.0351		400	30	34	65	38	25	5	36	4250

EH 24590.

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Handwheels

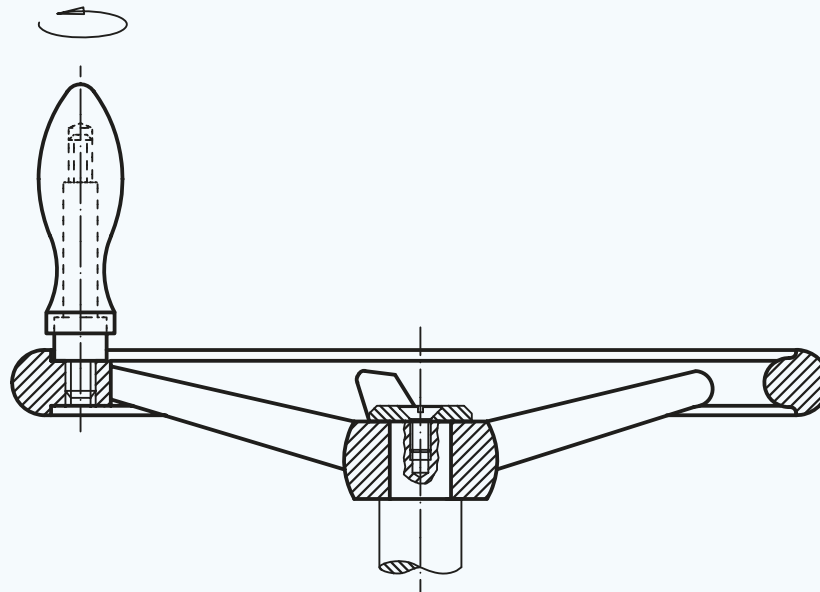
DIN 950
light metal

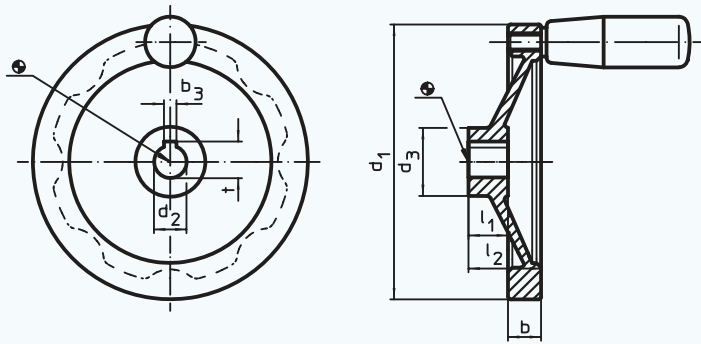


Ref. No. d ₂ small	Ref. No. d ₂ large	Finish	d ₁	d ₂ H7 small	d ₂ H7 large	d ₃	l ₁	l ₂	Number of spokes	Correspond. mach. Handle DIN 39/ DIN 98	g
24590.0400	24590.0401	without	80	10	12	24	16	13	3	16	150
24590.0405	24590.0406	keyway,	100	10	12	26	17	16	3	16	210
24590.0410	24590.0411	with solid	125	12	14	28	18	18	3	20	340
24590.0415	24590.0416	handle	140	14	16	30	19	20	3	20	420
24590.0420	24590.0421	EH 24450.,	160	14	16	32	20	20	3	25	615
24590.0430	24590.0431	assembled,	200	18	22	38	24	21	3	25	970
24590.0440	24590.0441	form B-F/G	250	22	26	45	28	22	5	32	1860
24590.0445	24590.0446	(formerly F 4)	315	26	30	53	33	23	5	32	2860
24590.0450	24590.0451		400	30	34	65	38	25	5	36	4210
24590.0500	24590.0501	with	80	10	12	24	16	13	3	16	150
24590.0505	24590.0506	keyway,	100	10	12	26	17	16	3	16	210
24590.0510	24590.0511	with solid	125	12	14	28	18	18	3	20	330
24590.0515	24590.0516	handle	140	14	16	30	19	20	3	20	420
24590.0520	24590.0521	EH 24450.	160	14	16	32	20	20	3	25	610
24590.0530	24590.0531	assembled,	200	18	22	38	24	21	3	25	960
24590.0540	24590.0541	form N-F/G	250	22	26	45	28	22	5	32	1860
24590.0545	24590.0546	(formerly F 3)	315	26	30	53	33	23	5	32	2860
24590.0550	24590.0551		400	30	34	65	38	25	5	36	4210

Keyways DIN 6885 sheet 1

	10,0	12,0	14,0	16,0	18,0	22,0	26,0	30,0	34,0
d ₂	3,0	4,0	5,0	5,0	6,0	6,0	8,0	8,0	10,0
b ₃	11,4	13,8	16,3	18,3	20,8	24,8	29,3	33,3	37,3
t									





EH 24600.

Disc-Type Handwheels

light metal



Material:

Handwheel:

- Aluminium permanent-mould casting

Cylindrical handle (EH 24530.):

- Plastic (PF 31) DIN 7708, black

Axe Part:

- Steel, galvanized

Note:

Hub machined; rim turned and mirror-finished on all sides. Non-machined surfaces cleanly blasted; rotation and plane working tolerance of rim inferior to JS 12.

There are gripping indentations on the rear sides. The non-machined, raw surfaces are blasted; together with the mirror-polished rim these handwheels are therefore showing a finish which in most cases does not require additional lacquering. Shaft-end washers EH 22270. for axial fastening.

Temperature range up to + 110 °C.

Ref. No. d ₂ small	Ref. No. d ₂ large	Finish	d ₁	d ₂ H7 small	d ₂ H7 large	d ₃	b	l ₁	l ₂ ≈	Correspond. cyl. handle EH 24530.	g
24600.0000	24600.0001	without	80	10	12	26	13,0	16	26	–	130
24600.0005	24600.0006	keyway,	100	10	12	28	14,0	17	30	–	203
24600.0010	24600.0011	without	125	12	14	31	15,0	18	33	–	307
24600.0015	24600.0016	cylindrical	140	14	16	36	16,5	19	36	–	430
24600.0020	24600.0021	handle	160	14	16	36	18,0	20	39	–	540
24600.0030	24600.0031		200	18	20	42	20,5	24	45	–	849
24600.0040	24600.0041		250	22	26	48	23,0	28	51	–	1495
24600.0100	24600.0101	with	80	10	12	26	13,0	16	26	–	139
24600.0105	24600.0106	keyway,	100	10	12	28	14,0	17	30	–	190
24600.0110	24600.0111	without	125	12	14	31	15,0	18	33	–	291
24600.0115	24600.0116	cylindrical	140	14	16	36	16,5	19	36	–	413
24600.0120	24600.0121	handle	160	14	16	36	18,0	20	39	–	529
24600.0130	24600.0131		200	18	20	42	20,5	24	45	–	880
24600.0140	24600.0141		250	22	26	48	23,0	28	51	–	1515
24600.0200	24600.0201	without	80	10	12	26	13,0	16	26	18 x M 6	160
24600.0205	24600.0206	keyway,	100	10	12	28	14,0	17	30	21 x M 6	255
24600.0210	24600.0211	with	125	12	14	31	15,0	18	33	23 x M 8	390
24600.0215	24600.0216	cylindrical	140	14	16	36	16,5	19	36	23 x M 8	510
24600.0220	24600.0221	handle	160	14	16	36	18,0	20	39	26 x M10	675
24600.0230	24600.0231	EH 24530.	200	18	20	42	20,5	24	45	26 x M10	995
24600.0240	24600.0241		250	22	26	48	23,0	28	51	28 x M10	1625
24600.0300	24600.0301	with	80	10	12	26	13,0	16	26	18 x M 6	160
24600.0305	24600.0306	keyway,	100	10	12	28	14,0	17	30	21 x M 6	255
24600.0310	24600.0311	with	125	12	14	31	15,0	18	33	23 x M 8	390
24600.0315	24600.0316	cylindrical	140	14	16	36	16,5	19	36	23 x M 8	510
24600.0320	24600.0321	handle	160	14	16	36	18,0	20	39	26 x M10	675
24600.0330	24600.0331	EH 24530.	200	18	20	42	20,5	24	45	26 x M10	995
24600.0340	24600.0341		250	22	26	48	23,0	28	51	28 x M10	1625

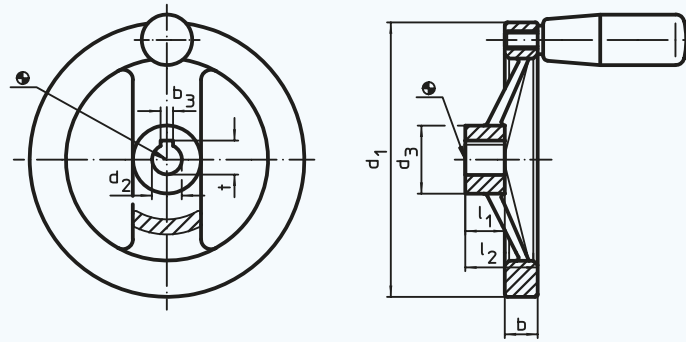
Keyways DIN 6885 sheet 1

d ₂	10,0	12,0	14,0	16,0	18,0	20,0	22,0	26,0
b ₃	3,0	4,0	5,0	5,0	6,0	6,0	6,0	8,0
t	11,4	13,8	16,3	18,3	20,8	22,8	24,8	29,3

EH 24610.

Spoked Handwheels

light metal



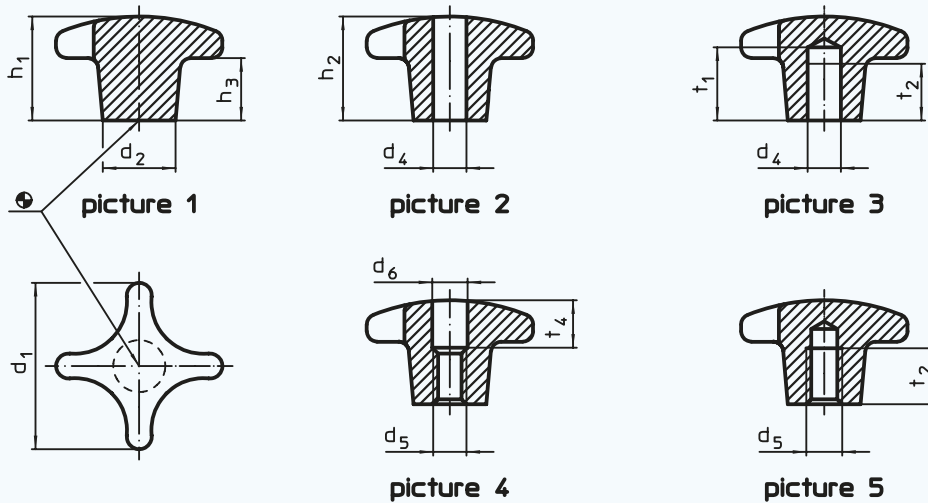
Material:	Handwheel:	Cylindrical handle (EH 24530.):	Axe Part:
	<ul style="list-style-type: none"> Aluminium permanent-mould casting 	<ul style="list-style-type: none"> Plastic (PF 31) DIN 7708, black similar to RAL 9005 	<ul style="list-style-type: none"> Steel, galvanized

Note:
 Hub machined; rim turned and mirror-finished on all sides. Non-machined surfaces cleanly blasted; rotation and plane working tolerance of rim inferior to JS 12.
 The non-machined, raw surfaces are blasted; together with the mirror-polished rim these handwheels are therefore showing a finish which in most cases does not require additional lacquering. Shaft-end washers EH 22270. for axial fastening.
 Temperature range up to 110 °C.

Ref. No. d _g small	Ref. No. d _g large	Finish	d ₁	d ₂ H7 small	d ₂ H7 large	d ₃	b	l ₁	l ₂ ≈	Correspond. cyl. handle EH 24530.	⊕ g
24610.0010	24610.0011	without	125	12	14	31	15,0	18	33	–	301
24610.0015	24610.0016	keyway,	140	14	16	36	16,5	19	36	–	400
24610.0020	24610.0021	without	160	14	16	36	18,0	20	39	–	520
24610.0030	24610.0031	cylindrical	200	18	20	42	20,5	24	45	–	886
24610.0040	24610.0041	handle	250	22	26	48	23,0	28	51	–	1454
24610.0110	24610.0111	with	125	12	14	31	15,0	18	33	–	303
24610.0115	24610.0116	keyway,	140	14	16	36	16,5	19	36	–	406
24610.0120	24610.0121	without	160	14	16	36	18,0	20	39	–	542
24610.0130	24610.0131	cylindrical	200	18	20	42	20,5	24	45	–	914
24610.0140	24610.0141	handle	250	22	26	48	23,0	28	51	–	1446
24610.0210	24610.0211	without	125	12	14	31	15,0	18	33	23 x M 8	390
24610.0215	24610.0216	keyway,	140	14	16	36	16,5	19	36	23 x M 8	490
24610.0220	24610.0221	with	160	14	16	36	18,0	20	39	26 x M10	645
24610.0230	24610.0231	cylindrical	200	18	20	42	20,5	24	45	26 x M10	1000
24610.0240	24610.0241	handle EH 24530.	250	22	26	48	23,0	28	51	28 x M10	1585
24610.0310	24610.0311	with	125	12	14	31	15,0	18	33	23 x M 8	390
24610.0315	24610.0316	keyway,	140	14	16	36	16,5	19	36	23 x M 8	490
24610.0320	24610.0321	with	160	14	16	36	18,0	20	39	26 x M10	645
24610.0330	24610.0331	cylindrical	200	18	20	42	20,5	24	45	26 x M10	1000
24610.0340	24610.0341	handle EH 24530.	250	22	26	48	23,0	28	51	28 x M10	1585

Keyways DIN 6885 sheet 1

d ₂	12,0	14,0	16,0	18,0	20,0	22,0	26,0
b ₃	4,0	5,0	5,0	6,0	6,0	6,0	8,0
t	13,8	16,3	18,3	20,8	22,8	24,8	29,3



EH 24620.
Palm Grips
DIN 6335 cast iron



Material:

- Grey cast iron GG 20, bright

Note:

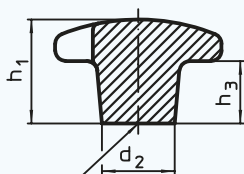
Sandblasted or tumbled.
Grips with different bores or surface treatment can be obtained on request.

Ref. No.	Finish	d ₁	d ₂	d ₄ H7	d ₅	d ₆	h ₁	h ₂	h ₃	t ₁	t ₂	t ₄	g
24620.0032	unmachined, form A (picture 1)	32	12	-	-	-	21	-	10	-	-	-	38
24620.0040		40	14	-	-	-	26	-	14	-	-	-	69
24620.0050		50	18	-	-	-	34	-	20	-	-	-	115
24620.0063		63	20	-	-	-	42	-	25	-	-	-	228
24620.0080		80	25	-	-	-	52	-	30	-	-	-	415
24620.0090		100	32	-	-	-	65	-	38	-	-	-	855
24620.0132	with smooth throughgoing bore, form B (picture 2)	32	12	6	-	-	-	20	-	-	-	-	34
24620.0140		40	14	8	-	-	-	25	-	-	-	-	59
24620.0150		50	18	10	-	-	-	32	-	-	-	-	95
24620.0163		63	20	12	-	-	-	40	-	-	-	-	171
24620.0180		80	25	16	-	-	-	50	-	-	-	-	338
24620.0190	100	32	20	-	-	-	63	-	-	-	-	709	
24620.0232	with smooth blind hole, form C (picture 3)	32	12	6	-	-	-	20	-	15	12	-	36
24620.0240		40	14	8	-	-	-	25	-	18	15	-	61
24620.0250		50	18	10	-	-	-	32	-	21	18	-	99
24620.0263		63	20	12	-	-	-	40	-	25	22	-	200
24620.0280		80	25	16	-	-	-	50	-	32	28	-	380
24620.0290	100	32	20	-	-	-	63	-	40	36	-	706	
24620.0332	with female thread, drilled out, form D (picture 4)	32	12	-	M 6	6,4	-	20	-	-	-	10	34
24620.0340		40	14	-	M 8	8,4	-	25	-	-	-	12	60
24620.0350		50	18	-	M 10	10,5	-	32	-	-	-	16	95
24620.0363		63	20	-	M 12	13,0	-	40	-	-	-	20	191
24620.0380		80	25	-	M 16	17,0	-	50	-	-	-	30	339
24620.0390		100	32	-	M 20	21,0	-	63	-	-	-	38	704
24620.0432	with threaded blind hole, form E (picture 5)	32	12	-	M 6	-	-	20	-	-	12	-	35
24620.0440		40	14	-	M 8	-	-	25	-	-	15	-	63
24620.0450		50	18	-	M 10	-	-	32	-	-	18	-	103
24620.0463		63	20	-	M 12	-	-	40	-	-	22	-	205
24620.0480		80	25	-	M 16	-	-	50	-	-	28	-	359
24620.0490	100	32	-	M 20	-	-	63	-	-	36	-	730	

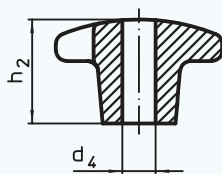
EH 24620.

Palm Grips

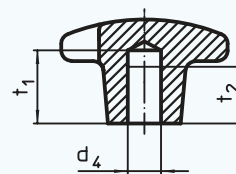
DIN 6335 cast iron,
plastic-coated



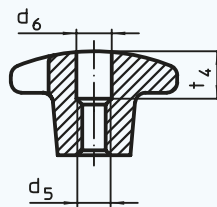
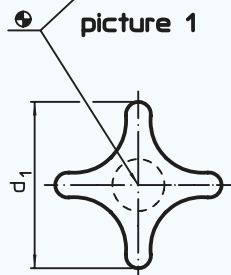
picture 1



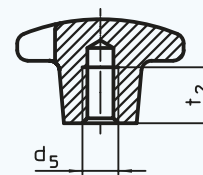
picture 2



picture 3



picture 4

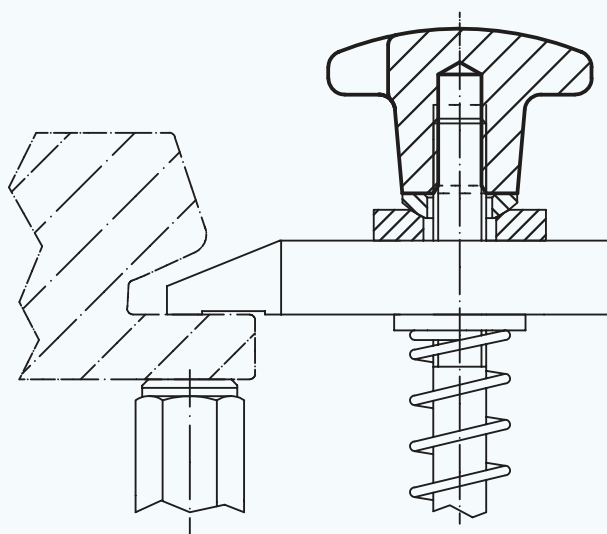


picture 5

Material:

• Grey cast iron GG 20, plastic-coated, orange similar to RAL 2004 or black similar to RAL 9005 dull finish

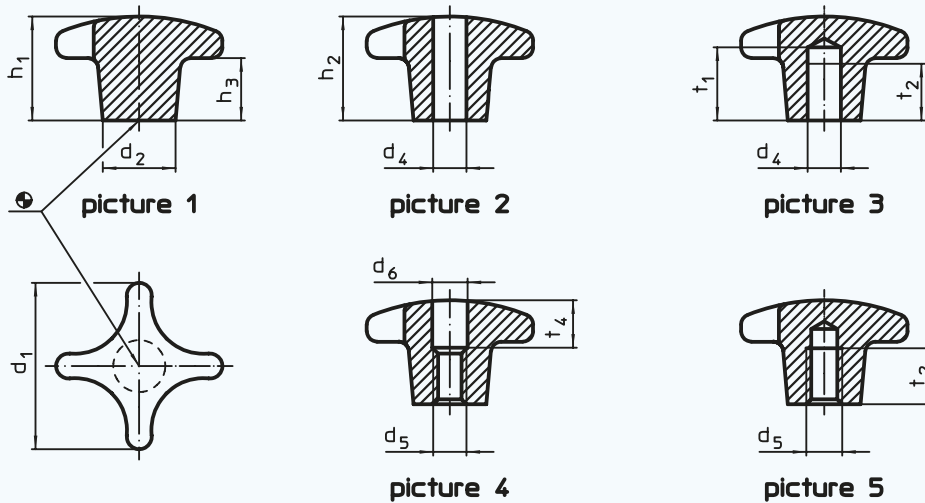
Ref. No. orange	Ref. No. black	Finish	d ₁	d ₂	d ₄ H7	d ₅	d ₆	h ₁	h ₂	h ₃	t ₁	t ₂	t ₄	g
24620.0540	24620.0640	with smooth	40	14	8	-	-	-	25	-	18	15	-	62
24620.0550	24620.0650	blind hole,	50	18	10	-	-	-	32	-	21	18	-	106
24620.0563	24620.0663	form C	63	20	12	-	-	-	40	-	25	22	-	201
24620.0580	24620.0680	(picture 3)	80	25	16	-	-	-	50	-	32	28	-	353
24620.0541	24620.0641	with threaded	40	14	-	M 8	-	-	25	-	-	15	-	56
24620.0551	24620.0651	blind hole,	50	18	-	M 10	-	-	32	-	-	18	-	110
24620.0564	24620.0664	form E	63	20	-	M 12	-	-	40	-	-	22	-	198
24620.0581	24620.0681	(picture 5)	80	25	-	M 16	-	-	50	-	-	28	-	364



EH 24630.

Palm Grips

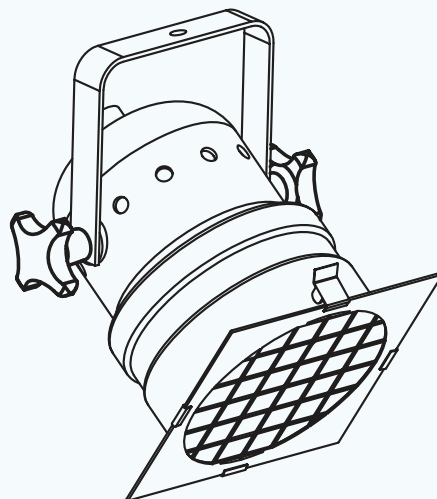
DIN 6335 light metal



Material:

• Light metal (aluminium), unpolished or polished

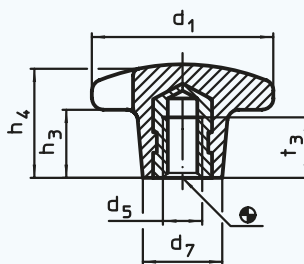
Ref. No. unpolished	Ref. No. polished	Finish	d ₁	d ₂	d ₄ H7	d ₅	d ₆	h ₁	h ₂	h ₃	t ₁	t ₂	t ₄	↕ g
24630.0040	-	unmachined,	40	14	-	-	-	26	-	14	-	-	-	27
24630.0050	-	form A	50	18	-	-	-	34	-	20	-	-	-	51
24630.0063	-	(picture 1)	63	20	-	-	-	42	-	25	-	-	-	95
24630.0080	-		80	25	-	-	-	52	-	30	-	-	-	161
24630.0140	24630.0540	with smooth	40	14	8	-	-	-	25	-	-	-	-	21
24630.0150	24630.0550	throughgoing bore,	50	18	10	-	-	-	32	-	-	-	-	41
24630.0163	24630.0563	form B	63	20	12	-	-	-	40	-	-	-	-	79
24630.0180	24630.0580	(picture 2)	80	25	16	-	-	-	50	-	-	-	-	133
24630.0240	24630.0640	with smooth	40	14	8	-	-	-	25	-	18	15	-	23
24630.0250	24630.0650	blind hole,	50	18	10	-	-	-	32	-	21	18	-	42
24630.0263	24630.0663	form C	63	20	12	-	-	-	40	-	25	22	-	73
24630.0280	24630.0680	(picture 3)	80	25	16	-	-	-	50	-	32	28	-	138
24630.0340	24630.0740	with female	40	14	-	M 8	8,4	-	25	-	-	-	12	23
24630.0350	24630.0750	thread, drilled out,	50	18	-	M 10	10,5	-	32	-	-	-	16	44
24630.0363	24630.0763	form D	63	20	-	M 12	13,0	-	40	-	-	-	20	70
24630.0380	24630.0780	(picture 4)	80	25	-	M 16	17,0	-	50	-	-	-	30	129
24630.0440	24630.0840	with threaded	40	14	-	M 8	-	-	25	-	-	15	-	24
24630.0450	24630.0850	blind hole,	50	18	-	M 10	-	-	32	-	-	18	-	46
24630.0463	24630.0863	form E	63	20	-	M 12	-	-	40	-	-	22	-	74
24630.0480	24630.0880	(picture 5)	80	25	-	M 16	-	-	50	-	-	28	-	142



EH 24640.

Palm Grips

DIN 6335 plastic



Material:

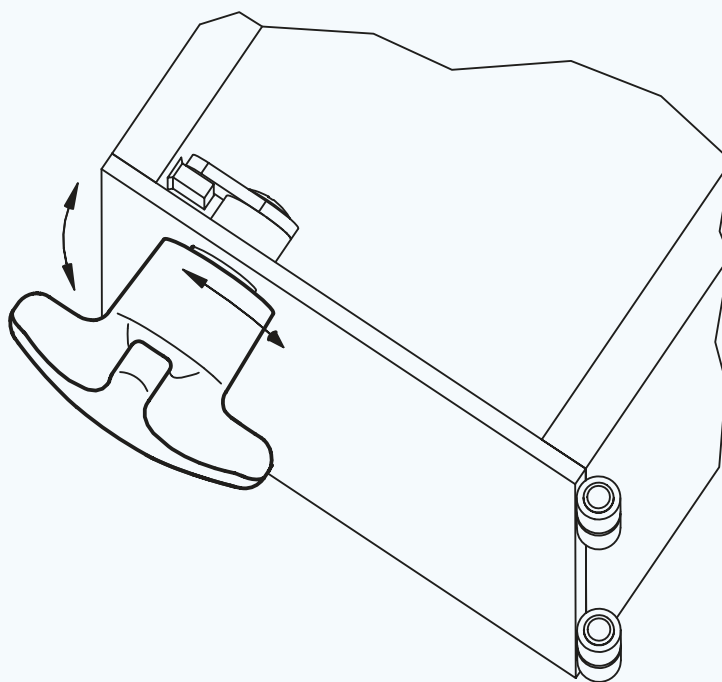
Handle: • Plastic (PF 31) DIN 7708, black

Bushing: • Steel, galvanized
• 24640.0220 - brass

Note:

Temperature range up to 110 °C.

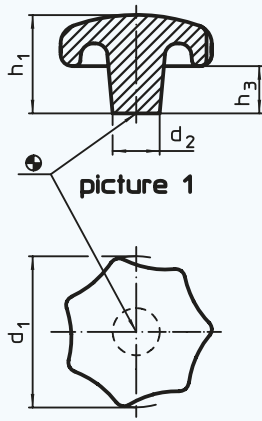
Ref. No.	Finish	d ₁	d ₅	d ₇	h ₃	h ₄	t ₃	±g
24640.0220	with threaded	20	M 4	10	6	13	6,5	3,3
24640.0225	bushing,	25	M 5	12	8	16	9,5	7,0
24640.0232	form K	32	M 6	14	10	20	12,0	12,0
24640.0240		40	M 8	18	13	25	14,0	16,0
24640.0250		50	M 10	22	20	32	18,0	32,0
24640.0263		63	M 12	26	25	40	22,0	62,0
24640.0280		80	M 16	35	30	50	30,0	137,0



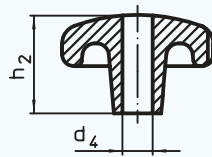
EH 24650.

Star Grips

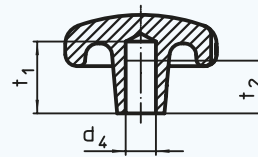
DIN 6336 cast iron



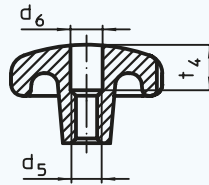
picture 1



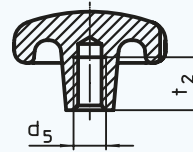
picture 2



picture 3



picture 4



picture 5



Material:

- Grey cast iron GG 20, bright

Note:

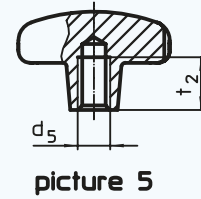
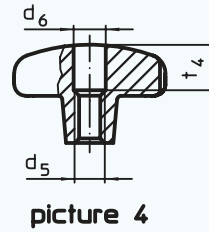
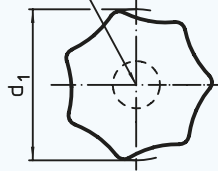
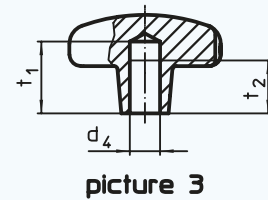
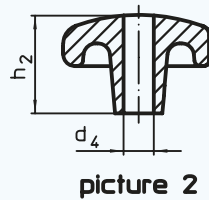
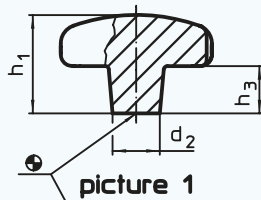
Sandblasted or tumbled.
Grips with different bores or surface treatment can be obtained on request.

Ref. No.	Finish	d ₁	d ₂	d ₄ H7	d ₅	d ₆	h ₁	h ₂	h ₃	t ₁	t ₂	t ₄	g
24650.0032	unmachined, form A (picture 1)	32	12	-	-	-	21	-	10	-	-	-	55
24650.0040		40	14	-	-	-	26	-	13	-	-	-	82
24650.0050		50	18	-	-	-	34	-	17	-	-	-	150
24650.0063		63	20	-	-	-	42	-	21	-	-	-	260
24650.0080		80	25	-	-	-	52	-	25	-	-	-	510
24650.0132	with smooth throughgoing bore, form B (picture 2)	32	12	6	-	-	20	-	-	-	-	-	49
24650.0140		40	14	8	-	-	25	-	-	-	-	-	72
24650.0150		50	18	10	-	-	32	-	-	-	-	-	130
24650.0163		63	20	12	-	-	40	-	-	-	-	-	220
24650.0180		80	25	16	-	-	50	-	-	-	-	-	440
24650.0232	with smooth blind hole, form C (picture 3)	32	12	6	-	-	20	-	15	12	-	-	50
24650.0240		40	14	8	-	-	25	-	18	15	-	-	74
24650.0250		50	18	10	-	-	32	-	21	18	-	-	135
24650.0263		63	20	12	-	-	40	-	25	22	-	-	235
24650.0280		80	25	16	-	-	50	-	32	28	-	-	460
24650.0332	with female thread, drilled out, form D (picture 4)	32	12	-	M 6	6,4	-	20	-	-	-	10	49
24650.0340		40	14	-	M 8	8,4	-	25	-	-	-	12	72
24650.0350		50	18	-	M 10	10,5	-	32	-	-	-	16	130
24650.0363		63	20	-	M 12	13,0	-	40	-	-	-	20	220
24650.0380		80	25	-	M 16	17,0	-	50	-	-	-	30	545
24650.0432	with threaded blind hole, form E (picture 5)	32	12	-	M 6	-	-	20	-	-	12	-	50
24650.0440		40	14	-	M 8	-	-	25	-	-	15	-	74
24650.0450		50	18	-	M 10	-	-	32	-	-	18	-	135
24650.0463		63	20	-	M 12	-	-	40	-	-	22	-	235
24650.0480		80	25	-	M 16	-	-	50	-	-	28	-	460

EH 24660.

Star Grips

DIN 6336 light metal



Material:

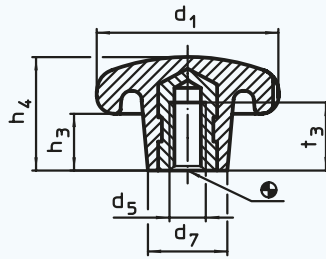
- Light metal (aluminium), unpolished or polished

Ref. No. unpolished	Ref. No. polished	Finish	d ₁	d ₂	d ₄ H7	d ₅	d ₆	h ₁	h ₂	h ₃	t ₁	t ₂	t ₄	g
24660.0040	-	unmachined,	40	14	-	-	-	26	-	13	-	-	-	36
24660.0050	-	form A	50	18	-	-	-	34	-	17	-	-	-	70
24660.0063	-	(picture 1)	63	20	-	-	-	42	-	21	-	-	-	128
24660.0080	-		80	25	-	-	-	52	-	25	-	-	-	245
24660.0140	24660.0540	with smooth	40	14	8	-	-	-	25	-	-	-	-	32
24660.0150	24660.0550	throughgoing	50	18	10	-	-	-	32	-	-	-	-	64
24660.0163	24660.0563	bore,	63	20	12	-	-	-	40	-	-	-	-	110
24660.0180	24660.0580	form B (picture 2)	80	25	16	-	-	-	50	-	-	-	-	200
24660.0240	24660.0640	with smooth	40	14	8	-	-	-	25	-	18	15	-	30
24660.0250	24660.0650	blind hole,	50	18	10	-	-	-	32	-	21	18	-	63
24660.0263	24660.0663	form C	63	20	12	-	-	-	40	-	25	22	-	117
24660.0280	24660.0680	(picture 3)	80	25	16	-	-	-	50	-	32	28	-	223
24660.0340	24660.0740	with female	40	14	-	M 8	8,4	-	25	-	-	-	12	32
24660.0350	24660.0750	thread, drilled out,	50	18	-	M 10	10,5	-	32	-	-	-	16	62
24660.0363	24660.0763	form D	63	20	-	M 12	13,0	-	40	-	-	-	20	109
24660.0380	24660.0780	(picture 4)	80	25	-	M 16	17,0	-	50	-	-	-	30	218
24660.0440	24660.0840	with threaded	40	14	-	M 8	-	-	25	-	-	15	-	33
24660.0450	24660.0850	blind hole,	50	18	-	M 10	-	-	32	-	-	18	-	63
24660.0463	24660.0863	form E	63	20	-	M 12	-	-	40	-	-	22	-	111
24660.0480	24660.0880	(picture 5)	80	25	-	M 16	-	-	50	-	-	28	-	227

EH 24670.

Star Grips

DIN 6336 plastic



Material:

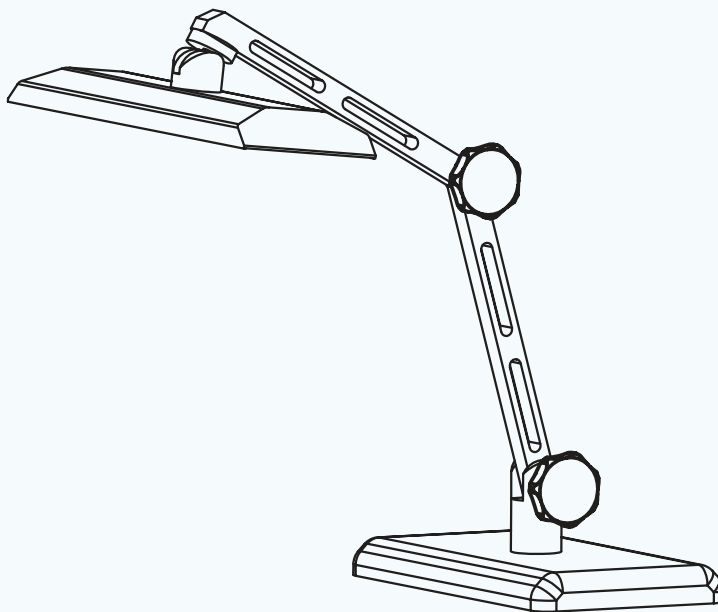
Handle: • Plastic (PF 31) DIN 7708, black

Bushing: • Steel, galvanized
• 24670.0220 - brass

Note:

Temperature range up to 110 °C.

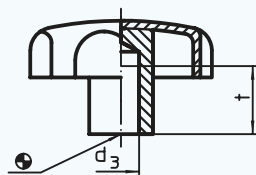
Ref. No.	Finish	d ₁	d ₅	d ₇	h ₃	h ₄	t ₃	±g
24670.0220	with threaded	20	M 4	10	7	13	6,5	3,4
24670.0225	bushing,	25	M 5	12	8	16	9,5	7,4
24670.0232	form K	32	M 6	14	10	20	12,0	11,0
24670.0240		40	M 8	18	13	25	14,0	22,0
24670.0250		50	M 10	22	17	32	18,0	40,0
24670.0263		63	M 12	26	21	40	22,0	83,0
24670.0280		80	M 16	35	25	50	30,0	163,0



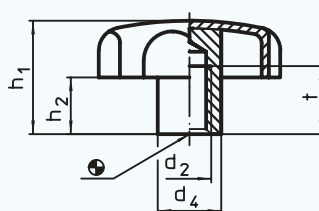
EH 24690.

Star Grips

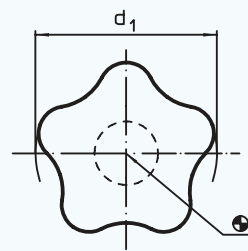
stainless steel



picture 1



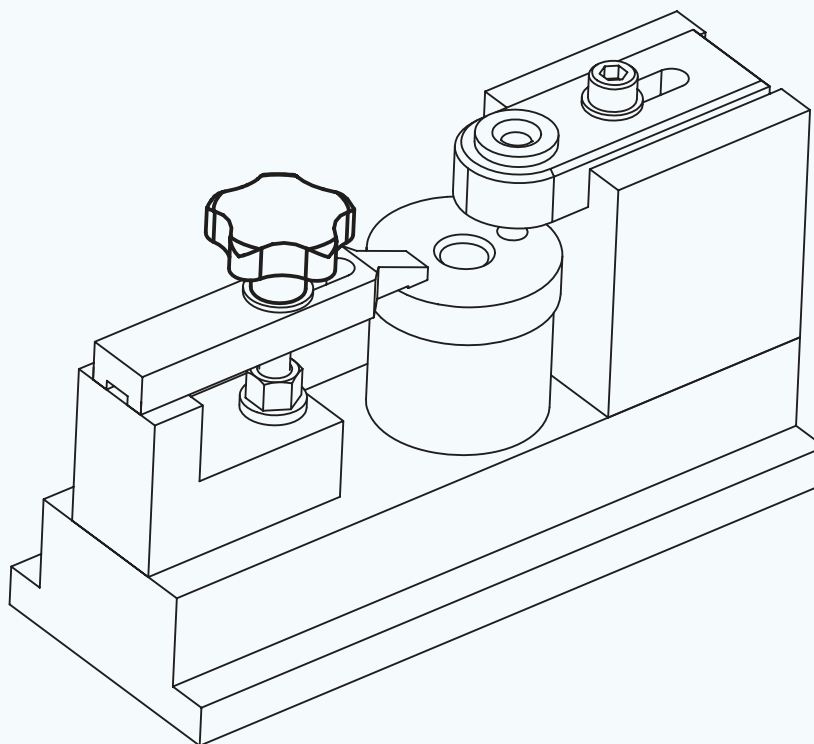
picture 2

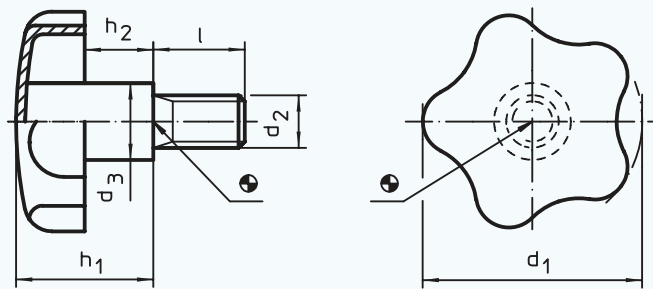


Material:
• Stainless steel 1.4301, dull blasted

Note:
Grip: Sheet-iron drawn
Hub: Butt-welded

Ref. No.	Finish	d ₁	d ₂	d ₃ H7	d ₄	h ₁ ≈	h ₂ ≈	t min.	g
24690.0240	with	40	-	8	14	25	12,5	15	29
24690.0250	smooth blind hole	50	-	10	18	32	17,5	18	67
24690.0260	(picture 1)	60	-	12	20	40	21,0	22	110
24690.0440	with threaded	40	M 8	-	14	25	12,5	15	37
24690.0450	blind hole	50	M 10	-	18	32	17,5	18	69
24690.0460	(picture 2)	60	M 12	-	20	40	21,0	22	112





EH 24690.

Grub Screws with Star Grip

stainless steel



Material:

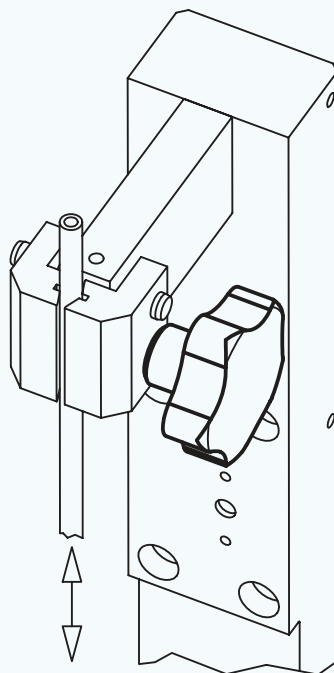
- Stainless steel 1.4301, dull blasted

Note:

Grip: Sheet-iron drawn

Hub: Butt-welded

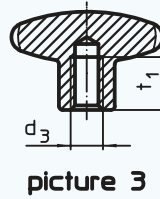
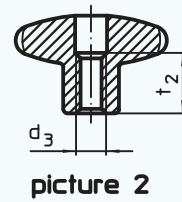
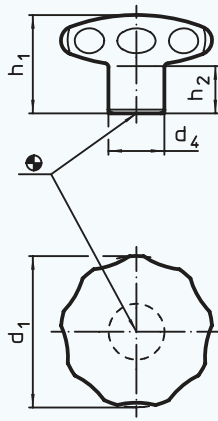
Ref. No.	d ₁	d ₂	l	d ₃	h ₁ ≈	h ₂ ≈	g
24690.0140	40	M 8	20	14	24,0	12,0	50
24690.0142	40	M 8	30	14	24,0	12,0	55
24690.0144	40	M 8	40	14	24,0	12,0	56
24690.0150	50	M 10	20	18	30,0	16,5	95
24690.0152	50	M 10	30	18	30,0	16,5	97
24690.0154	50	M 10	40	18	30,0	16,5	100
24690.0160	60	M 12	30	20	37,5	20,0	155
24690.0162	60	M 12	40	20	37,5	20,0	162
24690.0164	60	M 12	50	20	37,5	20,0	169



EH 24690.

Star Grips

stainless steel,
solid



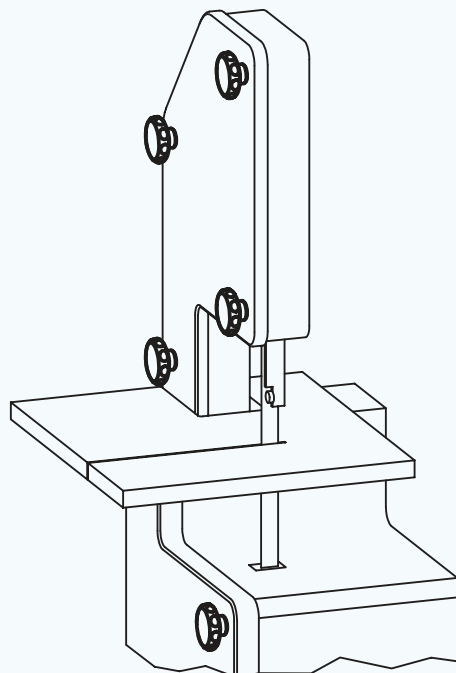
Material:

- Stainless steel 1.4305, dull blasted

Note:

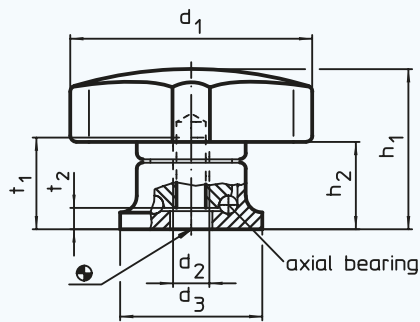
Execution without dirt trap. For all applications having high hygienic requirements (e.g. food industry).

Ref. No.	Finish	d ₁	d ₂ H7	d ₃	d ₄	h ₁	h ₂	t ₁ min.	t ₂	⌀ g
24690.0643	with smooth blind hole	40	8	–	18	30,5	15	12	–	131
24690.0653	(picture 1)	50	10	–	21	34,0	17	15	–	223
24690.0663		60	12	–	25	39,0	18	18	–	386
24690.0644	with female thread,	40	–	M 8	18	30,5	15	–	13	129
24690.0654	drilled-out	50	–	M 10	21	34,0	17	–	16	216
24690.0664	(picture 2)	60	–	M 12	25	39,0	18	–	20	362
24690.0645	with threaded	40	–	M 6	18	30,5	15	12	–	134
24690.0646	blind hole	40	–	M 8	18	30,5	15	12	–	132
24690.0655	(picture 3)	50	–	M 8	21	34,0	17	15	–	226
24690.0656		50	–	M 10	21	34,0	17	15	–	222
24690.0665		60	–	M 10	25	39,0	18	18	–	395
24690.0666		60	–	M 12	25	39,0	18	18	–	384

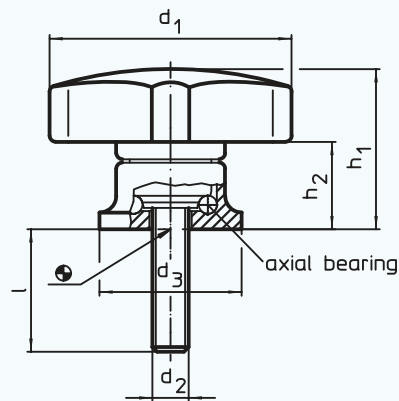


EH 24700.

Palm Grips with axial bearing



picture 1



picture 2



Material:

Handle: • Thermoplastic PA

Inner part: • Heat-treated steel, nitrided, black

Screw: • Quality 8.8, blackened black

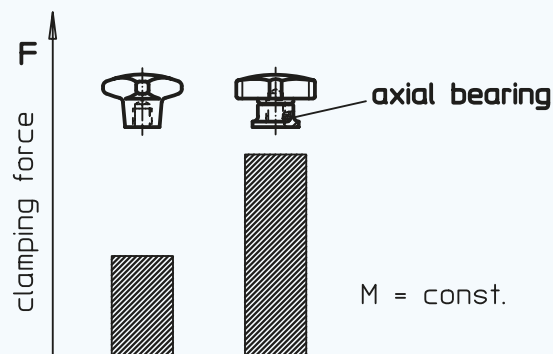
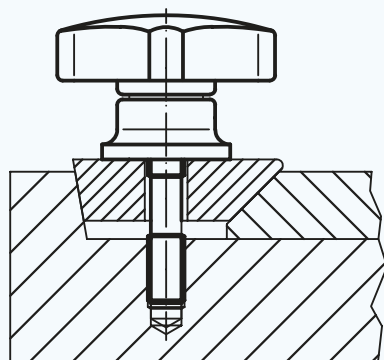
Note:

Advantages of axial bearing:

- Double clamping force with same grip size, by reducing the surface friction.
- Protection of work piece by a fixed locating surface.
- Little setting due to higher pre-clamping force of bolt, e.g. thread.

Temperature range up to max. 80 °C.

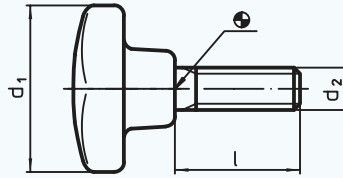
Ref. No.	Finish	d ₁	d ₂	l +2	d ₃	h ₁ ≈	h ₂ ≈	t ₁ min.	t ₂	g
24700.0040	with female thread (picture 1)	40	M 6	-	24	27	15,0	12,5	5,0	45
24700.0050		50	M 8	-	25	34	22,5	14,0	4,2	68
24700.0063		63	M 10	-	30	41	26,5	18,0	5,4	111
24700.0080		80	M 12	-	35	54	34,0	26,5	6,6	218
24700.0042	with screw (picture 2)	40	M 6	15	24	27	15,0	-	-	50
24700.0044		40	M 6	25	24	27	15,0	-	-	52
24700.0053		50	M 8	20	25	34	22,5	-	-	81
24700.0056		50	M 8	35	25	34	22,5	-	-	86
24700.0066		63	M 10	30	30	41	26,5	-	-	137
24700.0068		63	M 10	40	30	41	26,5	-	-	142
24700.0083		80	M 12	30	35	54	34,0	-	-	258
24700.0087		80	M 12	50	35	54	34,0	-	-	276



EH 24730.

Grub Screws with Palm Grip

DIN 6335 plastic



>>> Special types, e.g. differing lengths or threaded pins from brass / stainless steel upon request. <<<



Material:

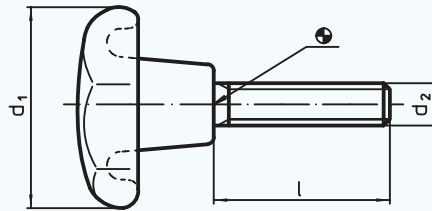
Handle: • Plastic (PF 31) DIN 7708, black

Screw: • Steel, galvanized

Note:

Temperature range up to 110 °C.

Ref. No.	Finish	d ₁	d ₂	l	g
24730.0051	form L	25	M 5	10	6,7
24730.0053		25	M 5	15	7,3
24730.0056		25	M 5	20	7,5
24730.0058		25	M 5	25	8,1
24730.0059		25	M 5	30	8,9
24730.0101		32	M 6	15	11,0
24730.0104		32	M 6	20	12,0
24730.0106		32	M 6	25	15,0
24730.0107		32	M 6	30	16,0
24730.0110		32	M 6	40	16,0
24730.0152		40	M 8	20	24,0
24730.0154		40	M 8	25	25,0
24730.0155		40	M 8	30	26,0
24730.0158		40	M 8	40	30,0
24730.0160		40	M 8	50	32,0
24730.0202		50	M 10	25	41,0
24730.0203		50	M 10	30	48,0
24730.0206		50	M 10	40	51,0
24730.0208		50	M 10	50	56,0
24730.0209		50	M 10	60	69,0
24730.0251		63	M 12	30	86,0
24730.0254		63	M 12	40	93,0
24730.0256		63	M 12	50	99,0
24730.0257		63	M 12	60	105,0
24730.0260		63	M 12	80	112,0
24730.0302		80	M 16	40	198,0
24730.0304		80	M 16	50	175,0
24730.0305		80	M 16	60	219,0
24730.0308		80	M 16	80	251,0



EH 24740.

**Grub Screws
with Star Grip**

DIN 6336 plastic

>>> Special types, e.g. differing lengths or threaded pins from brass / stainless steel upon request. <<<

Material:

Handle: • Plastic (PF 31) DIN 7708, black

Screw: • Steel, galvanized

Note:

Temperature range up to 110 °C.

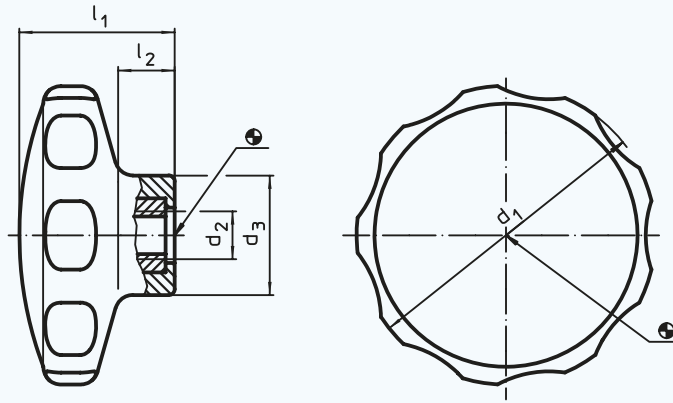


Ref. No.	Finish	d ₁	d ₂	l	g
24740.0051	form L	25	M 5	10	7,3
24740.0053		25	M 5	15	7,2
24740.0056		25	M 5	20	8,7
24740.0058		25	M 5	25	8,7
24740.0059		25	M 5	30	9,2
24740.0101		32	M 6	15	14,0
24740.0104		32	M 6	20	14,0
24740.0106		32	M 6	25	14,0
24740.0107		32	M 6	30	16,0
24740.0110		32	M 6	40	17,0
24740.0152		40	M 8	20	28,0
24740.0154		40	M 8	25	30,0
24740.0155		40	M 8	30	32,0
24740.0158		40	M 8	40	35,0
24740.0160		40	M 8	50	38,0
24740.0202		50	M 10	25	51,0
24740.0203		50	M 10	30	54,0
24740.0206		50	M 10	40	60,0
24740.0208		50	M 10	50	64,0
24740.0209		50	M 10	60	77,0
24740.0251		63	M 12	30	101,0
24740.0254		63	M 12	40	108,0
24740.0256		63	M 12	50	115,0
24740.0257		63	M 12	60	121,0
24740.0260		63	M 12	80	143,0
24740.0302		80	M 16	40	223,0
24740.0304		80	M 16	50	237,0
24740.0305		80	M 16	60	232,0
24740.0308		80	M 16	80	274,0

EH 24750.

Star Grips

plastic



>>> Special types, e.g. differing threads, upon request. <<<

Material:

Handle: • Thermoplastic PA 6, black similar to RAL 9005

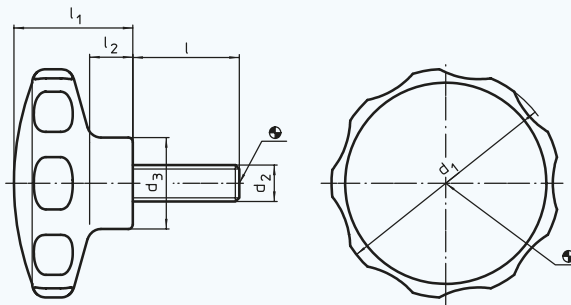
Threaded bushing: • Stainless steel

Cap: • Thermoplastic PA, black similar to RAL 9005
white similar to RAL 9019
orange similar to RAL 2004
yellow similar to RAL 1016
blue similar to RAL 5015

Note:

Temperature range from - 30 °C up to + 80 °C.

Ref. No. black	Ref. No. white	Ref. No. orange	Ref. No. yellow	Ref. No. blue	d ₁	d ₂	d ₃	l ₁	l ₂	g
24750.0030	24750.0031	24750.0032	24750.0033	24750.0034	30	M 4	14,0	19	7	5,3
24750.0035	24750.0036	24750.0037	24750.0038	24750.0039	30	M 5	14,0	19	7	5,7
24750.0040	24750.0041	24750.0042	24750.0043	24750.0044	40	M 5	16,5	22	9	8,2
24750.0045	24750.0046	24750.0047	24750.0048	24750.0049	40	M 6	16,5	22	9	9,5
24750.0050	24750.0051	24750.0052	24750.0053	24750.0054	50	M 6	22,0	26	10	16,0
24750.0055	24750.0056	24750.0057	24750.0058	24750.0059	50	M 8	22,0	26	10	19,0
24750.0060	24750.0061	24750.0062	24750.0063	24750.0064	62	M 8	22,0	35	13	19,0
24750.0065	24750.0066	24750.0067	24750.0068	24750.0069	62	M 10	22,0	35	13	39,0



EH 24750.

Star Grip Screws

plastic

>>> Special types, e.g. differing threads or thread lengths, upon request. <<<

Material:

Handle: • Thermoplastic PA 6,
black similar to RAL 9005

Screw: • Stainless steel

Cap: • Thermoplastic PA,
black similar to RAL 9005
white similar to RAL 9019
orange similar to RAL 2004
yellow similar to RAL 1016
blue similar to RAL 5015

Note:

Temperature range from - 30 °C up to + 80 °C.

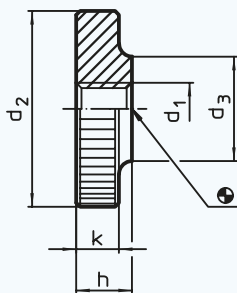
Ref. No. black	Ref. No. white	Ref. No. orange	Ref. No. yellow	Ref. No. blue	d ₁	d ₂	l	d ₃	l ₁	l ₂	g	
24750.0100	24750.0101	24750.0102	24750.0103	24750.0104	30	M	4	10	14,0	19	7	6,1
24750.0110	24750.0111	24750.0112	24750.0113	24750.0114	30	M	4	14	14,0	19	7	6,6
24750.0120	24750.0121	24750.0122	24750.0123	24750.0124	30	M	4	18	14,0	19	7	6,9
24750.0130	24750.0131	24750.0132	24750.0133	24750.0134	30	M	4	23	14,0	19	7	7,3
24750.0140	24750.0141	24750.0142	24750.0143	24750.0144	30	M	4	28	14,0	19	7	7,7
24750.0150	24750.0151	24750.0152	24750.0153	24750.0154	30	M	5	10	14,0	19	7	7,1
24750.0160	24750.0161	24750.0162	24750.0163	24750.0164	30	M	5	14	14,0	19	7	7,9
24750.0170	24750.0171	24750.0172	24750.0173	24750.0174	30	M	5	18	14,0	19	7	8,4
24750.0180	24750.0181	24750.0182	24750.0183	24750.0184	30	M	5	23	14,0	19	7	9,0
24750.0190	24750.0191	24750.0192	24750.0193	24750.0194	30	M	5	28	14,0	19	7	9,0
24750.0200	24750.0201	24750.0202	24750.0203	24750.0204	40	M	5	10	16,5	22	9	9,6
24750.0210	24750.0211	24750.0212	24750.0213	24750.0214	40	M	5	14	16,5	22	9	10,0
24750.0220	24750.0221	24750.0222	24750.0223	24750.0224	40	M	5	18	16,5	22	9	11,0
24750.0230	24750.0231	24750.0232	24750.0233	24750.0234	40	M	5	23	16,5	22	9	12,0
24750.0240	24750.0241	24750.0242	24750.0243	24750.0244	40	M	5	28	16,5	22	9	12,0
24750.0250	24750.0251	24750.0252	24750.0253	24750.0254	40	M	6	14	16,5	22	9	12,0
24750.0260	24750.0261	24750.0262	24750.0263	24750.0264	40	M	6	18	16,5	22	9	13,0
24750.0270	24750.0271	24750.0272	24750.0273	24750.0274	40	M	6	23	16,5	22	9	14,0
24750.0280	24750.0281	24750.0282	24750.0283	24750.0284	40	M	6	28	16,5	22	9	15,0
24750.0290	24750.0291	24750.0292	24750.0293	24750.0294	40	M	6	38	16,5	22	9	16,0
24750.0300	24750.0301	24750.0302	24750.0303	24750.0304	50	M	6	14	22,0	26	10	19,0
24750.0310	24750.0311	24750.0312	24750.0313	24750.0314	50	M	6	18	22,0	26	10	19,0
24750.0320	24750.0321	24750.0322	24750.0323	24750.0324	50	M	6	23	22,0	26	10	20,0
24750.0330	24750.0331	24750.0332	24750.0333	24750.0334	50	M	6	28	22,0	26	10	21,0
24750.0340	24750.0341	24750.0342	24750.0343	24750.0344	50	M	6	38	22,0	26	10	23,0
24750.0350	24750.0351	24750.0352	24750.0353	24750.0354	50	M	8	18	22,0	26	10	26,0
24750.0360	24750.0361	24750.0362	24750.0363	24750.0364	50	M	8	23	22,0	26	10	27,0
24750.0370	24750.0371	24750.0372	24750.0373	24750.0374	50	M	8	28	22,0	26	10	29,0
24750.0380	24750.0381	24750.0382	24750.0383	24750.0384	50	M	8	38	22,0	26	10	32,0
24750.0390	24750.0391	24750.0392	24750.0393	24750.0394	50	M	8	48	22,0	26	10	35,0
24750.0400	24750.0401	24750.0402	24750.0403	24750.0404	62	M	8	18	22,0	35	13	40,0
24750.0410	24750.0411	24750.0412	24750.0413	24750.0414	62	M	8	23	22,0	35	13	41,0
24750.0420	24750.0421	24750.0422	24750.0423	24750.0424	62	M	8	28	22,0	35	13	43,0
24750.0430	24750.0431	24750.0432	24750.0433	24750.0434	62	M	8	38	22,0	35	13	46,0
24750.0440	24750.0441	24750.0442	24750.0443	24750.0444	62	M	8	48	22,0	35	13	49,0
24750.0450	24750.0451	24750.0452	24750.0453	24750.0454	62	M	10	23	22,0	35	13	51,0
24750.0460	24750.0461	24750.0462	24750.0463	24750.0464	62	M	10	28	22,0	35	13	54,0
24750.0470	24750.0471	24750.0472	24750.0473	24750.0474	62	M	10	38	22,0	35	13	59,0
24750.0480	24750.0481	24750.0482	24750.0483	24750.0484	62	M	10	48	22,0	35	13	64,0
24750.0490	24750.0491	24750.0492	24750.0493	24750.0494	62	M	10	58	22,0	35	13	69,0



EH 24760.

Flat Knurled Nuts

DIN 467

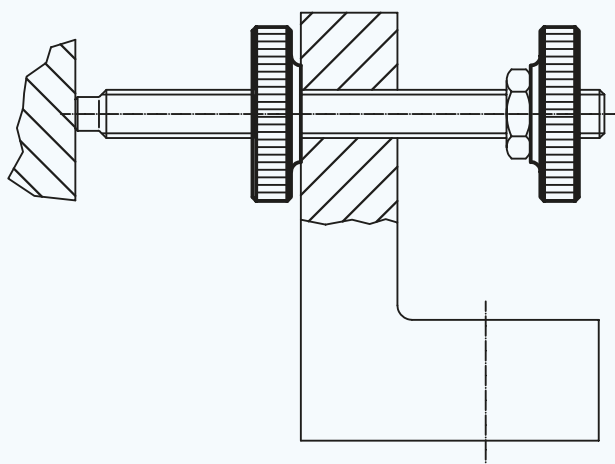


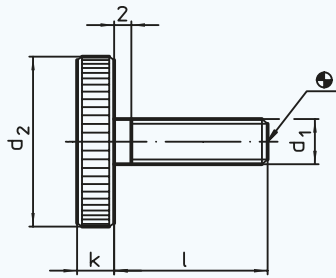
Material:

- Steel, quality 5, blackened
- Stainless steel 1.4305, dull blasted

Ref. No. Steel	Ref. No. Stainless steel	d_1	d_2	d_3	h	k	$\frac{h}{g}$
24760.0030	24760.0230	M 3	12	6	3	2,5	2,1
24760.0040	24760.0240	M 4	16	8	4	3,5	5,0
24760.0050	24760.0250	M 5	20	10	5	4,0	9,4
24760.0060	24760.0260	M 6	24	12	6	5,0	17,0
24760.0080	24760.0280	M 8	30	16	8	6,0	32,0
24760.0100	24760.0300	M 10	36	20	10	8,0	61,0
24760.0120*	-	M 12	40	22	12	10,0	92,0

* DIN standards do not include these dimensions.



**EH 24770.****Flat Knurled
Thumb Screws****DIN 653****Material:**

- Steel, quality 5.8, blackened
- Stainless steel 1.4305, dull blasted

Note:

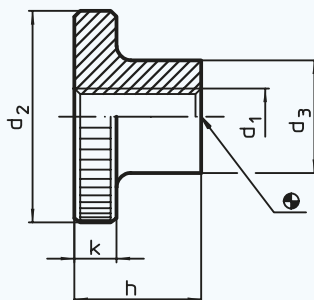
All knurled screws are one-piece manufactured with thread up to the head (DIN-designation A).

Ref. No. Steel	Ref. No. Stainless steel	d ₁	l	d ₂	k	g
24770.0072	-	M 3	6	12	2,5	2,3
24770.0073	-	M 3	8	12	2,5	2,4
24770.0074	-	M 3	10	12	2,5	2,5
24770.0077	-	M 3	16	12	2,5	2,7
24770.0092	24770.0292	M 4	8	16	3,5	5,6
24770.0093	24770.0293	M 4	10	16	3,5	5,7
24770.0094	24770.0294	M 4	12	16	3,5	6,1
24770.0096	24770.0296	M 4	16	16	3,5	6,2
24770.0098	-	M 4	20	16	3,5	6,6
24770.0100	-	M 4	25	16	3,5	7,0
24770.0112	24770.0312	M 5	10	20	4,0	10,0
24770.0113	24770.0313	M 5	12	20	4,0	11,0
24770.0115	24770.0315	M 5	16	20	4,0	12,0
24770.0117	24770.0317	M 5	20	20	4,0	12,0
24770.0119	-	M 5	25	20	4,0	12,0
24770.0121	-	M 5	30	20	4,0	13,0
24770.0132	24770.0332	M 6	12	24	5,0	18,0
24770.0134	24770.0334	M 6	16	24	5,0	20,0
24770.0136	24770.0336	M 6	20	24	5,0	20,0
24770.0138	24770.0338	M 6	25	24	5,0	20,0
24770.0140	-	M 6	30	24	5,0	22,0
24770.0154	24770.0354	M 8	20	30	6,0	37,0
24770.0156	24770.0356	M 8	25	30	6,0	39,0
24770.0158	24770.0358	M 8	30	30	6,0	41,0
24770.0160	-	M 8	35	30	6,0	42,0
24770.0161	-	M 8	40	30	6,0	44,0
24770.0172	24770.0372	M 10	20	36	8,0	71,0
24770.0174	24770.0374	M 10	25	36	8,0	72,0
24770.0176	24770.0376	M 10	30	36	8,0	76,0
24770.0180	24770.0380	M 10	40	36	8,0	80,0

EH 24780.

**Knurled Nuts
(with collar)**

DIN 466

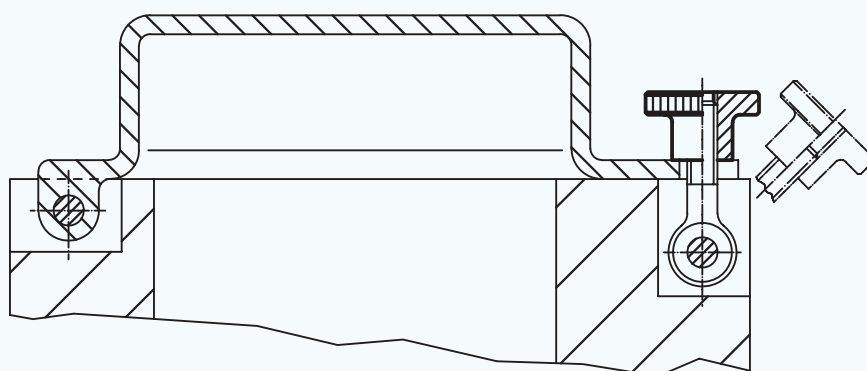


Material:

- Steel, quality 5, blackened
- Stainless steel 1.4305, dull blasted

Ref. No. Steel	Ref. No. Stainless steel		d_1	d_2	d_3	h	k	r_g
24780.0030	-	M 3	3	12	6	7,5	2,5	2,9
24780.0040	24780.0240	M 4	4	16	8	9,5	3,5	6,7
24780.0050	24780.0250	M 5	5	20	10	11,5	4,0	12,0
24780.0060	24780.0260	M 6	6	24	12	15,0	5,0	23,0
24780.0080	24780.0280	M 8	8	30	16	18,0	6,0	44,0
24780.0100	24780.0300	M 10	10	36	20	23,0	8,0	85,0
24780.0120*	-	M 12	12	40	22	25,0	10,0	119,0

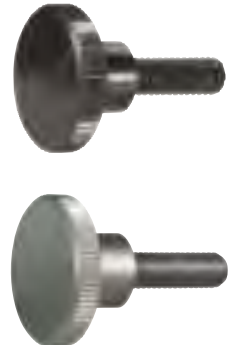
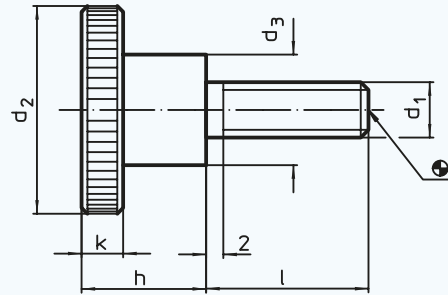
* DIN standards do not include these dimensions.



EH 24790.

**Knurled
Thumb Screws**

DIN 464



Material:

- Steel, quality 5.8, blackened
- Stainless steel 1.4305, dull blasted

Note:

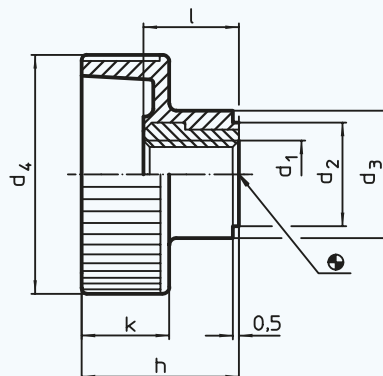
All knurled screws are one-piece manufactured.
 Contrary to the Official Standard Sheet, they all have a thread up to the head, but no recess at the thread end.

Ref. No. Steel	Ref. No. Stainless steel	d ₁	l	d ₂	d ₃	h	k	g
24790.0074	-	M 3	6	12	6	7,5	2,5	3,7
24790.0076	-	M 3	10	12	6	7,5	2,5	3,8
24790.0077	-	M 3	12	12	6	7,5	2,5	4,0
24790.0079	-	M 3	16	12	6	7,5	2,5	4,0
24790.0092	-	M 4	5	16	8	9,5	3,5	7,7
24790.0094	24790.0294	M 4	8	16	8	9,5	3,5	7,9
24790.0095	24790.0295	M 4	10	16	8	9,5	3,5	8,1
24790.0096	24790.0296	M 4	12	16	8	9,5	3,5	8,3
24790.0098	24790.0298	M 4	16	16	8	9,5	3,5	8,4
24790.0100	-	M 4	20	16	8	9,5	3,5	9,1
24790.0102	-	M 4	25	16	8	9,5	3,5	9,0
24790.0112	-	M 5	6	20	10	11,5	4,0	14,0
24790.0113	-	M 5	8	20	10	11,5	4,0	15,0
24790.0114	24790.0314	M 5	10	20	10	11,5	4,0	15,0
24790.0115	24790.0315	M 5	12	20	10	11,5	4,0	15,0
24790.0117	24790.0317	M 5	16	20	10	11,5	4,0	16,0
24790.0119	24790.0319	M 5	20	20	10	11,5	4,0	16,0
24790.0121	24790.0321	M 5	25	20	10	11,5	4,0	17,0
24790.0123	-	M 5	30	20	10	11,5	4,0	17,0
24790.0132	-	M 6	8	24	12	15,0	5,0	28,0
24790.0133	-	M 6	10	24	12	15,0	5,0	27,0
24790.0134	24790.0334	M 6	12	24	12	15,0	5,0	28,0
24790.0136	24790.0336	M 6	16	24	12	15,0	5,0	28,0
24790.0138	24790.0338	M 6	20	24	12	15,0	5,0	29,0
24790.0140	24790.0340	M 6	25	24	12	15,0	5,0	30,0
24790.0142	24790.0342	M 6	30	24	12	15,0	5,0	31,0
24790.0144	-	M 6	35	24	12	15,0	5,0	31,0
24790.0152	-	M 8	12	30	16	18,0	6,0	53,0
24790.0154	24790.0354	M 8	16	30	16	18,0	6,0	55,0
24790.0156	24790.0356	M 8	20	30	16	18,0	6,0	56,0
24790.0158	24790.0358	M 8	25	30	16	18,0	6,0	58,0
24790.0160	24790.0360	M 8	30	30	16	18,0	6,0	60,0
24790.0162	-	M 8	35	30	16	18,0	6,0	50,0
24790.0164	-	M 8	40	30	16	18,0	6,0	61,0
24790.0173	-	M 10	20	36	20	23,0	8,0	106,0
24790.0175	-	M 10	25	36	20	23,0	8,0	109,0
24790.0177	-	M 10	30	36	20	23,0	8,0	112,0
24790.0179	-	M 10	35	36	20	23,0	8,0	116,0
24790.0181	-	M 10	40	36	20	23,0	8,0	116,0

EH 24820.

Knurled Nuts

plastic



Material:

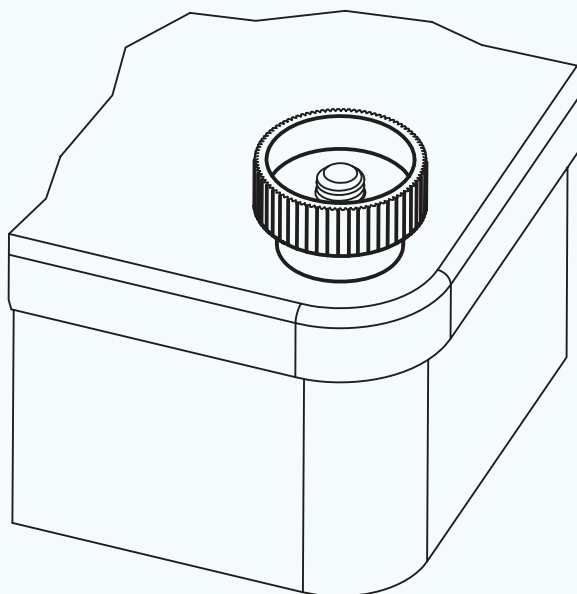
Handle: • Thermoplastic PA, black

Bushing: • Steel, galvanized

Note:

Temperature range from - 30 °C up to + 80 °C.

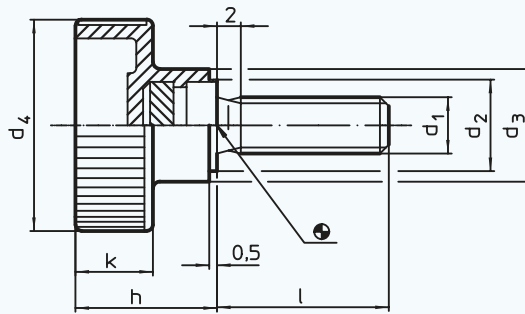
Ref. No.	d ₁	d ₂	d ₃	d ₄	h	k	l	g
24820.0004	M 4	9	12	19	14,0	8,0	9,0	4,5
24820.0005	M 5	9	12	19	14,0	8,0	9,0	4,0
24820.0006	M 6	12	14	24	16,5	9,5	10,5	7,0
24820.0008	M 8	14	16	30	19,5	11,0	11,5	10,0
24820.0010	M 10	16	18	36	22,5	12,5	14,0	15,0



EH 24830.

Knurled Thumb Screws

plastic



Material:

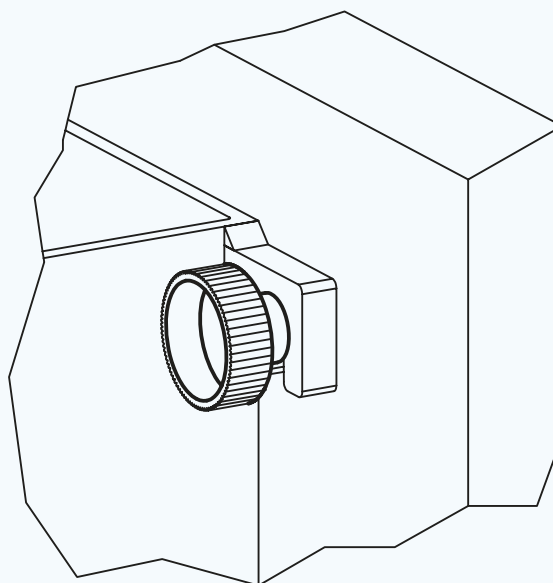
Handle: • Thermoplastic PA, black

Screw: • Steel, galvanized

Note:

Temperature range from - 30 °C up to + 80 °C.

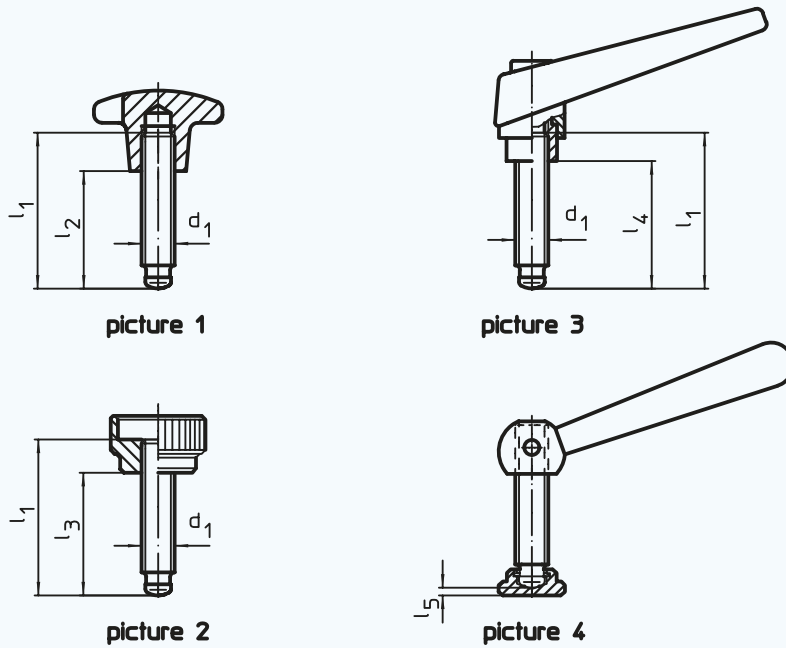
Ref. No.	d ₁	l	d ₂	d ₃	d ₄	h	k	±g
24830.0032	M 4	15	9	12	19	14,0	8,0	4,0
24830.0034	M 4	20	9	12	19	14,0	8,0	4,2
24830.0042	M 5	10	9	12	19	14,0	8,0	4,3
24830.0045	M 5	20	9	12	19	14,0	8,0	5,5
24830.0046	M 5	25	9	12	19	14,0	8,0	6,0
24830.0053	M 6	16	11	14	24	16,5	9,5	8,0
24830.0054	M 6	20	11	14	24	16,5	9,5	9,0
24830.0057	M 6	30	11	14	24	16,5	9,5	10,0
24830.0062	M 8	20	13	16	30	19,5	11,0	16,0
24830.0064	M 8	25	13	16	30	19,5	11,0	17,0
24830.0065	M 8	30	13	16	30	19,5	11,0	19,0
24830.0072	M 10	25	15	18	36	22,5	12,5	31,0
24830.0074	M 10	30	15	18	36	22,5	12,5	33,0
24830.0076	M 10	40	15	18	36	22,5	12,5	38,0



EH 24890.

**Clamping Screws
DIN 6332**

headless pin combined with different handles



- Picture 1**
Clamping screw with
- palm grip DIN 6335 from cast iron or plastic
 - star grip DIN 6336 from cast iron or plastic
- Picture 2**
Clamping screw with knurled nut DIN 6303

- Picture 3**
Clamping screw with
- clamping lever DIN 99
 - adjustable clamping lever EH 24400.
 - clamping lever EH 24430.
 - clamping lever EH 24440.
- Picture 4**
Clamping screw with thrust pad DIN 6311

Type:
Headless pin glued with handle part, DIN 99 additionally pinned together.
Clamping screws available **without** or **with** thrust pad DIN 6311, please indicate in order

Note:
Clamping screws are manufactured to order. Single parts, however, are in stock.
Description from order example only. No reference numbers.

d ₁	l ₁ DIN 6332	Nominal thread lengths l ₂ picture 1	Nominal thread lengths l ₃ picture 2	Nominal thread lengths l ₄ picture 3	l ₅ picture 4
M 6	30	20	22	20	2,1
M 6	50	40	42	40	2,1
M 8	40	27	30	28	3,0
M 8	60	47	50	48	3,0
M 10	60	44	48	45	3,6
M 10	80	64	68	65	3,6
M 12	60	40	46	41	4,6
M 12	80	60	66	61	4,6
M 12	100	80	86	81	4,6
M 16	80	55	-	55	5,4
M 16	100	75	-	75	5,4
M 16	125	100	-	100	5,4
M 20	100	-	-	70	5,5
M 20	125	-	-	95	5,5
M 20	150	-	-	120	5,5

Order example:
Clamping screw consisting of palm grip DIN 6336 GG and headless pin M 10 x 60 DIN 6332, without thrust pad DIN 6311

Description:
Clamping screw M 10 x 60 DIN 6332 with DIN 6336 case iron without thrust pad



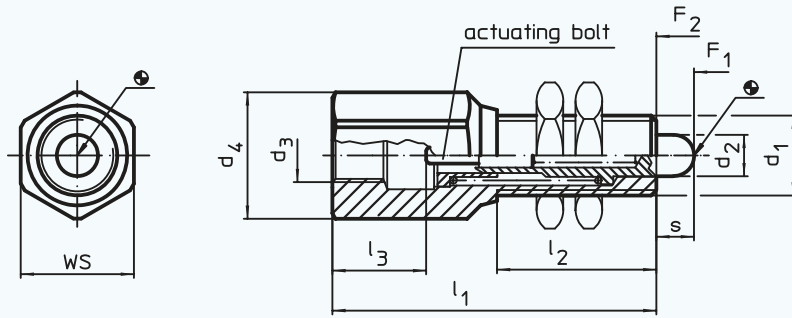
Machine Elements



EH 25010.

Sensing Elements

with sensor adaptor



Material:

Housing: • Stainless steel 1.4305
Spring: • Stainless steel

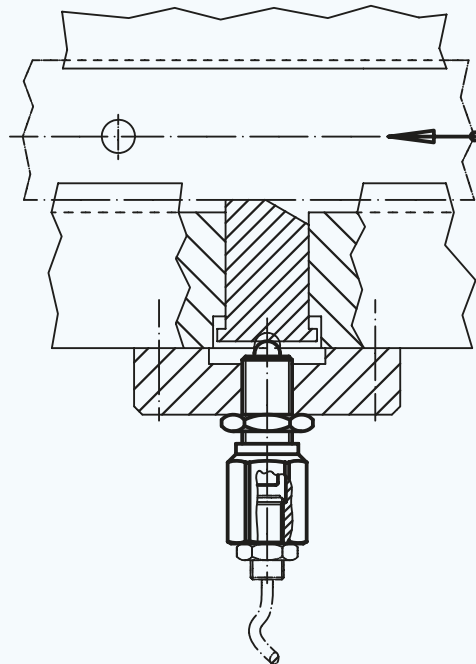
Pin: • Stainless steel 1.4305
Nut: • Brass (ISO 4035), nickel-plated

Note:

Spring plunger in robust and compact design with fine-pitch thread and integrated position sensing using standard proximity sensors. Suitable for multiple applications, e.g. for locking including position control and for proximity sensors with **flush contact**. Switching range adjustable via screwed position of sensor. Sensitivity of switching operations can be adjusted throughout the entire stroke.

Ref. No.	d ₁	d ₂	d ₃	d ₄	l ₁	l ₂	l ₃ ≈	s	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
25010.0012	M 12 x 1	6,2	M 8 x 1	19,0	44	20	15,5	5,6	17	24,0	41,5	57
25010.0016	M 16 x 1	8,5	M 12 x 1	21,5	65	32	20,0	7,5	19	32,5	65,5	103

* statistical average value

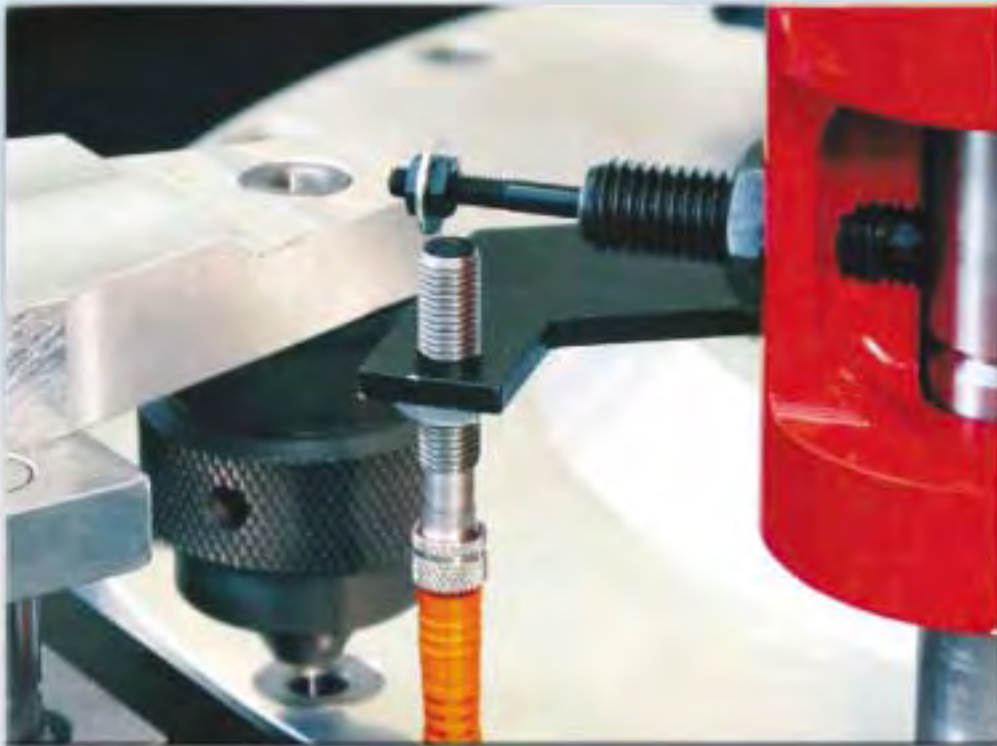


Installation examples:

EH 25010.

EH 25020.

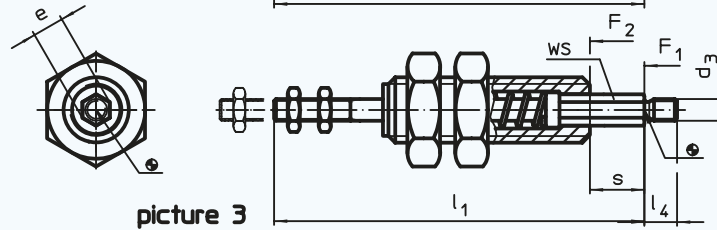
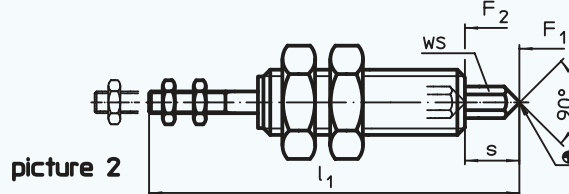
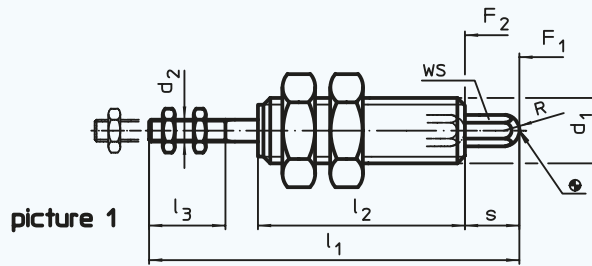
**Sensing
Elements**



EH 25020.

Sensing Elements

with actuating bolt, protected against rotating



Material:

Body: • Free cutting steel, blackened
Nut: • Steel, black (ISO 4035)

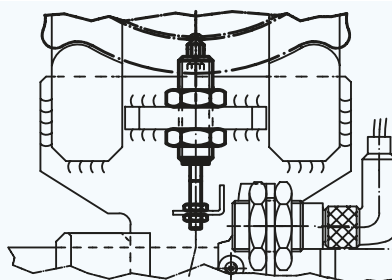
Actuating bolt: • Steel, nitrided, black
Spring: • Stainless steel

Note:

Spring plunger with position sensing by means of an actuating bolt which is protected against rotating. Suitable for multiple applications, e.g. as lift-off pin in tools with position control. Depending on the selected version, the tip is either round or fitted with a connection thread for all-purpose use. At the fastening thread of the actuating bolt, a switching element can be fitted which is secured against rotating and suitable for all commonly used switches.

Ref. No.	Finish	d ₁	s	d ₂	d ₃	e ≈	l ₁	l ₂	l ₃ min.	l ₄	R	WS	Spring load F ₁ N≈*	Spring load F ₂ N≈*	g
25020.0008	tip, round	M 8	6	M 2,5	-	3,5	50	32	9	-	1,75	3	4,1	7,6	15
25020.0010	(picture 1)	M 10	8	M 3	-	4,6	59	35	11	-	2,30	4	5,0	9,0	28
25020.0012		M 12	10	M 4	-	5,8	68	38	14	-	2,90	5	5,1	11,0	44
25020.0016		M 16	12	M 5	-	6,9	78	42	16	-	3,50	6	7,5	13,8	87
25020.0058	tip, pointed	M 8	6	M 2,5	-	3,5	50	32	9	-	-	3	4,1	7,6	14
25020.0060	(picture 2)	M 10	8	M 3	-	4,6	59	35	11	-	-	4	5,0	9,0	29
25020.0062		M 12	10	M 4	-	5,8	68	38	14	-	-	5	5,1	11,0	44
25020.0066		M 16	12	M 5	-	6,9	78	42	16	-	-	6	7,5	13,8	88
25020.0108	tip with connection thread (picture 3)	M 8	6	M 2,5	M 2,5	3,5	50	32	9	4	-	3	4,1	7,6	15
25020.0110		M 10	8	M 3	M 3	4,6	59	35	11	5	-	4	5,0	9,0	29
25020.0112		M 12	10	M 4	M 4	5,8	68	38	14	6	-	5	5,1	11,0	44
25020.0116		M 16	12	M 5	M 5	6,9	78	42	16	7	-	6	7,5	13,8	89

* statistical average value



Installation examples:

EH 25050.

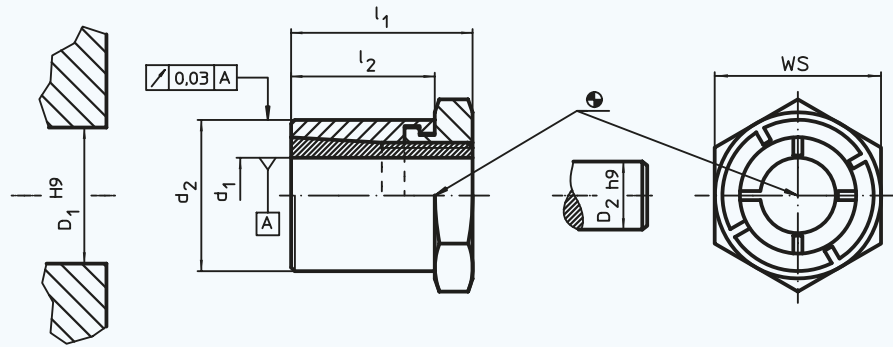
**Tapered Shaft
Hubs**



EH 25050.

Tapered Shaft Hubs

no lock nut



Material:

Inner part: • Steel, nickel-plated

External part: • Steel, galvanized

Nut: • Steel, nickel-plated

Note:

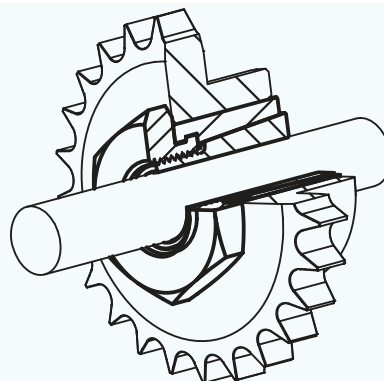
It is a self-centering and non-floating tapered shaft hub in corrosion-protected design with a hexagon nut. By using tapered shaft hubs, all shaft-hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently established.

Mounting instructions, mounting arrangements and technical data will be found on the following pages.

T_A = Tightening torque of nut, M = Transferable torque, F_a = Transferable thrust load
 p_W = Surface pressure shaft, p_N = Surface pressure hub.

The rotational accuracy is 0,03 mm.

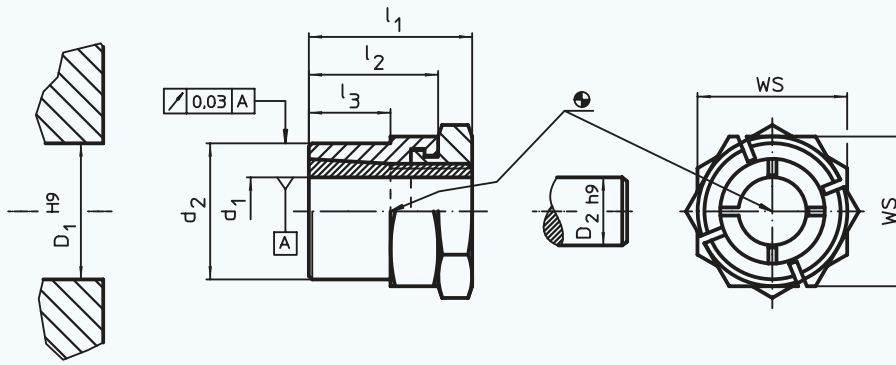
Ref. No.	d ₁	d ₂	l ₁	l ₂	WS	T _A max. Nm	M max. Nm	F _a max. kN	p _W max. N/mm ²	p _N max. N/mm ²	g
25050.0005	5	14	19	15	14	9,9	10,1	4,0	264	96	20
25050.0006	6	14	19	15	14	9,9	12,1	4,0	220	96	19
25050.0008	8	16	22	17	16	16,9	23,4	5,8	179	91	26
25050.0009	9	20	24	19	22	34,9	43,7	9,7	245	115	47
25050.0010	10	20	24	19	22	34,9	48,6	9,7	221	115	46
25050.0011	11	22	24	19	22	43,8	59,9	10,9	225	117	51
25050.0012	12	22	24	19	22	43,8	65,3	10,9	206	117	49
25050.0014	14	26	28	22	27	65,0	93,0	13,3	178	99	83
25050.0015	15	26	28	22	27	65,0	99,0	13,3	166	99	78
25050.0016	16	26	28	22	27	65,0	106,0	13,3	156	99	73
25050.0018	18	35	36	27	36	161,0	223,0	24,8	224	125	201
25050.0019	19	35	36	27	36	161,0	235,0	24,8	212	125	189
25050.0020	20	35	36	27	36	161,0	248,0	24,8	201	125	186
25050.0022	22	42	41	30	46	250,0	349,0	31,8	197	110	346
25050.0024	24	42	41	30	46	250,0	381,0	31,8	180	110	326
25050.0025	25	42	41	30	46	250,0	397,0	31,8	173	110	315
25050.0028	28	47	44	33	50	355,0	565,0	40,4	174	110	403
25050.0030	30	47	44	33	50	355,0	605,0	40,4	162	110	378
25050.0032	32	55	51	38	55	490,0	764,0	47,8	166	102	632
25050.0035	35	55	51	38	55	490,0	836,0	47,8	151	102	571
25050.0038	38	62	58	43	65	720,0	1179,0	62,1	159	111	897
25050.0040	40	62	58	43	65	720,0	1241,0	62,1	151	111	842



EH 25050.

Tapered Shaft Hubs

with lock nut



Material:

Inner part: • Steel, nickel-plated

External part: • Steel, galvanized

Nut: • Steel, nickel-plated

Note:

It is a self-centering and non-floating tapered shaft hub in corrosion-protected design with a hexagon nut and a lock nut. By using tapered shaft hubs, all shaft-hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently established.

The lock nut at the outer part facilitates locking of the shaft-hub joint if freely rotating shafts are involved. For mounting, a crescent wrench (thickness max. $l_2 - l_3$) is used.

Mounting instructions, mounting arrangements and technical data are found on the following pages.

T_A = Tightening torque of nut, M = Transferable torque, F_a = Transferable thrust load

p_W = Surface pressure shaft, p_N = Surface pressure hub.

The rotational accuracy is 0,03 mm.

Ref. No.	d_1	d_2	l_1	l_2	l_3	WS	T_A max. Nm	M max. Nm	F_a max. kN	p_W max. N/mm ²	p_N max. N/mm ²	μ g
25050.0105	5	12	19	15	9	14	9,9	10,1	4,0	264	119	18
25050.0106	6	12	19	15	9	14	9,9	12,1	4,0	220	119	17
25050.0108	8	14	22	17	11	16	16,9	23,4	5,8	179	121	23
25050.0109	9	18	24	19	12	22	34,9	43,7	9,7	245	127	47
25050.0110	10	18	24	19	12	22	34,9	48,6	9,7	221	127	46
25050.0111	11	20	24	19	12	22	43,8	59,9	10,9	225	128	47
25050.0112	12	20	24	19	12	22	43,8	65,3	10,9	206	128	45
25050.0114	14	24	28	22	15	27	65,0	93,0	13,3	178	107	78
25050.0115	15	24	28	22	15	27	65,0	99,0	13,3	166	107	75
25050.0116	16	24	28	22	15	27	65,0	106,0	13,3	156	107	70
25050.0118	18	30	36	27	17	36	161,0	223,0	24,8	224	145	179
25050.0119	19	30	36	27	17	36	161,0	235,0	24,8	212	145	169
25050.0120	20	30	36	27	17	36	161,0	248,0	24,8	201	145	213
25050.0122	22	38	41	30	20	46	250,0	349,0	31,8	197	122	341
25050.0124	24	38	41	30	20	46	250,0	381,0	31,8	180	122	320
25050.0125	25	38	41	30	20	46	250,0	397,0	31,8	173	122	310
25050.0128	28	42	44	33	23	50	355,0	565,0	40,4	174	123	370
25050.0130	30	42	44	33	23	50	355,0	605,0	40,4	162	123	348
25050.0132	32	50	51	38	28	55	490,0	764,0	47,8	166	112	555
25050.0135	35	50	51	38	28	55	490,0	836,0	47,8	151	112	501

Ref. No.	Finish	WS	μ g
25050.0814	special fork wrench	14	45
25050.0816		16	51
25050.0822		22	115
25050.0827		27	315
25050.0836		36	706
25050.0846		46	612
25050.0850		50	870
25050.0855		55	1125
25050.0865		65	1295

EH 25050.

Tapered Shaft Hubs

Mounting arrangements

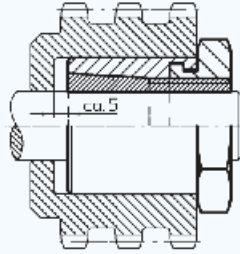


Pre-centering

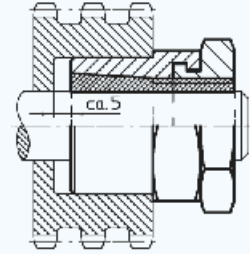
If longer hubs are used, additional support on the shaft can be achieved as shown in the accompanying drawings.

- Due to this support, forces acting outside the useful length of the tapered shaft hub can also be taken up.
- An increased rotational accuracy is achieved.

Tapered shaft hub with hexagon nut

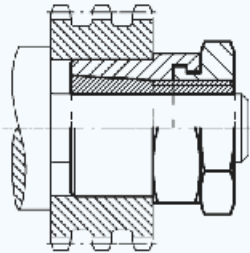
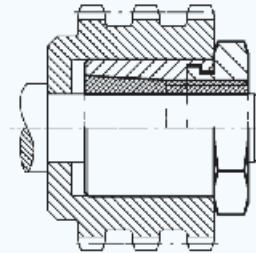


Tapered shaft hub with hexagon nut and lock nut



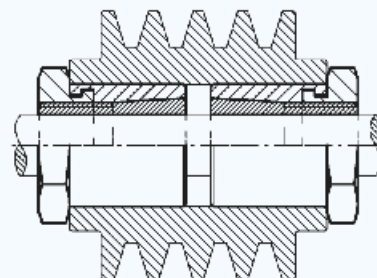
No axial shift

If, on mounting, the hub sits close to a collar, an axial offset is not possible when tightening the tapered shaft hub. In this case, only 60 % of the forces mentioned in the charts can be transmitted.



Two tapered shaft hubs in one hub

When using this version, the tapered shaft hub which is tightened first transmits 100 % of the forces mentioned in the charts. When tightening the second tapered shaft hub, an axial offset of the hub is not possible. Therefore, this tapered shaft hub is able to transmit only 60 % of the forces.



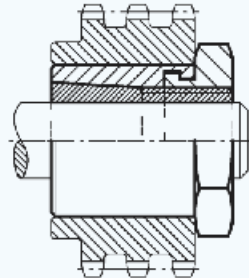
EH 25050.

Tapered Shaft Hubs

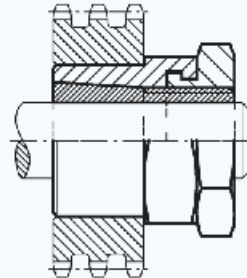
Assembly instructions



Tapered shaft hub with hexagon nut



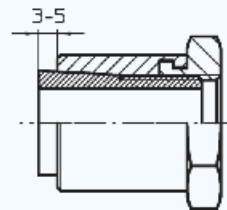
Tapered shaft hub with hexagon nut and lock nut



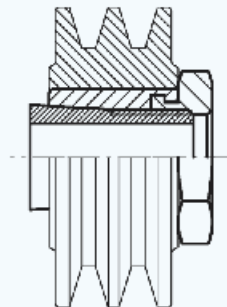
By using tapered shaft hubs, all shaft hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently established. Tapered shaft hubs are available with or without lock nut.

Assembly:

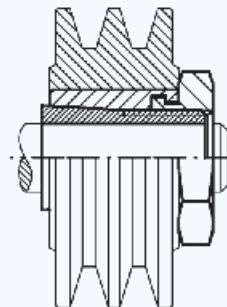
1. The contact surfaces of the shaft and the hub must be free from oil and dirt.
2. Rotate nut to the left until the inner part protrudes approximately 3-5 mm over the outer part.



3. Install tapered shaft hub in the hub hole.



4. Slightly tighten the nut when located in the desired position. Compensate the axial offset thus produced with a soft-face mallet. Tighten the tapered shaft hub.



Disassembly:

Release tapered shaft hub by turning the nut to the left until the inner part protrudes approximately 3-5 mm over the outer part.

EH 25050.

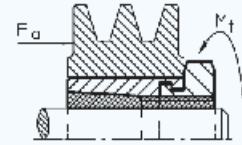
Tapered Shaft Hubs

Technical data



Simultaneous exposure to different forces

If torques (M_t) and axial forces (F_a) are transmitted simultaneously, a resultant total torque (M_r) is obtained which must be less than or equal to the maximum torque (M_{max}) indicated in the charts. ($M_r \leq M_{max}$).



$$M_r = \sqrt{M_t^2 + \left(F_a \times \frac{d_1}{2 \times 1000}\right)^2} \times v \quad [\text{Nm}]$$

- (M_r) = Resultant total torque
- (M_t) = Torque
- F_a = Axial force
- d_1 = Shaft diameter
- v = Safety factor

Example:

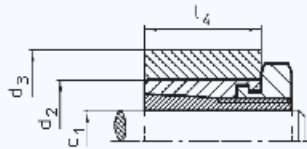
Shaft hub 25050.0125

- $M_t = 150 \text{ Nm}$
- $F_a = 5 \text{ kN}$
- $d_1 = 25 \text{ mm}$
- $v = 2$

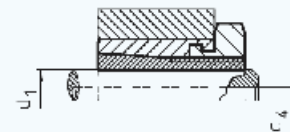
$$M_r = \sqrt{150^2 \text{ Nm}^2 + \left(5000 \text{ N} \times \frac{25 \text{ mm}}{2 \times 1000 \text{ mm/m}}\right)^2} \times 2 = 325 \text{ Nm}$$

A maximum torque (M_{max}) of 397 Nm is transmitted by the tapered shaft hub 25050.0125. The forces can be transmitted because M_r (325 Nm) is less than M_{max} .

Outside diameter of hub and inside diameter of hollow shaft



When fitting tapered shaft hubs, the outside diameter of the hub and the inside diameter of the hollow shaft have to be taken into account.



Smallest possible outside diameter of hub

$$d_3 \geq d_2 \times \sqrt{\frac{R_e + P_N \times C_N}{R_e - P_N \times C_N}} \quad [\text{mm}]$$

- d_1 = Shaft diameter
- d_2 = Hub hole
- d_3 = Outside diameter of hub
- d_4 = Inside diameter of hollow shaft
- R_e = Apparent yielding point
- $R_{p0,2}, R_{p0,1}$ = Permanent elongation limit

Largest possible inside diameter of hollow shaft

$$d_4 \leq d_1 \times \sqrt{\frac{R_e - 2p_w}{R_e (R_p)}}$$

- p_w = Surface pressure hub
- p_w = Surface pressure shaft
- C_N = Factor [is "1", if the hub length is \geq the fitting length of the tapered shaft hub ($L_N > L_2$)]

Example:

Tapered shaft hub 25050.0025, hub material GG25;

- $R_{p0,1} = 165 \text{ N/mm}^2$
- $C_N = 1$

$$d_3 \geq 42 \text{ mm} \times \sqrt{\frac{165 \text{ N/mm}^2 - 103 \text{ N/mm}^2 \times 1}{165 \text{ N/mm}^2 - 103 \text{ N/mm}^2 \times 1}} > 87,4 \text{ mm}$$

Example:

Tapered shaft hub 25050.0025, shaft material Ck45;

- $R_e = 380 \text{ N/mm}^2$
- $C_N = 1$

$$d_4 < 25 \text{ mm} \times \sqrt{\frac{380 \text{ N/mm}^2 - 2 \times 174 \text{ N/mm}^2}{380 \text{ N/mm}^2}} \leq 7,2 \text{ mm}$$

Material chart:

Diameter	Material									
	St 37-2	St 50-2	Ck 35	Ck 45	11 SMn 30	GG 15	GG 20	GG 25	GGG-40	AlMg 3 F 25
						Minimum strength values in N/mm ²				
	Re	Re	Re	Re	Re	Rp 0,1	Rp 0,1	Rp 0,1	Rp 0,2	Re
16 < d ₁ ≤ 40	225	285	320	360	375	90	130	165	250	180
40 < d ₁ ≤ 100	205	265	260	300	245	90	130	165	250	180

Installation examples:

EH 25070.

EH 25071.

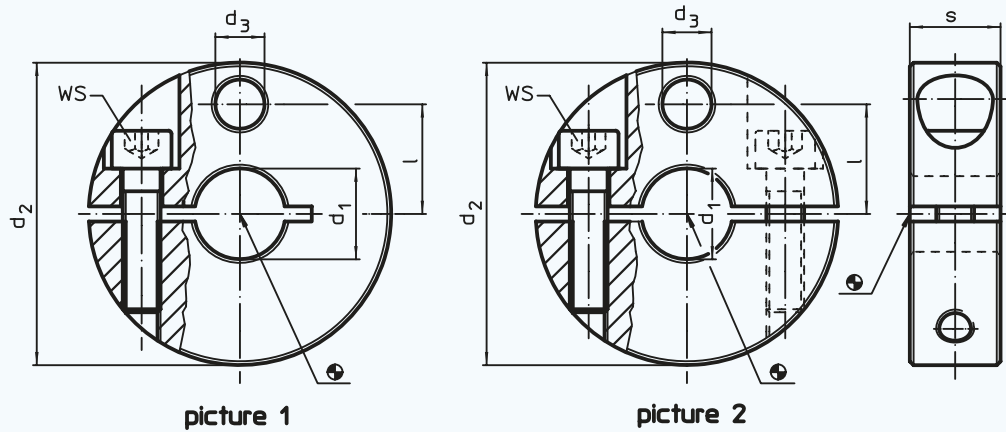
Set Collars



EH 25070.

Set Collars

with sensor adaptor



Material:

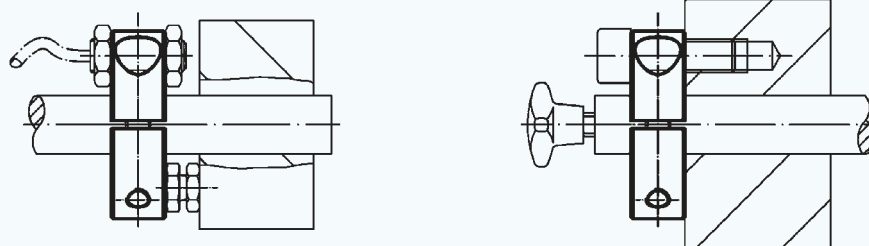
Set collar: • Stainless steel

Screw: • Stainless steel

Note:

Clamping ring made of stainless steel with strong clamping force. Available in two versions, slotted and divided. Clamping rings with a diameter d_1 exceeding 10 mm are provided with a fastening possibility for sensors, switches etc. Universal applicability, e.g. as a limit switch on a piston rod.

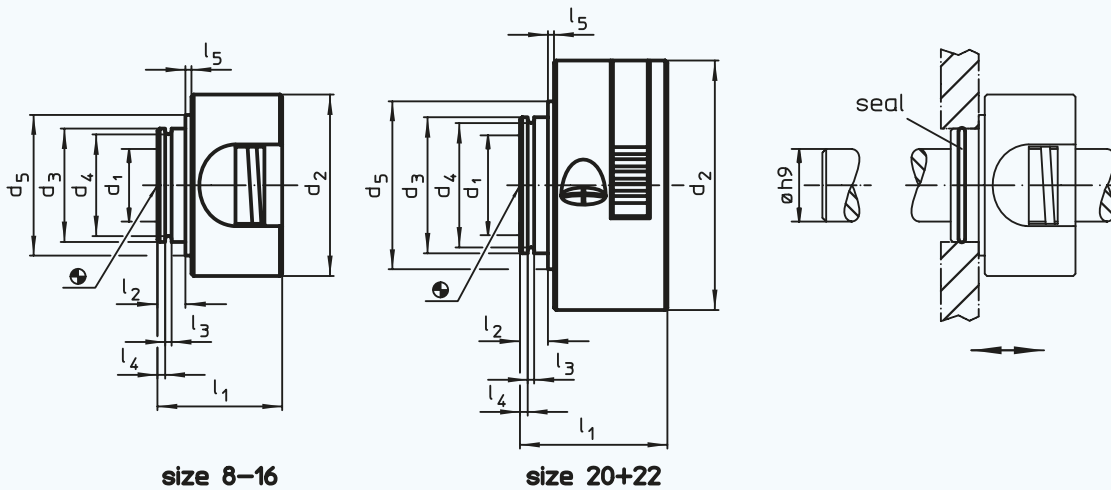
Ref. No.	Finish	d_1 H8	d_2 -0,5	d_3	l	s	WS	$\frac{r}{g}$
25070.0010	slotted (picture 1)	10	40	6,5	14,5	12	4	99
25070.0012		12	40	6,5	14,5	12	4	94
25070.0014		14	45	9,0	16,5	13	5	125
25070.0015		15	45	9,0	16,5	13	5	122
25070.0016		16	45	9,0	16,5	13	5	120
25070.0018		18	50	9,0	18,5	13	5	151
25070.0020		20	50	9,0	18,5	13	5	144
25070.0022		22	65	13,0	23,5	18	6	359
25070.0024		24	65	13,0	23,5	18	6	349
25070.0025		25	65	13,0	23,5	18	6	345
25070.0030		30	75	13,0	27,0	20	6	108
25070.0032		32	80	13,0	30,0	20	6	588
25070.0035		35	80	13,0	30,0	20	6	566
25070.0110	divided (picture 2)	10	40	6,5	14,5	12	4	94
25070.0112		12	40	6,5	14,5	12	4	90
25070.0114		14	45	9,0	16,5	13	5	114
25070.0115		15	45	9,0	16,5	13	5	112
25070.0116		16	45	9,0	16,5	13	5	110
25070.0118		18	50	9,0	18,5	13	5	142
25070.0120		20	50	9,0	18,5	13	5	139
25070.0122		22	65	13,0	23,5	18	6	341
25070.0124		24	65	13,0	23,5	18	6	330
25070.0125		25	65	13,0	23,5	18	6	330
25070.0130		30	75	13,0	27,0	20	6	488
25070.0132		32	80	13,0	30,0	20	6	564
25070.0135		35	80	13,0	30,0	20	6	542



EH 25071.

Set Collars

for quick setting



Material:

Body: • Thermoplastic PA 6, black

Inner parts: • Stainless steel

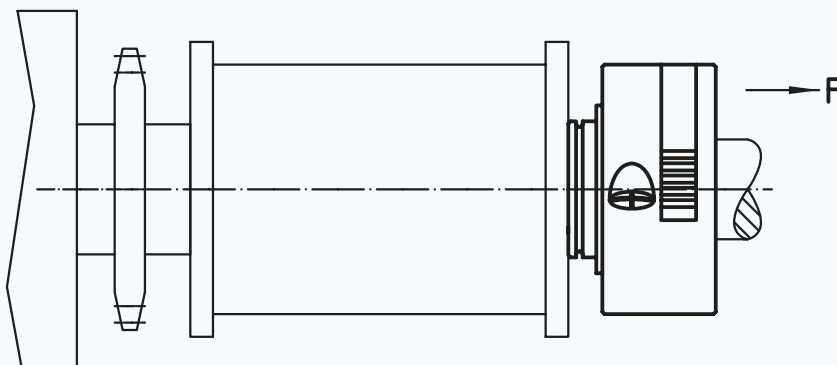
O-ring: • NBR plastic

Note:

To be used for positioning, gripping, clamping and as a quick adjustment element on shafts. Quick, self-clamping and vibration-free mounting by one-hand operation in pull-direction. Temperature range up to 80 °C.

Ref. No.	d ₁ +0,1	d ₂	d ₃	d ₄	d ₅	l ₁	l ₂	l ₃	l ₄	l ₅	Holding force axial, one-sided F N	± g
25071.0008	8	40	25	22,4	31	27,5	7	1,7	3,15	0,5	250	31
25071.0010	10	40	25	22,4	31	27,5	7	1,7	3,15	0,5	250	30
25071.0012	12	40	25	22,4	31	27,5	7	1,7	3,15	0,5	350	30
25071.0015	15	40	25	22,4	31	27,5	7	1,7	3,15	0,5	350	28
25071.0016	16	40	25	22,4	31	27,5	7	1,7	3,15	0,5	380	27
25071.0020	20	55	30	27,4	37	32,5	7	1,7	2,65	0,5	320	51
25071.0022	22	55	30	27,4	37	32,5	7	1,7	2,65	0,5	320	50

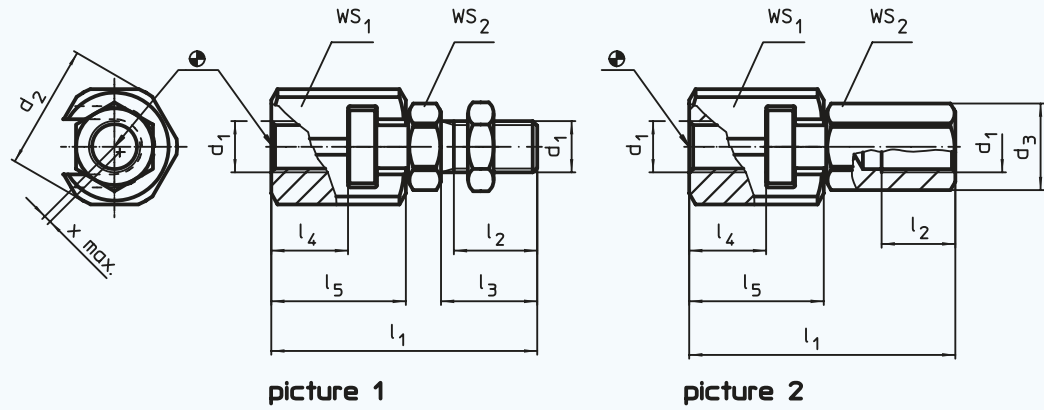
Ref. No.	Finish	d	suitable for Size	± g
25071.0052	O-ring	22 x 1,5	8 - 16	0,17
25071.0054		27 x 1,5	20 + 22	0,20



EH 25100.

Quick Plug Couplings

with radial offset compensation



Material:

Claw:

• Heat-treated steel, tempered, phosphated

Coupling part:

• Heat-treated steel, tempered, phosphated

Lock nut:

• Steel, black (ISO 4035/8675)

Note:

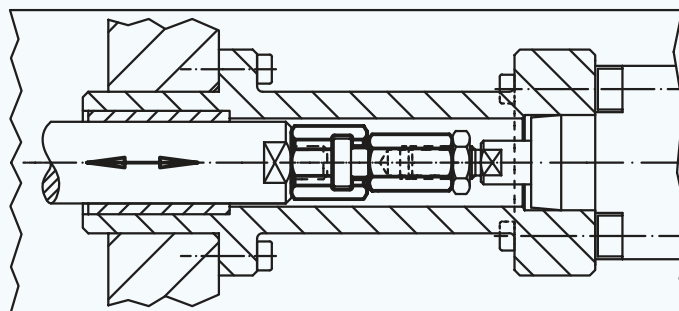
Quick plug coupling with radial offset compensation for multiple applications, e.g. as a link between a piston rod and a linear movement unit. Assembly and disassembly of this simple, solid and two-part coupling is by means of a T-slot; a manual re-adjustment is not necessary.

The quick plug coupling can be linked to all commonly used pneumatic and hydraulic lifting cylinders via the connecting thread.

The quick plug coupling does not transmit any torque.

Ref. No.	Finish	d ₁	d ₂	d ₃	l ₁ ≈	l ₂ min.	l ₃	l ₄ min.	l ₅	WS ₁	WS ₂	Axial offset x max.	kN max.*	g
25100.0006	with coupling screw (picture 1)	M 6	21,0	-	37,5	11,0	14	9,0	18,0	19	10	0,6	2,5	44
25100.0008		M 8	26,0	-	45,0	13,5	17	11,5	22,5	24	13	0,7	4,5	86
25100.0010		M 10	30,0	-	56,2	16,0	20	16,0	29,0	27	17	0,7	6,5	147
25100.0012		M 12	32,5	-	66,7	21,0	25	17,0	34,0	30	19	0,8	10,0	208
25100.0016		M 16	39,0	-	83,0	25,0	30	23,0	42,0	36	24	1,0	18,0	383
25100.0020		M 20	44,0	-	93,5	29,0	35	23,5	45,5	41	30	1,0	30,0	571
25100.0030		M 10 x 1,25	30,0	-	56,2	16,0	20	16,0	29,0	27	17	0,7	6,5	147
25100.0032		M 12 x 1,25	32,5	-	66,7	21,0	25	17,0	34,0	30	19	0,8	10,0	207
25100.0036		M 16 x 1,5	39,0	-	83,0	25,0	30	23,0	42,0	36	24	1,0	18,0	384
25100.0040		M 20 x 1,5	44,0	-	93,5	29,0	35	23,5	45,5	41	30	1,0	30,0	576
25100.0056	with coupling nut (picture 2)	M 6	21,0	11,0	37,5	11,0	-	9,0	18,0	19	10	0,6	2,5	47
25100.0058		M 8	26,0	14,4	45,0	13,5	-	11,5	22,5	24	13	0,7	4,5	91
25100.0060		M 10	30,0	19,0	56,2	15,0	-	16,0	29,0	27	17	0,7	6,5	160
25100.0062		M 12	32,5	21,2	66,7	17,5	-	17,0	34,0	30	19	0,8	10,0	223
25100.0066		M 16	39,0	27,0	83,0	22,0	-	23,0	42,0	36	24	1,0	18,0	401
25100.0070		M 20	44,0	34,0	93,5	25,0	-	23,5	45,5	41	30	1,0	30,0	606
25100.0080		M 10 x 1,25	30,0	19,0	56,2	15,0	-	16,0	29,0	27	17	0,7	6,5	159
25100.0082		M 12 x 1,25	32,5	21,2	66,7	17,5	-	17,0	34,0	30	19	0,8	10,0	221
25100.0086		M 16 x 1,5	39,0	27,0	83,0	22,0	-	23,0	42,0	36	24	1,0	18,0	400
25100.0090		M 20 x 1,5	44,0	34,0	93,5	25,0	-	23,5	45,5	41	30	1,0	30,0	601

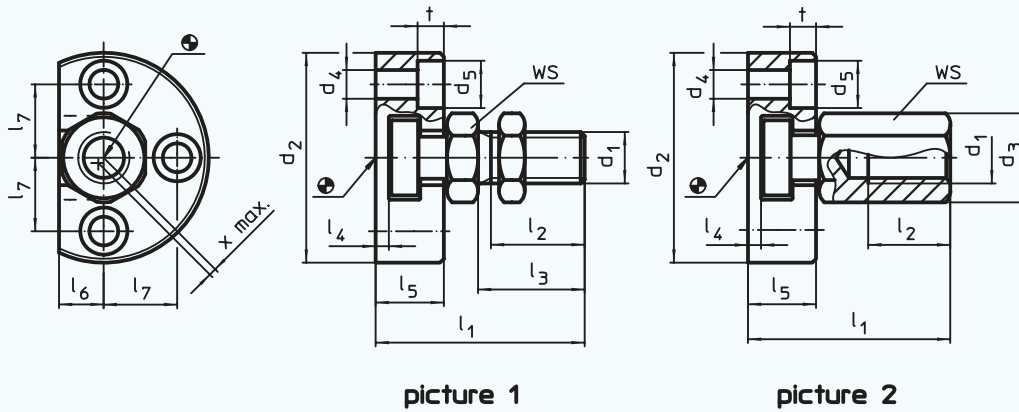
* maximum tensile and compression load



EH 25100.

Quick Plug Couplings

with radial offset compensation and screwed flange



Material:

Flange:

• Heat-treated steel, tempered, phosphated

Coupling part:

• Heat-treated steel, tempered, phosphated

Lock nut:

• Steel, black (ISO 4035/8675)

Note:

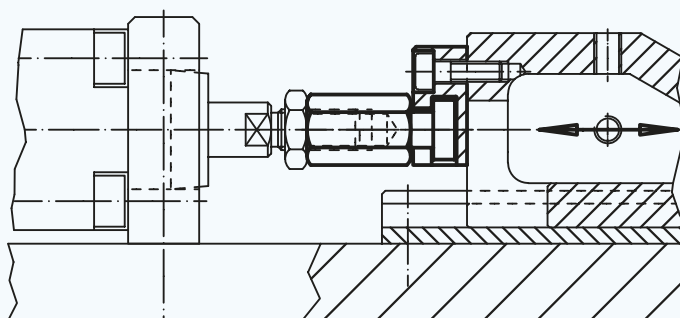
Quick plug coupling with radial offset compensation requiring only little space. Suitable for multiple applications, e.g. as a link between a piston rod and a linear-movement unit. Assembly and disassembly of this simple, solid and two-part coupling is by means of a T-slot; a manual re-adjustment is not necessary.

The quick plug coupling can be linked to all commonly used pneumatic and hydraulic lifting cylinders via the connecting thread.

The quick plug coupling does not transmit any torque.

Ref. No.	Finish	d ₁	d ₂	d ₃	d ₄	d ₅	l ₁ ≈	l ₂ min.	l ₃	l ₄	l ₅	l ₆	l ₇	WS	t	Axial offset x max.	kN max.*	g
25100.0206	with	M 6	42	-	5,5	10	30,5	11,0	14	3,0	11,0	7,0	14,0	10	5,4	0,6	2,5	75
25100.0208	coupling screw	M 8	48	-	6,6	11	35,5	13,5	17	3,0	13,0	8,0	16,0	13	6,4	0,7	4,5	116
25100.0210	(picture 1)	M 10	50	-	6,6	11	43,2	16,0	20	4,2	16,0	9,0	17,0	17	6,4	0,7	6,5	175
25100.0212		M 12	55	-	6,6	11	53,2	21,0	25	4,2	20,5	10,0	19,0	19	6,4	0,8	10,0	281
25100.0216		M 16	65	-	9,0	15	64,0	25,0	30	5,0	23,0	12,5	22,5	24	8,5	1,0	18,0	458
25100.0220		M 20	80	-	11,0	18	74,0	29,0	35	5,0	26,0	17,0	28,0	30	10,0	1,0	30,0	817
25100.0230		M 10 x 1,25	50	-	6,6	11	43,2	16,0	20	4,2	16,0	9,0	17,0	17	6,4	0,7	6,5	176
25100.0232		M 12 x 1,25	55	-	6,6	11	53,2	21,0	25	4,2	20,5	10,0	19,0	19	6,4	0,8	10,0	280
25100.0236		M 16 x 1,5	65	-	9,0	15	64,0	25,0	30	5,0	23,0	12,5	22,5	24	8,5	1,0	18,0	454
25100.0240		M 20 x 1,5	80	-	11,0	18	74,0	29,0	35	5,0	26,0	17,0	28,0	30	10,0	1,0	30,0	850
25100.0256	with	M 6	42	11,0	5,5	10	30,5	11,0	-	3,0	11,0	7,0	14,0	10	5,4	0,6	2,5	77
25100.0258	coupling nut	M 8	48	14,4	6,6	11	35,5	13,5	-	3,0	13,0	8,0	16,0	13	6,4	0,7	4,5	123
25100.0260	(picture 2)	M 10	50	19,0	6,6	11	43,2	15,0	-	4,2	16,0	9,0	17,0	17	6,4	0,7	6,5	187
25100.0262		M 12	55	21,2	6,6	11	53,2	17,5	-	4,2	20,5	10,0	19,0	19	6,4	0,8	10,0	295
25100.0266		M 16	65	27,0	9,0	15	64,0	22,0	-	5,0	23,0	12,5	22,5	24	8,5	1,0	18,0	472
25100.0270		M 20	80	34,0	11,0	18	74,0	25,0	-	5,0	26,0	17,0	28,0	30	10,0	1,0	30,0	849
25100.0280		M 10 x 1,25	50	19,0	6,6	11	43,2	15,0	-	4,2	16,0	9,0	17,0	17	6,4	0,7	6,5	187
25100.0282		M 12 x 1,25	55	21,2	6,6	11	53,2	17,5	-	4,2	20,5	10,0	19,0	19	6,4	0,8	10,0	298
25100.0286		M 16 x 1,5	65	27,0	9,0	15	64,0	22,0	-	5,0	23,0	12,5	22,5	24	8,5	1,0	18,0	477
25100.0290		M 20 x 1,5	80	34,0	11,0	18	74,0	25,0	-	5,0	26,0	17,0	28,0	30	10,0	1,0	30,0	852

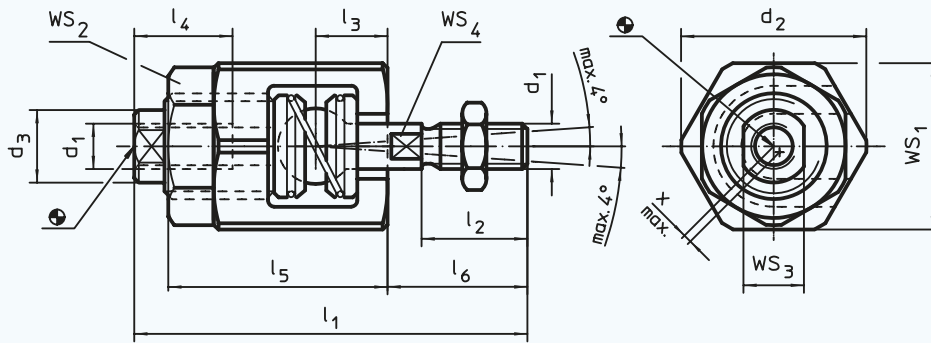
* maximum tensile and compression load



EH 25100.

Quick Plug Couplings

with angular and radial offset compensation



Material:

- Claw and seat:** • Heat-treated steel, tempered, phosphated
Nut: • Heat-treated steel, phosphated
Spring: • Stainless steel

- Coupling part:** • Heat-treated steel, nitrided, black
Lock nut: • Steel, black (ISO 4035/8675)

Note:

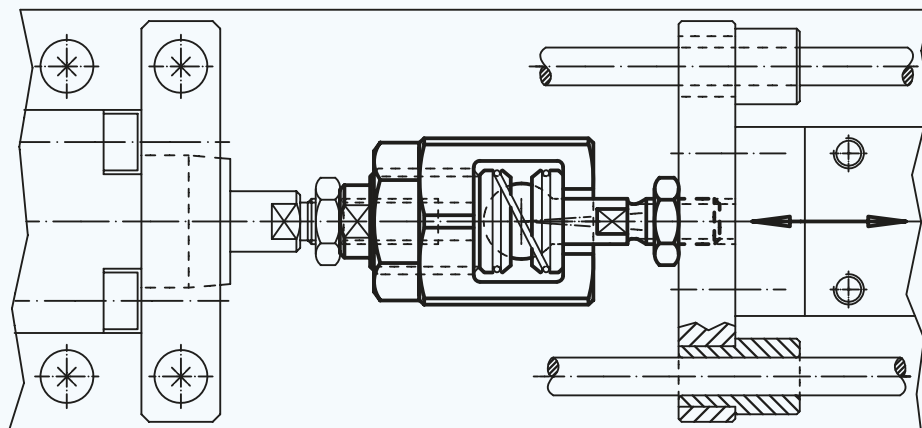
Quick plug coupling, adjustable without axial play, including angular and radial offset compensation. Suitable for multiple applications, e.g. for non-aligned linear movements. Solid and compact design, no loose elements. Assembly and disassembly is by means of a T-slot; a manual re-adjustment is not necessary.

The quick plug coupling can be linked to all commonly used pneumatic and hydraulic lifting cylinders via the connecting thread.

The quick plug coupling does not transmit any torque.

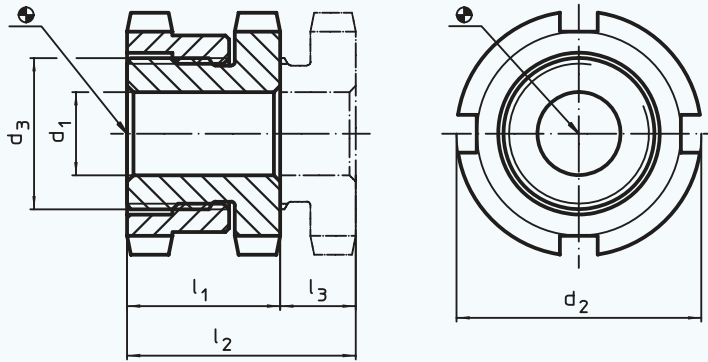
Ref. No.	d ₁	d ₂	d ₃	l ₁ ≈	l ₂	l ₃	l ₄ min.	l ₅	l ₆	WS ₁	WS ₂	WS ₃	WS ₄	Radial offset compensation x max.	kN max.*	g
25100.0406	M 6	24,5	9,6	52	14	9,5	13	29	18,5	22	19	8	5	0,6	2,5	75
25100.0408	M 8	30,0	15,0	63	18	11,5	16	33	23,5	27	24	13	7	0,6	4,5	137
25100.0410	M 10	44,0	21,0	81	22	16,0	24	43	30,5	41	36	18	12	0,7	6,5	401
25100.0412	M 12	44,0	21,0	85	26	16,0	24	43	34,5	41	36	18	12	0,7	10,0	405
25100.0416	M 16	60,0	32,0	121	34	26,0	34	62	45,0	55	46	27	18	1,0	18,0	1127
25100.0420	M 20	60,0	32,0	129	42	26,0	34	62	53,0	55	46	27	18	1,0	30,0	1152
25100.0430	M 10 x 1,25	44,0	21,0	81	22	16,0	24	43	30,5	41	36	18	12	0,7	6,5	403
25100.0432	M 12 x 1,25	44,0	21,0	85	26	16,0	24	43	34,5	41	36	18	12	0,7	10,0	406
25100.0436	M 16 x 1,5	60,0	32,0	121	34	26,0	34	62	45,0	55	46	27	18	1,0	18,0	1128
25100.0440	M 20 x 1,5	60,0	32,0	129	42	26,0	34	62	53,0	55	46	27	18	1,0	30,0	1155

* maximum tensile and compression load



EH 25120.

Height Adjusting Elements



Material:

- Heat-treated steel, galvanized, chromalized

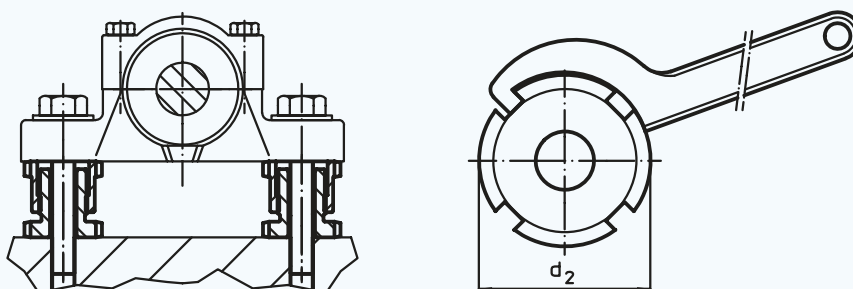
Note:

For levelling of machines and installations.

For vertical adjustment, the self-locking height adjusting elements are fitted with a fine-pitch thread. All elements have a throughgoing bore for fastening purposes. A turn-out lock serves as height limit for the maximum adjustment height.

Ref. No.	d ₁	d ₂	d ₃	l ₁ ≈	l ₂ ≈	Stroke l ₃ ≈	For screw	Load capacity for static load max. kN	Carrying force max. kN	Δ g
25120.0006	6,6	25	M 15 x 1,0	15	19	4	M 6	40	30,7	43
25120.0012	6,6	32	M 20 x 1,0	18	23	5	M 6	65	55,7	95
25120.0014	9,0	32	M 20 x 1,0	18	23	5	M 8	65	48,0	86
25120.0016	11,0	32	M 20 x 1,0	18	23	5	M 10	65	37,9	79
25120.0022	11,0	45	M 30 x 1,5	22	29	7	M 10	120	92,9	246
25120.0024	13,5	45	M 30 x 1,5	22	29	7	M 12	120	80,4	236
25120.0026	17,5	45	M 30 x 1,5	22	29	7	M 16	120	45,5	219
25120.0032	17,5	58	M 40 x 1,5	28	37	9	M 16	210	136,0	450
25120.0034	22,0	58	M 40 x 1,5	28	37	9	M 20	210	90,0	434
25120.0036	26,0	58	M 40 x 1,5	28	37	9	M 24	210	37,0	393
25120.0042	22,0	70	M 50 x 1,5	33	43	10	M 20	330	210,0	773
25120.0044	26,0	70	M 50 x 1,5	33	43	10	M 24	330	157,0	748
25120.0046	33,0	70	M 50 x 1,5	33	43	10	M 30	330	53,0	640

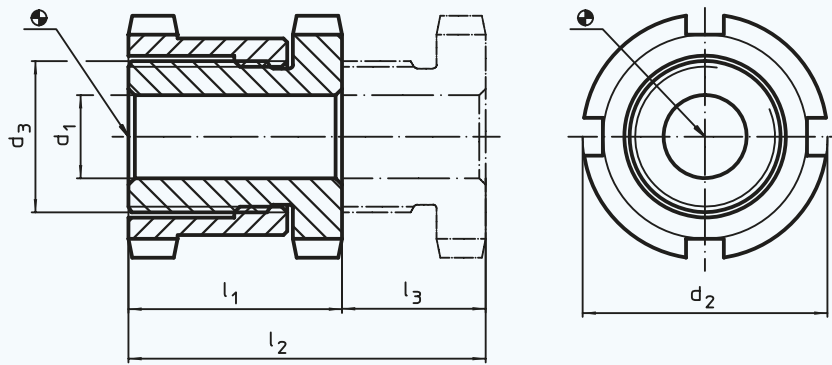
Ref. No.	Finish	For height adjusting element size d ₂	Dimensions of sickle spanner DIN 1810, form A	Δ g
25120.0981	Sickle spanner for vertical adjustment	25	25-28	45
25120.0982		32	30-32	44
25120.0983		45	45-50	156
25120.0984		58	58-62	250
25120.0985		70	68-75	253



EH 25120.

Height Adjusting Elements

high



Material:

- Heat-treated steel, galvanized, chromalized

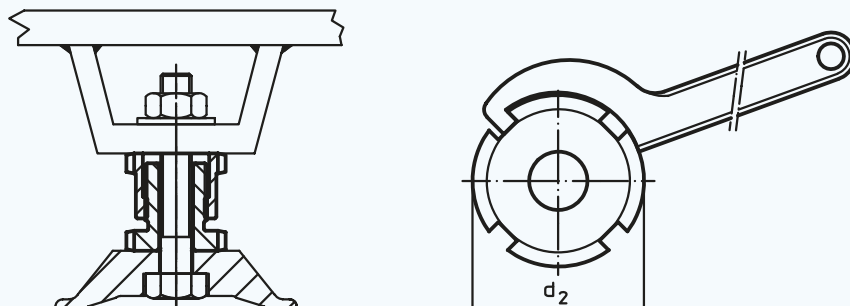
Note:

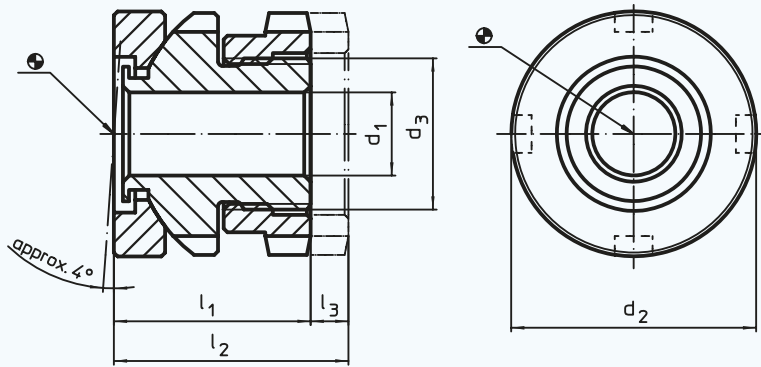
For levelling of machines and installations.

For vertical adjustment, the self-locking height adjusting elements are fitted with a fine-pitch thread. All elements have a throughgoing bore for fastening purposes. A turn-out lock serves as height limit for the maximum adjustment height.

Ref. No.	d ₁	d ₂	d ₃	l ₁ ≈	l ₂ ≈	Stroke l ₃ ≈	For screw	Load capacity for static load max. kN	Carrying force max. kN	g
25120.0106	6,6	25	M 15 x 1,0	28	43	15	M 6	40	30,7	68
25120.0112	6,6	32	M 20 x 1,0	35	55	20	M 6	65	55,7	161
25120.0114	9,0	32	M 20 x 1,0	35	55	20	M 8	65	48,0	152
25120.0116	11,0	32	M 20 x 1,0	35	55	20	M 10	65	37,9	142
25120.0122	11,0	45	M 30 x 1,5	42	67	25	M 10	120	92,9	369
25120.0124	13,5	45	M 30 x 1,5	42	67	25	M 12	120	80,4	357
25120.0126	17,5	45	M 30 x 1,5	42	67	25	M 16	120	45,5	321
25120.0132	17,5	58	M 40 x 1,5	54	86	32	M 16	210	136,0	835
25120.0134	22,0	58	M 40 x 1,5	54	86	32	M 20	210	90,0	771
25120.0136	26,0	58	M 40 x 1,5	54	86	32	M 24	210	37,0	705
25120.0142	22,0	70	M 50 x 1,5	66	106	40	M 20	330	210,0	1421
25120.0144	26,0	70	M 50 x 1,5	66	106	40	M 24	330	157,0	1428
25120.0146	33,0	70	M 50 x 1,5	66	106	40	M 30	330	53,0	1167

Ref. No.	Finish	For height adjusting element size d ₂	Dimensions of sickle spanner DIN 1810, form A	g
25120.0981	Sickle spanner for vertical adjustment	25	25-28	45
25120.0982		32	30-32	44
25120.0983		45	45-50	156
25120.0984		58	58-62	250
25120.0985		70	68-75	253





EH 25120.

Height Adjusting Elements

orienting



Material:

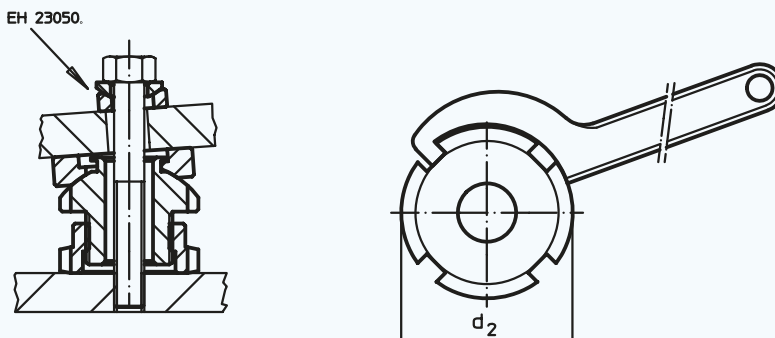
- Heat-treated steel, galvanized, chromalized

Note:

For levelling of machines and installations when seating areas are not parallel.
 For vertical adjustment, the self locking height adjusting elements are fitted with a fine-pitch thread. All elements have a through going bore for fastening purposes. A turn-out lock serves as height limit for the maximum adjustment height.

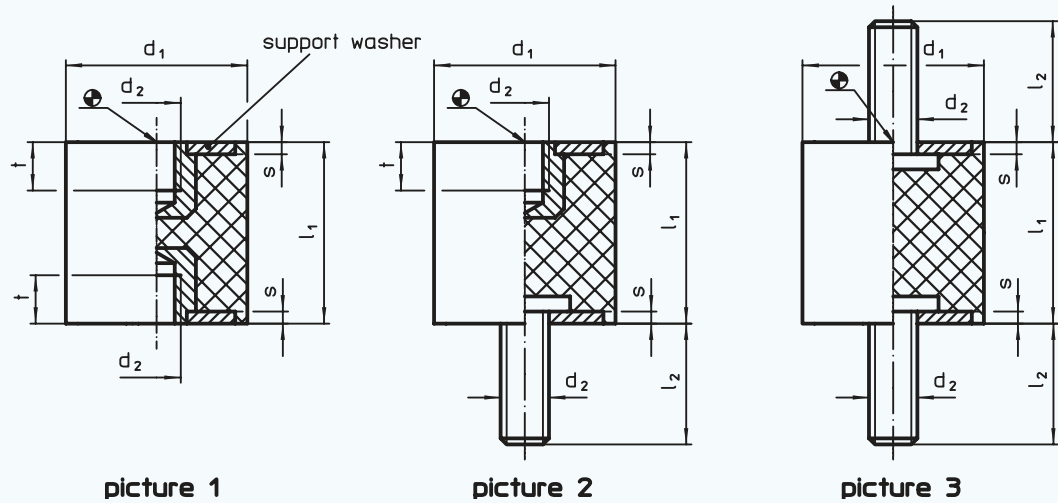
Ref. No.	d ₁	d ₂	d ₃	l ₁ ≈	l ₂ ≈	Stroke l ₃ ≈	For screw	Load capacity for static load max. kN	Carrying force max. kN	g
25120.0206	6,6	25	M 15 x 1,0	22	26	4	M 6	40	30,7	66
25120.0212	6,6	32	M 20 x 1,0	26	31	5	M 6	65	55,7	133
25120.0214	9,0	32	M 20 x 1,0	26	31	5	M 8	65	48,0	126
25120.0216	11,0	32	M 20 x 1,0	26	31	5	M 10	65	37,9	118
25120.0222	11,0	45	M 30 x 1,5	34	41	7	M 10	120	92,9	340
25120.0224	13,5	45	M 30 x 1,5	34	41	7	M 12	120	80,4	316
25120.0226	17,5	45	M 30 x 1,5	34	41	7	M 16	120	45,5	324
25120.0232	17,5	58	M 40 x 1,5	44	53	9	M 16	210	136,0	775
25120.0234	22,0	58	M 40 x 1,5	44	53	9	M 20	210	90,0	668
25120.0236	26,0	58	M 40 x 1,5	44	53	9	M 24	210	37,0	617
25120.0242	22,0	70	M 50 x 1,5	50	60	10	M 20	330	210,0	1157
25120.0244	26,0	70	M 50 x 1,5	50	60	10	M 24	330	157,0	1114
25120.0246	33,0	70	M 50 x 1,5	50	60	10	M 30	330	53,0	990

Ref. No.	Finish	For height adjusting element size d ₂	Dimensions of sickle spanner DIN 1810, form A	g
25120.0981	Sickle spanner for vertical adjustment	25	25-28	45
25120.0982		32	30-32	44
25120.0983		45	45-50	156
25120.0984		58	58-62	250
25120.0985		70	68-75	253



EH 25150.

**Rubber
Metal
Buffers**



Material:

- Body:** ● Natural rubber (caoutchouc NR), black
Bearing washer: ● Steel, galvanized, blue chromated
Threaded bushing: ● Steel, galvanized, blue chromated
Screw: ● Steel, galvanized, blue chromated

Note:

To be used for elastic bearing of motors, compressors, pumps etc.
 The hardness is 55 ±5° shore A. Further shore hardnesses upon request.
 Temperature range from - 30 °C up to + 80 °C.

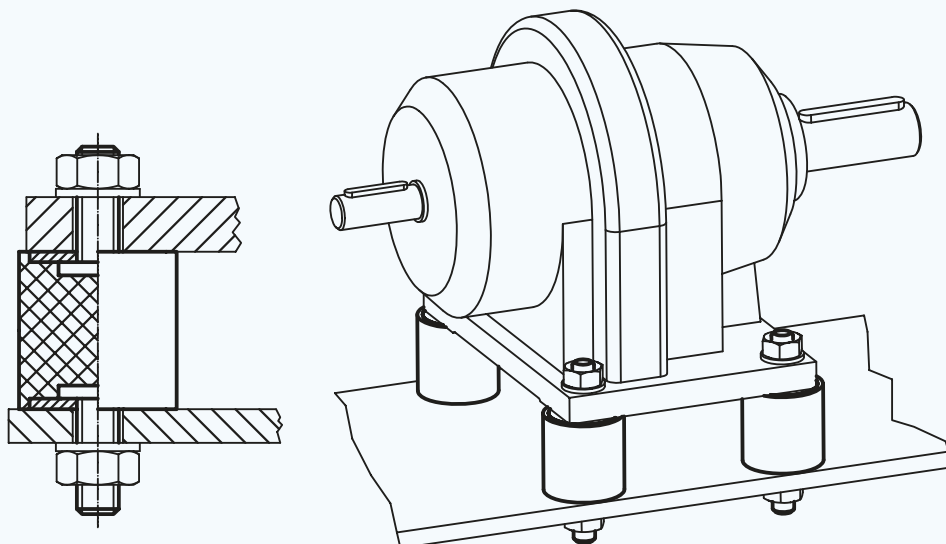
Ref. No.	Finish	d ₁ ± 1,5	l ₁ ± 1,5	d ₂	l ₂	s	t min.	Spring rate N / mm ≈	Load capacity max. N	Spring- range mm ≈	μ g
25150.0021	with female thread	20	15	M 6	-	2	5,0	95	355	3,75	10
25150.0022	(picture 1)	20	20	M 6	-	2	5,0	53	267	5,00	20
25150.0023		20	25	M 6	-	2	5,0	50	315	6,25	20
25150.0026		25	20	M 6	-	2	5,0	121	605	5,00	30
25150.0027		25	25	M 6	-	2	5,0	85	530	6,25	30
25150.0028		25	30	M 6	-	2	5,0	77	575	7,50	30
25150.0031		30	30	M 8	-	2	6,5	114	855	7,50	50
25150.0032		30	40	M 8	-	2	6,5	76	757	10,00	50
25150.0041		40	30	M 8	-	2	6,5	205	1535	7,50	80
25150.0042		40	40	M 8	-	2	6,5	164	1635	10,00	100
25150.0051		50	30	M 10	-	2	7,0	343	2570	7,50	130
25150.0052		50	40	M 10	-	2	7,0	245	2445	10,00	150
25150.0053		50	50	M 10	-	2	7,0	178	2225	12,50	130
25150.0061		60	30	M 10	-	2	7,0	453	3400	7,50	190
25150.0062		60	40	M 10	-	2	7,0	330	3300	10,00	220
25150.0071		70	45	M 10	-	3	7,0	356	4000	11,25	340
25150.0076		75	40	M 12	-	3	9,0	465	4650	10,00	360
25150.0077		75	55	M 12	-	3	9,0	327	4500	13,75	450

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EH 25150.

Rubber Metal Buffers

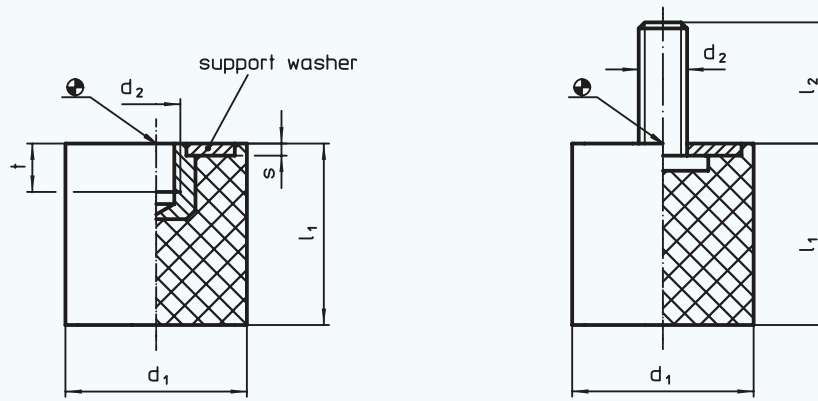
Ref. No.	Finish	d ₁ ± 1,5	l ₁ ± 1,5	d ₂	l ₂	s	t min.	Spring rate N / mm ≈	Load capacity max. N	Spring-range mm ≈	W g
25150.0121	with female thread and screw (picture 2)	20	15	M 6	18	2	5,0	95	355	3,75	15
25150.0122		20	20	M 6	18	2	5,0	53	265	5,00	17
25150.0123		20	25	M 6	18	2	5,0	50	315	6,25	18
25150.0126		25	15	M 6	18	2	5,0	184	690	3,75	26
25150.0127		25	20	M 6	18	2	5,0	121	605	5,00	28
25150.0128		25	30	M 6	18	2	5,0	76	570	7,50	36
25150.0131		30	15	M 8	20	2	6,5	143	535	3,75	41
25150.0132		30	30	M 8	20	2	6,5	113	850	7,50	50
25150.0141		40	20	M 8	23	2	6,5	302	1510	5,00	72
25150.0142		40	30	M 8	23	2	6,5	204	1530	7,50	85
25150.0143		40	40	M 8	23	2	6,5	163	1630	10,00	98
25150.0151		50	20	M 10	28	2	7,0	720	3600	5,00	115
25150.0152		50	30	M 10	28	2	7,0	343	2575	7,50	135
25150.0153		50	40	M 10	28	2	7,0	244	2440	10,00	160
25150.0154		50	50	M 10	28	2	7,0	176	2200	12,50	185
25150.0161		60	30	M 10	28	2	7,0	453	3400	7,50	200
25150.0162		60	40	M 10	28	2	7,0	333	3330	10,00	220
25150.0171	70	45	M 10	27	3	7,0	356	4000	11,25	372	
25150.0176	75	40	M 12	37	3	9,0	460	4600	10,00	385	
25150.0177	75	55	M 12	37	3	9,0	328	4510	13,75	450	
25150.0221	with screw (picture 3)	20	15	M 6	18	2	-	94	352	3,75	18
25150.0222		20	20	M 6	18	2	-	52	260	5,00	25
25150.0223		20	25	M 6	18	2	-	50	310	6,25	20
25150.0226		25	15	M 6	18	2	-	183	687	3,75	28
25150.0227		25	20	M 6	18	2	-	120	602	5,00	32
25150.0228		25	30	M 6	18	2	-	75	562	7,50	39
25150.0231		30	15	M 8	20	2	-	142	534	3,75	45
25150.0232		30	30	M 8	20	2	-	112	843	7,50	58
25150.0241		40	20	M 8	23	2	-	300	1500	5,00	80
25150.0242		40	30	M 8	23	2	-	204	1527	7,50	95
25150.0243		40	40	M 8	23	2	-	162	1620	10,00	100
25150.0251		50	20	M 10	28	2	-	718	3589	5,00	130
25150.0252		50	30	M 10	28	2	-	343	2570	7,50	150
25150.0253		50	40	M 10	28	2	-	244	2436	10,00	170
25150.0254		50	50	M 10	28	2	-	176	2198	12,50	195
25150.0261		60	30	M 10	28	2	-	453	3400	7,50	210
25150.0262		60	40	M 10	28	2	-	330	3300	10,00	236
25150.0271		70	45	M 10	27	3	-	356	4000	11,25	380
25150.0276		75	40	M 12	37	3	-	450	4500	10,00	410
25150.0277		75	55	M 12	37	3	-	320	4400	13,75	515



EH 25150.

Rubber Endstop Buffers

cylindric



picture 1

picture 2

Material:

Body:

- Natural rubber (caoutchouc NR), black

Bearing washer:

- Steel, galvanized, blue chromated

Threaded bushing:

- Steel, galvanized, blue chromated

Screw:

- Steel, galvanized, blue chromated

Note:

To be used as an elastic end-stop, bearing foot etc.
The hardness is 55 ± 5° shore A. Further shore hardnesses upon request.
Temperature range from - 30 °C up to + 80 °C.

Ref. No.	Finish	d ₁ ± 1,5	l ₁ ± 1,5	d ₂	l ₂	s	t min.	Spring rate N / mm ≈	Load capacity max. N	Spring-range mm ≈	g
25150.0321	with female thread	20	15	M 6	-	2	5,0	77	289	3,75	10
25150.0322	(picture 1)	20	20	M 6	-	2	5,0	60	302	5,00	10
25150.0323		20	25	M 6	-	2	5,0	48	297	6,25	10
25150.0326		25	15	M 6	-	2	5,0	163	612	3,75	20
25150.0327		25	20	M 6	-	2	5,0	112	560	5,00	20
25150.0328		25	30	M 6	-	2	5,0	68	509	7,50	20
25150.0331		30	15	M 8	-	2	6,5	294	934	3,75	20
25150.0332		30	20	M 8	-	2	6,5	185	924	5,00	30
25150.0333		30	30	M 8	-	2	6,5	117	876	7,50	30
25150.0341		40	20	M 8	-	2	6,5	247	1235	5,00	50
25150.0342		40	30	M 8	-	2	6,5	213	1600	7,50	70
25150.0343		40	40	M 8	-	2	6,5	182	1820	10,00	80
25150.0351		50	20	M 10	-	2	7,0	517	2587	5,00	80
25150.0352		50	30	M 10	-	2	7,0	327	2453	7,50	100
25150.0353		50	40	M 10	-	2	7,0	247	2468	10,00	120
25150.0361		60	30	M 10	-	2	7,0	467	3500	7,50	140
25150.0362		60	50	M 10	-	2	7,0	269	3367	12,50	210
25150.0371		70	40	M 10	-	3	7,0	410	4100	10,00	260
25150.0372		70	55	M 10	-	3	7,0	327	4500	13,75	340
25150.0376		75	30	M 12	-	3	9,0	600	4500	7,50	210
25150.0377		75	40	M 12	-	3	9,0	450	4500	10,00	290
25150.0378		75	50	M 12	-	3	9,0	352	4400	12,50	350

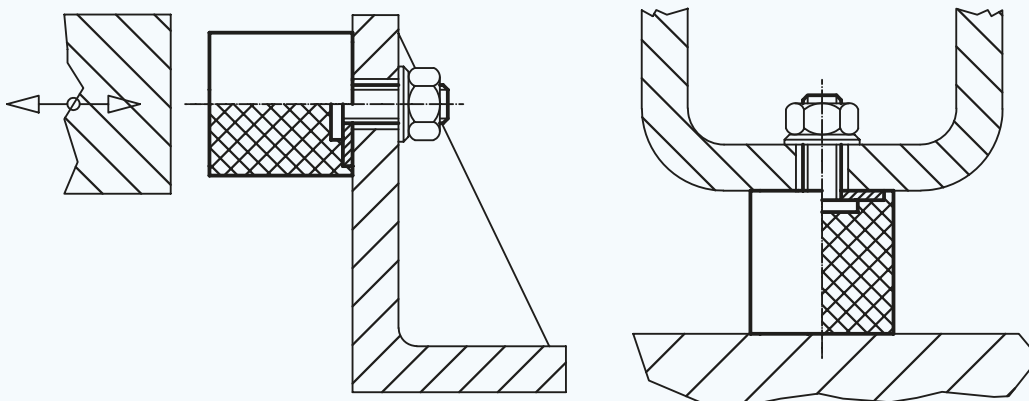
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EH 25150.

Rubber Endstop Buffers

cylindric

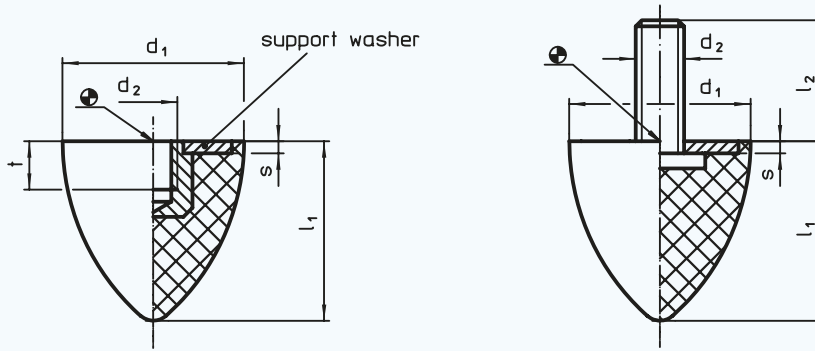
Ref. No.	Finish	d ₁ ± 1,5	l ₁ ± 1,5	d ₂	l ₂	s	t min.	Spring rate N / mm ≈	Load capacity max. N	Spring-range mm ≈	g
25150.0421	with screw	20	10	M 6	18	2	-	126	315	2,50	15
25150.0422	(picture 2)	20	15	M 6	18	2	-	77	289	3,75	10
25150.0423		20	20	M 6	18	2	-	60	302	5,00	13
25150.0424		20	30	M 6	18	2	-	38	285	7,50	20
25150.0426		25	15	M 6	18	2	-	163	612	3,75	18
25150.0427		25	20	M 6	18	2	-	112	560	5,00	20
25150.0428		25	30	M 6	18	2	-	68	509	7,50	25
25150.0431		30	15	M 8	20	2	-	294	934	3,75	28
25150.0432		30	20	M 8	20	2	-	185	924	5,00	35
25150.0433		30	25	M 8	20	2	-	130	815	6,25	38
25150.0434		30	30	M 8	20	2	-	117	876	7,50	43
25150.0441		40	20	M 8	23	2	-	247	1235	5,00	55
25150.0442		40	25	M 8	23	2	-	247	1546	6,25	60
25150.0443		40	30	M 8	23	2	-	213	1600	7,50	73
25150.0444		40	40	M 8	23	2	-	182	1820	10,00	83
25150.0451		50	20	M 10	28	2	-	517	2587	5,00	90
25150.0452		50	30	M 10	28	2	-	327	2453	7,50	118
25150.0453		50	40	M 10	28	2	-	247	2468	10,00	140
25150.0461		60	20	M 10	28	2	-	726	3630	5,00	220
25150.0462		60	40	M 10	28	2	-	340	3400	10,00	195
25150.0471		70	40	M 10	27	3	-	410	4100	10,00	265
25150.0472		70	55	M 10	27	3	-	327	4500	13,75	357
25150.0476		75	25	M 12	37	3	-	752	4700	6,25	223
25150.0477		75	40	M 12	37	3	-	450	4500	10,00	310
25150.0478		75	50	M 12	37	3	-	352	4400	12,50	340



EH 25150.

Rubber Endstop Buffers

parabolic



picture 1

picture 2



Material:

Body:

- Natural rubber (caoutchouc NR), black

Bearing washer:

- Steel, galvanized, blue chromated

Threaded bushing:

- Steel, galvanized, blue chromated

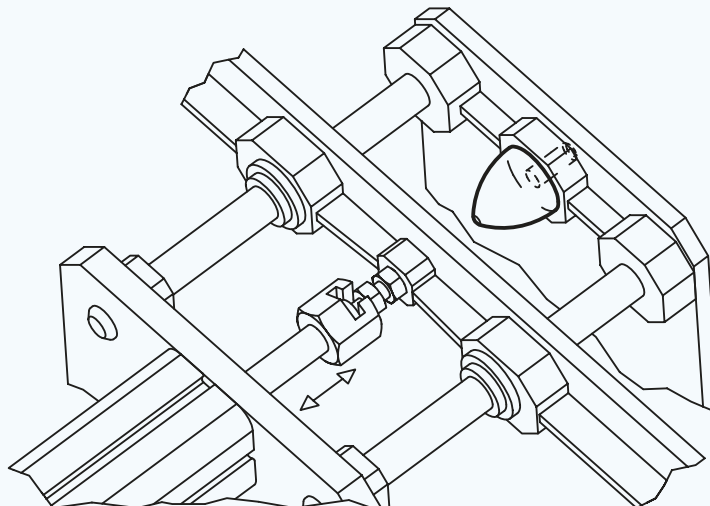
Screw:

- Steel, galvanized, blue chromated

Note:

To be used as an elastic end-stop. Due to the parabolic form the absorption is first soft and raises progressively. The hardness is 55 ± 5° shore A. Further shore hardnesses upon request. Temperature range from - 30 °C up to + 80 °C.

Ref. No.	Finish	d ₁ ± 1,5	l ₁ ± 1,5	d ₂	l ₂	s	t min.	Average spring range N / mm ≈	Load capacity max. N	Spring- range mm ≈	g
25150.0522	with female thread (picture 1)	20	24	M 6	-	2	5,0	16,6	100	6,00	10
25150.0532		30	30	M 8	-	2	6,5	24,0	150	6,25	30
25150.0533		30	36	M 8	-	2	6,5	26,6	200	7,50	30
25150.0537		35	40	M 8	-	2	6,5	65,0	650	10,00	40
25150.0552		50	61	M 8	-	2	6,5	50,0	750	15,00	110
25150.0553		50	68	M 10	-	2	7,0	50,0	850	17,00	120
25150.0622	with screw (picture 2)	20	24	M 6	18	2	-	16,6	100	6,00	11
25150.0632		30	30	M 8	18	2	-	24,0	150	6,25	20
25150.0633		30	36	M 8	20	2	-	26,6	200	7,50	39
25150.0637		35	40	M 8	23	2	-	65,0	650	10,00	45
25150.0652		50	61	M 8	28	2	-	50,0	750	15,00	114
25150.0653		50	68	M 10	28	2	-	50,0	850	17,00	131



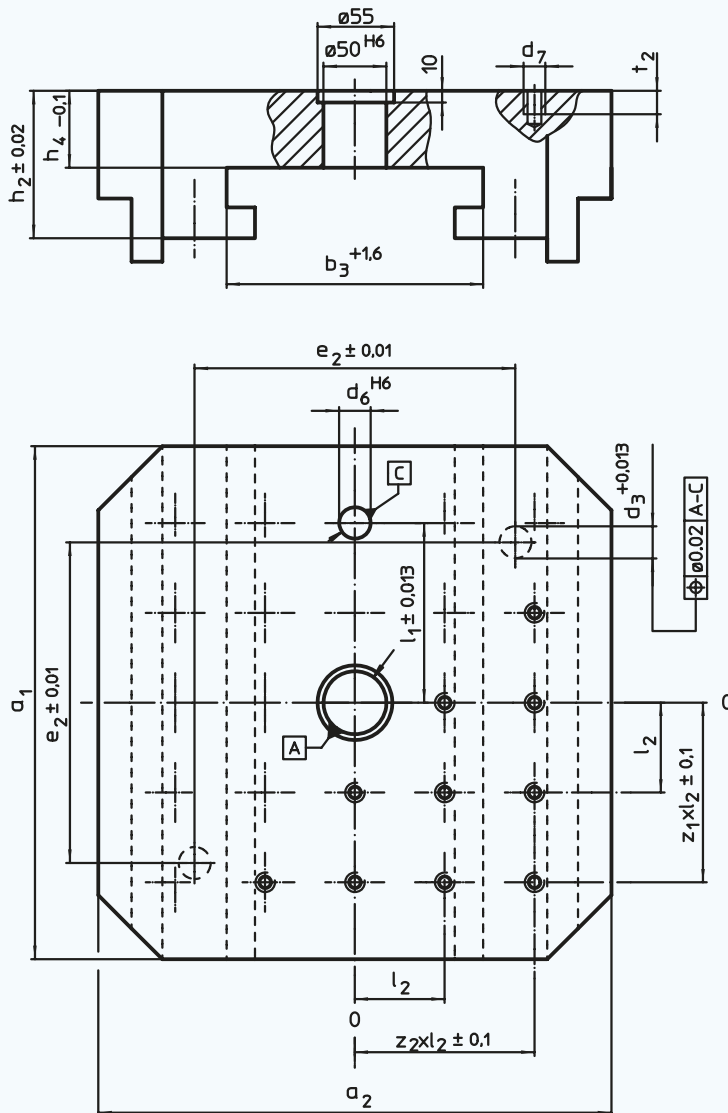


Basic Elements



EH 1901.

**Pallets
DIN 55 201-A1**



>>> Special plates upon request. <<<

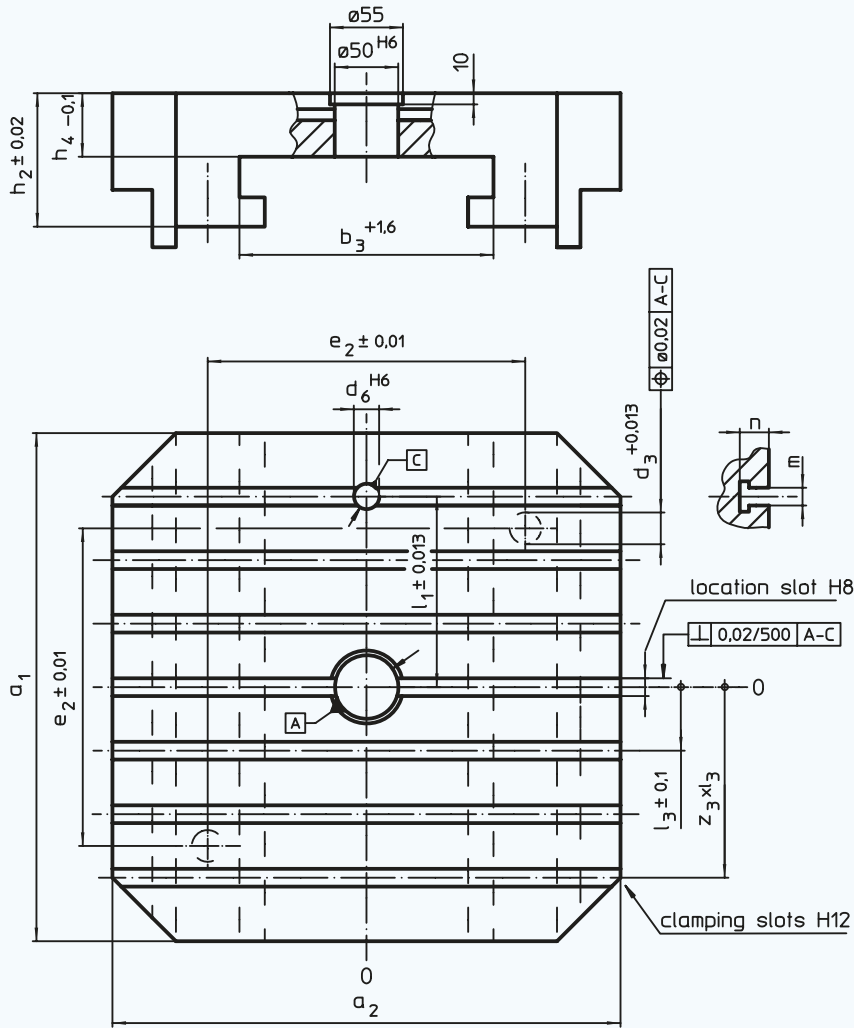
Material:

- Grey cast iron, guide tracks hardened

Ref. No.	a ₁ x a ₂	b ₃	d ₃	d ₆	d ₇	e ₂	h ₂	h ₄	l ₁	l ₂	t ₂	z ₁	z ₂	kg
1901.200	400 x 400	200	25	20	M 12	250	105	50	150	50	22	3	3,0	89
1901.300	400 x 500	200	25	20	M 12	250	105	50	150	50	22	3	4,0	104
1901.400	500 x 500	260	25	20	M 12	320	115	60	200	100	22	2	2,0	148
1901.500	500 x 630	260	25	20	M 12	320	115	60	200	100	22	2	2,5	176
1901.600	630 x 630	340	30	25	M 16	400	140	75	200	100	30	2	2,0	266

EH 1903.

**Pallets
DIN 55 201-A2**



>>> Special plates upon request. <<<

Material:

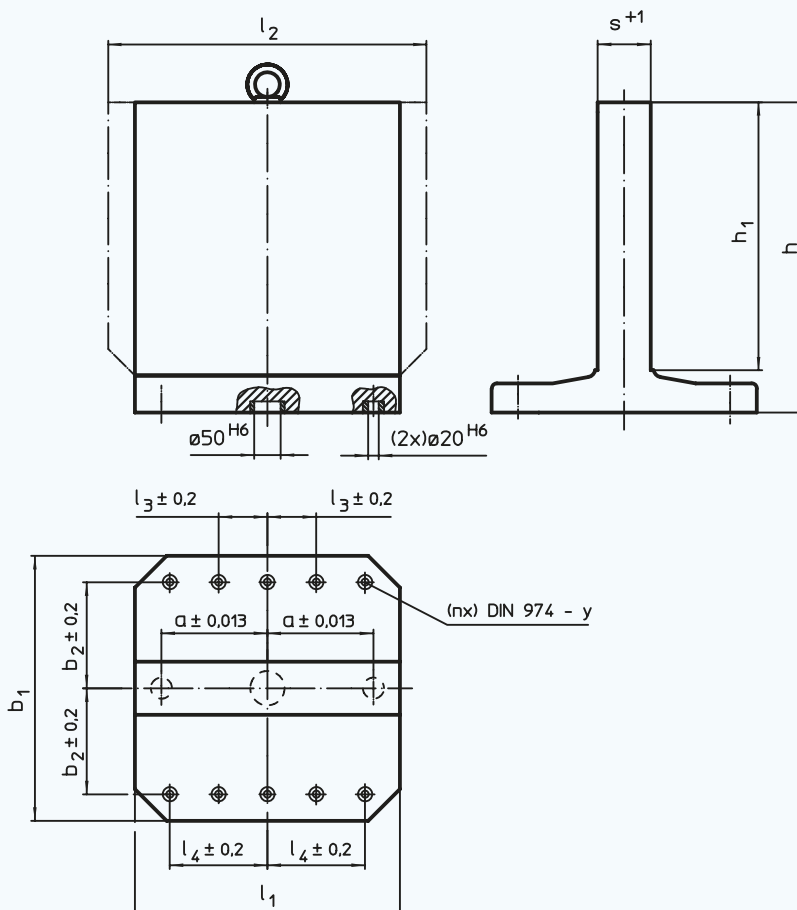
- Grey cast iron, guide tracks hardened

Ref. No.	$a_1 \times a_2$	b_3	d_3	d_6	e_2	h_2	h_4	l_1	l_3	m	n	z_3	Number of T-slots	kg
1903.200	400 x 400	200	25	20	250	105	50	150	50	14	23	3	7	85
1903.300	400 x 500	200	25	20	250	105	50	150	50	14	23	3	7	99
1903.400	500 x 500	260	25	20	320	115	60	200	100	14	23	2	5	139
1903.500	500 x 630	260	25	20	320	115	60	200	100	14	23	2	5	166
1903.600	630 x 630	340	30	25	400	140	75	200	100	18	30	2	5	258

**EH 1906. /
EH 1907.**

**Clamping
Angles**

semi-finished

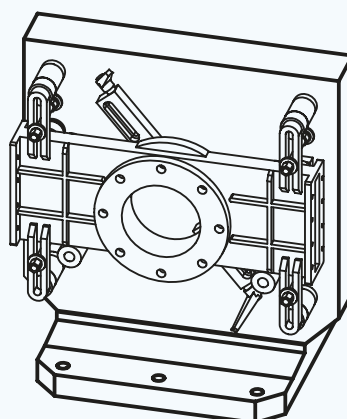


>>> Special plates upon request. <<<

Material:

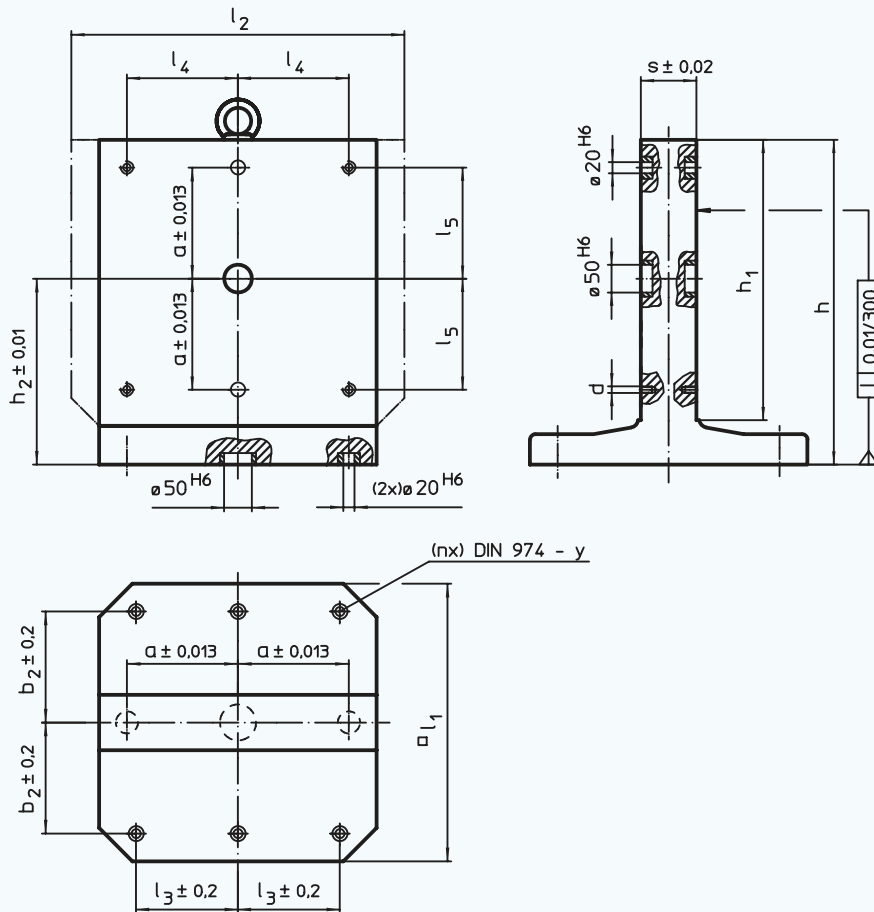
- Grey cast iron
- Aluminium

Ref. No. Grey cast iron	Ref. No. Al	$b_1 \times l_1$	l_2	h_1	h	a	b_2	l_3	l_4	$s+1$	n	y	kg Grey cast iron	kg Al
-	1907.010	250 x 320	-	320	380	120	100	-	100	61	4	10	-	22
1906.210	1907.210	400 x 400	-	400	475	150	150	-	150	81	4	12	150	54
1906.310	1907.310	400 x 400	500	400	475	150	150	-	150	81	4	12	173	62
1906.410	1907.410	500 x 500	-	500	595	200	200	-	200	101	6	12	284	102
1906.510	1907.510	500 x 500	630	500	595	200	200	-	200	101	6	12	334	117
1906.610	1907.610	630 x 630	-	630	725	200	200	-	200	131	6	16	388	140
1906.810	1907.810	800 x 800	-	800	910	300	300	100	300	151	8	16	745	267



EH 1906.

Clamping Angles

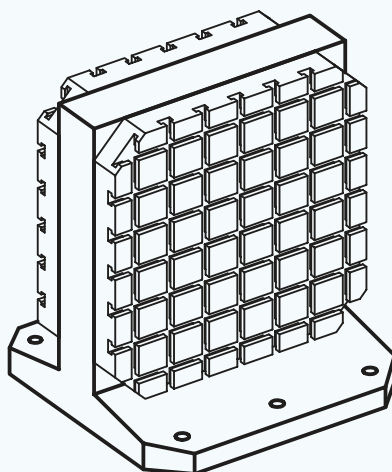


>>> Special plates upon request. <<<

Material:

- Grey cast iron

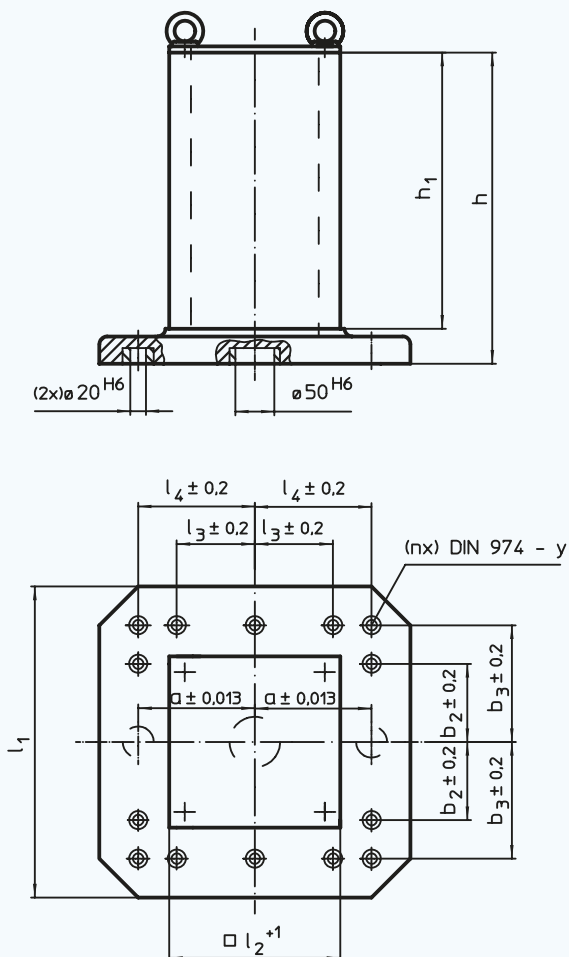
Ref. No.	l_1	l_2	h_1	h	a	b_2	l_3	l_4	l_5	h_2	$s^{\pm 0.02}$	n	y	d	kg
1906.240	400	-	400	475	150	150	150	100	100	275	80	4	12	M 12	147
1906.340	400	500	400	475	150	150	150	200	100	275	80	4	12	M 12	168
1906.440	500	-	500	595	200	200	200	200	200	345	100	6	12	M 12	295
1906.540	500	630	500	595	200	200	200	200	200	345	100	6	12	M 12	326
1906.640	630	-	630	725	200	200	200	200	200	410	130	6	16	M 16	385



EH 1908.

**Clamping
Cubes**

semi-finished

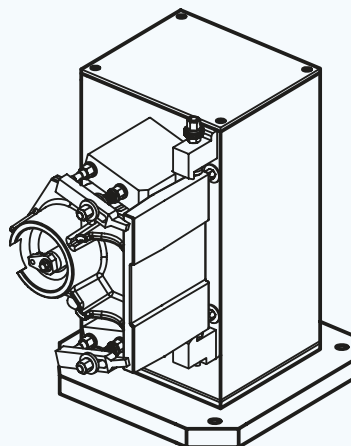


>>> Special plates upon request. <<<

Material:

- Grey cast iron

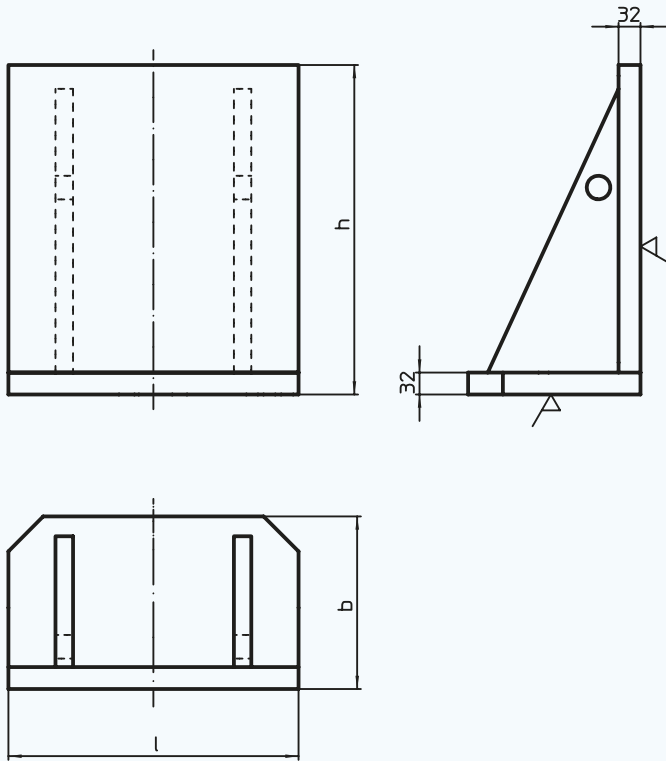
Ref. No.	l_1	l_2^{+1}	h_1	h	a	b_2	b_3	l_3	l_4	n	y	μ kg
1908.210	400	231	358	408	150	-	150	-	150	4	12	100
1908.410	500	331	510	565	200	-	200	-	200	6	12	209
1908.610	630	451	640	700	200	200	300	200	300	8	16	450



EH 1910.

Clamping Angles

one-sided,
welded,
semi-finished

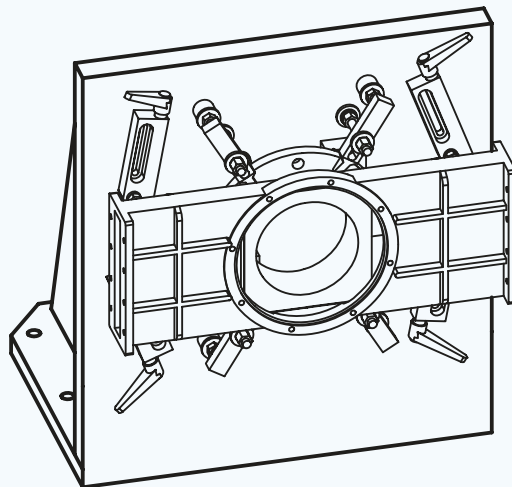


>>> Special plates upon request. <<<

Material:

- Steel, welded

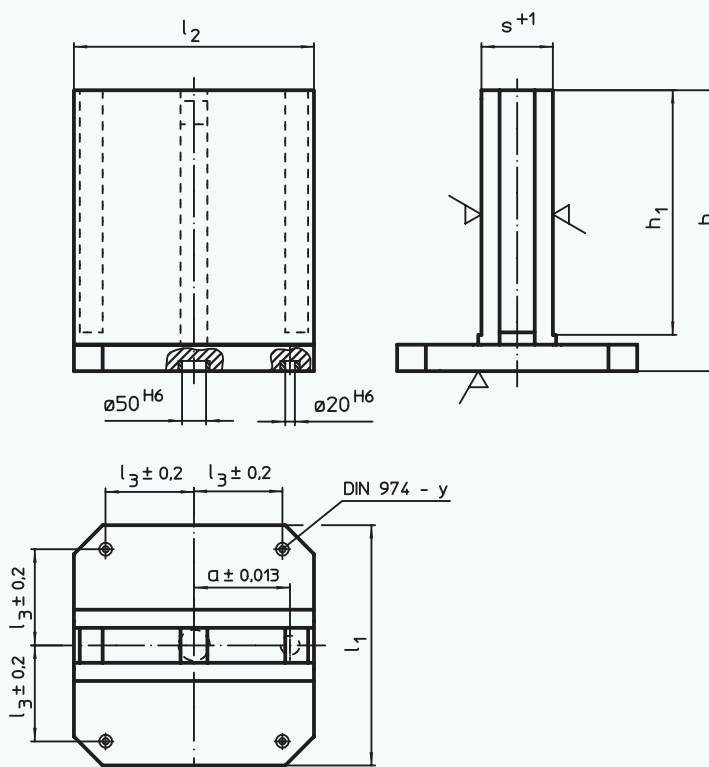
Ref. No.	l	b	h	⚖ kg
1910.020	400	250	450	76
1910.040	500	330	550	143
1910.060	630	370	650	180



EH 1910.

**Clamping
Angles**

welded,
semi-finished

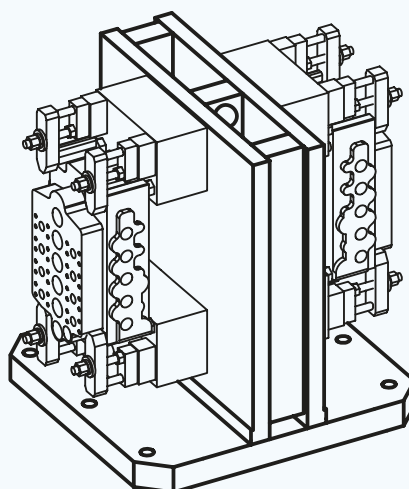


>>> Special plates upon request. <<<

Material:

- Steel, welded

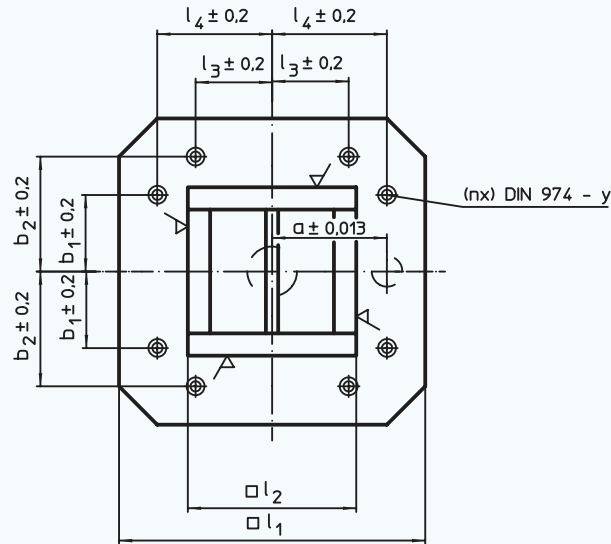
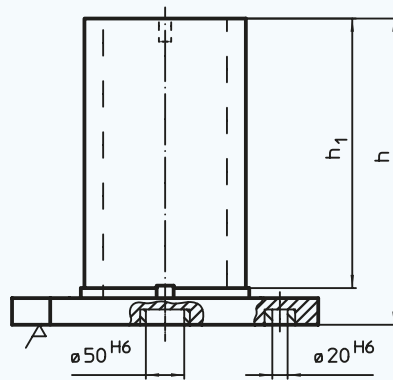
Ref. No.	l_1	l_2	l_3	h	h_1	s	a	y	kg
1910.120	400	400	150	475	425	121	150	12	148
1910.140	500	500	200	600	545	151	200	12	274
1910.160	630	630	200	725	660	181	200	16	395



EH 1910.

Clamping Cubes

welded,
semi-finished

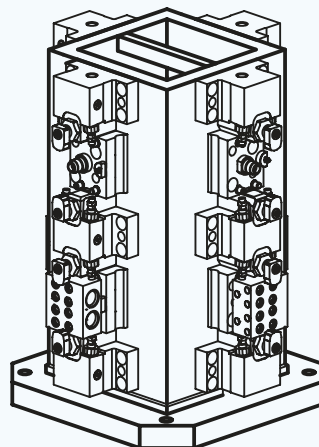


>>> Special plates upon request. <<<

Material:

- Steel, welded

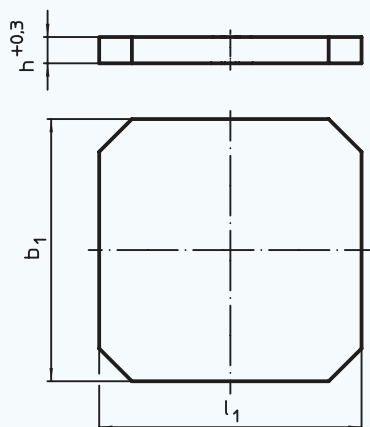
Ref. No.	l_1	l_2	l_3	l_4	h	h_1	a	b_1	b_2	n	y	\updownarrow kg
1910.220	400	231	–	150	500	450	150	150	–	4	12	134
1910.240	500	331	–	200	650	595	200	200	–	4	12	282
1910.260	630	451	200	300	800	740	200	200	300	8	16	427



EH 1912.

Base Plates

semi-finished

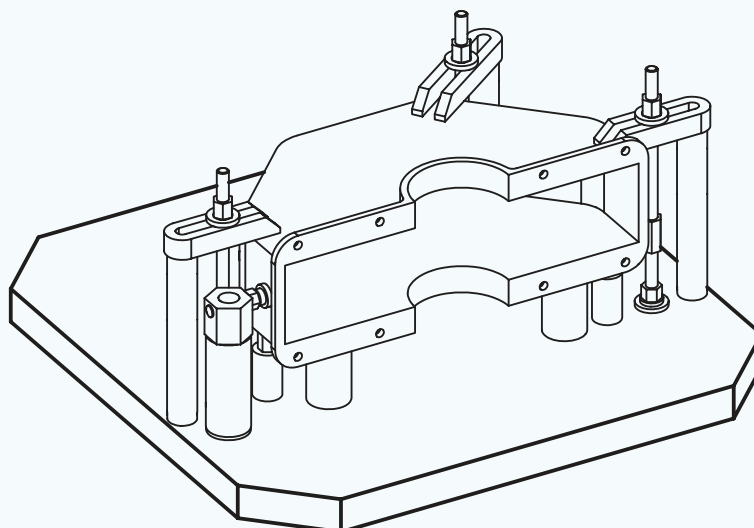


>>> Special plates upon request. <<<

Material:

- Grey cast iron

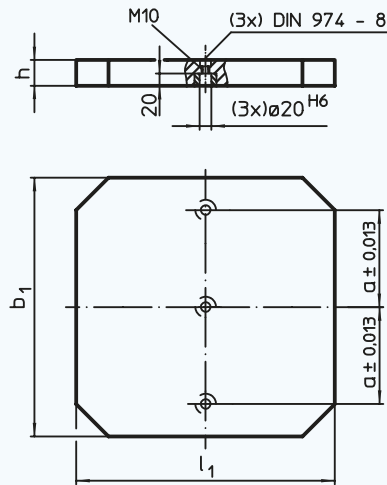
Ref. No.	$b_1 \times l_1$	$h^{+0,3}$	\bar{m} kg
1912.210	400 x 400	40,3	45
1912.310	400 x 500	40,3	57
1912.410	500 x 500	40,3	71
1912.510	500 x 630	50,3	112
1912.610	630 x 630	50,3	141



EH 1912.

Base Plates

with positioning holes

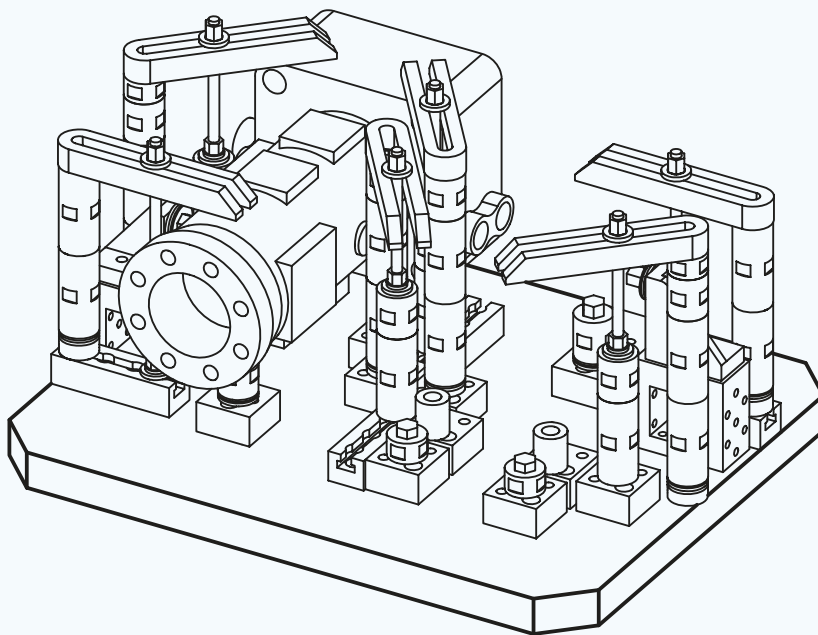


>>> Special plates upon request. <<<

Material:

- Grey cast iron

Ref. No.	$b_1 \times l_1$	h	a	↕ kg
1912.220	400 x 400	40 ± 0,02	150	45
1912.320	400 x 500	40 ± 0,02	150	57
1912.420	500 x 500	40 ± 0,02	200	71
1912.520	500 x 630	50 ± 0,03	200	112
1912.620	630 x 630	50 ± 0,03	200	141



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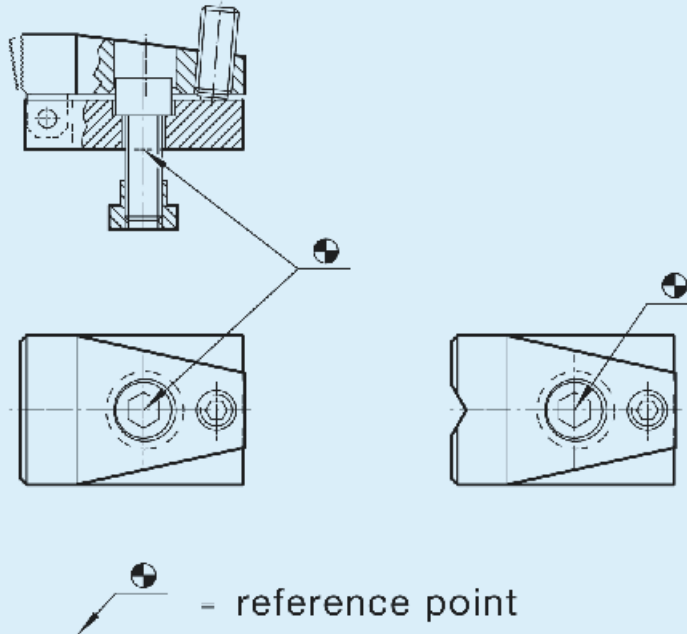




Technical Data



Example:



In order to permit a correct insertion of the selected view into the assembly, the reference or insertion point is marked with a "zero point" symbol.

The halder CAD file is available in system-neutral and in various system-specific formats.

The complete product catalogue including CAD capable product drawings in **2D** and **3D** is available on a **DVD**.

The same volume is accessible via the Internet for download at www.halder.com.



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- Information about all products and services of Halder
- Your contacts at Halder
- Download possibilities, e.g. for current QM Certificates.

ISO fits DIN 7154 and DIN 7155

Values in μm

Tolerance zone	H6	H7	H8	H9	H11	H12	H13	F7	E9	D12	C13	JS12	h5	g5	g6	k6	n6	h6	f7	f8	h8	h9	h11	h13
from 1 to 3	+6 0	+10 0	+14 0	+25 0	+60 0	+100 0	+140 0	+16 +6	+39 -14	+120 +20	+200 +60	+50 -50	0 -4	-2 -6	-2 -8	+6 0	+10 +4	0 -6	-6 -16	-6 -20	0 -14	0 -25	0 -60	0 -140
over 3 to 6	+8 0	+12 0	+18 0	+30 0	+75 0	+120 0	+180 0	+22 +10	-50 +20	+150 +30	+250 +70	+60 -60	0 -5	-4 -9	-4 -12	+9 1	+16 +8	0 -8	-10 -22	-10 -28	0 -18	0 -30	0 -75	0 -180
over 6 to 10	+9 0	+15 0	+22 0	+36 0	+90 0	+150 0	+220 0	+26 +13	-61 +25	+190 +40	+300 +80	+75 -75	0 -6	-5 -11	-5 -14	+10 1	+19 +10	0 -9	-13 -28	-13 -35	0 -22	0 -36	0 -90	0 -220
over 10 to 18	+11 0	+18 0	+27 0	+43 0	+110 0	+180 0	+270 0	+34 +16	+75 -32	+230 +50	+365 +95	+90 -90	0 -8	-6 -14	-6 -17	+12 1	+23 +12	0 -11	-16 -34	-16 -43	0 -27	0 -43	0 -110	0 -270
over 18 to 30	+13 0	+21 0	+33 0	+52 0	+130 0	+210 0	+320 0	+41 +20	-92 -40	+275 +65	+440 +110	+105 -105	0 -9	-7 -16	-7 -20	+15 +2	+28 +15	0 -13	-20 -41	-20 -53	0 -33	0 -52	0 -130	0 -330
over 30 to 40	+16 0	+25 0	+39 0	+62 0	+160 0	+250 0	+390 0	+50 +25	+112 +50	+330 +80	+510 +120	+125 +125	0 -11	-9 -20	-9 -25	+18 +2	+33 +17	0 -16	-25 -50	-25 -64	0 -39	0 -62	0 -160	0 -390
over 40 to 50																								
over 50 to 65	+19 0	+30 0	+46 0	+74 0	+190 0	+300 0	+460 0	+60 +30	-134 -60	+400 +100	+600 +140	+150 +150	0 -13	-10 -23	-10 -29	+21 +2	+39 +20	0 -19	-30 -60	-30 -76	0 -46	0 -74	0 -190	0 -460
over 65 to 80																								
over 80 to 100	+22 0	+35 0	+54 0	+87 0	+220 0	+360 0	+540 0	+71 +36	-169 -72	+470 +120	+710 +720	+175 -175	0 -15	-12 -27	-12 -34	+25 +3	+45 +23	0 -22	-36 -71	-36 -90	0 -54	0 -87	0 -220	0 -540
over 100 to 120																								

DIN ISO 2768, part 1

Table 1 Limit deviations for linear sizes with the exception of cut-off edges (for radius of curvature and chamfer heights, please refer to table 2)

Values in mm

Tolerance class		Limit deviations for ranges of nominal sizes							
Symbol	Designation	from 0,5 ¹⁾ to 3	over 3 to 6	over 6 to 30	over 30 to 120	over 120 to 400	over 400 to 1000	over 1000 to 2000	over 2000 to 4000
f	fine	$\pm 0,05$	$\pm 0,05$	$\pm 0,1$	$\pm 0,15$	$\pm 0,2$	$\pm 0,3$	$\pm 0,5$	-
m	medium	$\pm 0,1$	$\pm 0,1$	$\pm 0,2$	$\pm 0,3$	$\pm 0,5$	$\pm 0,8$	$\pm 1,2$	± 2
c	coarse	$\pm 0,2$	$\pm 0,3$	$\pm 0,5$	$\pm 0,8$	$\pm 1,2$	± 2	± 3	± 4
v	very coarse	-	$\pm 0,5$	± 1	$\pm 1,5$	$\pm 2,5$	± 4	± 6	± 8

¹⁾ For nominal sizes below 0.5 mm, the limit deviations are to be indicated directly on the relevant nominal size(s).

Table 2 Limit deviations for cut-off edges

(radius of curvature and chamfer heights)

Values in mm

Tolerance class		Limit deviations for ranges of nominal sizes		
Symbol	Designation	from 0,5 ¹⁾ to 3	over 3 to 6	over 6
f	fine	$\pm 0,2$	$\pm 0,5$	± 1
m	medium			
c	coarse	$\pm 0,4$	± 1	± 2
v	very coarse			

¹⁾ For nominal sizes below 0.5 mm, the limit deviations are to be indicated directly on the relevant nominal size(s).

Table 3 Limit deviations for angular dimensions

Tolerance class		Limit deviations for linear ranges, expressed in mm, for the shorter leg of relevant angle				
Symbol	Designation	up to 10	over 10 to 50	over 50 to 120	over 120 to 400	over 400
f	fine	$\pm 1^\circ$	$\pm 0^\circ 30'$	$\pm 0^\circ 20'$	$\pm 0^\circ 10'$	$\pm 0^\circ 5'$
m	medium					
c	coarse	$\pm 1^\circ 30'$	$\pm 1^\circ$	$\pm 0^\circ 30'$	$\pm 0^\circ 15'$	$\pm 0^\circ 10'$
v	very coarse	$\pm 3^\circ$	$\pm 2^\circ$	$\pm 1^\circ$	$\pm 0^\circ 30'$	$\pm 0^\circ 20'$

**Technical
Data**

DIN ISO 2768, part 2

Table 1. General tolerances for straightness and evenness

Values in mm

Tolerance class	General tolerances for straightness and evenness for ranges of nominal sizes					
	up to 10	over 10 to 30	over 30 to 100	over 100 to 300	over 300 to 1000	over 1000 to 3000
H	0,02	0,05	0,1	0,2	0,3	0,4
K	0,05	0,1	0,2	0,4	0,6	0,8
L	0,1	0,2	0,4	0,8	1,2	1,6

Table 2. General tolerances for perpendicularity

Values in mm

Tolerance class	Perpendicularity tolerances for ranges of nominal sizes for the shorter leg of the angle			
	up to 100	over 100 to 300	over 300 to 1000	over 1000 to 3000
H	0,2	0,3	0,4	0,5
K	0,4	0,6	0,8	1
L	0,6	1	1,5	2

Table 3. General tolerances for symmetry

Values in mm

Tolerance class	Symmetry tolerances for ranges of nominal sizes			
	up to 100	over 100 to 300	over 300 to 1000	over 1000 to 3000
H	0,5			
K	0,6		0,8	1
L	0,6	1	1,5	2

Article based torques (not valid for stainless steel)

EH 23070.
Flange Nuts
DIN 6330



EH 23080.
Collar Nuts
DIN 6331



EH 23090.
Collar Nuts
with Spherical Seat



EH 23090.
Extension Nuts



Thread	Strength Class	M6	M8	M10	M12	M16	M18	M20	M22	M24	M27	M30	M36	M42	M48	
Pitch	mm	1	1,25	1,50	1,75	2	2	2,50	2,50	2,50	3	3	3,50	4	4,50	5
Note:		22-27														
Test force $F_{t,0.2}$ (EN 22810-2)	kN	10,9	36,1	60	86	121	165	231	297	374	466	596	760	-	-	-

EH 23030.
T-bolts
DIN 757



Up to M10
quality 10.9
as from M14
quality 8.8

EH 23040.
Slide for T-nuts
DIN 6379



Up to M10
quality 10.9
as from M14
quality 8.8

EH 22600.
Swing Bolts
DIN 444



quality 8.8

Thread	Strength Class	M6	M8	M10	M12	M16	M18	M20	M22	M24	M27	M30	M36	M42	M48	
Pitch	mm	1	1,25	1,50	1,75	2	2	2,50	2,50	2,50	3	3	3,50	4	4,50	5
Note:		22-27														
Required tightening torque for permanent assembly with lubrication T_{req} (EN 1504)	Nm	8,6	17	26	38	53	73	91	117	148	188	221	289	364	542	714
Required tightening torque for permanent assembly without lubrication T_{req} (EN 1504)	Nm	10,9	23	38	55	77	107	133	167	208	259	324	394	561	776	1026
Required tightening torque for permanent assembly without lubrication T_{req} (EN 1504)	Nm	8,6	18	25	36	50	68	84	107	132	162	198	251	317	452	578
Required tightening torque for permanent assembly without lubrication T_{req} (EN 1504)	Nm	10,9	19	28	37	50	69	86	109	134	164	200	253	319	445	582

General torques / strengths for screwed connections

Thread	Strength Class	M6	M8	M10	M12	M16	M18	M20	M22	M24	M27	M30	M36	M42	M48		
Pitch	mm	1	1,25	1,50	1,75	2	2	2,50	2,50	2,50	3	3	3,50	4	4,50	5	
Note:		22-27															
Test force $F_{t,0.2}$ (EN 22810-2)	kN	10,9	36,1	60	86	121	165	231	297	374	466	596	760	-	-		
Bolts:																	
Headless	8.8	22-32															
	10.9	32-38															
	12.9	38-44															
Tightening values																	
Specified tightening torque T_{req} (EN 1504)	Nm	8,6	18	29	40	57	82	125	153	200	252	290	365	466	678	881	1222
Permissible load on screw (as 90% of yield strength)	kN	10,9	21	34	46	64	89	130	163	200	250	307	387	503	650	865	1131
Permissible load on screw (as 80% of yield strength)	kN	8,6	16	26	35	49	67	96	121	150	186	228	289	371	481	641	827
Test force $F_{t,0.2}$ (EN 22810-2) part 1	kN	10,9	17	27	37	51	70	96	122	152	187	230	291	374	481	631	812
Permissible tightening torque (as 90% of yield strength) (EN 1504)	Nm	8,6	18	29	40	57	82	125	153	200	252	290	365	466	678	881	1222
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	10,9	21	34	46	64	89	130	163	200	250	307	387	503	650	865	1131
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	8,6	19	29	40	55	77	107	133	167	208	259	324	394	561	776	1026
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	10,9	19	28	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	8,6	18	25	36	50	68	84	107	132	162	198	251	317	452	578	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	10,9	18	27	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	12,9	17	26	36	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	8,6	19	28	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	10,9	19	28	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	12,9	17	26	36	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	8,6	19	28	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	10,9	19	28	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	12,9	17	26	36	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	8,6	19	28	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	10,9	19	28	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	12,9	17	26	36	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	8,6	19	28	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	10,9	19	28	37	50	69	86	109	134	164	200	253	319	445	582	
Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	12,9	17	26	36	50	69	86	109	134	164	200	253	319	445	582	
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Permissible tightening torque (as 80% of yield strength) (EN 1504)	Nm	10,9	19	28	37	50	69										

Micro-encapsulated thread lockings

Micro-encapsulated adhesives for locking and sealing

Micro-encapsulated systems maintain their strength for a period of approx. 4 years when stored under normal conditions in a dry climate at temperatures between 20 °C and 25 °C without major fluctuations.

Product	OT preCOTE 80
Product colour	red
Temperature range	-50 °C up to +170 °C
Thread friction coefficient μ thread	0,26 - 0,29
Function	High-strength universal screw locking

preCOTE® 80

Based on the system of Onyx-Tschick, preCOTE is a liquid plastic material including a hardening agent both of which are encapsulated into a thin polymer layer and embedded into a scraper-type carrier system. PreCOTE is applied onto the thread of screws yielding a dry and non-toxic safety coating which is ready for use at any time.

Function

On assembly of threaded parts which are coated with preCOTE material, the micro capsules are ruptured by pressure and/or shearing force. During this, the liquid plastic material and the hardening agent are set free and mixed with each other thus initiating a chemical reaction (polymerisation). Due to the curing of the adhesive, a locking effect as well as an additional sealing effect is created.

Properties

The cured preCOTE material serves as a locking element for joints even when subject to highest dynamic transverse stress. This means that a loss of compressing excluding the setting rate will not occur. The setting rate depends on the material to be bonded and its surface roughness. Besides, a corrosion after threaded assemblies is avoided.

Mounting is performed according to almost the same procedures as with uncoated mating threads. Only the friction coefficient of the thread may be increased in some cases and therefore has to be compensated for by a correction of the tightening torque. Threaded joints which are locked and sealed with preCOTE material can be released without any damage being done to the threads using normal hand tools.

Curing

Curing will be initiated approx. 10-15 minutes after mounting. Curing will be fully completed after 24 hours, however, it can be accelerated by temperature exposure.



Test without prestressing - Test torques at room temperature

Threads ¹⁾	Torques in Nm		
	M ₀ max.	M ₁₀ min.	M ₁₀ max.
M 5	1	1	5,5
M 6	1,5	1,8	10
M 8 M 8x1	3	4	20
M 10 M 10x1,25	5,5	10	55
M 12 M 12x1,25 - M 12x1,5	7,5	16	95
M 14 M 14x1,5	11	22	160
M 16 M 16x1,5	14	35	250
M 18 M 18x1,5 - M 18x2	18	40	325
M 20 M 20x1,5 - M 20x2	22	45	500
M 22 M 22x1,5 - M 22x2	30	65	800
M 24 M 24x2	36	90	1050
M 27 M 27x2	42	120	1300
M 30 M 30x2	48	165	1700
M 33 M 33x2	55	210	2400
M 36 M 36x3	60	280	3000
M 39 M 39x3	70	330	4000

Requirements applicable to threaded joints without prestressing with test nut: Tolerance of thread 6 H

¹⁾ For nominal thread diameters < 3 mm with < 10 mm thread length torques may be agreed upon between the supplier and the purchaser.



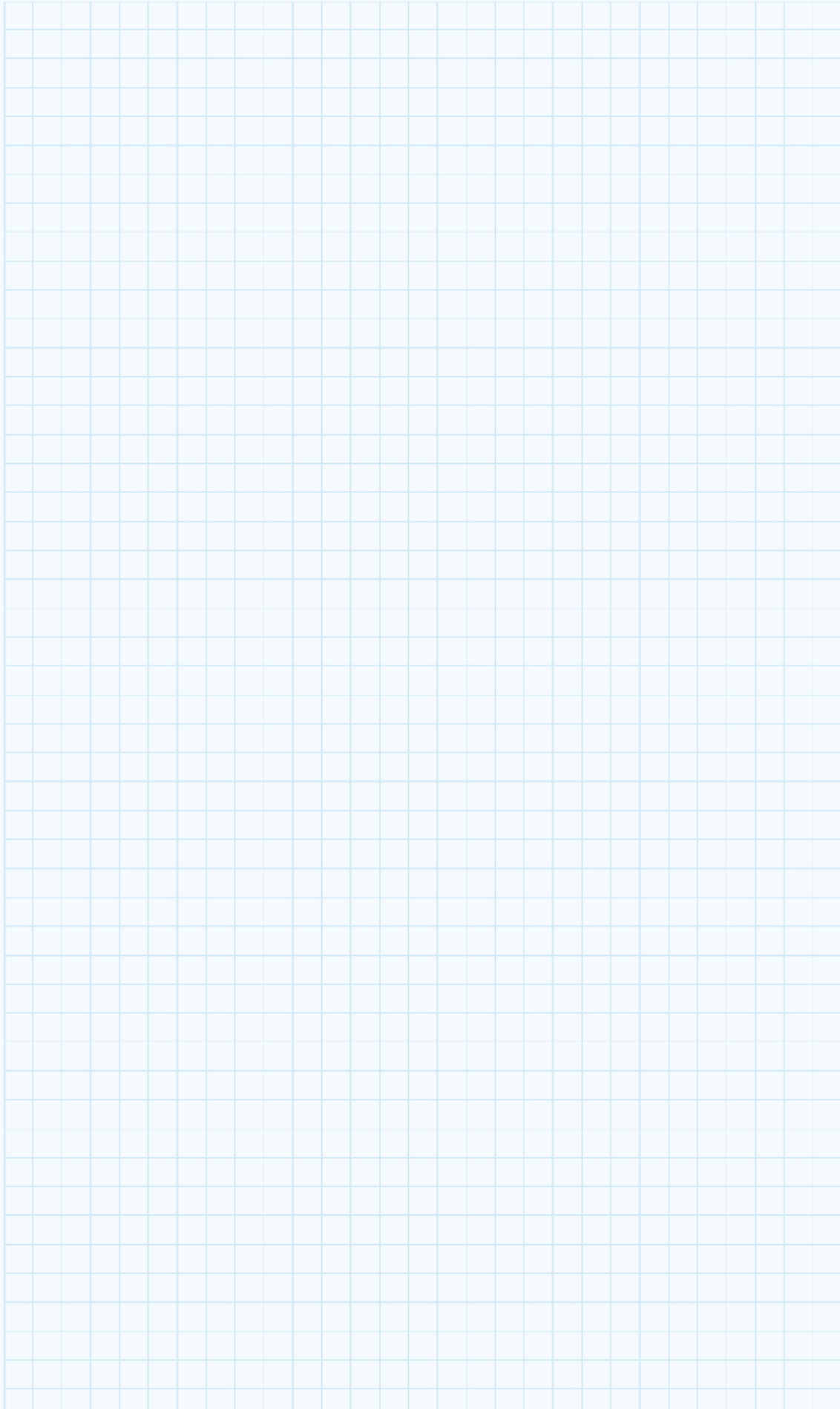
Notes

For your notes

A large, empty grid of light blue lines on a white background, intended for taking notes. The grid consists of approximately 30 columns and 40 rows of small squares.

For your notes

Notes



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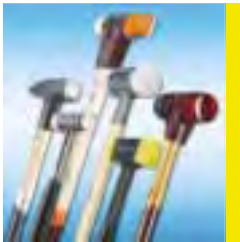
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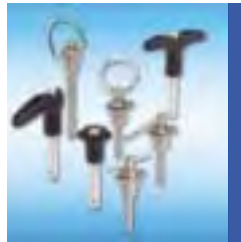
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