KREITZBERG
Normalien

Edition 3

All products are also available in our online shop ...

www.kreitzberg.de

KREITZBERG SUPPLIER PORTAL: OCI – OPEN CATALOG INTERFACE

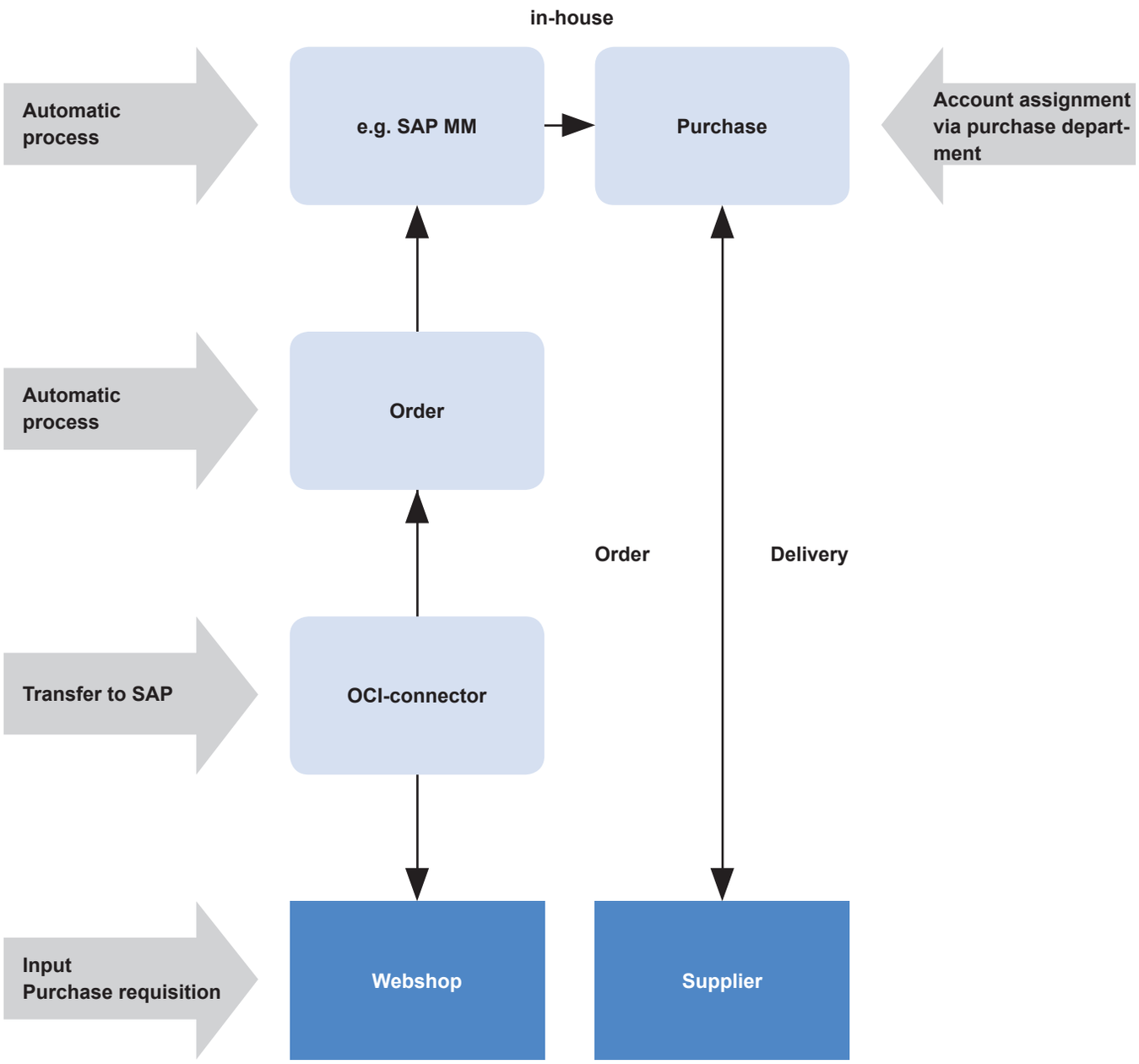
Process flow

Process

1. The OCI Connector transfers the order to SAP.
2. The order request is taken into account in SAP.
3. The order is released by an authorized person.
4. The order is sent to Kreitzberg Normalien GmbH via fax, e-mail or EDI
5. Kreitzberg Normalien GmbH confirms the order and sends it on time

OCI-process-optimisation

– Purchase process extremely shorened
– SAP is only for account assignment
– Discharge for the purchase department



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More than 25.000 norm parts on stock – that is our strength.

No matter what kind of norm parts you need, we have it. Always available and, if you wish, in your hands the same day. Our norm parts are shipped directly after your order. That is our understanding of service.

Our experience is your benefit.

Since 1966 we are at home in stamping and forming. 1976, when we developed the 30° punch with tapered head, together with a customer, we already did build up our reputation. Until today, it stands for quick and competent service. Arisen from the reputable commercial agency, founded by Bernd Kreitzberg, Kreitzberg Normalien is there for you since 2011. Your partner with a cross-vendor product range.

We are there for you. With appropriate solutions.

We will support you, no matter what kind of problem you have. We are your competent partner, when it comes to developing a process reliable product with high customer benefit. For any kind of problem, you can find not only a sympathetic ear, but also a technical exact solution at our house. Uncomplicated - and very quick.

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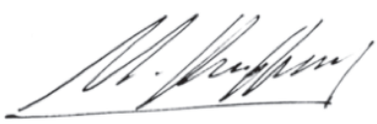
If it has to be really fast, you can rely on our special-punch-production.
With reliable express service within 24 hours - nobody helps you quicker.

Perfectly supplied around the globe.

Thanks to our international distribution structure, our product range including the corresponding service is also available for your customers abroad. With our wide online shop, **www.kreitzberg.de,** we are there for you, regardless of time zones. No matter where your company is based.



Yours sincerely, Mark Kreitzberg

INDEX

Categories

INDEX
Categories

INDEX
Categories

INDEX
Categories

INDEX
Categories

INDEX
Categories

INDEX

ABC

INDEX

ABC

INDEX

ABC

INDEX
ABC

INDEX
ABC

INDEX
ABC

INDEX

Order-No.

INDEX

Order-No.

INDEX

Order-No.

INDEX

Order-No.

INDEX

Order-No.

INDEX

Order-No.

Guide elements

INDEX

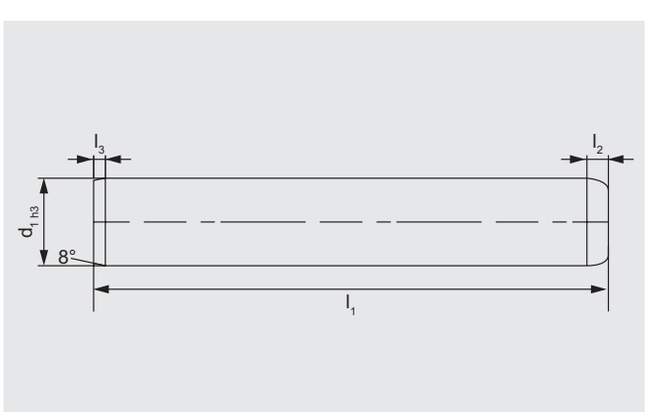
Guide elements

7174.	Ball cage with fastening ring groove, plastic	80
1283.	Ball cage, plastic, for highest stroking speed	81
1251.	Guide bush for ball bearing, ISO 9448-3	82
1252.44.	Headed guide bush for ball bearing, ISO 9448-7, Type 44	83
1252.45.	Headed guide bush for ball bearing, ISO 9448-7, Type 45	84
1252.46.	Headed guide bush for ball bearing, ISO 9448-7, Type 46	85
1252.47.	Headed guide bush for ball bearing, ISO 9448-7, Type 47	86
1252.49.	Headed guide bush for ball bearing, ISO 9448-7, Type 49	87
1253.44.	Flanged guide bush for ball bearing, ISO 9448-5, Type 44	88
1253.45.	Flanged guide bush for ball bearing, ISO 9448-5, Type 45	89
1253.46.	Flanged guide bush for ball bearing, ISO 9448-5 Type 46	90
1317.	Screw clamp, clamping height 6 mm, M8	91
1311.	Screw clamp, clamping height 6 mm, M6	91
1312./1323. 1321./1313. 1322./1314.	Screw clamp, milled, hardened, burnished	92
1324.	Screw clamp, eccentric design	92
1331.	Retainer disc with screw	93
1334.	Retainer disc with socket cap screw	93
1000.94.	Ball guide unit to Mercedes-Benz-Standard	94
1291.	Guide bush, bronze with solid lubricant	95
1292.	Guide bush with collar, bronze with solid lubricant	98
1293.	Guide bush with collar, bronze with solid lubricant, NAAMS	99
1287.	Guide bush with collar, bronze with solid lubricant, Type 87	100
1270.	Guide bush with collar, bronze with solid lubricant, Type 70	102
1271.	Guide bush with collar, bronze with solid lubricant, Type 71	102
1272.	Guide bush with collar, bronze with solid lubricant, Type 72	104
1273.	Guide bush with collar, bronze with solid lubricant, Type 73	105
2053.	Thrust washer, bronze with solid lubricant	106
91.	Retention bearing with screw holes	107
922.	Guide bearing with screw holes, sintered guide	108
923.	Guide bearing with solid lubricant	109
5190.	Flex-Pillar-Bearing for removable pillars	110
5192.	Flex-guide-Bearing for bush ISO 9448 and DIN 9831	111

Small dimensions

GUIDE PILLAR DIN 9825/ISO 9182-2, SMALL DIMENSION

Order-No.: 1121.d_1.l_1



Material:
Steel, surface hardened
Core strength: ≥ 900 N/mm²
Surface hardness: 61 + 3 HRC induction hardened
Hardness penetration: ≥ 1,8 mm

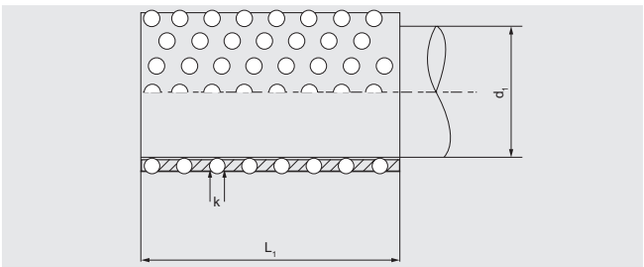
Execution:
Fine-ground, superfinished

Ordering example: d_1 = 6, l_1 = 40
1121.006.040

d_1	3	4 5	6	8
l_2	2	2	2	3
l_3	2	2	2	3
		l_1		
30	•			
40	•	•	•	
50	•	•	•	•
60	•	•	•	•
80	•	•	•	•
90				
100		•	•	•
112				
125			•	•
140			•	•
160			•	•

BALL CAGE, SMALL DIMENSION

Order-No.: 1234.



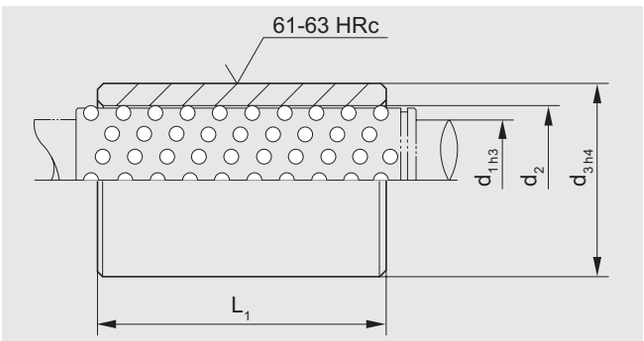
Material:
Cage: Brass
Balls: Steel hardened according to DIN 5401

Ordering example: d_1 = 5, L_1 = 20
1234.005.020

d_1	3	4	5	6	8
k	1	1	1	1	1
L_1	Total number of balls				
10	21	21	29	36	
15	35	35	49	61	61
20	49	49	69	69	69
25		64	89	89	89
30			109	109	109
35		120	144	144	
40					149

GUIDE BUSH FOR BALL BEARING, SMALL DIMENSION

Order-No.: 1254.



Material:
Roller bearing steel 100 Cr 6
Hardness: hardened to 60 + 4 HRC

Execution:
Guide bush bores d_2 fine-honed to IT3

Note:
Available in stainless steel upon request.

Ordering example: d_1 = 4, L_1 = 25
1254.004.025

d_1	3	4	5	6	8
d_2	5	6	7	8	10
d_3	7	8	10	11	14
			L_1		
10	•	•	•		
15	•	•	•	•	•
20	•	•	•	•	•
25		•	•	•	•
30			•	•	•
35				•	•
40					•

GUIDE PILLAR ENDWISE BOLT-ON TYPE, DIN 9825 / ISO 9182-2

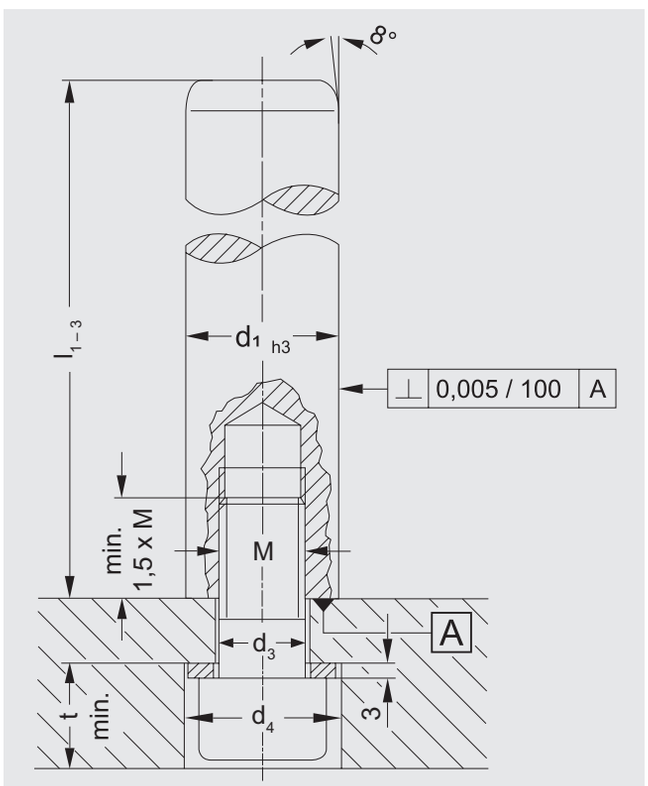
Order-No.: 113.d_1.L_1

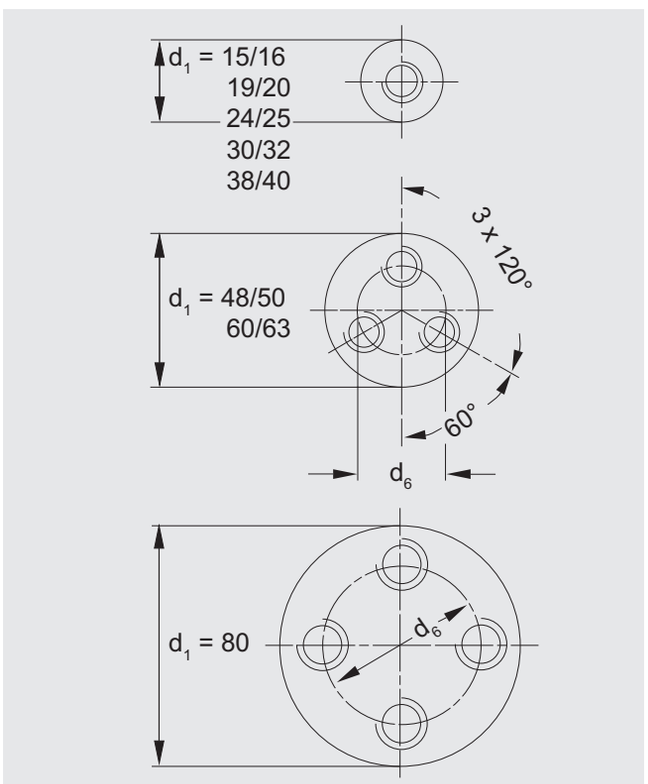
Material:
Steel surface hardened
Core strength: ≥ 900 N/mm²
Surface hardness: 60 + 3 HRC
Hardness penetration: ≥ 1,8 mm

Execution:
Fine-ground, superfinished

Screw tightening torque:
for M8 x 35 = 21 Nm
for M10 x 40 = 37 Nm
for M12 x 40 = 85 Nm
for M16 x 40 = 150 Nm
for M12 x 50 = 85 Nm
for M16 x 60 = 200 Nm

Ordering example: d_1 = 80, L_1 = 100
113.080.100





GUIDE PILLAR ENDWISE BOLT-ON TYPE, DIN 9825 / ISO 9182-2

Order-No.: 113.d_1.L_1

d_1	15/16	19/20	24/25	30/32	38/40	48/50	60/63	80
d_3	9	11	14	18	18	14	18	18
d_4	17	20	22	28	28	22	28	28
d_6	–	–	–	–	–	28	34	54
t	12	14	16	20,5	20,5	16	20,5	20,5
M	M8	M10	M12	M16	M16	M12	M16	M16
Screw	M8 x 35	M10 x 40	M12 x 40	M16 x 40	M16 x 40	M12 x 50	M16 x 60	M16 x 60
				L_1				
90	•							
100	•	•	•					
112	•	•	•					
125	•	•	•	•				
140	•	•	•	•				
160	•	•	•	•	•			
180	•	•	•	•	•	•		
200	•	•	•	•	•	•		
224	•	•	•	•	•	•		
250	•	•	•	•	•	•	•	
280	•	•	•	•	•	•	•	•
315	•	•	•	•	•	•	•	•
355	•	•	•	•	•	•	•	•
400		•	•	•	•	•	•	•
450			•	•	•	•	•	•
500			•	•	•	•	•	•
550					•	•	•	•
600					•	•	•	•
700					•	•	•	•
800					•	•	•	•

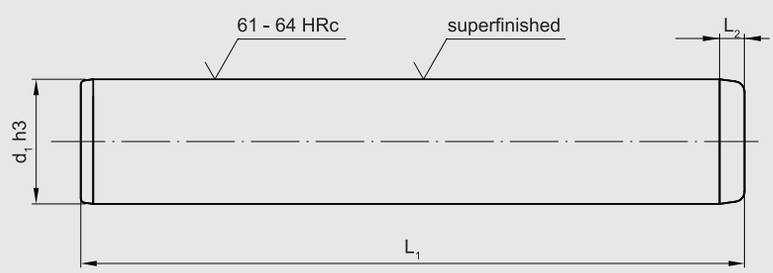
GUIDE PILLAR DIN 9825 / ISO 9182-2

Order-No.: 1121.d_1.L_1

Material:
Steel, surface hardened
Core strength: ≥ 900 N/mm²
Surface hardness: 61 + 3 HRC induction hardened
Hardness penetration: ≥ 1,8 mm

Execution:
Fine-ground, superfinished

Ordering example: d_1 = 40, L_1 = 200
1121.040.200



d_1	10	11	12	15	16	19	20	24	25	30	32	38	40	48	50	60	63	80
L_2	3	3	3	4	4	4	4	6	6	6	6	6	6	8	8	8	8	8
L_1																		
80		•	•															
90	•	•	•	•	•													
100	•	•	•	•	•	•	•	•	•									
112	•	•	•	•	•	•	•	•	•									
125	•	•	•	•	•	•	•	•	•	•	•							
140	•	•	•	•	•	•	•	•	•	•	•							
160		•	•	•	•	•	•	•	•	•	•	•	•					
180				•	•	•	•	•	•	•	•	•	•	•	•			
200				•	•	•	•	•	•	•	•	•	•	•	•			
224				•	•	•	•	•	•	•	•	•	•	•	•			
250				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
280				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
315				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
355				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
400						•	•	•	•	•	•	•	•	•	•	•	•	•
450								•	•	•	•	•	•	•	•	•	•	•
500								•	•	•	•	•	•	•	•	•	•	•
550												•	•	•	•	•	•	•
630												•	•	•	•	•	•	•

More lengths upon request

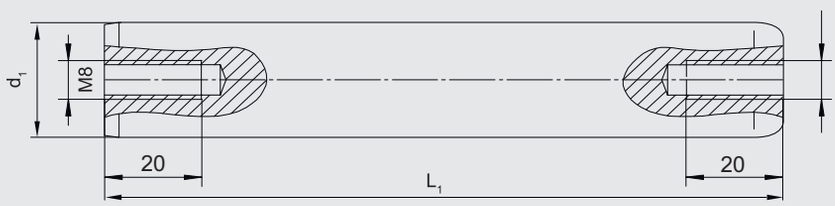
GUIDE PILLAR WITH INTERNAL THREAD ON BOTH SIDES, DIN 9825 / ISO 9182-2

Order-No.: 1122.d_1.L_1

Material:
Steel, surface hardened
Core strength: ≥ 900 N/mm²
Surface hardness: 60 + 3 HRC induction hardened
Hardness penetration: ≥ 1,8 mm

Execution:
Fine-ground, superfinished

Ordering example d_1 = 40, L_1 = 200
1122.040.200



d_1	10	11	12	15	16	19	20	24	25	30	32	38	40	48	50	60	63	80
									L_1									
80		•	•															
90	•	•	•	•	•													
100	•	•	•	•	•	•	•	•	•									
112	•	•	•	•	•	•	•	•	•									
125	•	•	•	•	•	•	•	•	•	•	•							
140	•	•	•	•	•	•	•	•	•	•	•							
160		•	•	•	•	•	•	•	•	•	•	•	•					
180				•	•	•	•	•	•	•	•	•	•	•	•			
200				•	•	•	•	•	•	•	•	•	•	•	•			
224				•	•	•	•	•	•	•	•	•	•	•	•			
250				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
280				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
315				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
355				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
400						•	•	•	•	•	•	•	•	•	•	•	•	•
450								•	•	•	•	•	•	•	•	•	•	•
500								•	•	•	•	•	•	•	•	•	•	•
550												•	•	•	•	•	•	•
630												•	•	•	•	•	•	•

More lengths upon request.

GUIDE PILLAR WITH COLLAR, SCREW CLAMP RETENTION, DIN 9825 / ISO 9182-5

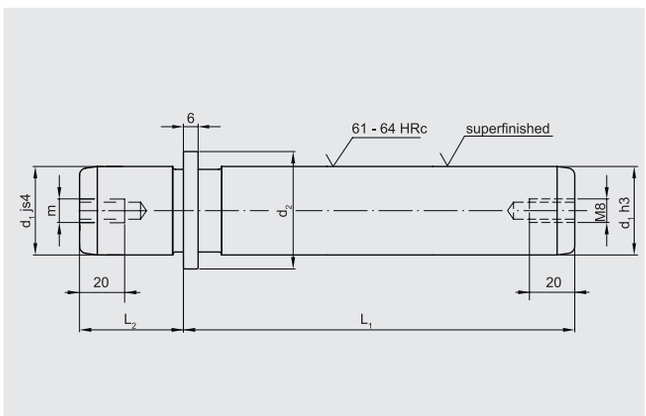
Order-No.: 1111.d_1.L_1

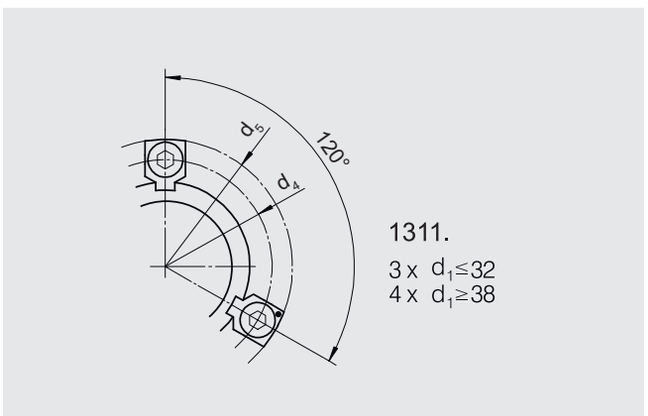
Material:
Steel, surface hardened
Core strength: ≥ 900 N/mm²
Surface hardness: 60 + 3 HRC induction hardened
Hardness penetration: ≥ 1,8 mm

Execution:
Fine-ground, superfinished

Note:
Screw clamp 1311. has to be ordered separately:
– **up to** d_1 = 32 with three screw clamps
– **from** d_1 = 38 with four screw clamps

Ordering example: d_1 = 40, L_1 = 200
1111.040.200





d_1	15-16	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	22	25	32	40	50	63	80	95
d_4	33	36	43	51	61	74	91	106
d_5	45,7	48,7	55,7	63,7	73,7	86,7	103,7	118,4
m	M8	M8	M8	M8	M8	M8	M8	M12
L_2	20	23	30	37	37	47	47	60
				L_1				
100	•	•	•					
112	•	•	•	•				
125	•	•	•	•	•			
140	•	•	•	•	•	•		
160	•	•	•	•	•	•	•	
180	•	•	•	•	•	•	•	
200	•	•	•	•	•	•	•	•
224			•	•	•	•	•	•
250			•	•	•	•	•	•
280				•	•	•	•	•
315				•	•	•	•	•
355					•	•	•	•
400						•	•	•

GUIDE PILLAR WITH COLLAR "ECO-LINE"

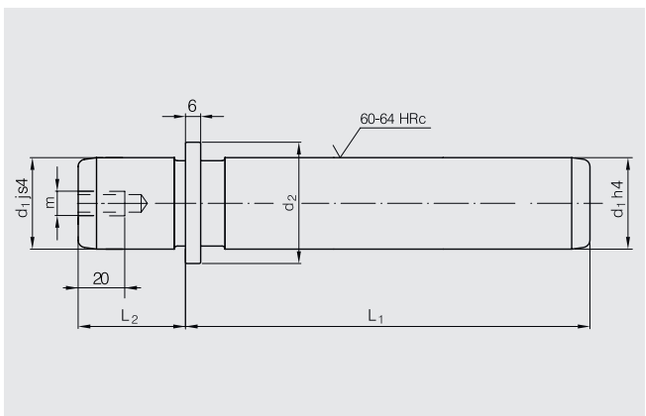
Order-No.: 1112.d_1.L_1

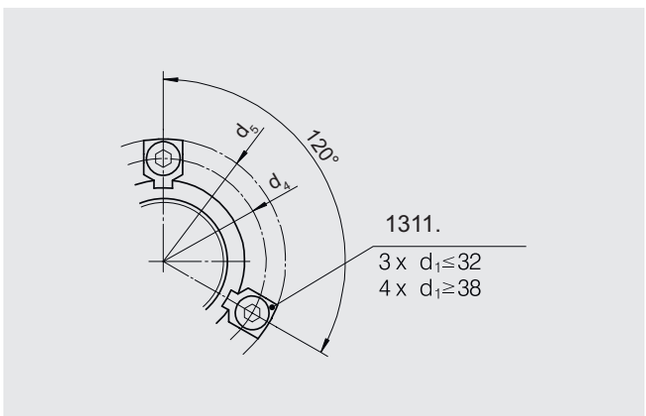
Material:
Steel, surface hardened
Surface hardness: 60 + 4 HRC
Hardness penetration: 1,5 + 1 mm

Execution:
Fine-ground, superfinished

Note:
Guide pillars only recommended for use with sliding guides.
Screw clamp 1311. has to be ordered separately:
– **up to** d_1 = 32 with three screw clamps
– **from** d_1 = 38 with four screw clamps

Ordering example: d_1 = 40, L_1 = 200
1112.040.200





d_1	15-16	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	22	25	32	40	50	63	80	95
d_4	33	36	43	51	61	74	91	106
d_5	45,7	48,7	55,7	63,7	73,7	86,7	103,7	118,4
m	M8	M8	M8	M8	M8	M8	M8	M12
L_2	20	23	30	37	37	47	47	60
				L_1				
100	•	•	•					
112	•	•	•	•				
125	•	•	•	•	•			
140	•	•	•	•	•	•		
160	•	•	•	•	•	•	•	
180	•	•	•	•	•	•	•	
200	•	•	•	•	•	•	•	•
224			•	•	•	•	•	•
250			•	•	•	•	•	•
280				•	•	•	•	•
315				•	•	•	•	•
355					•	•	•	•
400						•	•	•

GUIDE PILLAR FOR LARGE TOOLS, DIN 9833 / ISO 9182-3

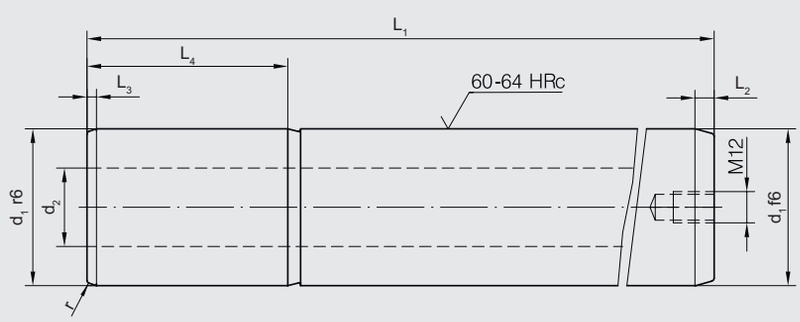
Order-No.: 114.d_1.L_1

Material:
Steel, surface hardened
Surface hardness: 60 + 4 HRC
Hardness penetration: 1,5 + 1 mm

Execution:
Ground
up to d_1= 80 **without** central hole
by d_1= 80 **with one** lifting thread M12
from d_1= 100 **with** central hole (through) and **with two** lifting threads M12

Note:
Locating bore H7.
This guide pillar is recommended to be used only with guide elements with solid lubricant.

Ordering example: d_1 = 40, L_1 = 200: 114.040.200



d_1	25	32	40	50	63	80	100	125	160
d_2	–	–	–	–	–	–	51	68	105
L_2	8	8	8	10	10	10	10	12	12
L_3	4	4	4	4	4	4	4	5	5
L_4	40	45	56	70	80	100	125	140	180
r	2	2	2	2,5	2,5	2,5	3	3	4
				L_1					
125	•	•							
140	•	•	•						
160	•	•	•	•					
180	•	•	•	•	•				
200	•	•	•	•	•				
224	•	•	•	•	•	•			
250		•	•	•	•	•	•		
280			•	•	•	•	•	•	
315				•	•	•	•	•	
355				•	•	•	•	•	
400					•	•	•	•	•
450						•	•	•	•
500						•	•	•	•
560									•

GUIDE PILLAR, CONICAL, DIN 9825 / ISO 9182-4, AFNOR

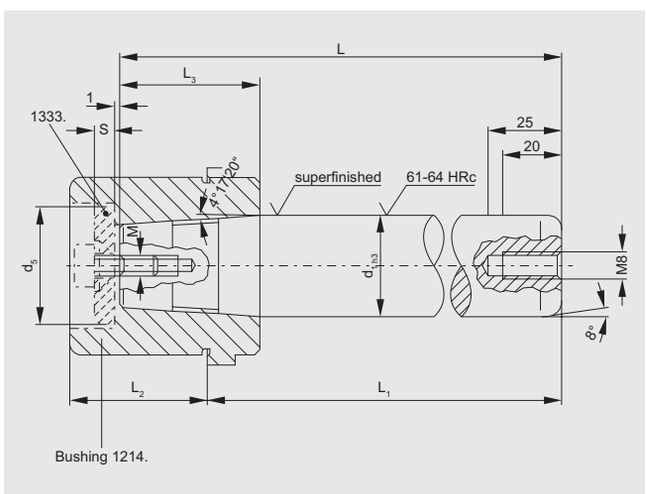
Order-No.: 116.d_1.L_1

Material:
Steel, surface hardened
Core strength: ≥ 900 N/mm²
Surface hardness: 61 + 3 HRC, induction hardened
Hardness penetration: ≥ 1,8 mm

Execution:
Fine-ground, superfinished

Note:
Demountable pillars with conical shaft 116. are recommended where frequent demounting and re-fitting is neccessary. Method of manufacturing entails that centre holes are not concentric with O.D. Retaining disc included.

Ordering example: d_1 = 40, L_1 = 200
116.040.200



d_1	19-20	24-25	30-32	38-40	48-50	60-63
M	M6	M8	M8	M8	M10	M12
L_2	30/37	37/47	37/47	47/60	47/60	60/77
L_3	38	35	48	48	59	69
L_1	L					
100	126	123				
112	138	135	145			
125	151	158	158	158		
140	166	163	173	173	180	
160	186	183	193	193	200	211
180	206	203	213	213	220	231
200	226	223	233	233	240	251
224		247	257	257	264	275
250		273	283	283	290	301
280			313	313	320	331
315				348	355	366
355					395	406

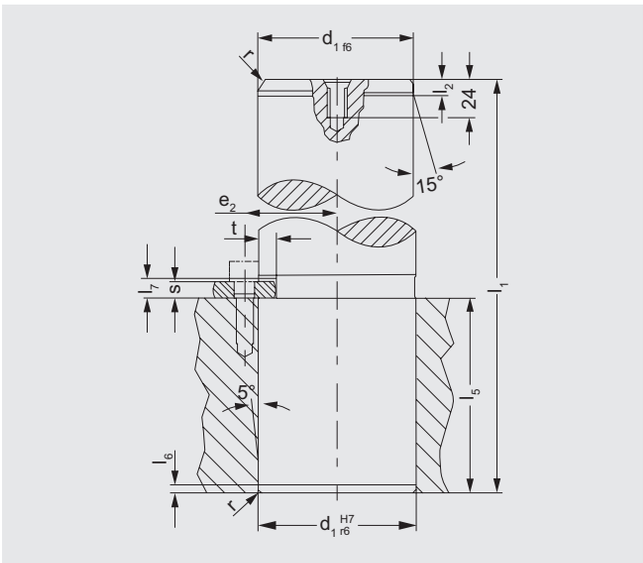
GUIDE PILLAR WITH GROOVE, ACCORDING TO VW-STANDARD

Order-No.: 119.d_1.l_1

Material:
Steel, surface hardened
Surface hardness: 60 + 4 HRC
Hardness penetration: 1,5 + 1 mm

Note:
Guide pillar is recommended to be used only with guide elements with solid lubricant.

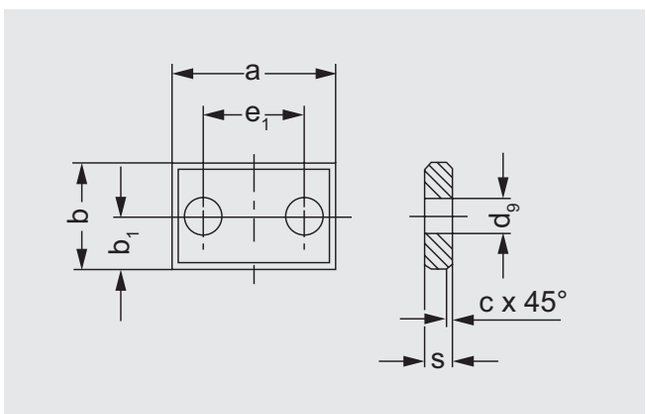
Ordering example: d_1 = 25, l_1 = 125: 119.025.125



d_1	25	32	40	50	63	80
l_2	8	8	8	10	10	10
l_5	40	45	56	70	80	100
l_6	4	4	4	4	4	4
l_7	7	7	10	10	12	12
r	2	2	2	2,5	2,5	3
e_2	20,5	24	29,5	33,5	43	50
t	3	3	4	4	6,5	8
			l_1			
125	•	•				
140	•	•	•			
160	•	•	•	•		
180	•	•	•	•	•	
200	•	•	•	•	•	
224	•	•	•	•	•	•
250		•	•	•	•	•
280			•	•	•	•
315				•	•	•
355				•	•	•
400					•	•
450						•
500						•

LOCATING PLATE FOR GUIDE PILLAR, ACCORDING TO VW-STANDARD

Order-No.: 119.1.D_1



Material:
Steel

Note:
Screws are not included.
Use socket cap screws DIN EN ISO 4762.

Ordering example: D_1 = 25 u. 32
119.1.02

Order-No.:	Pillar-ø (=D_1)	a	b	s	c	b_1	e_1	d_9
119.1.02	**25 u. 32**	40	20	5	1	10	20	9
119.1.04	**40 u. 50**	48	25	8	2	12,5	24	11
119.1.06	**63 u. 80**	60	34	10	2	17	30	14

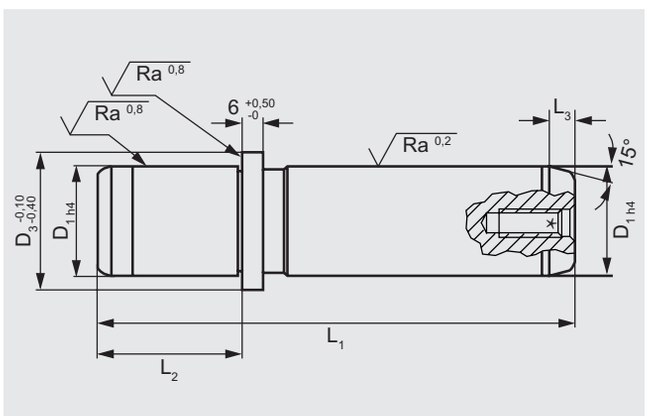
GUIDE PILLAR WITH COLLAR, ACCORDING TO WDX-STANDARD

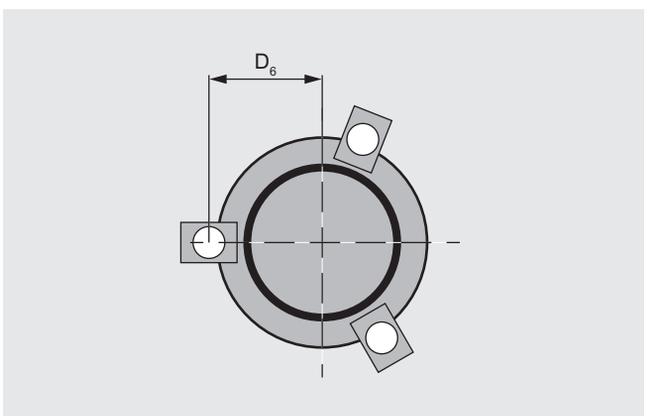
Order-No.: 222.D_1.L_1

Material:
Steel 1.7131
Surface hardness: 60 + 62 HRC

Note:
From ø 80 with one lifting thread M12.

Ordering example: D_1 = 40, L_1 = 100
222.040.100





D_1	D_3	L_3	L_2	D_6	L_1																
					100	110	120	130	140	150	160	170	180	200	220	240	260	280	300	320	360	400
25	32	6	40	34	•	•	•	•	•	•	•	•	•	•								
32	40	8	42	37,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•				
40	50	8	56	41,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
50	60	10	70	46,5		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
63	80	10	80	53				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
80 (M12)	90	10	100	61,5				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
100 (M12)	110	10	125	71,5									•	•	•	•	•	•	•	•	•	•

All specifications in mm. *from ø 80 = one lifting thread M12.

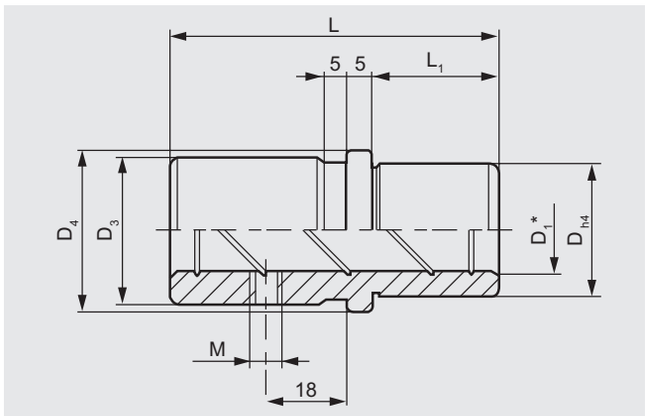
DEMOUNTABLE BUSH ACCORDING TO DME / EOC / LAMINA, CARBONITRIDED

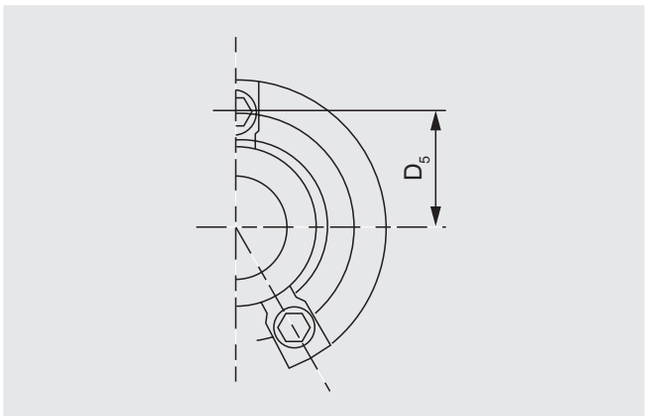
Order-No.: 2213.5.D1 / 2213.4.D1 / 2213.1.D1

Material:
Sintered metal
Hardness: 60 + 62 HRC

Ordering example: D1 = 18
2213.5.018
2213.4.018
2213.1.018

Suitable DME/EOC/Lamina-Norm-Pillars are available upon request.





2213.5. **short version**

D1	L	L1	D	D3	D4	D5
18 – 19	50	18	28	31	34	20,5
24 – 25	55	23	38	40	44	25,5
30 – 32	60	26	45	49	53	31,5
40 – 42	67	30	54	59	63	36,5
50 – 52	75	35	65	75	79	44,5
63	90	48	81	87	92	51

2213.4. **long version**

D1	L	L1	D	D3	D4	D5
18 – 19	70	27	28	31	34	20,5
24 – 25	80	32	38	40	44	25,5
30 – 32	90	37	45	49	53	31,5
40 – 42	100	47	54	59	63	36,5
50 – 52	110	57	65	75	79	44,5
63	130	67	81	87	92	51

All specifications in mm.

2213.1. **medium version**

D1	L	L1	D	D3	D4	D5
18 – 19	70	18	28	31	34	20,5
24 – 25	80	23	38	40	44	25,5
30 – 32	90	26	45	49	53	31,5
40 – 42	100	30	54	59	63	36,5
50 – 52	110	35	65	75	79	44,5
63	130	48	81	87	92	51

*

D1*	Tolerance
15/16	+0,007
	+0,015
19/20	+0,009
	+0,017
24/25	+0,010
	0,018
30/32	+0,011
	+0,019
38/40	+0,012
	+0,020
48/50	+0,013
	+0,022
60/63	+0,014
	+0,023
80	+0,015
	+0,024

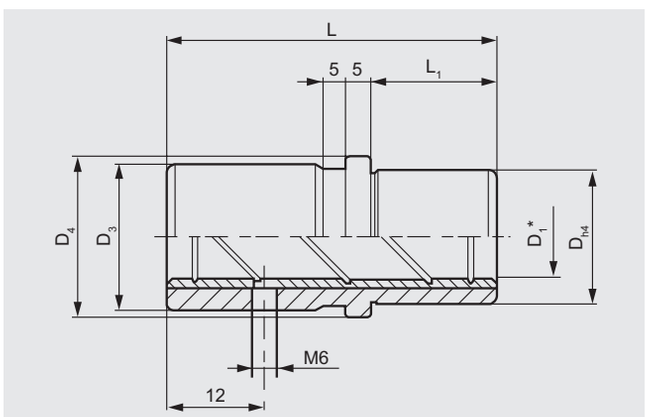
DEMOUNTABLE BUSH ACCORDING TO DME / EOC / LAMINA, STEEL AND BRONZE

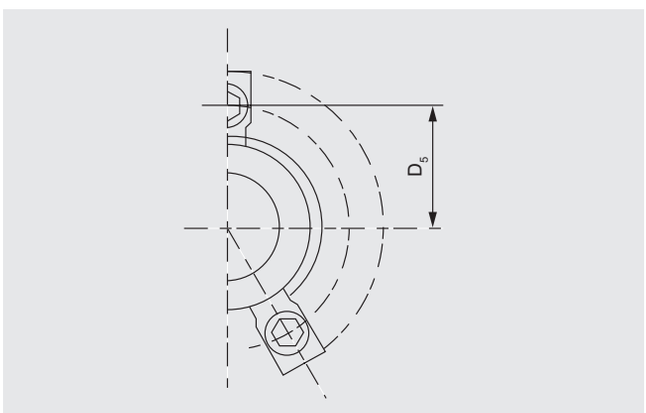
Order-No.: 2211.5.D1 / 2211.4.D1 / 2211.1.D1

Material:
Steel with Bronze
Hardness: 60 + 62 HRC

Ordering example: D1 = 18
2211.5.018
2211.4.018
2211.1.018

Suitable DME/EOC/Lamina-Norm-Pillars are available upon request.





2211.5. **short version**

D1	L	L1	D	D3	D4	D5
18 – 19	50	18	28	31	34	20,5
24 – 25	55	23	38	40	44	25,5
30 – 32	60	26	45	49	53	31,5
40 – 42	67	30	54	59	63	36,5
50 – 52	75	35	65	75	79	44,5
63	90	48	81	87	92	51
80	100	48	100	108	111	60,5

2211.4. **medium version**

D1	L	L1	D	D3	D4	D5
18 – 19	70	18	28	31	34	20,5
24 – 25	80	23	38	40	44	25,5
30 – 32	90	26	45	49	53	31,5
40 – 42	100	30	54	59	63	36,5
50 – 52	110	35	65	75	79	44,5
63	130	48	81	87	92	51
80	150	48	100	108	111	60,5

2211.1. **long version**

D1	L	L1	D	D3	D4	D5
18 – 19	70	27	28	31	34	20,5
24 – 25	80	32	38	40	44	25,5
30 – 32	90	37	45	49	53	31,5
40 – 42	100	47	54	59	63	36,5
50 – 52	110	57	65	75	79	44,5
63	130	67	81	87	92	51
80	150	77	100	108	111	60,5

All specifications in mm.

*

D1*	Tolerance
15/16	+0,007
	+0,015
19/20	+0,009
	+0,017
24/25	+0,010
	0,018
30/32	+0,011
	+0,019
38/40	+0,012
	+0,020
48/50	+0,013
	+0,022
60/63	+0,014
	+0,023
80	+0,015
	+0,024

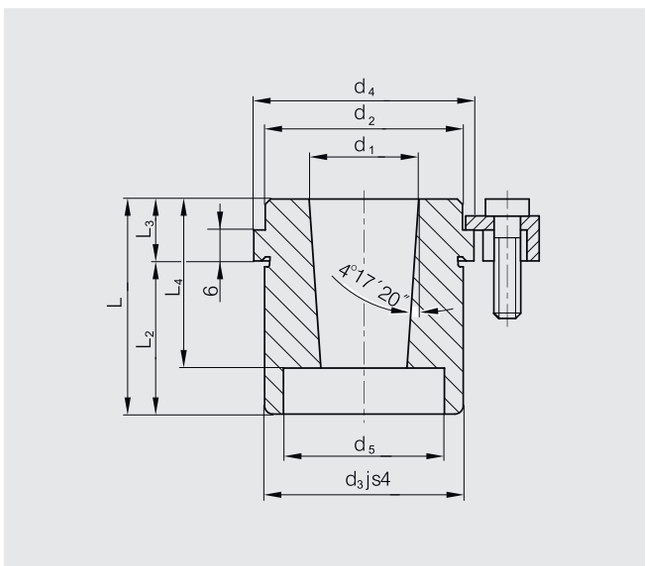
RETAINING BUSH FOR GUIDE PILLAR CONICAL, DIN 9825/ISO 9182-4

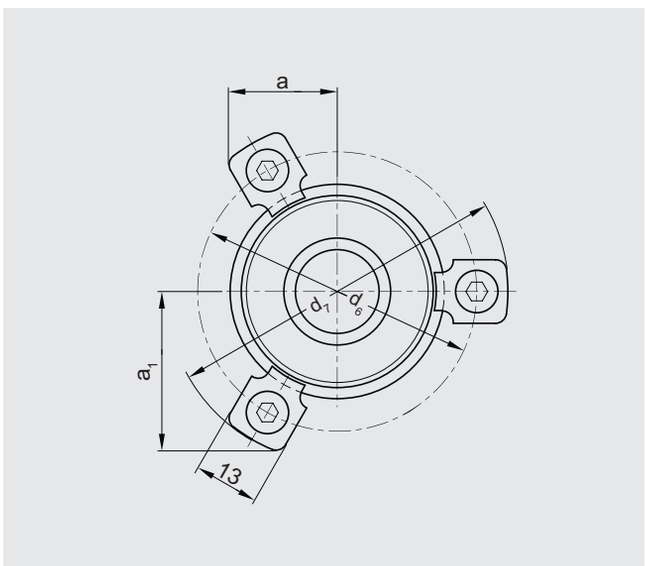
Order-No.: 1214.d_1.L_2

Material:
16 MnCr5 case hardened 58 ± 2 HRC
Hardness penetration: ≥ 0,8 – 1,0 mm

Execution:
Retaining bore, outside diameter and shoulder precision ground.

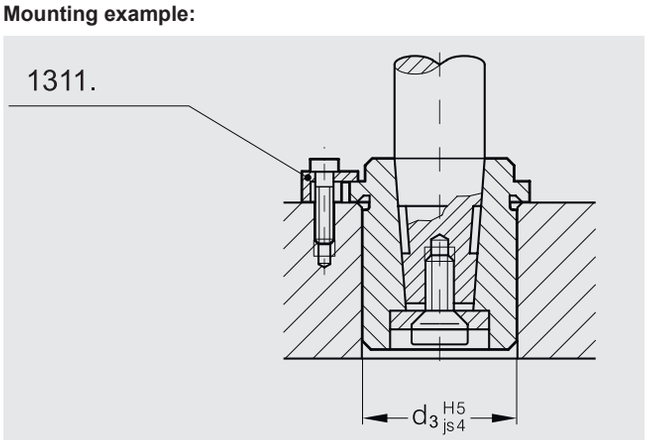
Ordering example: d_1 = 24, L_2 = 37
1214.024.037





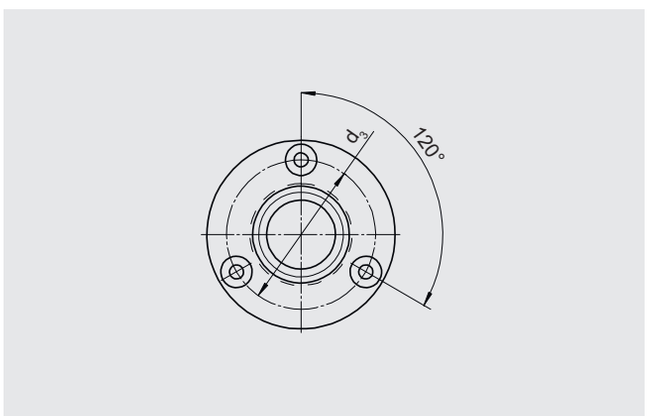
d_1	19-20	24-25	30-32	38-40	48-50	60-63
d_2	32	40	48	58	70	85
d_3	32	40	48	58	70	85
d_4	40	48	56	66	80	95
d_5	23	26	33	41	51	64
d_6	53	60	67	77	91	106
d_7	65,7	72,7	79,7	89,7	103,7	18,7
a	20,9	22,65	24,4	35,3	40,2	45,5
a_1	30,3	33,4	36,4	35,3	40,2	45,5
L	42/49	49/59	52/62	62/75	65/78	78/95
L_2	**30/37**	**37/47**	**37/47**	**47/60**	**47/60**	**60/77**
L_3	12	12	15	15	18	18
L_4	39	36	49	49	59	70

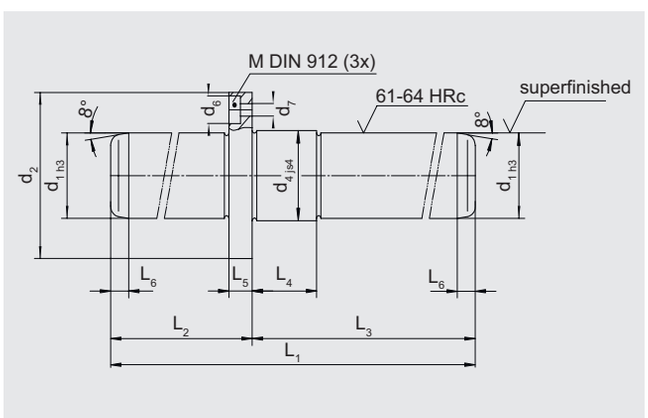
Mounting example:



DEMOUNTABLE GUIDE PILLAR WITH CENTRE FIXING

Order-No.: 117.d_1.L_2.L_3





Material:
Steel, surface hardened
Core strength: ≥ 900 N/mm2
Surface hardness: 61 + 3 HRC induction hardened
Hardness penetration: ≥ 2,0 + 1,6 mm

Execution: Precision ground

Note: Use socket cap screws DIN EN ISO 4762 12.9.

Ordering example: d_1 = 40, L_2 = 90, L_3 = 110
117.040.090.110

d_1	d_2	d_3	d_4	d_6	d_7	t	L_1	L_2	L_3	L_4	L_5	L_6
12	28	20	13	6	3,4	3,4	90	**40**	**50**	12	6	3
							100	**40**	**60**			
							110	**50**	**60**			
							120	**50**	**70**			
							130	**60**	**70**			
							140	**70**	**70**			
16	38	28	18	8	4,5	4,6	140	**60**	**80**	16	8	4
							150	**60**	**90**			
							160	**70**	**90**			
							170	**70**	**100**			
							180	**80**	**100**			
							190	**90**	**100**			
19	42	32	22	8	4,5	4,6	160	**70**	**90**	20	8	4
							170	**70**	**100**			
							180	**80**	**100**			
							190	**80**	**110**			
							200	**90**	**110**			
							210	**100**	**110**			
25	48	38	26	8	4,5	4,6	180	**80**	**100**	22	8	6
							190	**80**	**110**			
							200	**90**	**110**			
							210	**90**	**120**			
							220	**100**	**120**			
							230	**110**	**120**			
32	60	49	34	10	5,5	5,7	180	**80**	**100**	25	10	7
							190	**80**	**110**			
							200	**90**	**110**			
							210	**90**	**120**			
							220	**100**	**120**			
							230	**100**	**130**			
							240	**110**	**130**			
40	70	56	42	11	6,6	6,8	200	**90**	**110**	27	12	7
							210	**90**	**120**			
							220	**100**	**120**			
							230	**100**	**130**			
							240	**110**	**130**			
							250	**110**	**140**			
							260	**120**	**140**			

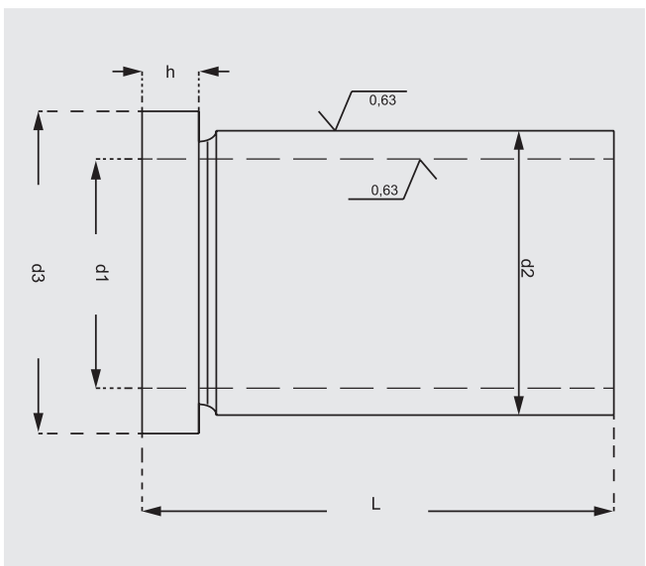
GUIDE BUSH, SELF-LUBRICATING, SUPERCOAT

Order-No.: 3366.d_2.d_1.L

Material:
Steel 18 Ni Cr Mo 5, hardened 60-62 HRC
Coating: SUPERCOAT self-lubricating (optional)

Execution:
Precision ground, locating bore ISO H7

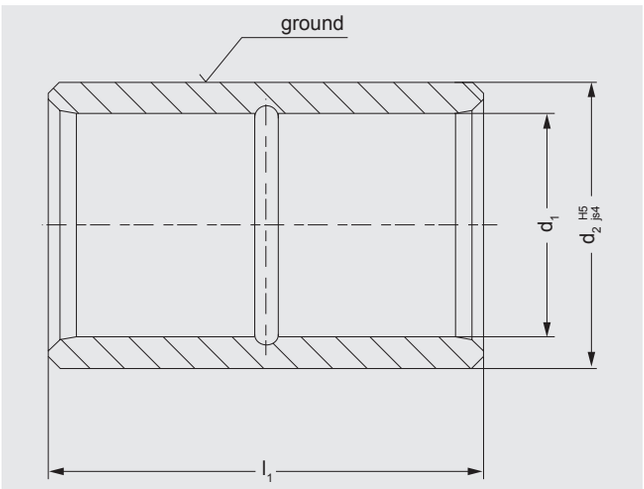
Ordering example: d_2 = 20, d_1 = 15, L = 27
3366.20.15.27



d_1	10	12	15	16	19	20	24	25	30	32
d_2	16	16	20	20	26	26	30	30	40	40
$d_{3-0,5}$	20	20	25	25	31	31	35	35	46	46
$h_{-0,1}$	3,5	3,5	6	6	6	6	6	6	6	6
					L					
12	•	•								
17	•	•	•	•						
22	•	•	•	•	•	•				
27	•	•	•	•	•	•	•	•		
36	•	•	•	•	•	•	•	•	•	•
46			•	•	•	•	•	•	•	•
56							•	•	•	•

GUIDE BUSH, SINTERED FERRITE CARBONITRIDED WITH LONG-TERM LUBRICATION, ISO 9448-2

Order-No.: 1241.d_1.L_1



Material:
Sintered ferrite of high purity, carbonitrided, long-term lubrication.

Execution:
Bearing surfaces and outside diameter precision ground

Note:
The position of the bearing is given by push fit holes tolerance H5. The adhesive provides optimum push retention whilst offering the following **advantages:**
- high accuracy and stiffness
- no problems to find position when changing bushings.

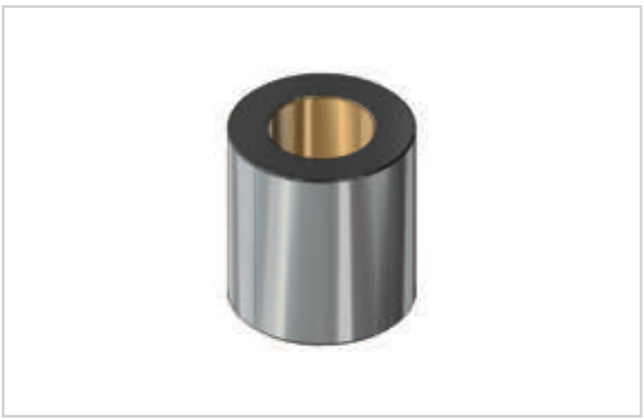
We do not recommend to press fit for the same reasons mentioned above.

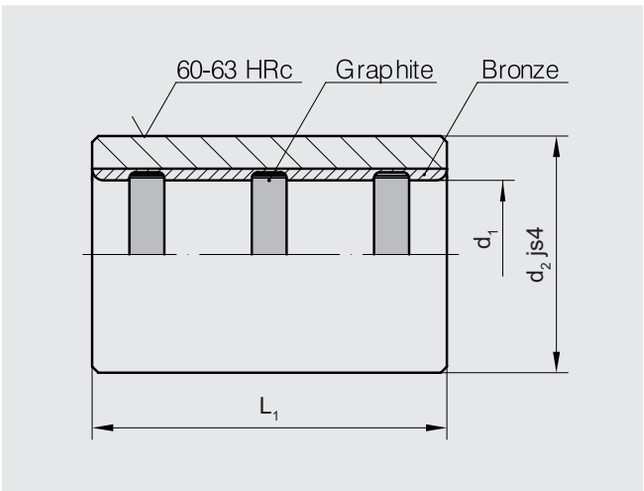
Ordering example: d_1 = 15, L_1 = 23
1241.15.02

d_1	8	11-12	15-16	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	13,7	22	28	32	40	48	58	70	85	95,7
					L_1					
15	•									
23		•	•	•	•					
30		•	•	•	•	•	•			
37		•	•	•	•	•	•	•		
47			•	•	•	•	•	•		
60			•	•	•	•	•	•	•	•
77				•	•	•	•	•	•	
95						•	•	•	•	
110										•
120							•	•	•	•

GUIDE BUSH STEEL / BRONZE, WITH SOLID LUBRICATION RINGS

Order-No.: 1242.d_1.L_1





Material:
1.0503, Bronze with solid lubricant

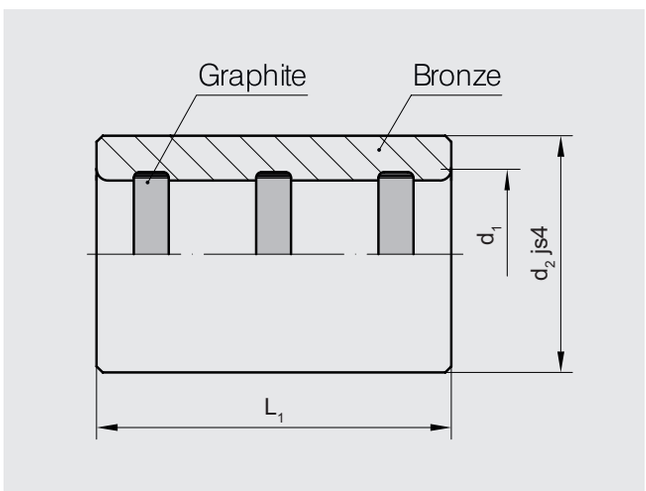
Execution:
Bearing surfaces and outside diameter precision ground.

Ordering example: d_1 = 15, L_1 = 23
1242.015.023

d_1	15-16	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	28	32	40	48	58	70	85	105
				L_1				
15								
23	•	•	•					
30	•	•	•	•	•			
37	•	•	•	•	•	•		
47	•	•	•	•	•	•		
60	•	•	•	•	•	•	•	•
77		•	•	•	•	•	•	
95				•	•	•	•	
110								•
120					•	•	•	•

GUIDE BUSH "ECO-LINE", BRONZE WITH SOLID LUBRICATION RINGS, ISO 9448-2

Order-No.: 1243.d_1.L_1



Material:
Bronze with solid lubricant, oilless lubricating.

Execution:
Locating bore H7.

Ordering example: d_1 = 15, L_1 = 23
1243.015.023

d_1	11-12	15-16	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	22	28	32	40	48	58	70	85	105
					L_1				
15									
23	•	•	•	•					
30	•	•	•	•	•	•			
37	•	•	•	•	•	•	•		
47		•	•	•	•	•	•		
60		•	•	•	•	•	•	•	•
77			•	•	•	•	•	•	
95					•	•	•	•	
110									•
120						•	•	•	•

HEADED GUIDE BUSH, BRONZE COATED, ISO 9448-6, TYPE 1

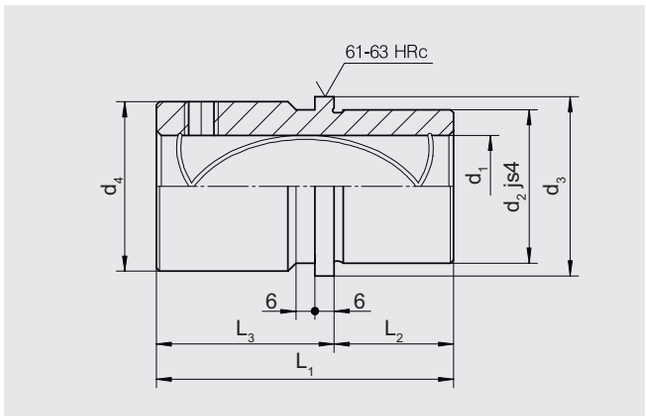
Order-No.: 1211.1.d_1

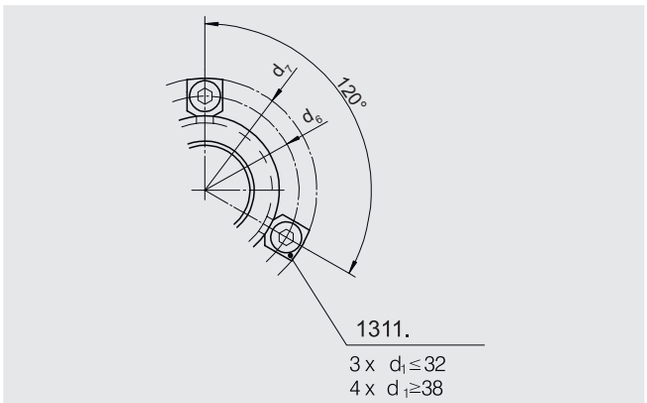
Material:
1.0503, d_4 and d_2 induction hardened 500 + 100 HV 10

Execution:
Bronze coated internal bore.
Diameter d3 and collar face precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1211.1.032





d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	39	46	53	63	77	92	115
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	59	79	93	108	127	150	150
L_2	23	23	30	37	47	60	60
L_3	36	56	63	71	80	90	90

HEADED GUIDE BUSH, BRONZE COATED, ISO 9448-6, TYPE 4

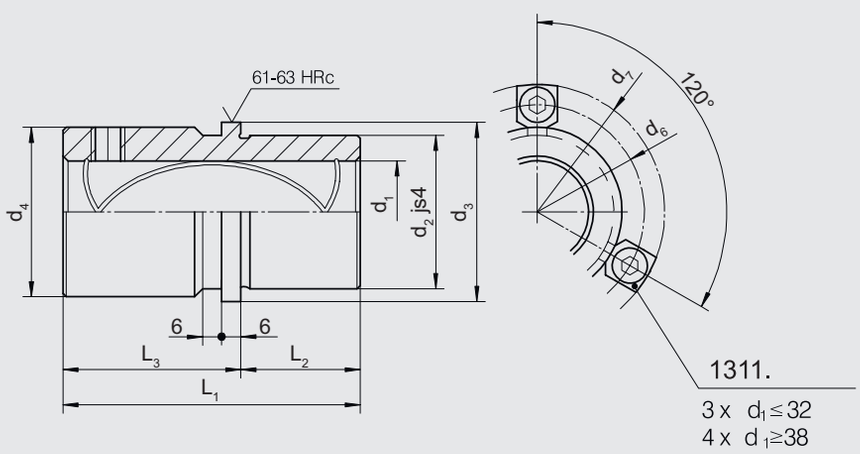
Order-No.: 1211.4.d_1

Material:
1.0503, d_4 and d_2 induction hardened 500 + 100 HV 10

Execution:
Bronze coated internal bore.
Diameter d3 and collar face precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1211.4.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	39	46	53	63	77	92	115
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	43	59	75	82	97	116	120
L_2	23	23	30	37	47	60	66
L_3	20	36	45	45	50	56	60

HEADED GUIDE BUSH, BRONZE COATED, ISO 9448-6, TYPE 5

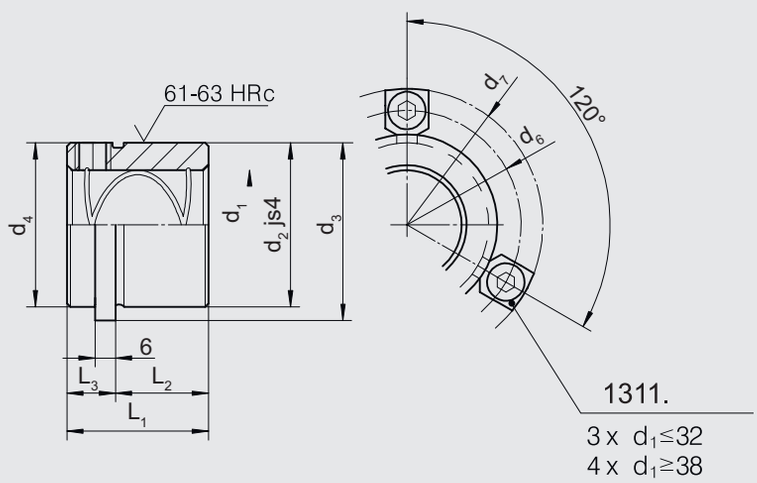
Order-No.: 1211.5.d_1

Material:
1.0503, d_4 and d_2 induction hardened 500 + 100 HV 10

Execution:
Bronze coated internal bore.
Diameter d3 and collar face precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1211.5.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	32	40	48	58	70	85	105
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	35	35	42	52	65	80	80
L_2	23	23	30	37	47	60	60
L_3	12	12	12	15	18	20	20

HEADED GUIDE BUSH "ECO-LINE", BRONZEPLATED, ISO 9448-6 TYPE 1

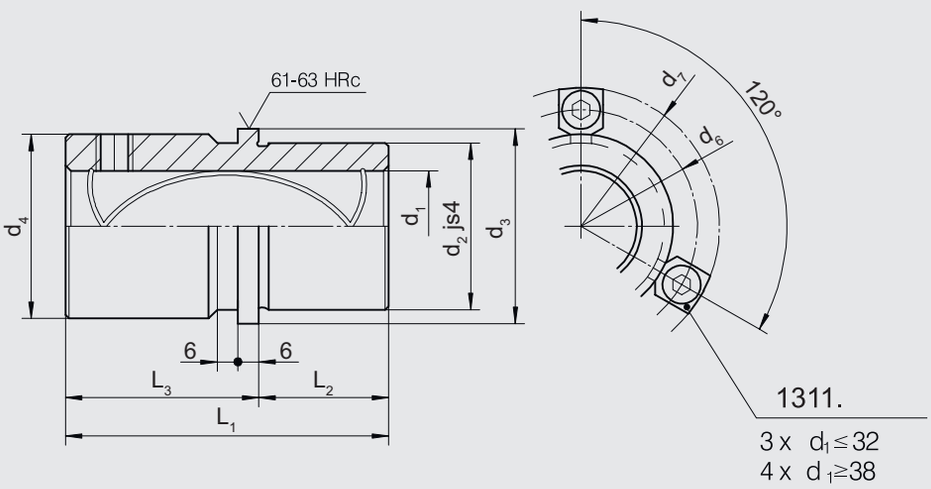
Order-No.: 1212.1.d_1

Material:
1.0503, d_4 and d_2 induction hardened 500 + 100 HV 10

Execution:
Bronze coated internal bore.
Outside diameter fine-ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1212.1.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	39	46	53	63	77	92	115
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	59	79	93	108	127	150	150
L_2	23	23	30	37	47	60	60
L_3	36	56	63	71	80	90	90

HEADED GUIDE BUSH "ECO-LINE", BRONZEPLATED, ISO 9448-6, TYPE 4

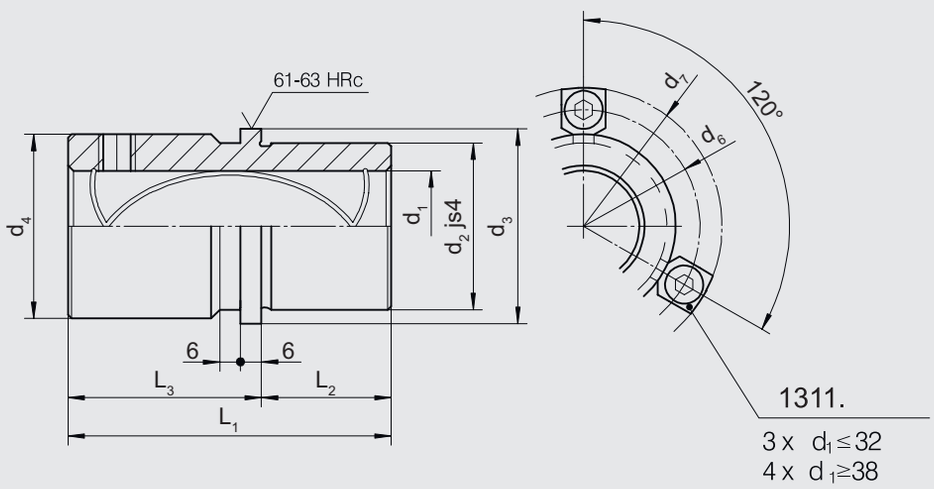
Order-No.: 1212.4.d_1

Material:
1.0503, d_4 and d_2 induction hardened 500 + 100 HV 10

Execution:
Bronze coated internal bore.
Outside diameter fine-ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1212.4.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	39	46	53	63	77	92	115
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	43	59	75	82	97	116	120
L_2	23	23	30	37	47	60	66
L_3	20	36	45	45	50	56	60

HEADED GUIDE BUSH "ECO-LINE", BRONZEPLATED, ISO 9448-6, TYPE 5

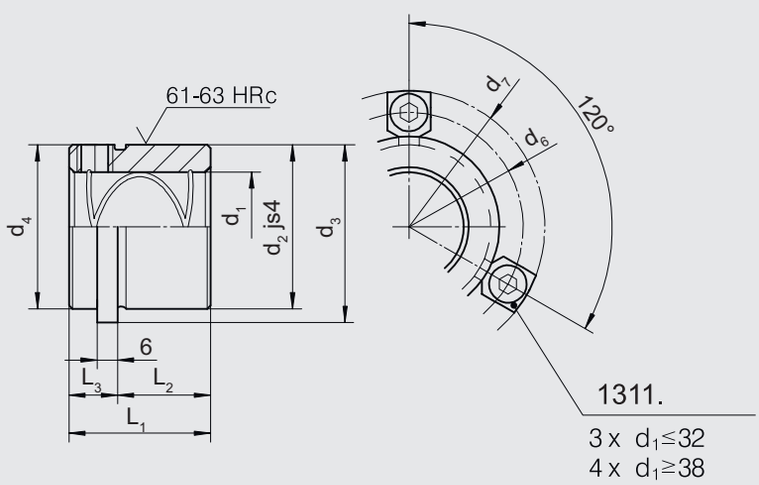
Order-No.: 1212.5.d_1

Material:
1.0503, d_4 and d_2 induction hardened 500 + 100 HV 10

Execution:
Bronze coated internal bore.
Outside diameter fine-ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1212.5.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	32	40	48	58	70	85	105
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	35	35	42	52	65	80	80
L_2	23	23	30	37	47	60	60
L_3	12	12	12	15	18	20	20

HEADED GUIDE BUSH, SINTERED FERRITE CARBONITRIDED WITH LONG-TERM LUBRICATION, ISO 9448-6, TYPE 1

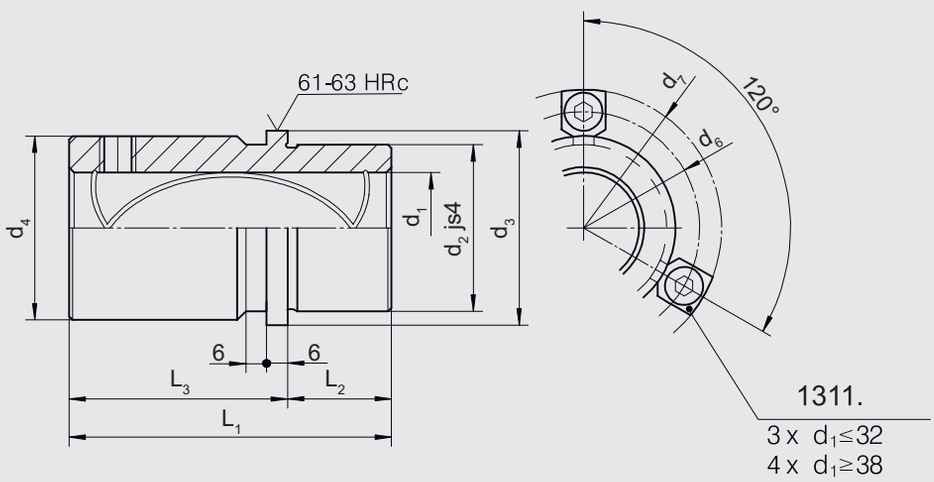
Order-No.: 1213.1.d_1

Material:
Sintered ferrite of high purity, carbonitrided, long-term lubrication.

Execution:
Bearing surfaces and outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.
Headed guide bushes carbonitrided are convertible with ball bearing guide bushes.

Ordering example: d_1 = 32
1213.1.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63
d_2	32	40	48	58	70	85
d_3	40	48	56	66	80	95
d_4	39	46	53	63	77	92
d_6	52	60	67	77	91	106
d_7	64,7	72,7	79,7	89,7	103,7	118,7
L_1	59	79	93	108	127	150
L_2	23	23	30	37	47	60
L_3	36	56	63	71	80	90

HEADED GUIDE BUSH, SINTERED FERRITE CARBONITRIDED WITH LONG-TERM LUBRICATION, ISO 9448-6 TYPE 2

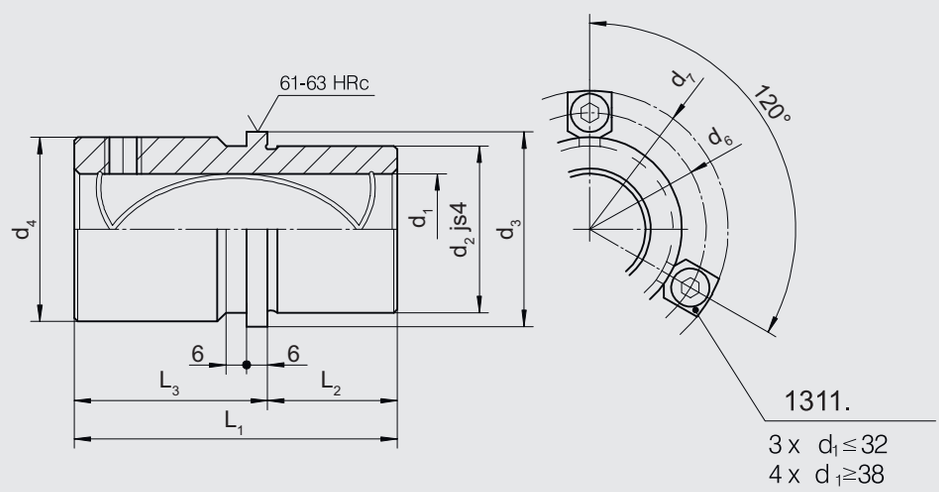
Order-No.: 1213.2.d_1

Material:
Sintered ferrite of high purity, carbonitrided, long-term lubrication.

Execution:
Bearing surfaces and outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.
Headed guide bushes carbonitrided are convertible with ball bearing guide bushes.

Ordering example: d_1 = 32
1213.2.032



d_1	24-25	30-32	38-40	48-50
d_2	40	48	58	70
d_3	48	56	66	80
d_4	46	53	63	77
d_6	60	67	77	91
d_7	72,7	79,7	89,7	103,7
L_1	80	93	110	131
L_2	30	37	47	60
L_3	50	56	63	71

HEADED GUIDE BUSH, SINTERED FERRITE CARBONITRIDED WITH LONG-TERM LUBRICATION, ISO 9448-6, TYPE 3

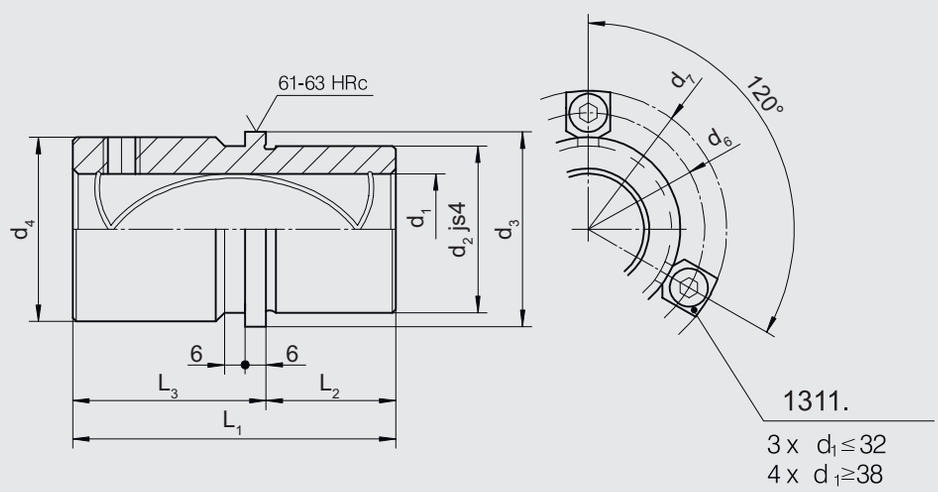
Order-No.: 1213.3.d_1

Material:
Sintered ferrite of high purity, carbonitrided, long-term lubrication.

Execution:
Bearing surfaces and outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.
Headed guide bushes carbonitrided are convertible with ball bearing guide bushes.

Ordering example: d_1 = 32
1213.3.032



d_1	24-25	30-32	38-40	48-50
d_2	40	48	58	70
d_3	48	56	66	80
d_4	46	53	63	77
d_6	60	67	77	91
d_7	72,7	79,7	89,7	103,7
L_1	55	69	79	96
L_2	30	37	47	60
L_3	25	32	32	36

HEADED GUIDE BUSH, SINTERED FERRITE CARBONITRIDED WITH LONG-TERM LUBRICATION, ISO 9448-6 TYPE 4

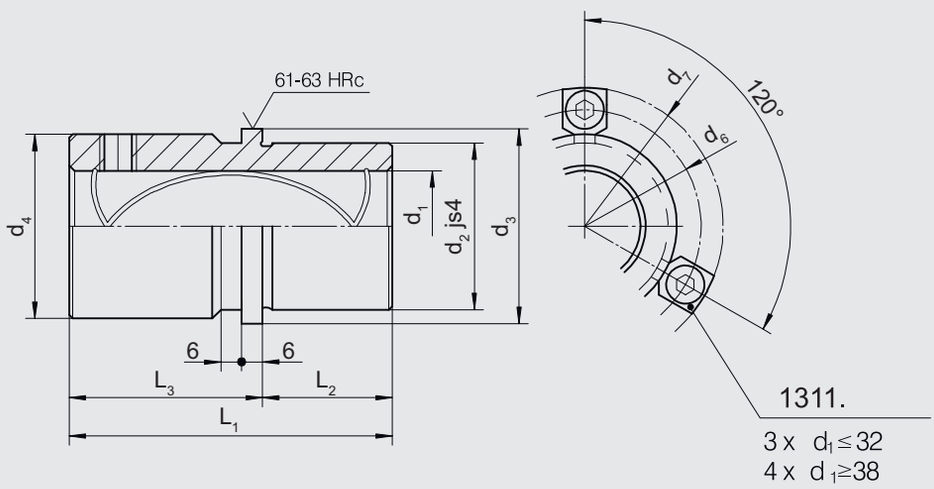
Order-No.: 1213.4.d_1

Material:
Sintered ferrite of high purity, carbonitrided, long-term lubrication.

Execution:
Bearing surfaces and outside diameter precision ground

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.
Headed guide bushes carbonitrided are convertible with ball bearing guide bushes.

Ordering example: d_1 = 32
1213.4.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63
d_2	32	40	48	58	70	85
d_3	40	48	56	66	80	95
d_4	32	40	48	58	70	85
d_6	52	60	67	77	91	106
d_7	64,7	72,7	79,7	89,7	103,7	118,7
L_1	43	59	75	82	97	116
L_2	23	23	30	37	47	60
L_3	20	36	45	45	50	56

HEADED GUIDE BUSH, SINTERED FERRITE CARBONITRIDED WITH LONG-TERM LUBRICATION, ISO 9448-6, TYPE 5

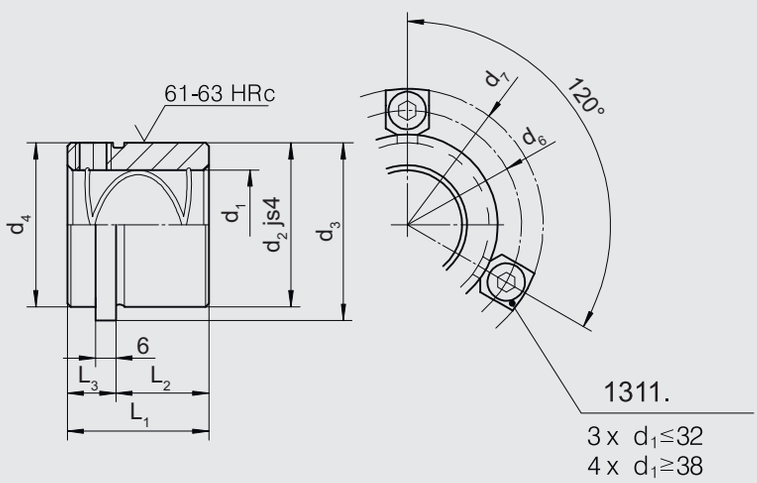
Order-No.: 1213.5.d_1

Material:
Sintered ferrite of high purity, carbonitrided, long-term lubrication.

Execution:
Bearing surfaces and outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.
Headed guide bushes carbonitrided are convertible with ball bearing guide bushes.

Ordering example: d_1 = 32
1213.5.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63
d_2	32	40	48	58	70	85
d_3	40	48	56	66	80	95
d_4	32	40	48	58	70	85
d_6	52	60	67	77	91	106
d_7	64,7	72,7	79,7	89,7	103,7	118,7
L_1	35	35	42	52	65	80
L_2	23	23	30	37	47	60
L_3	12	12	12	15	18	20

HEADED GUIDE BUSH "ECO-LINE", BRONZE WITH SOLID LUBRICANT RINGS, ISO 9448-6, TYPE 1

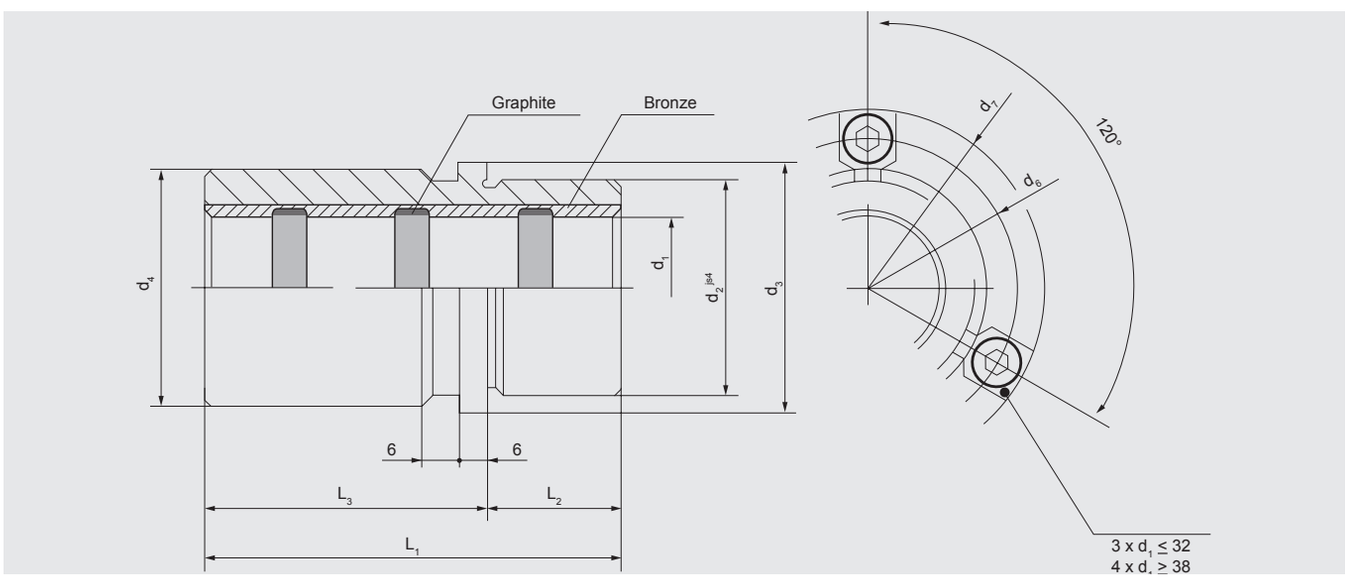
Order-No.: 1295.1.d_1

Material:
Bronze with solid lubricant, oilless lubricating

Execution:
Contact surface with solid lubricant rings. Outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1295.1.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	39	46	53	63	77	92	115
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	59	79	93	108	127	150	150
L_2	23	23	30	37	47	60	60
L_3	36	56	63	71	80	90	90

HEADED GUIDE BUSH "ECO-LINE", BRONZE WITH SOLID LUBRICANT RINGS, ISO 9448-6, TYPE 4

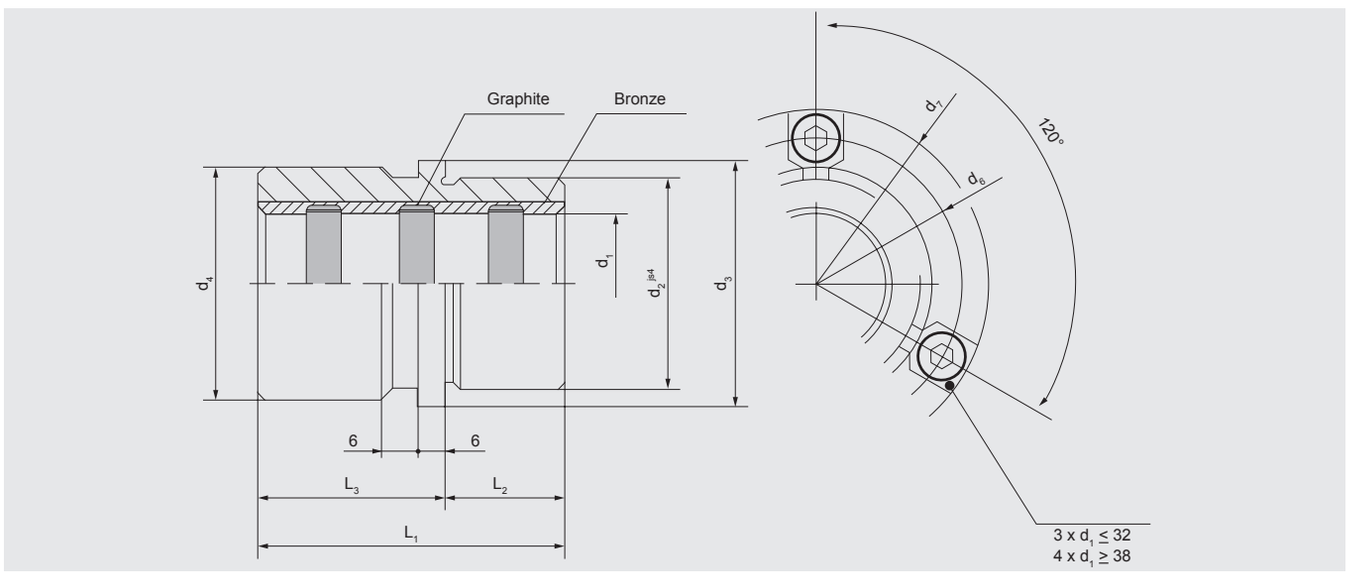
Order-No.: 1295.4.d_1

Material:
Bronze with solid lubricant, oilless lubricating

Execution:
Contact surface with solid lubricant rings. Outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1295.4.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	39	46	53	63	77	92	115
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	43	59	75	82	97	116	120
L_2	23	23	30	37	47	60	66
L_3	20	36	45	45	50	56	60

HEADED GUIDE BUSH "ECO-LINE", BRONZE WITH SOLID LUBRICANT RINGS, ISO 9448-6, TYPE 5

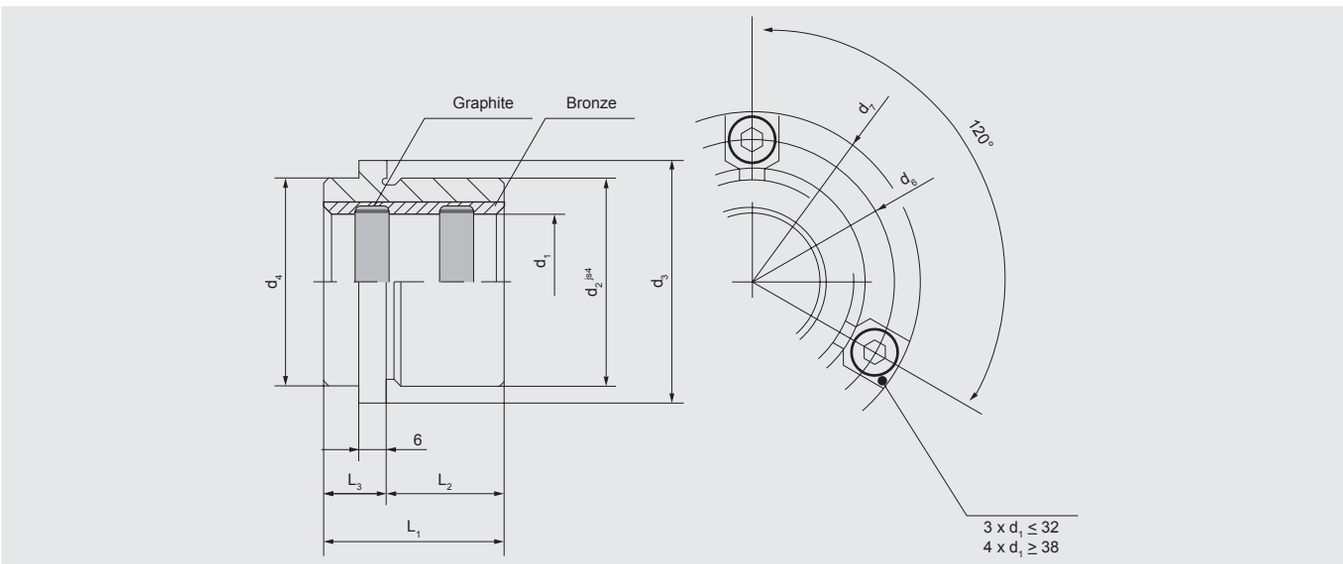
Order-No.: 1295.5.d_1

Material:
Bronze with solid lubricant, oilless lubricating

Execution:
Contact surface with solid lubricant rings. Outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1295.5.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	32	40	48	58	70	85	105
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	35	35	42	52	65	80	80
L_2	23	23	30	37	47	60	60
L_3	12	12	12	15	18	20	20

GUIDE BUSH ISO 9448-6, STEEL WITH BRONZE AND SOLID LUBRICANT RINGS, TYPE 1

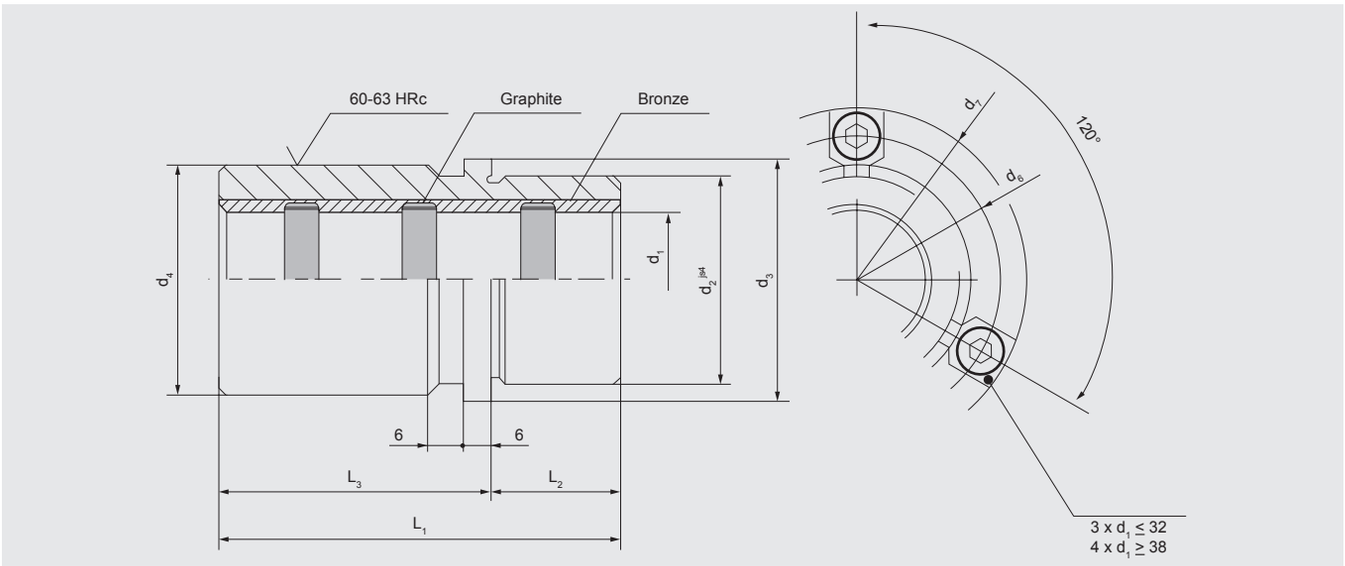
Order-No.: 1215.1.d_1

Material:
1.0503, d_3 and d_8 induction hardened 500 + 100 HV 10

Execution:
Contact surface with Bronze with solid lubricant. Outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1215.1.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	39	46	53	63	77	92	115
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	59	79	93	108	127	150	150
L_2	23	23	30	37	47	60	60
L_3	36	56	63	71	80	90	90

GUIDE BUSH ISO 9448-6, STEEL WITH BRONZE AND SOLID LUBRICANT RINGS, TYPE 4

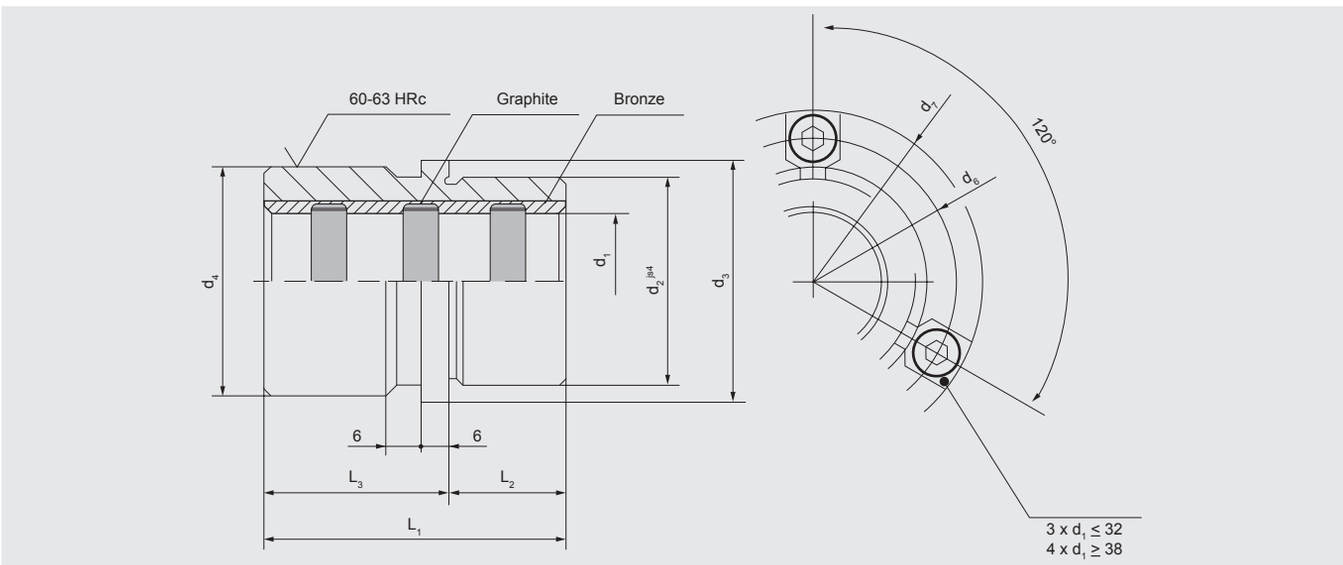
Order-No.: 1215.4.d_1

Material:
1.0503, d_3 and d_8 induction hardened 500 + 100 HV 10

Execution:
Contact surface with Bronze with solid lubricant. Outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 32
1215.4.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	39	46	53	63	77	92	115
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	43	59	75	82	97	116	120
L_2	23	23	30	37	47	60	66
L_3	20	36	45	45	50	56	60

GUIDE BUSH ISO 9448-6, STEEL WITH BRONZE AND SOLID LUBRICANT RINGS, TYPE 5

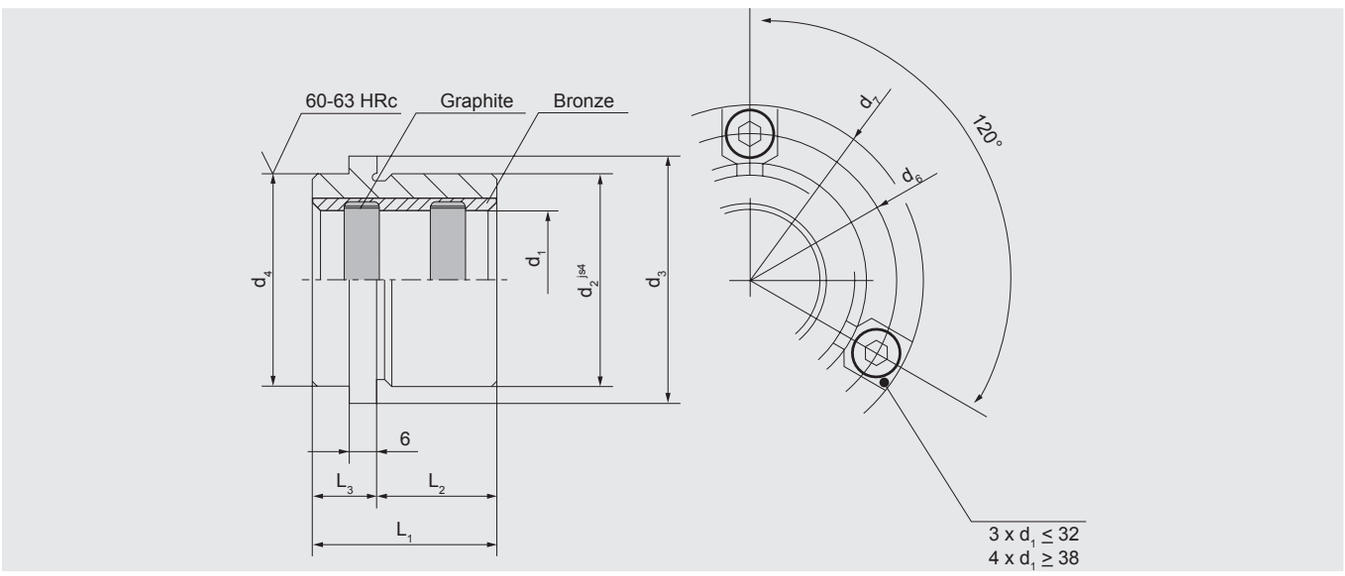
Order-No.: 1215.5.d_1

Material:
1.0503, d_3 and d_8 induction hardened 500 + 100 HV 10

Execution:
Contact surface with Bronze with solid lubricant. Outside diameter precision ground.

Note:
Locating bore H5. The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1= 32
1215.5.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	40	48	56	66	80	95	118
d_4	32	40	48	58	70	85	105
d_6	52	60	67	77	91	106	129
d_7	64,7	72,7	79,7	89,7	103,7	118,7	141,7
L_1	35	35	42	52	65	80	80
L_2	23	23	30	37	47	60	60
L_3	12	12	12	15	18	20	20

FLANGED GUIDE BUSH, SINTERED FERRITE CARBONITRIDED WITH LONG-TERM LUBRICATION, ISO 9448-4 TYPE 1

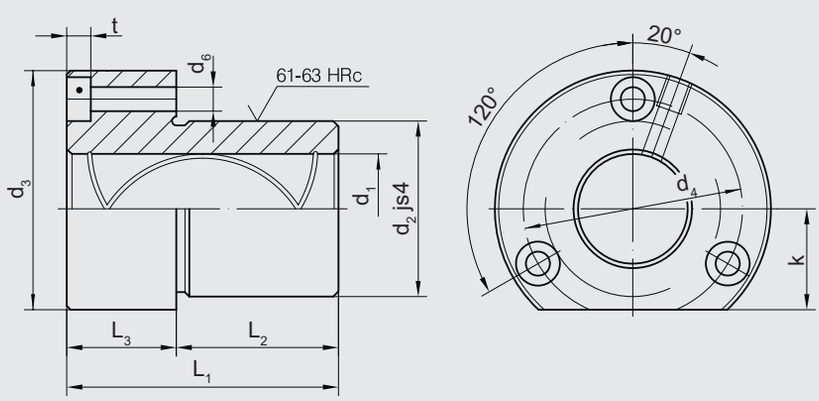
Order-No.: 1222.1.d_1

Material:
Sintered ferrite of high purity, carbonitrided, long-term lubrication.

Execution:
Bearing surfaces and outside diameter precision ground.

Note:
Locating bore H5. The guide bush is fixed by means of three screws to DIN EN ISO 4762.
Screws not included.

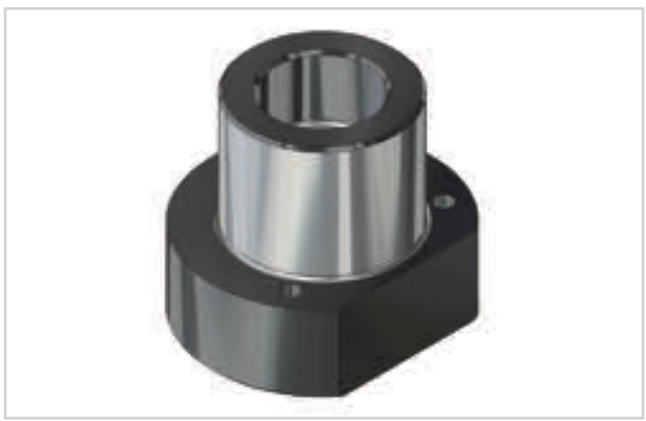
Ordering example: d_1 = 32
1222.1.032



d_1	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	32	40	48	58	70	85	105
d_3	50	63	72	85	104	120	148
d_4	40	50	58	70	86	100	125
d_6	4,5	5,5	5,5	6,6	9	9	11
k	18	23	28	33	38	46	56
t	4,6	5,7	5,7	6,8	9	9	11
L_3	15	25	25	30	42	42	50
L_2	37	37	47	47	60	60	75
L_1	52	62	72	77	102	102	125

FLANGED GUIDE BUSH, SINTERED FERRITE CARBONITRIDED WITH LONG-TERM LUBRICATION, ISO 9448-4, TYPE 2

Order-No.: 1222.2.d_1

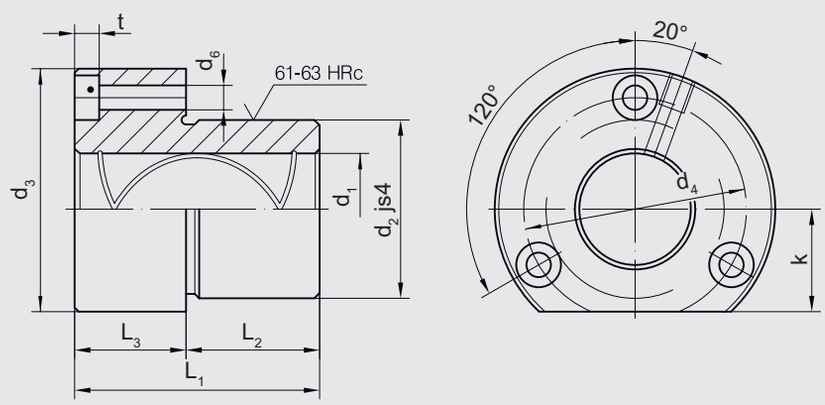


Material:
Sintered ferrite of high purity, carbonitrided, long-term lubrication.

Execution:
Bearing surfaces and outside diameter precision ground.

Note:
Locating bore H5. The guide bush is fixed by means of three screws :
– **up to** d_1 16: screws to DIN 6912
– **from** d_1 19: screws to DIN EN ISO 4762
Screws not included.

Ordering example: d_1 = 32
1222.2.032



d_1	15-16	19-20	24-25	30-32	38-40	48-50	60-63
d_2	28	32	40	48	58	70	85
d_3	45	50	63	72	85	104	120
d_4	35	40	50	58	70	86	100
d_6	4,5	4,5	5,5	5,5	6,6	9	9
k	15	18	23	28	33	38	46
t	3,4	4,6	5,7	5,7	6,8	9	9
L_1	36	45	55	62	67	89	89
L_2	30	30	30	37	37	47	47
L_3	6	15	25	25	30	42	42

FLANGED GUIDE BUSH, SINTERED FERRITE CARBONITRIDED WITH LONG-TERM LUBRICATION, ISO 9448-4, TYPE 4

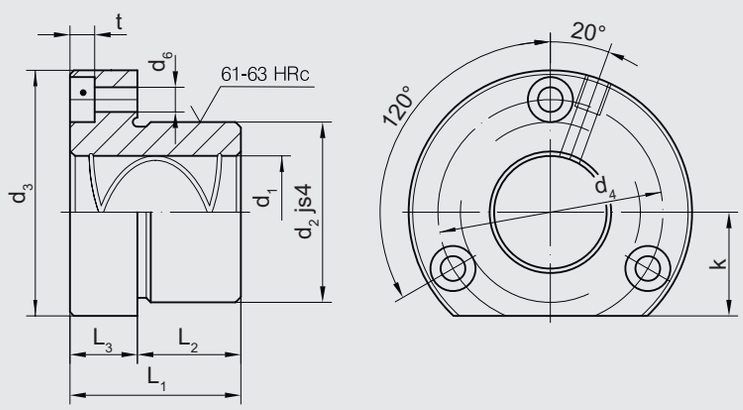
Order-No.: 1222.4.d_1

Material:
Sintered ferrite of high purity, carbonitrided, long-term lubrication.

Execution:
Bearing surfaces and outside diameter precision ground.

Note:
Locating bore H5. The guide bush is fixed by means of three screws:
– **up to** d_1 16: screws to DIN 6912
– **from** d_1 19: screws to DIN EN ISO 4762
Screws not included.

Ordering example: d_1 = 32
1222.4.032



d_1	15-16	19-20	24-25	30-32	38-40	48-50
d_2	28	32	40	48	58	70
d_3	45	50	63	72	85	104
d_4	35	40	50	58	70	86
d_6	4,5	4,5	5,5	5,5	6,6	9
k	15	18	23	28	33	38
t	3,4	4,6	5,7	5,7	6,8	9
L_1	29	38	38	45	55	62
L_2	23	23	23	30	30	37
L_3	6	15	15	15	25	25

FLANGED GUIDE BUSH "ECO-LINE", BRONZE WITH SOLID LUBRICANT RINGS, ISO 9448-4 TYPE 1

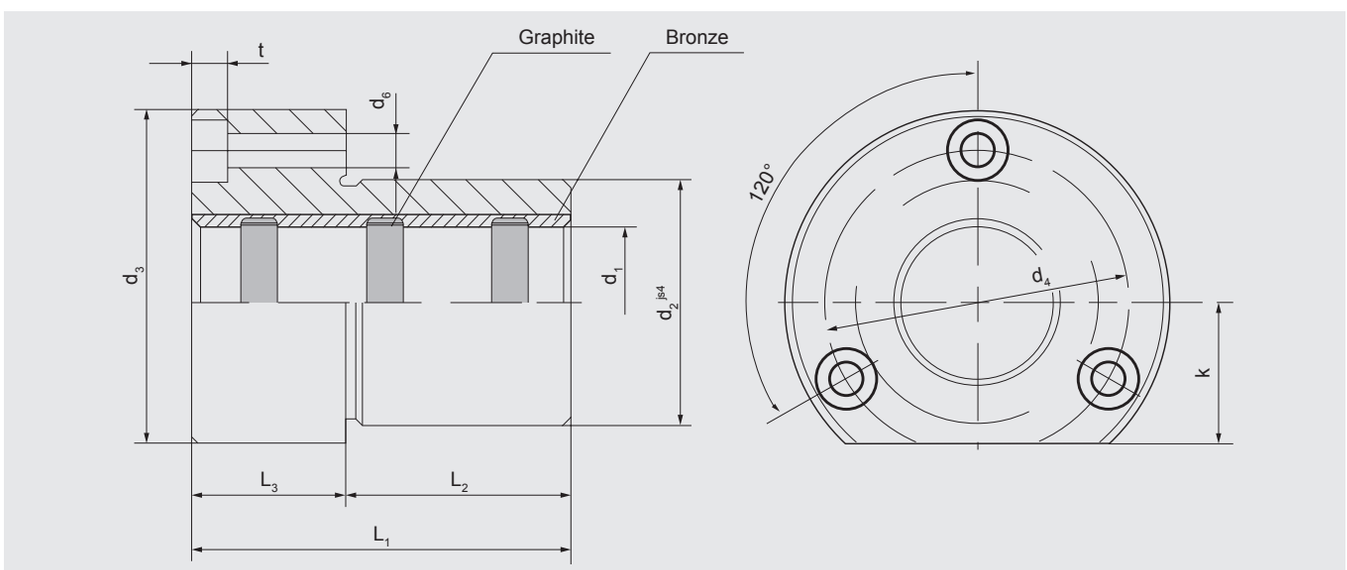
Order-No.: 1221.1.d_1

Material:
Bronze with solid lubricant, oilless lubricating.

Execution:
Contact surface with solid lubricant rings.
Outside diameter precision ground.

Note:
Screws not included.
Locating bore H6. The guide bush is fixed by means of three screws to DIN EN ISO 4762.

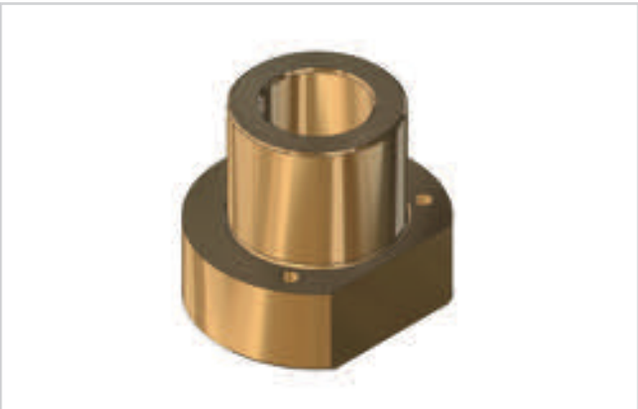
Ordering example: d_1 = 32
1221.1.032



d_1	19	20	24	25	30	32	38	40	48	50	60	63	80
d_2	32	32	40	40	48	48	58	58	70	70	85	85	105
d_3	50	50	63	63	72	72	85	85	104	104	120	120	148
d_4	40	40	50	50	58	58	70	70	86	86	100	100	125
d_6	4,5	4,5	5,5	5,5	5,5	5,5	6,6	6,6	9	9	9	9	11
k	18	18	23	23	28	28	33	33	38	38	46	46	56
t	4,6	4,6	5,7	5,7	5,7	5,7	6,8	6,8	9	9	9	9	11
L_1	52	52	62	62	72	72	77	77	102	102	102	102	125
L_2	37	37	37	37	47	47	47	47	60	60	60	60	75
L_3	15	15	25	25	25	25	30	30	42	42	42	42	50

FLANGED GUIDE BUSH "ECO-LINE", BRONZE WITH SOLID LUBRICANT RINGS, ISO 9448-4, TYPE 2

Order-No.: 1221.2.d_1

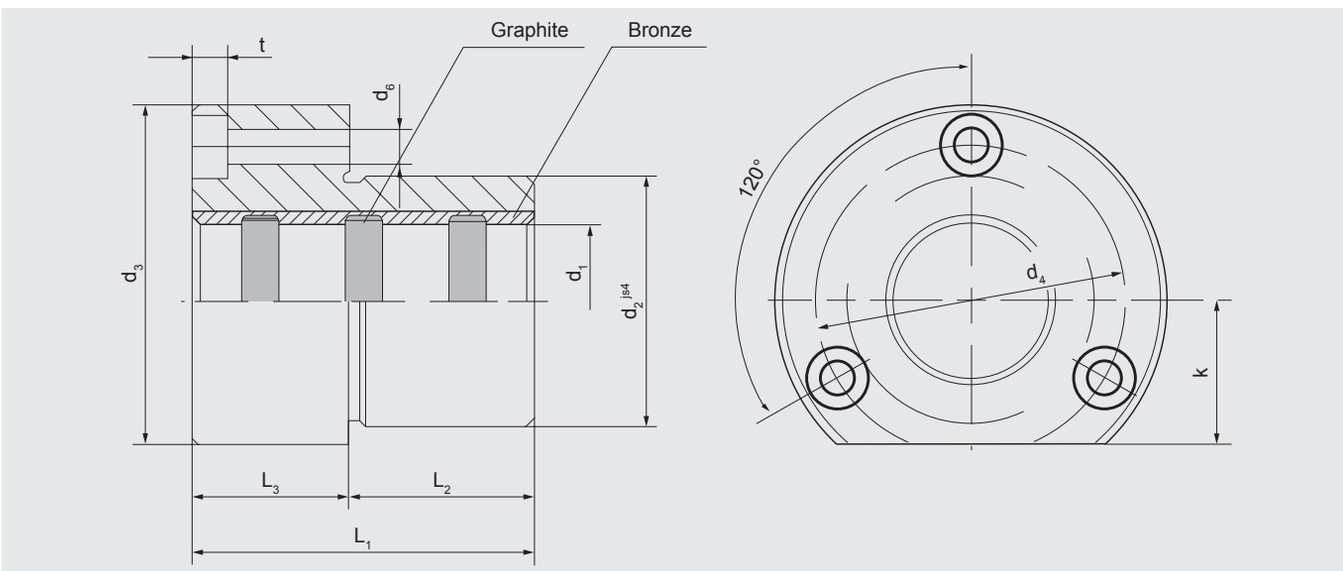


Material:
Bronze with solid lubricant, oilless lubricating.

Execution:
Contact surface with solid lubricant rings.
Outside diameter precision ground.

Note:
Screws not included.
Locating bore H6. The guide bush is fixed by means of three screws:
– **up to** d_1 16: screws to DIN 6912
– **from** d_1 19: screws to DIN EN ISO 4762

Ordering example: d_1 = 32
1221.2.032



d_1	15	16	19	20	24	25	30	32	38	40	48	50	60	63
d_2	28	28	32	32	40	40	48	48	58	58	70	70	85	85
d_3	45	45	50	50	63	63	72	72	85	85	104	104	120	120
d_4	35	35	40	40	50	50	58	58	70	70	86	86	100	100
d_6	4,5	4,5	4,5	4,5	5,5	5,5	5,5	5,5	6,6	6,6	9	9	9	9
k	15	15	18	18	23	23	28	28	33	33	38	38	46	46
t	3,4	3,4	4,6	4,6	5,7	5,7	5,7	5,7	6,8	6,8	9	9	9	9
L_1	36	36	45	45	55	55	62	62	67	67	89	89	89	89
L_2	30	30	30	30	30	30	37	37	37	37	47	47	47	47
L_3	6	6	15	15	25	25	25	25	30	30	42	42	42	42

FLANGED GUIDE BUSH "ECO-LINE", BRONZE WITH SOLID LUBRICANT RINGS, ISO 9448-4, TYPE 4

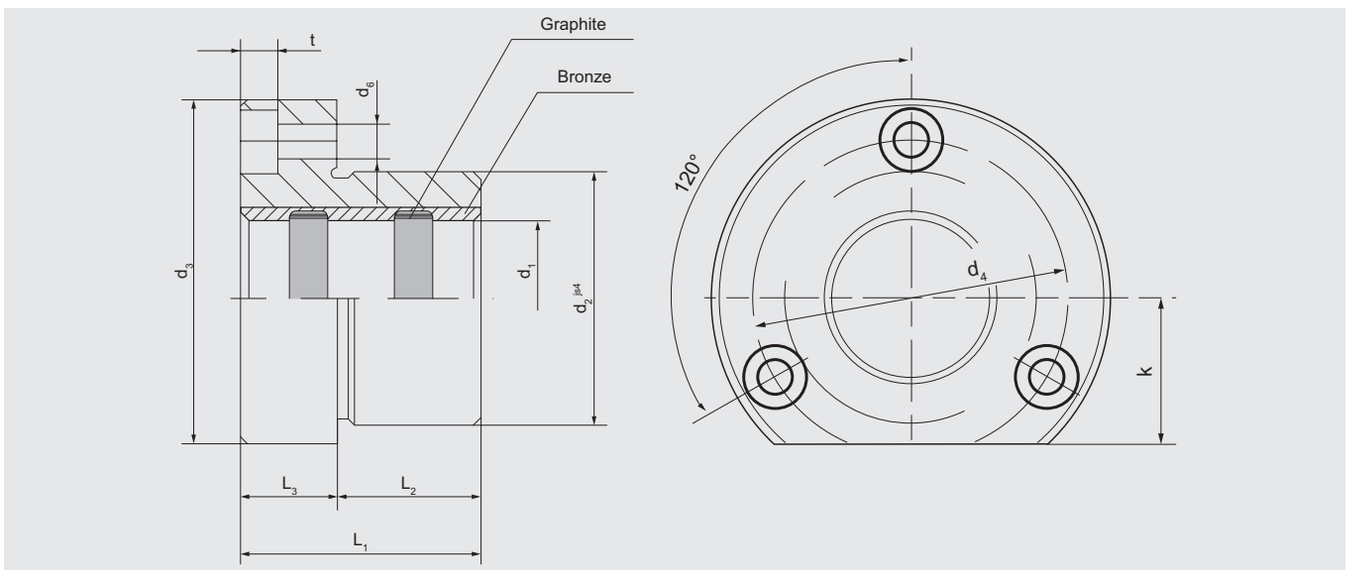
Order-No.: 1221.4.d_1

Material:
Bronze with solid lubricant, oilless lubricating.

Execution:
Contact surface with solid lubricant rings.
Outside diameter precision ground.

Note:
Screws not included.
Locating bore H6. The guide bush is fixed by means of three screws:
– **up to** d_1 16: screws to DIN 6912
– **from** d_1 19: screws to DIN EN ISO 4762

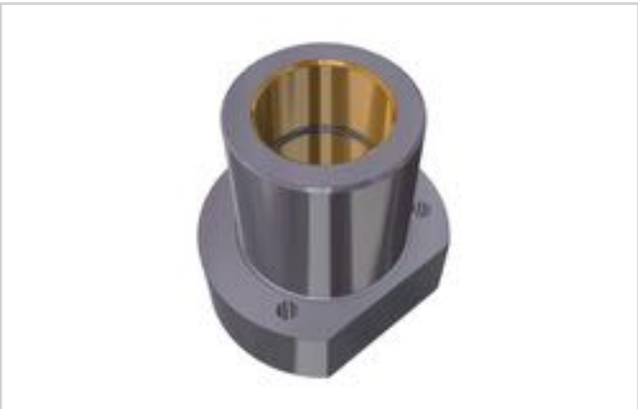
Ordering example: d_1 = 32
1221.4.032



d_1	15	16	19	20	24	25	30	32	38	40	48	50
d_2	28	28	32	32	40	40	48	48	58	58	70	70
d_3	45	45	50	50	63	63	72	72	85	85	104	104
d_4	35	35	40	40	50	50	58	58	70	70	86	86
d_6	4,5	4,5	4,5	4,5	5,5	5,5	5,5	5,5	6,6	6,6	9	9
k	15	15	18	18	23	23	28	28	33	33	38	38
t	3,4	3,4	4,6	4,6	5,7	5,7	5,7	5,7	6,8	6,8	9	9
L_1	29	29	38	38	38	38	45	45	55	55	62	62
L_2	23	23	23	23	23	23	30	30	30	30	37	37
L_3	6	6	15	15	15	15	15	15	25	25	25	25

FLANGED GUIDE BUSH DIN 9831 STEEL / BRONZE WITH SOLID LUBRICANT RINGS, TYPE 1

Order-No: 1223.1.d_1

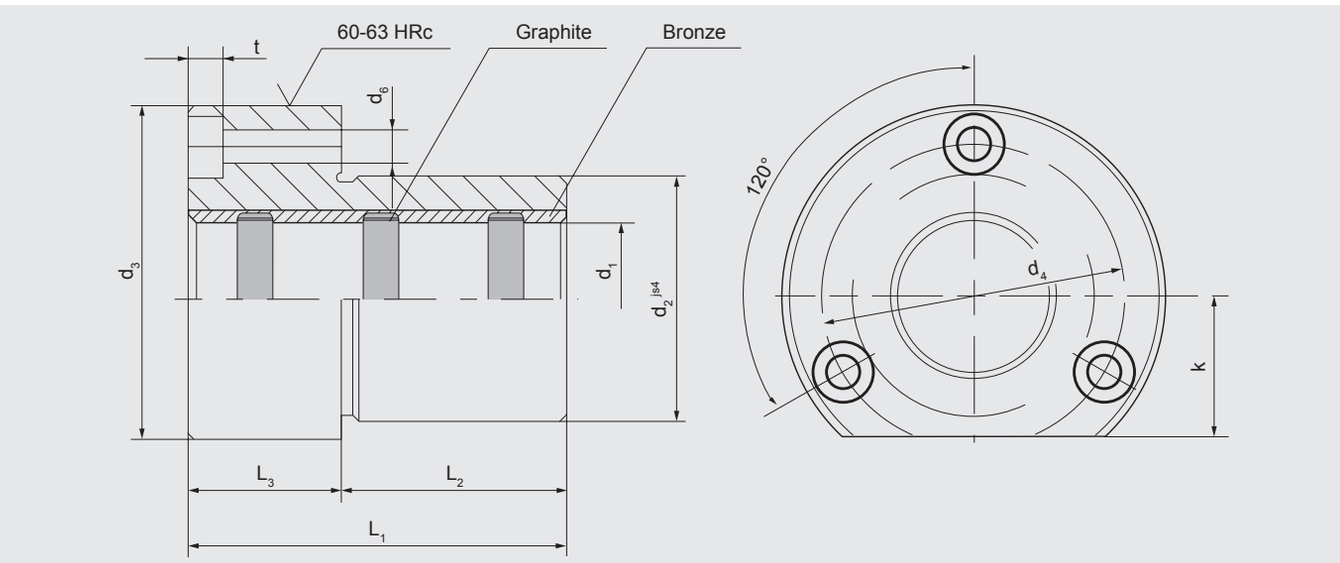


Material:
1.0503, d_4 and d_2 induction hardened 500 + 100 HV 10

Execution:
Contact surface with Bronze with solid lubricant. Outside diameter precision ground.

Note:
Screws not included.
Fixing with three screws.
– **up to** d_1 16: screws according to DIN 6912
– **from** d_1 19: screws according to DIN EN ISO 4762

Ordering example: d_1 = 32
1223.1.032



d_1	19	20	24	25	30	32	38	40	48	50	60	63	80
d_2	32	32	40	40	48	48	58	58	70	70	85	85	105
d_3	50	50	63	63	72	72	85	85	104	104	120	120	148
d_4	40	40	50	50	58	58	70	70	86	86	100	100	125
d_6	4,5	4,5	5,5	5,5	5,5	5,5	6,6	6,6	9	9	9	9	11
k	18	18	23	23	28	28	33	33	38	38	46	46	56
t	4,6	4,6	5,7	5,7	5,7	5,7	6,8	6,8	9	9	9	9	11
L_1	52	52	62	62	72	72	77	77	102	102	102	102	125
L_2	37	37	37	37	47	47	47	47	60	60	60	60	75
L_3	15	15	25	25	25	25	30	30	42	42	42	42	50

FLANGED GUIDE BUSH DIN 9831 STEEL / BRONZE WITH SOLID LUBRICANT RINGS, TYPE 2

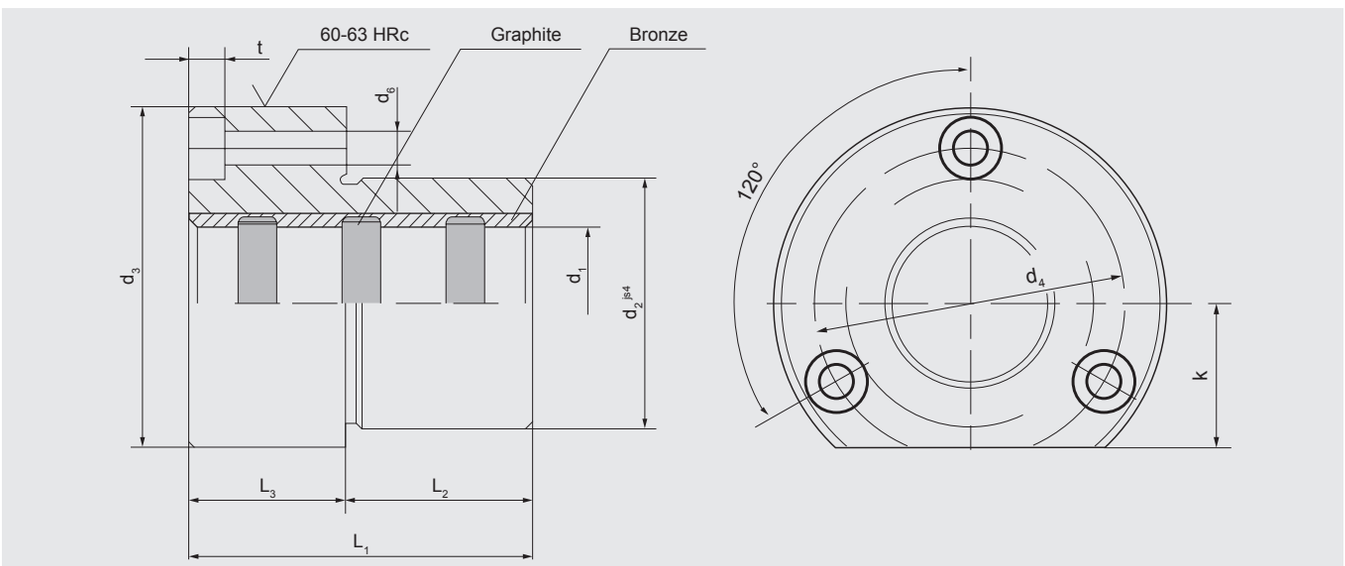
Order-No.: 1223.2.d_1

Material:
1.0503, d_4 and d_2 induction herdened 500 + 100 HV 10

Execution:
Contact surface with Bronze with solid lubricant. Outside diameter precision ground.

Note:
Screws not included.
Fixing with three screws.
– **up to** d_1 16: screws according to DIN 6912
– **from** d_1 19: screws according to DIN EN ISO 4762

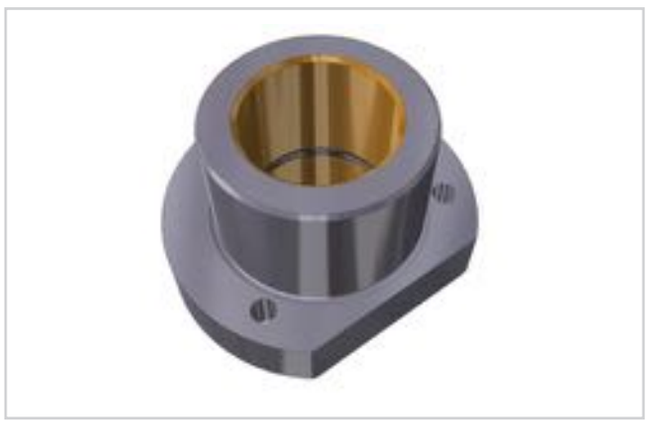
Ordering example: d_1 = 32
1223.2.032



d_1	15	16	19	20	24	25	30	32	38	40	48	50	60	63
d_2	28	28	32	32	40	40	48	48	58	58	70	70	85	85
d_3	45	45	50	50	63	63	72	72	85	85	104	104	120	120
d_4	35	35	40	40	50	50	58	58	70	70	86	86	100	100
d_6	4,5	4,5	4,5	4,5	5,5	5,5	5,5	5,5	6,6	6,6	9	9	9	9
k	15	15	18	18	23	23	28	28	33	33	38	38	46	46
t	3,4	3,4	4,6	4,6	5,7	5,7	5,7	5,7	6,8	6,8	9	9	9	9
L_1	36	36	45	45	55	55	62	62	67	67	89	89	89	89
L_2	30	30	30	30	30	30	37	37	37	37	47	47	47	47
L_3	6	6	15	15	25	25	25	25	30	30	42	42	42	42

FLANGED GUIDE BUSH DIN 9831 STEEL / BRONZE WITH SOLID LUBRICANT RINGS, TYPE 4

Order-No.: 1223.4.d_1

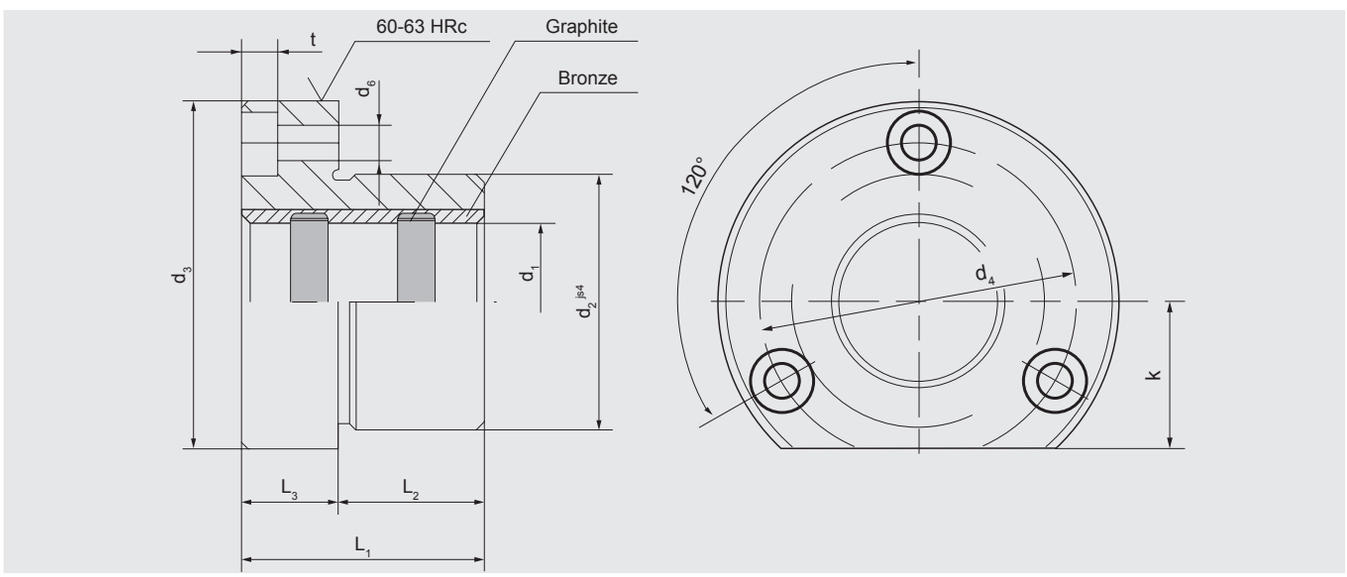


Material:
1.0503, d_4 and d_2 induction herdened 500 + 100 HV 10

Execution:
Contact surface with Bronze with solid lubricant. Outside diameter precision ground.

Note:
Screws not included.
Fixing with three screws.
– **up to** d_1 16: screws according to DIN 6912
– **from** d_1 19: screws according to DIN EN ISO 4762

Ordering example: d_1 = 32
1223.4.032



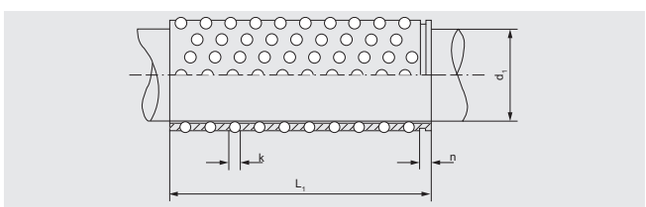
d_1	15	16	19	20	24	25	30	32	38	40	48	50
d_2	28	28	32	32	40	40	48	48	58	58	70	70
d_3	45	45	50	50	63	63	72	72	85	85	104	104
d_4	35	35	40	40	50	50	58	58	70	70	86	86
d_6	4,5	4,5	4,5	4,5	5,5	5,5	5,5	5,5	6,6	6,6	9	9
k	15	15	18	18	23	23	28	28	33	33	38	38
t	3,4	3,4	4,6	4,6	5,7	5,7	5,7	5,7	6,8	6,8	9	9
L_1	29	29	38	38	38	38	45	45	55	55	62	62
L_2	23	23	23	23	23	23	30	30	30	30	37	37
L_3	6	6	15	15	15	15	15	15	25	25	25	25

BALL CAGE

Order-No.: 1231.d_1.L_1

Note:
Cage: Brass / Balls: Steel hardened to DIN 5401

Ordering example: d_1 = 20, L_1 = 71 – 1231.020.071

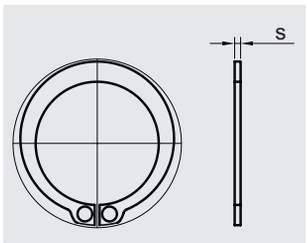


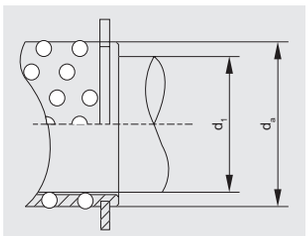
L_1	10/11/12	15	16	18	19	20	24/25	30/32	38/40	48/50	60/63	80
k	2	3	3	3	3	3	3	4	4	4	4	6
n	1,1	1,6	1,6	1,6	1,6	1,6	1,6	2,1	2,1	2,1	2,1	3
10												
15												
20												
24			64			80						
25												
28			80			100						
30												
32					120	120	120					
39	176											
40							160	120				
44		144	144	180	180	180	180					
45								140	168			
50								160	192	224		
55								180	216			
56		192	192	240	240	240	240					
57	272											
64		224	224									
63									264	308		
70								240				
72		256	256	320	320	320	320					
80					360	360	360	280	336	392		
95								340	408	476	544	
96					440	440	440					
105								380	456	532	608	
119												540
120							560	440	528	120	704	
140								520	624	728	832	648
160								600	720	840	960	
161												756
180									816	952	1088	
182												864
200									912	1064	1216	
203												972
238												1152
240									1104	1288	1472	

CIRCLIP DIN 471

Order-No.: 1232.d_1

Ordering example: d_1 = 12 1232.012





d_1	10	11	12	15	16	19
d_a	13 x 1	14 x 1	15 x 1	20 x 1,2	21 x 1,2	24 x 1,2

d_1	20	24	25	30	32	38
d_a	25 x 1,2	29 x 1,5	30 x 1,5	38 x 1,75	40 x 1,75	46 x 1,75

d_1	40	48	50	60	63	80
d_a	48 x 1,75	56 x 2	58 x 2	68 x 2,5	70 x 2,5	90 x 3

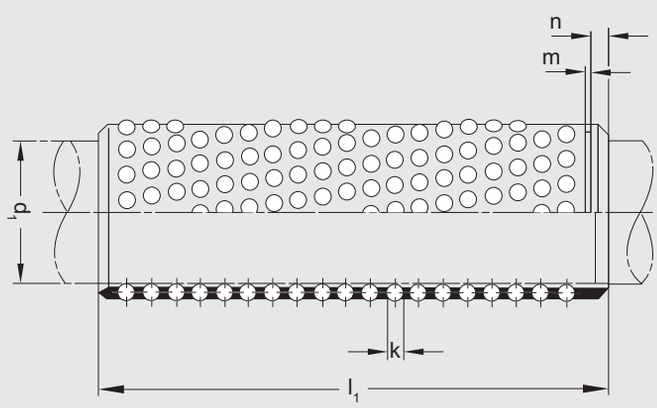
BALL CAGE WITH CIRCLIP GROOVE, ALUMINIUM

Order-No.: 1235.d_1.l

Material:
Cage: Aluminium
Balls: Steel hardened to DIN 5401

Note:
Ball cages from ø 10 has a groove for circlip to DIN 471.

Ordering example: d_1 = 10, l_1 = 40
1235.010.040



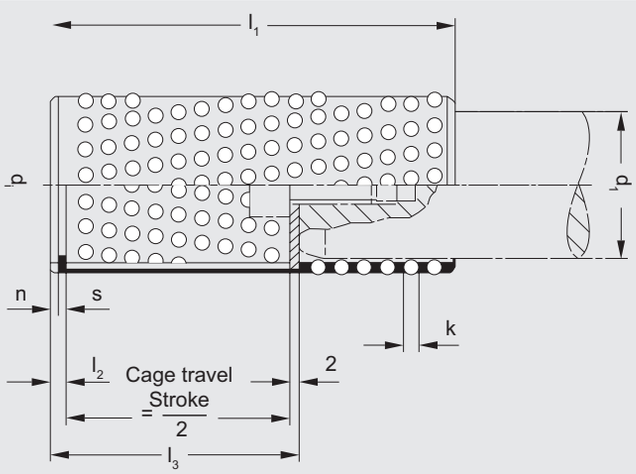
	d_1	10	11/12	15	16	19	20	24/25	30/32	38/40	48/50	60/63	80
	k	2	2	3	3	3	3	3	4	4	4	4	6
l	l_1	Total number of balls											
40	**39**	176	176										
56	**57**	272	272										
45	**44**			144	144	180	180	180					
56	**56**			192	192	240	240	240					
63	**64**			224	224								
71	**72**			256	256	320	320	320					
24	**24**				64		80						
28	**28**				80		100						
31	**32**					120	120	120					
80	**80**					360	360	360	280	336	392		
95	**96**					440	440	440					
40	**40**							160	120				
120	**120**							560	440	528	616	704	
45	**45**								140	168			
50	**50**								160	192	224		
56	**55**								180	216			
71	**70**								240				
95	**95**								340	408	476	544	
105	**105**								380	456	532	608	
140	**140**								520	624	728	832	648
160	**160**								600	720	840	960	
63	**65**									264	308		
180	**180**									816	952	1088	
200	**200**									912	1064	1216	
240	**240**									1104	1288	1472	
120	**119**												540
160	**161**												756
180	**182**												864
200	**203**												972
240	**238**												1152

BALL CAGE WITH CIRCLIP AND FASTENING RING GROOVE, BRASS

Order-No.: 1237.d_1.l.l_3

Material:
Cage: Brass
Balls: Steel hardened to DIN 5401

Ordering example: d_1 = 30, l = 80, l_3 = 51
1237.030.080.051



	d_1	19	20	24	25	30	32	38	40	48	50	60	63
	k	3	3	3	3	4	4	4	4	4	4	4	4
	l_2	2,6	2,6	2,6	2,6	2,6	2,6	3,45	3,45	4,3	4,3	4,3	4,3
l	l_1	l_3											
56	56	**31**	**31**	**31**	**31**								
72	72	**41**	**41**	**41**	**41**								
80	80	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**	**51**		
70	70					**41**	**41**						
95	95					**61**	**61**	**61**	**61**	**61**	**61**	**61**	**61**
105	105					**61**	**61**	**61**	**61**				
120	120							**73**	**73**	**73**	**73**	**73**	**73**
140	140											**83**	**83**

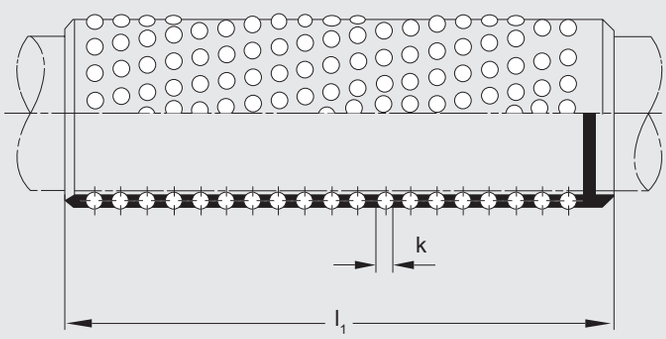
BALL CAGE WITH ASSEMBLY AID, BRASS

Order-No.: 1238.d_1.l

Material:
Cage: Brass
Balls: Steel hardened to DIN 5401

Note:
No assistantce is needed for their assembly.
These cages are equipped with a suitably positioned brake ring insert. That ensures equal cage spacing especially on die sets with multiple pillars.

Ordering example: d_1 = 10, l = 40
1238.010.040



	d_1	10	11/12	15	16	19	20	24/25	30/32	38/40	48/50	60/63	80
	k	2	2	3	3	3	3	3	4	4	4	4	6
l	l_1	Total number of balls											
40	39	176	176										
56	57	272	272										
45	44			144	144	180	180	180					
56	56			192	192	240	240	240					
63	64			224	224								
71	72			256	256	320	320	320					
24	24				64		80						
28	28				80		100						
31	32					120	120	120					
80	80					360	360	360	280	336	392		
95	96					440	440	440					
40	40							160	120				
120	120							560	440	528	616	704	
45	45								140	168			
50	50								160	192	224		
56	55								180	216			
71	70								240				
95	95								340	408	476	544	
105	105								380	456	532	608	
140	140								520	624	728	832	648
160	160								600	720	840	960	
63	65									264	308		
180	180									816	952	1088	
200	200									912	1064	1216	
240	240									1104	1288	1472	
120	119												540
160	161												756
180	182												864
200	203												972
240	238												1152

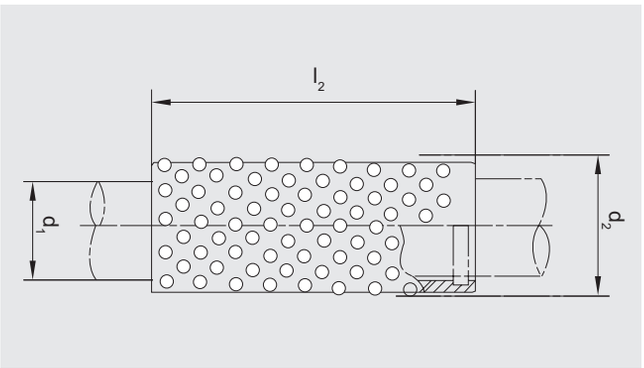
BALL CAGE WITH ASSEMBLY AID, PLASTIC

Order-No.: 7173.d_1.l_2

Material:
Cage: POM M25
Balls: Steel hardened, quality class 1, assorted

Note:
Cage travel = ½ stroke length

Ordering example: d_1 = 30 , l_2 = 38
7173.030.038



d_1	d_2	l_2
15	21	30
15	21	38
15	21	43
15	21	54
15	21	63
16	22	30
16	22	38
16	22	43
16	22	54
16	22	63
19	25	30
19	25	38
19	25	43
19	25	54
19	25	63
19	25	74
20	26	30
20	26	38
20	26	43
20	26	54
20	26	63
20	26	74
24	30	30
24	30	38
24	30	43
24	30	54
24	30	63
24	30	74
24	30	83
24	30	90
25	31	30
25	31	38
25	31	43
25	31	54
25	31	63
25	31	74
25	31	83
25	31	90
30	38	38
30	38	43
30	38	54
30	38	58
30	38	68
30	38	74
30	38	83
30	38	88
30	38	103
30	38	108
32	40	38
32	40	43
32	40	54
32	40	58
32	40	68
32	40	74
32	40	83
32	40	88
32	40	103
32	40	108
38	46	38
38	46	43
38	46	58
38	46	68
38	46	88
38	46	94
38	46	108
38	46	128
40	48	38
40	48	43
40	48	58
40	48	68
40	48	88
40	48	94
40	48	108
40	48	128
48	56	43
48	56	58
48	56	68
48	56	74
48	56	88
48	56	108
48	56	128
50	58	43
50	58	58
50	58	68
50	58	74
50	58	88
50	58	108
50	58	128

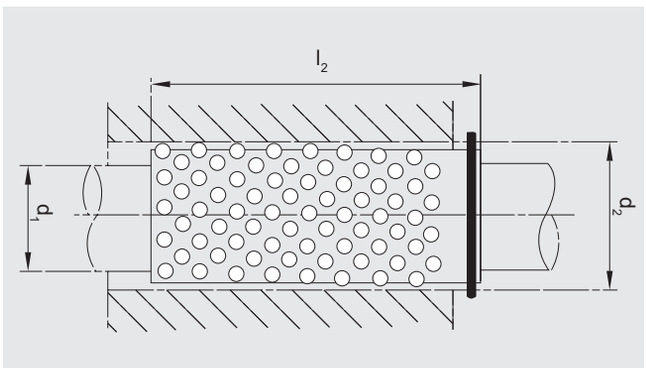
BALL CAGE WITH FASTENING RING GROOVE, PLASTIC

Order-No.: 7174.d_1.l_2

Material:
Cage: POM M25
Balls: Steel hardened, quality class 1, assorted

Note:
Cage travel = ½ stroke length

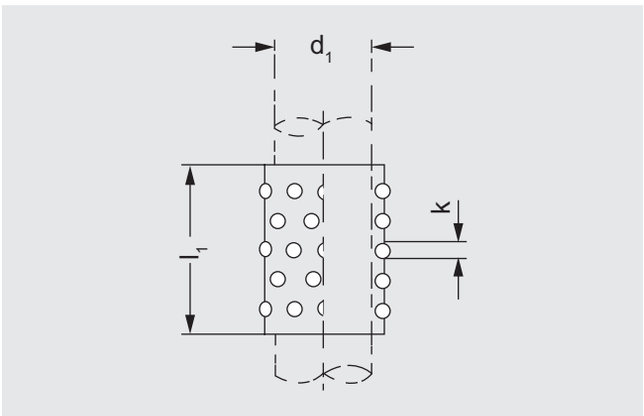
Ordering example: d_1 = 15, l_2 = 30
7174.015.030



d_1	d_2	l_2
15	21	30
15	21	38
15	21	43
15	21	54
15	21	63
16	22	30
16	22	38
16	22	43
16	22	54
16	22	63
19	25	30
19	25	38
19	25	43
19	25	54
19	25	63
19	25	74
20	26	30
20	26	38
20	26	43
20	26	54
20	26	63
20	26	74
24	30	30
24	30	38
24	30	43
24	30	54
24	30	63
24	30	74
24	30	83
24	30	90
25	31	30
25	31	38
25	31	43
25	31	54
25	31	63
25	31	74
25	31	83
25	31	90
30	38	38
30	38	43
30	38	54
30	38	58
30	38	68
30	38	74
30	38	83
30	38	88
30	38	103
30	38	108
32	40	38
32	40	43
32	40	54
32	40	58
32	40	68
32	40	74
32	40	83
32	40	88
32	40	103
32	40	108
38	46	38
38	46	43
38	46	58
38	46	68
38	46	88
38	46	94
38	46	108
38	46	128
40	48	38
40	48	43
40	48	58
40	48	68
40	48	88
40	48	94
40	48	108
40	48	128
48	56	43
48	56	58
48	56	68
48	56	74
48	56	88
48	56	108
48	56	128
50	58	43
50	58	58
50	58	68
50	58	74
50	58	88
50	58	108
50	58	128

BALL CAGE, PLASTIC, FOR HIGHEST STROKING SPEED

Order-No.: 1283.d_1.d_2.l_1



Material:
Cage: Plastic tube (POM)
Balls: Steel hardened DIN 5401- Quality Class 1

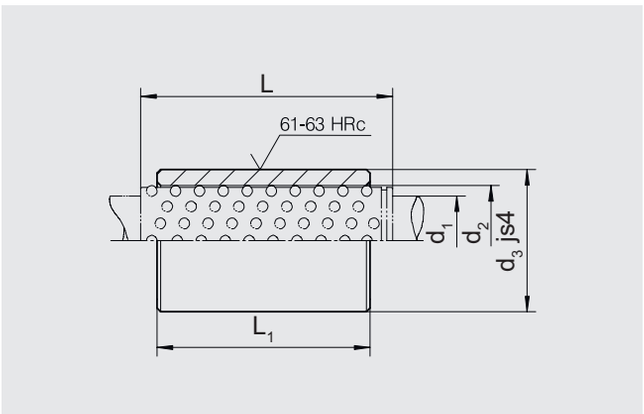
Note:
Owing to its much lower inertia, the plastic ball cage of particular advantage in die sets operating at stroking speed of 1000 SPM and more.
The phenomenon of ball-drag at the reversal point of cage travel, set up by the cage inertia, no longer occurs. The negative influence of this drag is eliminated – and so are the wear symptoms associated with it.

Ordering example: d_1 = 12, d_2 = 2, l_1 = 21
1283.012.020.021

Order-No..:	d_1	d_2	l_1
1283.012.020.021	12	2	21
1283.012.020.042	12	2	42
1283.012.025.021	12	2,5	21
1283.012.025.042	12	2,5	42
1283.015.030.045	15	3	45
1283.015.030.056	15	3	56
1283.015.030.063	15	3	63
1283.015.030.071	15	3	71

GUIDE BUSH FOR BALL BEARING, ISO 9448-3

Order-No.: 1251.d_1.L_1



Material:
Tool steel, hardened 61 ± 2 HRC

Execution:
Bearing surfaces honed, outside diameter precision ground.

Note:
Slip-Fit-Bonding:
The position of the bush is given by push fit hole tolerance H5. The adhesive provides optimum push retention whilst offering the following
advantages:
– high accuracy and stiffness
– no problems to find position when changing bushings
We do not recommend to press fit bushings.

Ordering example: d_1 = 30, L_1 = 120
1251.030.120

d_1		8	10	11	12	15	16	19	20	24	25	30	32	38	40	48	50	60	63	80
d_2		11	14	15	16	21	22	25	26	30	31	38	40	46	48	56	58	68	71	92
d_3		18	22	22	22	28	28	32	32	40	40	48	48	58	58	70	70	85	85	105
L_1	L																			
23	40		•	•	•															
23	45					•	•	•	•	•	•									
30	40	•	•	•	•															
30	45					•	•	•	•	•	•	•	•	•	•					
37	40		•	•	•															
37	45					•	•	•	•	•	•									
37	50											•	•	•	•	•	•			
47	56					•	•	•	•	•	•	•	•							
47	63													•	•	•	•			
60	71					•	•	•	•	•	•	•	•							
60	80													•	•	•	•			
60	95																	•	•	
77	95							•	•	•	•	•	•	•	•	•	•	•	•	
95	120											•	•	•	•	•	•	•	•	
120	140													•	•	•	•	•	•	•

HEADED GUIDE BUSH FOR BALL BEARING, ISO 9448-7, TYPE 44

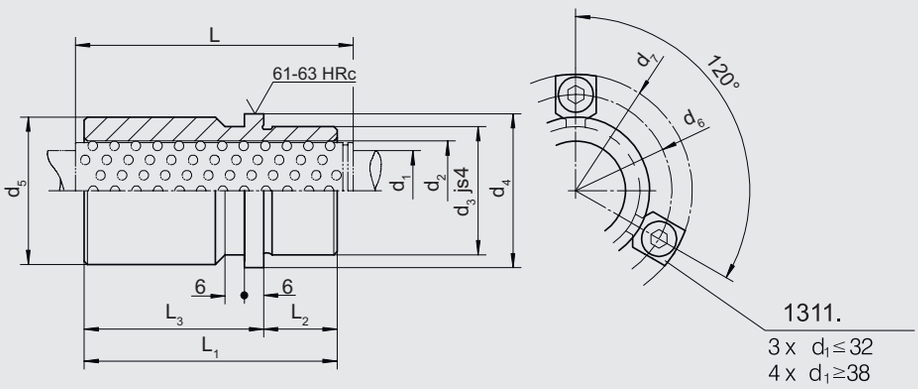
Order-No.: 1252.44.d_1

Material:
Guide bush: Tool Steel
Hardness: 61 ± 2 HRC

Execution:
Bearing surfaces honed, outside diameter precision ground.

Note:
The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 40
1252.44.040



d_1	19	20	24	25	30	32	38	40	48	50	60	63	80
d_2	25	26	30	31	38	40	46	48	56	58	68	71	92
d_3	32	32	40	40	48	48	58	58	70	70	85	85	105
d_4	40	40	48	48	56	56	66	66	80	80	95	95	118
d_5	39	39	46	46	53	53	63	63	77	77	92	92	115
d_6	52	52	60	60	67	67	77	77	91	91	106	106	129
d_7	64,7	64,7	72,7	72,7	79,7	79,7	89,7	89,7	103,7	103,7	118,7	118,7	141,7
L	71	71	95	95	120	120	120	120	140	140	160	160	160
L_1	59	59	79	79	93	93	108	108	127	127	150	150	150
L_2	23	23	23	23	30	30	37	37	47	47	60	60	60
L_3	36	36	56	56	63	63	71	71	80	80	90	90	90

HEADED GUIDE BUSH FOR BALL BEARING, ISO 9448-7, TYPE 45

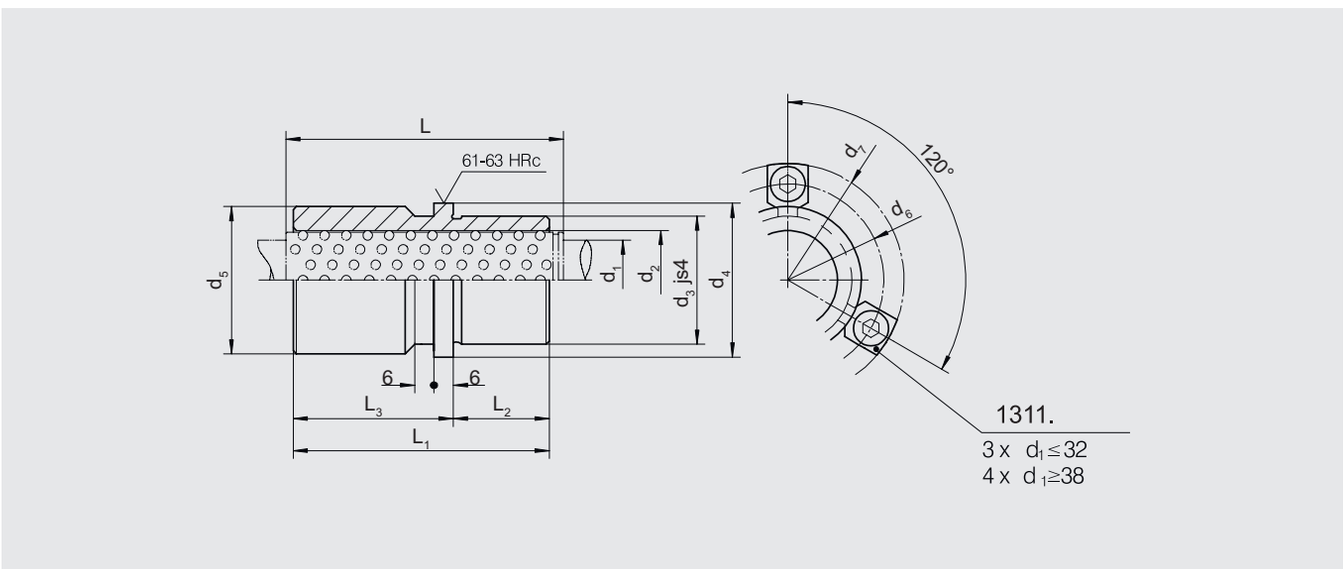
Order-No.: 1252.45.d_1

Material:
Guide bush: Tool steel
Hardness: 61 ± 2 HRC

Execution:
Bearing surfaces honed, outside diameter precision ground.

Note:
The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 40
1252.45.040



d_1	24	25	30	32	38	40	48	50
d_2	30	31	38	40	46	48	56	58
d_3	40	40	48	48	58	58	70	70
d_4	48	48	56	56	66	66	80	80
d_5	46	46	53	53	63	63	77	77
d_6	60	60	67	67	77	77	91	91
d_7	72,7	72,7	79,7	79,7	89,7	89,7	103,7	103,7
L	95	95	120	120	140	140	160	160
L_1	80	80	93	93	110	110	131	131
L_2	30	30	37	37	47	47	60	60
L_3	50	50	56	56	63	63	71	71

HEADED GUIDE BUSH FOR BALL BEARING, ISO 9448-7, TYPE 46

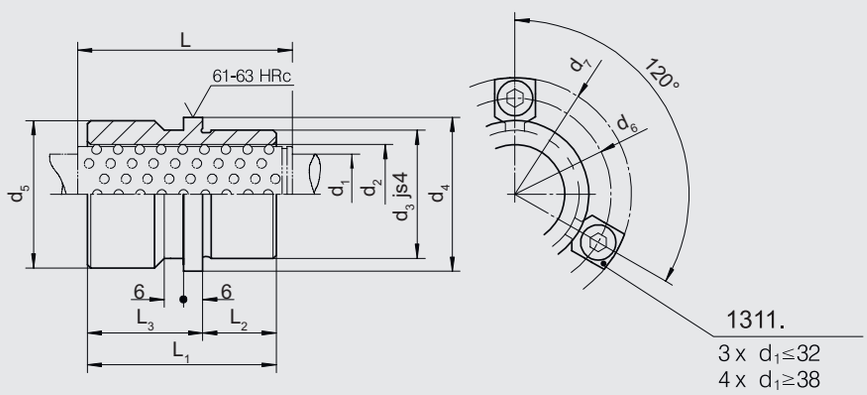
Order-No.: 1252.46.d_1

Material:
Guide bush: Tool steel
Hardness: 61 ± 2 HRC

Execution:
Bearing surfaces honed, outside diameter precision ground.

Note:
The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 40
1252.46.040



d_1	19	20	24	25	30	32	38	40	48	50	60	63	80
d_2	25	26	30	31	38	40	46	48	56	58	68	71	92
d_3	32	32	40	40	48	48	58	58	70	70	85	85	105
d_4	40	40	48	48	56	56	66	66	80	80	95	95	118
d_5	39	39	46	46	53	53	63	63	77	77	92	92	115
d_6	52	52	60	60	67	67	77	77	91	91	106	106	129
d_7	64,7	64,7	72,7	72,7	79,7	79,7	89,7	89,7	103,7	103,7	118,7	118,7	141,7
L	56	56	71	71	95	95	105	105	120	120	140	140	140
L_1	43	43	59	59	75	75	82	82	97	97	116	116	120
L_2	23	23	23	23	30	30	37	37	47	47	60	60	60
L_3	20	20	36	36	45	45	45	45	50	50	56	56	60

HEADED GUIDE BUSH FOR BALL BEARING, ISO 9448-7, TYPE 47

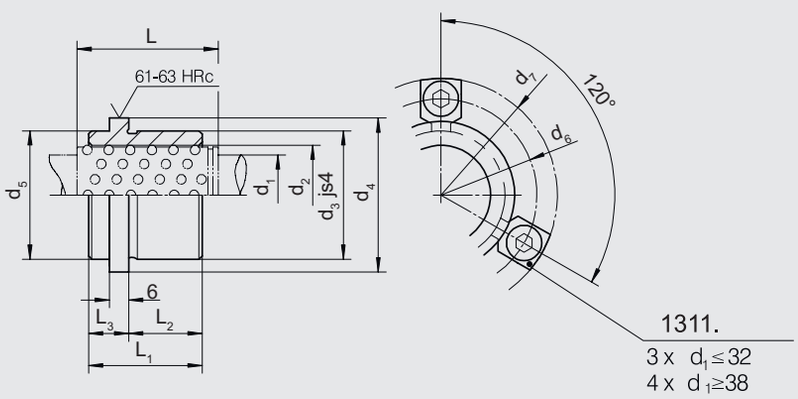
Order-No.: 1252.47.d_1

Material:
Guide bush: Tool steel
Hardness: 61 ± 2 HRC

Execution:
Bearing surfaces honed, outside diameter precision ground.

Note:
The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 40
1252.47.040



d_1	19	20	24	25	30	32	38	40	48	50	60	63	80
d_2	25	26	30	31	38	40	46	48	56	58	68	71	92
d_3	32	32	40	40	48	48	58	58	70	70	85	85	105
d_4	40	40	48	48	56	56	66	66	80	80	95	95	118
d_5	32	32	40	40	48	48	58	58	70	70	85	85	105
d_6	52	52	60	60	67	67	77	77	91	91	106	106	129
d_7	64,7	64,7	72,7	72,7	79,7	79,7	89,7	89,7	103,7	103,7	118,7	118,7	141,7
L	45	45	45	45	56	56	63	63	80	80	95	95	120
L_1	35	35	35	35	42	42	52	52	65	65	80	80	80
L_2	23	23	23	23	30	30	37	37	47	47	60	60	60
L_3	12	12	12	12	12	12	15	15	18	18	20	20	20

HEADED GUIDE BUSH FOR BALL BEARING, ISO 9448-7, TYPE 49

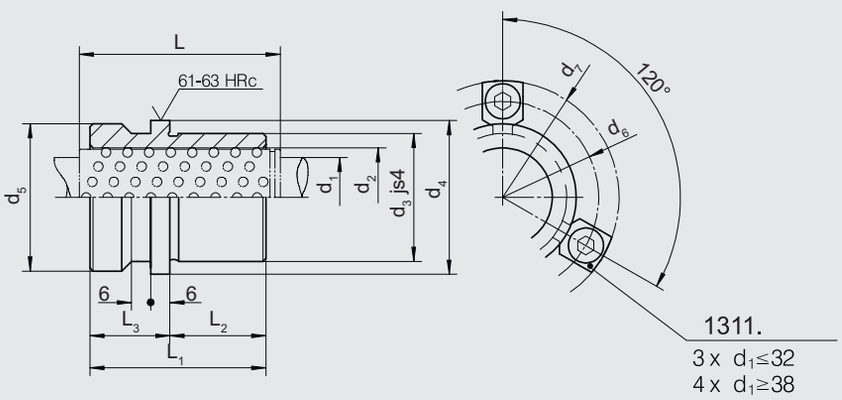
Order-No.: 1252.49.d_1

Material:
Guide bush: Tool steel
Hardness: 61 ± 2 HRC

Execution:
Bearing surfaces honed, outside diameter precision ground.

Note:
The attachment is with three 1311. screw clamps and from d_1 = 38 with four 1311. screw clamps.

Ordering example: d_1 = 40
1252.49.040



d_1	24	25	30	32	38	40	48	50
d_2	30	31	38	40	46	48	56	58
d_3	40	40	48	48	58	58	70	70
d_4	48	48	56	56	66	66	80	80
d_5	46	46	53	53	63	63	77	77
d_6	60	60	67	67	77	77	91	91
d_7	72,7	72,7	79,7	79,7	89,7	89,7	103,7	103,7
L	71	71	80	80	95	95	120	120
L_1	55	55	69	69	79	79	96	96
L_2	30	30	37	37	47	47	60	60
L_3	25	25	32	32	32	32	36	36

FLANGED GUIDE BUSH FOR BALL BEARING, ISO 9448-5, TYPE 44

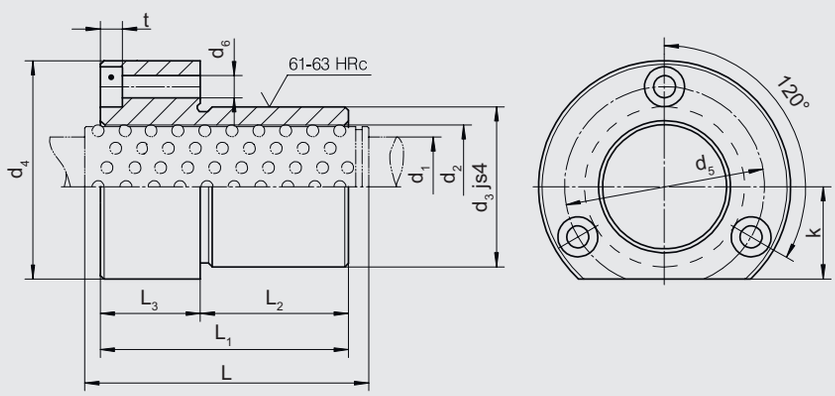
Order-No.: 1253.44.d_1

Material:
Guide bush: Tool steel
Hardness: 61 ± 2 HRC

Execution:
Bearing surfaces honed, outside diameter precision ground.

Note:
Screws are not contained in the scope of delivery.
The guide bush is fixed by means of three screws to DIN EN ISO 4762.

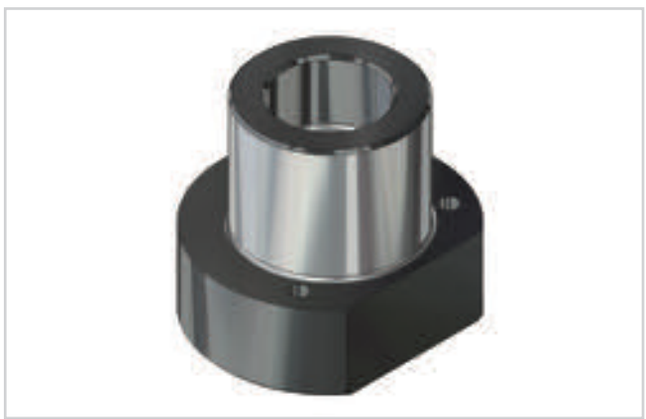
Ordering example: d_1 = 40
1253.44.040



d_1	19	20	24	25	30	32	38	40	48	50	60	63	80
d_2	25	26	30	31	38	40	46	48	56	58	68	71	92
d_3	32	32	40	40	48	48	58	58	70	70	85	85	105
d_4	50	50	63	63	72	72	85	85	104	104	120	120	148
d_5	40	40	50	50	58	58	70	70	86	86	100	100	125
d_6	4,5	4,5	5,5	5,5	5,5	5,5	6,6	6,6	9	9	9	9	11
k	18	18	23	23	28	28	33	33	38	38	46	46	56
t	4,6	4,6	5,7	5,7	5,7	5,7	6,8	6,8	9	9	9	9	11
L	71	71	71	71	80	80	95	95	120	120	120	120	140
L_1	52	52	62	62	72	72	77	77	102	102	102	102	125
L_2	37	37	37	37	47	47	47	47	60	60	60	60	75
L_3	15	15	25	25	25	25	30	30	42	42	42	42	50

FLANGED GUIDE BUSH FOR BALL BEARING, ISO 9448-5, TYPE 45

Order-No.: 1253.45.d_1

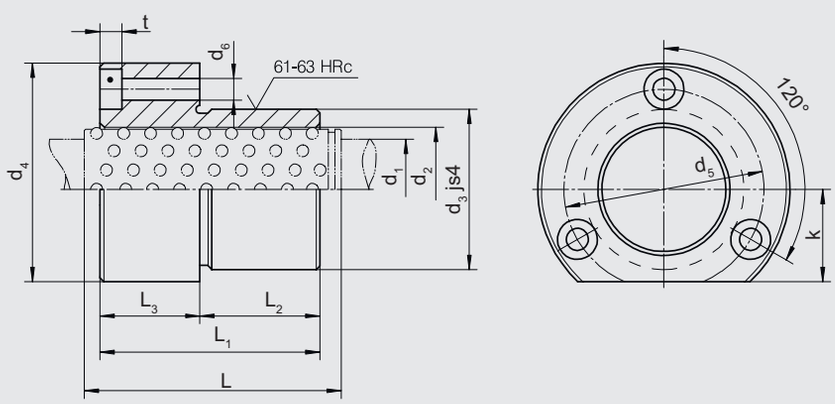


Material:
Guide bush: Tool steel
Hardness: 61 ± 2 HRC

Execution:
Bearing surfaces honed, outside diameter precision ground.

Note:
Screws are not contained in the scope of delivery.
The guide bush is fixed by means of three screws
– **up to** ø 16 screws to DIN 6912
– **from** ø 19: screws to DIN EN ISO 4762

Ordering example: d_1 = 40
1253.45.040



d_1	15	16	19	20	24	25	30	32	38	40	48	50	60	63
d_2	21	22	25	26	30	31	38	40	46	48	56	58	68	71
d_3	28	28	32	32	40	40	48	48	58	58	70	70	85	85
d_4	45	45	50	50	63	63	72	72	85	85	104	104	120	120
d_5	35	35	40	40	50	50	58	58	70	70	86	86	100	100
d_6	4,5	4,5	4,5	4,5	5,5	5,5	5,5	5,5	6,6	6,6	9	9	9	9
k	15	15	18	18	23	23	28	28	33	33	38	38	46	46
t	3,4	3,4	4,6	4,6	5,7	5,7	5,7	5,7	6,8	6,8	9	9	9	9
L	45	45	56	56	71	71	71	71	80	80	95	95	95	95
L_1	36	36	45	45	55	55	62	62	67	67	89	89	89	89
L_2	30	30	30	30	30	30	37	37	37	37	47	47	47	47
L_3	6	6	15	15	25	25	25	25	30	30	42	42	42	42

FLANGED GUIDE BUSH FOR BALL BEARING, ISO 9448-5, TYPE 46

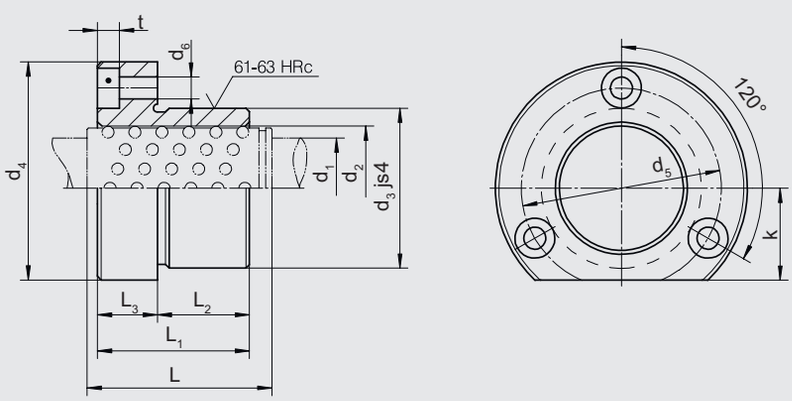
Order-No.: 1253.46.d_1

Material:
Guide bush: Tool steel
Hardness: 61 ± 2 HRC

Execution:
Bearing surfaces honed, outside diameter precision ground.

Note:
Screws are not contained in the scope of delivery.
The guide bush is fixed by means of three screws
– **up to** ø 16 screws to DIN 6912
– **from** ø 19: screws to DIN EN ISO 4762

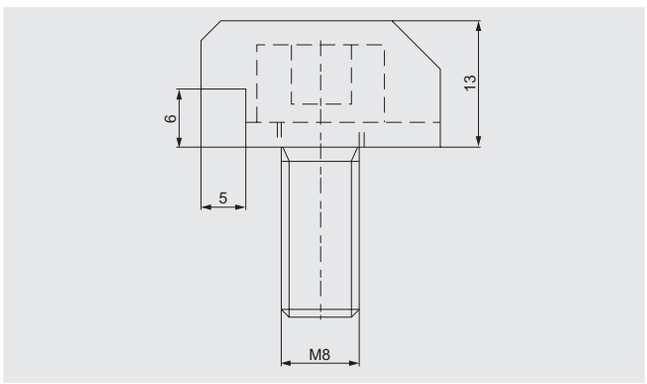
Ordering example: d_1 = 40
1253.46.040

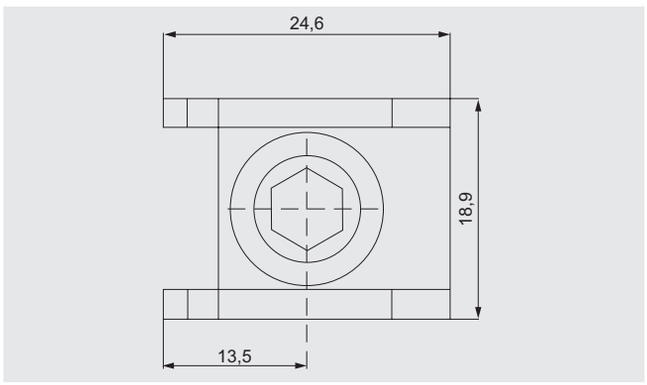


d_1	12	15	16	19	20	24	25	30	32	38	40	48	50
d_2	16	21	22	25	26	30	31	38	40	46	48	56	58
d_3	23	28	28	32	32	40	40	48	48	58	58	70	70
d_4	43	45	45	50	50	63	63	72	72	85	85	104	104
d_5	33	35	35	40	40	50	50	58	58	70	70	86	86
d_6	4,5	4,5	4,5	4,5	4,5	5,5	5,5	5,5	5,5	6,6	6,6	9	9
k	13	15	15	18	18	23	23	28	28	33	33	38	38
t	4,6	3,4	3,4	4,6	4,6	5,7	5,7	5,7	5,7	6,8	6,8	9	9
L	40	45	45	45	45	45	45	56	56	63	63	80	80
L_1	25	29	29	38	38	38	38	45	45	55	55	62	62
L_2	16	23	23	23	23	23	23	30	30	30	30	37	37
L_3	9	6	6	15	15	15	15	15	15	25	25	25	25

SCREW CLAMP, CLAMPING HEIGHT 6 MM, M8

Order-No.: 1317.

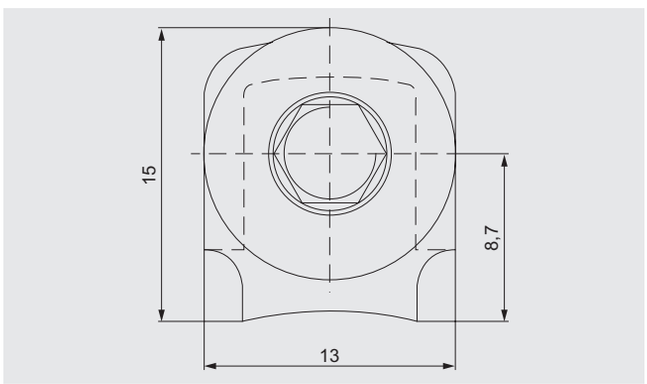




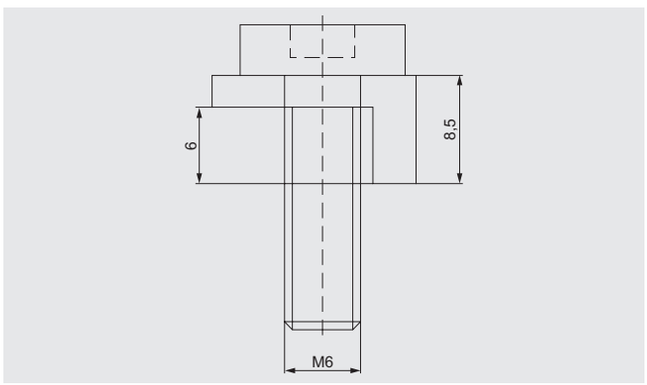
Note:
according to NAAMS, incl. screw
– Steel punched bent component

SCREW CLAMP, CLAMPING HEIGHT 6 MM, M6

Order-No.: 1311.



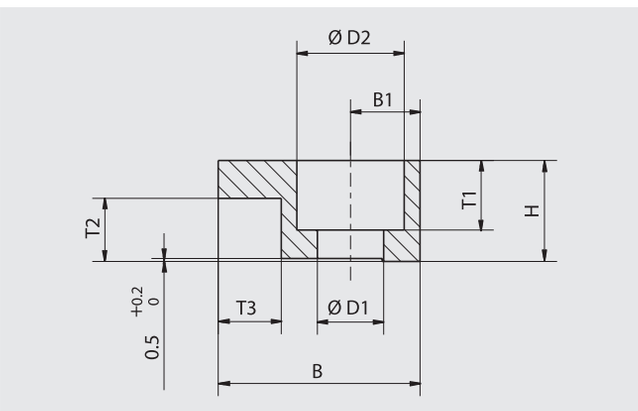
Note:
incl. screw
– Steel punched bent component

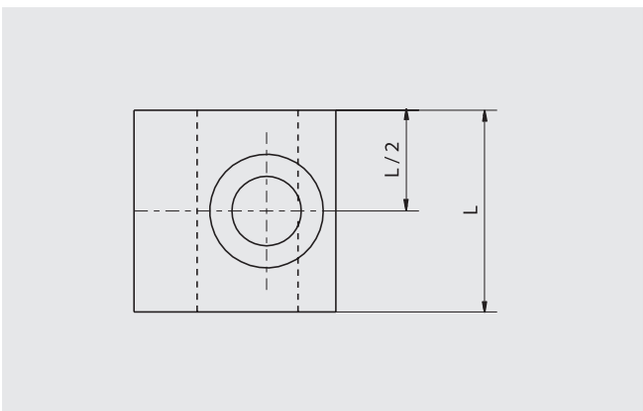


SCREW CLAMP, MILLED, HARDENED, BURNISHED

Note:
– Steel milled
– Clamping height 6-6,3 mm

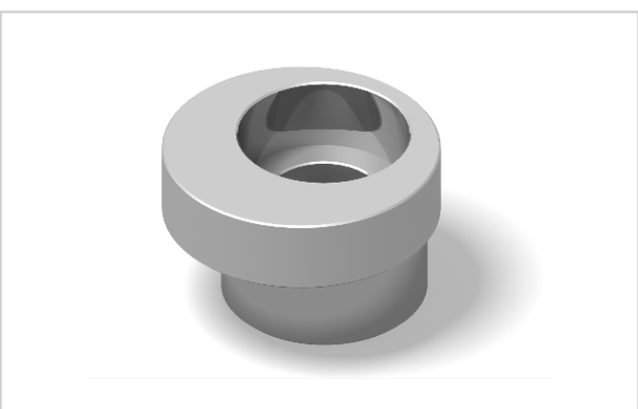
Order -No:	B	L	H	B1	D1	D2	T1	T2	T3
1312.	20	20	10	7,5	6,5	11	7	6,3	5
1323.	25	20	12	10	9	15	8,5	6,3	5
1321.	32	25	16	11	11	18	11	6,3	10
1313.	32	32	16	11	11	18	11	10	10
1322.	32	32	16	11	11	18	11	6,3	10
1314.	32	32	16	11	11	18	11	6	10





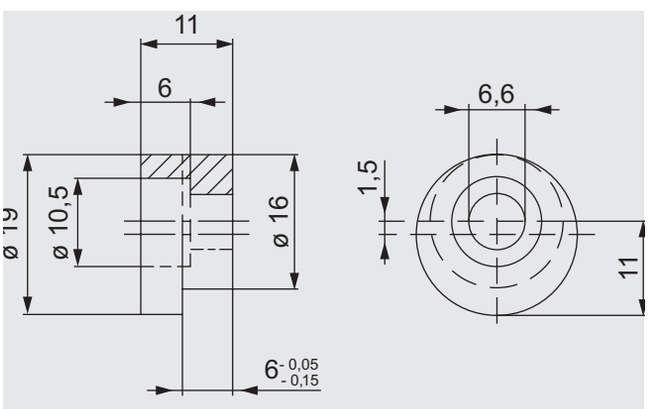
SCREW CLAMP, ECCENTRIC DESIGN

Order-No.: 1324.



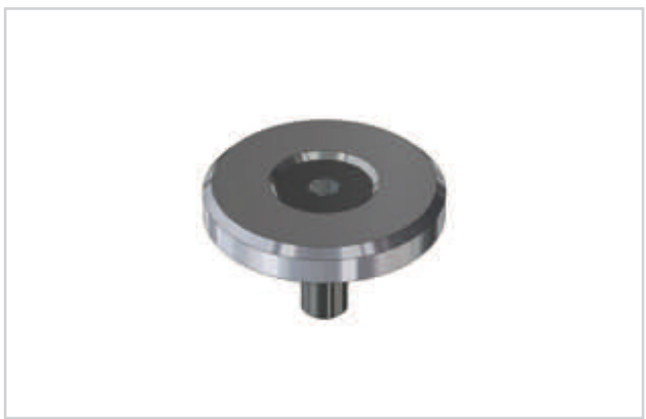
Material:
1.0718

Note:
Excl. screw
– Clamping height 6 mm
– Screw M6



RETAINER DISC WITH SCREW

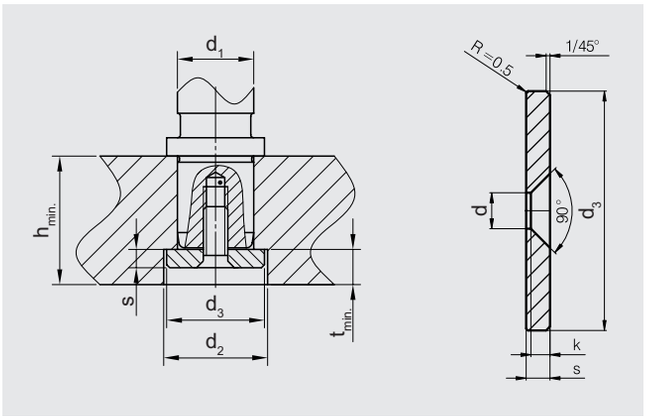
Order-No.: 1331.d_1 (Pillar diameter)



s	6	6	6	6	6	6	6	12
k	4,8	4,8	4,8	4,8	4,8	4,8	4,8	6,5
d	9	9	9	9	9	9	9	13
d_3	22	25	32	40	50	60	70	93
d_1	**15-16**	**19-20**	**24-25**	**30-32**	**38-40**	**48-50**	**60-63**	**80**

Note:
Incl. screw

Ordering example: d_1 = 50
1331.050



RETAINER DISC WITH SOCKET CAP SCREW

Order-No.: 1334.Pillar diameter

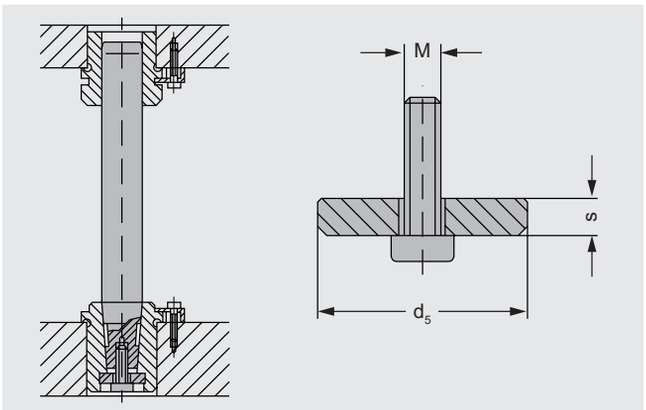
Material: Retaining disc: Steel, burnished
Socket head cap screw DIN 6912

Note:
Has to be ordered separately to guide pillar, conical according to AFNOR 116.

Ordering example: Pillar diameter = 16
1334.016

Order-No.:	Pillar-ø	d_5	s	M
1334.016	**16**	18	3	M6
1334.020	**20**	22	3	M6
1334.025	**25**	25	4	M8
1334.032	**32**	32	4	M8
1334.040	**40**	40	4	M8
1334.050	**50**	50	5	M10
1334.063	**63**	63	6	M12

Mounting example:

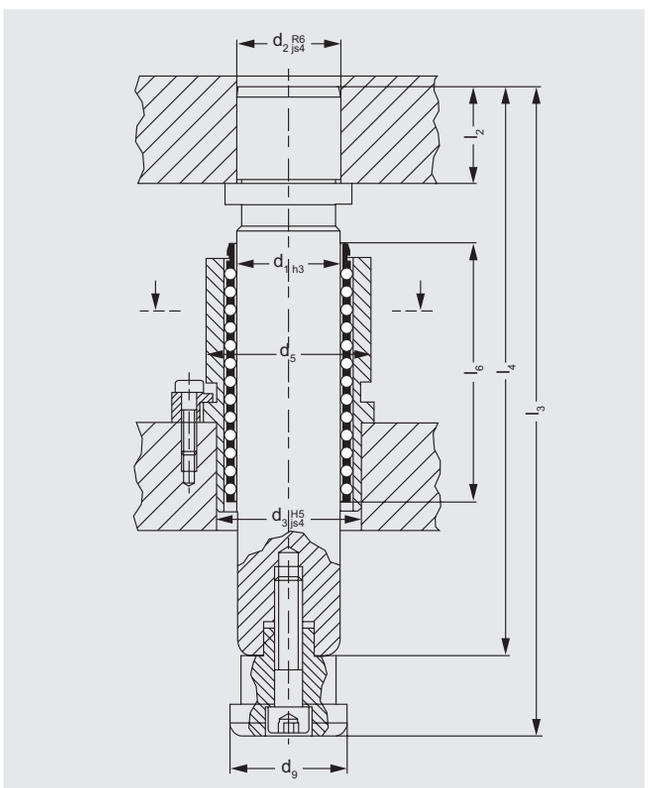


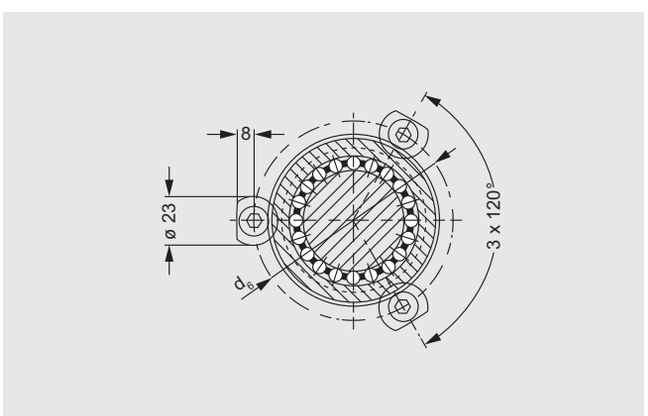
BALL GUIDE UNIT ACCORDING TO MERCEDES-BENZ-STANDARD

Order-No.: 1000.94.d_1

Material:
Demountable guide pillar: Steel, surface hardened
Guide bush: Tooling Steel
Cage retainer: Steel
Ball cage: Brass

Ordering example: d_1 = 80
1000.94.080

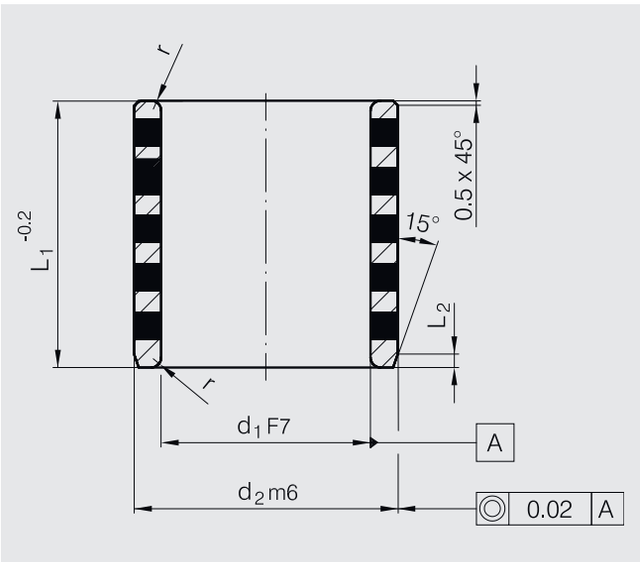




d_1	**50**	**80**
d_2	50	80
d_3	70	105
d_5	80	118
d_6	97	135
d_9	57	91
l_2	47	75
l_3	316	450
l_4	271	400
l_6	128	160

GUIDE BUSH, BRONZE WITH SOLID LUBRICANT

Order-No.: 1291.d_1.d_2.L_1



Material:
Bronze with solid lubricant, oiless lubricating

Note:
Recommended register bore, for press fit H7, for bond in G7 (poss. secure with set screw).
Note that press fitment reduces inside bush diameter. Bushes can be used with radial or axial motion.

Ordering example: d_1 = 20, d_2 = 28, L_1 = 16
1291.020.028.016

d_1	d_2	r	L_1	L_2
8	**12**	0,5	**8**	2
8	**12**	0,5	**10**	2
8	**12**	0,5	**12**	2
8	**12**	0,5	**15**	2
10	**14**	0,5	**8**	2
10	**14**	0,5	**10**	2
10	**14**	0,5	**12**	2
10	**14**	0,5	**15**	2
10	**14**	0,5	**20**	2
10	**15**	0,5	**10**	2
12	**18**	0,5	**10**	2
12	**18**	0,5	**12**	2
12	**18**	0,5	**15**	2
12	**18**	0,5	**16**	2
12	**18**	0,5	**20**	2
12	**18**	0,5	**25**	2
12	**18**	0,5	**30**	2
13	**19**	0,5	**10**	2
13	**19**	0,5	**15**	2
13	**19**	0,5	**16**	2
13	**19**	0,5	**20**	2
14	**20**	0,5	**10**	2
14	**20**	0,5	**12**	2
14	**20**	0,5	**15**	2
14	**20**	0,5	**20**	2
14	**20**	0,5	**25**	2
14	**20**	0,5	**30**	2
15	**21**	0,75	**10**	2
15	**21**	0,75	**12**	2
15	**21**	0,75	**15**	2
15	**21**	0,75	**16**	2
15	**21**	0,75	**20**	2
15	**21**	0,75	**25**	2
15	**21**	0,75	**30**	2
16	**22**	0,75	**10**	2
16	**22**	0,75	**12**	2
16	**22**	0,75	**15**	2
16	**22**	0,75	**16**	2
16	**22**	0,75	**20**	2
16	**22**	0,75	**25**	2
16	**22**	0,75	**30**	2
16	**22**	0,75	**35**	2
16	**22**	0,75	**40**	2
18	**24**	0,75	**15**	2
18	**24**	0,75	**16**	2
18	**24**	0,75	**20**	2
18	**24**	0,75	**25**	2

d_1	d_2	r	L_1	L_2
18	**24**	0,75	**30**	2
18	**24**	0,75	**35**	2
18	**24**	0,75	**40**	2
19	**25**	0,75	**37**	2
20	**26**	0,75	**40**	4
20	**28**	0,75	**15**	4
20	**28**	0,75	**20**	4
20	**28**	0,75	**25**	4
20	**28**	0,75	**30**	4
20	**28**	0,75	**35**	4
20	**28**	0,75	**37**	4
20	**28**	0,75	**40**	4
20	**28**	0,75	**50**	4
20	**30**	0,75	**16**	4
20	**30**	0,75	**20**	4
20	**30**	0,75	**25**	4
20	**30**	0,75	**30**	4
20	**30**	0,75	**35**	4
20	**30**	0,75	**40**	4
24	**32**	0,75	**47**	4
25	**32**	0,75	**50**	4
25	**33**	0,75	**16**	4
25	**33**	0,75	**20**	4
25	**33**	0,75	**25**	4
25	**33**	0,75	**30**	4
25	**33**	0,75	**35**	4
25	**33**	0,75	**40**	4
25	**33**	0,75	**47**	4
25	**33**	0,75	**50**	4
25	**33**	0,75	**60**	4
25	**35**	0,75	**16**	4
25	**35**	0,75	**20**	4
25	**35**	0,75	**25**	4
25	**35**	0,75	**30**	4
25	**35**	0,75	**35**	4
25	**35**	0,75	**40**	4
25	**35**	0,75	**50**	4
28	**38**	0,75	**30**	4
28	**38**	0,75	**40**	4
30	**38**	0,75	**20**	4
30	**38**	0,75	**25**	4
30	**38**	0,75	**30**	4
30	**38**	0,75	**35**	4
30	**38**	0,75	**40**	4
30	**38**	0,75	**50**	4
30	**38**	0,75	**60**	4
30	**40**	0,75	**20**	4

d_1	d_2	r	L_1	L_2
30	**40**	0,75	**25**	4
30	**40**	0,75	**30**	4
30	**40**	0,75	**35**	4
30	**40**	0,75	**40**	4
30	**40**	0,75	**50**	4
30	**40**	0,75	**60**	4
30	**42**	0,75	**60**	4
31,5	**40**	0,75	**30**	4
31,5	**40**	0,75	**40**	4
32	**42**	0,75	**30**	4
32	**42**	0,75	**40**	4
32	**42**	0,75	**60**	4
35	**44**	0,75	**25**	4
35	**44**	0,75	**30**	4
35	**44**	0,75	**35**	4
35	**44**	0,75	**40**	4
35	**44**	0,75	**50**	4
35	**44**	0,75	**60**	4
35	**45**	0,75	**20**	4
35	**45**	0,75	**25**	4
35	**45**	0,75	**30**	4
35	**45**	0,75	**35**	4
35	**45**	0,75	**40**	4
35	**45**	0,75	**50**	4
35	**45**	0,75	**60**	4
38	**48**	1,5	**30**	4
38	**48**	1,5	**40**	4
38	**48**	1,5	**77**	4
40	**50**	1,5	**20**	4
40	**50**	1,5	**25**	4
40	**50**	1,5	**30**	4
40	**50**	1,5	**35**	4
40	**50**	1,5	**40**	4
40	**50**	1,5	**50**	4
40	**50**	1,5	**60**	4
40	**55**	1,5	**25**	4
40	**55**	1,5	**30**	4
40	**55**	1,5	**35**	4
40	**55**	1,5	**40**	4
40	**55**	1,5	**50**	4
40	**55**	1,5	**60**	4
45	**55**	1,5	**30**	4
45	**55**	1,5	**35**	4
45	**55**	1,5	**40**	4
45	**55**	1,5	**50**	4
45	**55**	1,5	**60**	4
45	**56**	1,5	**30**	4

d_1	d_2	r	L_1	L_2
45	56	1,5	35	4
45	56	1,5	40	4
45	56	1,5	50	4
45	56	1,5	60	4
45	60	1,5	30	4
45	60	1,5	35	4
45	60	1,5	40	4
45	60	1,5	50	4
45	60	1,5	60	4
45	60	1,5	70	4
45	60	1,5	80	4
50	60	1,5	30	4
50	60	1,5	35	4
50	60	1,5	40	4
50	60	1,5	50	4
50	60	1,5	60	4
50	60	1,5	70	4
50	60	1,5	80	4
50	60	1,5	95	4
50	62	2	30	3
50	62	2	35	3
50	62	2	40	3
50	62	2	50	3
50	62	2	60	3
50	62	2	70	3
50	65	1,5	30	4
50	65	1,5	40	4
50	65	1,5	50	4
50	65	1,5	60	4
50	65	1,5	70	4
50	65	1,5	80	4
50	65	1,5	100	4
55	70	2	40	4
55	70	2	50	4
55	70	2	60	4
55	70	2	70	4
60	74	2	30	4
60	74	2	35	4
60	74	2	40	4
60	74	2	50	4
60	74	2	60	4
60	74	2	70	4
60	74	2	80	4
60	75	2	30	4
60	75	2	35	4
60	75	2	40	4
60	75	2	50	4

d_1	d_2	r	L_1	L_2
60	75	2	60	4
60	75	2	70	4
60	75	2	80	4
60	75	2	100	4
63	75	2	60	4
63	75	2	70	4
63	75	2	80	4
65	80	2	50	4
65	80	2	60	4
65	80	2	70	4
65	80	2	80	4
70	85	2	35	4
70	85	2	40	4
70	85	2	50	4
70	85	2	60	4
70	85	2	70	4
70	85	2	80	4
70	85	2	100	4
70	90	2	50	4
70	90	2	60	4
70	90	2	70	4
70	90	2	80	4
75	90	2	60	4
75	90	2	70	4
75	90	2	80	4
75	90	2	100	4
75	95	2	60	4
75	95	2	70	4
75	95	2	80	4
75	95	2	100	4
80	96	2	40	4
80	96	2	50	4
80	96	2	60	4
80	96	2	70	4
80	96	2	80	4
80	96	2	100	4
80	96	2	120	4
80	100	2	40	4
80	100	2	50	4
80	100	2	60	4
80	100	2	70	4
80	100	2	80	4
80	100	2	100	4
80	100	2	120	4
80	100	2	140	4
85	100	2	80	4
90	110	2	60	4

d_1	d_2	r	L_1	L_2
90	110	2	70	4
90	110	2	80	4
90	110	2	100	4
90	110	2	120	4
100	120	2	60	4
100	120	2	70	4
100	120	2	80	4
100	120	2	100	4
100	120	2	120	4
100	120	2	140	4
110	130	2	80	4
110	130	2	100	4
110	130	2	120	4
120	140	2	80	4
120	140	2	100	4
120	140	2	120	4
120	140	2	140	4
120	140	2	140	4
125	145	2	100	4
125	145	2	120	4
130	150	2	100	4
130	150	2	120	4
130	150	2	130	4
140	160	2	100	4
140	160	2	140	4
150	170	2	100	4
150	170	2	150	4
160	180	2	100	4
160	180	2	150	4

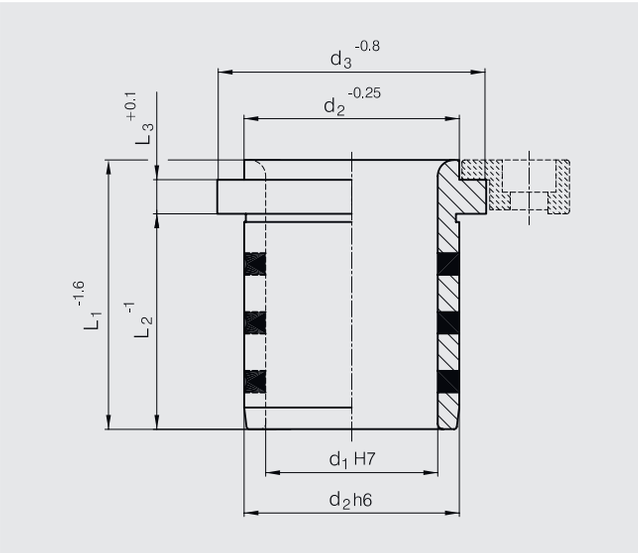
GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT

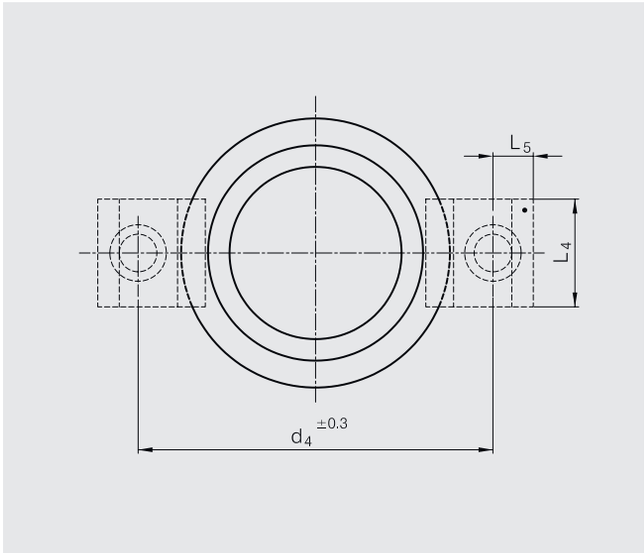
Order-No.: 1292.d_1

Material:
Bronze with solid lubricant, oiless lubricating.

Note:
Screw clamps with screws to be ordered separately:
– up to d_1 = 50 1312. (M 6316 DIN EN ISO 4762)
– from d_1 = 60 1313. (M 10320 DIN EN ISO 4762)

Ordering example: d_1 = 50
1292.050





d_1	24/25	30/32	38/40	48/50	60/63	80	100	125	160
d_2	32	40	50	63	80	100	125	160	200
d_3	40	50	63	70	90	112	140	180	220
d_4	58	66	79	89	123	143	168	203	243
L_1	40	50	63	71	80	100	125	160	200
L_2	30	40	50	56	63	80	103	132	170
L_3	6,3	6,3	6,3	6,3	10	10	10	10	10
L_4	20	20	20	20	32	32	32	32	32
L_5	7,5	7,5	7,5	7,5	11	11	11	11	11

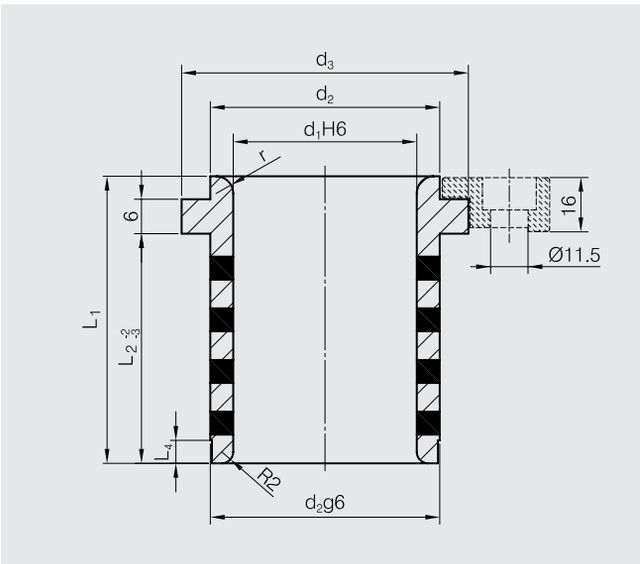
GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT, NAAMS

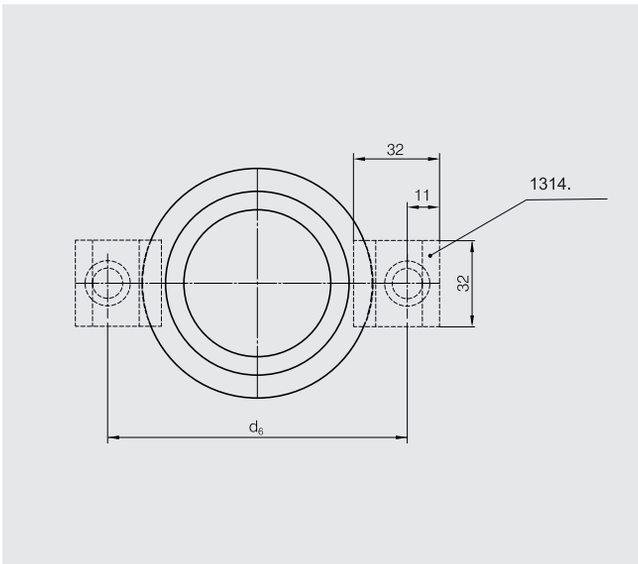
Order-No.: 1293.d_1

Material:
Bronze with solid lubricant, oiless lubricating.

Note:
Register bore, H7
Screw clamps with screws to be ordered separately: 1314.

Ordering example: d_1 = 50
1293.050

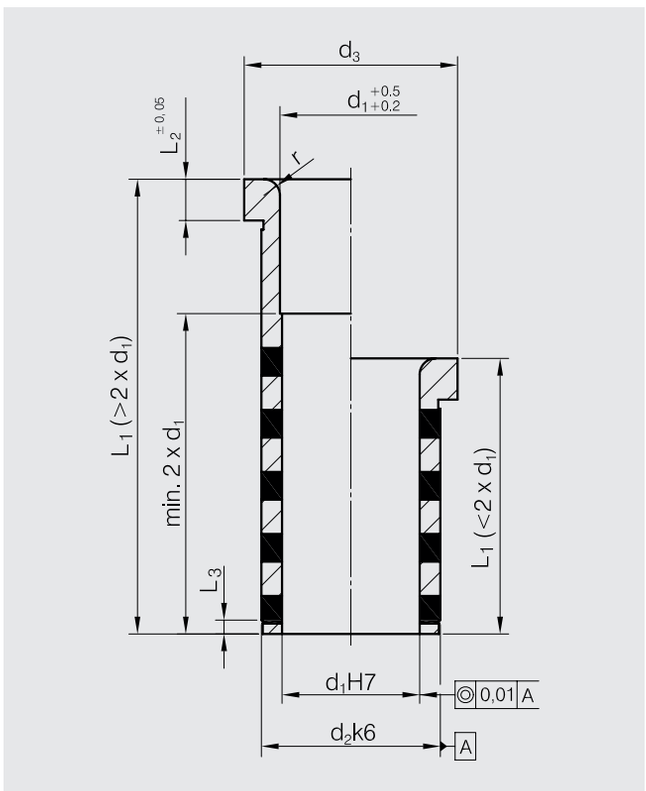




d_1	25	32	40	50	63	80	100	115	125
d_2	32	40	50	63	80	100	125	140	160
d_3	40	50	63	71	90	112	140	155	180
r	3	3	3	5	6	8	10	10	12
L_1	40	50	63	71	80	100	125	140	160
L_2	30	40	50	56	63	80	106	120	132
L_4	3	4	5	6,3	8	10	12,5	12,5	16

GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT, TYPE 87

Order-No.: 1287.d_1.L_1



Material:
Bronze with solid lubricant, oiless lubricating.

Note:
Register bore, H7

Ordering example: d_1 = 14, L_1 = 56
1287.014.056

d_1	d_2	d_3	r	L_1	L_2	L_3
9-10	14	16	1	**12**	3	2
9-10	14	16	1	**17**	3	2
9-10	14	16	1	**22**	3	2
9-10	14	16	1	**27**	3	2
9-10	14	16	1	**36**	3	2
12	18	23	1,5	**17**	6	3
12	18	23	1,5	**22**	6	3
12	18	23	1,5	**27**	6	3
12	18	23	1,5	**36**	6	3
14-15	20	25	1,5	**17**	6	3
14-15	20	25	1,5	**22**	6	3
14-15	20	25	1,5	**27**	6	3
14-15	20	25	1,5	**36**	6	3
14-15	20	25	1,5	**46**	6	3
14-15	20	25	1,5	**56**	6	3
16	22	27	1,5	**17**	6	3
16	22	27	1,5	**22**	6	3
16	22	27	1,5	**27**	6	3
16	22	27	1,5	**36**	6	3
16	22	27	1,5	**46**	6	3
16	22	27	1,5	**56**	6	3
18-20	26	31	1,5	**17**	6	3
18-20	26	31	1,5	**22**	6	3
18-20	26	31	1,5	**27**	6	3
18-20	26	31	1,5	**36**	6	3
18-20	26	31	1,5	**46**	6	3
18-20	26	31	1,5	**56**	6	3
18-20	26	31	1,5	**66**	6	3
22-24	30	35	2	**17**	6	3
22-24	30	35	2	**22**	6	3
22-24	30	35	2	**27**	6	3
22-24	30	35	2	**36**	6	3
22-24	30	35	2	**46**	6	3

d_1	d_2	d_3	r	L_1	L_2	L_3
22-24	30	35	2	**56**	6	3
22-24	30	35	2	**66**	6	3
22-24	30	35	2	**76**	6	3
22-24	30	35	2	**86**	6	3
30-32	42	47	2	**27**	6	3
30-32	42	47	2	**36**	6	3
30-32	42	47	2	**46**	6	3
30-32	42	47	2	**56**	6	3
30-32	42	47	2	**66**	6	3
30-32	42	47	2	**76**	6	3
30-32	42	47	2	**86**	6	3
30-32	42	47	2	**96**	6	3
30-32	42	47	2	**116**	6	3
40-42	54	60	3	**56**	10	4
40-42	54	60	3	**66**	10	4
40-42	54	60	3	**76**	10	4
40-42	54	60	3	**86**	10	4
40-42	54	60	3	**96**	10	4
40-42	54	60	3	**116**	10	4
40-42	54	60	3	**136**	10	4
40-42	54	60	3	**156**	10	4
50	66	72	3	**76**	10	4
50	66	72	3	**86**	10	4
50	66	72	3	**96**	10	4
50	66	72	3	**116**	10	4
50	66	72	3	**136**	10	4
50	66	72	3	**156**	10	4
50	66	72	3	**196**	10	4
60	80	86	3	**96**	20	4
60	80	86	3	**116**	20	4
60	80	86	3	**136**	20	4
60	80	86	3	**156**	20	4
60	80	86	3	**196**	20	4

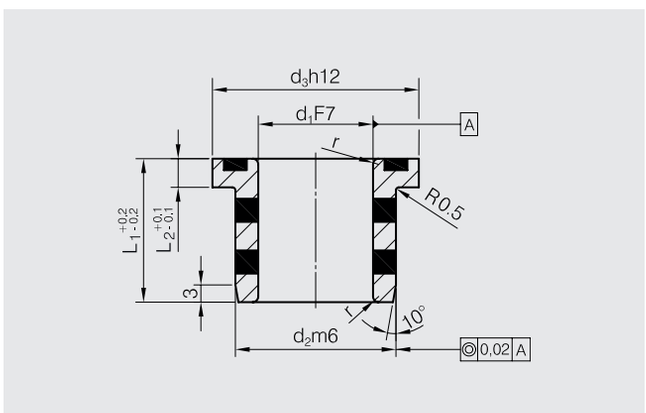
GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT, TYPE 70

Order-No.: 1270.d_1.L_1

Material:
Bronze with solid lubricant, oiless lubricating.

Note:
Register bore, H7

Ordering example: d_1 = 20, L_1 = 25
1270.020.025



d_1	12	16	20	25	30	40	50	50	60	60
d_2	18	22	28	33	38	50	60	62	75	75
d_3	25	30	36	43	48	60	68	75	83	90
r	1	1	1	1	1	2	2	2	3	3
L_1	15	20	25	30	35	45	50	55	60	65
L_2	4	5	5	5	5	5	5	6	7,5	7

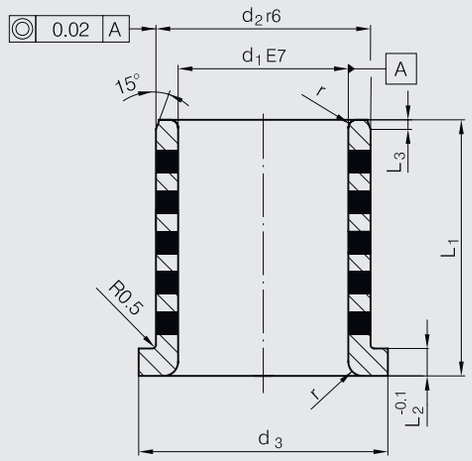
GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT, TYPE 71

Order-No.: 1271.d_1.L_1

Material:
Bronze with solid lubricant, oiless lubricating.

Note:
Register bore, H7. Note that press fitment reduces inside bush diameter.

Ordering example: d_1 = 50, L_1 = 40
1271.050.040

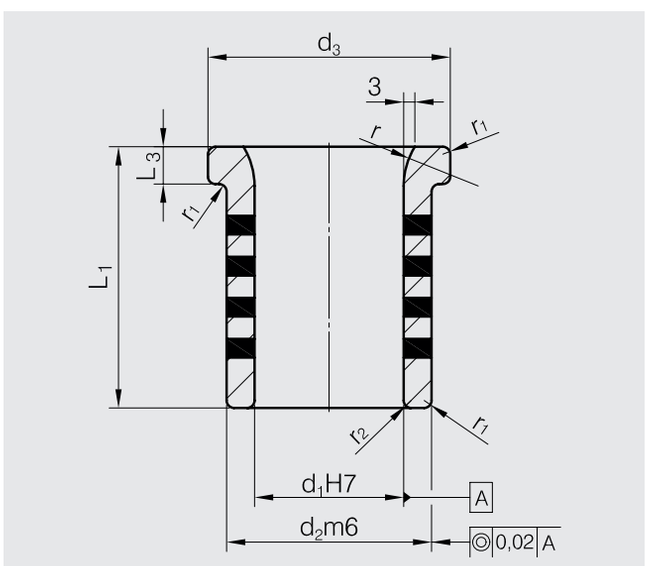


d_1	d_2	d_3	r	L_1	L_2	L_3
10	14	22	1	**15**	2	2
10	14	22	1	**20**	2	2
12	18	25	1	**15**	3	3
12	18	25	1	**20**	3	3
13	19	26	1,5	**15**	3	3
13	19	26	1,5	**20**	3	3
14	20	27	1,5	**15**	3	3
14	20	27	1,5	**20**	3	3
15	21	28	1,5	**15**	3	3
15	21	28	1,5	**20**	3	3
15	21	28	1,5	**25**	3	3
16	22	29	1,5	**15**	3	3
16	22	29	1,5	**20**	3	3
16	22	29	1,5	**25**	3	3
16	22	29	1,5	**30**	3	3
20	30	40	1,5	**15**	5	3
20	30	40	1,5	**20**	5	3
20	30	40	1,5	**30**	5	3
20	30	40	1,5	**40**	5	3
25	35	45	2	**20**	5	3
25	35	45	2	**25**	5	3
25	35	45	2	**30**	5	3
25	35	45	2	**35**	5	3
25	35	45	2	**40**	5	3
30	40	50	2	**20**	5	3
30	40	50	2	**25**	5	3
30	40	50	2	**30**	5	3
30	40	50	2	**35**	5	3
30	40	50	2	**40**	5	3
30	40	50	2	**50**	5	3
31,5	40	50	2	**35**	5	3
35	45	60	2	**25**	5	4

d_1	d_2	d_3	r	L_1	L_2	L_3
35	45	60	2	**30**	5	4
35	45	60	2	**40**	5	4
35	45	60	2	**50**	5	4
40	50	65	2	**30**	5	4
40	50	65	2	**40**	5	4
40	50	65	2	**50**	5	4
45	55	70	2	**30**	5	4
45	55	70	2	**40**	5	4
45	55	70	2	**50**	5	4
45	55	70	2	**60**	5	4
50	60	75	2	**30**	5	4
50	60	75	2	**40**	5	4
50	60	75	2	**50**	5	4
50	60	75	2	**60**	5	4
55	65	80	2	**40**	5	4
55	65	80	2	**60**	5	4
60	75	90	3	**40**	7,5	5
60	75	90	3	**50**	7,5	5
60	75	90	3	**80**	7,5	5
63	75	85	3	**67,5**	7,5	5
70	85	105	3	**50**	7,5	5
70	85	105	3	**80**	7,5	5
75	90	110	3	**60**	7,5	5
80	100	120	3	**60**	10	5
80	100	120	3	**80**	10	5
80	100	120	3	**100**	10	5
90	110	130	3	**60**	10	5
90	110	130	3	**80**	10	5
100	120	150	3	**80**	10	5
100	120	150	3	**100**	10	5
120	140	170	3	**80**	10	5
120	140	170	3	**100**	10	5

GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT, TYPE 72

Order-No.: 1272.d_1.L_1



Material:
Bronze with solid lubricant, oiless lubricating.

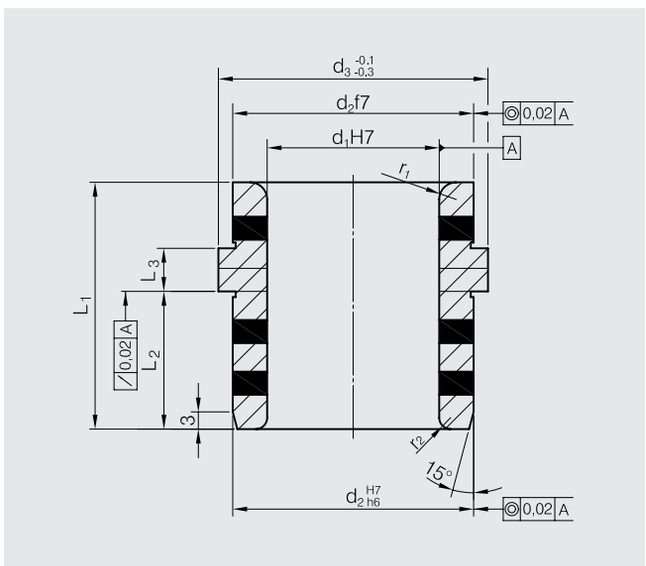
Note:
Register bore, H7

Ordering example: d_1 = 25, L_1 = 40
1272.025.040

d_1	25	30	40	50	60	65	65	80	80	100	100
d_2	35	40	55	65	75	80	80	100	100	120	120
d_3	45	50	65	75	85	90	90	110	110	130	130
r	10	20	20	20	20	20	20	20	20	20	20
r_1	1	1	2	2	2	2	2	2	2	2	2
r_2	2	2	2	2	2	2	2	3	3	3	3
L_1	40	50	70	80	80	80	120	100	140	100	140
L_3	7	10	10	10	10	10	10	10	10	10	10

GUIDE BUSH WITH COLLAR, BRONZE WITH SOLID LUBRICANT, TYPE 73

Order-No.: 1273.d_1.L_1



Material:
Bronze with solid lubricant, oiless lubricating.

Note:
Register bore, H7

Ordering example: d_1 = 50, L_1 = 77
1273.050.077

d_1	**25**	**30**	**40**	**40**	**50**	**50**	**60**	**63**	**63**	**63**
d_2	35	42	50	50	63	63	80	80	80	80
d_3	40	47	60	60	72	72	86	90	90	90
r_1	3	3	4	4	4	4	3	4	4	4
r_2	2	2	2	2	3	3	3	3	3	3
L_1	**43**	**43**	**60**	**64**	**77**	**92**	**78**	**95**	**100**	**108**
L_2	24	24	35,5	39,5	44,5	55,5	49	55,5	62,5	62,5
L_3	7,5	7,5	6	6	8	8	7,5	8	8	8

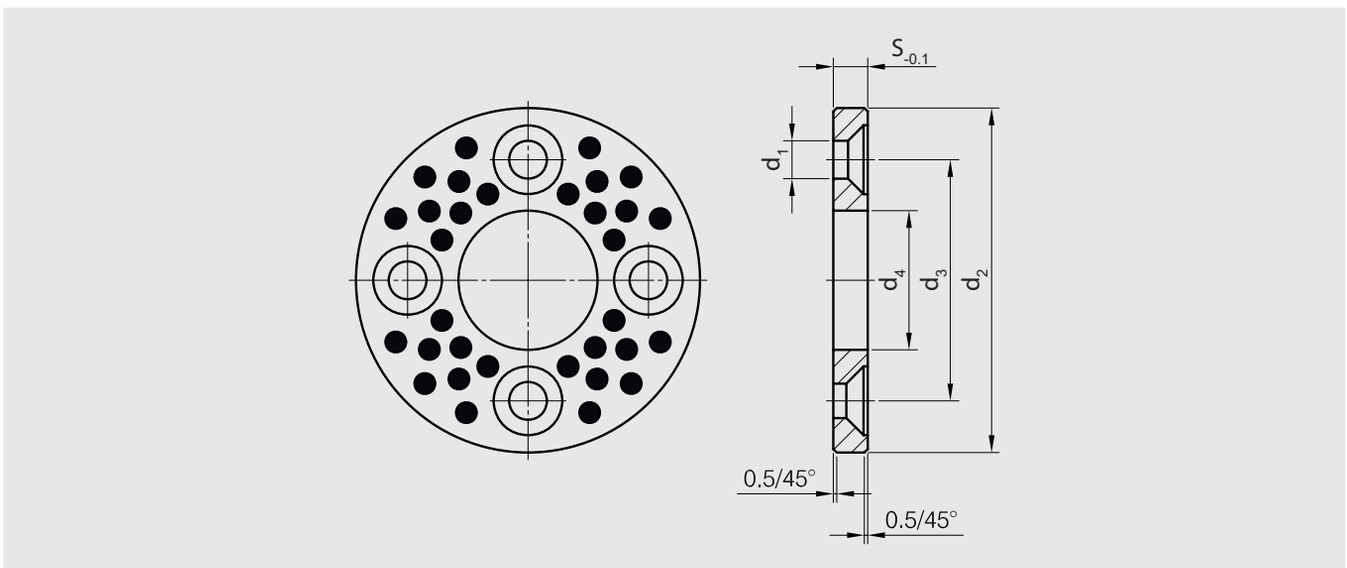
THRUST WASHER, BRONZE WITH SOLID LUBRICANT

Order-No.: 2053.d_4

Material:
Bronze with solid lubricant, oiless lubricating.

Note:
For combination loads use together with bushes 1291.
Screws not included.
Fixing: from d_4 = 20,2 2 x M5
from d_4 = 40,2 2 x M6
from d_4 = 50,3 4 x M6
from d_4 = 60,3 4 x M8
from d_4 = 90,5 4 x M10

Ordering example: d_4 = 40,2
2053.040

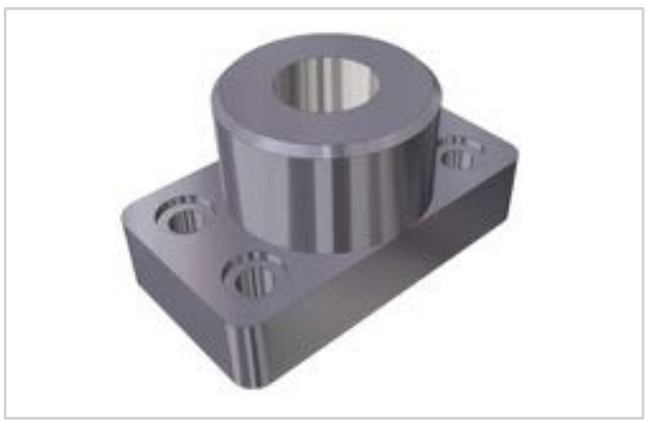


d_1	3,4	3,4	3,4	3,4	3,4	3,4	3,4	5,5	5,5	5,5	5,5	6,6	6,6
d_2	30	40	40	40	50	50	50	50	55	60	70	80	90
d_3	20	28	28	28	28	28	35	35	40	45	50	60	67,5
d_4	**10,2**	**12,2**	**13,2**	**14,2**	**15,2**	**16,2**	**18,2**	**20,2**	**25,2**	**30,2**	**35,2**	**40,2**	**45,3**
s	3	3	3	3	3	3	3	5	5	5	5	7	7
Bore	2 x M3	2 x M3	2 x M3	2 x M3	2 x M3	2 x M3	2 x M3	2 x M5	2 x M5	2 x M5	2 x M5	2 x M6	2 x M6

d_1	6,6	9	9	9	11	11	11
d_2	100	120	130	150	170	190	200
d_3	75	90	100	120	140	160	175
d_4	**50,3**	**60,3**	**70,3**	**80,3**	**90,5**	**100,5**	**120,5**
s	8	8	10	10	10	10	10
Bore	4 x M6	4 x M8	4 x M8	4 x M8	4 x M10	4 x M10	4 x M10

RETENTION BEARING WITH SCREW HOLES

Order-No.: 91.D1

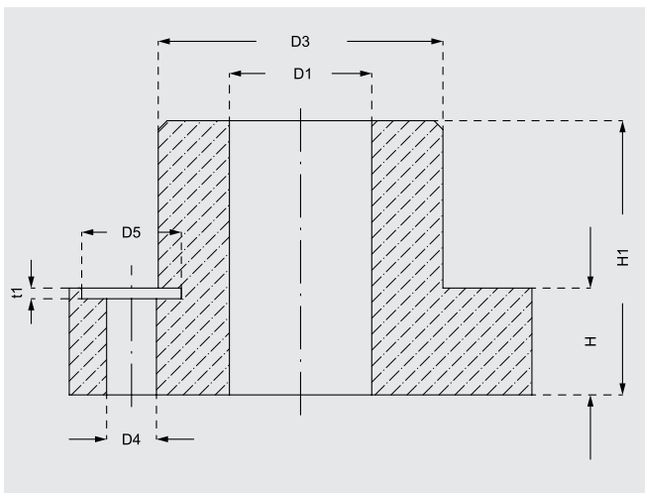


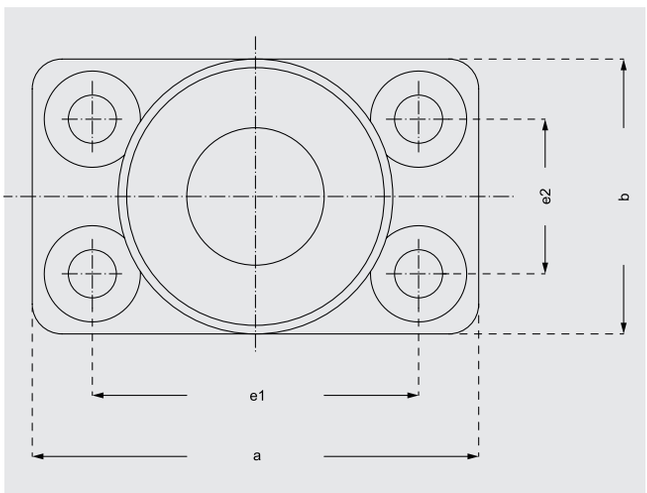
Material:
Special cast iron

Execution:
Face and top machined.
Hole fine bored to d1R6 fit.

Note:
Check squareness of pillars after press-fitting

Ordering example: D1 = 19
91.019

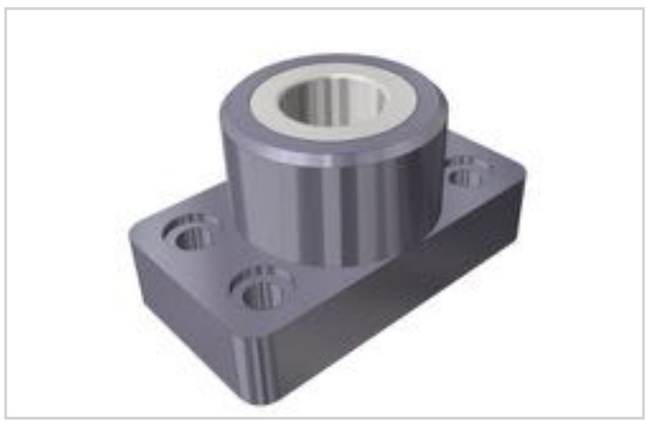




D1	15 / 16	19 / 20	24 / 25	30 / 32	38 / 40	48 / 50	60 / 63	80
D3	35	45	50	65	80	96	110	130
D4	6,6	9	9	11	14	18	18	22
D5	11	15	15	18	20	26	26	33
a	70	85	90	115	130	160	180	215
b	35	45	50	65	80	96	110	130
e1	53	64	68	83	95	118	132	160
e2	19	24	28	34	45	55	62	75
H	19	18	22	25	30	35	35	40
H1	30	37	47	60	77	95	120	120
t1	3	3	3	3	3	4	4	4

GUIDE BEARING WITH SCREW HOLES, SINTERED GUIDE

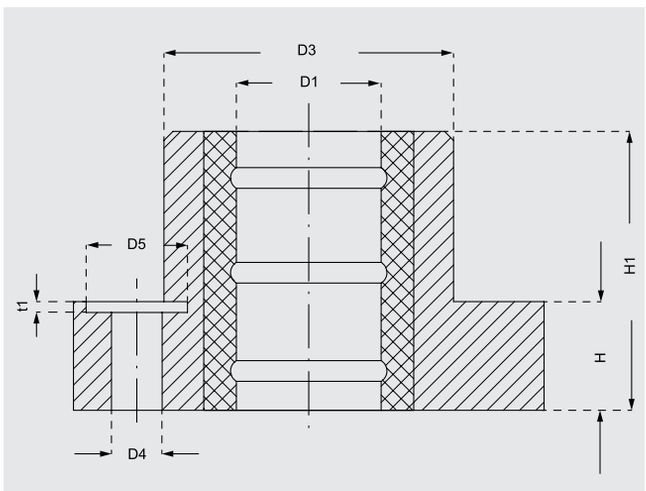
Order-No.: 922.D1

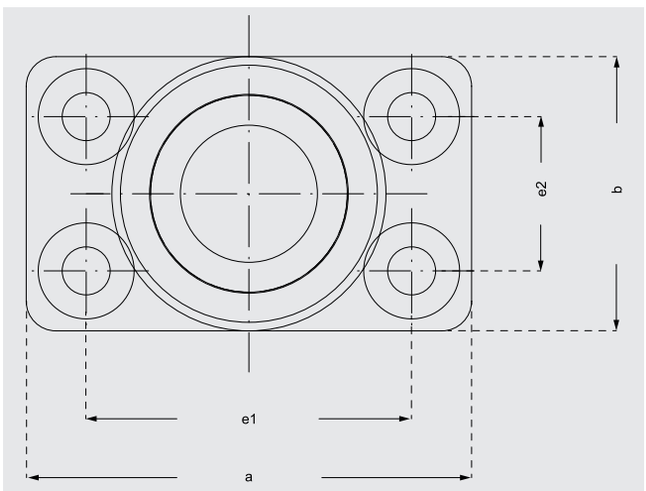


Material:
Basic body: Special cast iron

Execution:
Face and top machined. Bores honed.

Ordering example: D1 = 19
922.019

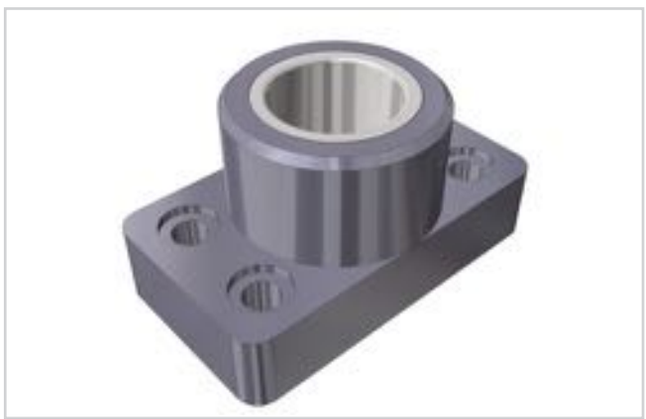




D1	15 / 16	19 / 20	24 / 25	30 / 32	38 / 40	48 / 50	60 / 63	80
D3	35	45	50	65	80	96	110	130
D4	6,6	9	9	11	14	18	18	22
D5	11	15	15	18	20	26	26	33
a	70	85	90	115	130	160	180	215
b	35	45	50	65	80	96	110	130
e1	53	64	68	83	95	118	132	160
e2	19	24	28	34	45	55	62	75
H	19	18	22	25	30	35	35	40
H1	30	37	47	60	77	95	120	120
t1	3	3	3	3	3	4	4	4

GUIDE BEARING WITH SOLID LUBRICANT

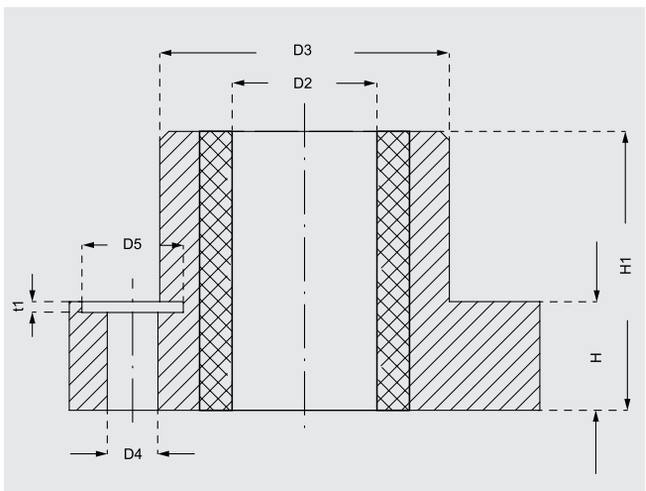
Order-No. 923.D1

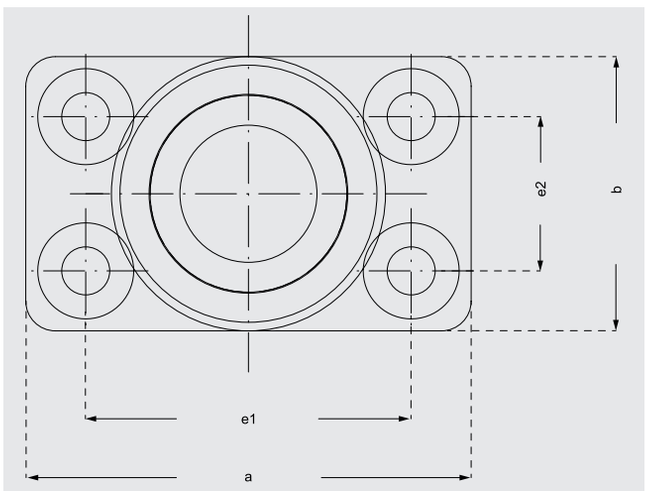


Material:
Basic body: Special cast iron

Execution:
Face and top machined. Bores honed.

Ordering example: D1 = 19
923.019



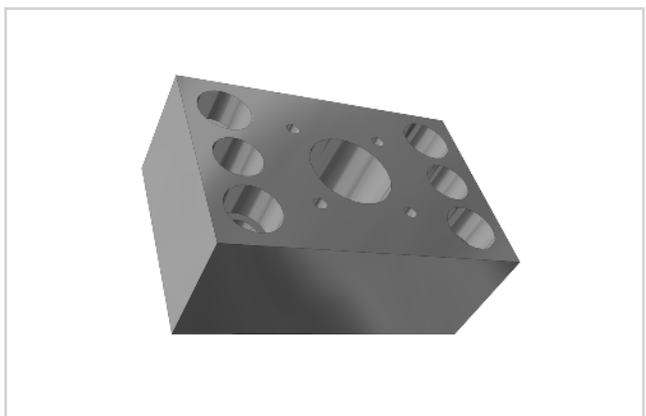


D1*	15 /16	19 / 20	24 / 25	30 / 32	38 / 40	48 / 50	60 / 63
D2	21 / 22	25 / 26	30 / 31	38 / 40	46 / 48	56 / 58	68 / 71
D3	35	45	50	65	80	96	110
D4	6,6	9	9	11	14	18	18
D5	11	15	15	18	20	26	26
a	70	85	90	115	130	160	180
b	35	45	50	65	80	96	110
e1	53	64	68	83	95	118	132
e2	19	24	28	34	45	55	62
H	19	18	22	25	30	35	35
H1	30	37	47	60	77	95	120
t1	3	3	3	3	3	4	4

*D1 = Pillar diameter

FLEX-PILLAR-BEARING FOR REMOVABLE PILLARS

Order-No.: 5190.d_2

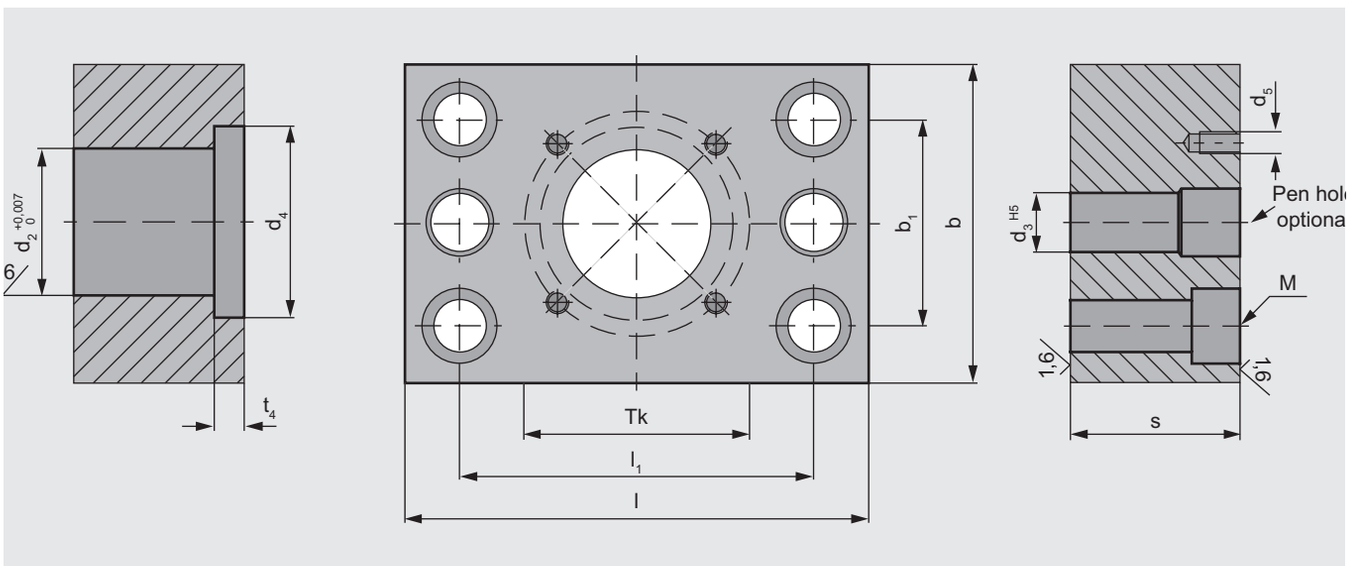


Material:
C45 / 1.1730 tool steel
Load: ca. 640 N/mm²

Execution:
Variation possibilities through manufacturing according to DIN / ISO for pillars 1111. / 1112.

Note:
With use of C45 steel for the bearing, material fatigue resp. hairline cracks and breaking is excluded in comparison to cast bearings. Our steel bearings have the same hole pattern as cast bearings, thereby they can be used when something is broken.

Ordering example: d_2 = 30
5190.030

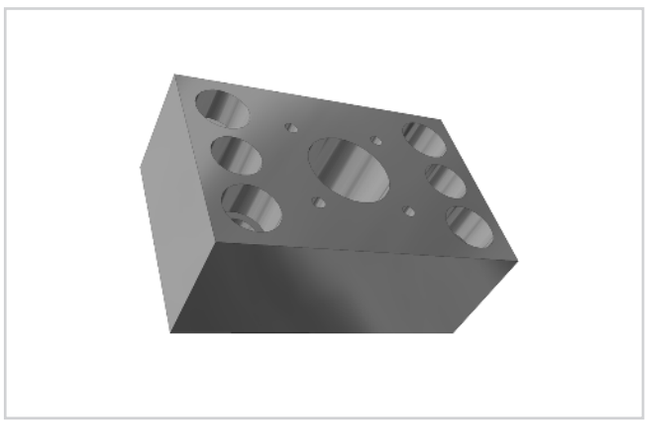


Order-No.:	d_2	s	b	l	M	Tk	l_1	b_1	d_3	d_4*	t_4*	d_5*
5190.030	**30**	38	70	115	M10	63,7	83	34	10	41	7	M6
5190.032	**32**	38	70	115	M10	63,7	83	34	10	41	7	M6
5190.038	**38**	38	80	130	M12	73,7	95	45	12	51	7	M6
5190.040	**40**	38	80	130	M12	73,7	95	45	12	51	7	M6
5190.048	**48**	48	100	160	M16	86,7	118	55	16	61	7	M6
5190.050	**50**	48	100	160	M16	86,7	118	55	16	61	7	M6
5190.063	**63**	48	110	180	M16	103,7	132	62	16	71	7	M6

*optional

FLEX-GUIDE-BEARING FOR BUSH ISO 9448 AND DIN 9831

Order-No.: 5192.d_2



Material:
C45 / 1.1730 tool steel
Load: ca. 640 N/mm²

Execution:Va
Variation possibilities through manufacturing according to DIN / ISO for bushes 1211.4., 1212.4., 1295.4., 1252.4.

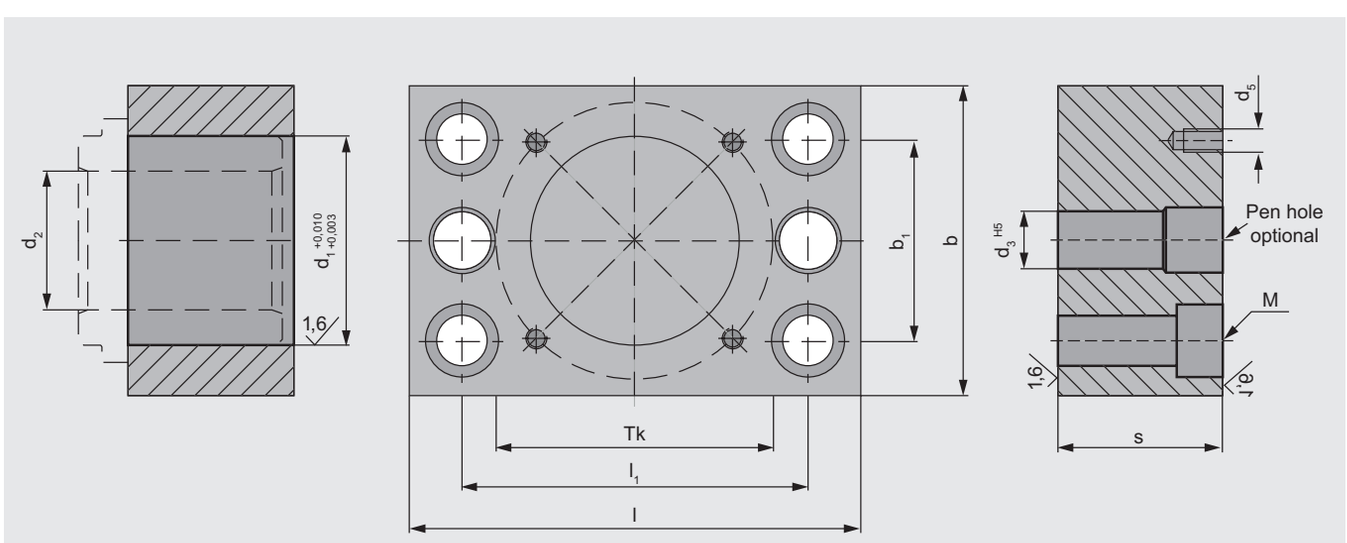
Note:
With use of C45 steel for the bearing, material fatigue resp. hairline cracks and breaking is excluded in comparison to cast bearings. Our steel bearings have the same hole pattern as cast bearings, thereby they can be used when something is broken.

Ordering example: d_2 = 30
5192.030

Mounting example:

O.-No.: 5192.	d_2	d_1	s	b	l	M	Tk	l_1	b_1	d_3	d_5*
.030	**30**	48	31	70	115	M10	67	83	34	10	M6
.032	**32**	48	31	70	115	M10	67	83	34	10	M6
.038	**38**	58	38	80	130	M12	77	95	45	12	M6
.040	**40**	58	38	80	130	M12	77	95	45	12	M6
.048	**48**	70	48	96	100	M16	91	118	55	16	M6
.050	**50**	70	48	96	100	M16	91	118	55	16	M6
.063	**63**	85	61	110	180	M16	106	132	62	16	M6

*optional



Guides and centering units

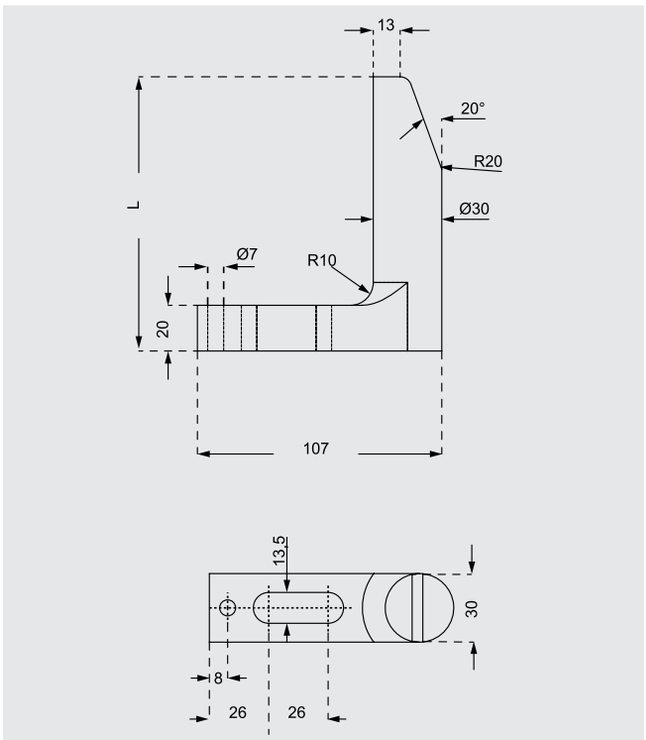
INDEX

Guides and Centering Units

GUIDE, TYPE 10

Order-No.: 1351.10.L

Ordering example: L = 65
1351.10.065

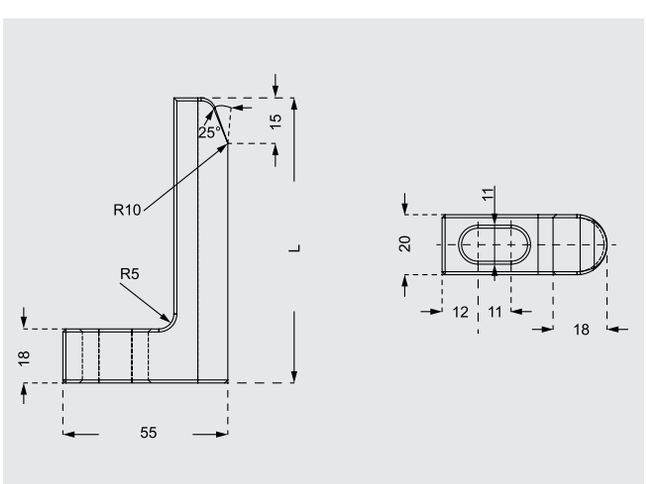


Order-No.:	L
1351.10.065	65
1351.10.090	90
1351.10.120	120
1351.10.150	150
1351.10.180	180
1351.10.250	250
1351.10.300	300
1351.10.350	350

GUIDE, TYPE 14

Order-No.: 1351.14.

Ordering example: L = 55
1351.14.055

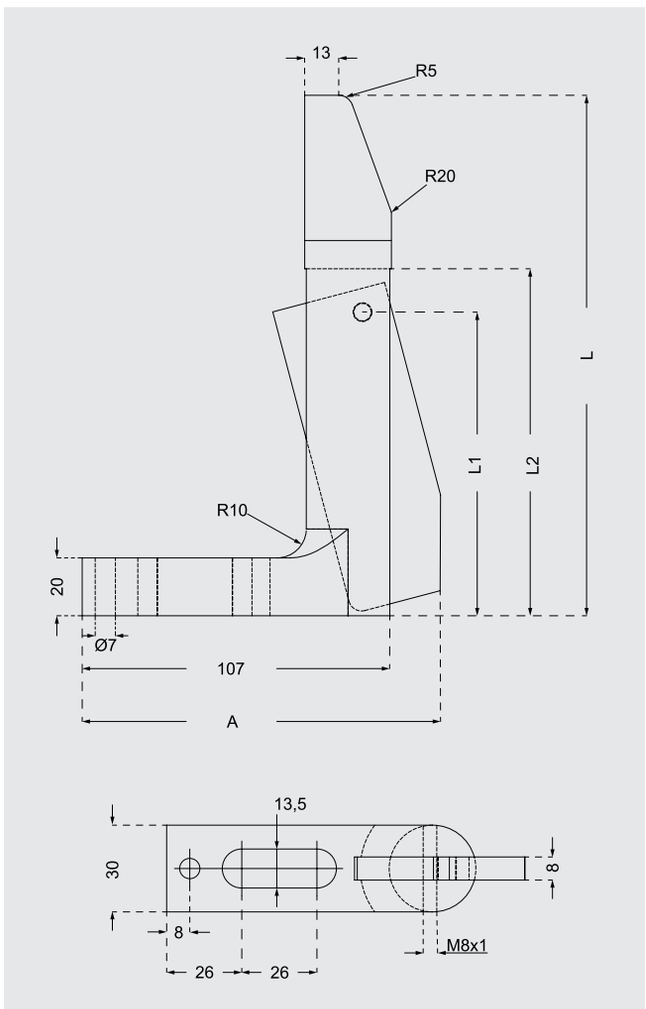


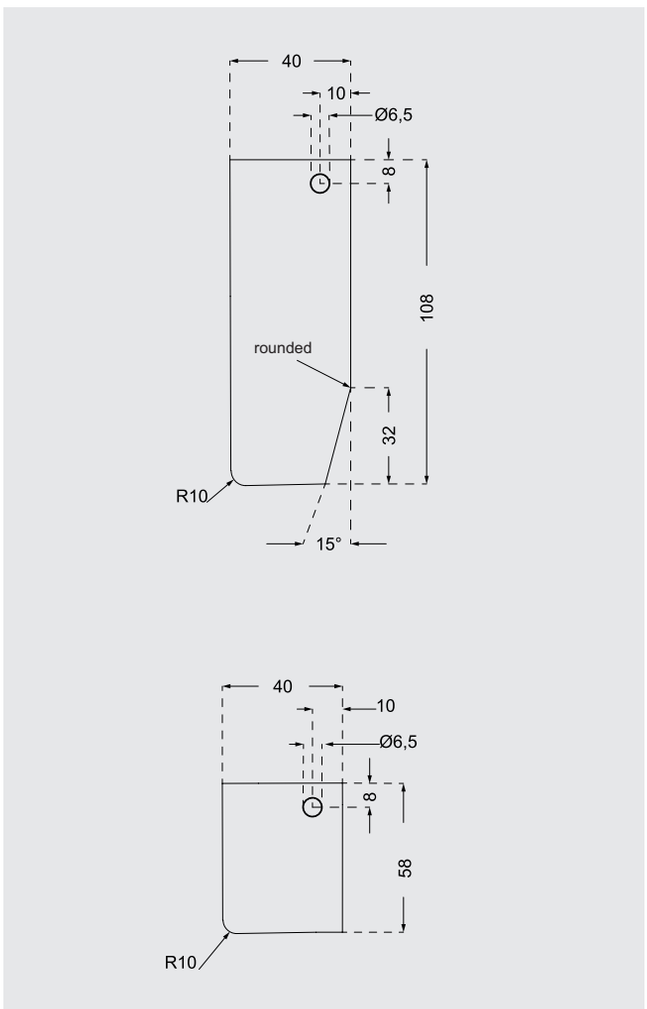
Order-No.:	L
1351.14.055	55
1351.14.095	95

GUIDE WITH PART POSITION CONTROL AND SPRING

Order-No.: 1351.12.L

Ordering example: L = 120
1351.12.120

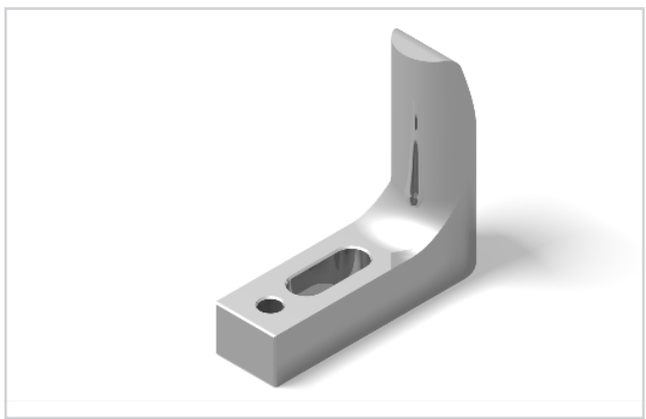




Order-No.:	A	L	L_1	L_2
1351.12.120	120	**120**	56	70
1351.12.150	120	**150**	56	70
1351.12.180	124	**180**	107	120
1351.12.250	124	**250**	107	120

GUIDE TO MERCEDES-BENZ STANDARD - HARDENED/UNHARDENED

Order-No.: 1351.10.20.L.1 / 1351.10.20.L

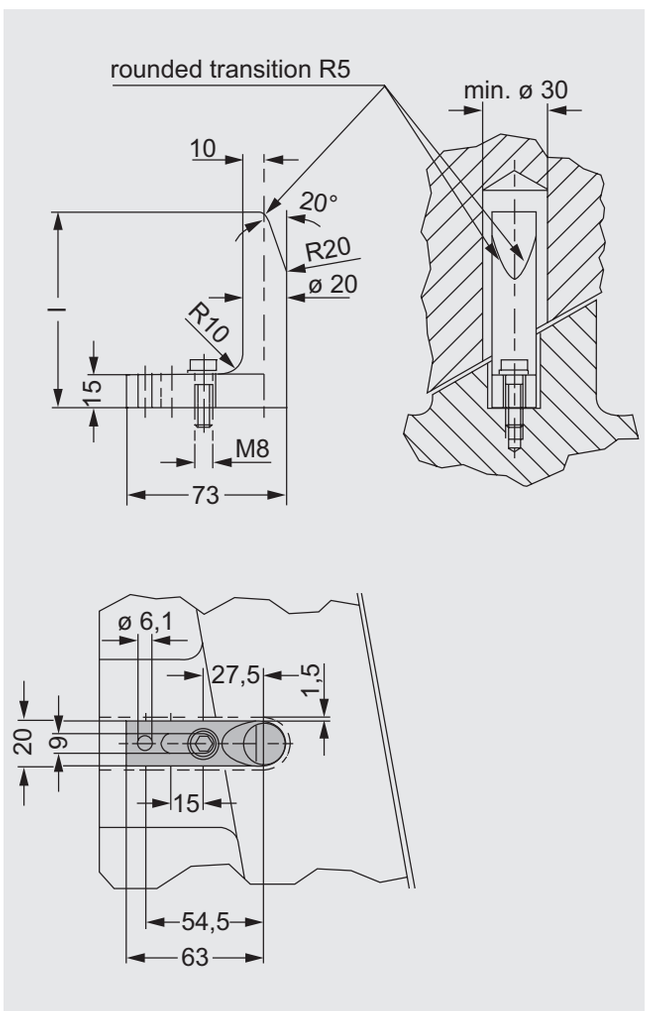


Material:
Ck 60, area of pilot taper hardened 58 + 2 HRC

Execution:
forged

Note:
Guides are preferably used in confined spaces in sequential compound dies.

Ordering example: L = 65
hardened: 1351.10.20.065.1
unhardened: 1351.10.20.065



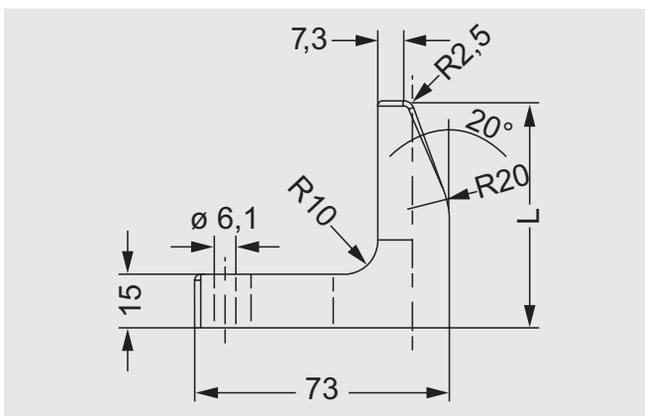
Order-No.:	L
1351.10.20.065.1	65
1351.10.20.090.1	90
1351.10.20.065	65
1351.10.20.090	90

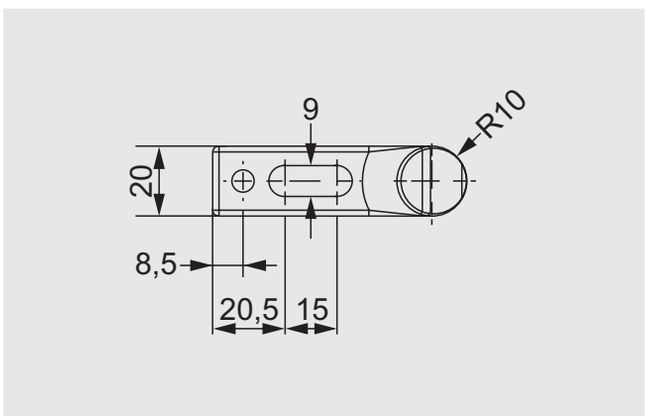
GUIDE TO BMW-STANDARD

Order-No.: 1351.15.L

Material:
CK 60

Ordering example: L = 65
1351.15.065





Order-No.:	L
1351.15.065	65
1351.15.090	90

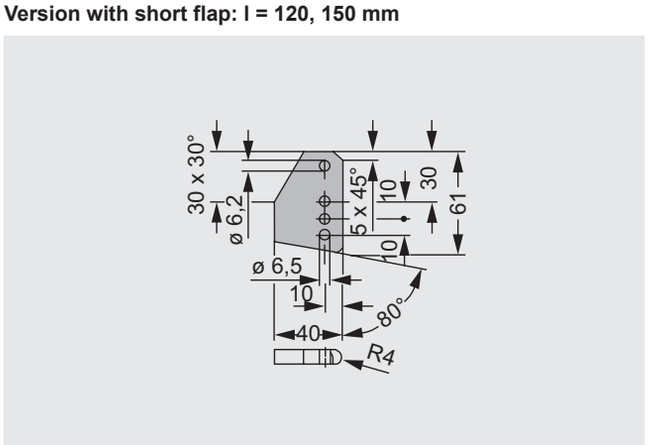
GUIDE WITH PART POSITION CONTROL, VDI

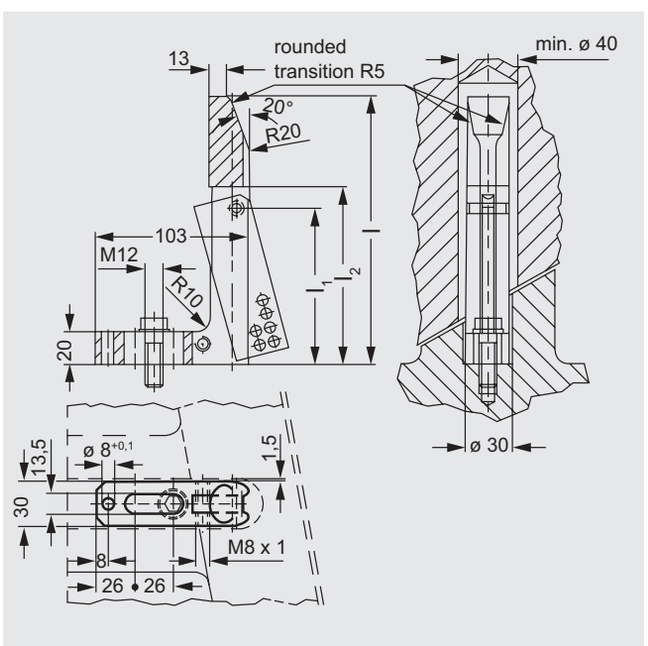
Order-No.: 1351.13.l

Material:
Guide: Ck 60, area of pilot taper hardened 50 + 5 HRC Flap: St 37, hardened 58 + 2 HRC.

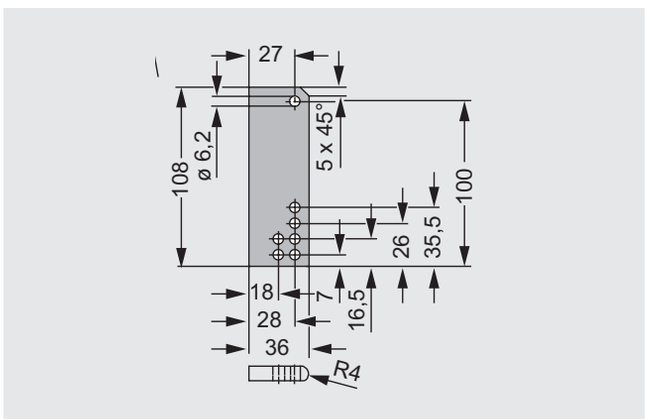
Ordering example: l = 120
1351.13.120

Version with short flap: l = 120, 150 mm

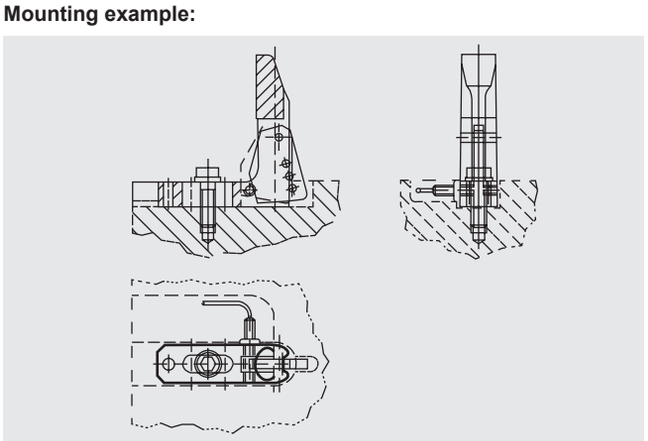




Version with long flap: l = 180, 250 mm



Mounting example:

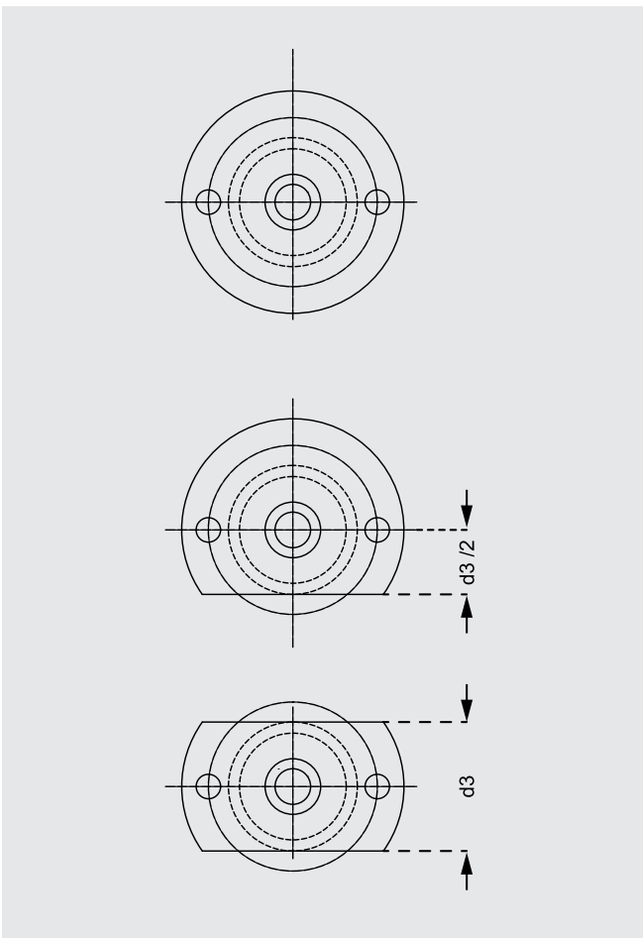


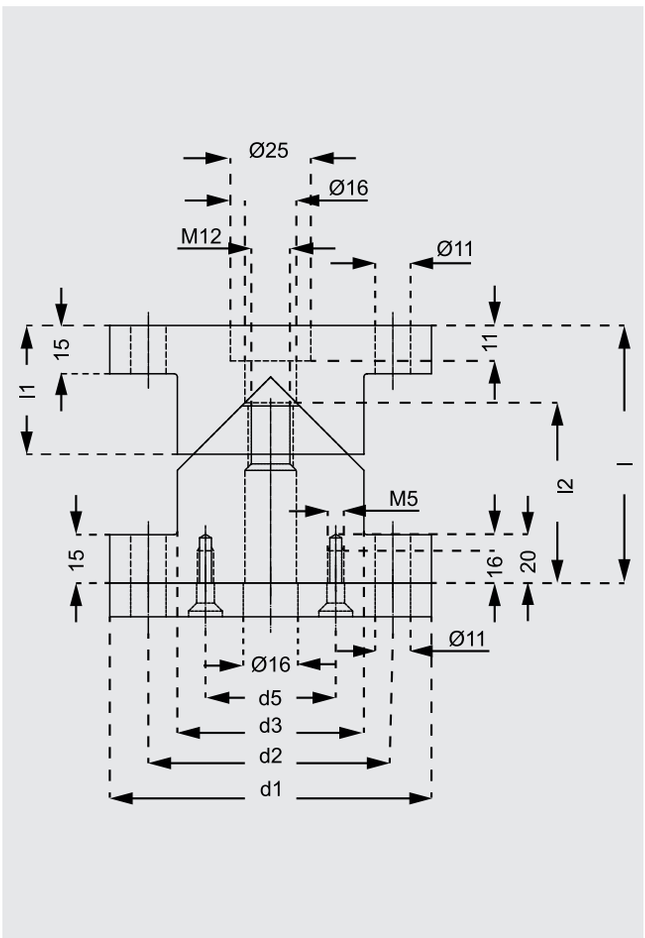
Order-No.:	l	l_1	l_2
1351.13.120	**120**	55	70
1351.13.150	**150**	55	70
1351.13.180	**180**	105	120
1351.13.250	**250**	105	120

CENTERING UNIT WITH ADJUSTING WASHER

Order-No.: 1341.d1.1/2

Ordering example: d1 = 100, 1 = one flat side
1341.100.1
d1 = 100, 2 = two flat sides
1341.100.2
d1 = 100 = without flat side
1341.100



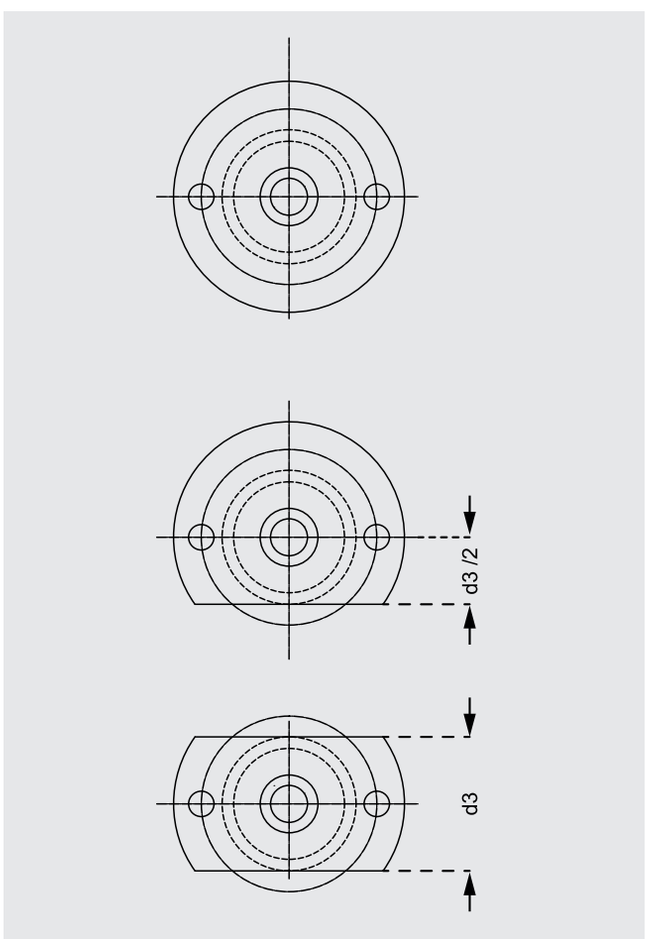


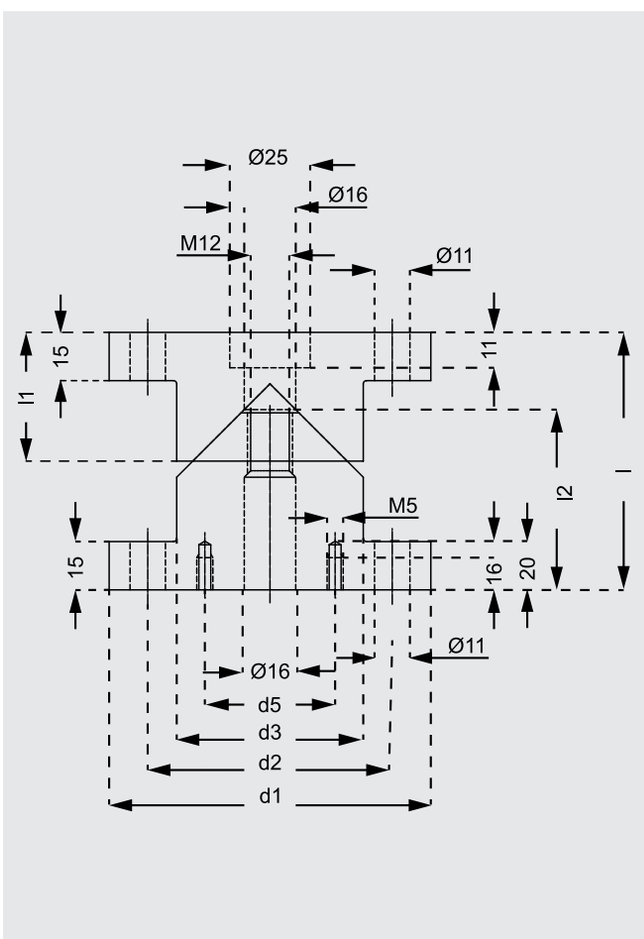
Order-No.:	d1	d2	d3	l	l_1	l_2	d_5
1341.100	**100**	76	58	80	40	55	40,5
1341.100.1	**100**	76	58	80	40	55	40,5
1341.100.2	**100**	76	58	80	40	55	40,5
1341.120	**120**	96	78	90	50	65	50,5
1341.120.1	**120**	96	78	90	50	65	50,5
1341.120.2	**120**	96	78	90	50	65	50,5

CENTERING UNIT WITHOUT ADJUSTING WASHER

Order-No.: 1342.d1.1/2

Ordering example: d1 = 100, 1 = one flat side
1342.100.1
d1 = 100, 2 = two flat sides
1342.100.2
d1 = 100 = without flat side
1342.100

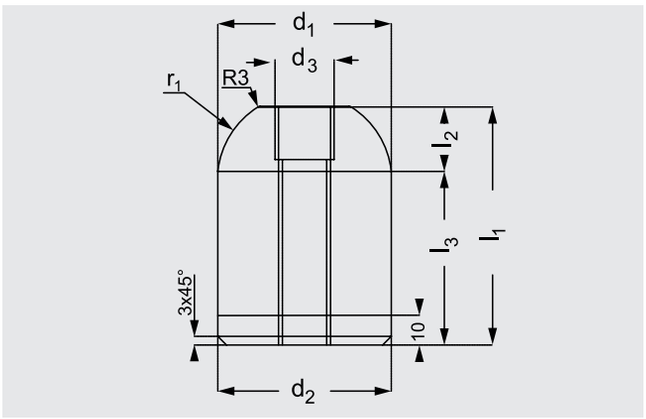




Order-No.:	d_1	d_2	d_3	l	l_1	l_2	d_5
1342.100.	**100**	76	58	80	40	55	40,5
1342.100.1	**100**	76	58	80	40	55	40,5
1342.100.2	**100**	76	58	80	40	55	40,5
1342.120	**120**	96	78	90	50	65	50,5
1342.120.1	**120**	96	78	90	50	65	50,5
1342.120.2	**120**	96	78	90	50	65	50,5

CENTERING PIN TO VW-STANDARD / BMW-STANDARD

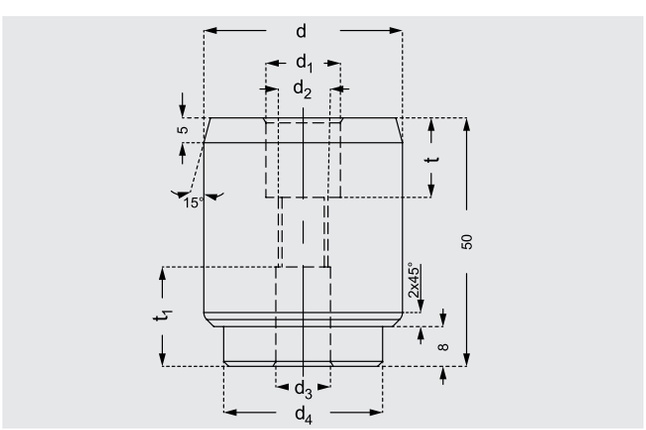
Order-No.: 1361.10.d_1.l_1



Order-No.:	d_1	d_2	d_3	l_1	l_2	l_3	r_1	Standard
1361.10.022.045	**22**	21,95	M8	**45**	16	35	15	BMW / VW
1361.10.022.055	**22**	21,95	M8	**55**	16	45	15	VW
1361.10.032.050	**32**	31,95	M10	**50**	20	35	20	BMW
1361.10.040.055	**40**	39,95	M10	**55**	20	35	25	BMW / VW
1361.10.040.065	**40**	39,95	M10	**65**	20	45	25	VW
1361.10.050.055	**50**	49,95	M10	**55**	20	35	25	BMW
1361.10.056.080	**56**	55,95	M10	**80**	20	60	30	BMW

CENTERING PIN TO DAIMLER-STANDARD

Order-No.: 1361.11.d



Order-No.:	d	d_1	d_2	d_3	t	t_1
1361.11.022	**22**	11	M8	9	13	16
1361.11.025	**25**	11	M8	9	13	16
1361.11.032	**32**	11	M8	9	13	16
1361.11.040	**40**	15	M10	11	16	20
1361.11.050	**50**	15	M10	11	16	20

Oilless guide elements

INDEX

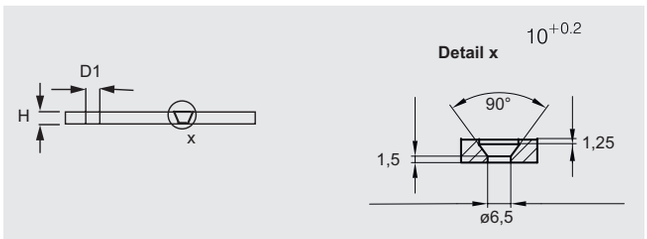
Oilless guide elements

DISTANCE PLATE FOR WEAR PLATE

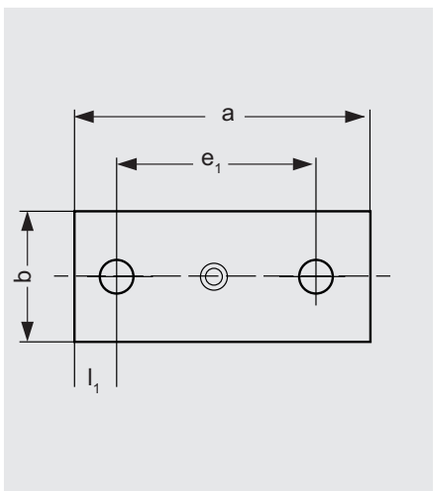
Order-No.: 881.00.b.a

Material:
St37

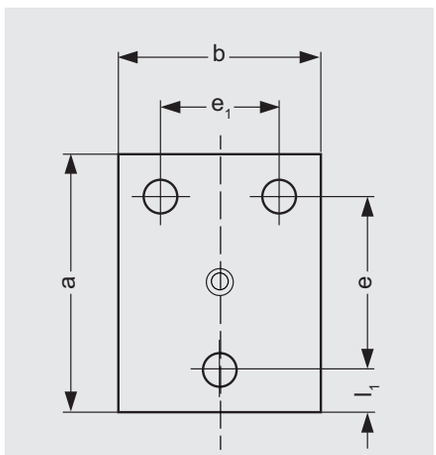
Ordering example: b = 78, a = 248
881.00.078.248



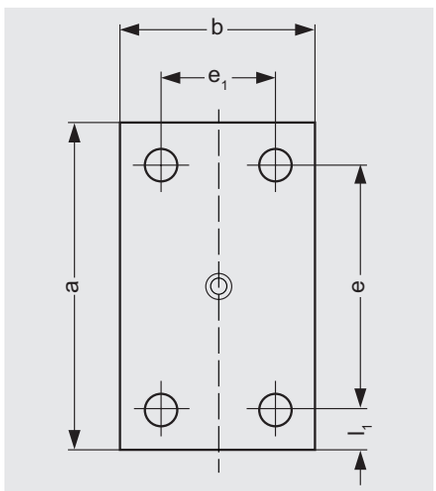
Shape A



Shape B



Shape C



Order-No.:	For wear plate	b	H	a	e	e1	l1	D1	Shape
881.00.048.078	881.71.050.080	**48**	**6,5**	78	-	30	24	9	A
881.00.048.098	881.71.050.100 / 881.71.100.050	**48**	**6,5**	98	-	50	24	13,5	A
881.00.048.123	881.71.050.125 / 881.71.125.050	**48**	**6,5**	123	-	75	24	13,5	A
881.00.048.158	881.71.050.160 / 881.71.160.050	**48**	**6,5**	158	-	110	24	13,5	A
881.00.048.198	881.71.050.200	**48**	**6,5**	198	-	150	24	13,5	A
881.00.078.078	881.71.080.080	**78**	**6,5**	78	-	30	24	13,5	A
881.00.078.098	881.71.080.100 / 881.71.100.080	**78**	**6,5**	98		50	24	13,5	A
881.00.078.123	881.71.080.125 / 881.71.125.080	**78**	**6,5**	123		75	24	13,5	A
881.00.078.158	881.71.080.160 / 881.71.160.080	**78**	**6,5**	158		110	24	13,5	A
881.00.078.198	881.71.080.200	**78**	**6,5**	198		150	24	13,5	A
881.00.098.098	881.71.100.100	**98**	**6,5**	98		50	24	13,5	A
881.00.098.123	881.71.100.125	**98**	**6,5**	123		75	24	13,5	A
881.00.098.158	881.71.100.160	**98**	**6,5**	158		110	24	13,5	A
881.00.098.198	881.71.100.200	**98**	**6,5**	198		150	24	13,5	A
881.00.098.248	881.71.100.250	**98**	**6,5**	248		170	39	13,5	A
881.00.098.313	881.71.100.315	**98**	**6,5**	313		235	39	13,5	A
881.00.123.098	881.71.125.100	**123**	**6,5**	98	75	50	24	13,5	B
881.00.123.123	881.71.125.125	**123**	**6,5**	123	75	75	24	13,5	B
881.00.123.158	881.71.125.160	**123**	**6,5**	158	75	110	24	13,5	B
881.00.123.198	881.71.125.200	**123**	**6,5**	198	75	150	24	13,5	B
881.00.123.248	881.71.125.250	**123**	**6,5**	248	75	170	39	13,5	B
881.00.123.313	881.71.125.315	**123**	**6,5**	313	75	235	39	13,5	B
881.00.158.098	881.71.160.100	**158**	**6,5**	98	110	50	24	13,5	B
881.00.158.123	881.71.160.125	**158**	**6,5**	123	75	110	24	13,5	B
881.00.158.158	881.71.160.160	**158**	**6,5**	158	110	110	24	13,5	B
881.00.158.198	881.71.160.200	**158**	**6,5**	198	110	150	24	3,5	B
881.00.158.248	881.71.160.250	**158**	**6,5**	248	110	170	39	13,5	C
881.00.158.313	881.71.160.315	**158**	**6,5**	313	110	235	39	13,5	C

SLIDING PAD ISO 9183-1, BRONZE WITH SOLID LUBRICANT, TYPE 70

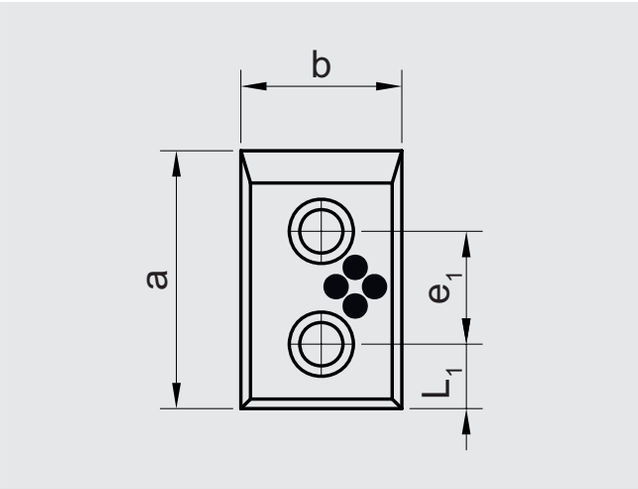
Order-No.: 881.70.b.a

Material:
Bronze with solid lubricant, low maintenance.

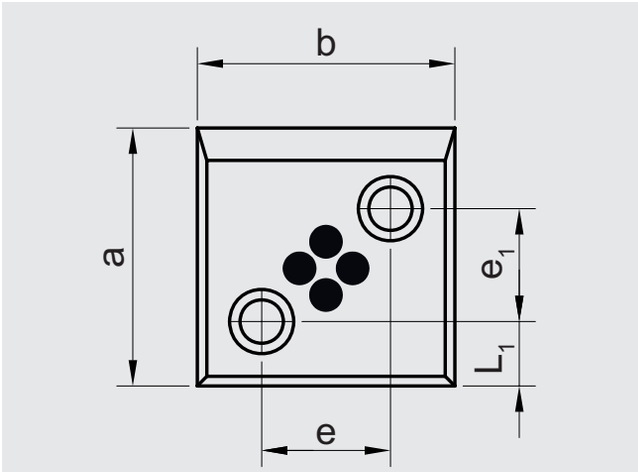
Note:
Sliding pads are preferably used in large tools with large surface pressure.
Bronze with solid lubricant ensures low maintenance service even in arduous multishift applications.
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M12 x 25.

Ordering example: b = 50, a = 80
881.70.050.080

Shape A



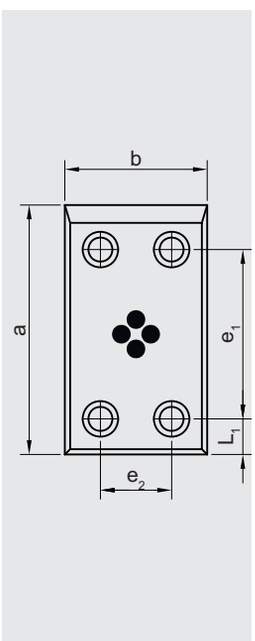
Shape B



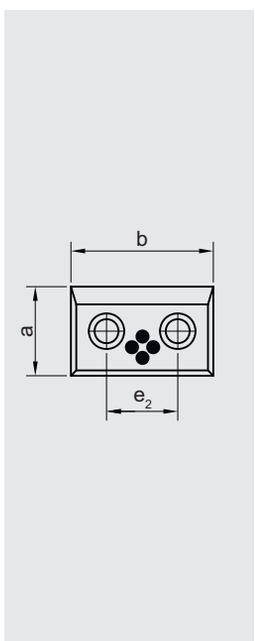
e_1	35	55	80	112	155	100	0	35	55	80	115	155	100	132	0	35	55	80	115	155
e_2							40	40	40	40	40	40	40	40	60	60	60	60	60	60
b	**50**	**50**	**50**	**50**	**50**	**50**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**100**	**100**	**100**	**100**	**100**	**100**
a	**80**	**100**	**125**	**160**	**200**	**250**	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**50**	**80**	**100**	**125**	**160**	**200**
L_1	20	20	20	20	20	20	20	20	20	25	20	20	20	20	25	20	20	20	20	20
Shape	A	A	A	A	A	F	D	B	B	B	C	C	E	E	D	B	B	C	C	C

e_1	100	132	0	35	55	80	115	155	100	132	0	35	55	80	115	155	100	132	115	155
e_2	60	60	85	85	85	85	85	85	85	85	120	120	120	120	120	120	120	120	160	160
b	**100**	**100**	**125**	**125**	**125**	**125**	**125**	**125**	**125**	**125**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**160**	**200**	**200**
a	**250**	**315**	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**160**	**200**
L_1	20	20	25	20	20	20	20	20	20	20	25	20	20	20	20	20	20	20	20	20
Shape	E	E	D	B	C	C	C	C	E	E	D	C	C	C	C	C	E	E	C	C

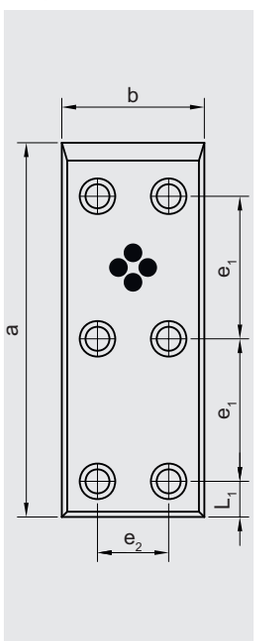
Shape C



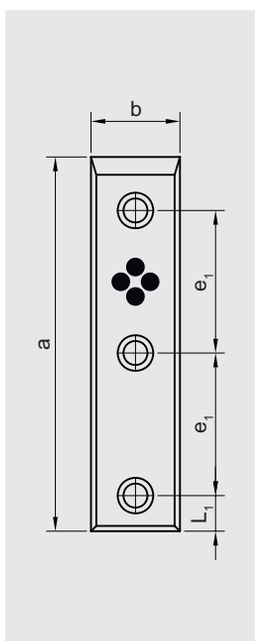
Shape D

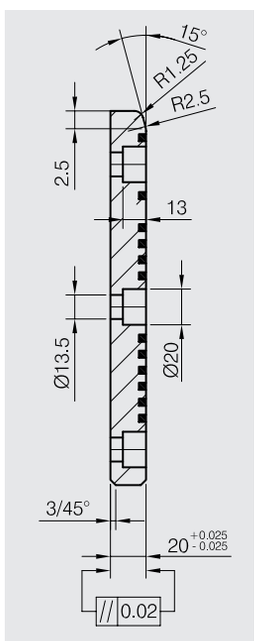


Shape E



Shape F





SLIDING PAD VDI 3357, BRONZE WITH SOLID LUBRICANT, TYPE 71

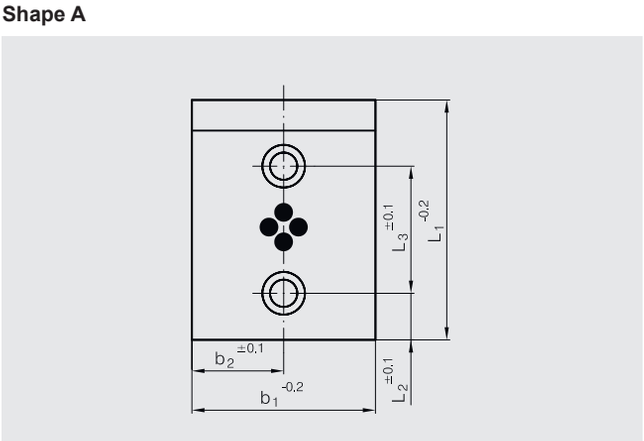
Order-No.: 881.71.b_1.L_1

Material:
Bronze with solid lubricant, low maintenance.

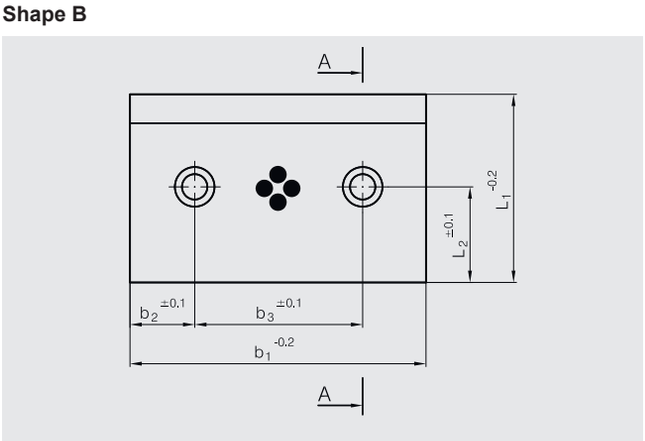
Note:
Sliding pads are preferably used in large tools with large surface pressure.
Bronze with solid lubricant ensures low maintenance service even in arduous multishift applications.
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762.
d_2= ø 9 M8 x 25
d_2= ø 13,5 M12 x 25

Ordering example: b_1 = 125, L_1 = 50
881.71.125.050

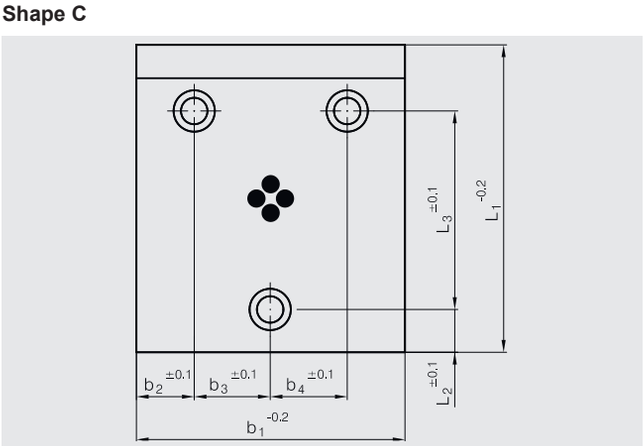
Shape A



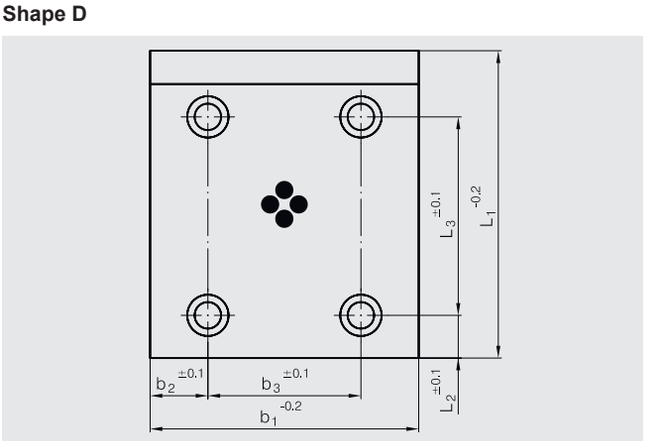
Shape B

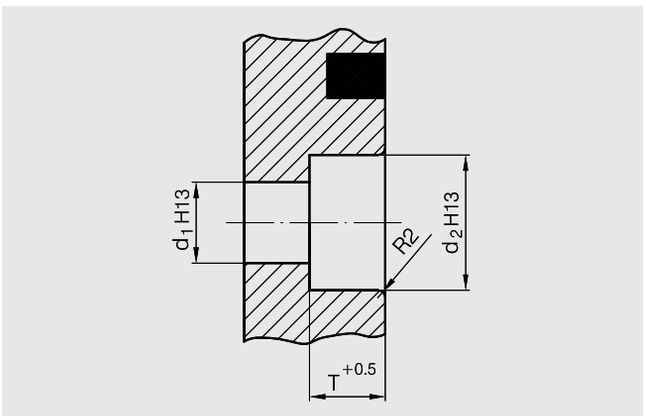


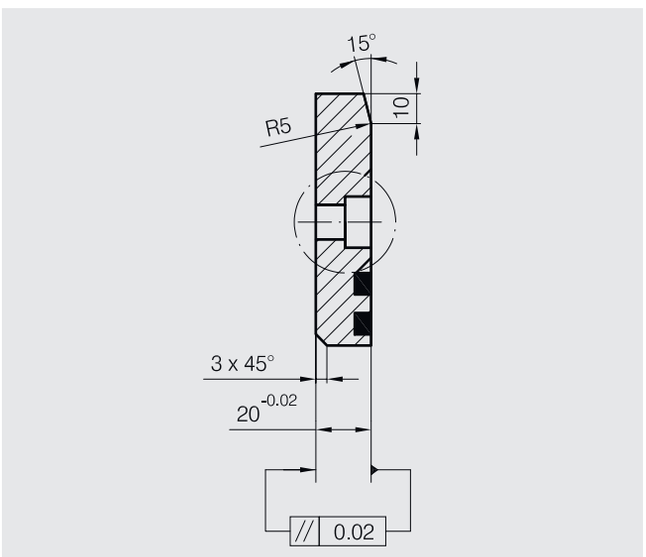
Shape C



Shape D







b_1	b_2	b_3	b_4	L_1	L_2	L_3		Shape
50	25	–	–	**80**	25	30	M8 x 25	A
50	25	–	–	**100**	25	50	M12 x 25	A
50	25	–	–	**125**	25	75	M12 x 25	A
50	25	–	–	**160**	25	110	M12 x 25	A
50	25	–	–	**200**	25	150	M12 x 25	A
80	25	30	–	**50**	25	–	M8 x 25	B
80	40	–	–	**80**	25	30	M12 x 25	A
80	40	–	–	**100**	25	50	M12 x 25	A
80	40	–	–	**125**	25	75	M12 x 25	A
80	40	–	–	**160**	25	110	M12 x 25	A
80	40	–	–	**200**	25	150	M12 x 25	A
80	40	–	–	**250**	40	170	M12 x 25	A
80	40	–	–	**315**	40	235	M12 x 25	A
100	25	50	–	**50**	25	–	M12 x 25	B
100	25	50	–	**80**	40	–	M12 x 25	B
100	50	–	–	**100**	25	50	M12 x 25	A
100	50	–	–	**125**	25	75	M12 x 25	A
100	50	–	–	**160**	25	110	M12 x 25	A
100	50	–	–	**200**	25	150	M12 x 25	A
100	50	–	–	**250**	40	170	M12 x 25	A
100	50	–	–	**315**	40	235	M12 x 25	A
125	25	75	–	**50**	25	–	M12 x 25	B
125	25	75	–	**80**	40	–	M12 x 25	B
125	25	37,5	37,5	**100**	25	50	M12 x 25	C
125	25	37,5	37,5	**125**	25	75	M12 x 25	C
125	25	37,5	37,5	**160**	25	110	M12 x 25	C
125	25	37,5	37,5	**200**	25	150	M12 x 25	C
125	25	37,5	37,5	**250**	40	170	M12 x 25	C
125	25	37,5	37,5	**315**	40	235	M12 x 25	C
160	25	110	–	**50**		–	M12 x 25	B
160	25	110	–	**80**		–	M12 x 25	B
160	25	55	55	**100**		50	M12 x 25	C
160	25	55	55	**125**		75	M12 x 25	C
160	25	55	55	**160**		110	M12 x 25	C
160	25	55	55	**200**		150	M12 x 25	C
160	25	110	–	**250**		170	M12 x 25	D
160	25	110	–	**315**		235	M12 x 25	D

SLIDING PAD AFNOR, BRONZE WITH SOLID LUBRICANT, TYPE 74

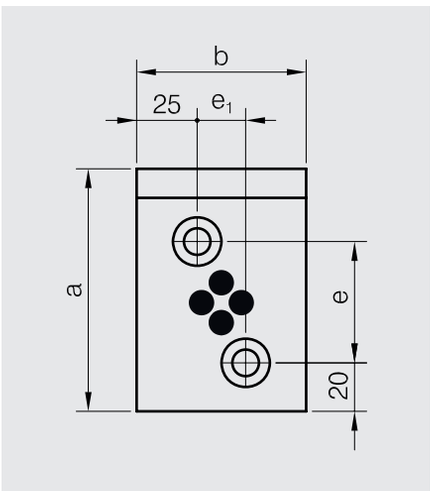
Order-No.: 881.74.b.a

Material:
Bronze with solid lubricant, low maintenance.

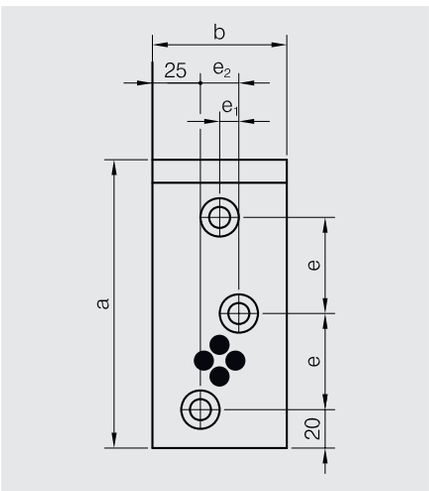
Note:
Sliding pads are preferably used in large tools with large surface pressure.
Bronze with solid lubricant ensures low maintenance service even in arduous multishift applications.
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M10 x 25.

Ordering example: b = 100, a = 100
881.74.100.100

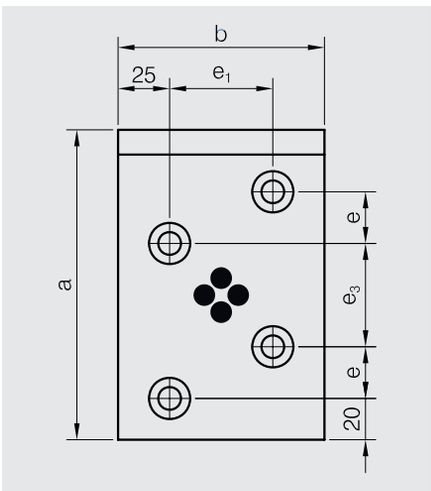
Shape A



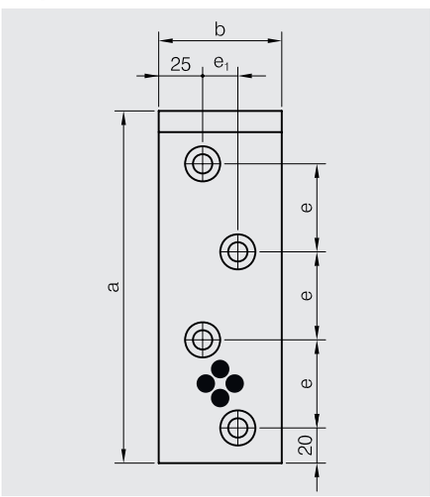
Shape B



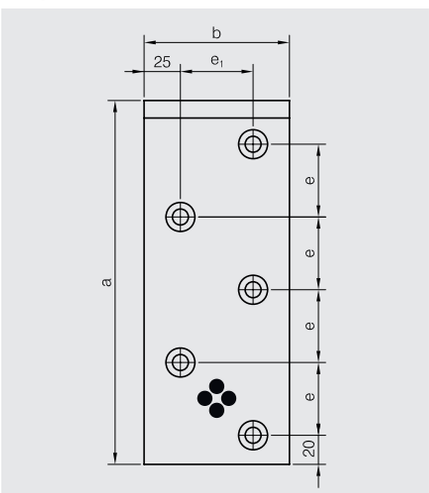
Shape C

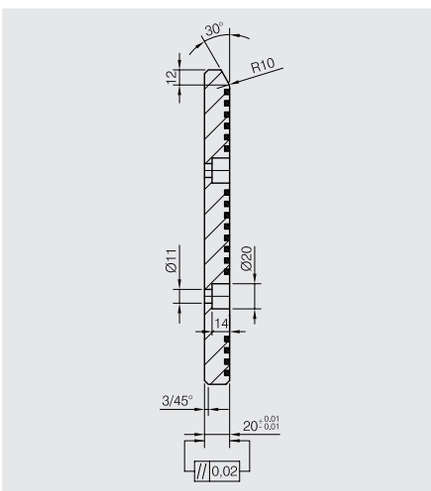


Shape D

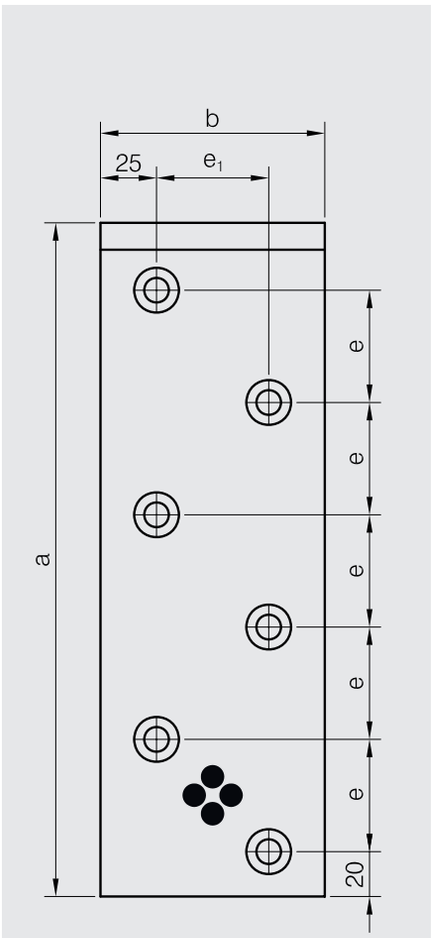


Shape E

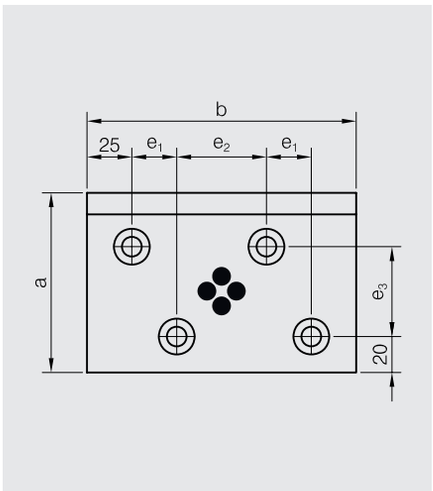




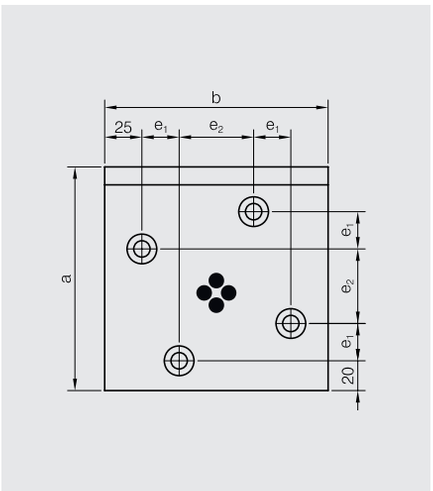
Shape F



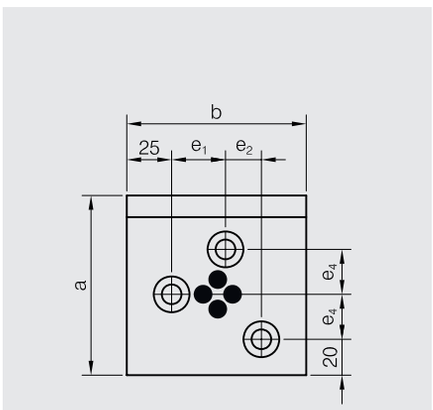
Shape G

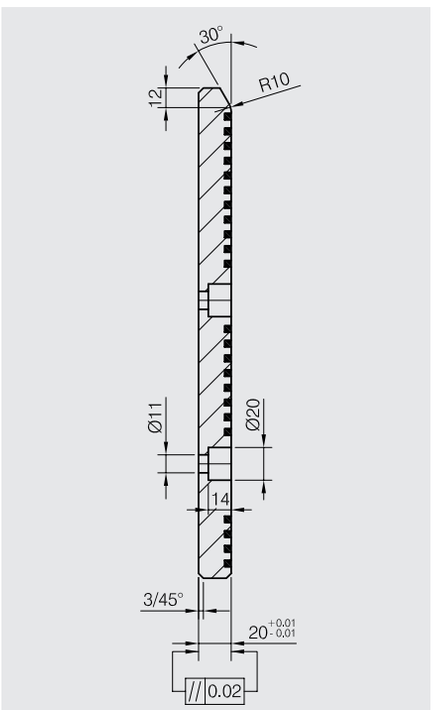


Shape H



Shape I





e	50	50	50	–	25	50	50	50	–	–	50	50	50	–
e_1	20	10	20	30	50	50	50	50	25	25	100	100	100	50
e_2	–	20	–	20	–	–	–	–	50	50	–	–	–	50
e_3	–	–	–	–	50	–	–	–	50	–	–	–	–	50
e_4	–	–	–	25	–	–	–	–	–	–	–	–	–	–
b	**70**	**70**	**70**	**100**	**100**	**100**	**100**	**100**	**150**	**150**	**150**	**150**	**150**	**200**
a	**100**	**150**	**200**	**100**	**150**	**200**	**250**	**300**	**100**	**150**	**200**	**250**	**300**	**100**
Shape	A	B	D	I	C	D	E	F	G	H	D	E	F	G

SLIDING PAD AFNOR, GG25 WITH SOLID LUBRICANT, TYPE 75

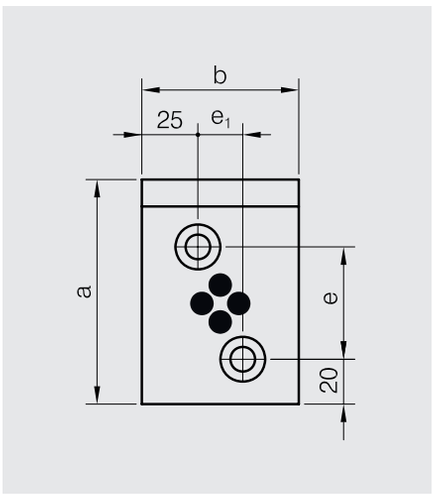
Order-No.: 881.75.b.a

Material:
GG25 special cast iron with solid lubricant, low maintenance.

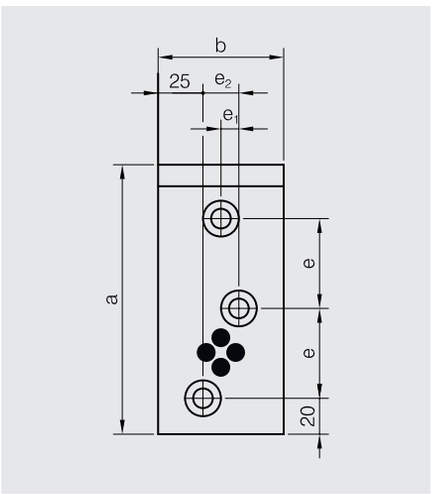
Note:
Sliding pads are preferably used in large tools with large surface pressure.
GG25 with solid lubricant ensures low maintenance service even in arduous multishift applications.
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M10 x 25.

Ordering example: b = 100, a = 100
881.75.100.100

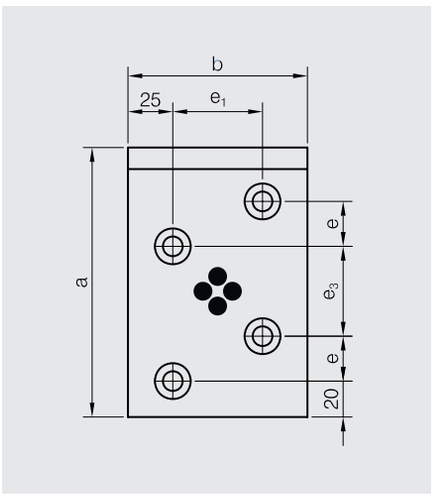
Shape A



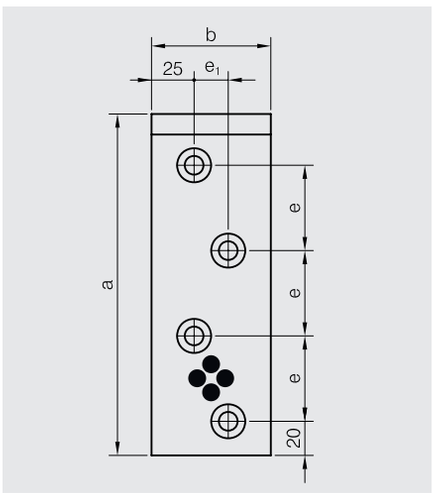
Shape B



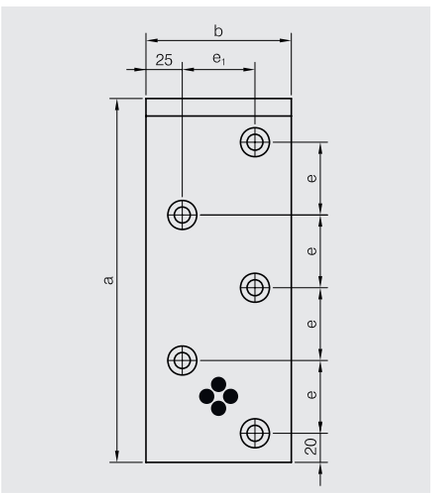
Shape C

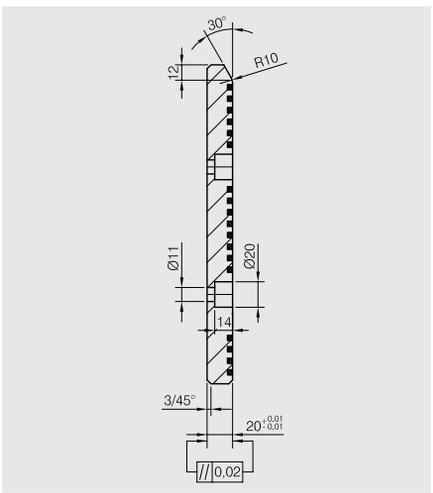


Shape D

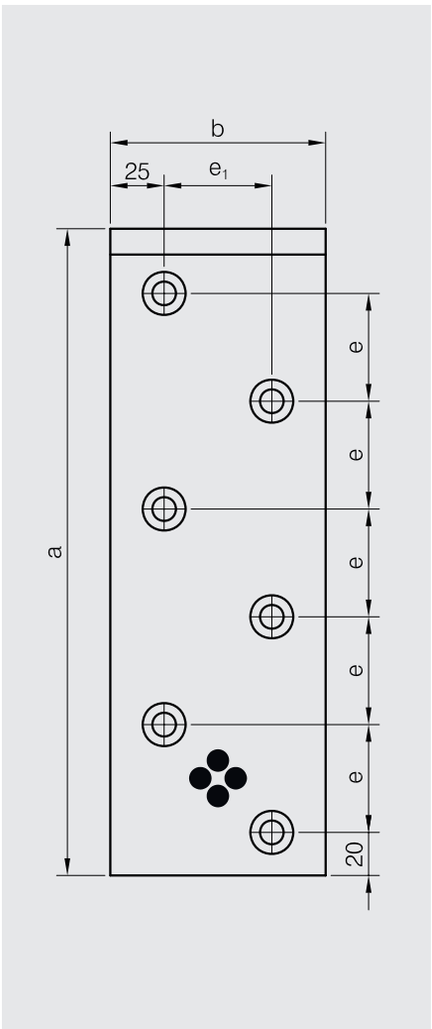


Shape E

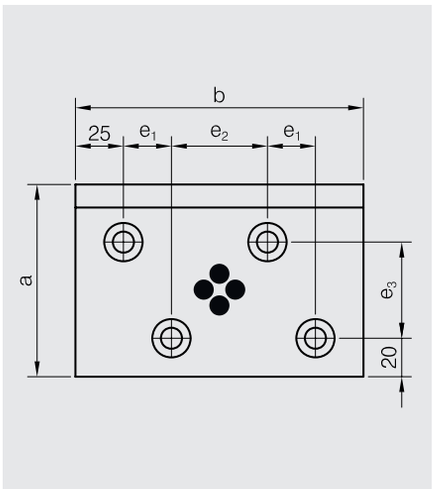




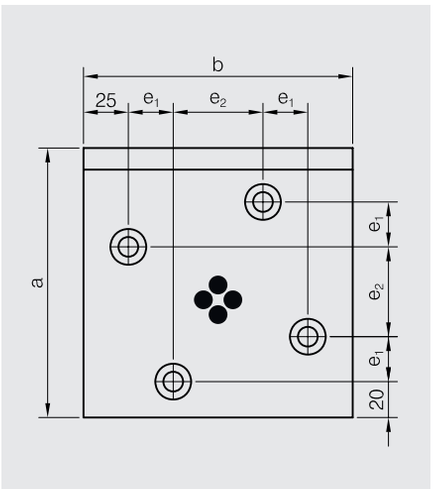
Shape F



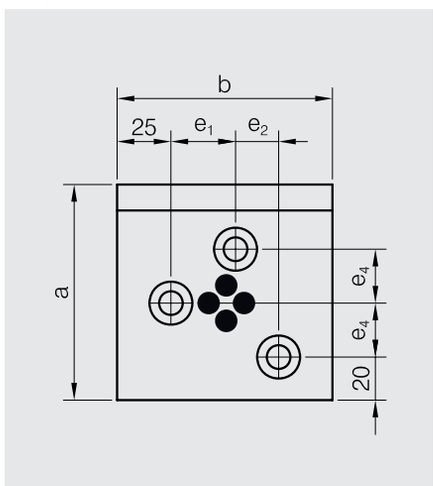
Shape G

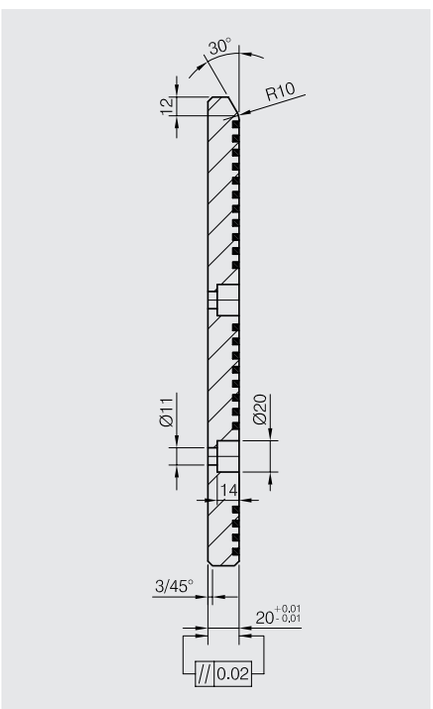


Shape H



Shape I





e	50	50	50	–	25	50	50	50	–	–	50	50	50	–
e_1	20	10	20	30	50	50	50	50	25	25	100	100	100	50
e_2	–	20	–	20	–	–	–	–	50	50	–	–	–	50
e_3	–	–	–	–	50	–	–	–	50	–	–	–	–	50
e_4	–	–	—	25	–	–	–	–	–	–	–	–	–	–
b	**70**	**70**	**70**	**100**	**100**	**100**	**100**	**100**	**150**	**150**	**150**	**150**	**150**	**200**
a	**100**	**150**	**200**	**100**	**150**	**200**	**250**	**300**	**100**	**150**	**200**	**250**	**300**	**100**
Shape	A	B	D	I	C	D	E	F	G	H	D	E	F	G

SLIDING PAD, SMALL DIMENSION, BRONZE WITH SOLID LUBRICANT, TYPE 72

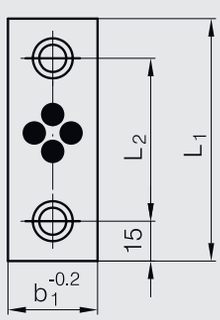
Order-No.: 881.72.b_1.L_1

Material:
Bronze with solid lubricant, low maintenance.

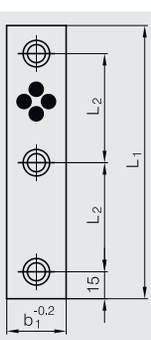
Note:
Sliding pads are preferably used in large tools with large surface pressure.
Bronze with solid lubricant ensures low maintenance service even in arduous multishift applications.
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M12 x 30.

Ordering example: b_1 = 18, L_1 = 50
881.72.018.050

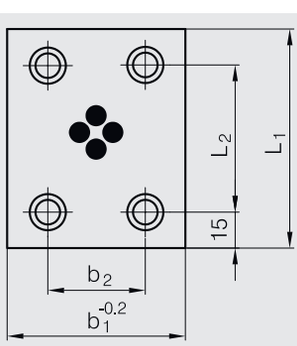
Shape A



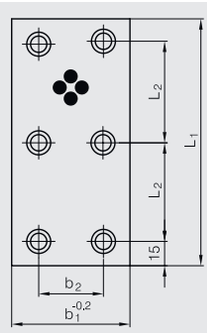
Shape B

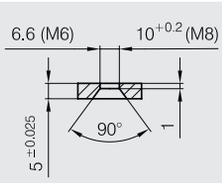


Shape C



Shape D





b_1	b_2	L_1	L_2		Shape
18	–	**50**	20	M6	A
18	–	**75**	45	M6	A
18	–	**100**	70	M6	A
18	–	**150**	60	M6	B
28	–	**50**	20	M8	A
28	–	**75**	45	M8	A
28	–	**100**	70	M8	A
28	–	**150**	60	M8	B
38	–	**50**	20	M8	A
38	–	**75**	45	M8	A
38	–	**100**	70	M8	A
38	–	**150**	60	M8	B
48	–	**75**	45	M8	A
48	–	**100**	70	M8	A
48	–	**125**	95	M8	A
48	–	**150**	60	M8	B
75	45	**75**	45	M8	C
75	45	**100**	70	M8	C
75	45	**125**	95	M8	C
75	45	**150**	60	M8	D
100	70	**100**	70	M8	C
100	70	**125**	95	M8	C
100	70	**150**	60	M8	D

SLIDING PAD, BRONZE WITH SOLID LUBRICANT, TYPE 76

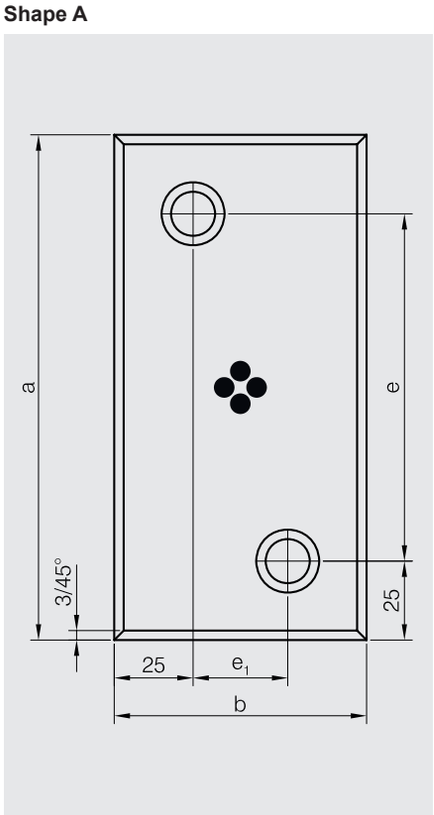
Order-No.: 881.76.b.a

Material:
Bronze with solid lubricant, low maintenance.

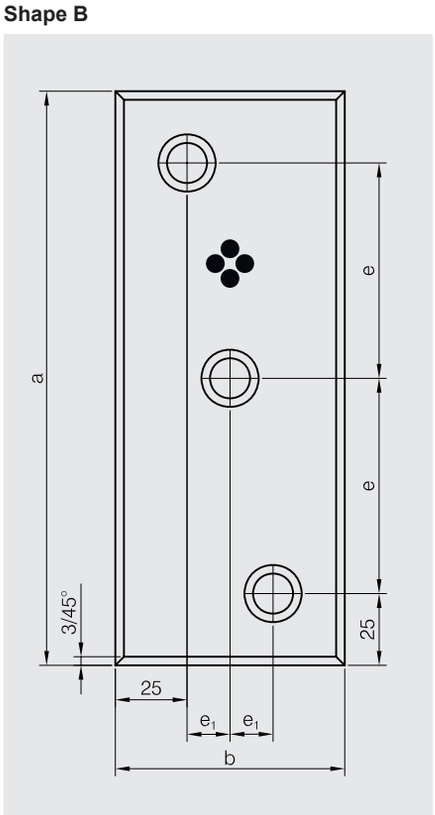
Note:
Sliding pads are preferably used in large tools with large surface pressure.
Bronze with solid lubricant ensures low maintenance service even in arduous multishift applications.
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M12 x 30.

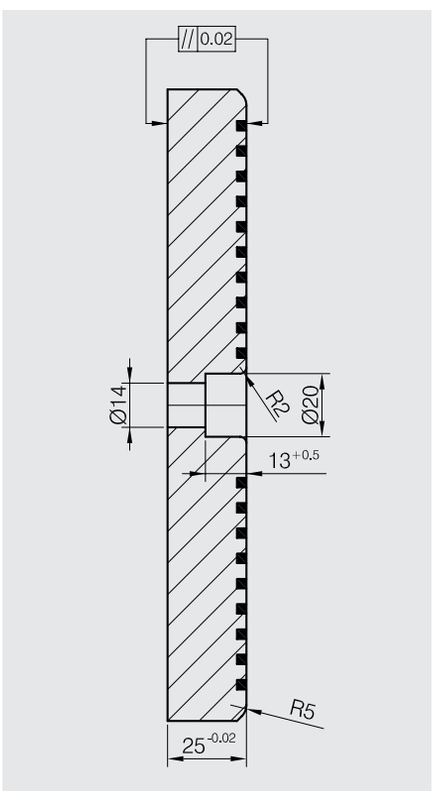
Ordering example: b = 80, a = 100
881.76.080.100

Shape A



Shape B





e	50	75	110	150	75	110	150	75
e_1	30	30	30	30	50	50	50	75
b	**80**	**80**	**80**	**80**	**100**	**100**	**100**	**125**
a	**100**	**125**	**160**	**200**	**125**	**160**	**200**	**125**
Shape	A	A	A	B	A	A	B	A

SLIDING PAD NAAMS, BRONZE WITH SOLID LUBRICANT, TYPE 79

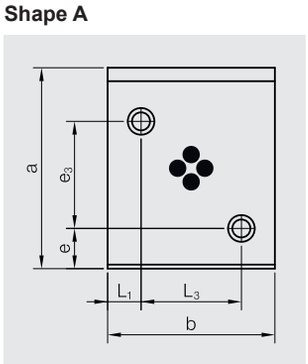
Order-No.: 881.79.b.a

Material:
Bronze with solid lubricant, low maintenance.

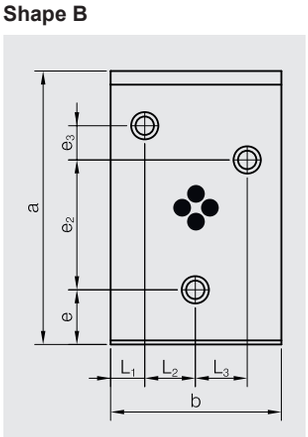
Note:
Sliding pads are preferably used in large tools with large surface pressure.
Bronze with solid lubricant ensures low maintenance service even in arduous multishift applications.
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M12 x 30.

Ordering example: b = 50, a = 100
881.79.050.100

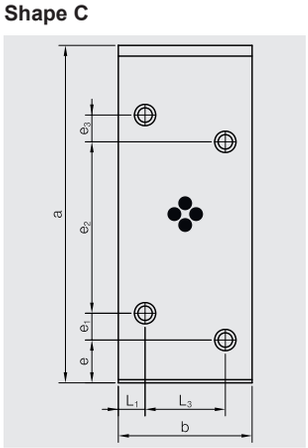
Shape A



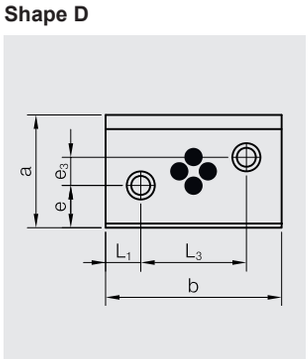
Shape B

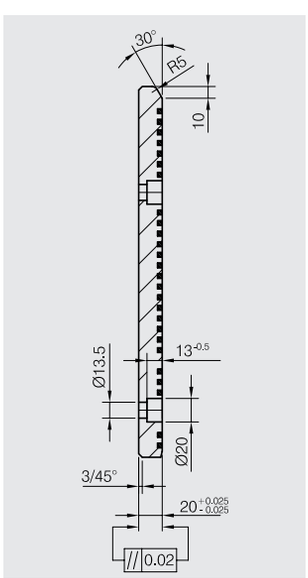


Shape C



Shape D





e	e_1	e_2	e_3	L_1	L_2	L_3	a	b	Shape
30	–	–	30	25	–	–	**100**	**50**	A
30	–	-	80	25	–	–	**150**	**50**	A
40	–	–	120	25	–	–	**200**	**50**	A
30	–	–	30	20	–	40	**100**	**80**	A
30	–	–	80	20	–	40	**150**	**80**	A
40	–	–	120	20	–	40	**200**	**80**	A
40	–	–	170	20	–	40	**250**	**80**	A
40	–	210	25	20	20	20	**315**	**80**	B
14	–	–	13	22	–	–	**50**	**10**	D
30	–	–	20	22	–	–	**80**	**10**	D
30	–	–	3	22	–	–	**100**	**10**	A
30	–	–	80	22	–	–	**150**	**10**	A
40	–	95	25	22	28	28	**200**	**10**	B
40	–	145	25	22	28	28	**250**	**10**	B
40	–	210	25	22	28	28	**315**	**10**	B
30	–	–	20	25	–	–	**80**	**125**	D
30	–	–	30	25	–	–	**100**	**125**	A
30	–	–	80	25	–	–	**150**	**125**	A
40	–	95	25	25	37	37	**200**	**125**	B
40	–	145	25	25	37	37	**250**	**125**	B
40	25	210	25	25	–	–	**315**	**125**	C
30	–	–	30	30	–	–	**100**	**160**	A
30	–	–	80	30	–	–	**150**	**160**	A
40	–	95	25	30	50	50	**200**	**160**	B
40	25	145	25	30	–	100	**250**	**160**	C
40	25	210	25	30	–	100	**315**	**160**	C

SLIDING PAD VDI 3357, BRONZE BRONZE WITH SOLID LUBRICANT, TYPE 81

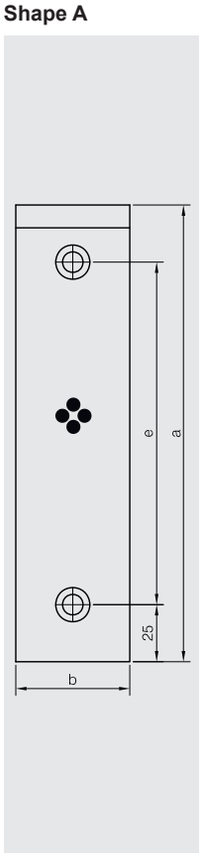
Order-No.: 881.81.b.a

Material:
Bronze with solid lubricant, low maintenance.

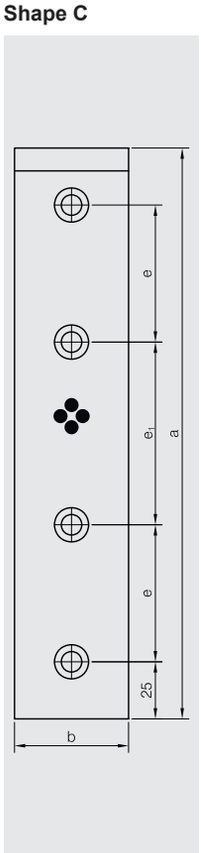
Note:
Sliding pads are preferably used in large tools with large surface pressure.
Bronze with solid lubricant ensures low maintenance service even in arduous multishift applications.
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M8 x 25.

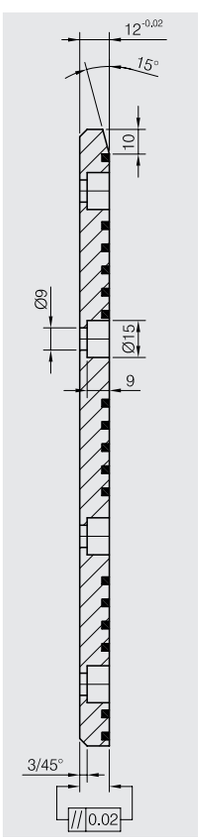
Ordering example: b = 25, a = 160
881.81.025.160

Shape A



Shape C





e	e_1	b	a	Shape
110	–	**25**	**160**	A
150	–	**25**	**200**	A
30	–	**30**	**80**	A
50	–	**30**	**100**	A
75	–	**30**	**125**	A
110	–	**30**	**160**	A
150	–	**30**	**200**	A
30	–	**40**	**80**	A
50	–	**40**	**100**	A
75	–	**40**	**125**	A
110	–	**40**	**160**	A
150	–	**40**	**200**	A
30	–	**50**	**80**	A
50	–	**50**	**100**	A
75	–	**50**	**125**	A
110	–	**50**	**160**	A

e	e_1	b	a	Shape
150	–	**50**	**200**	A
60	80	**50**	**250**	C
80	90	**50**	**300**	C
100	100	**50**	**350**	C
120	110	**50**	**400**	C
30	–	**60**	**80**	A
50	–	**60**	**100**	A
75	–	**60**	**125**	A
110	–	**60**	**160**	A
150	–	**60**	**200**	A
30	–	**80**	**80**	A
50	–	**80**	**100**	A
75	–	**80**	**125**	A
110	–	**80**	**160**	A
150	–	**80**	**200**	A
70	60	**80**	**250**	C

SLIDING PAD VDI 3357, STEEL

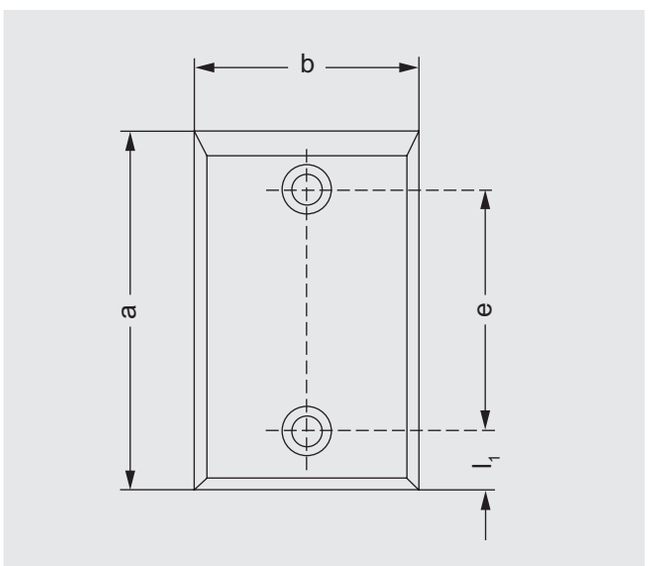
Order-No.: 843.b.a

Material:
Steel, surface hardened.

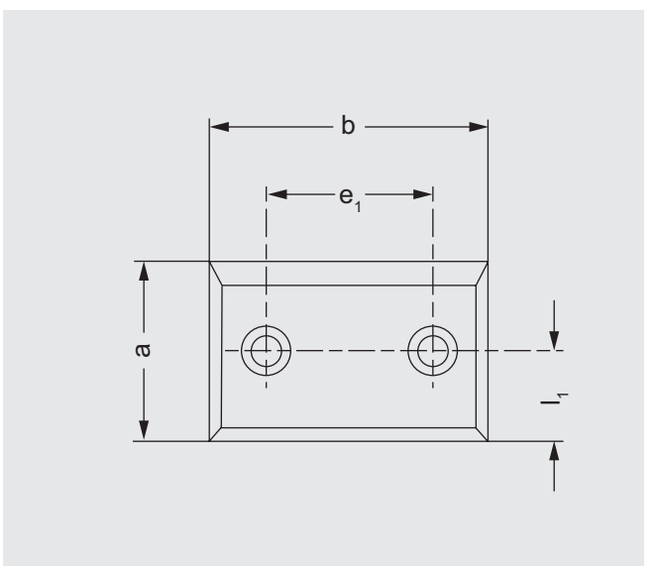
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762.

Ordering example: b = 50, a = 80
843.050.080

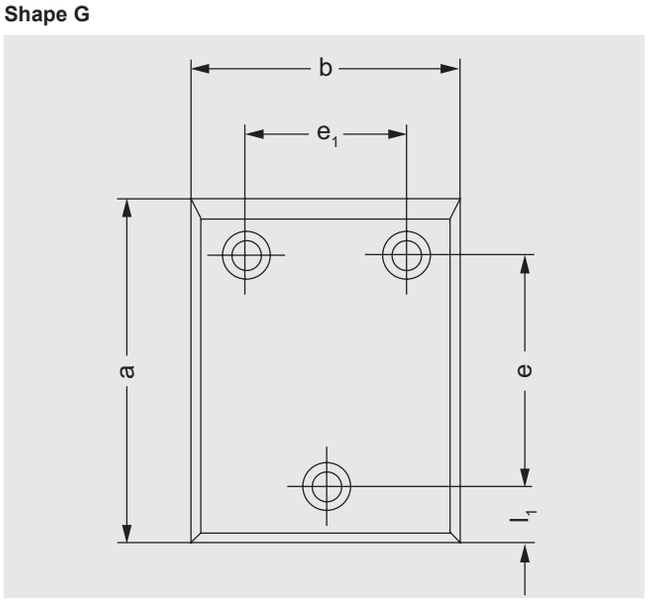
Shape B



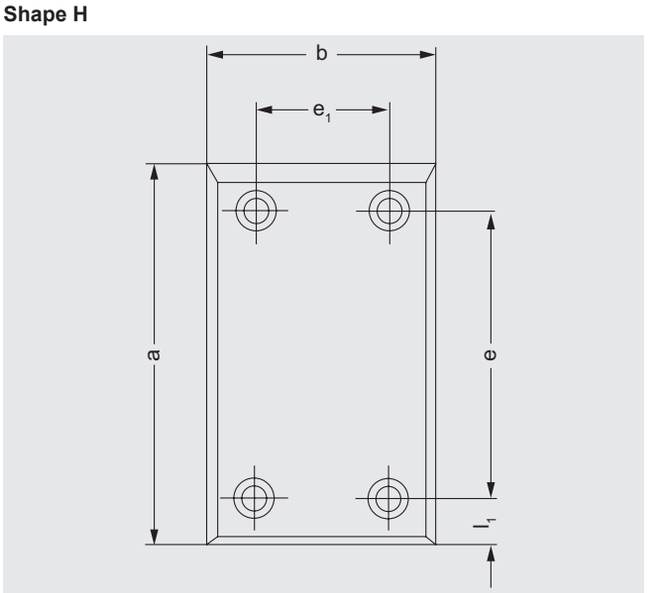
Shape D

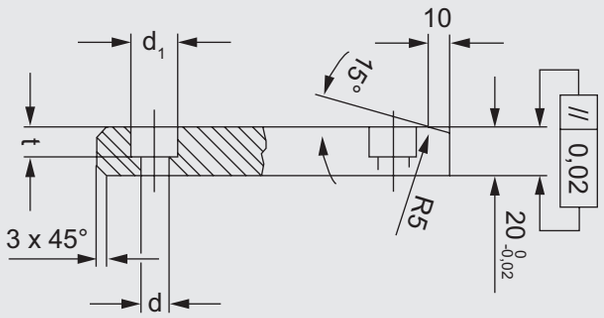


Shape G



Shape H

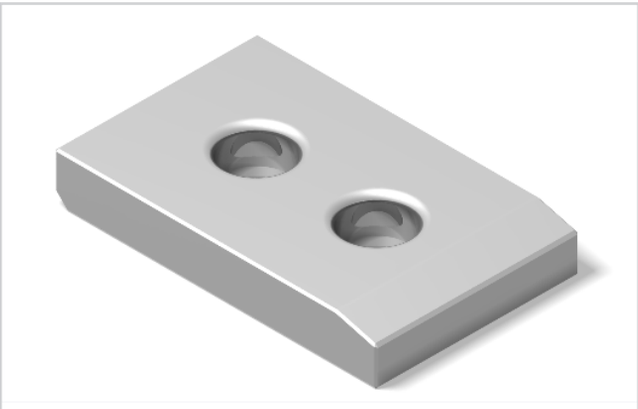




Order-No.:	Shape	b	a	l_1	e	e_1	d	d_1	t	number of screw holes
843.050.080	B	**50**	**80**	25	30	–	9	15	9	2
843.050.100	B	**50**	**100**	25	50	–	13,5	20	13	2
843.050.125	B	**50**	**125**	25	75	–	13,5	20	13	2
843.050.160	B	**50**	**160**	25	110	–	13,5	20	13	2
843.050.200	B	**50**	**200**	25	150	–	13,5	20	13	2
843.080.050	D	**80**	**50**	25	–	30	9	15	9	2
843.080.080	B	**80**	**80**	25	30	–	13,5	20	13	2
843.080.100	B	**80**	**100**	25	50	–	13,5	20	13	2
843.080.125	B	**80**	**125**	25	75	–	13,5	20	13	2
843.080.160	B	**80**	**160**	25	110	–	13,5	20	13	2
843.080.200	B	**80**	**200**	25	150	–	13,5	20	13	2
843.080.250	B	**80**	**250**	40	170	–	13,5	20	13	2
843.080.315	B	**80**	**315**	40	235	–	13,5	20	13	2
843.100.050	D	**100**	**50**	25	–	50	13,5	20	13	2
843.100.080	D	**100**	**80**	40	–	50	13,5	20	13	2
843.100.100	B	**100**	**100**	25	50	–	13,5	20	13	2
843.100.125	B	**100**	**125**	25	75	–	13,5	20	13	2
843.100.160	B	**100**	**160**	25	110	–	13,5	20	13	2
843.100.200	B	**100**	**200**	25	150	–	13,5	20	13	2
843.100.250	B	**100**	**250**	40	170	–	13,5	20	13	2
843.100.315	B	**100**	**315**	40	235	–	13,5	20	13	2
843.125.050	D	**125**	**50**	25	–	75	13,5	20	13	2
843.125.080	D	**125**	**80**	40	–	75	13,5	20	13	2
843.125.100	G	**125**	**100**	25	50	75	13,5	20	13	3
843.125.125	G	**125**	**125**	25	75	75	13,5	20	13	3
843.125.160	G	**125**	**160**	25	110	75	13,5	20	13	3
843.125.200	G	**125**	**200**	25	150	75	13,5	20	13	3
843.125.250	G	**125**	**250**	40	175	75	13,5	20	13	3
843.125.315	G	**125**	**315**	40	235	75	13,5	20	13	3
843.160.050	D	**160**	**50**	25	–	110	13,5	20	13	2
843.160.080	D	**160**	**80**	40	–	110	13,5	20	13	2
843.160.100	G	**160**	**100**	25	50	110	13,5	20	13	3
843.160.125	G	**160**	**125**	25	75	110	13,5	20	13	3
843.160.160	G	**160**	**160**	25	110	110	13,5	20	13	3
843.160.200	G	**160**	**200**	25	150	110	13,5	20	13	3
843.160.250	H	**160**	**250**	40	170	110	13,5	20	13	4
843.160.315	H	**160**	**315**	40	235	110	13,5	20	13	4

SLIDING PAD VDI 3357, STEEL

Order-No.: 844.b.a

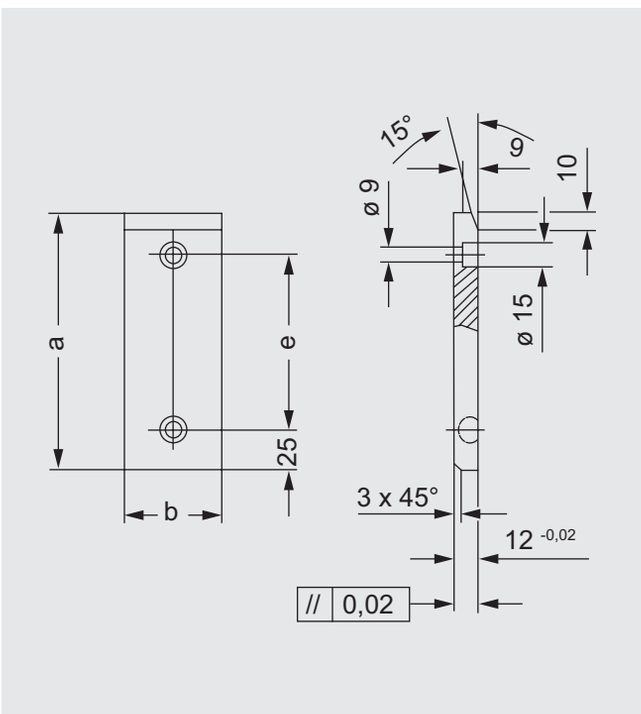


Material:
Steel, surface hardened.

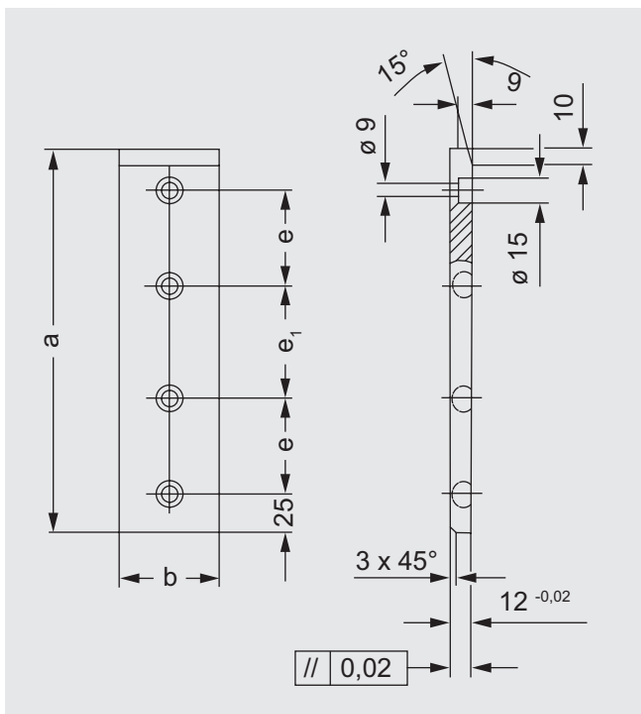
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M8.

Ordering example: b = 30, a = 80
844.030.080

Shape A



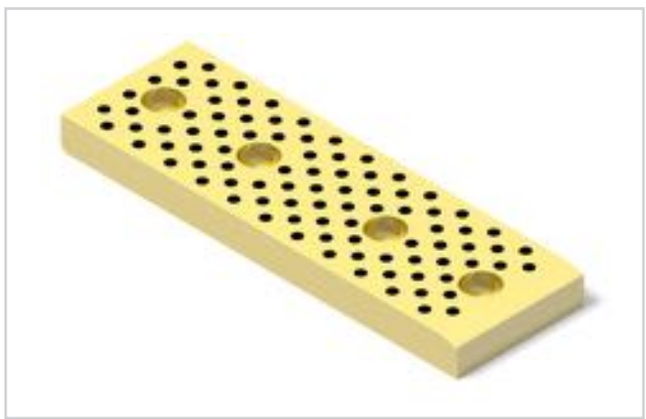
Shape B



Order-No.:	Shape	b	a	e	e_1	number of screw holes
844.030.080	A	**30**	**80**	30	–	2
844.030.100	A	**30**	**100**	50	–	2
844.030.125	A	**30**	**125**	75	–	2
844.030.160	A	**30**	**160**	110	–	2
844.030.200	A	**30**	**200**	150	–	2
844.040.080	A	**40**	**80**	30	–	2
844.040.100	A	**40**	**100**	50	–	2
844.040.125	A	**40**	**125**	75	–	2
844.040.160	A	**40**	**160**	110	–	2
844.040.200	A	**40**	**200**	150	–	2
844.040.225	A	**40**	**225**	175	–	2
844.040.240	B	**40**	**240**	60	70	4
844.040.250	B	**40**	**250**	60	80	4
844.040.260	B	**40**	**260**	60	90	4
844.040.280	B	**40**	**280**	60	110	4
844.050.080	A	**50**	**80**	30	–	2
844.050.100	A	**50**	**100**	50	–	2
844.050.125	A	**50**	**125**	75	–	2
844.050.160	A	**50**	**160**	110	–	2
844.050.180	A	**50**	**180**	130	–	2
844.050.200	A	**50**	**200**	150	–	2
844.050.225	A	**50**	**225**	175	–	2
844.050.240	B	**50**	**240**	60	70	4
844.050.250	B	**50**	**250**	60	80	4
844.050.260	B	**50**	**260**	60	90	4
844.050.280	B	**50**	**280**	60	110	4
844.060.080	A	**60**	**80**	30	–	2
844.060.100	A	**60**	**100**	50	–	2
844.060.125	A	**60**	**125**	75	–	2
844.060.160	A	**60**	**160**	110	–	2
844.060.200	A	**60**	**200**	150	–	2
844.060.225	A	**60**	**225**	175	–	2
844.060.240	B	**60**	**240**	60	70	4
844.060.250	B	**60**	**250**	60	80	4
844.060.260	B	**60**	**260**	60	90	4
844.060.280	B	**60**	**280**	60	110	4
844.060.300	B	**60**	**300**	80	90	4
844.060.320	B	**60**	**320**	80	110	4
844.060.340	B	**60**	**340**	80	130	4
844.060.350	B	**60**	**350**	100	100	4
844.080.080	A	**80**	**80**	30	–	2
844.080.100	A	**80**	**100**	50	–	2
844.080.125	A	**80**	**125**	75	–	2
844.080.160	A	**80**	**160**	110	–	2
844.080.200	A	**80**	**200**	150	–	2
844.080.225	A	**80**	**225**	175	–	2
844.080.240	B	**80**	**240**	60	70	4
844.080.250	B	**80**	**250**	60	80	4
844.080.260	B	**80**	**260**	60	90	4
844.080.280	B	**80**	**280**	60	110	4
844.080.300	B	**80**	**300**	80	90	4
844.080.320	B	**80**	**320**	80	110	4
844.080.340	B	**80**	**340**	80	130	4
844.080.350	B	**80**	**350**	100	100	4
844.100.250	B	**100**	**250**	60	80	4
844.100.280	B	**100**	**280**	60	110	4
844.100.300	B	**100**	**300**	80	90	4
844.100.320	B	**100**	**320**	80	110	4
844.100.340	B	**100**	**340**	80	130	4
844.100.350	B	**100**	**350**	100	100	4

SLIDING PAD VDI 3357, BRONZE WITH SOLID LUBRICANT

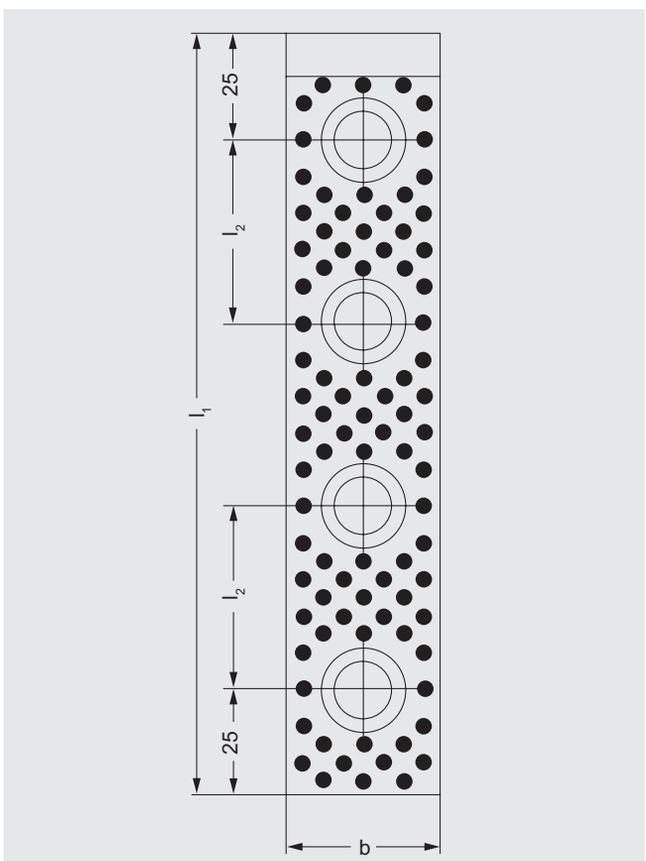
Order-No.: 845.b.l_1

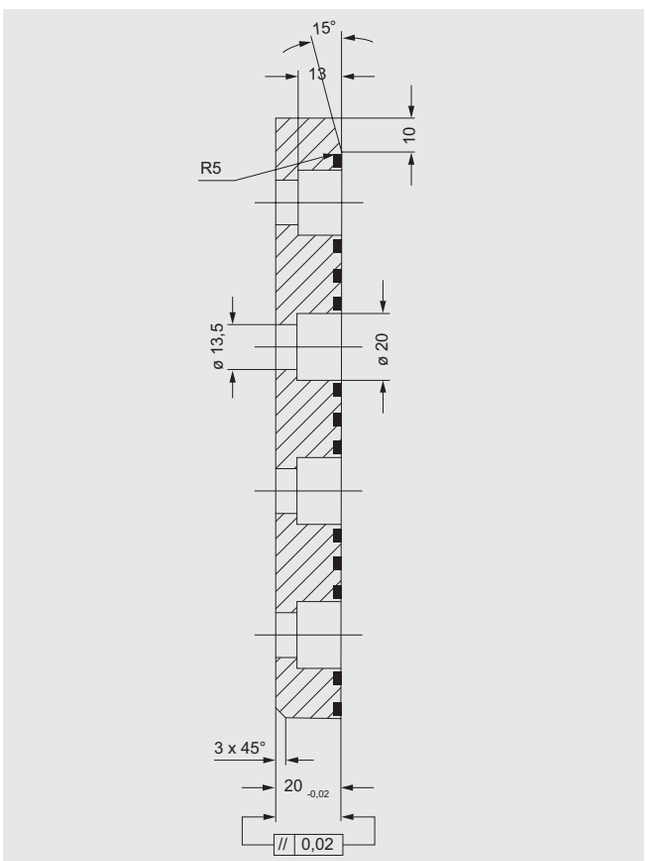


Material:
Bronze with solid lubricant, low maintenance.

Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M12.

Ordering example: b = 50, l_1 = 250
845.050.250





Order-No.:	b	l_1	l_2
845.050.250	**50**	**250**	60
845.050.300	**50**	**300**	80
845.050.350	**50**	**350**	100
845.050.400	**50**	**400**	120
845.050.450	**50**	**450**	140
845.050.500	**50**	**500**	150
845.080.250	**80**	**250**	60
845.080.300	**80**	**300**	80
845.080.350	**80**	**350**	100
845.080.400	**80**	**400**	120
845.080.450	**80**	**450**	140
845.080.500	**80**	**500**	150
845.100.250	**100**	**250**	60
845.100.300	**100**	**300**	80
845.100.350	**100**	**350**	100
845.100.400	**100**	**400**	120
845.100.450	**100**	**450**	140
845.100.500	**100**	**500**	150
845.125.250	**125**	**250**	60
845.125.300	**125**	**300**	80
845.125.350	**125**	**350**	100
845.125.400	**125**	**400**	120
845.125.450	**125**	**450**	140
845.125.500	**125**	**500**	150
845.160.250	**160**	**250**	60
845.160.300	**160**	**300**	80
845.160.350	**160**	**350**	100
845.160.400	**160**	**400**	120
845.160.450	**160**	**450**	140
845.160.500	**160**	**500**	150

SLIDING PAD, BRONZE WITH SOLID LUBRICANT

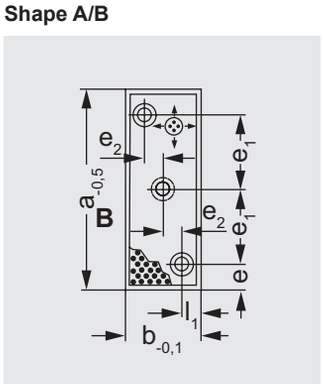
Order-No.: 883.78.b.s.a

Material:
Bronze with solid lubricant, low maintenance.

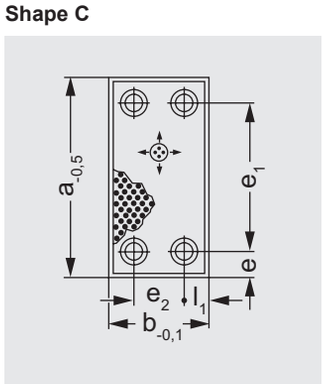
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 or countersunk cap screws DIN 7991/ISO 10642.

Ordering example: b = 30, s = 12, a = 100
883.78.030.12.0100

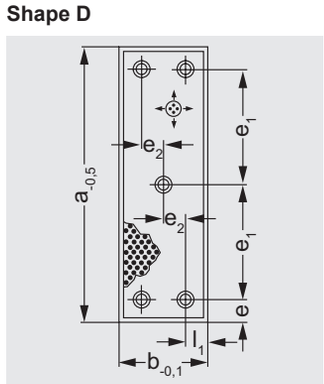
Shape A/B



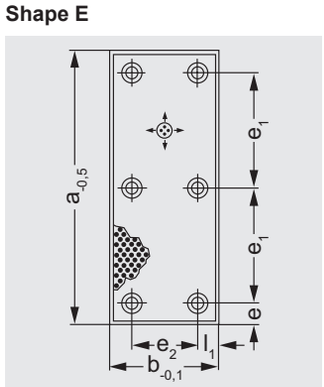
Shape C



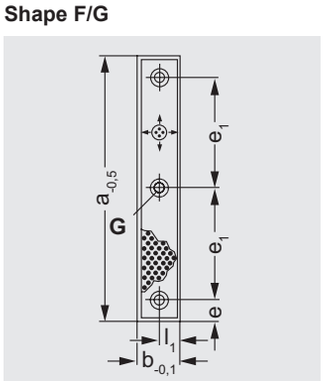
Shape D



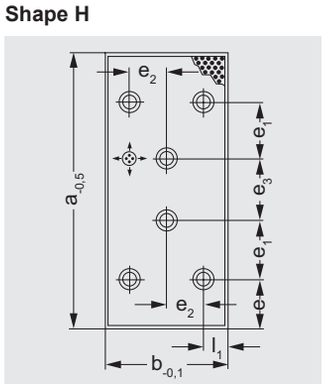
Shape E



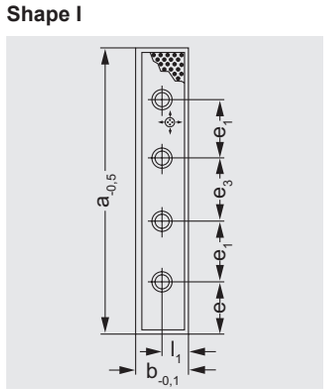
Shape F/G



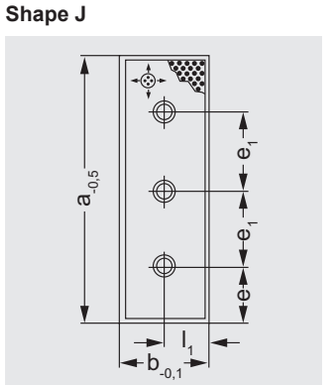
Shape H



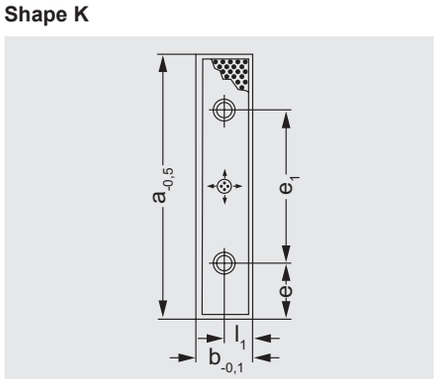
Shape I



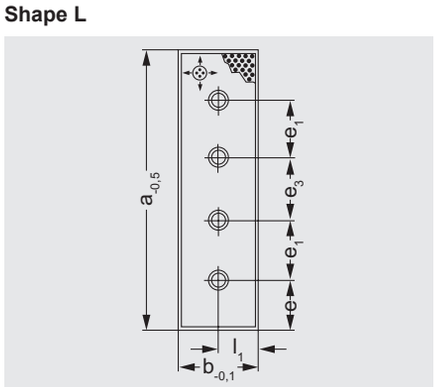
Shape J



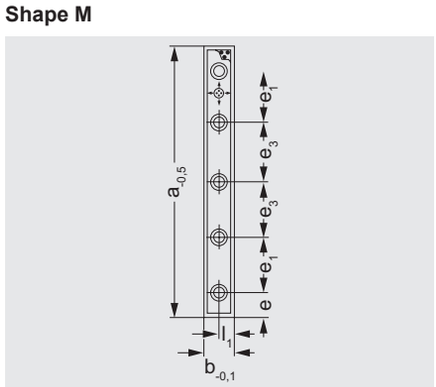
Shape K



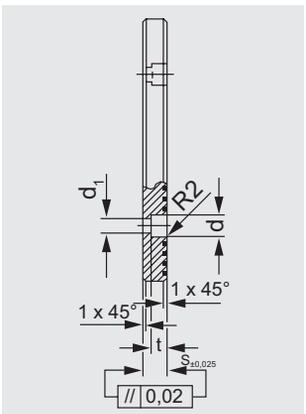
Shape L



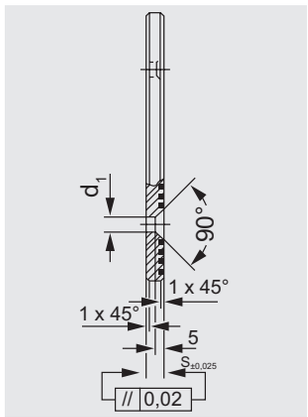
Shape M



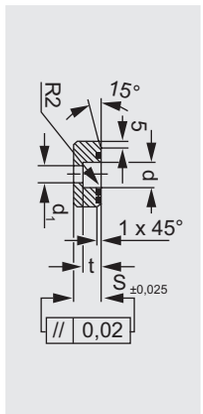
Shape A, B, C, D, E, H, L, M



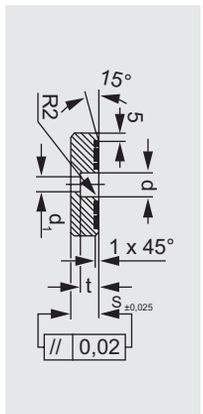
Shape F, G



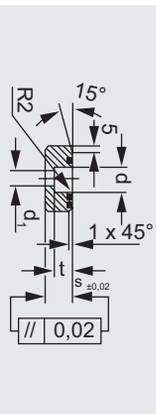
Shape I



Shape J



Shape K



Order-No.:	Shape	b	s	a	l_1	e	e_1	e_2	e_3	number of screw holes	d	d_1	t
883.78.030.12.0100	A	**30**	**12**	**100**	15	20	60	–	–	2	15	9	9
883.78.030.12.0160	B	**30**	**12**	**160**	15	20	60	–	–	3	15	9	9
883.78.030.12.0240	B	**30**	**12**	**240**	15	25	95	–	–	3	15	9	9
883.78.030.12.0250	B	**30**	**12**	**250**	15	20	105	–	–	3	15	9	9
883.78.030.12.0300	L	**30**	**12**	**300**	15	25	85	–	80	4	15	9	9
883.78.030.12.0350	L	**30**	**12**	**350**	15	25	100	–	100	4	15	9	9
883.78.030.12.0400	L	**30**	**12**	**400**	15	25	115	–	120	4	15	9	9
883.78.030.12.0450	M	**30**	**12**	**450**	15	25	100	–	100	5	15	9	9
883.78.030.12.0500	M	**30**	**12**	**500**	15	25	110	–	115	5	15	9	9
883.78.040.08.0100	F	**40**	**8**	**100**	20	20	60	–	–	2	–	9	5
883.78.040.08.0160	G	**40**	**8**	**160**	20	20	60	–	–	3	–	9	5
883.78.040.08.0250	G	**40**	**8**	**250**	20	20	105	–	–	3	–	9	5
883.78.040.12.0100	A	**40**	**12**	**100**	20	20	60	–	–	2	15	9	9
883.78.040.12.0160	B	**40**	**12**	**160**	20	20	60	–	–	3	15	9	9
883.78.040.12.0250	B	**40**	**12**	**250**	20	20	105	–	–	3	15	9	9
883.78.040.16.0100	A	**40**	**16**	**100**	20	20	60	–	–	2	18	11	11
883.78.040.16.0160	B	**40**	**16**	**160**	20	20	60	–	–	3	18	11	11
883.78.040.16.0250	B	**40**	**16**	**250**	20	20	105	–	–	3	18	11	11
883.78.050.20.0100	A	**50**	**20**	**100**	15	20	60	20	–	2	20	13,5	13
883.78.050.20.0160	B	**50**	**20**	**160**	15	20	60	10	–	3	20	13,5	13
883.78.050.20.0240	A	**50**	**20**	**240**	25	50	140	–	–	2	20	13,5	13
883.78.050.20.0240	K	**50**	**20**	**240**	25	50	140	–	–	2	20	13,5	13
883.78.050.20.0250	B	**50**	**20**	**250**	15	20	105	10	–	3	20	13,5	13
883.78.050.20.0300	B	**50**	**20**	**300**	25	50	100	–	–	3	20	13,5	13
883.78.050.20.0300	J	**50**	**20**	**300**	25	50	100	–	–	3	20	13,5	13
883.78.050.20.0350	B	**50**	**20**	**350**	25	50	125	–	–	3	20	13,5	13
883.78.050.20.0350	J	**50**	**20**	**350**	25	50	125	–	–	3	20	13,5	13
883.78.050.20.0400	J	**50**	**20**	**400**	25	50	150	–	–	3	20	13,5	13
883.78.050.20.0450	I	**50**	**20**	**450**	25	50	115	–	120	4	20	13,5	13
883.78.050.20.0500	I	**50**	**20**	**500**	25	50	135	–	130	4	20	13,5	13
883.78.060.16.0100	A	**60**	**16**	**100**	15	20	60	30	–	2	18	11	11
883.78.060.16.0160	B	**60**	**16**	**160**	15	20	60	15	–	3	18	11	11
883.78.060.16.0250	B	**60**	**16**	**250**	15	20	105	15	–	3	18	11	11
883.78.080.12.0100	A	**80**	**12**	**100**	20	20	60	40	–	2	15	9	9
883.78.080.12.0160	C	**80**	**12**	**160**	20	20	120	40	–	4	15	9	9
883.78.080.12.0250	D	**80**	**12**	**250**	20	20	105	20	–	5	15	9	9
883.78.080.20.0100	A	**80**	**20**	**100**	20	20	60	40	–	2	20	13,5	13
883.78.080.20.0160	C	**80**	**20**	**160**	20	20	120	40	–	4	20	13,5	13
883.78.080.20.0250	D	**80**	**20**	**250**	20	20	105	20	–	5	20	13,5	13
883.78.080.20.0300	B	**80**	**20**	**300**	40	50	100	–	–	3	20	13,5	13
883.78.080.20.0300	J	**80**	**20**	**300**	40	50	100	–	–	3	20	13,5	13
883.78.080.20.0350	B	**80**	**20**	**350**	40	50	125	–	–	3	20	13,5	13
883.78.080.20.0350	J	**80**	**20**	**350**	40	50	125	–	–	3	20	13,5	13
883.78.080.20.0400	B	**80**	**20**	**400**	40	50	150	–	–	3	20	13,5	13
883.78.080.20.0400	J	**80**	**20**	**400**	40	50	150	–	–	3	20	13,5	13
883.78.080.20.0450	L	**80**	**20**	**450**	40	50	115	–	120	4	20	13,5	13
883.78.080.20.0450	I	**80**	**20**	**450**	40	50	115	–	120	4	20	13,5	13
883.78.080.20.0500	L	**80**	**20**	**500**	40	50	135	–	130	4	20	13,5	13
883.78.080.20.0500	I	**80**	**20**	**500**	40	50	135	–	130	4	20	13,5	13
883.78.100.16.0100	A	**100**	**16**	**100**	20	20	60	60	–	2	18	11	11
883.78.100.16.0160	C	**100**	**16**	**160**	20	20	120	60	–	4	18	11	11
883.78.100.16.0250	E	**100**	**16**	**250**	20	20	105	60	–	6	18	11	11
883.78.125.20.0100	C	**125**	**20**	**100**	20	20	60	85	–	4	20	13,5	13
883.78.125.20.0160	C	**125**	**20**	**160**	20	20	120	85	–	4	20	13,5	13
883.78.125.20.0250	E	**125**	**20**	**250**	20	20	105	85	–	6	20	13,5	13
883.78.125.20.0400	D	**125**	**20**	**400**	25	50	150	37,5	–	5	20	13,5	13
883.78.125.20.0450	H	**125**	**20**	**450**	25	50	115	37,5	120	6	20	13,5	13
883.78.125.20.0500	H	**125**	**20**	**500**	25	50	135	37,5	130	6	20	13,5	13

SLIDING PAD, BRONZE WITH SOLID LUBRICANT, TYPE 85

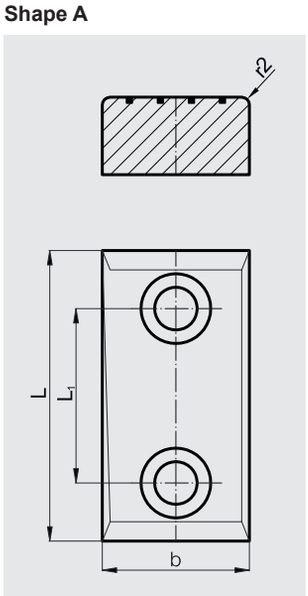
Order-No.: 881.85.b.L

Material:
Bronze with solid lubricant, low maintenance.

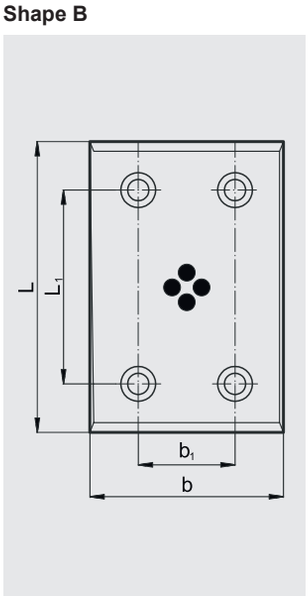
Note:
Sliding pads are preferably used in large tools with large surface pressure.
Bronze with solid lubricant ensures low maintenance service even in arduous multishift.
Screws are not included.
Fixing: Use socket cap screws.

Ordering example: b = 28, L = 75
881.85.028.075

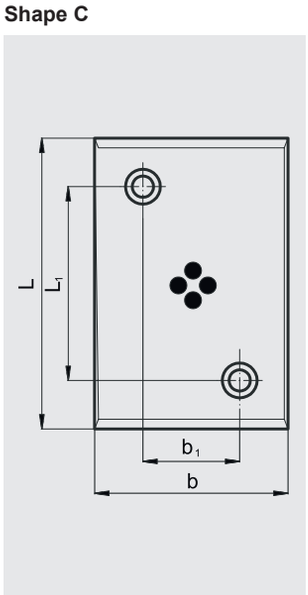
Shape A

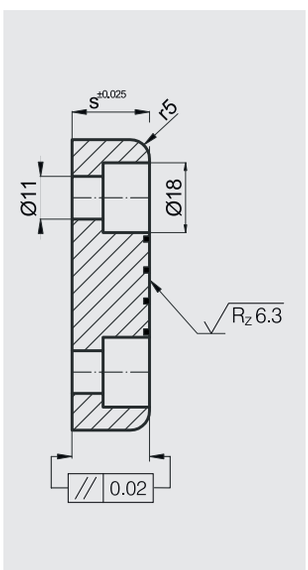


Shape B



Shape C





b x L x s	b_1	L_1	Shape
28 x 75 x 20		45	A
28 x 100 x 20		50	A
28 x 125 x 20		75	A
28 x 150 x 20		100	A
38 x 75 x 20		45	A
38 x 100 x 20		50	A
38 x 125 x 20		75	A
38 x 150 x 20		100	A
38 x 200 x 20		150	A
48 x 75 x 20		45	A
48 x 100 x 20		50	A
48 x 125 x 20		75	A
48 x 150 x 20		100	A
48 x 200 x 20		150	A
58 x 75 x 20		45	A
58 x 100 x 20		50	A
58 x 150 x 20		100	A
75 x 75 x 20		25	A
75 x 100 x 20		50	A
75 x 125 x 20		75	A
75 x 150 x 20		100	A
75 x 200 x 20		150	A
75 x 100 x 20	25	50	C
100 x 100 x 20	50	5	B
100 x 125 x 20	50	75	B
100 x 150 x 20	50	100	B
100 x 200 x 20	50	150	B
100 x 250 x 20	50	200	B
100 x 300 x 20	50	200	B
125 x 125 x 20	50	75	B
125 x 150 x 20	50	100	B
125 x 200 x 20	50	150	B
125 x 250 x 20	50	200	B
125 x 300 x 20	50	250	B
125 x 350 x 20	50	200	B
150 x 150 x 20	100	100	B
150 x 200 x 20	100	150	B
150 x 250 x 20	100	200	B
150 x 300 x 20	100	250	B
200 x 200 x 20	150	150	B
200 x 250 x 20	150	200	B
200 x 300 x 20	150	250	B

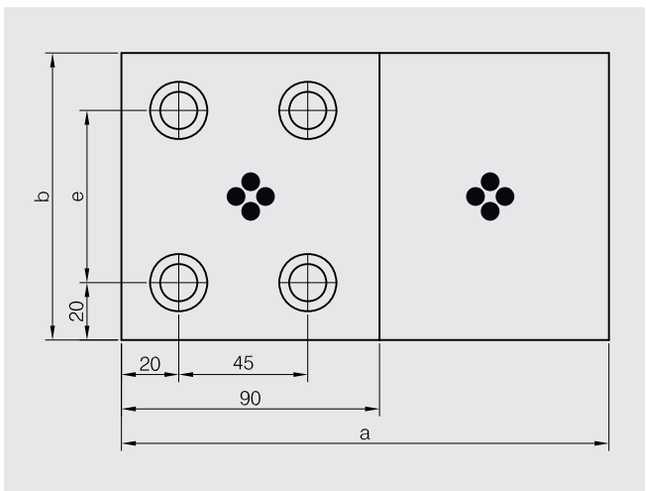
OVERRUN CAM VDI 3357, BRONZE WITH SOLID LUBRICANT, TYPE 92

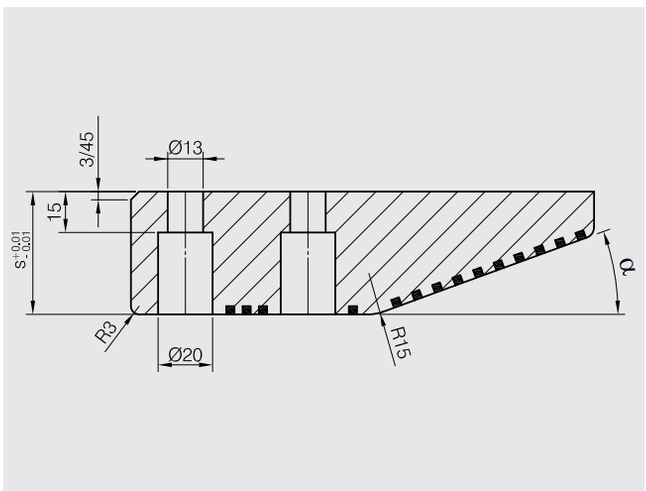
Order-No.: 881.92.b.a

Material:
Bronze with solid lubricant, low maintenance.

Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M12 x 40.

Ordering example: b = 100, a = 170
881.92.100.170





e	60	60	60	85	85	85	110	110	110	160	160	160
s	45	45	60	45	45	60	45	45	60	45	45	60
α	20	30	30	20	30	30	20	30	30	20	30	30
b	**100**	**100**	**100**	**125**	**125**	**125**	**150**	**150**	**150**	**200**	**200**	**200**
a	**170**	**150**	**170**	**170**	**150**	**170**	**170**	**150**	**170**	**170**	**150**	**170**

GUIDE BRACKET VDI 3387, STEEL WITH SOLID LUBRICANT, TYPE 73

Order-No.: 881.73.b.a.s

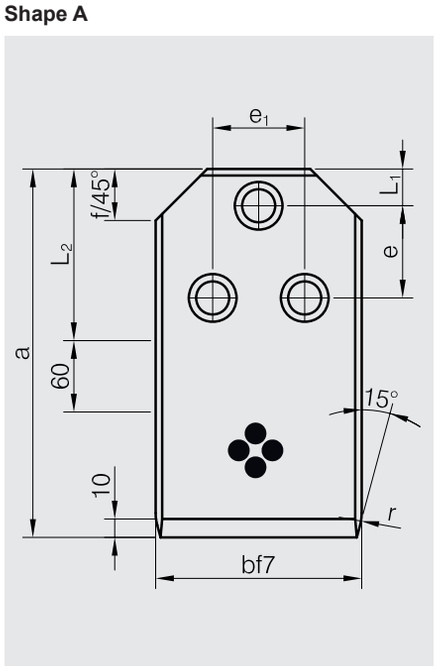
Material:
Steel, surface hardened. Sliding faces with embedded solid lubricant.

Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762.

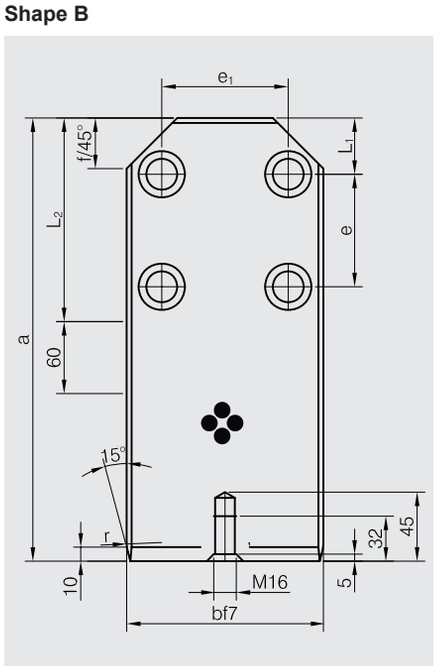
- b = 63 M12 x 40
- b = 71 M12 x 40
- b = 090 M16 x 50
- b = 112 M16 x 50
- b = 140 M20 x 50
- b = 190 M20 x 70
- b = 240 M24 x 80

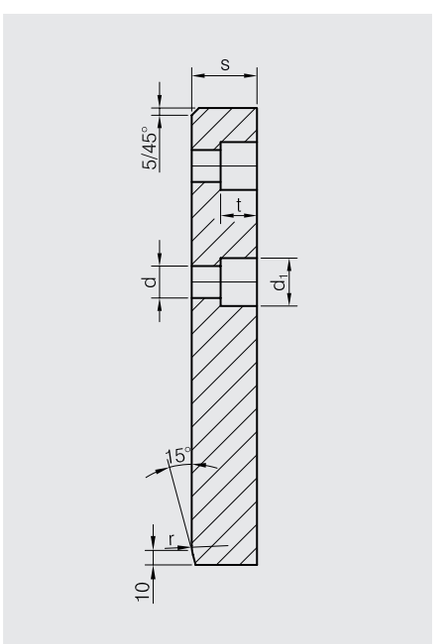
Ordering example: b = 63, a = 180, s = 25
881.73.063.180.025

Shape A



Shape B





Order-No.:	Form	b	a	s	l_1	l_2	e	e_1	d	d_1	f	t	r	Number of screw holes
881.73.063.180.036	A	**63**	**180**	**36**	20	90	50	36	14	20	18	16	16	3
881.73.063.200.036	A	**63**	**200**	**36**	20	90	50	36	14	20	18	16	16	3
881.73.063.224.036	A	**63**	**224**	**36**	20	90	50	36	14	20	18	16	16	3
881.73.071.180.036	A	**71**	**180**	**36**	20	90	50	36	14	20	18	16	16	3
881.73.071.200.036	A	**71**	**200**	**36**	20	90	50	36	14	20	18	16	16	3
881.73.071.224.036	A	**71**	**224**	**36**	20	90	50	36	14	20	18	16	16	3
881.73.090.200.045	A	**90**	**200**	**45**	20	100	50	50	18	26	28	21	25	3
881.73.090.224.045	A	**90**	**224**	**45**	20	100	50	50	18	26	28	21	25	3
881.73.090.250.045	A	**90**	**250**	**45**	20	100	50	50	18	26	28	21	25	3
881.73.112.200.045	A	**112**	**200**	**45**	20	100	50	50	18	26	28	21	25	3
881.73.112.224.045	A	**112**	**224**	**45**	20	100	50	50	18	26	28	21	25	3
881.73.112.250.045	A	**112**	**250**	**45**	20	100	50	50	18	26	28	21	25	3
881.73.140.315.045	B	**140**	**315**	**45**	40	150	80	90	22	33	36	25,5	31,5	4
881.73.140.400.045	B	**140**	**400**	**45**	40	150	80	90	22	33	36	25,5	31,5	4
881.73.140.400.056	B	**140**	**400**	**56**	40	150	80	90	22	33	36	25,5	31,5	4
881.73.190.400.056	B	**190**	**400**	**56**	40	150	80	90	22	33	36	25,5	31,5	4
881.73.240.500.056	B	**240**	**500**	**56**	40	250	160	160	26	40	36	30,5	31,5	4
881.73.240.630.056	B	**240**	**630**	**56**	40	250	160	160	26	40	36	30,5	31,5	4

GUIDE BRACKET VDI 3387, BRONZE WITH SOLID LUBRICANT, TYPE 89

Order-No.: 881.89.b.a.s

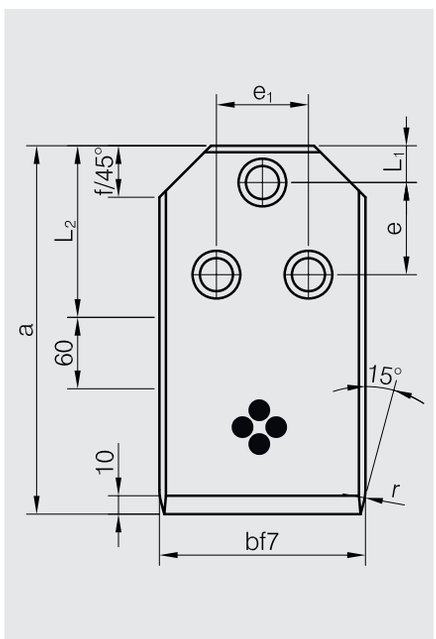
Material:
Bronze with solid lubricant.

Note:
Screws are not included.
Fixing: Use socket cap screws.

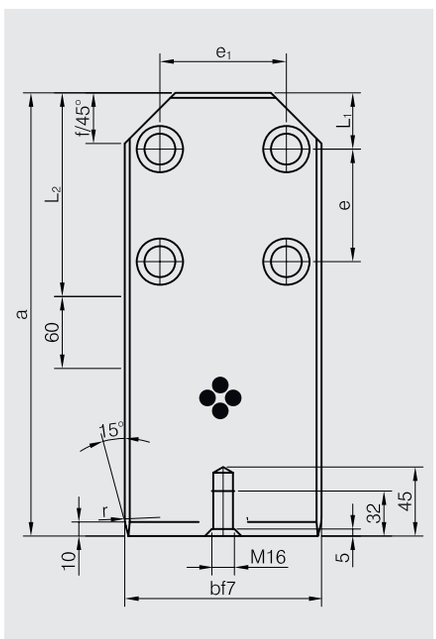
b = 63 M12 x 40
b = 71 M12 x 40
b = 90 M16 x 50
b = 112 M16 x 50
b = 140 M20 x 50
b = 190 M20 x 70
b = 240 M24 x 80

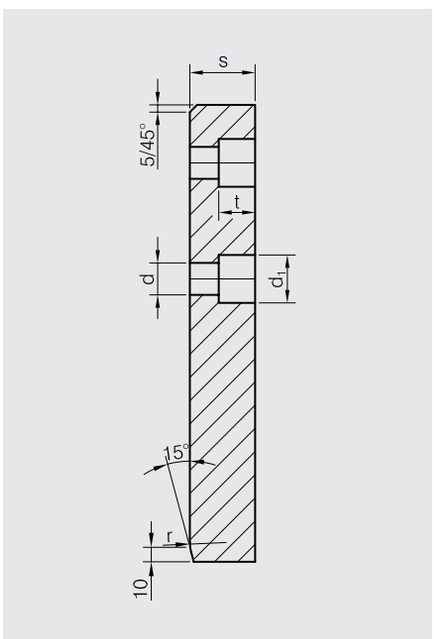
Ordering example: b = 63, a = 180, s = 25
881.89.063.180.025

Shape A



Shape B





e	e_1	L_1	L_2	f	d	d_1	t	r	b	a	s	Shape
50	36	20	90	18	14	20	16	16	**63**	**180**	**25**	A
50	36	20	90	18	14	20	16	16	**63**	**200**	**25**	A
50	36	20	90	18	14	20	16	16	**63**	**224**	**25**	A
50	36	20	90	18	14	20	16	16	**63**	**180**	**36**	A
50	36	20	90	18	14	20	16	16	**63**	**200**	**36**	A
50	36	20	90	18	14	20	16	16	**63**	**224**	**36**	A
50	36	20	90	18	14	20	16	16	**71**	**180**	**25**	A
50	36	20	90	18	14	20	16	16	**71**	**200**	**25**	A
50	36	20	90	18	14	20	16	16	**71**	**224**	**25**	A
50	36	20	90	18	14	20	16	16	**71**	**180**	**36**	A
50	36	20	90	18	14	20	16	16	**71**	**200**	**36**	A
50	36	20	90	18	14	20	16	16	**71**	**224**	**36**	A
50	50	20	100	28	18	26	21	25	**90**	**200**	**36**	A
50	50	20	100	28	18	26	21	25	**90**	**224**	**36**	A
50	50	20	100	28	18	26	21	25	**90**	**250**	**36**	A
50	50	20	100	28	18	26	21	25	**90**	**200**	**45**	A
50	50	20	100	28	18	26	21	25	**90**	**224**	**45**	A
50	50	20	100	28	18	26	21	25	**90**	**250**	**45**	A
50	50	20	100	28	18	26	21	25	**112**	**200**	**36**	A
50	50	20	100	28	18	26	21	25	**112**	**224**	**36**	A
50	50	20	100	28	18	26	21	25	**112**	**250**	**36**	A
50	50	20	100	28	18	26	21	25	**112**	**200**	**45**	A
50	50	20	100	28	18	26	21	25	**112**	**224**	**45**	A
50	50	20	100	28	18	26	21	25	**112**	**250**	**45**	A
80	90	40	150	36	22	33	25,5	31,5	**140**	**315**	**45**	B
80	90	40	150	36	22	33	25,5	31,5	**140**	**355**	**45**	B
80	90	40	150	36	22	33	25,5	31,5	**140**	**400**	**45**	B
80	90	40	150	36	22	33	25,5	31,5	**140**	**315**	**56**	B
80	90	40	150	36	22	33	25,5	31,5	**140**	**400**	**56**	B
80	90	40	150	36	22	33	25,5	31,5	**190**	**315**	**45**	B
80	90	40	150	36	22	33	25,5	31,5	**190**	**400**	**45**	B
80	90	40	150	36	22	33	25,5	31,5	**190**	**315**	**56**	B
80	90	40	150	36	22	33	25,5	31,5	**190**	**400**	**56**	B
80	90	40	150	36	22	33	25,5	31,5	**190**	**315**	**71**	B
80	90	40	150	36	22	33	25,5	31,5	**190**	**400**	**71**	B
160	160	40	250	36	26	40	30,5	31,5	**240**	**500**	**56**	B
160	160	40	250	36	26	40	30,5	31,5	**240**	**630**	**56**	B
160	160	40	250	36	26	40	30,5	31,5	**240**	**500**	**71**	B
160	160	40	250	36	26	40	30,5	31,5	**240**	**630**	**71**	B
160	160	40	250	36	26	40	30,5	31,5	**240**	**500**	**90**	B
160	160	40	250	36	26	40	30,5	31,5	**240**	**630**	**90**	B

SLIDE CENTRE GUIDE, BRONZE WITH SOLID LUBRICANT

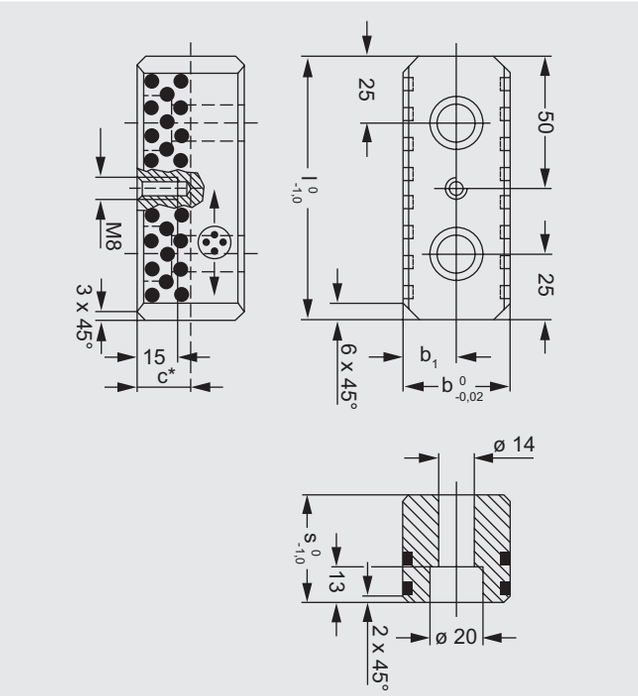
Order-No.: 887.72.b.s.l

Material:
Bronze with solid lubricant, low maintenance.

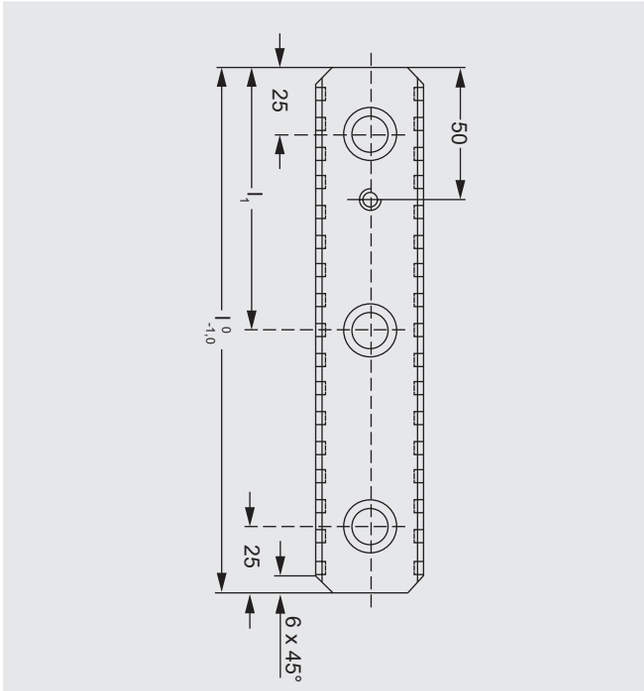
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M12.

Ordering example: b = 30, s = 30, l = 100
887.72.030.030.100

Shape A



Shape B



Order-No.:	Shape	b	l	s	b_1	l_1	c*	Number of screw holes
887.72.030.030.100	A	**30**	**100**	**30**	15	–	18	2
887.72.030.030.150	A	**30**	**150**	**30**	15	–	18	2
887.72.030.030.200	B	**30**	**200**	**30**	15	100	18	3
887.72.030.030.250	B	**30**	**250**	**30**	15	125	18	3
887.72.030.030.300	B	**30**	**300**	**30**	15	150	18	3
887.72.030.030.350	B	**30**	**350**	**30**	15	175	18	3
887.72.040.030.100	A	**40**	**100**	**30**	20	–	18	2
887.72.040.030.150	A	**40**	**150**	**30**	20	–	18	2
887.72.040.030.200	B	**40**	**200**	**30**	20	100	18	3
887.72.040.030.250	B	**40**	**250**	**30**	20	125	18	3
887.72.040.030.300	B	**40**	**300**	**30**	20	150	18	3
887.72.040.030.350	B	**40**	**350**	**30**	20	175	18	3
887.72.040.040.100	A	**40**	**100**	**40**	20	–	20	2
887.72.040.040.150	A	**40**	**150**	**40**	20	–	20	2
887.72.040.040.200	B	**40**	**200**	**40**	20	100	20	3
887.72.040.040.250	B	**40**	**250**	**40**	20	125	20	3
887.72.040.040.300	B	**40**	**300**	**40**	20	150	20	3
887.72.040.040.350	B	**40**	**350**	**40**	20	175	20	3

*Solid lubricant area

FLAT GUIDE BAR, BRONZE WITH SOLID LUBRICANT, TYPE 70

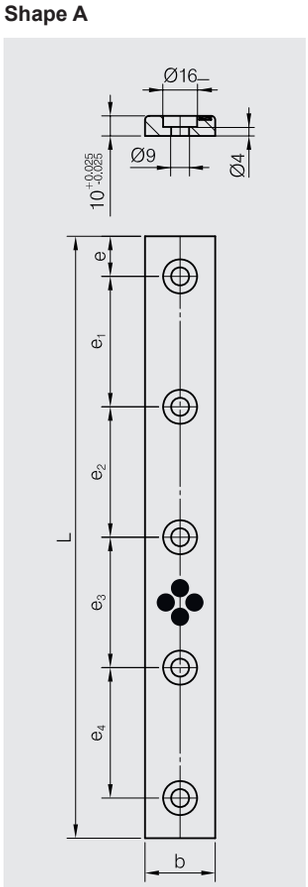
Order-No.: 882.70.b.L

Material:
Bronze with solid lubricant, low maintenance.

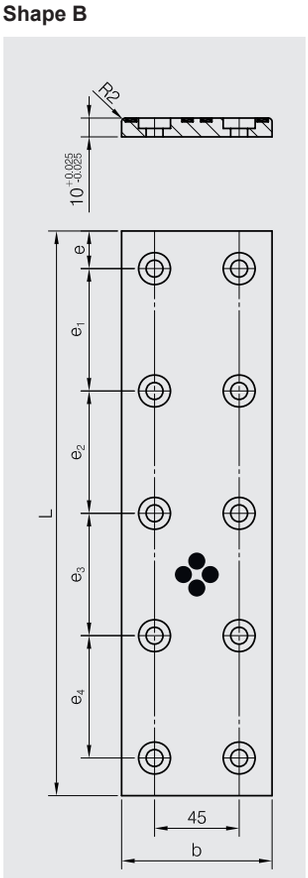
Execution:
Sliding faces ground.

Ordering example: b = 25, L = 75
882.70.025.075

Shape A



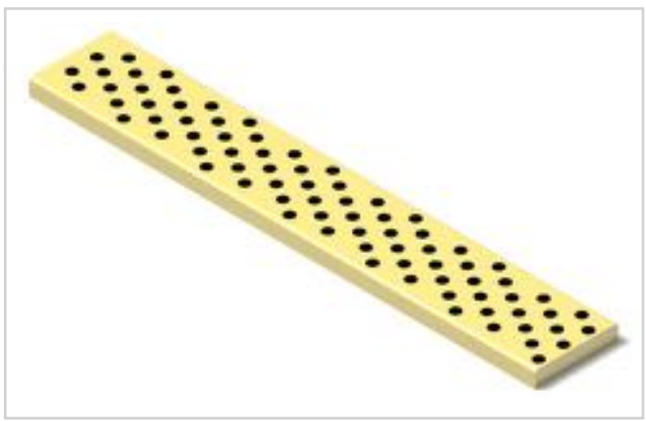
Shape B



e	e_1	e_2	e_3	e_4	b	L	Shape
20	60	–	–	–	**35**	**100**	A
20	55	55	–	–	**35**	**150**	A
20	55	50	55	–	**35**	**200**	A
20	70	70	70	–	**35**	**250**	A
20	65	650	65	65	**35**	**300**	A
20	80	75	75	80	**35**	**350**	A
20	60	–	–	–	**50**	**100**	A
20	55	55	–	–	**50**	**150**	A
20	55	50	55	–	**50**	**200**	A
20	70	70	70	–	**50**	**250**	A
20	65	65	65	65	**50**	**300**	A
20	80	75	75	80	**50**	**350**	A
20	110	–		–	**75**	**150**	B
20	80	80		–	**75**	**200**	B
20	105	105		–	**75**	**250**	B
20	85	90	85	–	**75**	**300**	B
20	120	120	120	–	**75**	**400**	B
20	115	115	115	115	**75**	**500**	B

FLAT GUIDE BAR VDI 3357, BRONZE WITH SOLID LUBRICANT, TYPE 71

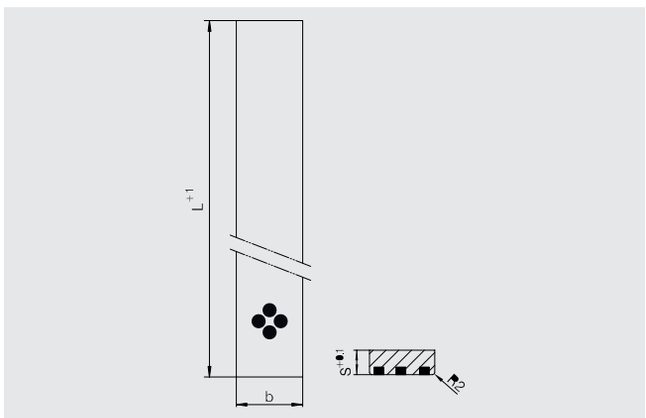
Order-No.: 882.71.b.s.L



Material:
Bronze with solid lubricant, low maintenance.

Execution:
Sliding faces ground.

Ordering example: b = 80, s = 12, L = 500
882.71.080.012.0500



b	s	L
20	4	305
20	10	605
20	10	1005
20	12	1005
25	5	305
25	5	500
25	5	605
25	5	1005
30	6	500
30	6	605
30	6	1005
30	8	500
30	8	605
30	8	1005
30	10	1005
30	12	605
35	10	500
35	10	605
35	10	1005

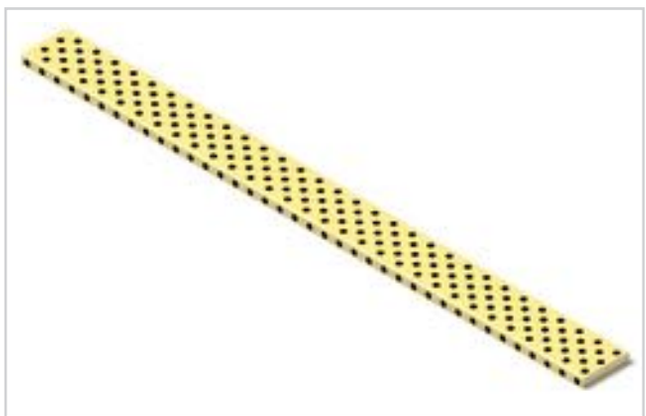
b	s	L
40	8	500
40	8	605
40	8	1005
40	10	500
40	10	605
40	10	1005
40	12	500
40	12	1005
40	16	500
40	16	605
40	16	1005
50	8	1005
50	10	500
50	10	605
50	10	1005
50	12	500
50	12	605
50	12	1005
50	20	605

b	s	L
50	20	1005
60	8	605
60	8	1005
60	10	605
60	10	1005
60	12	605
60	12	1005
60	16	500
60	16	605
60	16	1005
60	20	500
60	20	1005
75	12	605
75	12	1005
80	12	500
80	12	605
80	12	1005
80	16	500
80	16	605

b	s	L
80	16	1005
80	20	500
80	20	605
80	20	1005
100	10	500
100	10	1005
100	12	1005
100	16	605
100	16	500
100	16	1005
125	20	605
125	20	1005
160	20	1005

FLAT GUIDE BAR WITH TWO SLIDING SURFACES, BRONZE WITH SOLID LUBRICANT, TYPE 73

Order-No.: 882.73.b.s.L

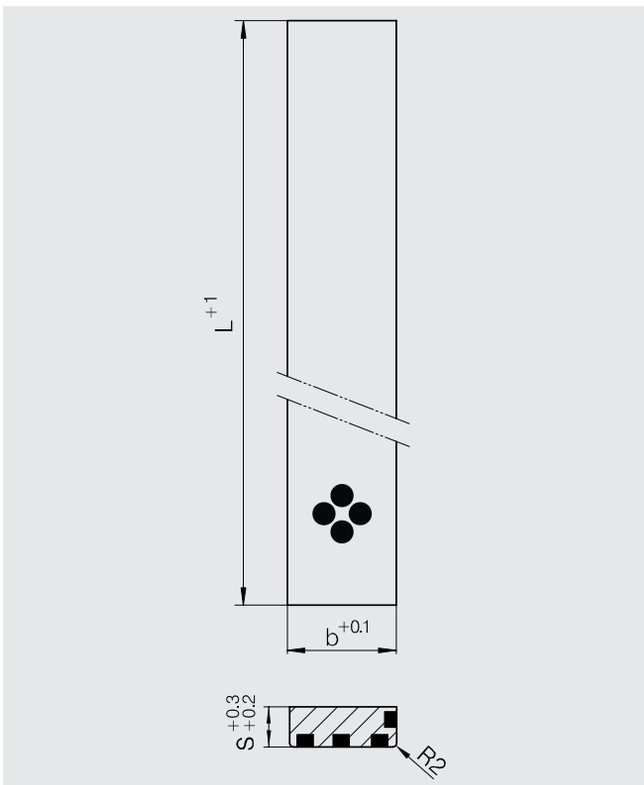


Material:
Bronze with solid lubricant, low maintenance.

Execution:
Sliding faces ground.

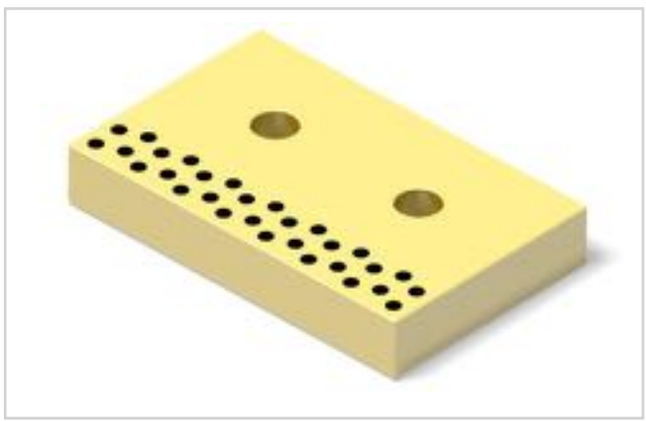
Ordering example b = 25, s = 15, L = 305
882.73.025.015.0305

b	s	L
25	5	305
30	6	305
35	10	605
35	10	1005
40	8	605
40	12	605
40	8	1005
40	12	1005
50	10	605
50	10	1005
50	20	1005
60	16	605
60	16	1005
60	20	1005
80	12	605
80	20	605
80	12	1005
80	20	1005
100	20	605
100	20	1005



RETAINING PLATE VDI 3357, BRONZE WITH SOLID LUBRICANT, TYPE 74

Order-No.: 882.74.b.s.a

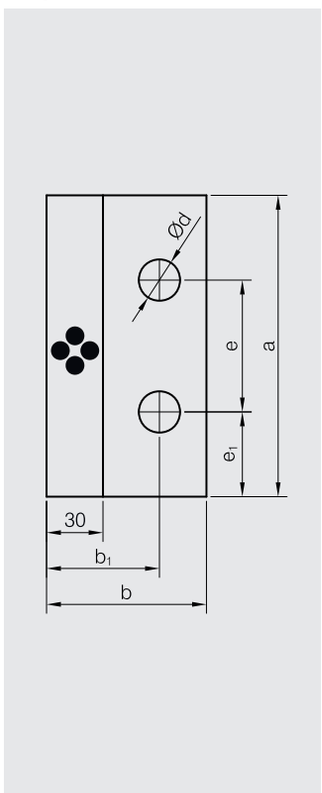


Material:
Bronze with solid lubricant, low maintenance.

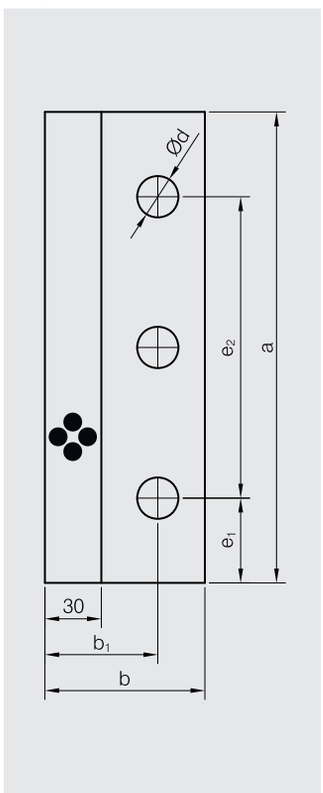
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762.
M10 x 30
M12 x 40
M16 x 50
M20 x 70
M24 x 70

Ordering example b = 35, s = 10, a = 100
882.74.035.25.100

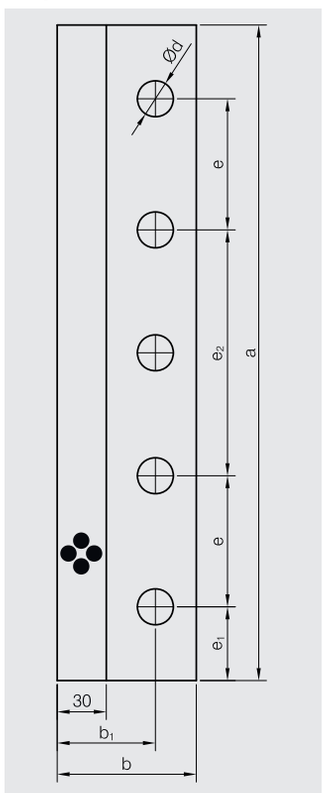
Shape A

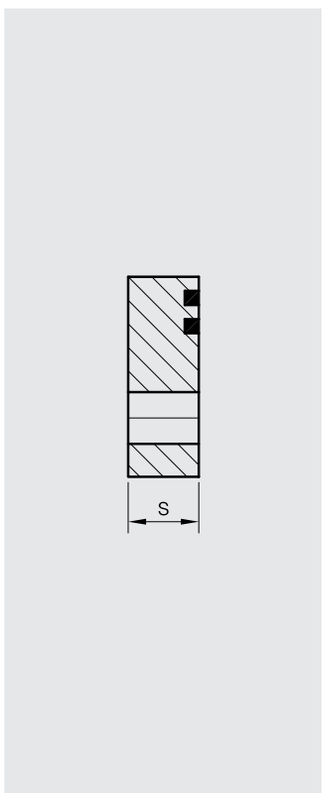


Shape B



Shape C

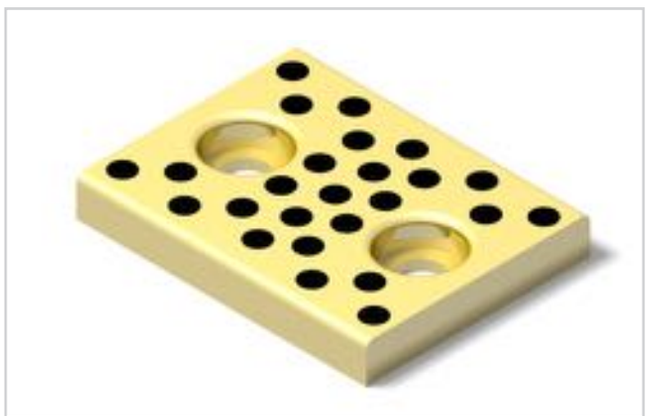




e	70	110	–	–	–	80	70	110	–	80	70	110	–	–	–	80	80	
e_1	–	–	45	45	45	45	–	–	45	45	45	45	45	45	45	45	45	45
e_2	45	45	160	210	260	150	45	45	160	150	–	–	160	210	260	150	190	240
b	**85**	**85**	**85**	**85**	**85**	**85**	**125**	**125**	**125**	**125**	**125**	**125**	**125**	**125**	**125**	**125**	**125**	**125**
b_1	60	60	60	60	60	60	75	75	75	75	75	75	75	75	75	75	75	75
d	22	22	22	22	22	22	18	18	18	18	22	22	22	22	22	22	22	22
a	**160**	**200**	**250**	**300**	**350**	**400**	**160**	**200**	**250**	**400**	**160**	**200**	**250**	**300**	**350**	**400**	**450**	**500**
s	**30**	**30**	**30**	**30**	**30**	**30**	**25**	**25**	**25**	**25**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**
Form	A	B	B	B	B	C	A	A	B	C	A	A	B	B	B	C	C	C

FLAT GUIDE BAR, BRONZE WITH SOLID LUBRICANT, TYPE 75

Order-No.: 882.75.b.L

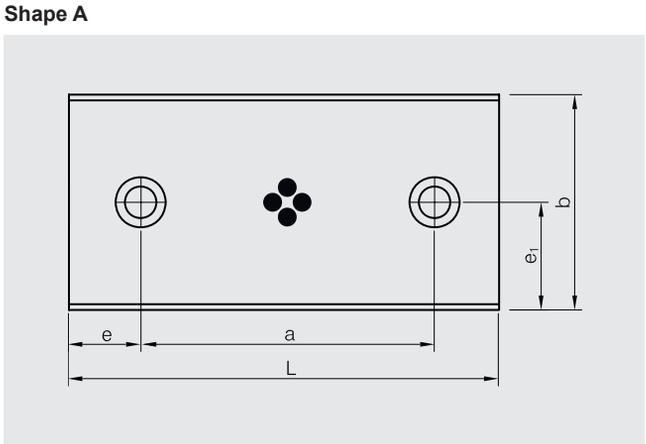


Material:
Bronze with solid lubricant, low maintenance.

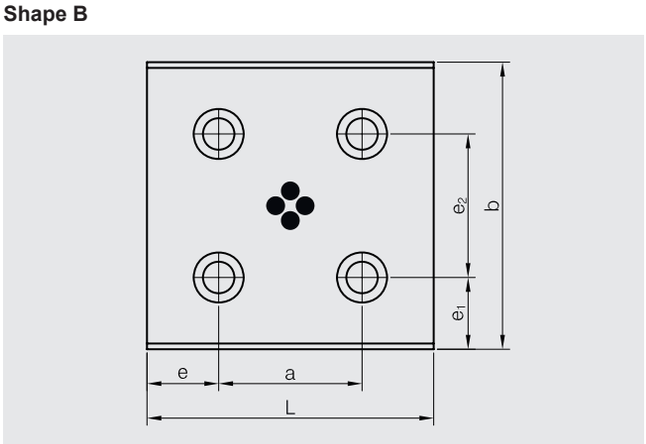
Note:
Screws are not included.
Fixing: Use Socket cap screws DIN EN ISO 4762 M10 x 25.

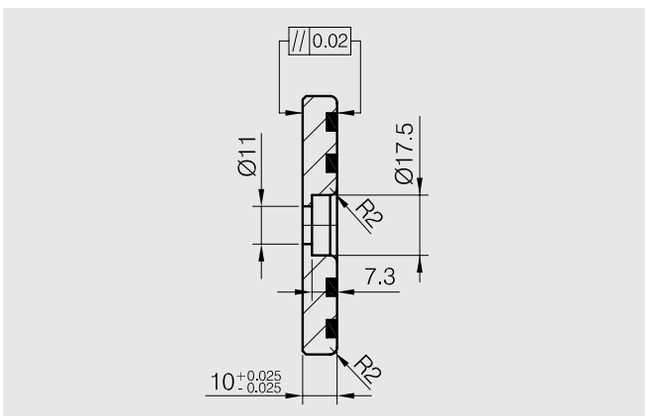
Ordering example: b = 32, L = 100
882.75.032.100

Shape A



Shape B

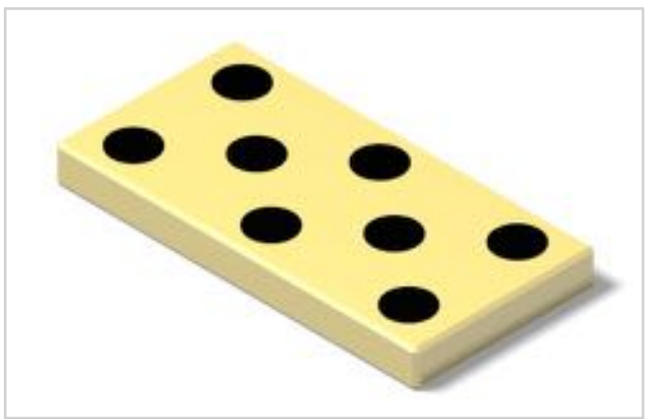




e_1	e_2	a	e	b	L	Shape
14		45	15	**28**	**75**	A
14		50	25	**28**	**100**	A
14		75	25	**28**	**125**	A
14		100	25	**28**	**150**	A
19		45	15	**38**	**75**	A
19		50	25	**38**	**100**	A
19		75	25	**38**	**125**	A
19		100	25	**38**	**150**	A
24		45	15	**48**	**75**	A
24		50	25	**48**	**100**	A
24		75	25	**48**	**125**	A
24		100	25	**48**	**150**	A
24		150	25	**48**	**200**	A
37,5		45	15	**75**	**75**	A
37,5		50	25	**75**	**100**	A
37,5		75	25	**75**	**125**	A
37,5		100	25	**75**	**150**	A
37,5		150	25	**75**	**200**	A
25	50	50	25	**100**	**100**	B
25	50	75	25	**100**	**125**	B
25	50	100	25	**100**	**150**	B
25	50	150	25	**100**	**200**	B
25	50	200	25	**100**	**250**	B
37,5	50	100	25	**125**	**150**	B
37,5	50	150	25	**125**	**200**	B
37,5	50	200	25	**125**	**250**	B
25	100	100	25	**150**	**150**	B
25	100	150	25	**150**	**200**	B
25	100	200	25	**150**	**250**	B

FLAT GUIDE BAR, BRONZE WITH SOLID LUBRICANT, TYPE 76

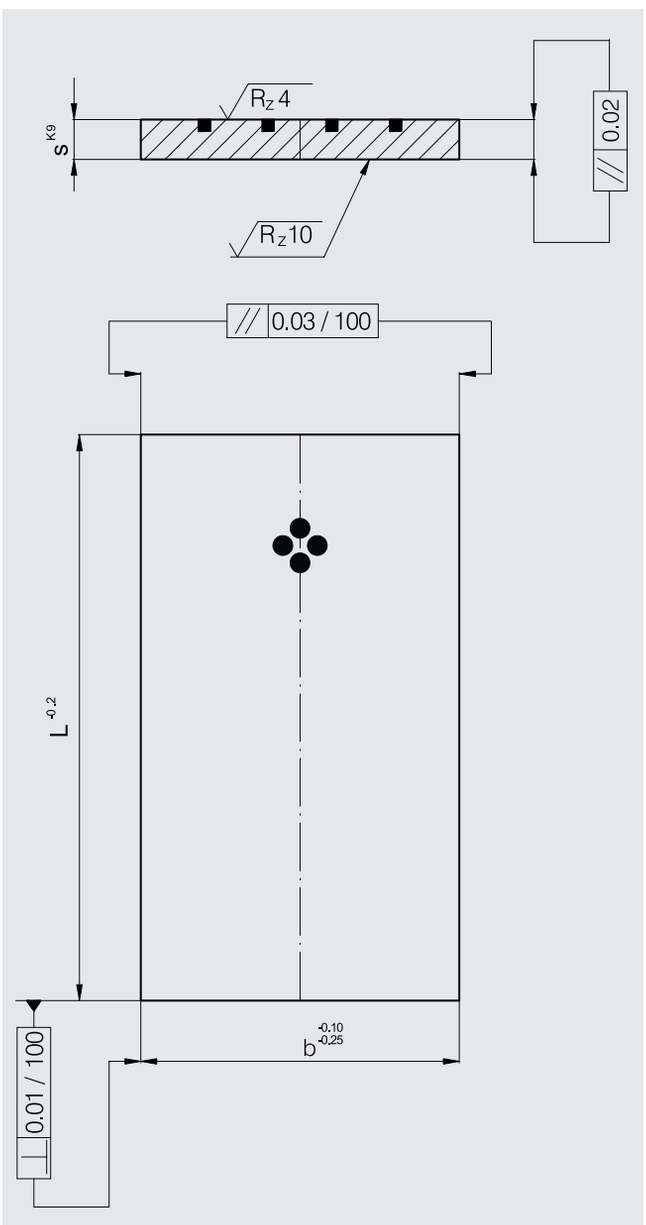
Order-No.: 882.76.b.s.L



Material:
Bronze with solid lubricant, low maintenance.

Execution:
Sliding faces ground.

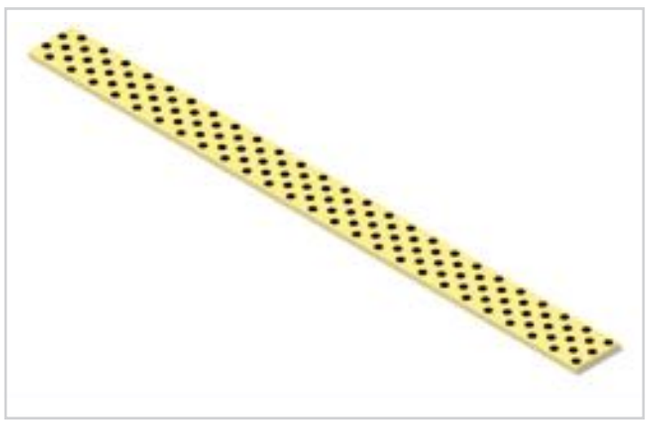
Ordering example: b = 25, s = 5, L = 50
882.76.025.005.050



b	s	L
25	5	50
25	5	71
25	5	90
40	5	50
40	5	71
40	5	90
40	6	80
40	6	100
40	6	125
40	6	160
40	6	200
63	6	80
63	6	100
63	6	125
63	6	160

FLAT GUIDE BAR, BRONZE WITH SOLID LUBRICANT, TYPE 77

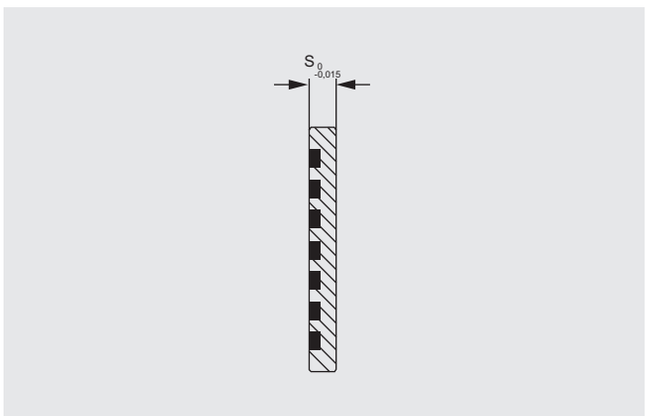
Order-No.: 882.77.b.s.L

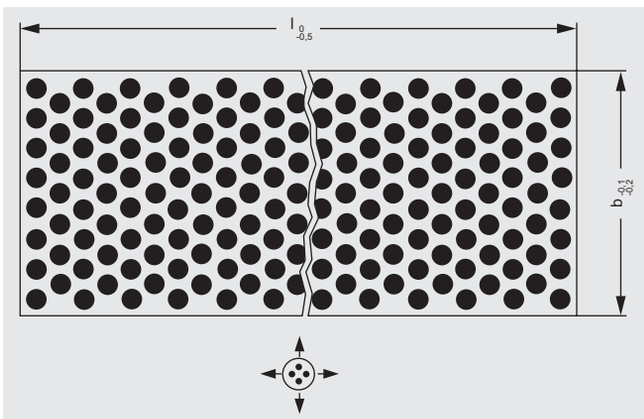


Material:
Bronze with solid lubricant, low maintenance.

Execution:
Sliding faces ground.

Ordering example: b = 25, s = 6, L = 500
882.77.025.006.500

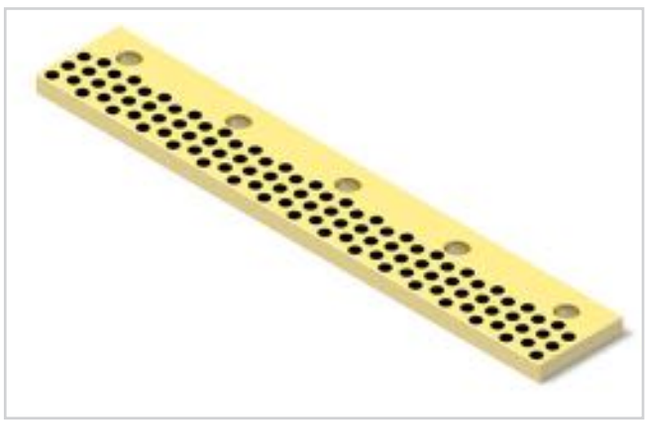




Order-No.:	b	s	L
882.77.025.006.500	25	6	500
882.77.040.006.500	40	6	500
882.77.063.008.500	63	8	500
882.77.080.010.500	80	10	500

RETAINING PLATE, BRONZE WITH SOLID LUBRICANT, TYPE 78

Order-No.: 882.78.b.L

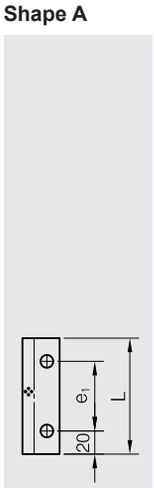


Material:
Bronze with solid lubricant, low maintenance.

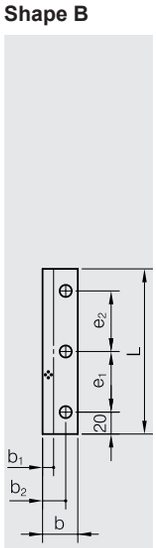
Execution:
Sliding faces ground.

Ordering example: b = 32, L= 160
882.78.032.0160

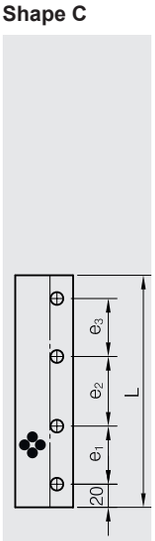
Shape A



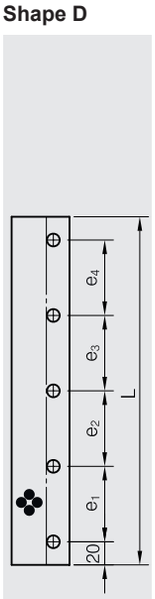
Shape B



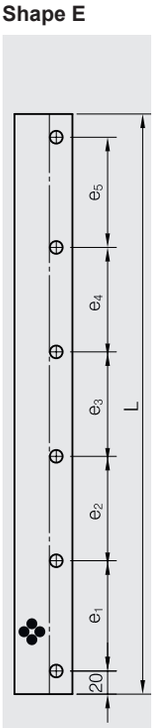
Shape C



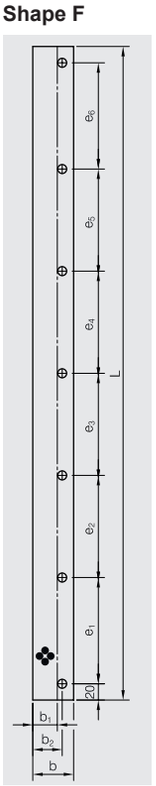
Shape D



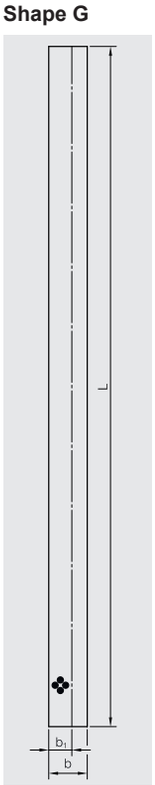
Shape E

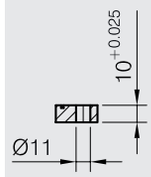


Shape F



Shape G





e_1	60	55	60	55	70	65	80	90	95	115	130		
e_2		55	60	50	70	65	75	90	90	110	125		
e_3				55	70	65	75	90	90	110	125		
e_4						65	80	90	90	110	125		
e_5									95	115	125		
e_6											130		
b_1	10	10	10	30	30	30	30	30	30	30	30	30	30
b_2	21	21	21	36	36	36	36	36	36	36	36	36	36
Shape	A	B	B	C	C	D	D	D	E	E	F	G	G
b	**32**	**32**	**32**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**
L	**100**	**150**	**160**	**200**	**250**	**300**	**350**	**400**	**500**	**600**	**800**	**605**	**1005**

RETAINING PLATE, VDI 3357, STEEL

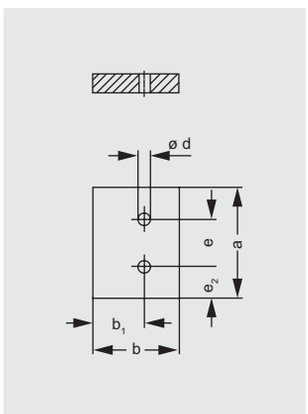
Order-No.: 882.79.b.s.a

Material:
Steel, surface hardened.

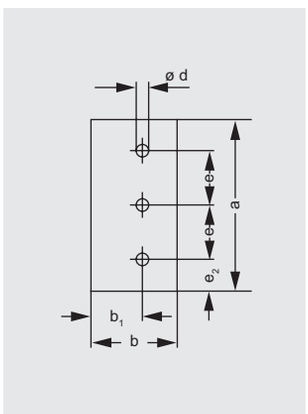
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762.

Ordering example: b = 35, s = 10, a = 160
882.79.035.10.160

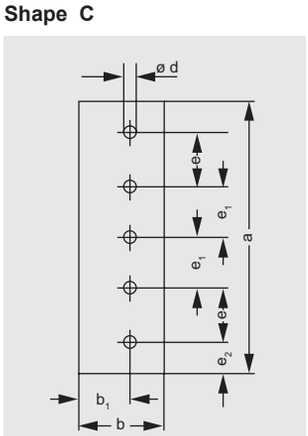
Shape A



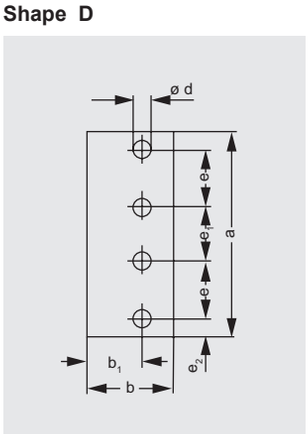
Shape B



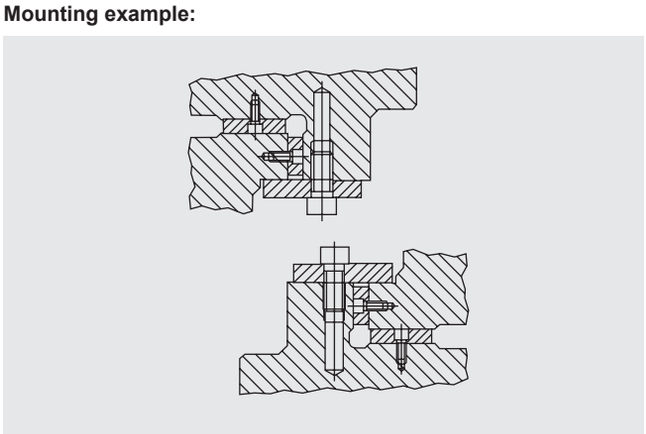
Shape C



Shape D



Mounting example:



Order-No.:	Shape	b	s	a	b_1	d	e	e_1	e_2	Number of screw holes
882.79.035.10.160	A	**35**	**10**	**160**	20	11	70	–	45	2
882.79.035.10.200	A	**35**	**10**	**200**	20	11	110	–	45	2
882.79.035.10.250	B	**35**	**10**	**250**	20	11	80	–	45	3
882.79.045.15.160	A	**45**	**15**	**160**	30	13,5	70	–	45	2
882.79.045.15.200	A	**45**	**15**	**200**	30	13,5	110	–	45	2
882.79.045.15.250	B	**45**	**15**	**250**	30	13,5	80	–	45	3
882.79.055.15.160	A	**55**	**15**	**160**	35	17,5	70	–	45	2
882.79.055.15.200	A	**55**	**15**	**200**	35	17,5	110	–	45	2
882.79.055.15.250	B	**55**	**15**	**250**	35	17,5	80	–	45	3
882.79.075.25.160	A	**75**	**25**	**160**	40	17,5	70	–	45	2
882.79.075.25.200	A	**75**	**25**	**200**	40	17,5	110	–	45	2
882.79.075.25.250	B	**75**	**25**	**250**	40	17,5	80	–	45	3
882.79.085.28.240	B	**85**	**28**	**240**	60	22	95	–	25	3
882.79.085.28.300	D	**85**	**28**	**300**	60	22	85	80	25	4
882.79.085.28.350	D	**85**	**28**	**350**	60	22	100	100	25	4
882.79.085.28.400	D	**85**	**28**	**400**	60	22	115	120	25	4
882.79.085.28.450	C	**85**	**28**	**450**	60	22	100	100	25	5
882.79.085.30.160	A	**85**	**30**	**160**	60	22	70	–	45	2
882.79.085.30.200	A	**85**	**30**	**200**	60	22	110	–	45	2
882.79.085.30.250	B	**85**	**30**	**250**	60	22	80	–	45	3
882.79.085.30.300	B	**85**	**30**	**300**	60	22	105	–	45	3
882.79.085.30.350	B	**85**	**30**	**350**	60	22	130	–	45	3
882.79.085.30.400	C	**85**	**30**	**400**	60	22	80	75	45	5
882.79.100.25.160	A	**100**	**25**	**160**	60	17,5	70	–	45	2
882.79.100.25.200	A	**100**	**25**	**200**	60	17,5	110	–	45	2
882.79.100.25.250	B	**100**	**25**	**250**	60	17,5	80	–	45	3
882.79.100.25.400	C	**100**	**25**	**400**	60	17,5	80	75	45	5
882.79.100.30.160	A	**100**	**30**	**160**	60	22	70	–	45	2
882.79.100.30.200	A	**100**	**30**	**200**	60	22	110	–	45	2
882.79.100.30.250	B	**100**	**30**	**250**	60	22	80	–	45	3
882.79.100.30.400	C	**100**	**30**	**400**	60	22	80	75	45	5
882.79.125.25.160	A	**125**	**25**	**160**	75	17,5	70	–	45	2
882.79.125.25.200	A	**125**	**25**	**200**	75	17,5	110	–	45	2
882.79.125.25.250	B	**125**	**25**	**250**	75	17,5	80	–	45	3
882.79.125.25.400	C	**125**	**25**	**400**	75	17,5	80	75	45	5
882.79.125.25.300	D	**125**	**25**	**300**	80	26	85	80	25	4
882.79.125.25.350	D	**125**	**25**	**350**	80	26	100	100	25	4
882.79.125.25.400	D	**125**	**25**	**400**	80	26	115	120	25	4
882.79.125.25.450	C	**125**	**25**	**450**	80	26	100	100	25	5
882.79.125.25.500	C	**125**	**25**	**500**	80	26	110	115	25	5
882.79.125.30.160	A	**125**	**30**	**160**	75	22	70	–	45	2
882.79.125.30.200	A	**125**	**30**	**200**	75	22	110	–	45	2
882.79.125.30.250	B	**125**	**30**	**250**	75	22	80	–	45	3
882.79.125.30.300	B	**125**	**30**	**300**	75	22	105	–	45	3
882.79.125.30.350	B	**125**	**30**	**350**	75	22	130	–	45	3
882.79.125.30.400	C	**125**	**30**	**400**	75	22	80	75	45	5
882.79.125.30.450	C	**125**	**30**	**450**	75	22	80	95	50	5
882.79.125.30.500	C	**125**	**30**	**500**	75	22	80	120	50	5

RETAINING PLATE, STEEL WITH SOLID LUBRICANT, VDI 3357

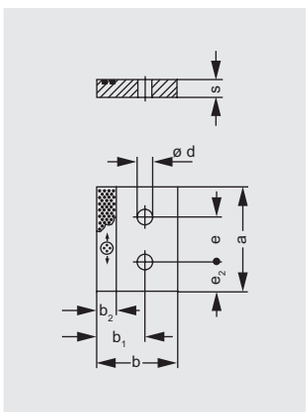
Order-No.: 882.81.b.s.a

Material:
Steel, surface hardened.

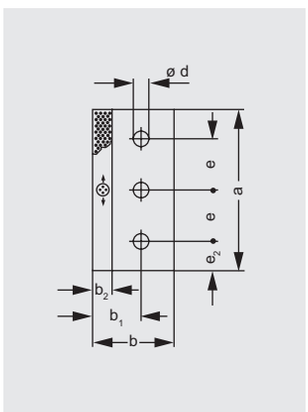
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762.

Ordering example: b = 35, s = 10, a = 160
882.81.035.10.160

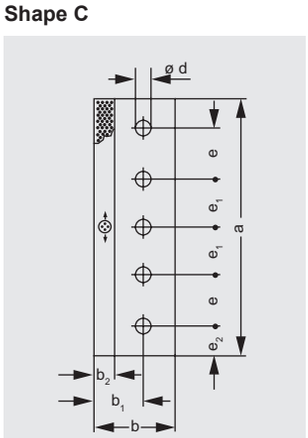
Shape A



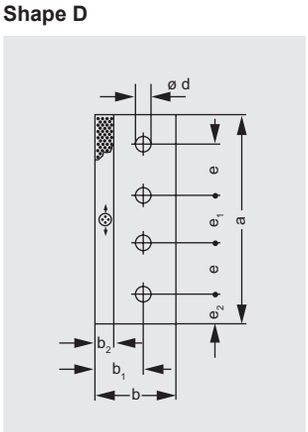
Shape B



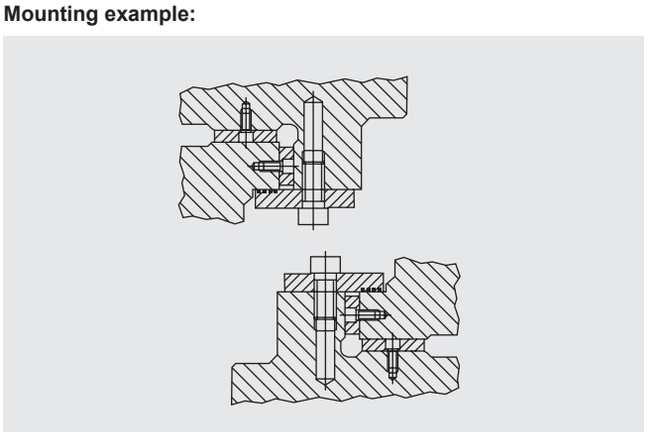
Shape C



Shape D



Mounting example:



Order-No.:	Shape	b	s	a	b_2	b_1	d	e	e_1	e_2	Number of screw holes
882.81.035.10.160	A	**35**	**10**	**160**	10	20	11	70	–	45	2
882.81.035.10.200	A	**35**	**10**	**200**	10	20	11	110	–	45	2
882.81.035.10.250	B	**35**	**10**	**250**	10	20	11	80	–	45	3
882.81.045.15.160	A	**45**	**15**	**160**	15	30	13,5	70	–	45	2
882.81.045.15.200	A	**45**	**15**	**200**	15	30	13,5	110	–	45	2
882.81.045.15.250	B	**45**	**15**	**250**	15	30	13,5	80	–	45	3
882.81.055.15.160	A	**55**	**15**	**160**	20	35	17,5	70	–	45	2
882.81.055.15.200	A	**55**	**15**	**200**	20	35	17,5	110	–	45	2
882.81.055.15.250	B	**55**	**15**	**250**	20	35	17,5	80	–	45	3
882.81.075.25.160	A	**75**	**25**	**160**	25	40	17,5	70	–	45	2
882.81.075.25.200	A	**75**	**25**	**200**	25	40	17,5	110	–	45	2
882.81.075.25.250	B	**75**	**25**	**250**	25	40	17,5	80	–	45	3
882.81.085.28.240	B	**85**	**28**	**240**	30	60	22	95	–	25	3
882.81.085.28.300	D	**85**	**28**	**300**	30	60	22	85	80	25	4
882.81.085.28.350	D	**85**	**28**	**350**	30	60	22	100	100	25	4
882.81.085.28.400	D	**85**	**28**	**400**	30	60	22	115	120	25	4
882.81.085.28.450	C	**85**	**28**	**450**	30	60	22	100	100	25	5
882.81.085.30.160	A	**85**	**30**	**160**	30	60	22	70	–	45	2
882.81.085.30.200	A	**85**	**30**	**200**	30	60	22	110	–	45	2
882.81.085.30.250	B	**85**	**30**	**250**	30	60	22	80	–	45	3
882.81.085.30.300	B	**85**	**30**	**300**	30	60	22	105	–	45	3
882.81.085.30.350	B	**85**	**30**	**350**	30	60	22	130	–	45	3
882.81.085.30.400	C	**85**	**30**	**400**	30	60	22	80	75	45	5
882.81.100.25.160	A	**100**	**25**	**160**	30	60	17,5	70	–	45	2
882.81.100.25.200	A	**100**	**25**	**200**	30	60	17,5	110	–	45	2
882.81.100.25.250	B	**100**	**25**	**250**	30	60	17,5	80	–	45	3
882.81.100.25.400	C	**100**	**25**	**400**	30	60	17,5	80	75	45	5
882.81.100.30.160	A	**100**	**30**	**160**	30	60	22	70	–	45	2
882.81.100.30.200	A	**100**	**30**	**200**	30	60	22	110	–	45	2
882.81.100.30.250	B	**100**	**30**	**250**	30	60	22	80	–	45	3
882.81.100.30.400	C	**100**	**30**	**400**	30	60	22	80	75	45	5
882.81.125.25.160	A	**125**	**25**	**160**	30	75	17,5	70	–	45	2
882.81.125.25.200	A	**125**	**25**	**200**	30	75	17,5	110	–	45	2
882.81.125.25.250	B	**125**	**25**	**250**	30	75	17,5	80	–	45	3
882.81.125.25.300	D	**125**	**25**	**300**	30	80	26	85	80	25	4
882.81.125.25.350	D	**125**	**25**	**350**	30	80	26	100	100	25	4
882.81.125.25.400	C	**125**	**25**	**400**	30	75	17,5	80	75	45	5
882.81.125.25.400	D	**125**	**25**	**400**	30	80	26	115	120	25	4
882.81.125.25.450	C	**125**	**25**	**450**	30	80	26	100	100	25	5
882.81.125.25.500	C	**125**	**25**	**500**	30	80	26	110	115	25	5
882.81.125.30.160	A	**125**	**30**	**160**	30	75	22	70	–	45	2
882.81.125.30.200	A	**125**	**30**	**200**	30	75	22	110	–	45	2
882.81.125.30.250	B	**125**	**30**	**250**	30	75	22	80	–	45	3
882.81.125.30.300	B	**125**	**30**	**300**	30	75	22	105	–	45	3
882.81.125.30.350	B	**125**	**30**	**350**	30	75	22	130	–	45	3
882.81.125.30.400	C	**125**	**30**	**400**	30	75	22	80	75	45	5
882.81.125.30.450	C	**125**	**30**	**450**	30	75	22	80	95	50	5
882.81.125.30.500	C	**125**	**30**	**500**	30	75	22	80	120	50	5

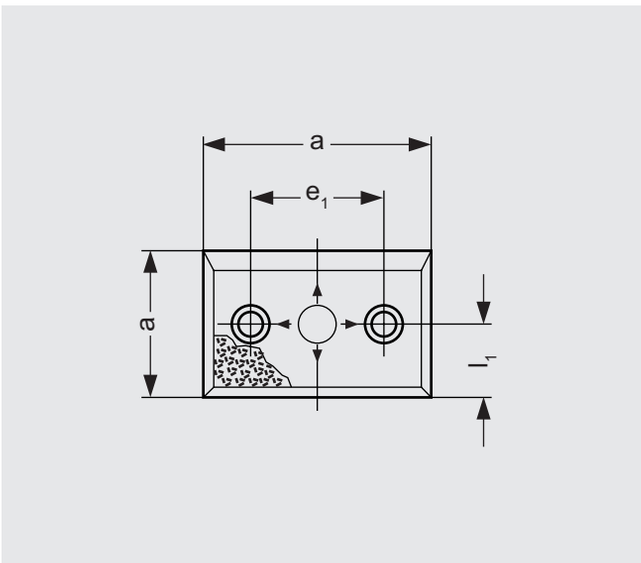
SLIDING PAD, STEEL WITH SINTERLAYER, VDI 3357

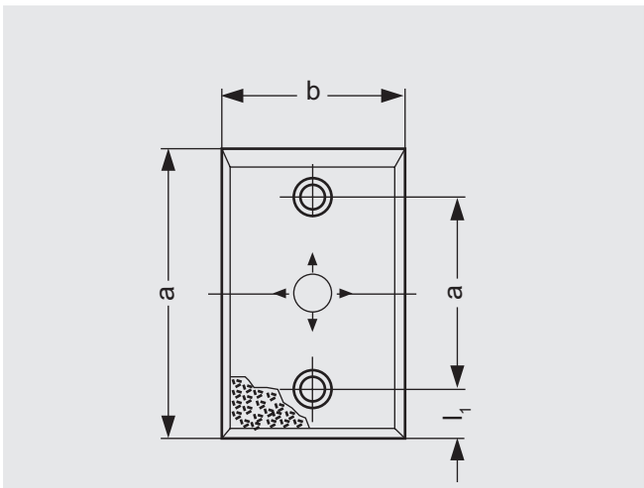
Order-No.: 896.30.b.a

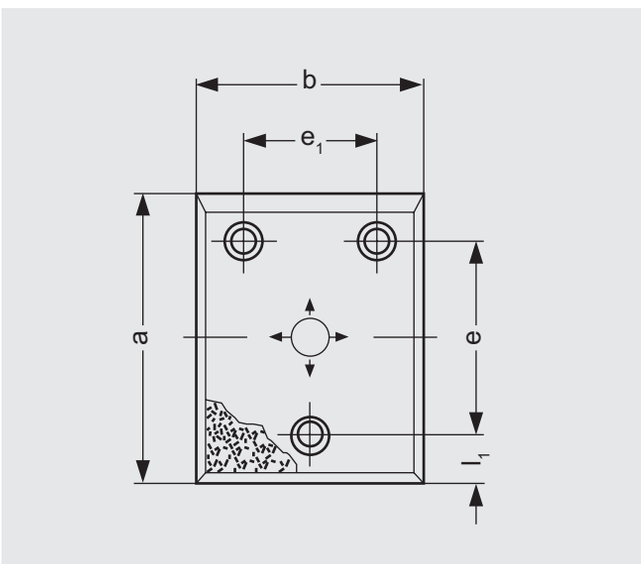
Material:
Steel plate with sinterlayer, part of lubricant 20 – 25 %

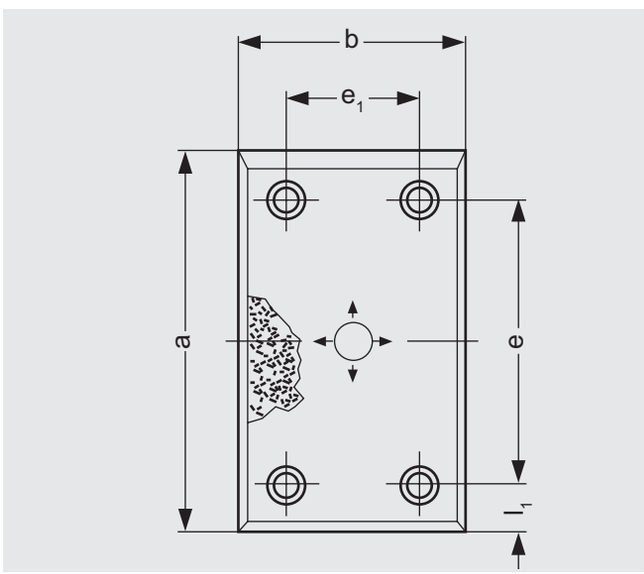
Note:
Steel with sinterlayer is a two-layer material. It ensures low maintenance, selflubricating service even in arduous multishift applications.
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762.

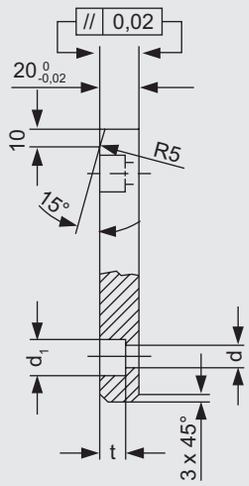
Ordering example: b = 50, a = 80
896.30.050.080







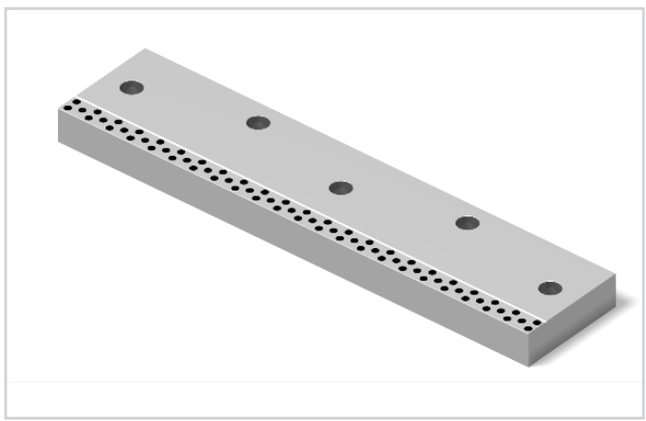




Order-No.:	Shape	b	a	l_1	e	e_1	d	d_1	t	Number of screw holes
896.30.050.080	B	**50**	**80**	**25**	30	–	9	15	9	2
896.30.050.100	B	**50**	**100**	**25**	50	–	13,5	20	13	2
896.30.050.125	B	**50**	**125**	**25**	75	–	13,5	20	13	2
896.30.050.160	B	**50**	**160**	**25**	110	–	13,5	20	13	2
896.30.050.200	B	**50**	**200**	**25**	150	–	13,5	20	13	2
896.30.080.050	D	**80**	**50**	**25**	–	30	9	15	9	2
896.30.080.080	B	**80**	**80**	**25**	30	–	13,5	20	13	2
896.30.080.100	B	**80**	**100**	**25**	50	–	13,5	20	13	2
896.30.080.125	B	**80**	**125**	**25**	75	–	13,5	20	13	2
896.30.080.160	B	**80**	**160**	**25**	110	–	13,5	20	13	2
896.30.080.200	B	**80**	**200**	**25**	150	–	13,5	20	13	2
896.30.080.250	B	**80**	**250**	**40**	170	–	13,5	20	13	2
896.30.080.315	B	**80**	**315**	**40**	235	–	13,5	20	13	2
896.30.100.050	D	**100**	**50**	**25**	–	50	13,5	20	13	2
896.30.100.080	D	**100**	**80**	**40**	–	50	13,5	20	13	2
896.30.100.100	B	**100**	**100**	**25**	50	–	13,5	20	13	2
896.30.100.125	B	**100**	**125**	**25**	75	–	13,5	20	13	2
896.30.100.160	B	**100**	**160**	**25**	110	–	13,5	20	13	2
896.30.100.200	B	**100**	**200**	**25**	150	–	13,5	20	13	2
896.30.100.250	B	**100**	**250**	**40**	170	–	13,5	20	13	2
896.30.100.315	B	**100**	**315**	**40**	235	–	13,5	20	13	2
896.30.125.050	D	**125**	**50**	**25**	–	75	13,5	20	13	2
896.30.125.080	D	**125**	**80**	**40**	–	75	13,5	20	13	2
896.30.125.100	G	**125**	**100**	**25**	50	75	13,5	20	13	3
896.30.125.125	G	**125**	**125**	**25**	75	75	13,5	20	13	3
896.30.125.160	G	**125**	**160**	**25**	110	75	13,5	20	13	3
896.30.125.200	G	**125**	**200**	**25**	150	75	13,5	20	13	3
896.30.125.250	G	**125**	**250**	**40**	170	75	13,5	20	13	3
896.30.125.315	G	**125**	**315**	**40**	235	75	13,5	20	13	3
896.30.160.050	D	**160**	**50**	**25**	–	110	13,5	20	13	2
896.30.160.080	D	**160**	**80**	**40**	–	110	13,5	20	13	2
896.30.160.100	G	**160**	**100**	**25**	50	110	13,5	20	13	3
896.30.160.125	G	**160**	**125**	**25**	75	110	13,5	20	13	3
896.30.160.160	G	**160**	**160**	**25**	110	110	13,5	20	13	3
896.30.160.200	G	**160**	**200**	**25**	150	110	13,5	20	13	3
896.30.160.250	H	**160**	**250**	**40**	170	110	13,5	20	13	4
896.30.160.315	H	**160**	**315**	**40**	235	110	13,5	20	13	4

RETAINING PLATE, STEEL WITH SOLID LUBRICANT, NAAMS, TYPE 82

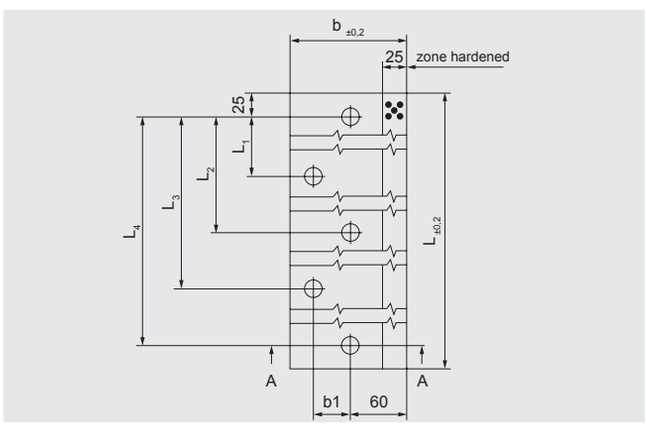
Order-No.: 882.82.b.a

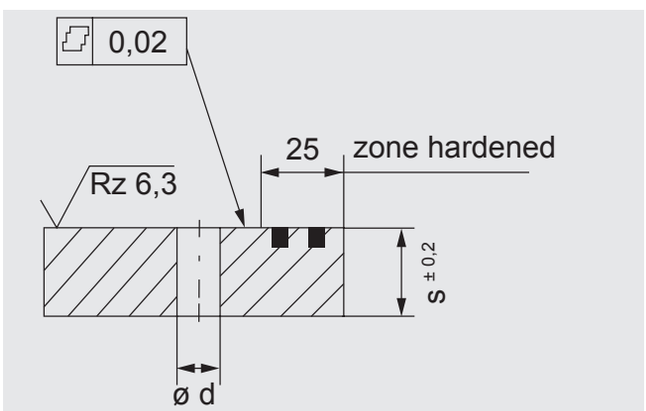


Material:
Steel, surface hardened.

Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 M16 x 50.

Ordering example: b = 75, a = 200
882.82.075.200

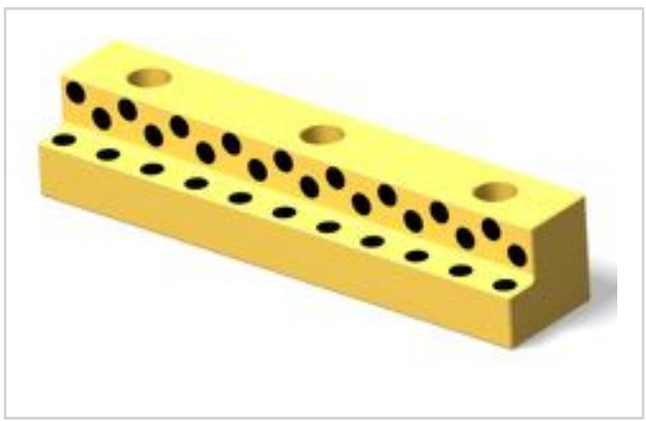




b	a	s	b_1 ±0,1	b_2 ±0,1	L_1 ±0,1	L_2 ±0,1	L_3 ±0,1	L_4 ±0,1
75	**200**	30	55	40	100	–	–	175
75	**250**	30	55	40	90	–	160	225
75	**315**	30	55	40	90	158	225	290
75	**350**	30	55	40	100	175	250	325
75	**400**	30	55	40	115	200	285	375
75	**450**	30	55	40	125	225	325	425
100	**200**	30	80	55	100	–	–	175
100	**250**	30	80	55	90	–	160	225
100	**315**	30	80	55	90	158	225	290
100	**350**	30	80	55	100	175	250	325
100	**400**	30	80	55	125	200	285	375
100	**450**	30	80	55	125	225	325	425
125	**200**	30	105	65	100	–	–	175
125	**250**	30	105	65	90	–	160	225
125	**315**	30	105	65	90	158	225	290
125	**350**	30	105	65	100	175	250	325
125	**400**	30	105	65	115	200	285	375
125	**450**	30	105	65	125	225	325	425
150	**200**	30	130	65	100	–	–	175
150	**250**	30	130	65	90	–	160	225
150	**315**	30	130	65	90	158	225	290
150	**350**	30	130	65	100	175	250	325
150	**400**	30	130	65	115	200	285	375
150	**450**	30	130	65	125	225	325	425

ANGLED GUIDE GIB, BRONZE WITH SOLID LUBRICANT, TYPE 70

Order-No.: 883.70.Form.L_1

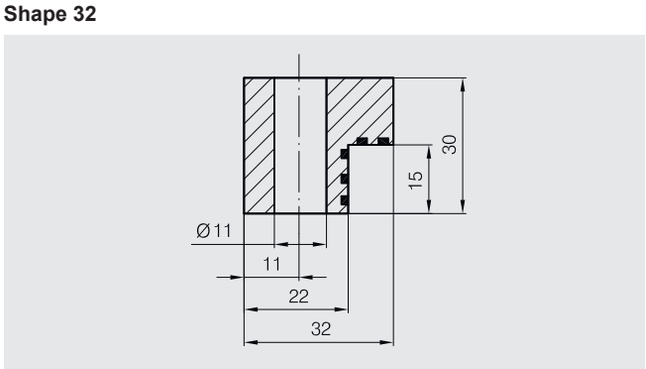


Material:
Bronze with solid lubricant, low maintenance.

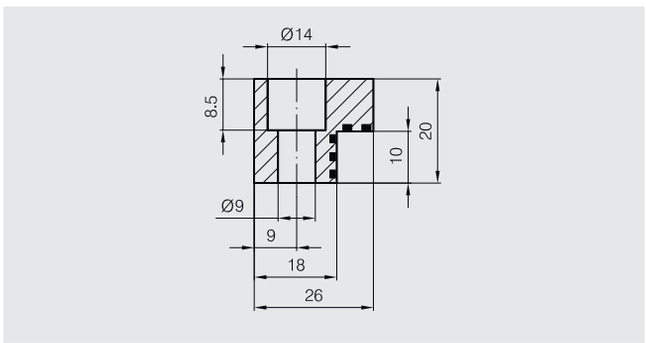
Note:
Screws are not included.

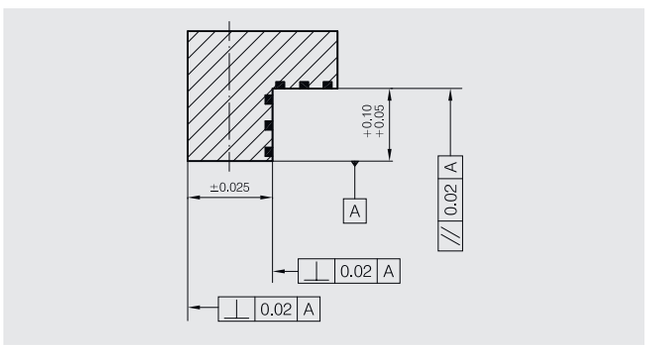
Ordering example: Form = 32, L_1 = 100
883.70.032.100

Shape 32

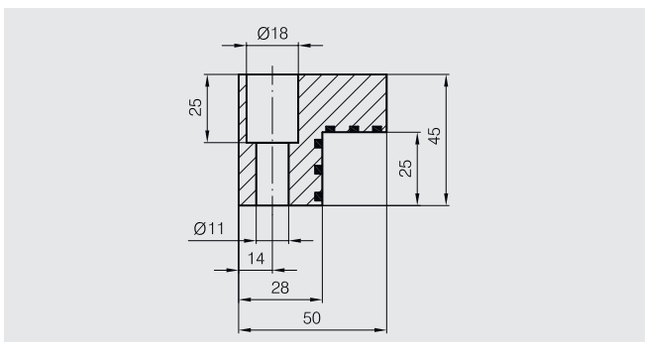


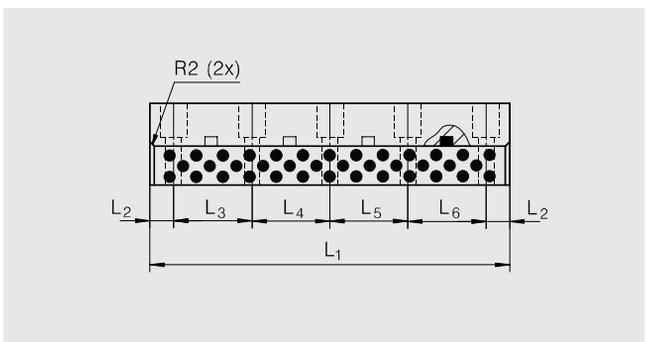
Shape 26





Shape 50

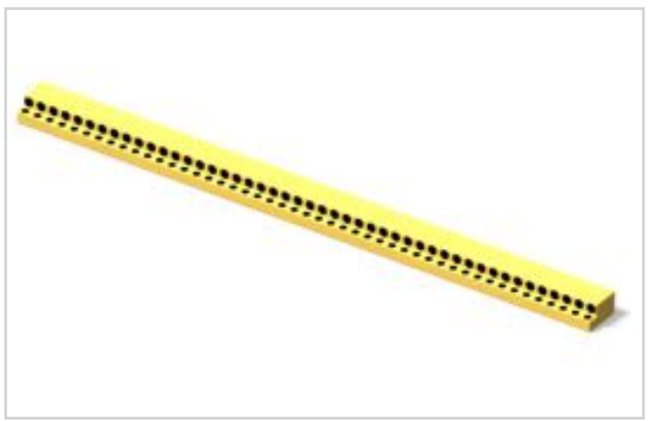




L_1	100	150	200	100	150	200	250	200	250	300	350
L_2	20	20	20	20	20	20	20	20	20	20	20
L_3	60	55	55	60	55	55	70	55	70	65	80
L_4	–	55	50	–	55	50	70	50	70	65	75
L_5	–	–	55	–	–	55	70	55	70	65	75
L_6	–	–	–	–	–	–	–	–	–	65	80
Shape	**26**	**26**	**26**	**32**	**32**	**32**	**32**	**50**	**50**	**50**	**50**
	2 x M8	3 x M8	4 x M8	2 x M10	3 x M10	4 x M10	4 x M10	4 x M10	4 x M10	5 x M10	5 x M10

ANGLED GUIDE GIB, BRONZE WITH SOLID LUBRICANT, TYPE 71

Order-No.: 883.71.Shape.L_1

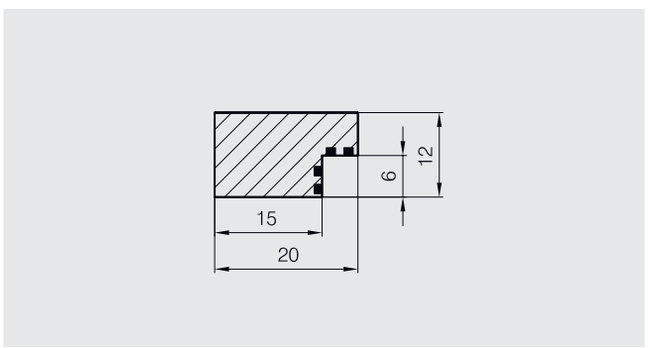


Material:
Bronze with solid lubricant, low maintenance.

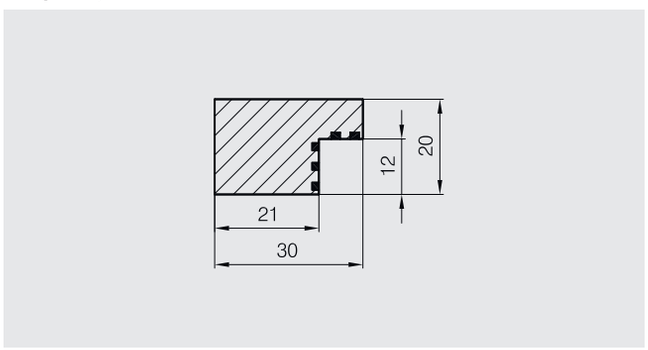
Note:
Screws are not included.

Ordering example: Form = 20.12, L_1 = 605
883.71.020.012.0605

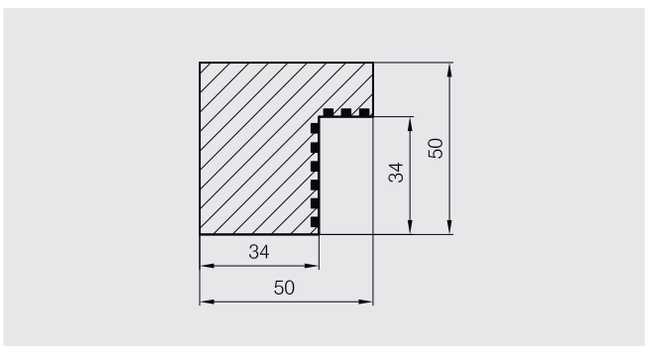
Shape 20,12



Shape 30,20

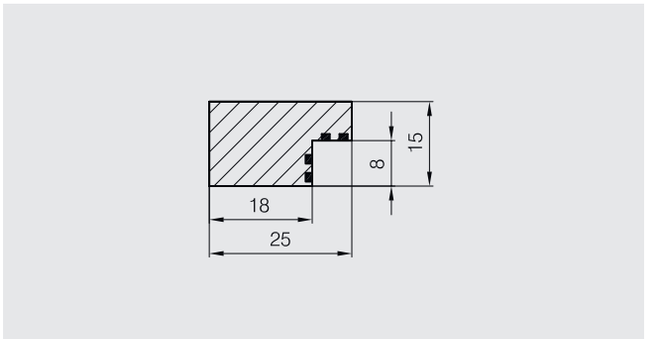


Shape 50,50

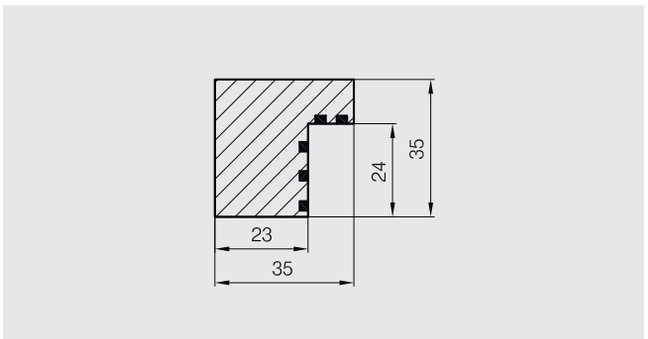


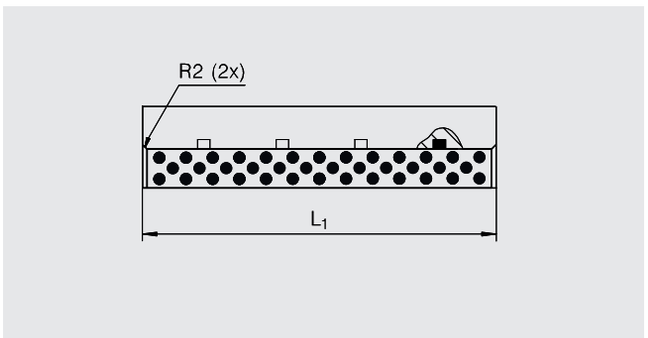
Shape	20,12	25,12	30,20	32,30	35,35	50,50
L_1 = 500	•	•	•		•	•
L_1 = 605	•	•	•	•	•	•
L_1 = 1005	•	•	•	•	•	•

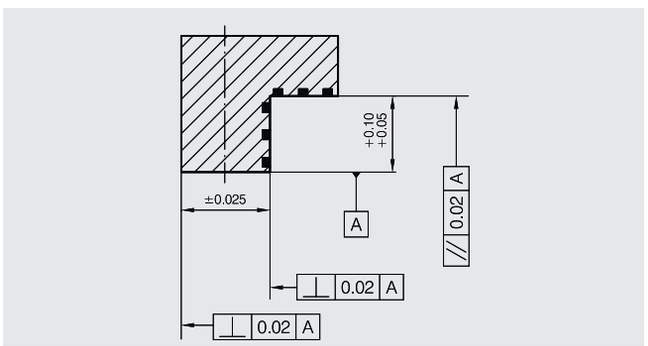
Shape 25,15



Shape 35,35

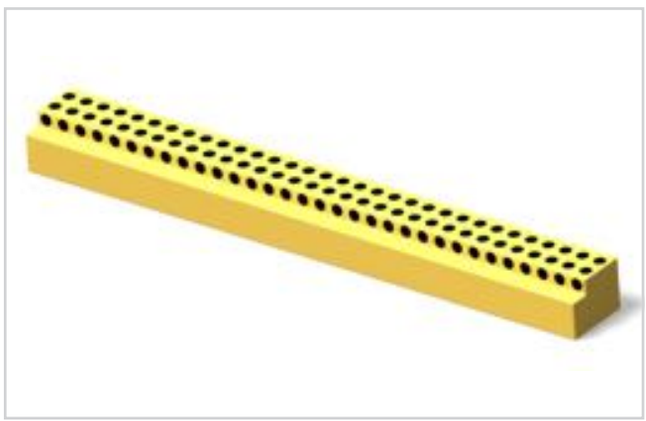


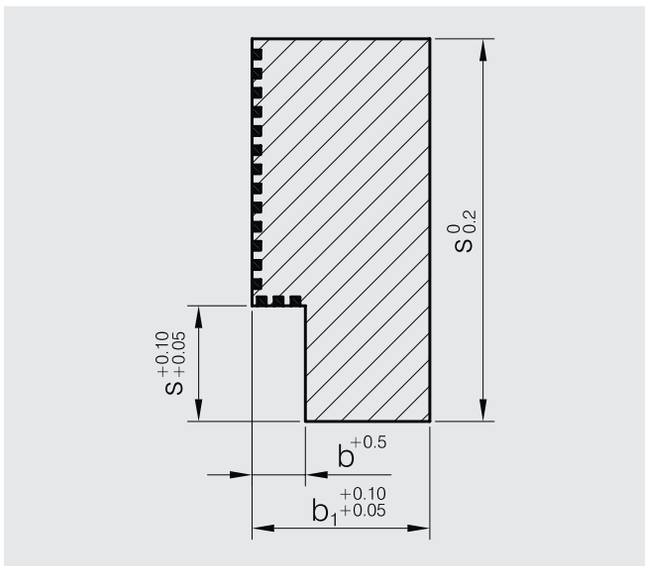




ANGLED GUIDE GIB, BRONZE WITH SOLID LUBRICANT, TYPE 72

Order-No.: 883.72.b.s.L





Material:
Bronze with solid lubricant, low maintenance.

Ordering example: b = 15, s = 12, L = 0205
883.72.015.012.0205

L	205	605	605	605	605	605	605	605
b_1	5	5	5	8	8	8	12	12
s_1	5	7	7	10	10	10	22	26
b	**15**	**20**	**20**	**28**	**28**	**28**	**40**	**40**
s	**12**	**17**	**22**	**27**	**36**	**46**	**66**	**86**

ANGLED GUIDE GIB, BRONZE WITH SOLID LUBRICANT, TYPE 73

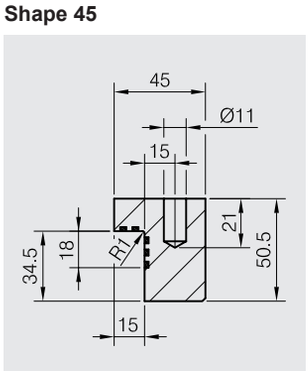
Order-No.: 883.73.Shape.L

Material:
Bronze with solid lubricant, low maintenance.

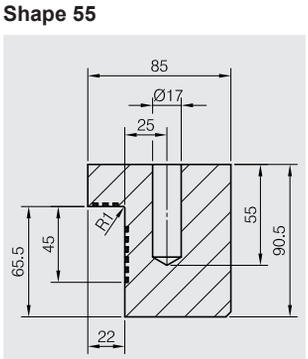
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 and dowel pins DIN 7979.

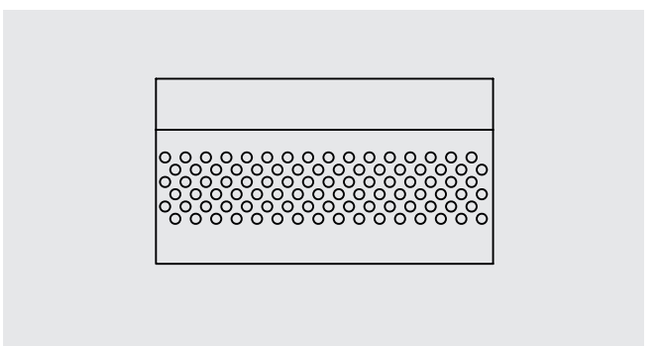
Ordering example: Form = 45, L = 100
883.73.045.0100

Shape 45

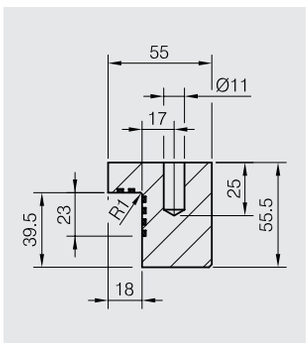


Shape 55

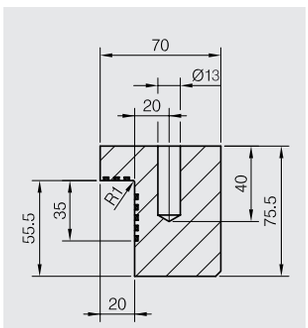


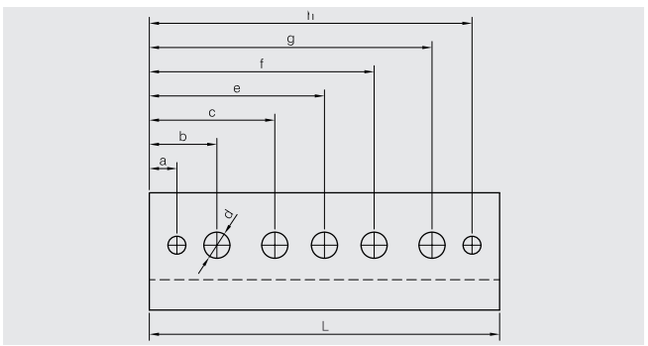


Shape 70



Shape 85





a	10	–	10	10	10	12,5	12,5	12,5	12,5	15	15	15	15
b	27,5	27,5	27,5	27,5	27,5	35	35	35	35	42,5	42,5	42,5	42,5
c	–	–	–	–	–	–	–	–	125	–	–	–	125
e	–	–	–	–	–	–	–	125	200	–	–	–	125
f	–	–	–	–	–	–	–	–	275				275
g	75,5	97,5	132,5	72,5	132,5	125	165	215	365	117,5	157,5	207,5	357,5
h	90	–	150	90	150	147,5	187,5	237,5	387,5	145	485	235	385
d	13	13	13	13	13	17	17	17	17	22	22	22	22
Shape	**45**	**45**	**45**	**55**	**55**	**70**	**70**	**70**	**70**	**85**	**85**	**85**	**85**
L	**100**	**125**	**160**	**100**	**160**	**160**	**200**	**250**	**400**	**160**	**200**	**250**	**400**

GUIDE BAR WITH TWO SLIDING SURFACES VDI 3357, BRONZE WITH SOLID LUBRICANT, TYPE 75

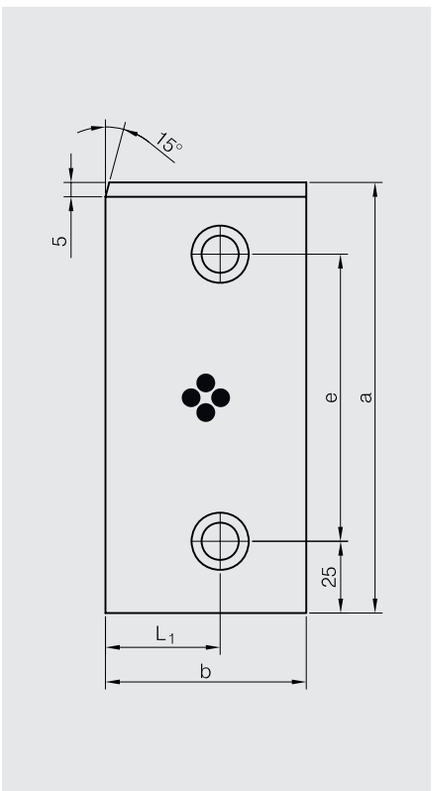
Order-No.: 883.75.b.a.s

Material:
Bronze with solid lubricant, low maintenance.

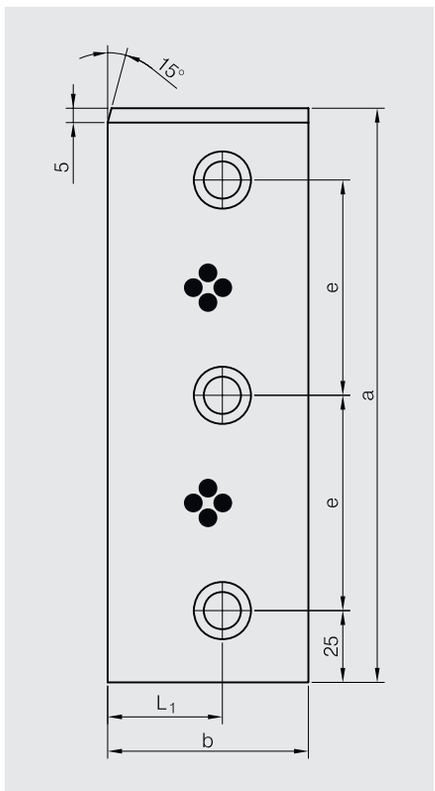
Note:
Fixing: Use socket cap screws DIN EN ISO 4762.
M 8 x 20
M10 x 25
M12 x 35
M12 x 45

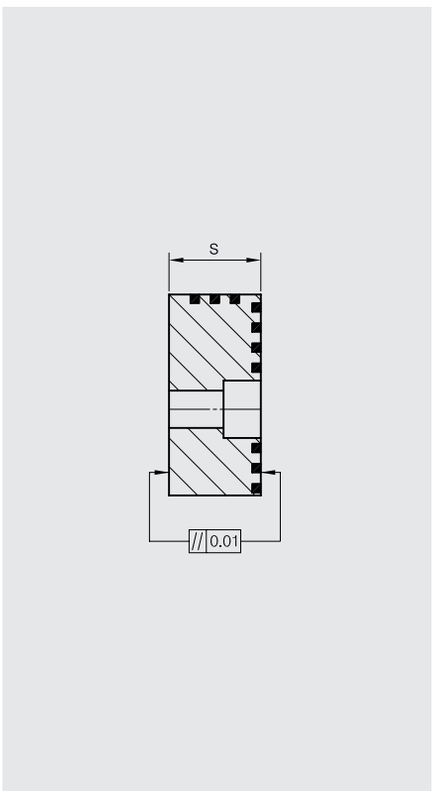
Ordering example: b = 70, a = 125, s = 32
883.75.070.125.032

Shape A



Shape B





L_1	30	30	30	30	30	30	30	30
e	75	100	110	75	75	100	110	75
b	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**
a	**125**	**150**	**160**	**200**	**125**	**150**	**160**	**200**
s	**30**	**30**	**30**	**30**	**40**	**40**	**40**	**40**
Shape	A	A	A	B	A	A	A	B

GUIDE BAR WITH THREE SLIDING SURFACES, BRONZE WITH SOLID LUBRICANT, TYPE 76

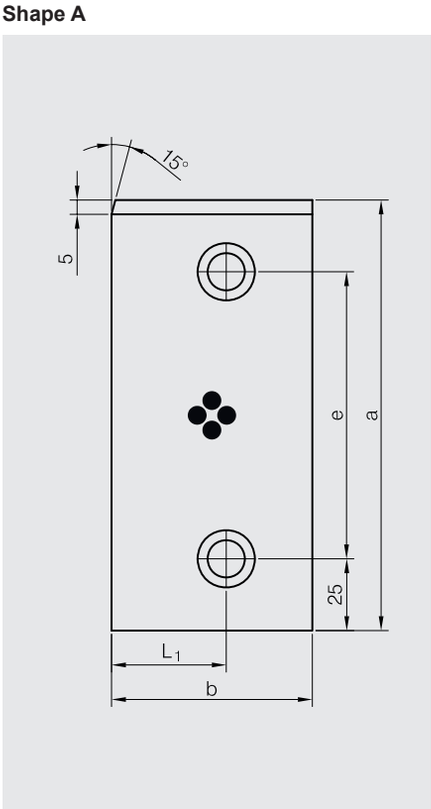
Order-No.: 883.76.b.a.s

Material:
Bronze with solid lubricant, low maintenance.

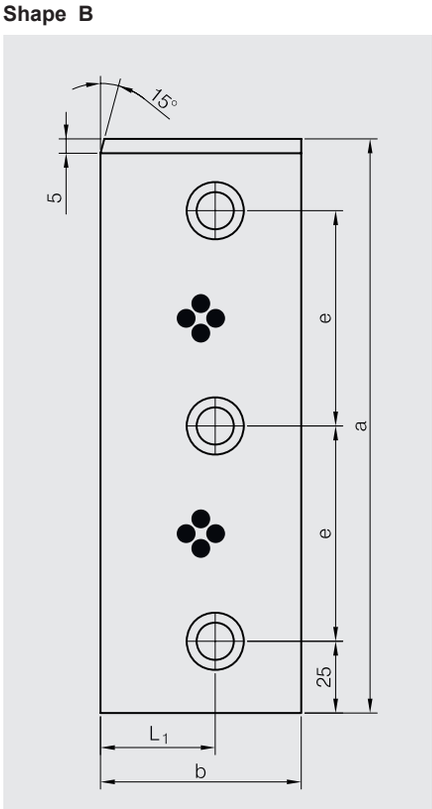
Note:
Fixing: Use socket cap screws DIN EN ISO 4762.
b = 70 M12
b = 90 M16

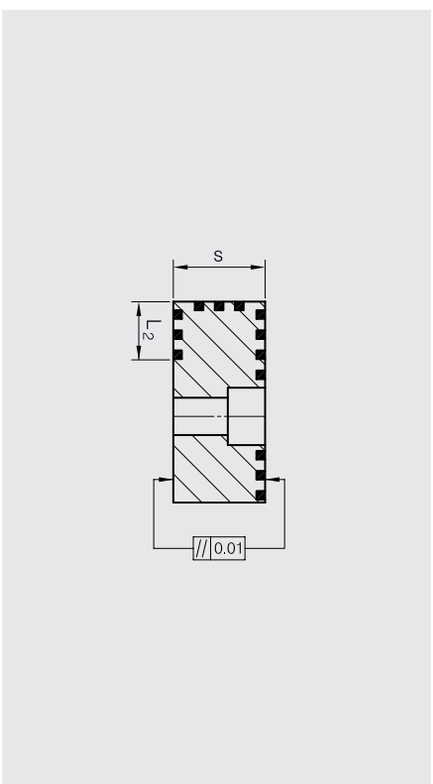
Ordering example: b = 70, a = 125, s = 32
883.76.070.125.032

Shape A



Shape B

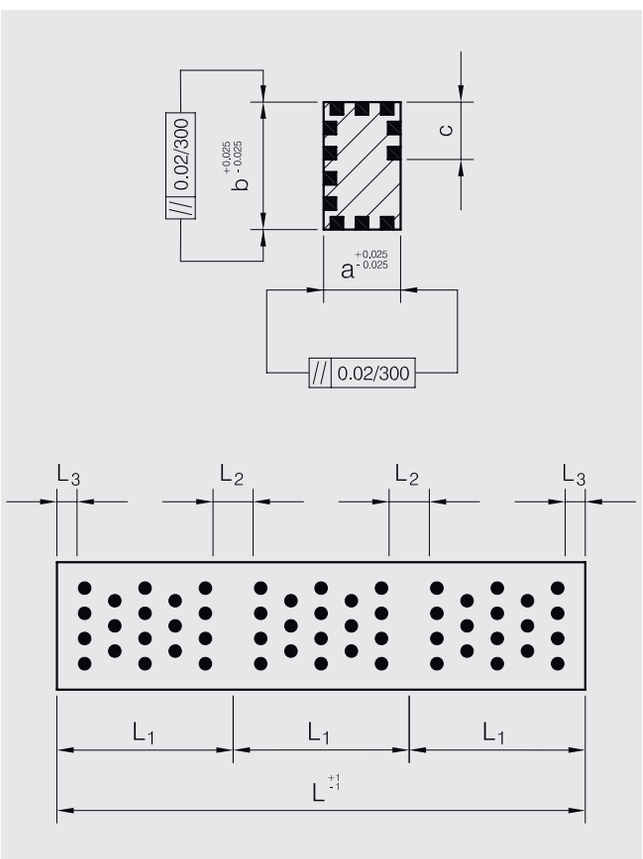




L_1	40	40	40	55	55	55
L_2	25	25	25	30	30	30
e	75	100	75	75	50	75
b	**70**	**70**	**70**	**90**	**90**	**90**
a	**125**	**150**	**200**	**125**	**150**	**200**
s	**32**	**32**	**32**	**45**	**45**	**45**
Shape	A	A	B	A	A	B

GUIDE BAR WITH FOUR SLIDING SURFACES, BRONZE WITH SOLID LUBRICANT, TYPE 74

Order-No.: 883.74.b.a.L



Material:
Bronze with solid lubricant, low maintenance.

Ordering example: b = 15,3, a = 10,3, L = 75
883.74.015.010.075

c	L_1	L_2	b	a	L
6	25	6	**15,3**	**10,3**	**75**
6	25	6	**15,3**	**10,3**	**100**
6	25	6	**15,3**	**10,3**	**125**
6	25	6	**15,3**	**10,3**	**150**
6	25	6	**15,3**	**10,3**	**175**
6	25	6	**15,3**	**10,3**	**200**
6	25	6	**15,3**	**10,3**	**225**
6	25	6	**15,3**	**10,3**	**250**
6	25	6	**15,3**	**10,3**	**275**
6	25	6	**15,3**	**10,3**	**300**
8	35	8	**25,3**	**15,3**	**105**
8	35	8	**25,3**	**15,3**	**140**
8	35	8	**25,3**	**15,3**	**175**
8	35	8	**25,3**	**15,3**	**210**
8	35	8	**25,3**	**15,3**	**245**
8	35	8	**25,3**	**15,3**	**280**
8	35	8	**25,3**	**15,3**	**315**
8	35	8	**25,3**	**15,3**	**350**
8	35	8	**25,3**	**15,3**	**385**
8	35	8	**25,3**	**15,3**	**420**
8	35	8	**25,3**	**15,3**	**455**
8	35	8	**25,3**	**15,3**	**490**
12	45	10	**35,3**	**25,3**	**135**
12	45	10	**35,3**	**25,3**	**180**
12	45	10	**35,3**	**25,3**	**25**
12	45	10	**35,3**	**25,3**	**270**
12	45	10	**35,3**	**25,3**	**315**
12	45	10	**35,3**	**25,3**	**360**
12	45	10	**35,3**	**25,3**	**405**
12	45	10	**35,3**	**25,3**	**450**
12	45	10	**35,3**	**25,3**	**495**
16	55	12	**45,3**	**35,3**	**165**
16	55	12	**45,3**	**35,3**	**220**
16	55	12	**45,3**	**35,3**	**275**
16	55	12	**45,3**	**35,3**	**330**
16	55	12	**45,3**	**35,3**	**385**
16	55	12	**45,3**	**35,3**	**440**
16	55	12	**45,3**	**35,3**	**495**

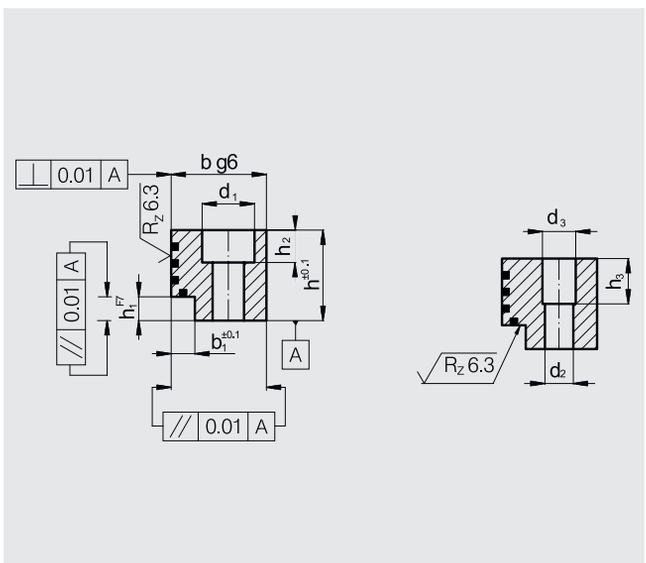
ANGLED GUIDE GIB, BRONZE WITH SOLID LUBRICANT, TYPE 77

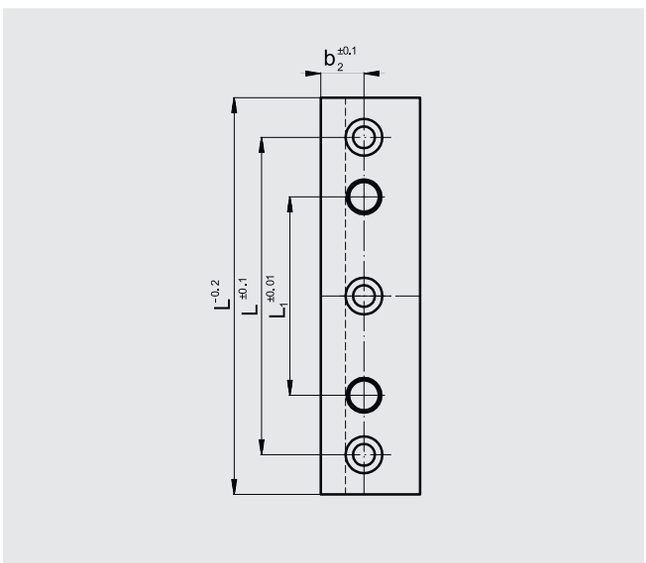
Order-No.: 883.77.b.L

Material:
Bronze with solid lubricant, low maintenance.

Note:
Screws are not included.

Ordering example: b = 16, L = 50
883.77.016.050





b	16	16	16	20	20	20	25	25	25	30	30	30
L	**50**	**71**	**90**	**80**	**100**	**125**	**100**	**125**	**160**	**125**	**160**	**200**
h	11	11	11	19	19	19	31	31	31	49	49	49
b_1	5	5	5	5	5	5	6	6	6	7	7	7
b_2	9,5	9,5	9,5	12	12	12	15,5	15,5	15,5	18	18	18
L_1	34	55	74	64	84	109	80	105	140	95	130	170
L_2	14	35	54	40	60	85	50	75	110	55	90	130
h_1	4,0	4,0	4,0	5,0	5,0	5,0	6,0	6,0	6,0	8,0	8,0	8,0
h_2	5,7	5,7	5,7	6,8	6,8	6,8	9,0	9,0	9,0	11,0	11,0	11,0
h_3	–	–	–	9,5	9,5	9,5	19,0	19,0	19,0	34,0	34,0	34,0
d	5,5	5,5	5,5	6,6	6,6	6,6	9,0	9,0	9,0	11,0	11,0	11,0
d_1	10,0	10,0	10,0	11,0	11,0	11,0	15,0	15,0	15,0	18,0	18,0	18,0
d_2	5,0	5,0	5,0	6,0	6,0	6,0	8,0	8,0	8,0	10,0	10,0	10,0
d_3	–	–	–	7,0	7,0	7,0	9,0	9,0	9,0	12,0	12,0	12,0
	2	2	3	2	2	3	2	2	3	2	2	3

GUIDE BAR WITH ONE SLIDING SURFACE, BRONZE WITH SOLID LUBRICANT, TYPE 79

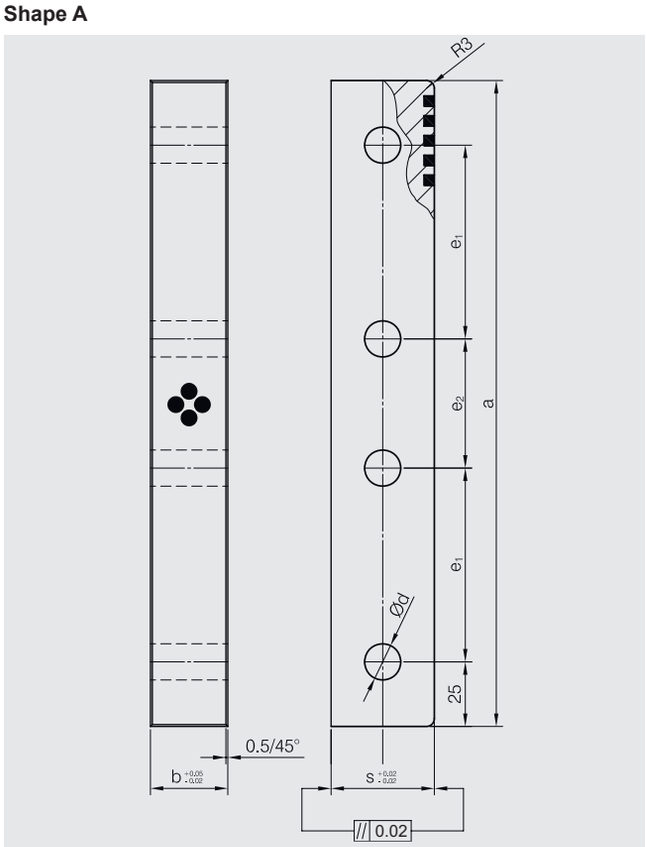
Order-No.: 883.79.b.a

Material:
Bronze with solid lubricant, low maintenance.

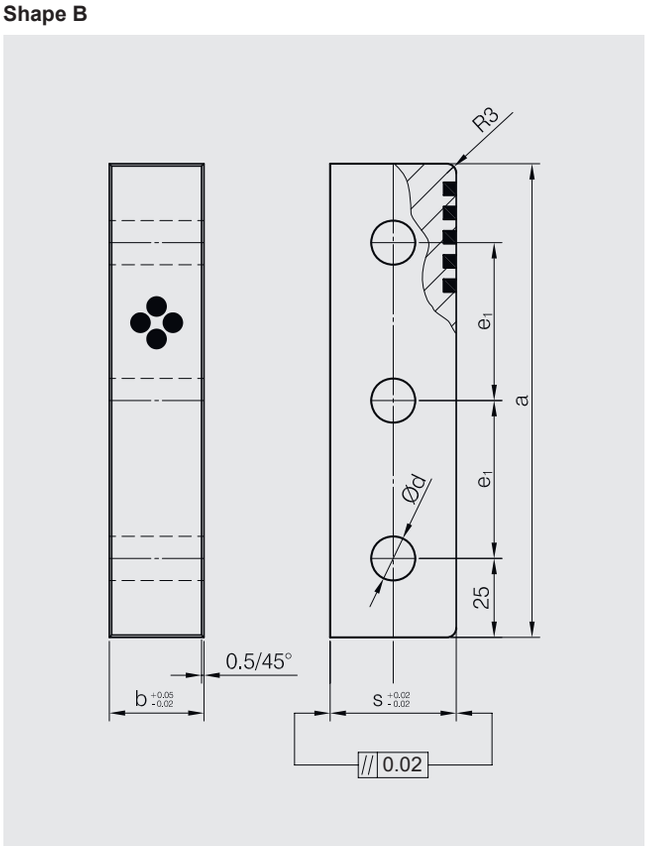
Note:
Sliding pads are preferably used in large tools with large surface pressure.
Bronze with solid lubricant ensures low maintenance service even in arduous multishift.
Screws are not included.

Ordering example: b = 30, a = 150
883.79.030.150

Shape A



Shape B



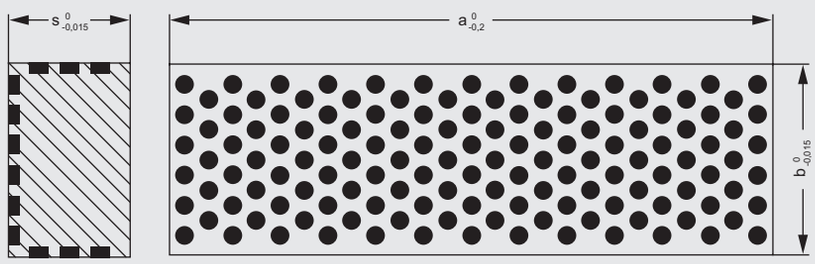
e_1	50	75	75	50	75	75	50	75	75	50	75	75	50	75	75	50	75	75
e_2	–	–	50	–	–	50	–	–	50	–	–	50	–	–	50	–	–	50
d	14	14	14	14	14	14	18	18	18	18	18	18	18	18	18	18	18	18
b	**30**	**30**	**30**	**40**	**40**	**40**	**45**	**45**	**45**	**55**	**55**	**55**	**60**	**60**	**60**	**70**	**70**	**70**
a	**150**	**200**	**250**	**150**	**200**	**250**	**150**	**200**	**250**	**150**	**200**	**250**	**150**	**200**	**250**	**150**	**200**	**250**
s	40	40	40	40	40	40	50	50	50	50	50	50	50	50	50	50	50	50
Shape	A	A	B	A	A	B	A	A	B	A	A	B	A	A	B	A	A	B

GUIDE BAR WITH THREE SLIDING SURFACES, BRONZE WITH SOLID LUBRICANT

Order-No.: 883.80.b.s.a

Material:
Bronze with solid lubricant, low maintenance.

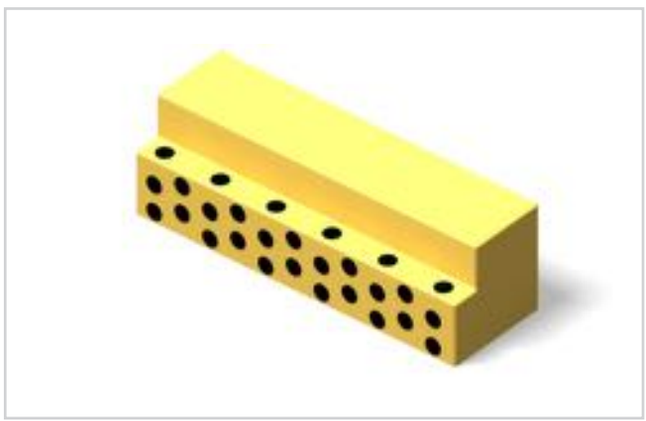
Ordering example: b = 25, s = 16, a = 80
883.80.025.016.080



Order-No.:	b	s	a
883.80.025.016.080	25	16	80
883.80.025.016.100	25	16	100
883.80.025.016.125	25	16	125
883.80.040.025.125	40	25	125
883.80.040.025.160	40	25	160
883.80.040.025.200	40	25	200
883.80.063.040.200	63	40	200
883.80.063.040.250	63	40	250
883.80.063.040.315	63	40	315

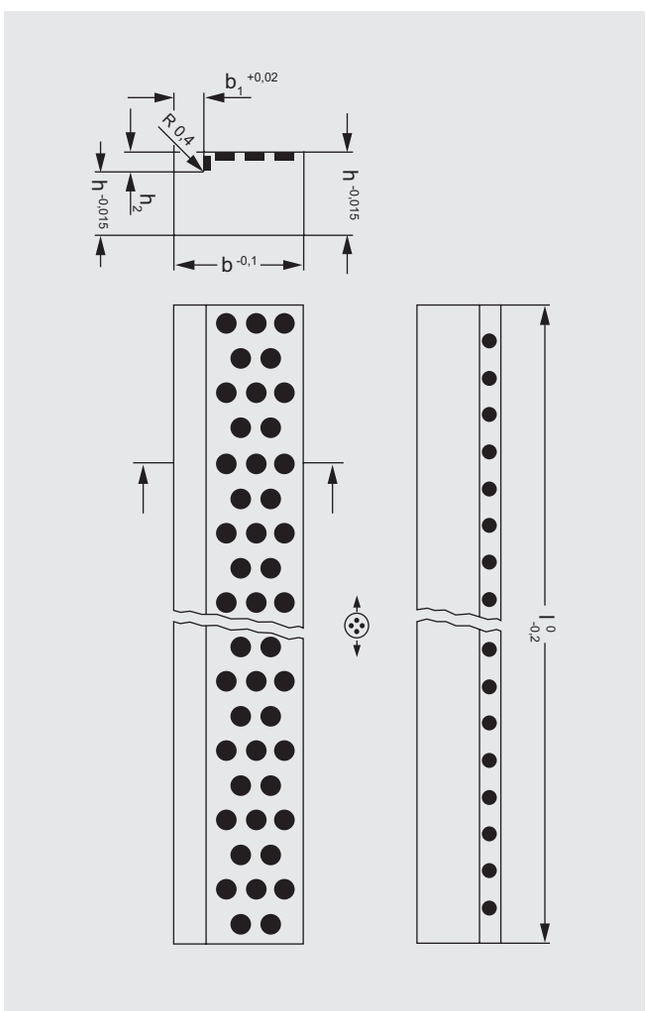
ANGLED GUIDE GIB, BRONZE WITH SOLID LUBRICANT

Order-No.: 8936.s.b.l



Material:
Bronze with solid lubricant, low maintenance.

Ordering example: s = 16, b = 11,5, l = 40
8936.016.115.040



Order-No.:	s	b	l	h_1	h_2	b_1
8936.016.115.040	**16**	**11,5**	**40**	12	4	6
8936.016.115.050	**16**	**11,5**	**50**	12	4	6
8936.016.115.063	**16**	**11,5**	**63**	12	4	6
8936.016.115.080	**16**	**11,5**	**80**	12	4	6
8936.016.155.050	**16**	**15,5**	**50**	11	5	8
8936.016.155.063	**16**	**15,5**	**63**	11	5	8
8936.016.155.080	**16**	**15,5**	**80**	11	5	8
8936.016.155.100	**16**	**15,5**	**100**	11	5	8
8936.020.195.063	**20**	**19,5**	**63**	15	5	8
8936.020.195.080	**20**	**19,5**	**80**	15	5	8
8936.020.195.100	**20**	**19,5**	**100**	15	5	8
8936.020.195.125	**20**	**19,5**	**125**	15	5	8
8936.020.245.080	**20**	**24,5**	**80**	15	5	8
8936.020.245.100	**20**	**24,5**	**100**	15	5	8
8936.020.245.125	**20**	**24,5**	**125**	15	5	8
8936.020.245.160	**20**	**24,5**	**160**	15	5	8
8936.025.315.100	**25**	**31,5**	**100**	19	6	10
8936.025.315.125	**25**	**31,5**	**125**	19	6	10
8936.025.315.160	**25**	**31,5**	**160**	19	6	10
8936.025.315.200	**25**	**31,5**	**200**	19	6	10
8936.025.395.125	**25**	**39,5**	**125**	19	6	10
8936.025.395.160	**25**	**39,5**	**160**	19	6	10
8936.025.395.200	**25**	**39,5**	**200**	19	6	10
8936.025.395.250	**25**	**39,5**	**250**	19	6	10
8936.032.495.160	**32**	**49,5**	**160**	24	8	12
8936.032.495.200	**32**	**49,5**	**200**	24	8	12
8936.032.495.250	**32**	**49,5**	**250**	24	8	12
8936.032.495.315	**32**	**49,5**	**315**	24	8	12

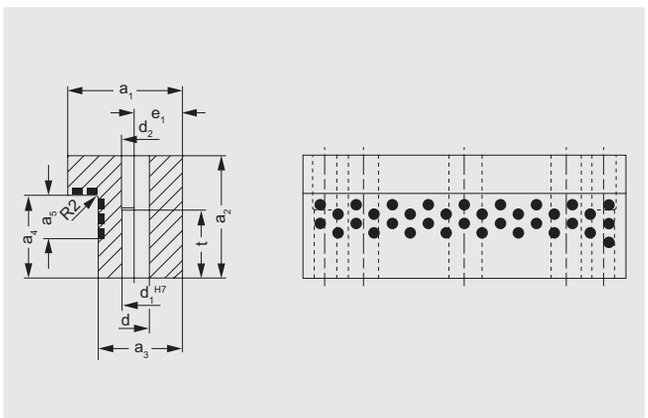
ANGLED GUIDE GIB, BRONZE WITH SOLID LUBRICANT

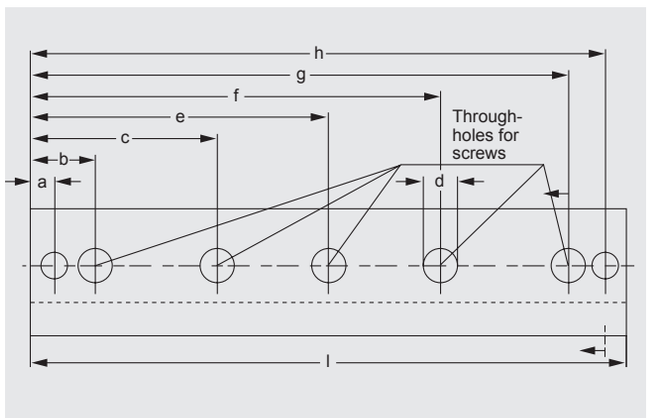
Order-No.: 8937.a_1.l

Material:
Bronze with solid lubricant, low maintenance.

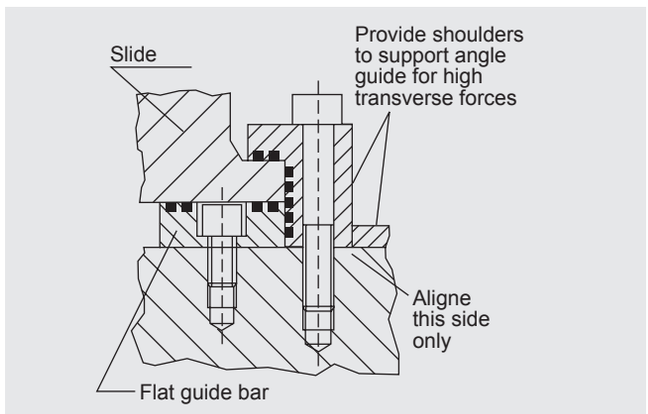
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 and dowel pins DIN 7979.

Ordering example: a_1 = 55, l = 100
8937.055.100





Mounting example



Order-No.:	a_1	a_2	l	a_3	a_4	a_5	a	b	c	e	e_1	f	g	h	d	d_1	d_2	t	Number of screw holes
8937.055.100	**55**	55	**100**	37	39	23	10	27,5	–	–	20	–	72,5	90	13,5	10	11	30	2
8937.055.160	**55**	55	**160**	37	39	23	10	27,5	–	–	20	–	132,5	150	13,5	10	11	30	2
8937.070.160	**70**	75	**160**	50	55	35	12,5	35	–	–	30	–	125	147,5	17,5	12	13	30	2
8937.070.200	**70**	75	**200**	50	55	35	12,5	35	–	–	30	–	165	187,5	17,5	12	13	30	2
8937.070.250	**70**	75	**250**	50	55	35	12,5	35	–	125	30	–	215	237,5	17,5	12	13	30	3
8937.070.400	**70**	75	**400**	50	55	35	12,5	35	125	200	30	275	365	387,5	17,5	12	13	30	5
8937.085.160	**85**	90	**160**	63	65	45	15	42,5	–	–	38	–	117,5	145	22	16	17	30	2
8937.085.200	**85**	90	**200**	63	65	45	15	42,5	–	–	38	–	157,5	185	22	16	17	30	2
8937.085.250	**85**	90	**250**	63	65	45	15	42,5	–	125	38	–	207,5	235	22	16	17	30	3
8937.085.400	**85**	90	**400**	63	65	45	15	42,5	125	200	38	275	357,5	385	22	16	17	30	5

ANGLED GUIDE GIB, BRONZE WITH SOLID LUBRICANT

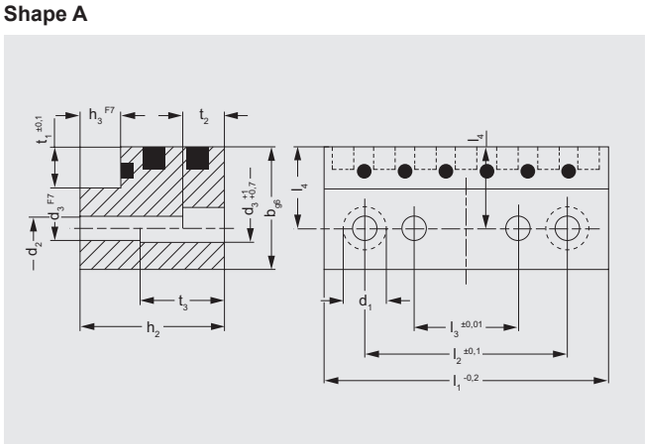
Order-No.: 8938.b.s.l_1

Material:
Bronze with solid lubricant, low maintenance.

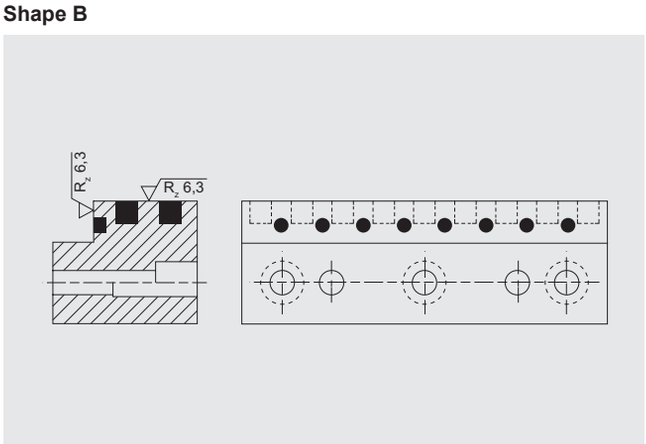
Note:
Screws are not included.
Fixing: Use socket cap screws DIN EN ISO 4762 and dowel pins DIN 7979.

Ordering example: b = 16, s = 12, l_1 = 50
8938.016.012.050

Shape A



Shape B



Order-No.:	Shape	b	s	h_2	l_1	h_3	t_1	l_2	l_3	l_4	d_1	d_2	d_3	t_2	t_3	number of screw holes
8938.016.012.050	A	**16**	**12**	11	**50**	4	5	34	14	9,5	10	5,5	5	5,7	–	2
8938.016.012.050	A	**16**	**12**	11	**71**	4	5	55	35	9,5	10	5,5	5	5,7	–	2
8938.016.012.050	B	**16**	**12**	11	**90**	4	5	74	54	9,5	10	5,5	5	5,7	–	3
8938.016.012.050	A	**20**	**20**	19	**80**	5	5	64	40	12	11	6,6	6	6,8	9,5	2
8938.016.012.050	A	**20**	**20**	19	**100**	5	5	84	60	12	11	6,6	6	6,8	9,5	2
8938.016.012.050	B	**20**	**20**	19	**125**	5	5	109	85	12	11	6,6	6	6,8	9,5	3
8938.016.012.050	A	**25**	**32**	31	**100**	6	6	80	50	15,5	15	9	8	9	19	2
8938.016.012.050	A	**25**	**32**	31	**125**	6	6	105	75	15,5	15	9	8	9	19	2
8938.016.012.050	B	**25**	**32**	31	**160**	6	6	140	110	15,5	15	9	8	9	19	3
8938.016.012.050	A	**30**	**50**	49	**125**	8	7	95	55	18	18	11	10	11	34	2
8938.016.012.050	A	**30**	**50**	49	**160**	8	7	130	90	18	18	11	10	11	34	2
8938.016.012.050	B	**30**	**50**	49	**200**	8	7	170	130	18	18	11	10	11	34	3

PRISMATIC GUIDE, BRONZE WITH SOLID LUBRICANT, SLIDING BLOCK, STEEL

Order-No: 8963.70.L / 8963.71.L

8963.70. Prismatic guide

Material:
Bronze with solid lubricant, low maintenance.

Note:
Screws and pins are not included.

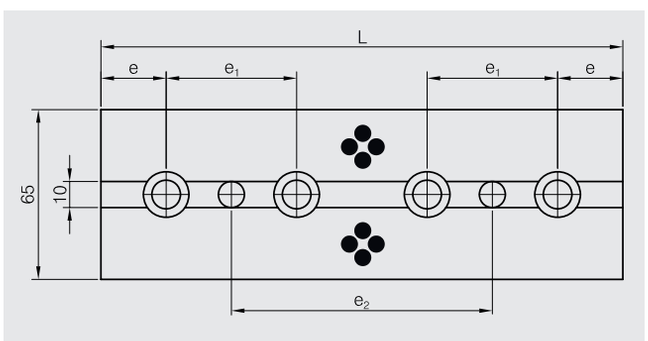
8963.71. Sliding block

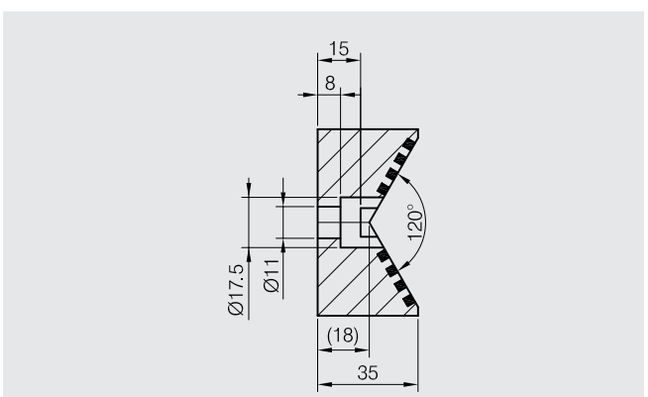
Material:
Steel, sliding faces surface hardened.

Note:
Screws and pins are not included.

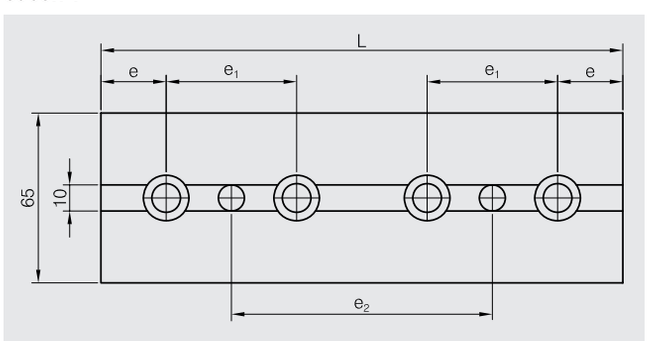
Ordering example: L = 100
8963.70. or 71.100

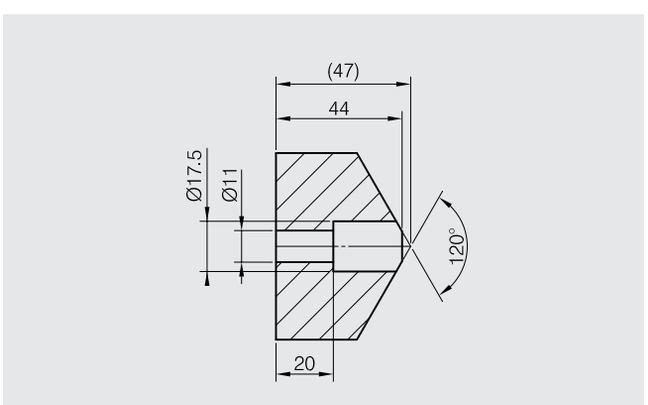
8963.70

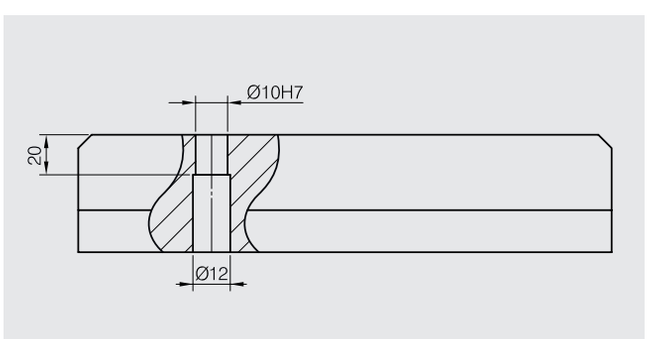




8963.71







e	20	25	25	25	25
e_1	60	50	50	50	50
e_2	20	50	100	150	200
L	**100**	**150**	**200**	**250**	**300**
8963.70.	•	•	•	•	•
8963.71.	•	•	•	•	•

PRISMATIC GUIDE, BRONZE WITH SOLID LUBRICANT, SLIDING BLOCK, STEEL

Order-No.: 8963.72.L / 8963.73.L

8963.72. Prismatic guide

Material:
Bronze with solid lubricant, low maintenance.

Note:
Screws and pins are not included.

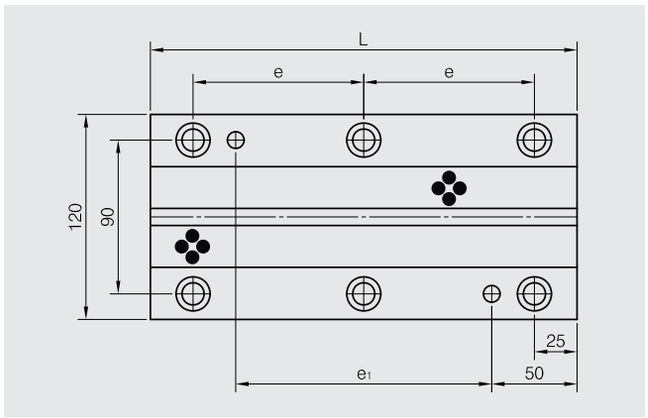
8963.73. Sliding block

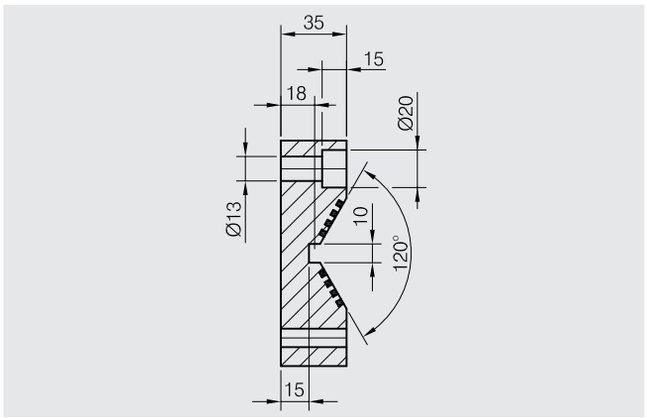
Material:
Steel, sliding faces surface hardened.

Note:
Screws and pins are not included.

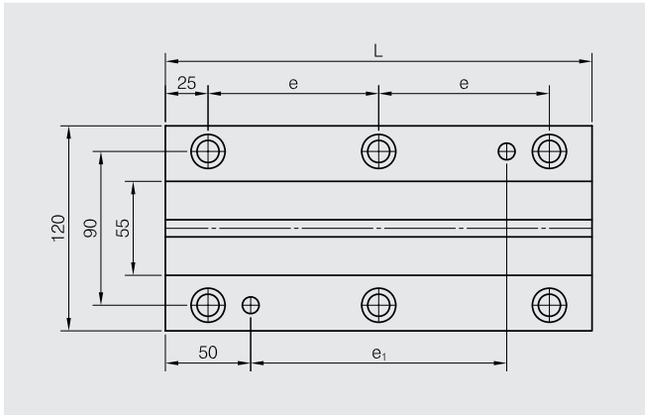
Ordering example: L = 100
8963.72 o. 73.150

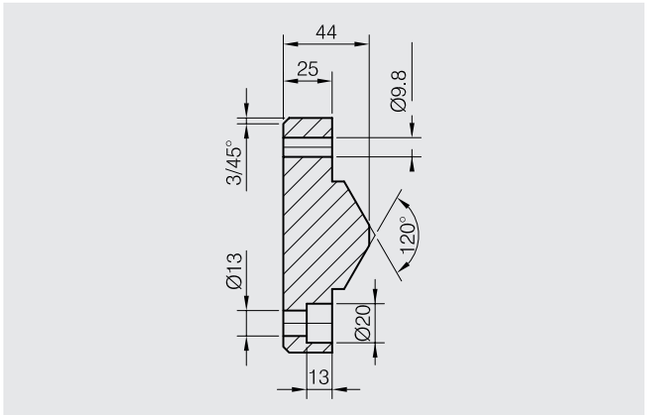
8963.72





8963.73





e	50	75	100	125
e_1	50	100	150	200
L	**150**	**200**	**250**	**300**
8963.72.	•	•	•	•
8963.73.	•	•	•	•

PRISMATIC GUIDE STEEL, SLIDING BLOCK BRONZE W. SOLID LUBRICANT, NAAMS

Order-No.: 8963.82.L.b / 8963.83.L.b

8963.82. Sliding block

Material:
Bronze with solid lubricant, low maintenance.

Note:
Screws and pins are not included.

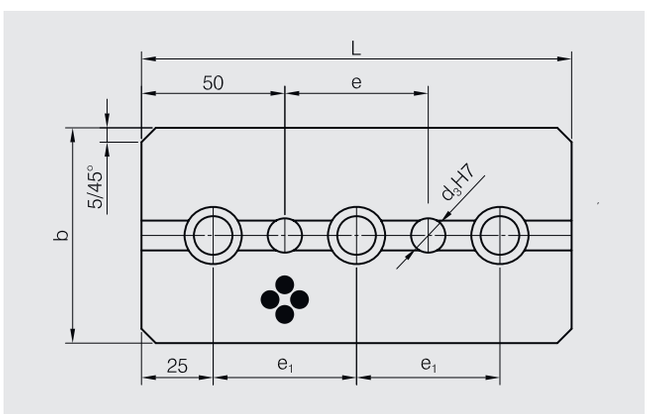
8963.83. Prismatic guide

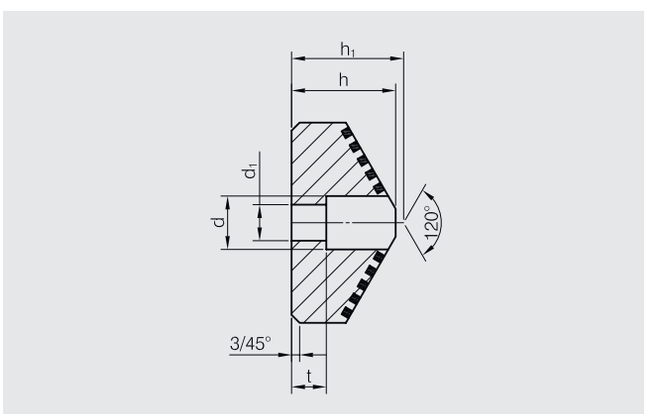
Material:
Steel, sliding faces surface hardened.

Note:
Screws and pins are not included.

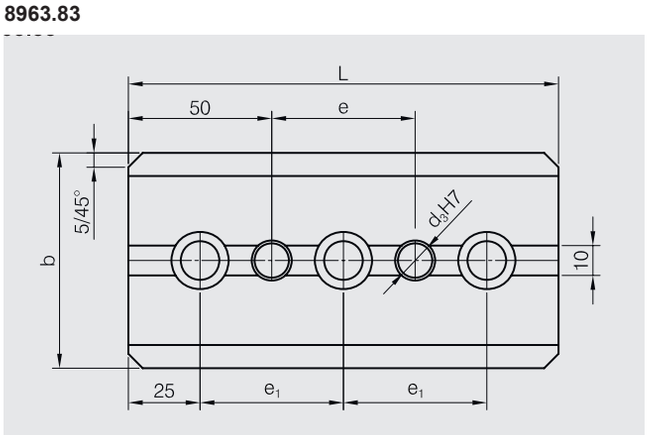
Ordering example: L = 100, b = 75
8963.82. o. 83.100.075

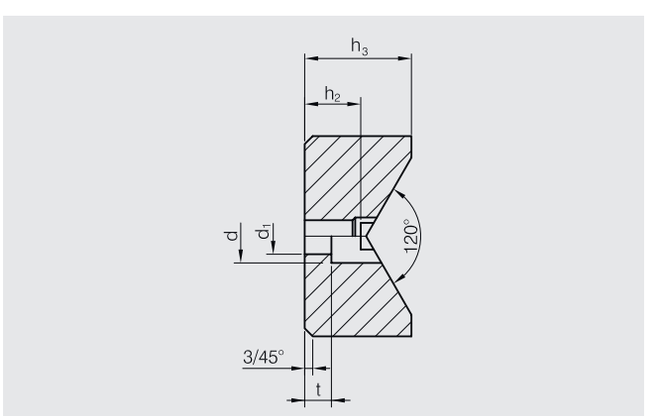
8963.82





8963.83

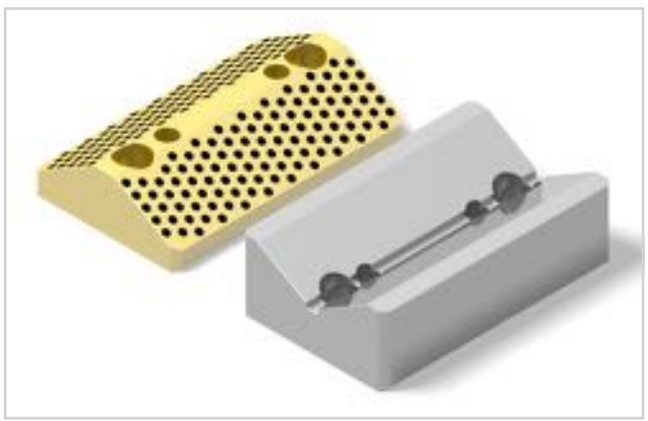




e	e_1	h	h_1	h_2	h_3	t	t_1	d	d_1	d_3	b	L	8963.82.	8963.83.
50	–	39	42	21	40	13	10	20	13,5	12	**75**	**150**	•	•
100	–	39	42	21	40	13	10	20	13,5	12	**75**	**200**	•	•
150	100	39	42	21	40	13	10	20	13,5	12	**75**	**250**	•	•
200	125	39	42	21	40	13	10	20	13,5	12	**75**	**300**	•	•
50	–	52	57	27	60	15	15	26	17,5	16	**125**	**150**	•	•
100	–	52	57	27	60	15	15	26	17,5	16	**125**	**200**	•	•
150	100	52	57	27	60	15	15	26	17,5	16	**125**	**250**	•	•
200	125	52	57	27	60	15	15	26	17,5	16	**125**	**300**	•	•

PRISMATIC GUIDE STEEL, SLIDING BLOCK BRONZE W. SOLID LUBRICANT VDI 3357

Order-No.: 8963.84.L.b / 8963.85.L.b



8963.84. Sliding block

Material:
Bronze with solid lubricant, low maintenance.

Note:
Screws and pins are not included.

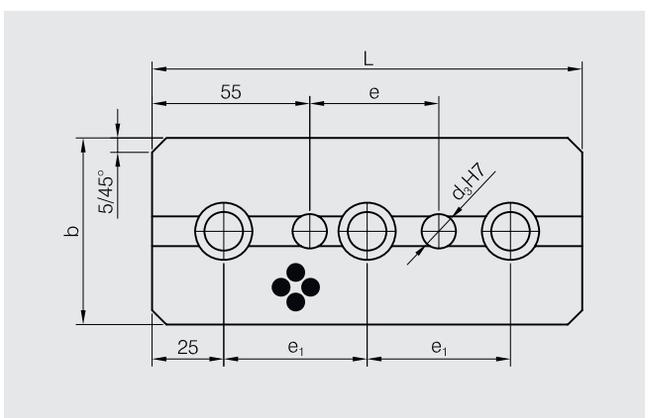
8963.85. Prismatic guide

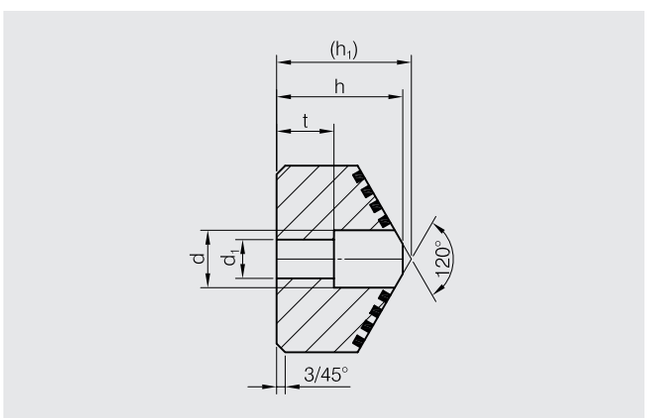
Material:
Steel, sliding faces surface hardened.

Note:
Screws and pins are not included.

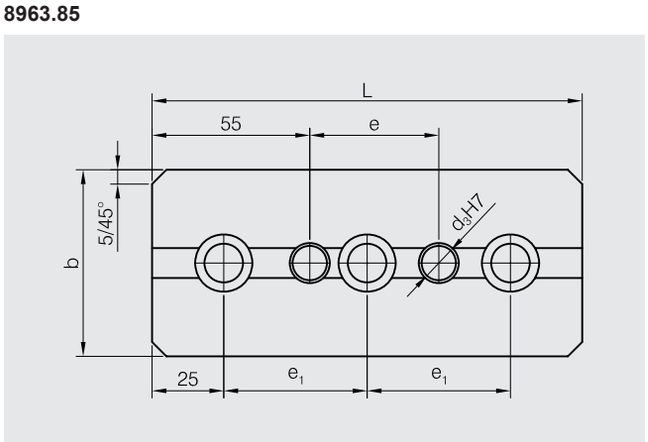
Ordering example: L = 100, b = 65
8963.84 o. 85.100.065

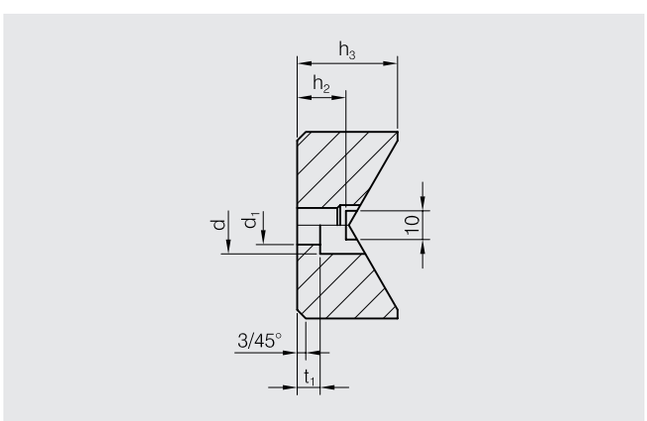
8963.84



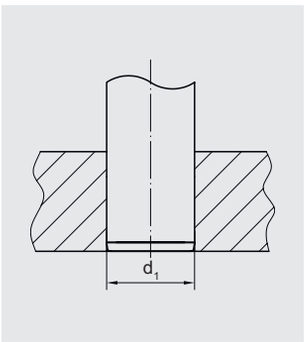


8963.85

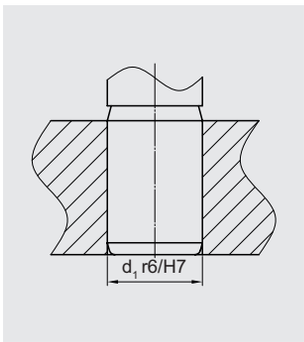




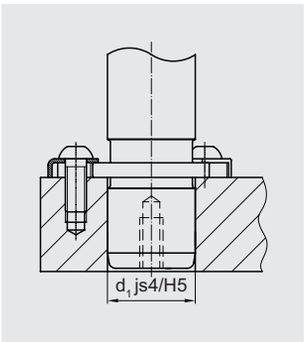
e	e_1	h	h_1	h_2	h_3	t	t_1	d	d_1	d_3	b	L	8963.84.	8963.85.
45	50	44	47	15	35	20	8	20	13,5	12	**65**	**150**	•	•
95	75	44	47	15	35	20	8	20	13,5	12	**65**	**200**	•	•
145	100	44	47	15	35	20	8	20	13,5	12	**65**	**250**	•	•
195	125	44	47	15	35	20	8	20	13,5	12	**65**	**300**	•	•
45	50	52	57	24	60	15	15	26	17,5	16	**125**	**150**	•	•
95	75	52	57	24	60	15	15	26	17,5	16	**125**	**200**	•	•
145	100	52	57	24	60	15	15	26	17,5	16	**125**	**250**	•	•
195	125	52	57	24	60	15	15	26	17,5	16	**125**	**300**	•	•



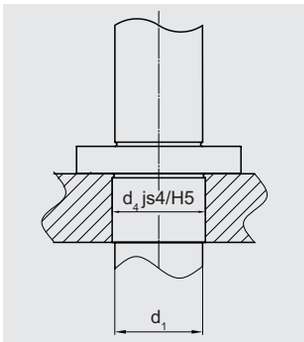
d_1	D
10-11-12	- 0,015 - 0,025
15-16	
19-20	
24-25	
30-32	
38-40	
48-50	
60-63	



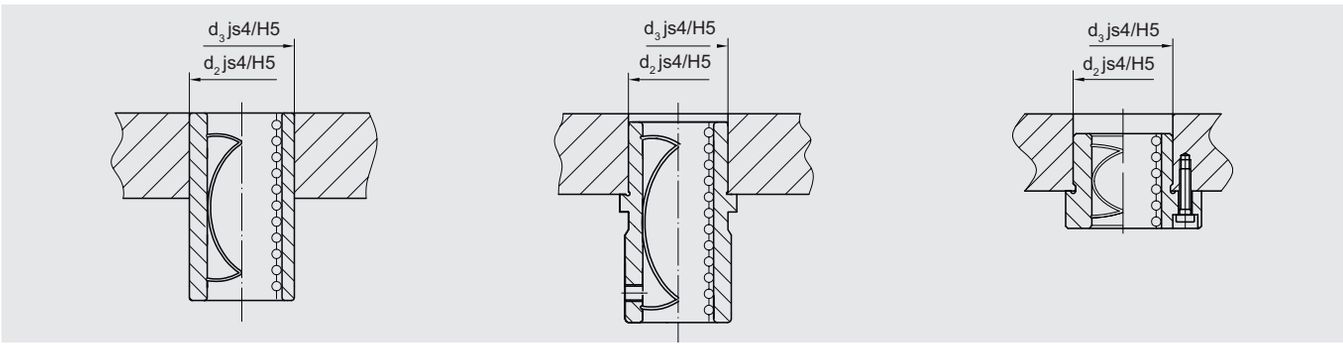
d_1	D
25	+ 0,021 0
32	+ 0,025 0
40	
50	
63	+ 0,030 0
80	
100	+ 0,035 0
125	+ 0,040 0
160	



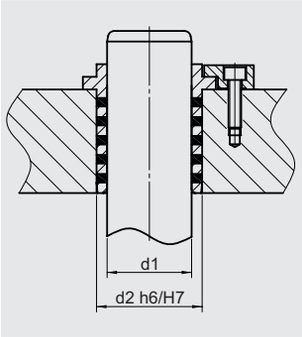
d_1	D
15-16	+ 0,008 0
19-20	+ 0,009 0
24-25	+ 0,009 0
30-32	+ 0,011
38-40	+ 0,013
48-50	+ 0,013 0
60-63	+ 0,013 0
80	+ 0,013 0



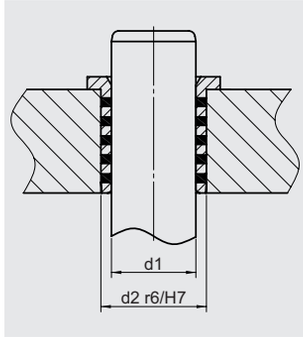
d_1	d_4	D
12	13	+ 0,008 0
16	18	+ 0,008 0
19	22	+ 0,009 0
25	26	+ 0,009 0
32	34	+ 0,011 0
40	42	+ 0,011 0



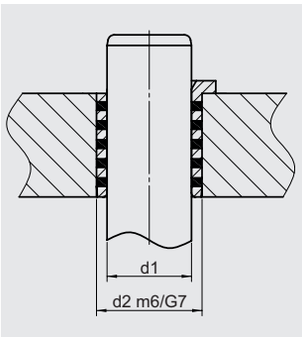
d_1	10-11-12	15-16	19-20	24-25	30-32	38-40	48-50	60-63	80
d_2	22	28	32	40	48	58	70	85	95,7/105
d_3	22/26	28	32	40	48	58	70	85	105
	+ 0,009 0	+ 0,009 0	+ 0,011 0	+ 0,011 0	+ 0,011 0	+ 0,013 0	+ 0,013 0	+ 0,015 0	+ 0,015 0



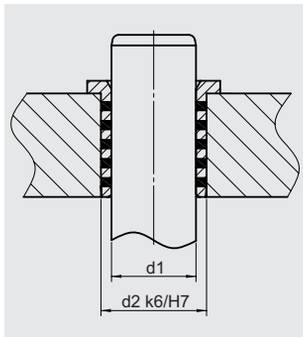
d_1	d_2	D
24/25 30/32 38/40/42	32/35 40/42 50	+ 0,025 0
48/50/52 60/63	63 80	+ 0,03 0
80	100	+ 0,035 0
100 125	125 160	+ 0,04 0
160	200	+ 0,046 0



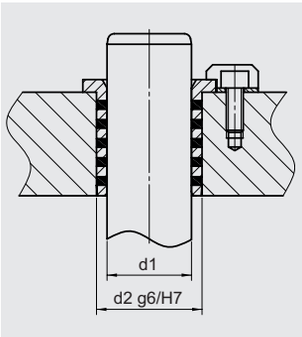
d_1	d_2	D
1012	14-18	+ 0,018 0
13-20	19-30	+ 0,021 0
25-40	35-50	+ 0,025 0
45-63	55-75	+ 0,03 0
70-100	85-120	+ 0,035 0
120	140	+ 0,04 0



d_1	d_2	D
8-12	12-18	+ 0,024 + 0,006
13-20	19-30	+ 0,028 + 0,007
25-40	33-50	+ 0,034 + 0,009
40-65	55-80	+ 0,04 + 0,01
70-100	85-120	+ 0,047 + 0,012
110-160	130-180	+ 0,054 + 0,014



d_1	d_2	D
9/10	14	+ 0,018 0
14/15	20	+ 0,025 0
18/20	26	
22/24	30	
30/32	42	+ 0,025 0
40/42	54	+ 0,03 0



d_1	d_2	D
25/32/40	32/35	+ 0,025 + 0
50/63	63	+ 0,03 + 0
80	100	+ 0,035 + 0
100/125	125/160	+ 0,04 + 0

Spring plungers

INDEX

Spring plungers

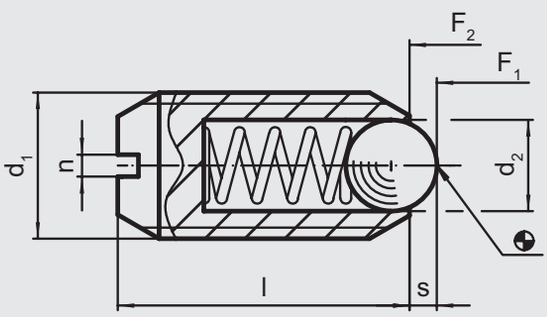
SPRING PLUNGER, WITH SPRING LOADED BALL, WITH SLOT, STANDARD SPRING FORCE

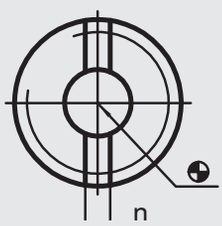
Order-No.: 4221.d_1

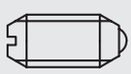
Material:
Sleeve: Free machining steel, burnished
Ball: Hardened ball bearing steel
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Temperature operating range: max. 250°C

Ordering example: d_1 = M3
4221.003







Standard spring force

Order-No.:	d_1	d_2	l	s	Spring force (N)	
					initial	final
4221.003	**M3**	15	7	0,4	3	4,5
4221.004	**M4**	2,5	9	0,8	8,5	14
4221.005	**M5**	3	12	0,9	8	14
4221.006	**M6**	3,5	14	1	11	18
4221.008	**M8**	4,5	16	1,5	18	31
4221.010	**M10**	6	19	2	24	45
4221.012	**M12**	8	22	2,5	26	49
4221.016	**M16**	10	24	3,5	41	86
4221.020	**M20**	12	30	4,5	56	111
4221.024	**M24**	15	34	5,5	81	151

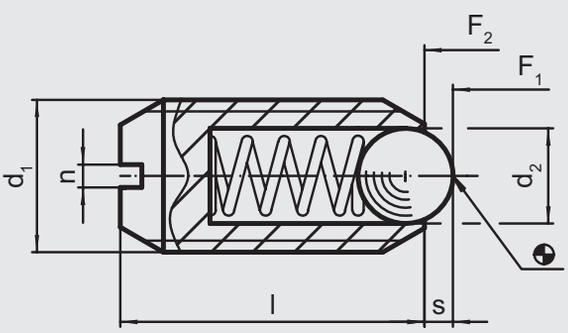
SPRING PLUNGER, WITH SPRING LOADED BALL, WITH SLOT, INCREASED SPRING FORCE

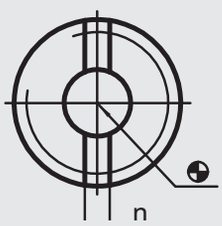
Order-No.: 4222.d_1

Material:
Sleeve: Free machining steel, burnished
Ball: Hardened ball bearing steel
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Temperature operating range: max. 250°C

Ordering example: d_1 = M5
4222.005





Increased spring force

Order-No.:	d_1	d_2	l	s	Spring force (N)	
					initial	final
4222.005	**M5**	3	12	0,9	15	22
4222.006	**M6**	3,5	14	1	19	28
4222.008	**M8**	4,5	16	1,5	36	62
4222.010	**M10**	6	19	2	57	104
4222.012	**M12**	8	22	2,5	61	110
4222.016	**M16**	10	24	3,5	68	142
4222.020	**M20**	12	30	4,5	84	166
4222.024	**M24**	15	34	5,5	127	237

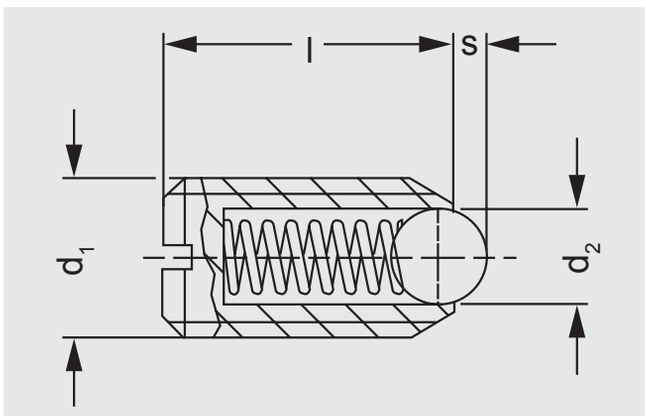
SPRING PLUNGER, WITH SPRING LOADED BALL, WITH SLOT, STANDARD SPRING FORCE

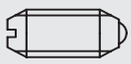
Order-No.: 4223.d_1

Material:
Sleeve: Nirosta 1.4305
Ball: Nirosta, hardened
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Admissible temperature range: max. 250°C

Ordering example: d_1 = M3
4223.003





Standard spring force

Order-No.:	d_1	d_2	l	s	Spring force (N)	
					initial	final
4223.003	**M3**	1,5	7	0,4	3	4,5
4223.004	**M4**	2,5	9	0,8	8,5	14
4223.005	**M5**	3	12	0,9	8	14
4223.006	**M6**	3,5	14	1	11	18
4223.008	**M8**	4,5	16	1,5	18	31
4223.010	**M10**	6	19	2	24	45
4223.012	**M12**	8	22	2,5	26	49
4223.016	**M16**	10	24	3,5	41	86
4223.020	**M20**	12	30	4,5	56	111
4223.024	**M24**	15	34	5,5	81	151

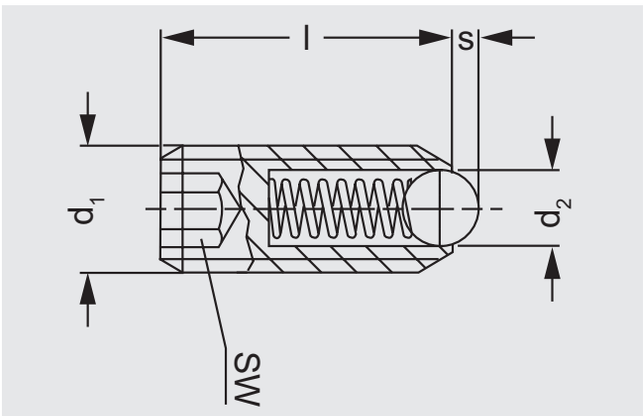
SPRING PLUNGER, WITH SPRING LOADED BALL, WITH HEXAGON SOCKET, INCREASED SPRING FORCE

Order-No.: 4224.d_1

Material:
Sleeve: Nirosta 1.4305
Ball: Nirosta, hardened
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Admissible temperature range: max. 250°C

Ordering example: d_1 = M5
4224.005



Increased spring force

Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4224.005	**M5**	3	14	0,9	2,5	15	22
4224.006	**M6**	3,5	15	1	3	19	28
4224.008	**M8**	4,5	18	1,5	4	36	62
4224.010	**M10**	6	23	2	5	57	104
4224.012	**M12**	8	26	2,5	6	61	110
4224.016	**M16**	10	33	3,5	8	68	142
4224.020	**M20**	12	43	4,5	10	84	166
4224.024	**M24**	15	48	5,5	12	127	237

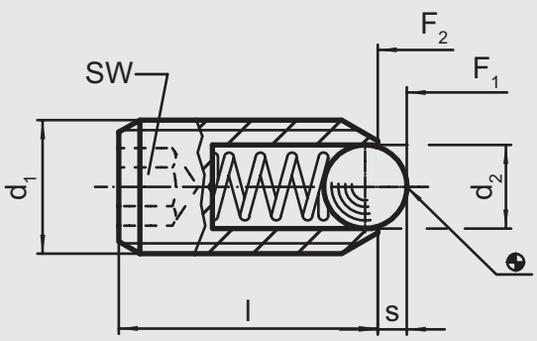
SPRING PLUNGER, WITH SPRING LOADED BALL, WITH HEXAGON SOCKET, STANDARD SPRING FORCE

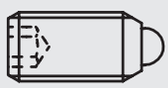
Order-No.: 4231.d_1

Material:
Sleeve: Free machining steel, burnished
Ball: Hardened ball bearing steel
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Temperature operating range: max. 250°C

Ordering example: d_1 = M3
4231.003





Standard spring force

Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4231.003	**M3**	1,5	8	0,4	1,5	3	4,5
4231.004	**M4**	2,5	12	0,8	2	8,5	14
4231.005	**M5**	3	14	0,9	2,5	8	14
4231.006	**M6**	3,5	15	1	3	11	18
4231.008	**M8**	4,5	18	1,5	4	18	31
4231.010	**M10**	6	23	2	5	24	45
4231.012	**M12**	8	26	2,5	6	26	49
4231.016	**M16**	10	33	3,5	8	41	86
4231.020	**M20**	12	43	4,5	10	56	111
4231.024	**M24**	15	48	5,5	12	81	151

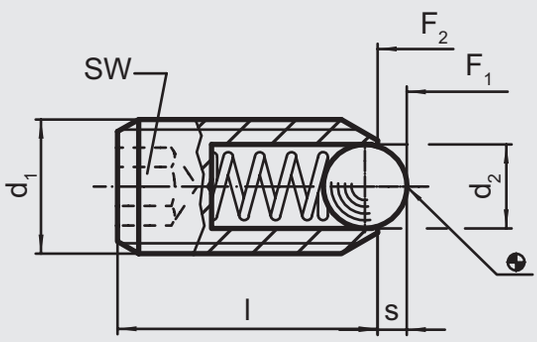
SPRING PLUNGER, WITH SPRING LOADED BALL, WITH HEXAGON SOCKET, STANDARD SPRING FORCE

Order-No.: 4232.d_1

Material:
Sleeve: Free machining steel, burnished
Ball: Hardened ball bearing steel
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Temperature operating range: max. 250°C

Ordering example: d_1 = M5
4232.005



Increased spring force

Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4232.005	**M5**	3	14	0,9	2,5	15	22
4232.006	**M6**	3,5	15	1	3	19	28
4232.008	**M8**	4,5	18	1,5	4	36	62
4232.010	**M10**	6	23	2	5	57	104
4232.012	**M12**	8	26	2,5	6	61	110
4232.016	**M16**	10	33	3,5	8	68	142
4232.020	**M20**	12	43	4,5	10	84	166
4232.024	**M24**	15	48	5,5	12	127	237

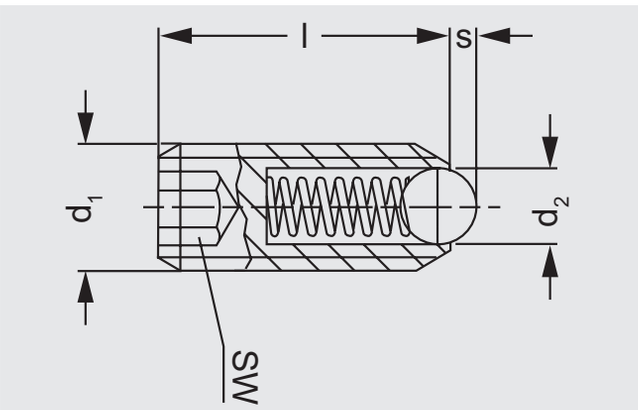
SPRING PLUNGER, WITH SPRING LOADED BALL, WITH HEXAGON SOCKET, STANDARD SPRING FORCE

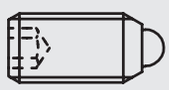
Order-No.: 4233.d_1

Material:
Sleeve: Nirosta 1.4305
Ball: Nirosta, hardened
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Admissible temperature range: max. 250°C

Ordering example: d_1 = M3
4233.003





Standard spring force

Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4233.003	**M3**	1,5	8	0,4	1,5	3	4,5
4233.004	**M4**	2,5	12	0,8	2	8,5	14
4233.005	**M5**	3	14	0,9	2,5	8	14
4233.006	**M6**	3,5	15	1	3	11	18
4233.008	**M8**	4,5	18	1,5	4	18	31
4233.010	**M10**	6	23	2	5	24	45
4233.012	**M12**	8	26	2,5	6	26	49
4233.016	**M16**	10	33	3,5	8	41	86
4233.020	**M20**	12	43	4,5	10	56	111
4233.024	**M24**	15	48	5,5	12	81	151

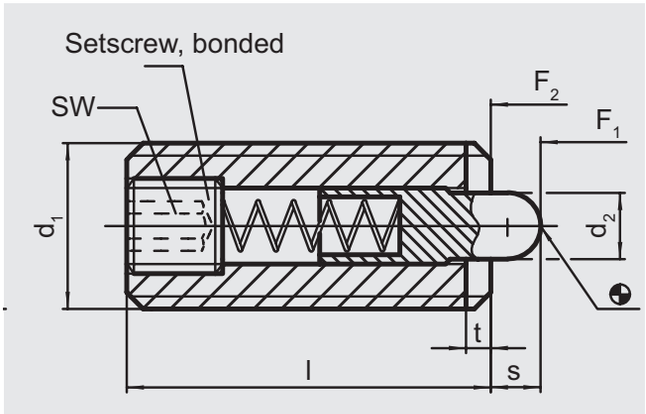
SPRING PLUNGER, WITH SPRING LOADED PIN, WITH SLOT, STANDARD SPRING FORCE

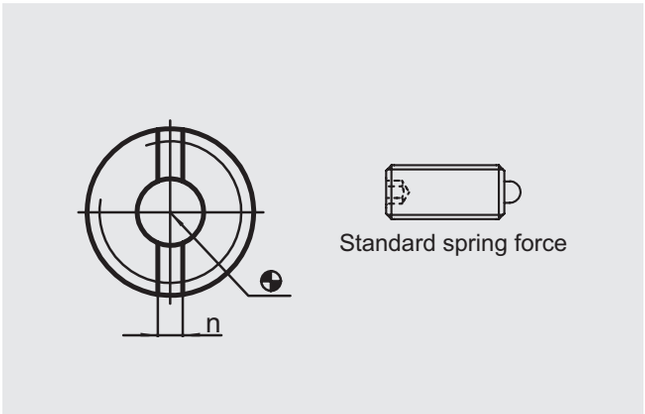
Order-No.: 4241.d_1

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel hardened, burnished
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards. Removable with hexagon socket screw key or slotted screwdriver.

Ordering example: d_1 = M3
4241.003





Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4241.003	**M3**	1	12	1	0,7	2	4
4241.004	**M4**	1,5	15	1,5	1,3	4,5	16
4241.005	**M5**	2,4	18	2,3	1,5	6	19
4241.006	**M6**	2,7	20	2,5	2	6	19
4241.008	**M8**	3,5	22	3	2,5	10	39
4241.010	**M10**	4	22	3	3	10	39
4241.012	**M12**	6	28	4	4	12	53
4241.016	**M16**	7,5	32	5	5	45	100
4241.020	**M20**	10	40	7	6	52	125
4241.024	**M24**	12	52	10	8	70	170

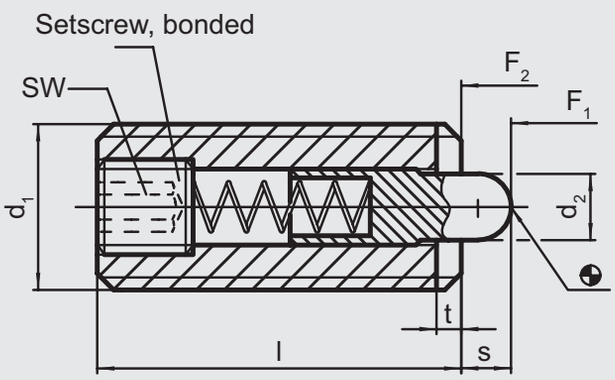
SPRING PLUNGER, WITH SPRING LOADED PIN, WITH SLOT, INCREASED SPRING FORCE

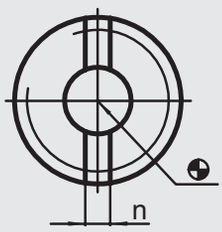
Order-No.: 4242.d_1

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel hardened, burnished
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards. Removable with hexagon socket screw key or slotted screwdriver.

Ordering example: d_1 = M5
4242.005





Increased spring force

Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4242.005	**M5**	2,4	18	2,3	1,5	11	40
4242.006	**M6**	2,7	20	2,5	2	15	43
4242.008	**M8**	3,5	22	3	2,5	20	75
4242.010	**M10**	4	22	3	3	20	75
4242.012	**M12**	6	28	4	4	45	120
4242.016	**M16**	7,5	32	5	5	64	160
4242.020	**M20**	10	40	7	6	75	195
4242.024	**M24**	12	52	10	8	75	245

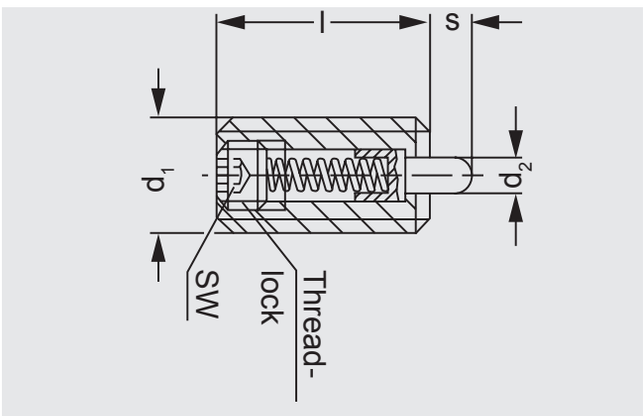
SPRING PLUNGER, WITH SPRING LOADED PIN, WITH SLOT, STANDARD SPRING FORCE

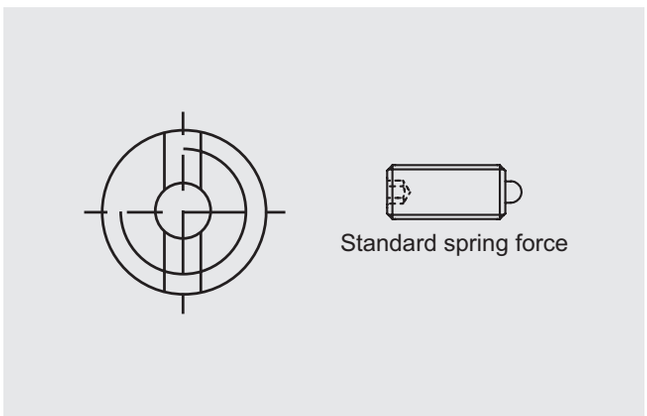
Order-No.: 4243.d_1

Material:
Sleeve: Nirosta 1.4305
Pin: Nirosta 1.4305
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards. Removable with hexagon socket screw key or slotted screwdriver.

Ordering example: d_1 = M4
4243.004





Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4243.004	**M4**	1,5	15	1,5	1,3	4,5	16
4243.005	**M5**	2,4	18	2,3	1,5	6	19
4243.006	**M6**	2,7	20	2,5	2	6	19
4243.008	**M8**	3,5	22	3	2,5	10	39
4243.010	**M10**	4	22	3	3	10	39
4243.012	**M12**	6	28	4,	4	12	53
4243.016	**M16**	7,5	32	5	5	45	100
4243.020	**M20**	10	40	7	6	52	125

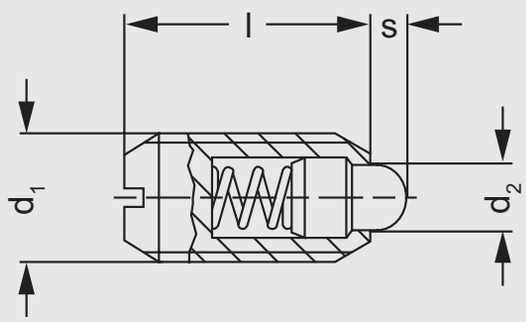
SPRING PLUNGER, WITH SPRING LOADED PIN, WITH SLOT, INCREASED SPRING FORCE

Order-No.: 4244.d_1

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel hardened, burnished
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Temperature operating range: max. 250°C
Identification of increased spring force by two longitudinal marks on the sleeve.

Ordering example: d_1 = M6
4244.006



Standard spring force

Order-No.:	d_1	d_2	l	s	Spring force (N)	
					initial	final
4244.006	**M6**	2,7	14	2	11	25
4244.008	**M8**	3,8	16	2	23	59
4244.010	**M10**	4,5	19	2,5	20	54
4244.012	**M12**	6,2	22	3,5	38	96
4244.016	**M16**	8,5	24	4,5	50	100
4244.020	**M20**	10	30	6,5	52	133
4244.024	**M24**	13	34	8	91	223

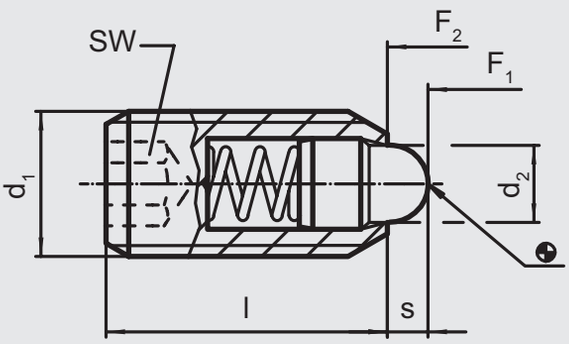
SPRING PLUNGER, WITH SPRING LOADED PIN, WITH HEXAGON SOCKET, STANDARD SPRING FORCE

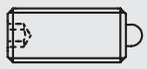
Order-No.: 4251.d_1

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel hardened, burnished
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Temperature operating range: max. 250°C

Ordering example: d_1 = M4
4251.004





Standard spring force

Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4251.004	**M4**	1,8	12	1,5	2	4,5	12,5
4251.005	**M5**	2,4	14	2	2,5	5	13
4251.006	**M6**	2,7	15	2	3	6	17
4251.008	**M8**	3,8	18	2	4	16	33
4251.010	**M10**	4,5	23	2,5	5	19	42
4251.012	**M12**	6,2	26	3,5	6	22	57
4251.016	**M16**	8,5	33	4,5	8	38	78
4251.020	**M20**	10	43	6,5	10	39	81
4251.024	**M24**	13	48	8	12	72	155

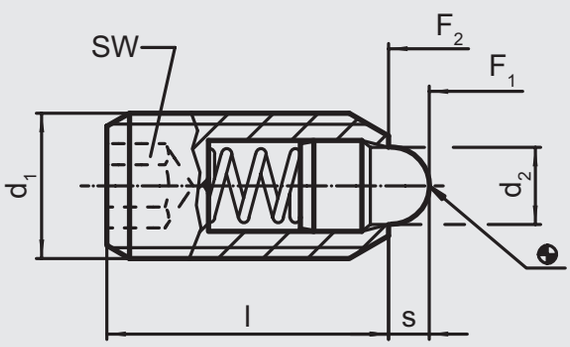
SPRING PLUNGER, WITH SPRING LOADED PIN, WITH HEXAGON SOCKET, INCREASED SPRING FORCE

Order-No.: 4252.d_1

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel hardened, burnished
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Temperature operating range: max. 250°C

Ordering example: d_1 = M6
4252.006



Increased spring force

Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4252.006	**M6**	2,7	15	2	3	11	25
4252.008	**M8**	3,8	18	2	4	23	59
4252.010	**M10**	4,5	23	2,5	5	20	54
4252.012	**M12**	6,2	26	3,5	6	38	96
4252.016	**M16**	8,5	33	4,5	8	50	100
4252.020	**M20**	10	43	6,5	10	52	133
4252.024	**M24**	13	48	8	12	91	223

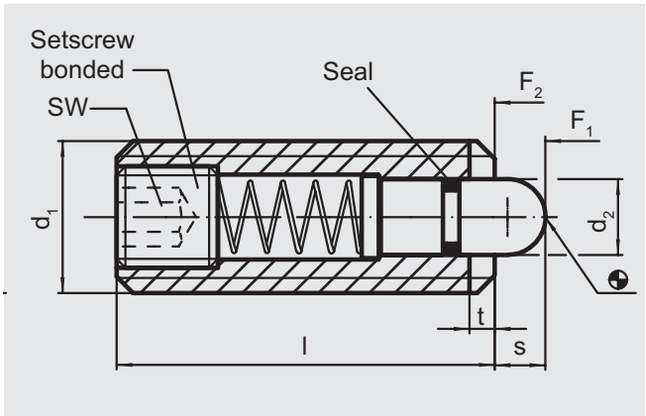
SPRING PLUNGER, WITH SPRING LOADED PIN AND SEAL, WITH HEXAGON SOCKET, STANDARD SPRING FORCE

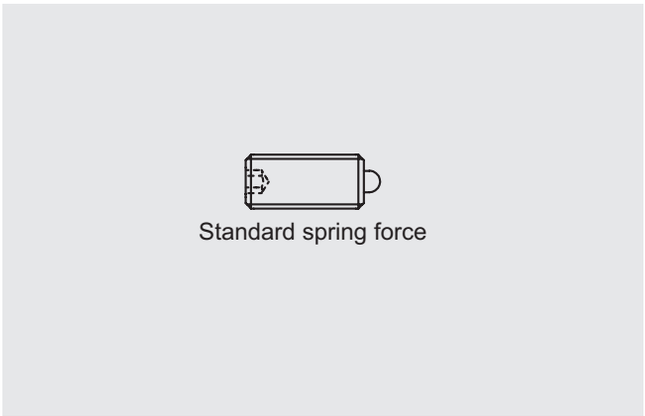
Order-No.: 4271.d_1

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel hardened, burnished
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards. The seal prevents the ingress of liquids into the forcing pin. Assembly and dismantling using hexagon socket key and slotted screwdriver.
Temperature operating range: –30°C up to 80°C

Ordering example: d_1 = M8
4271.008





Order-No.:	d_1	d_2	l	s	t	SW	Spring force (N)	
							initial	final
4271.008	**M8**	3,8	26	3	1,4	2,5	9	24
4271.010	**M10**	4	28	3,5	1,4	3	15	30
4271.012	**M12**	6	35	4	2	4	24	50
4271.016	**M16**	7,5	40	5	2,5	5	36	58

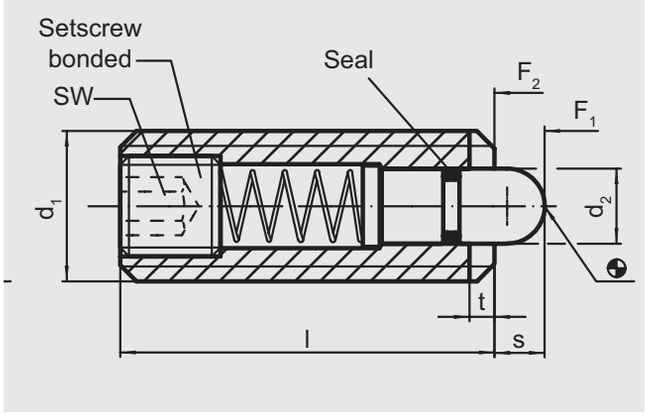
SPRING PLUNGER, WITH SPRING LOADED PIN AND SEAL, WITH HEXAGON SOCKET, INCREASED SPRING FORCE

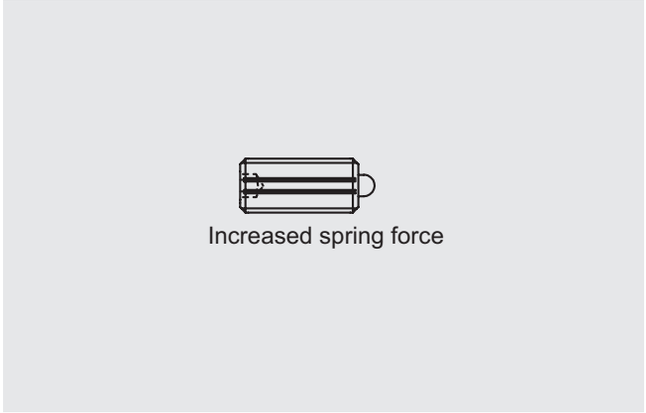
Order-No.: 4272.d_1

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel hardened, burnished
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards. The seal prevents the ingress of liquids into the forcing pin. Assembly and dismantling using hexagon socket key and slotted screwdriver.
Temperature operating range: –30°C up to 80°C
Identification of increased spring force by two longitudinal marks on the sleeve.

Ordering example: d_1 = M8
4272.008





Order-No.:	d_1	d_2	l	s	t	SW	Spring force (N)	
							initial	final
4272.008	**M8**	3,8	26	3	1,4	2,5	17	39
4272.010	**M10**	4	28	3,5	1,4	3	22	43
4272.012	**M12**	6	35	4	2	4	40	80
4272.016	**M16**	7,5	40	5	2,5	5	44	113

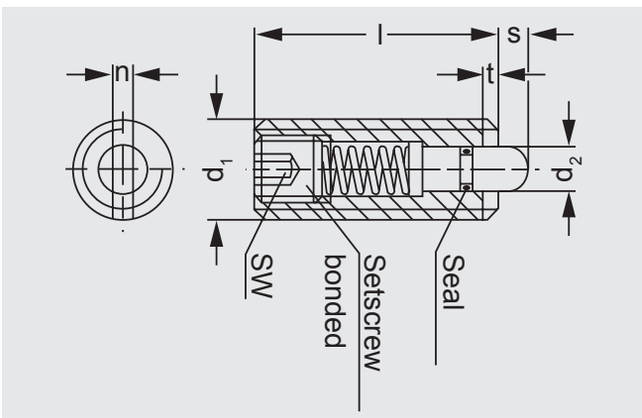
SPRING PLUNGER, WITH SPRING LOADED PIN AND SEAL, WITH HEXAGON SOCKET, STANDARD SPRING FORCE

Order-No.: 4273.d_1

Material:
Sleeve: Nirosta 1.4305
Pin: Nirosta 1.4305
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards. The seal prevents the ingress of liquids into the forcing pin. Assembly and dismantling using hexagon socket key and slotted screwdriver.
Temperature operating range: –30°C up to 80°C

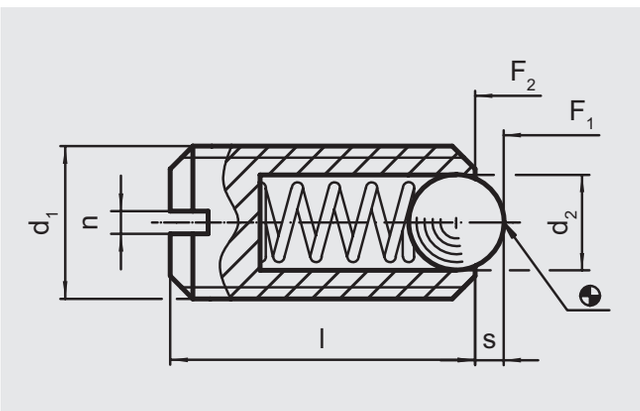
Ordering example: d_1 = M8
4273.008



Order-No.:	d_1	d_2	l	s	t	SW	Spring force (N)	
							initial	final
4273.008	**M8**	3,8	26	3	1,4	2,5	9	24
4273.010	**M10**	4	28	3,5	1,4	3	15	30
4273.012	**M12**	6	35	4	2	4	24	50
4273.016	**M16**	7,5	40	5	2,5	5	36	58

SPRING PLUNGER, WITH SPRING LOADED BALL, WITH SLOT, POM

Order-No.: 4281.d_1



Material:
Sleeve: Delrin blue (POM)
Ball: Nirosta, hardened
Spring: Nirosta

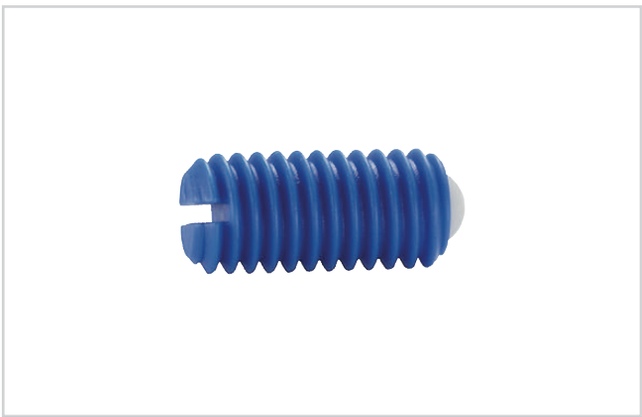
Note:
For locking and for pressing upwards or downwards.
Admissible temperature range: -30°C to +50°C

Ordering example: d_1 = M6
4281.006

Order-No.:	d_1	d_2	l	s	n	Spring force (N)	
						initial	final
4281.006	**M6**	3,5	14	0,9	1	12	17
4281.008	**M8**	5	16	1,5	1,2	20	35
4281.010	**M10**	6	19	1,9	1,5	25	45

SPRING PLUNGER, WITH SPRING LOADED BALL, WITH SLOT, POM

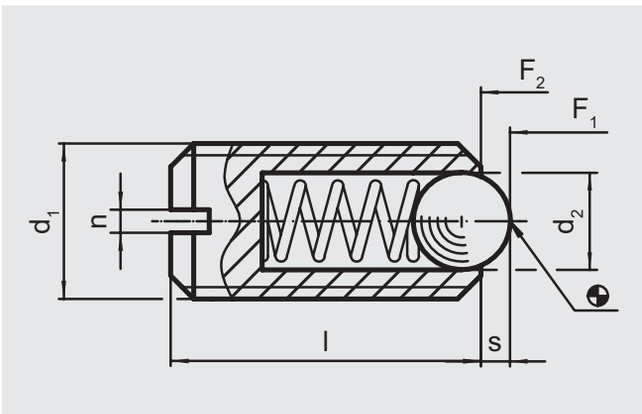
Order-No.: 4282.d_1



Material:
Sleeve: Delrin blue (POM)
Ball: Delrin white (POM)
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards.
Temperature operating range: –30°C up to 50°C

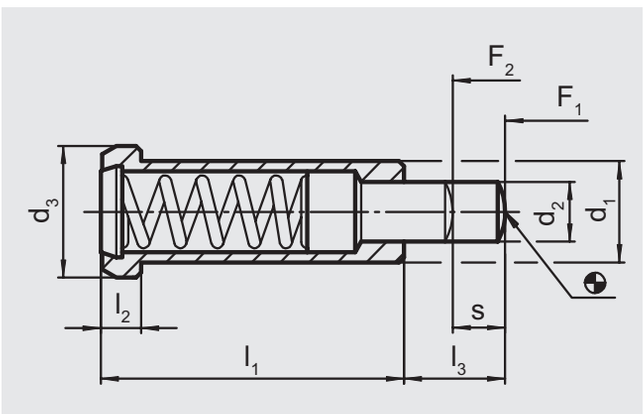
Ordering example: d_1 = M6
4282.006



Order-No.:	d_1	d_2	l	s	n	Spring force (N)	
						initial	final
4282.006	**M6**	3,5	14	0,9	1	12	17
4282.008	**M8**	5	16	1,5	1,2	20	35
4282.010	**M10**	6	19	1,9	1,5	25	45

SPRING PLUNGER WITH SPRING LOADED PIN, STRAIGHT VERSION WITH COLLAR

Order-No: 426.d_1



Material:
Sleeve: Free machining steel, burnished
Pin: Steel, case hardened, burnished
Spring: Nirosta

Note:
For use in toolmaking as forcing pins and spring loaded limit stops.
Neither the threaded cartridge nor any of its components can escape from the mounting.
Temperature operating range: max. 250 °C

Ordering example: d_1 = 6
426.006

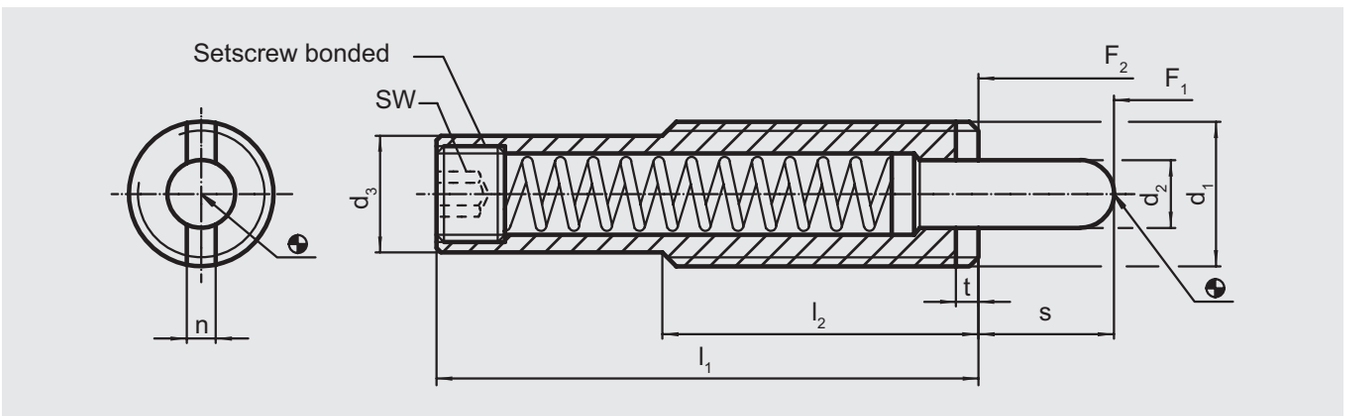
Order-No.:	d_1	d_2	d_3	l_1	l_2	l_3	s	Spring force (N)	
								initial	final
426.006	**6**	2,7	8	20	3,2	6	3,5	10	22
426.008	**8**	3,9	10	24	3,2	8	4,5	30	88
426.010	**10**	5,9	13	30	4	10	5,5	42	110
426.012	**12**	7,9	16	36	5	12	6,5	50	130

SPRING PLUNGER, LONG CONSTRUCTION, STANDARD SPRING FORCE

Order-No.: 4291.

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel, hardened, burnished
Spring: Nirosta

Note:
Spring plungers are used as ejectors, damper pins, fixing and retaining pins. Assembly and dismantling using hexagon socket key and slotted screwdriver.



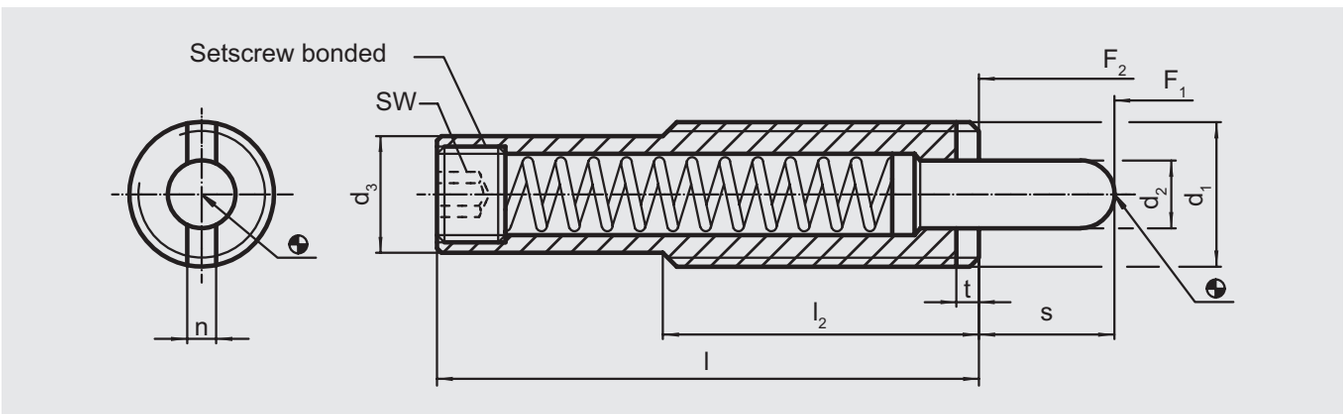
Order-No.:	d_1	d_2	d_3	s	l_1	l_2	n	t	SW	Spring force (N)	
										initial	final
4291.0408	M10	4	7,8	8	35	25	1,5	1,4	3	**6**	**16**
4291.0412	M12	5,5	9,5	10	43	35	2,7	2	4	**4**	**18**
4291.0430	M16	8	13,4	10	48	35	3,2	3	6	**7**	**24**
4291.0432	M16	8	13,4	10	58	35	3,2	3	6	**15**	**42**
4291.0436	M16	8	13,4	15	58	35	3,2	3	6	**9**	**33**
4291.0440	M16	8	13,4	20	58	35	3,2	3	6	**4**	**23**
4291.0442	M16	8	13,4	20	83	35	3,2	3	6	**11**	**43**
4291.0444	M16	8	13,4	25	98	35	3,2	3	6	**13**	**41**
4291.0450	M16	8	13,4	30	98	35	3,2	3	6	**13**	**47**
4291.0452	M16	8	13,4	30	118	35	3,2	3	6	**24**	**110**
4291.0455	M16	8	13,4	40	148	35	3,2	3	6	**13**	**63**
4291.0460	M16	8	13,4	50	148	35	3,2	3	6	**7**	**43**
4291.0480	M24	10	19,6	15	60	45	3,7	3	8	**14**	**87**

SPRING PLUNGER, LONG CONSTRUCTION, STANDARD SPRING FORCE

Order-No.: 4292.

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel, hardened, burnished
Spring: Nirosta

Note:
Spring plungers are used as ejectors, damper pins, fixing and retaining pins. Assembly and dismantling using hexagon socket key and slotted screwdriver.



Order-No.:	d_1	d_2	d_3	s	l_1	l_2	n	t	SW	Spring force (N)	
										initial	final
4292.0512	M12	5,5	9,5	10	43	35	2,7	2	4	**7**	**46**
4292.0530	M16	8	13,4	10	48	35	3,2	3	6	**10**	**43**
4292.0532	M16	8	13,4	10	58	35	3,2	3	6	**14**	**84**
4292.0536	M16	8	13,4	15	58	35	3,2	3	6	**10**	**57**
4292.0542	M16	8	13,4	20	83	35	3,2	3	6	**18**	**72**
4292.0544	M16	8	13,4	25	98	35	3,2	3	6	**20**	**70**
4292.0550	M16	8	13,4	30	98	35	3,2	3	6	**20**	**80**
4292.0555	M16	8	13,4	40	148	35	3,2	3	6	**21**	**113**
4292.0560	M16	8	13,4	50	148	35	3,2	3	6	**13**	**75**
4292.0580	M24	10	19,6	15	60	45	3,7	3	8	**24**	**192**

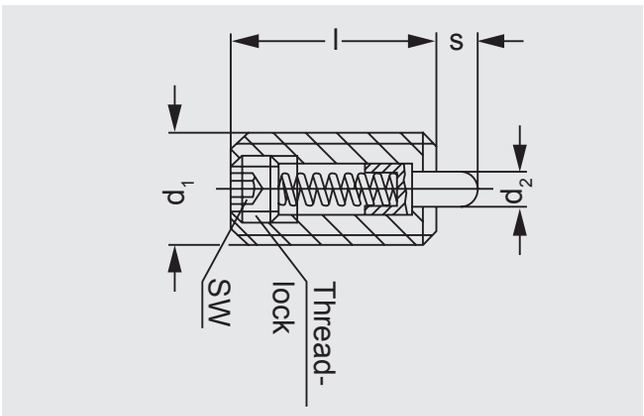
SPRING PLUNGER, WITH SPRING LOADED PIN, WITH SLOT, STANDARD SPRING FORCE

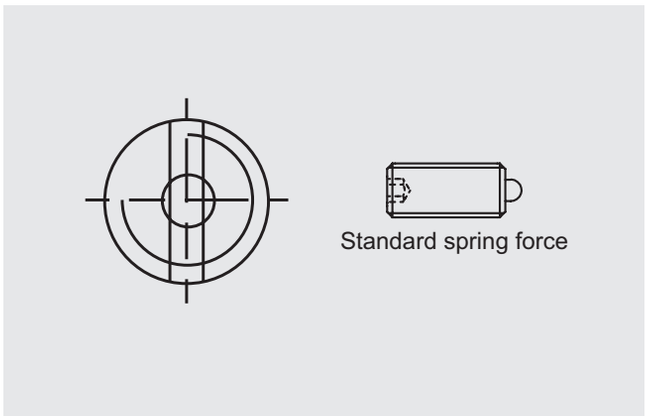
Order No.: 4293.d_1

Material:
Sleeve: Nirosta 1.4305
Pin: Delrin white (POM)
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards. Removable with hexagon socket screw key or slotted screwdriver.

Ordering example: d_1 = M4
4293.004





Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4293.004	**M4**	1,5	15	1,5	1,3	4,5	16
4293.005	**M5**	2,4	18	2,3	1,5	6	19
4293.006	**M6**	2,7	20	2,5	2	6	19
4293.008	**M8**	3,5	22	3	2,5	10	39
4293.010	**M10**	4	22	3	3	10	39
4293.012	**M12**	6	28	4	4	12	53
4293.016	**M16**	7,5	32	5	5	45	100

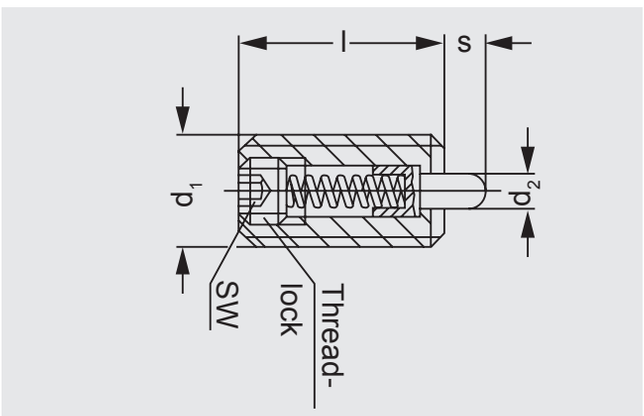
PRING PLUNGER, WITH SPRING LOADED PIN, WITH SLOT, STANDARD SPRING FORCE

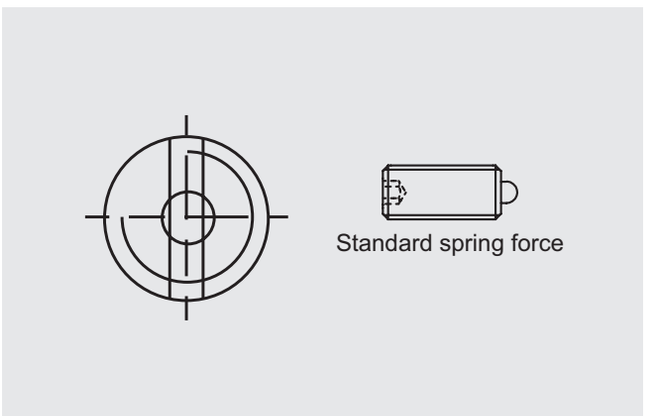
Order-No.: 4192.d_1

Material:
Sleeve: Free machining steel, burnished
Pin: Delrin white (POM)
Spring: Nirosta

Note:
For locking and for pressing upwards or downwards. Removable with hexagon socket screw key or slotted screwdriver.

Ordering example: d_1 = M4
4192.004





Order-No.:	d_1	d_2	l	s	SW	Spring force (N)	
						initial	final
4192.004	**M4**	1,5	15	1,5	1,3	4,5	16
4192.005	**M5**	2,4	18	2,3	1,5	6	19
4192.006	**M6**	2,7	20	2,5	2	6	19
4192.008	**M8**	3,5	22	3	2,5	10	39
4192.010	**M10**	4	22	3	3	10	39
4192.012	**M12**	6	28	4	4	12	53
4192.016	**M16**	7,5	32	5	5	45	100

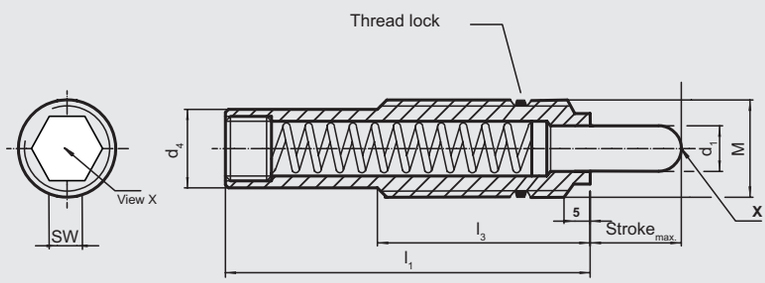
SPRING PLUNGER, STANDARD SPRING FORCE, VDI 3004

Order-No.: 421.Stroke.l_1.1/2

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel, hardened, burnished
Spring: Nirosta

Note:
Spring plungers are used as ejectors, damper pins, fixing and retaining pins. Assembly and dismantling using hexagon socket key and slotted screwdriver.

Ordering example Stroke max. = 10, l_1 = 60, 16 x 2 = 1
421.010.060.1



Order-No.:	M							Spring rate	Spring force (N)	
	d_1	d_4	16 x 2	16 x 1,5	l_1	l_3	Stroke max.		initial	final
421.010.060.1	6	13,4	•		**60**	35	**10**	0,95	3,8	13,3
421.010.060.2	6	13,4		•	**60**	35	**10**	0,95	3,8	13,3
421.015.060.1	6	13,4	•		**60**	35	**15**	2	10	40
421.015.060.2	6	13,4		•	**60**	35	**15**	2	10	40
421.020.080.1	6	13,4	•		**80**	35	**20**	1,38	6,9	34,5
421.020.080.2	6	13,4		•	**80**	35	**20**	1,38	6,9	34,5
421.030.080.1	6	13,4	•		**80**	35	**30**	1,3	6,5	45,5
421.030.080.2	6	13,4		•	**80**	35	**30**	1,3	6,5	45,5
421.030.120.1	6	13,4	•		**120**	35	**30**	0,73	18	40
421.030.120.2	6	13,4		•	**120**	35	**30**	0,73	18	40
421.040.150.1	6	13,4	•		**150**	35	**40**	0,6	13,2	37,2
421.040.150.2	6	13,4		•	**150**	35	**40**	0,6	13,2	37,2
421.050.150.1	6	13,4	•		**150**	35	**50**	0,6	13,2	43,2
421.050.150.2	6	13,4		•	**150**	35	**50**	0,6	13,2	43,2
421.060.150.1	6	13,4	•		**150**	35	**60**	0,6	13,2	49,2
421.060.150.2	6	13,4		•	**150**	35	**60**	0,6	13,2	49,2
421.070.200.1	6	13,4	•		**200**	35	**70**	0,44	9,68	40,5
421.070.200.2	6	13,4		•	**200**	35	**70**	0,44	9,68	40,5
421.080.200.1	6	13,4	•		**200**	35	**80**	0,44	9,68	44,8
421.080.200.2	6	13,4		•	**200**	35	**80**	0,44	9,68	44,8

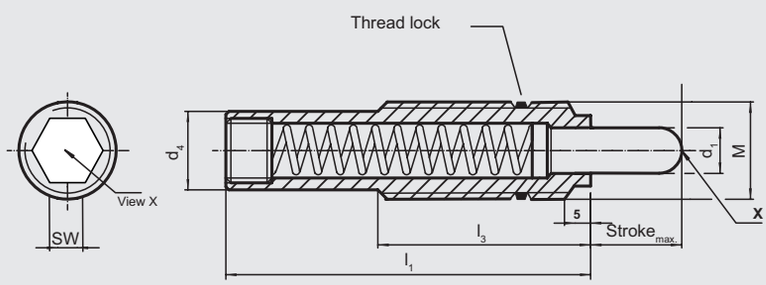
SPRING PLUNGER, INCREASED SPRING FORCE, VDI 3004

Order-No.: 422.Stroke.l_1.1/2

Material:
Sleeve: Free machining steel, burnished
Pin: Free machining steel, hardened, burnished
Spring: Nirosta

Note:
Spring plungers are used as ejectors, damper pins, fixing and retaining pins. Assembly and dismantling using hexagon socket key and slotted screwdriver.

Ordering example Stroke max. = 10, l1 = 60, 16 x 2 = 1
422.010.060.1



Order-No.:	M							Spring rate	Spring force (N)	
	d_1	d_4	16 x 2	16 x 1,5	l_1	l_3	Stroke max.		initial	final
422.010.060.1	6	13,4	•		**60**	35	**10**	3,25	13	45,5
422.010.060.2	6	13,4		•	**60**	35	**10**	3,25	13	45,5
422.015.060.1	6	13,4	•		**60**	35	**15**	2,6	15	56
422.015.060.2	6	13,4		•	**60**	35	**15**	2,6	15	56
422.020.080.1	6	13,4	•		**80**	35	**20**	6,9	34,5	172,5
422.020.080.2	6	13,4		•	**80**	35	**20**	6,9	34,5	172,5
422.030.120.1	6	13,4	•		**120**	35	**30**	2	20	80
422.030.120.2	6	13,4		•	**120**	35	**30**	2	20	80
422.030.150.1	6	13,4	•		**150**	35	**30**	2,55	56,1	132,6
422.030.150.2	6	13,4		•	**150**	35	**30**	2,55	56,1	132,6
422.040.150.1	6	13,4	•		**150**	35	**40**	2,55	56,1	158,1
422.040.150.2	6	13,4		•	**150**	35	**40**	2,55	56,1	158,1
422.050.200.1	6	13,4	•		**200**	35	**50**	1,61	19,3	99,9
422.050.200.2	6	13,4		•	**200**	35	**50**	1,61	19,3	99,9
422.060.200.1	6	13,4	•		**200**	35	**60**	1,61	19,3	116,1
422.060.200.2	6	13,4		•	**200**	35	**60**	1,61	19,3	116,1
422.070.200.1	6	13,4	•		**200**	35	**70**	1,61	19,3	132,1
422.070.200.2	6	13,4		•	**200**	35	**70**	1,61	19,3	132,1
422.080.200.1	6	13,4	•		**200**	35	**80**	0,94	25	100,1
422.080.200.2	6	13,4		•	**200**	35	**80**	0,94	25	100,1

THRUST PAD DRIVER FOR SPRING PLUNGERS WITH HEXAGON SOCKETS

Order-No.: 427.M

Order-No.:	M
427.003	M3
427.004	M4
427.006	M6
427.008	M8
427.010	M10
427.012	M12
427.016	M16
427.020	M20
427.024	M24

INSERTION TOOL FOR SPRING PLUNGERS 4291. / 4292.

Order-No.: 429.M

Order-No.:	M
429.010	M10
429.012	M12
429.016	M16
429.022	M22
429.024	M24

INSERTION TOOL FOR SPRING PLUNGERS 421. / 422.

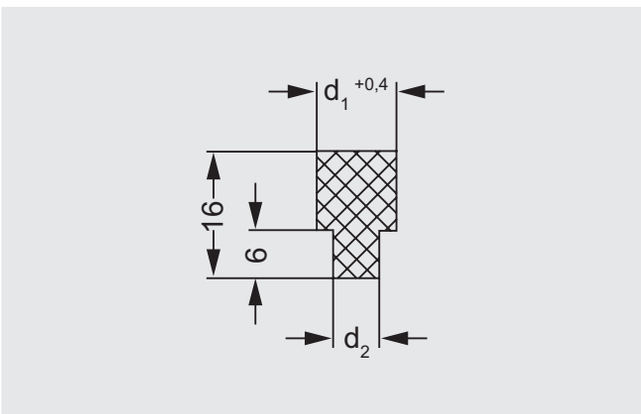
Order-No.: 428.

SHEDDER INSERT

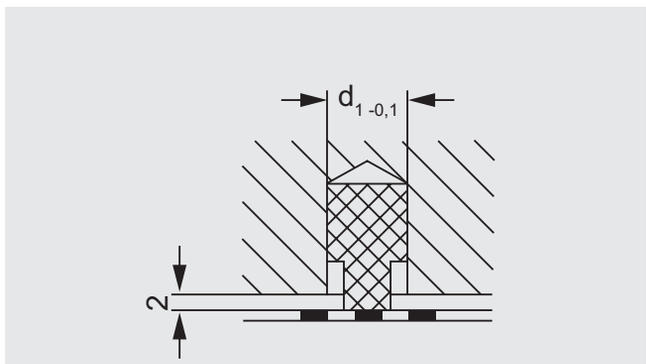
Order-No.: 522.d_1.L

Note:
Hardness: 90 Shore A

Ordering example: d_1 = 8, L = 16
522.008.016



Mounting example



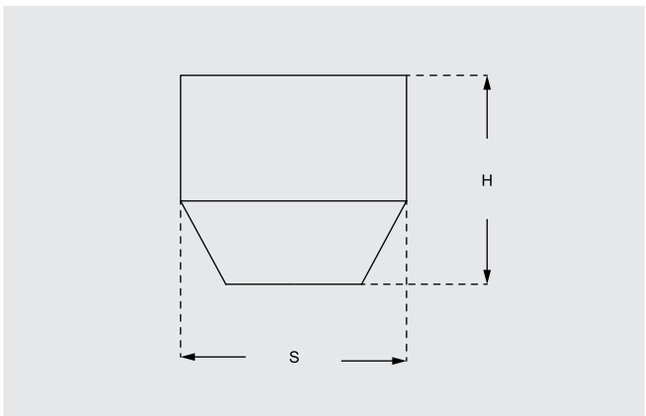
Order-No.:	d_1	d_2	L	Stripping force (daN)
522.008.016	**8**	4	**16**	20
522.010.016	**10**	6	**16**	25
522.012.016	**12**	8	**16**	30

ELASTOMER SPRING PLUNGER

Order-No.: 1353.20.S H

Material:
Elastomer 92SH

Ordering example: S = 6, H = 10
1353.20.0610



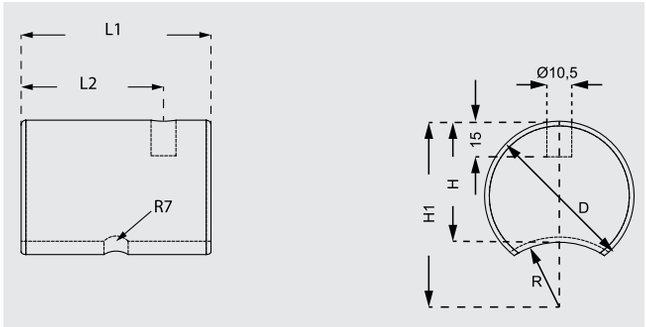
Order-No.:	S	H	F max. (N)
1353.20.0610	**6**	**10**	100
1353.20.1015	**10**	**15**	450
1353.20.1625	**16**	**25**	1500
1353.20.2425	**24**	**25**	3000
1353.20.4040	**40**	**40**	25000

ELASTOMER RETAINING ELEMENT

Order-No.: 1352.21.D L_1

Material:
Elastomer 92SH

Ordering example: D = 40, L_1 = 60
1352.21.4060



Order-No.:	D	H	H_1	L_1	L_2	R
1352.21.4060	**40**	32	50	**60**	45	18
1352.21.5080	**50**	40	63	**80**	60	23
1352.21.6380	**63**	51	86	**80**	60	35

Gas springs

OVERALL INFORMATION

Kreitzberg Normalien GmbH
METROL SPRINGS – Representation Germany

METROL SPRINGS, incorporated in 1984 in Northampton / Großbritannien, has developed into the biggest and most established manufacturer for gas springs in GB.

Besides gas springs for stamping and forming, METROL SPRINGS also manufactures gas springs and gas struts for different industrial sectors. Accessories, wire springs and drawing parts complete METROLS delivery portfolio.

Advantages of METROL SPRINGS gas springs:
2 Guarantee for two years: as a lot of new tools have to wait several months for their continuous service and METROL SPRINGS is convinced of the quality of their products, they are giving this extraordinary long guarantee.

Every METROL SPRINGS gas spring has a guarantee for 100.000 cycles. If used according to METROLS user guidlines, even a longer working life is possible.

METROL SPRINGS gas springs are easy to maintain. Up to 95 % of all used gas springs can be refurbished for reinstatement.

METROL SPRINGS gas springs are manufactured as follows: diameter of 12 – 195 mm, spring length of 44 – 760 mm, spring force of 7 – 125000 daN.

Besides the standard range of gas springs, METROL has the Low Force Increase series, special gas springs with low pressure build-up over total stroke.

The Mini Nitro-Springs series was originaly designed to replace die springs and can be used in small tools with narrow space conditions.

Additionally, METROL SPRINGS manufactures gas springs with extraordinary high spring force and compact measurements. (Heavy Duty Compact Series). METROL is also able to design and manufacture bespoke products to meet the needs of the customer.

All METROL SPRINGS cylinders are designed and manufactured in accordance with the ISO9001:2008 quality system and conform to the rigorous standards of the European Pressure Equipment Directive (PED2014/68/EU).

METROL SPRINGS has a very good value-for-money ratio. For further information, product data sheets and CAD-files please visit the METROL SPRINGS website.

www.metrol.com
Our worldwide distribution network provides support, wherever you are in the world.

We are glad to offer you an alternative for your current gas springs. Simply tell us your present supplier and the order-no. We will offer you an equivalent gas spring.

We are confident, that we are able to provide premium products at great conditions
Kreitzberg Normalien GmbH
Metrol Springs Representation Germany
Obere Leimbach 12
57074 Siegen
Tel.: 02 71 / 31 77 99 90
Fax: 02 71 / 31 77 99 80
mail@kreitzberg.de

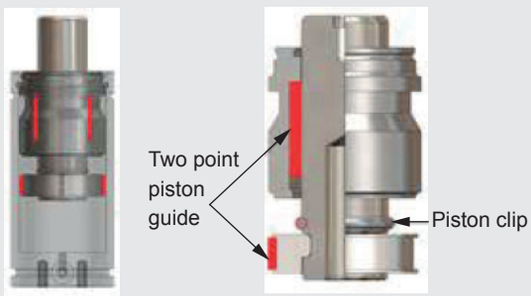
INDEX

Gas springs

Flexi guide design

Specially designed piston guides allow the piston to flex under side loads to elminate metal to metal contact, which can damage the piston rod surface. (large side forces still result in heat build up which can damage the seals).

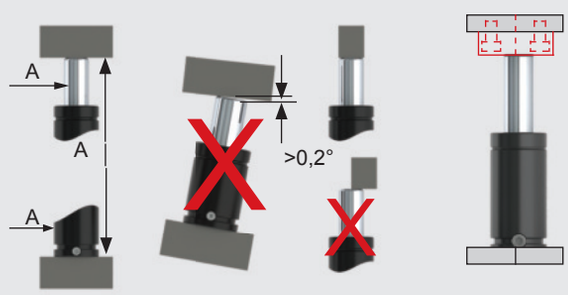
Rod and stop guided springs



The rod and stop guided springs utilise a two guide system. The main guide in the seal unit is designed to offer maximum guidance reducing the side load impact on the main seal.

The stop is also guided through the bore of the spring, with two areas of guidance the effects of side loading is reduced. This is considered to be the optimum design for durability and reducing the impact side loading.

Design guide for reducing side loading



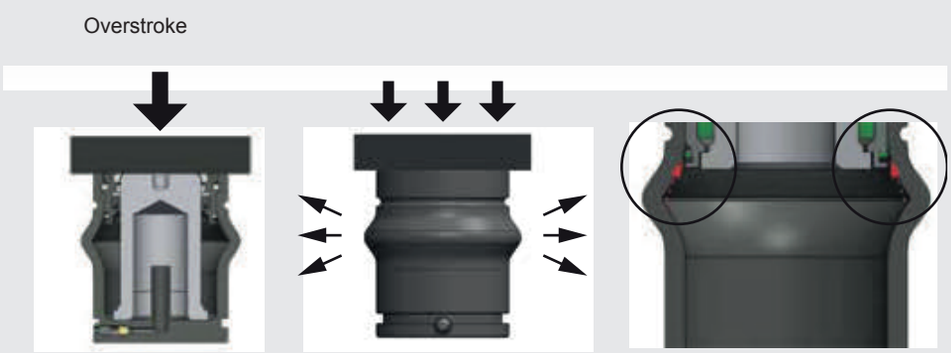
Gas springs must always work completely perpendicular to the contact surface. Side forces will dramatically reduce the life of the product.

Thrust plates protect against damage to the piston top and the tool contact area. Damage can introduce side loading, reducing the life of the gas spring.

Excess pressure protection

To protect gas springs from excess pressure, this design characteristic was developed to let escape the overly high-density gas.

Overstroke protection



To protect gas springs from overstroke, e.g. during impact of the tool on the spring, the cylinder walls were designed in order to expand to spread the excess pressure.

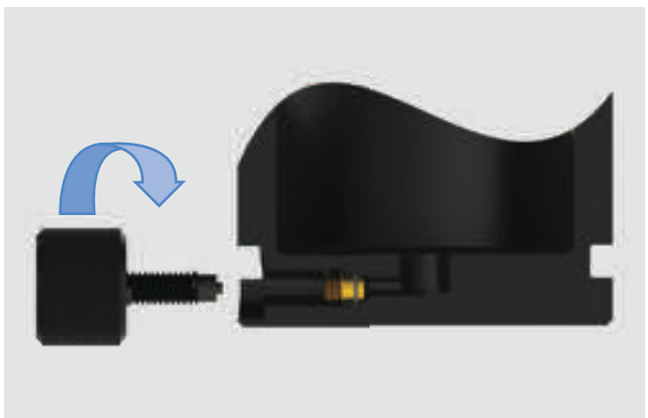
Charging, overhaul and maintenance

Before attempting any work on a gas spring system the person must have attended and passed the Metrol training course. Upon completion of the course a certifcate of competence is issued.
Attempting to perform work on a spring without completing the course may infringe safety and have a negative impacton the life of the product.
Overhaul and maintenance instructions are found in the manual. This manual is available to people who have completed the Metrol training course.

USE ONLY NITROGEN WHEN CHARGING - THE USE OF OXYGEN WILL CAUSE AN EXPLOSION.

To degas:

Withdraw the port plug.



Discharge the gas spring with the vent key, pressing slightly on the valve. Always ensure gas springs are inverted when degassing.

Only certifed trained personnel should perform work on gas springs.

Wear safety goggles.
Invert the cylinder.

When charging, ensure piston rod is fully extended. Maximium Charge pressure must not be exceeded.

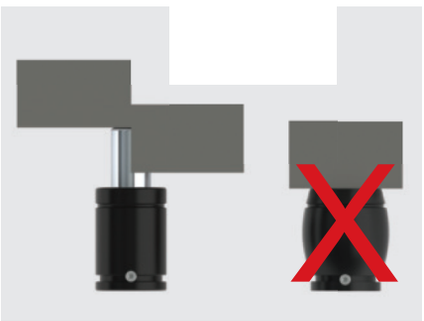
GAS SPRING SAFETY

Gas spring identification
All gas springs are permanently marked on the cylinder.

- Model type/stroke (e.g. ISNG.1500/050)
- Max. charge pressure
- Warning - use only nitrogen
- Serial number
- Date of manufacture
- CE / PED 97/23/EC

Tool safety warning plates
MET: 8218 – Mini warning plate 5 x 7 cm

MET: 8219 – Large warning plate 7,5 x 11,5 cm



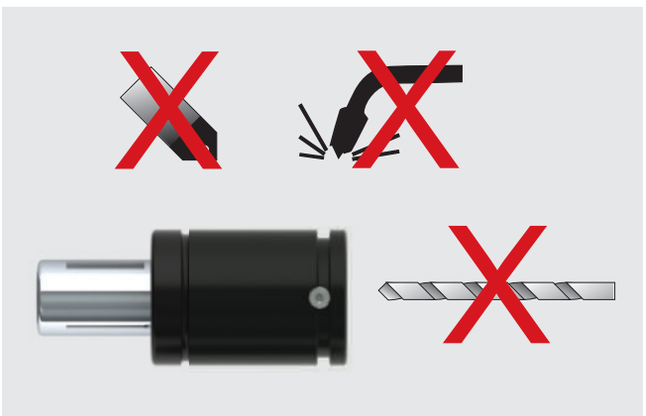
Any damage to the Gas Spring could affect safety and life of the product. The spring should be de-gassed and disposed of.

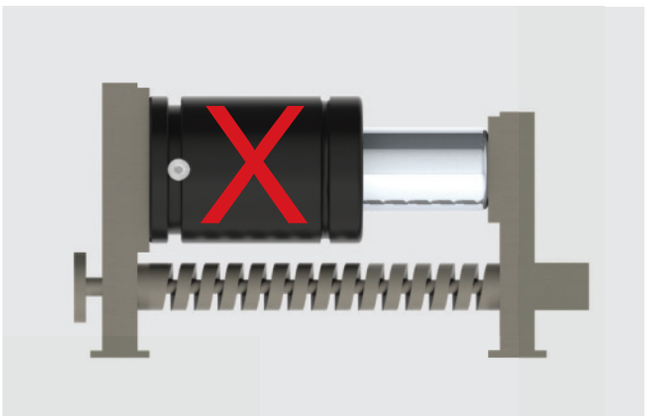
Use only nitrogen

Max working temperature

Protect from damage

Do not modify, machine, drill or weld gas springs



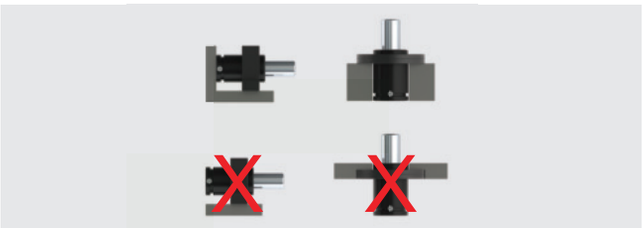


ASSEMBLY GUIDE

Correct assembly:

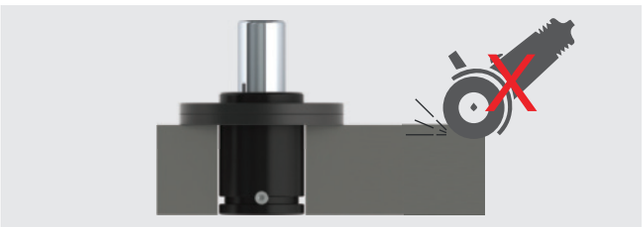
Ensure the gas spring sits on a flat surface. Uneven surfaces can cause side loading or structural damage.

Where possible, positively retain springs on a flat surface. Ensure bolts are tight and the spring cannot move. Do not use the threaded hole in piston, this is for maintenance only. Screws must have a clamping length of 2 to 4 x thread diameter and thread depth of 1 x thread diameter for steel and 1.5 x for cast iron.



Always use a torque wrench to tighten:

M6 10 Nm
M8 24 Nm
M10 45 Nm
M12 80 Nm
M16 160 – 180 Nm



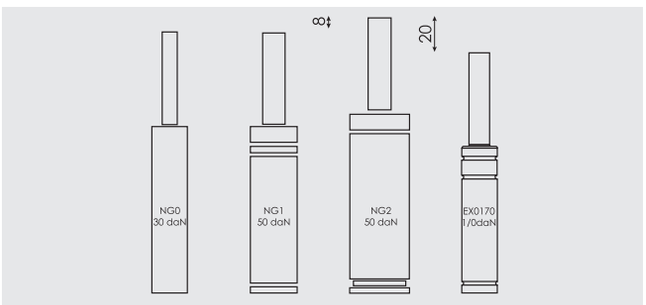
Gas springs should be protected from grinding dust during tool construction or maintenance. Grinding dust can adhere to the piston surface and mix with oil to create a grinding paste which can damage the main seal. If grinding has taken place near the springs, then the piston should be cleaned before operation.

Protect gas springs from liquid or solid contamination. Pockets should be cleaned regularly and equipped with drainage.

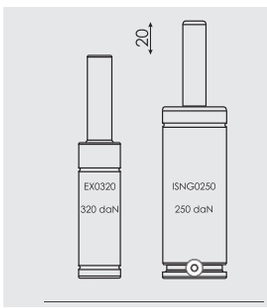
Do not use gas springs in such a way that the piston rod is released freely from its compressed position. This could cause internal damage.

GAS SPRING OVERVIEW

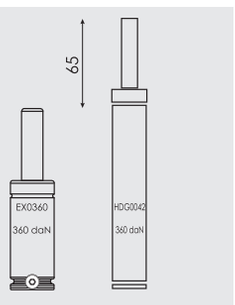
0 – 2500N



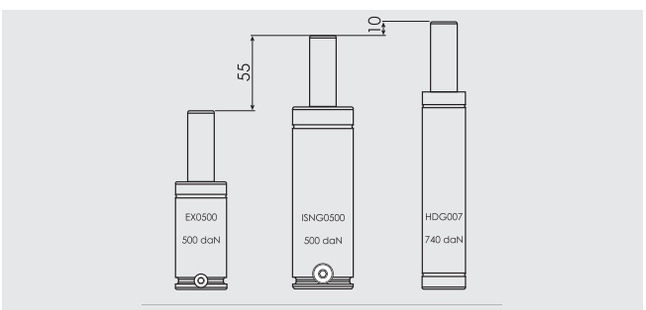
2500N – 3600N



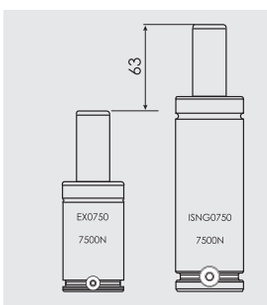
3600N – 5000N



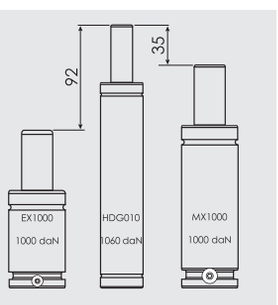
5000N – 7500N



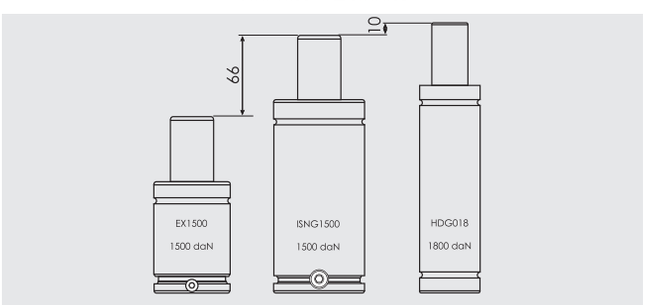
7500N – 10000N



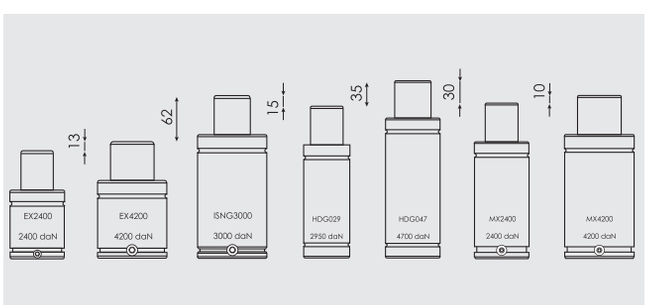
10000N – 15000N



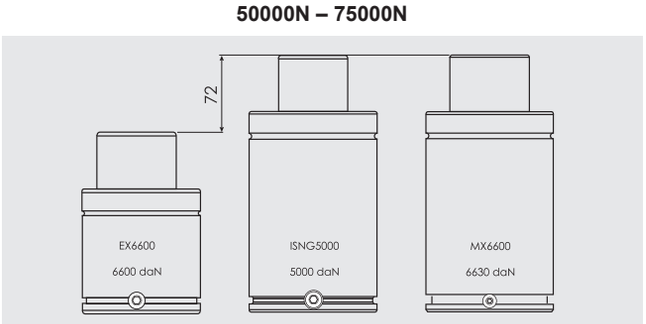
15000N – 24000N



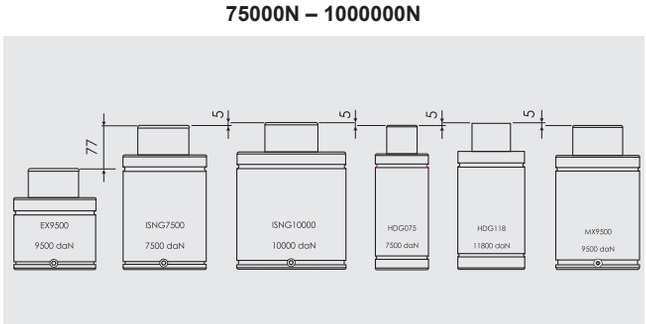
24000N – 50000N



50000N – 75000N



75000N – 1000000N

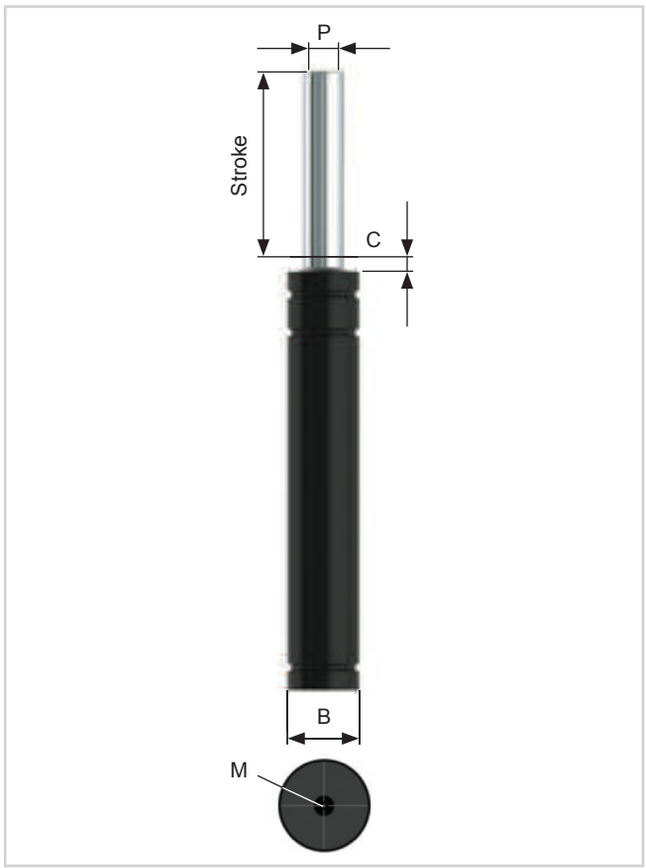


GAS SPRING OVERVIEW

Type	Initial force(daN)	Diameter (ø)	Stroke length (mm)
R12	50	12	7 – 125
R15	70	15	7 – 125
NG0	90	19	7 – 125
EX.00170.	170	19	7 – 125
NG1	200	24,9	10 – 125
NG2	200	32	10 – 125
ISNG.00250.	250	38	10 – 125
EX.00320.	320	24,9	7 – 125
EX.00360.	360	32	10 – 125
HDG.00420.	420	24,9	6 – 50
EX.00500.	500	38	10 – 125
ISNG.00500.	500	45	10 – 125
HS-EX.00500.	500	38	25 – 125
HDG.00750.	740	32	6 – 50
EX.00750.	750	45	10 – 125
ISNG.00750.	750	50	12,7 – 300
HS-EX.00750.	750	45	25 – 125
RSNG.00750.	750	50	12,7 – 300
EX.01000.	1000	50	13 – 125
MX.01000.	1000	50	13 – 300
HS-EX.01000.	1000	50	25 – 125
HS-MX.01000.	1000	50	13 – 300
HDG.01000.	1060		6 – 50
EX.01500.	1500	63	13 – 125
ISNG.01500.	1500	75	25 – 300
HS-EX.01500.	1500	63	25 – 125
HS-NG.01500.	1500	5	25 – 300
RSNG.01500.	1500	50	25 – 300
DSNG.01500.	1500	75	25 – 300
HDG.01800.	1800	75	6 – 50
EX.02400.	2400	75	16 – 125
MX.02400.	2400	75	25 – 300
HS-EX.02400.	2400	63,2	25 – 125
HS-MX.02400.	2400	95	25 – 300
HDG.03000.	2950	95	6 – 50
ISNG.03000.	3000	95	25 – 300
HS-NG.03000.	3000	95	25 – 300
RSNG.03000.	3000	95	25 – 300
DSNG.03000.	3000	95	25 – 300
EX.04200.	4200	95	16 – 125
MX.04200.	4200	95	25 – 300
HS-EX.04200.	4200	95	25 – 125
HS-MX.04200.	4200	95	25 – 300
HDG.04700.	4700	75	10 – 50
ISNG.05000.	5000	120	25 – 300
HS-NG.05000.	5000	120	25 – 300
RSNG.05000.	5000	120	25 – 300
DSNG.05000.	5000	120	25 – 300
EX.06600.	6600	120	16 – 125
HS-EX.06600.	6600	120	25 – 125
HS-MX.06600.	6600	120	25 – 300
MX.06600.	6630	120	25 – 300
ISNG.07500.	7500	150	25 – 300
HDG.07500.	7500	95	10 – 50
HS-NG.07500.	7500	150	25 – 300
RSNG.07500.	7500	150	25 – 300
DSNG.07500.	7500	150	25 – 300
EX.09500.	9500	150	19 – 125
MX.09500.	9500	150	25 – 300
HS-EX.09500.	9500	150	25 – 125
HS-MX.09500.	9500	150	25 – 300
ISNG.10000.	10000	195	25 – 300
HDG.11800.	11800	120	10 – 50

MINI NITRO SPRINGS SERIES

Overview



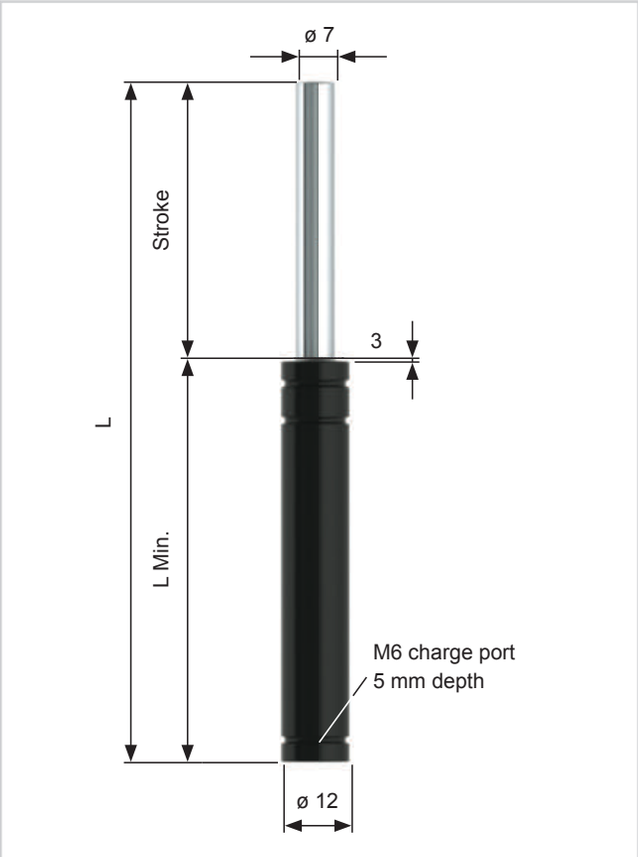
Type	M
R12	M6 x 1
R15	M6 x 1
NG0	M6 x 1
NG1	M6 x 1
NG2	M8 x 1

Originally designed to replace die springs, the Mini Nitro-Springs are a versatile range. Available in 19, 25 and 32mm diameters. Mini Nitro-Springs can be pre-set to four different pressures, represented by the colours, green, blue, red and yellow. An upper and lower C groove can be used for attachement with a front flange.

PED 97/23/EC

Use only nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Type	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe system		Overhaul
							Micro 24	CNOMO	
R12	6	12	50	7 – 125	3	DP, TH			
R15	7	15	70	7 – 125	3	DP, TH			
NG0	8	19	90	7 – 125	1	DP, TH			
NG1	12	24,9	200	10 – 125	1	DP, TH, FF			
NG2	12	32	200	10 – 125	1	DP, TH, FF, SFF, SF			

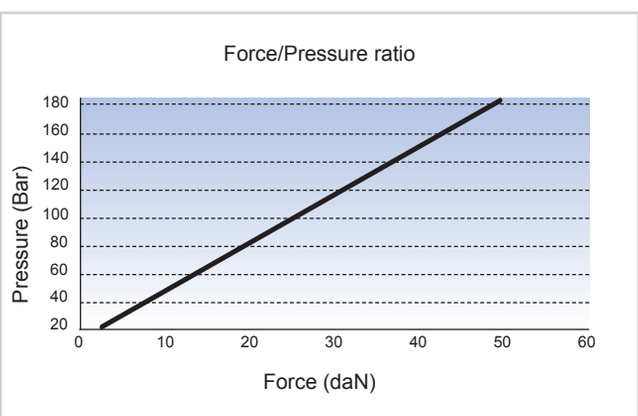


Order-No.: Type/Stroke	Charging pressure (Bar)	Force (DaN) @ 20°C		Colour
		Initial	End	
R12-045-XXX	45	13	53	Green
R12-090-XXX	90	25	80	Blue
R12-135-XXX	135	38	105	Red
R12-180-XXX	180	50	135	Yellow

Type	Stroke	L	L Min.
R12	7	56	49
	10	62	52
	13	67,4	57,7
	15	72	57
	19	80	61
	25	92	67
	38,1	118,2	80,1
	50	142	92
	63,5	172	108,5
	75	195	120
	80	205	125
	100	245	145
	125	295	170

Note:
Special stroke sizes available upon request.

Ordering example: Spring Type x Force + Stroke
R12.00013.050

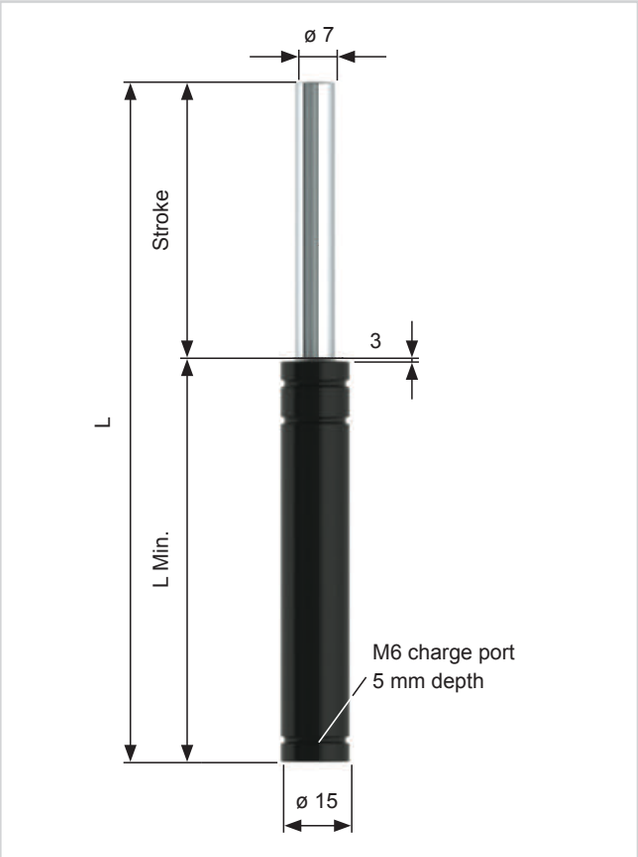


Mounting examples

(all dimensions are mm.)

Drop-in pocket

M6 Tapped hole

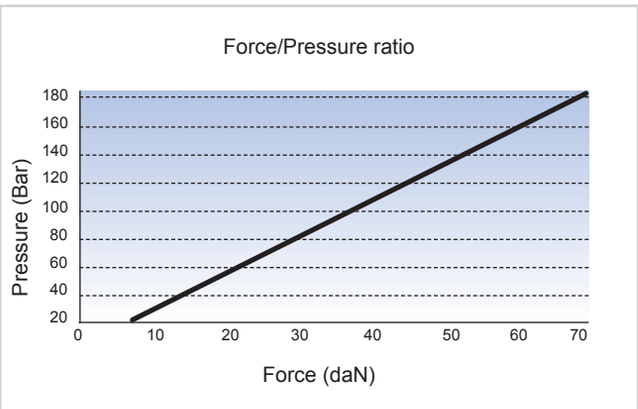


Order-No.: Type/Stroke	Charging pressure (Bar)	Force (DaN) @ 20°C		Colour
		Initial	End	
R15-045-XXX	45	18	53	Green
R15-090-XXX	90	35	80	Blue
R15-135-XXX	135	50	105	Red
R15-180-XXX	180	70	135	Yellow

Type	Stroke	L	L Min.
R15	7	56	49
	10	62	52
	13	67,4	57,7
	15	72	57
	19	80	61
	25	92	67
	38,1	118,2	80,1
	50	142	92
	63,5	172	108,5
	75	195	120
	80	205	125
	100	245	145
	125	295	170

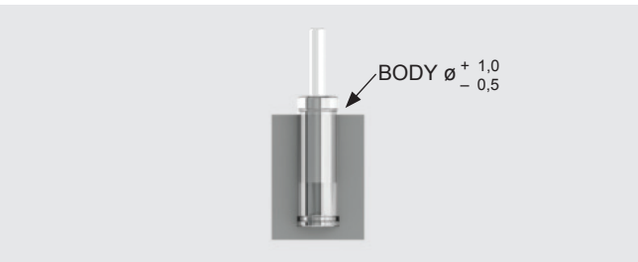
Note:
Special stroke sizes available upon request.

Ordering example: Spring Type x Force + Stroke
R15.00018.050



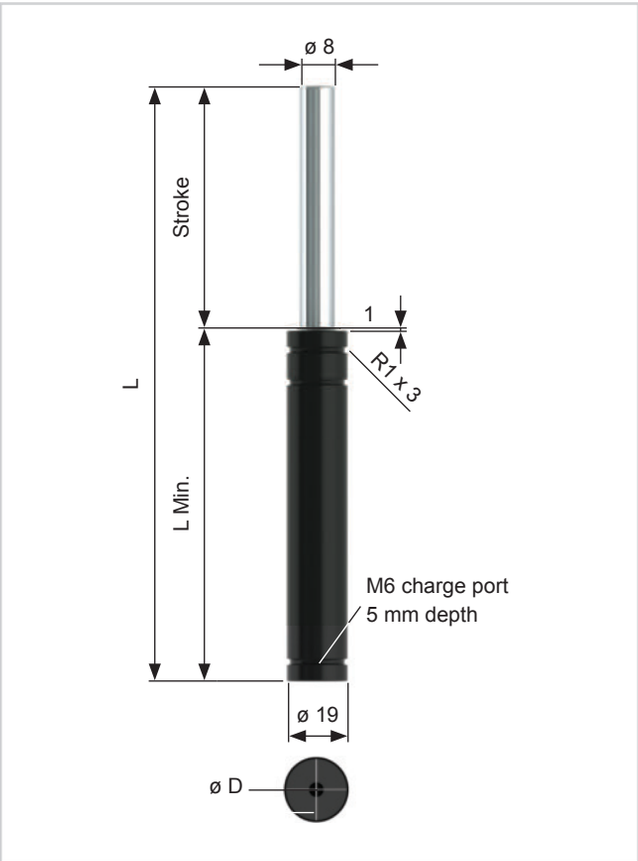
Mounting examples

(all dimensions are mm.)



Drop-in pocket

M6 Tapped hole

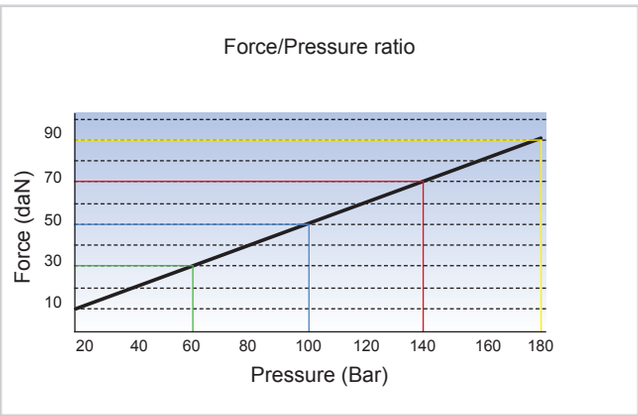


Order-No.: Type/Stroke	Charging pressure (Bar)	Force (DaN) @ 20°C		Colour
		Initial	End	
NG0-060-XXX	60	30	53	Green
NG0-100-XXX	100	50	80	Blue
NG0-140-XXX	140	70	105	Red
NG0-180-XXX	180	90	135	Yellow

Type	Stroke	L	L Min.
NG0	7	56	49
	10	62	52
	15	72	57
	25	92	67
	38,1	118,2	80,1
	50	142	92
	63,5	172	108,5
	80	205	125
	100	245	145
	125	295	170

Note:
Special stroke sizes available upon request.

Ordering example: Spring Type x Force + Stroke
NG0.00030.050

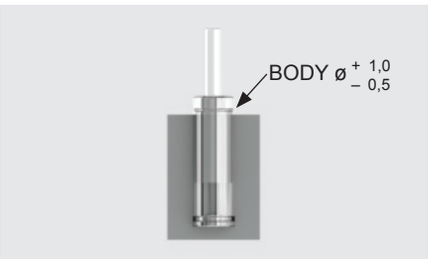


ISO PED 97/23/EC

Use only Nitrogen		
Max. pressure 180 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Mounting examples

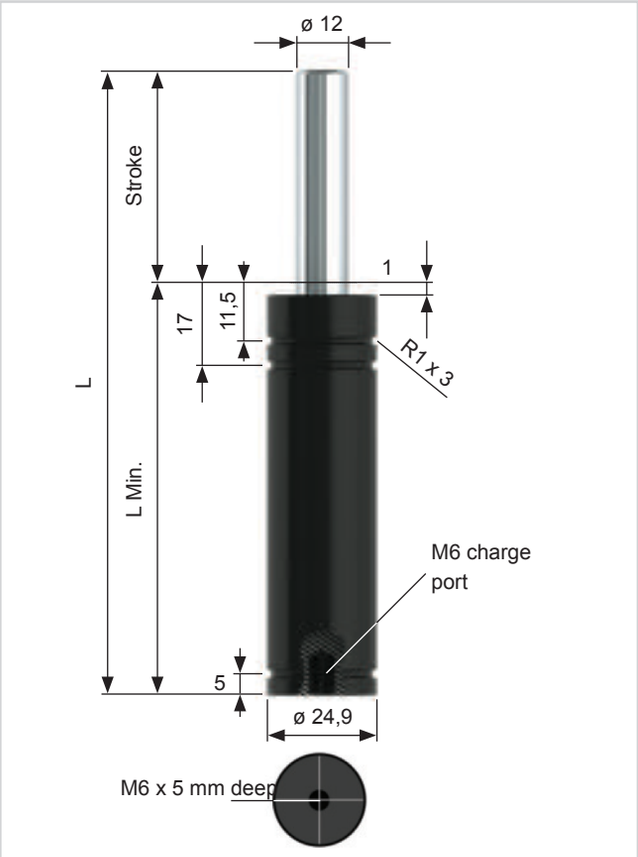
(all dimensions are mm)

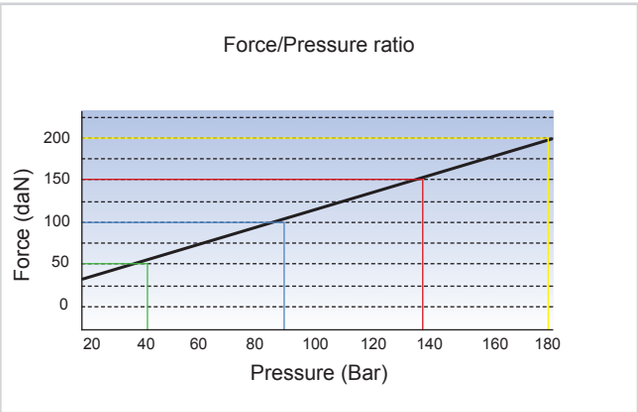


Drop-in Pocket

M6 tapped hole - only for strokes up to 25mm

Front Flange 19 FF





Order-No.: Type/Stroke	Charging pressure (Bar)	Force (DaN) @ 20°C		Colour
		Initial	End	
NG1-050-XXX	45	50	65	Green
NG1-100-XXX	90	100	131	Blue
NG1-150-XXX	135	150	196	Red
NG1-200-XXX	180	200	262	Yellow

Type	Stroke	L	L Min.
NG1	10	62	52
	12,7	67,4	54,7
	15	72	57
	16	74	58
	25	92	67
	38,1	118,2	80,1
	50	142	92
	63,5	172	108,5
	80	205	125
	100	245	145
	125	295	170
	150	353	203
	160	373	213
	175	403	228
	200	453	253

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Spring Type x Force + Stroke + Mounting
NG1.00050.050.FF

Ordering example with HT: HT.NG1.00050.050.FF

ISO PED 97/23/EC

Use only Nitrogen		
Max. pressure: 180 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Mounting examples

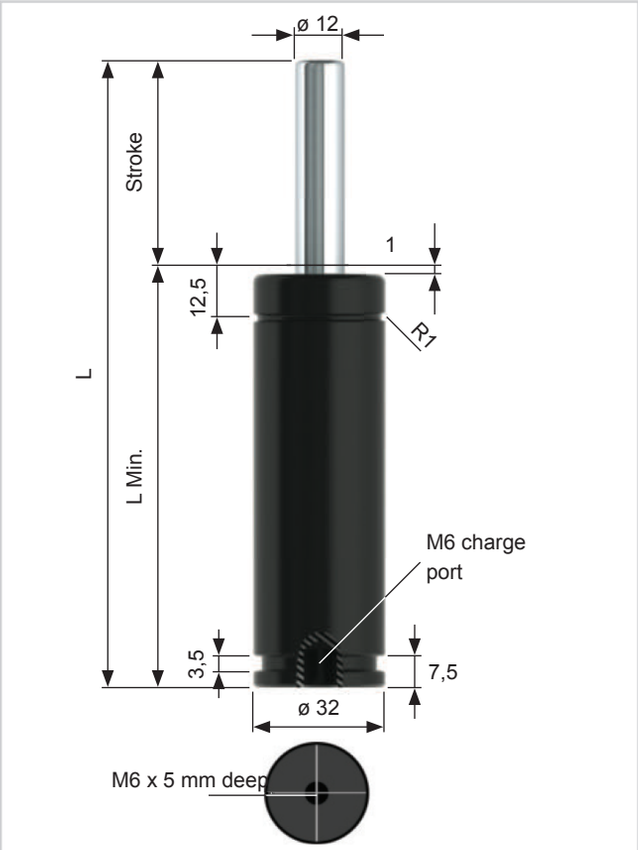
(all dimensions are mm)

Drop-in pocket

Front Flange

M6 tapped hole, for strokes up to 25mm

End Support 25 ES

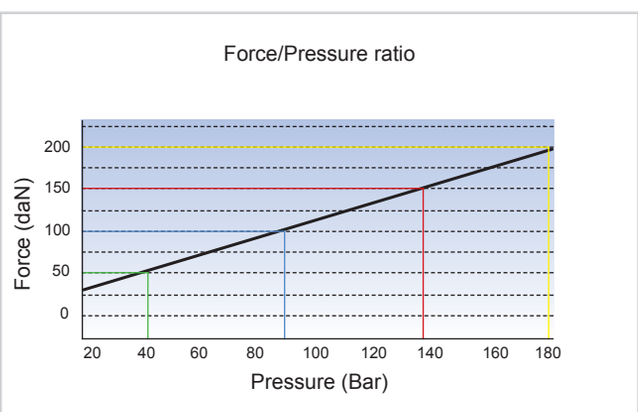


Order-No.: Type/Stroke	Charging pressure (Bar)	Force (DaN) @ 20°C		Colour
		Initial	End	
NG2-050-XXX	45	50	65	Green
NG2-100-XXX	90	100	131	Blue
NG2-150-XXX	135	150	196	Red
NG2-200-XXX	180	200	262	Yellow

Type	Stroke	L	L Min.
NG2	10	70	60
	12,7	75,4	62,7
	16	82	66
	25	100	75
	38,1	126,2	88,1
	50	150	100
	63,5	177	113,5
	80	210	130
	100	250	150
	125	300	175

Note:
Special stroke sizes available upon request.

Ordering example: Spring Type x Force + Stroke + Mounting
NG2.00050.050.FF



ISO PED 97/23/EC

Use only Nitrogen		
Max. pressure: 180 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Mounting examples

(All dimensions are mm)

M8 Tapped Hole

Square Font Flange 32 SFF

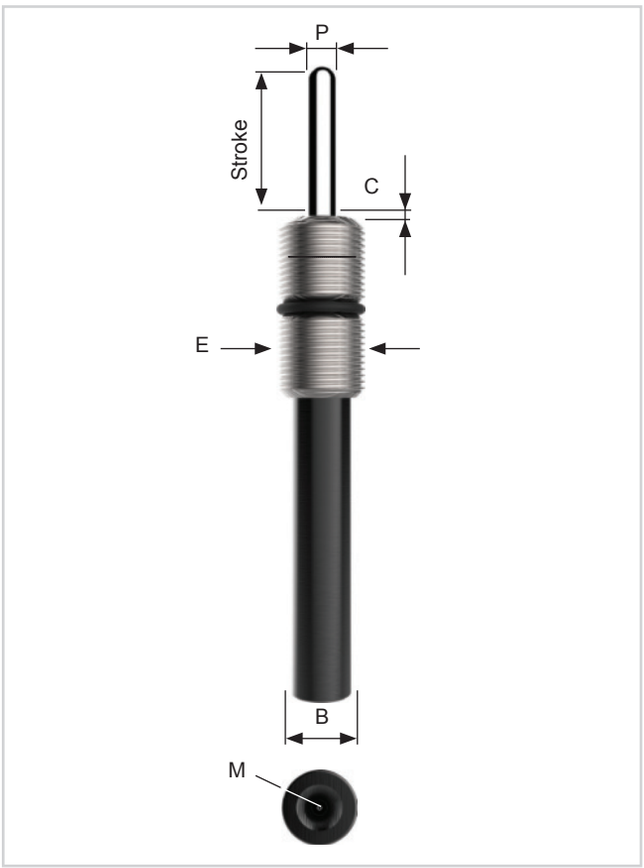
Front Flange 32 FF

Square Flange 32 SF

Drop-in pocket

EP SERIES, EJECTOR SPRINGS

Overview



Type	M	E
EP2-16x1,5	M6x5	M16x1,5
EP2-16x2	M6x5	M16x2
EP2-24x1,5	M6x5	M24x1,5

The MNE range of ejector springs are designed to be mounted in a threaded pocket, (built into the application), enabling the part to be 'ejected' from the mould after the cpmpression cycle is complete.

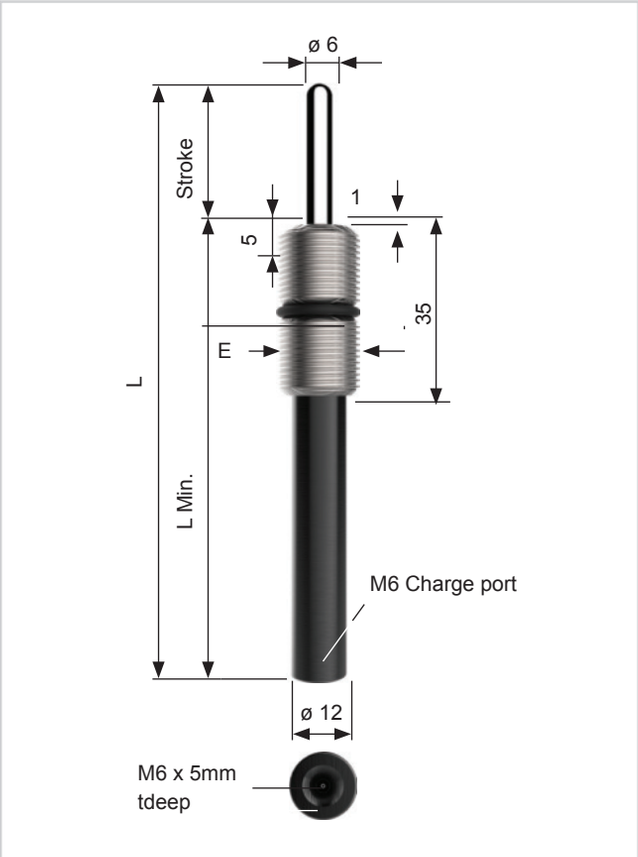
The EP2-16 version is available with einther a 1,5mm or 2mm pitch for compatibility. The EP2-24 is available with either a 12mm or 20mm diameter body.

This range of ejectors are available with either a 12mm or 20mm diameter body.

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 12 Bar	Max. piston velocity: 1,6 m/Sek.

Type	P	B	Initial force (daN)	Stroke range	C	Pipe system		Overhaul
						Micro24	CNOMO	
EP2-16x1,5	6	12	420	7 – 125	1			
EP2-16x2	6	12	420	7 - 125	1			
EP2-24x1,5	12	20	1700	65 - 125	1			

EP2-16



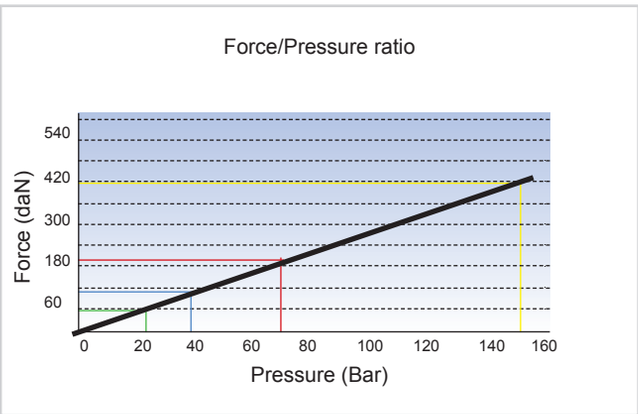
Order-No.: Type/Stroke	E	Charging pressure (Bar)	Force (daN) @ 20°C		Colour
			Initial	End	
EP2-16x(E)-020 -XXX	1,5/2	20	57	95	Green
EP2-16x(E)-040 -XXX	1,5/2	40	110	190	Blue
EP2-16x(E)-075 -XXX	1,5/2	75	210	360	Red
EP2-16x(E)-150 -XXX	1,5/2	150	420	715	Yellow

Type	Stroke	L	L Min.
EP2-16x1,5/ EP2-16x2	10	65	55
	20	85	65
	30	105	75
	40	125	85
	50	145	95
	60	165	105
	70	185	115
	80	205	125
	100	245	145
	125	295	170

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Spring Type + Force + Stroke
EP2-16x15.00020.050

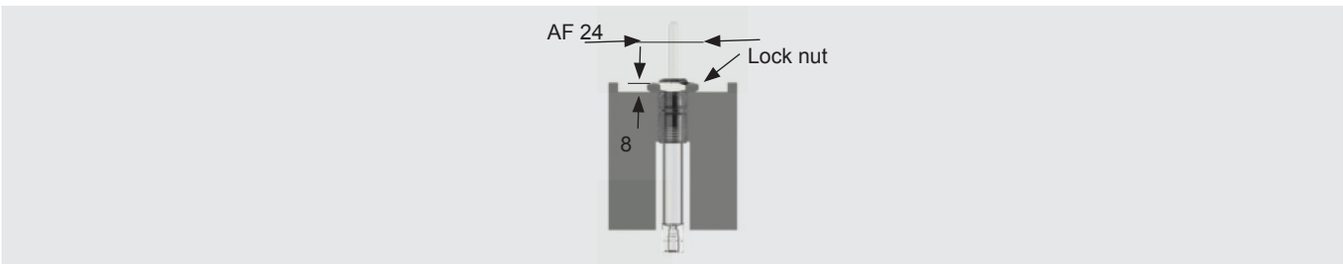
Ordering example with HT: HT. EP2-16x15.00020.050



Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 12 Bar	Max. piston velocity: 1,6 m/Sek.

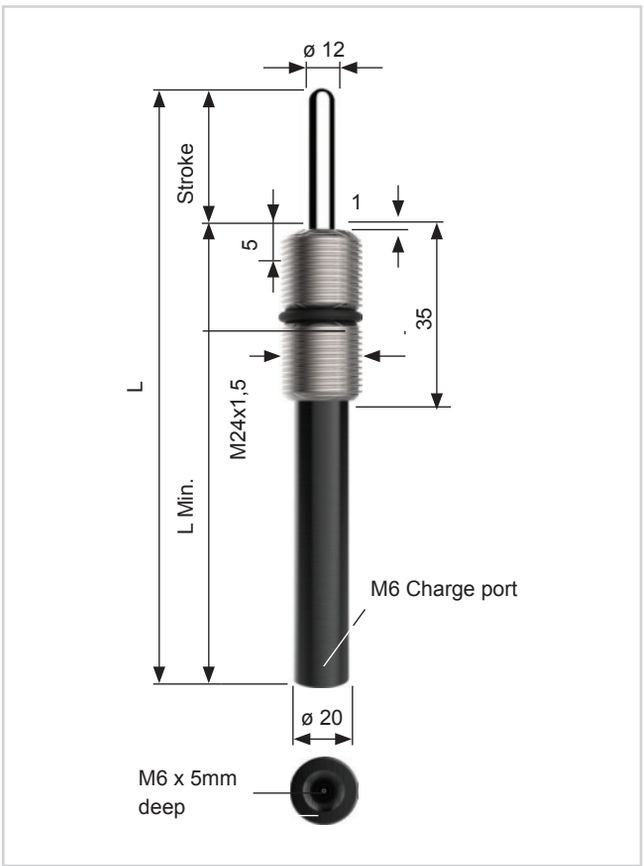
Mounting examples

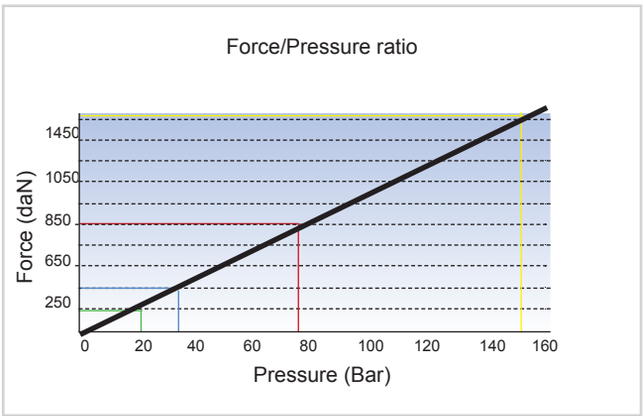
(All dimensions are mm.)



Threaded pocket

EP2-24





Order-No.: Type/Stroke	Charging pressure (Bar)	Force (daN) @ 20°C		Colour
		Initial	End	
EP2-24x1,5-020 -XXX	20	230	390	Green
EP2-24x1,5-040 -XXX	40	450	800	Blue
EP2-24x1,5-075 -XXX	75	850	1500	Red
EP2-24x1,5-150 -XXX	150	1700	2900	Yellow

Type	Stroke	L	L Min.
EP2-24x1,5	10	65	55
	20	85	65
	30	105	75
	40	125	85
	50	145	95
	60	165	105
	70	185	115
	80	205	125
	100	245	145
	125	295	170

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

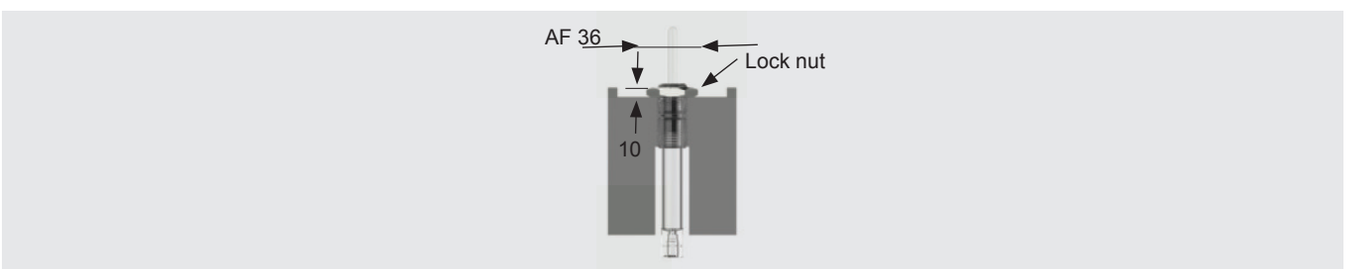
Ordering example: Spring Type + Force + Stroke
EP2-24x15.00020.050

Ordering example with HT: HT.EP2-24x15.00020.050

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 6 Bar	Max. piston velocity: 1,6 m/Sek.

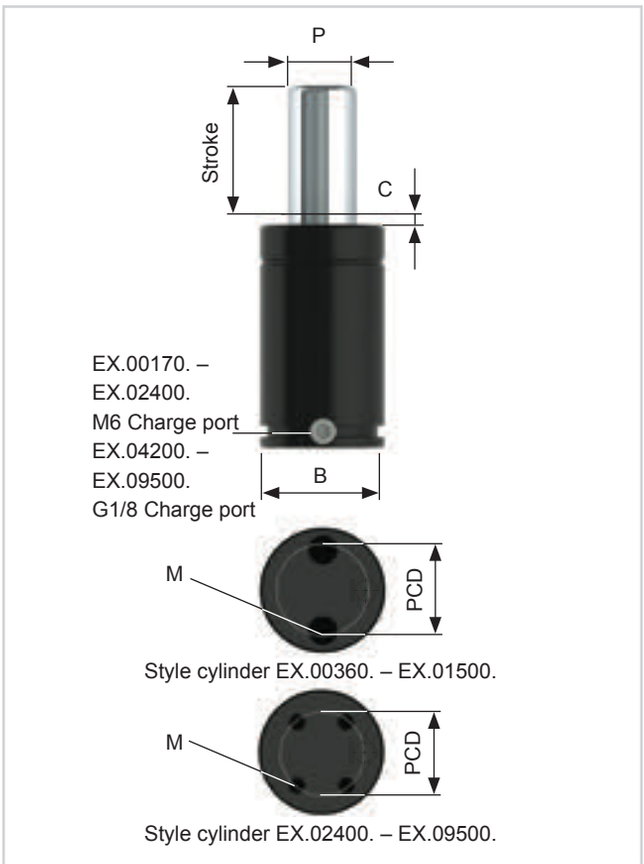
Mounting examples

(All dimensions are mm.)



Threaded pocket

EX SERIES
Overview



Type	PCD	M	Tapped hole depth
EX.00170.	–	M6 x 1	1 x M6 x 5 mm
EX.00320.	–	M6 x 1	1 x M6 x 5 mm
EX.00360.	20	M6 x 2	1 x M6 x 6 mm
EX.00500.	25	M6 x 2	1 x M6 x 6 mm
EX.00750.	20	M8 x 2	2 x M8 x 6 mm
EX.01000.	20	M8 x 2	2 x M8 x 6 mm
EX.01500.	20	M8 x 2	2 x M8 x 6 mm
EX.02400.	40	M8 x 4	4 x M8 x 6 mm
EX.04200.	60	M8 x 4	4 x M8 x 12 mm
EX.06600.	80	M10 x 4	4 x M10 x 12 mm
EX.09500.	100	M10 x 4	4 x M10 x 13 mm

The EX range is our most powerful, compact rod sealed gas spring. Special rod guiding elements in the seal unit reduce side load impact to prevent rod and seal wear, increasing durability and seal life.
EX0170 and EX0320 have upper and lower C grooves for front flange mounting.

EX0360 > EX9500 the upper C groove and lower U groove allow numerous flange mounting options.
EX0360 > EX2400 there is an M6 side port for charging and also connecting in series using the Micro hose system or CNOMO hose system.
EX4200 > EX9500 there is a G1/8 side port for charging and connecting in series using the CNOMO hose system.

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

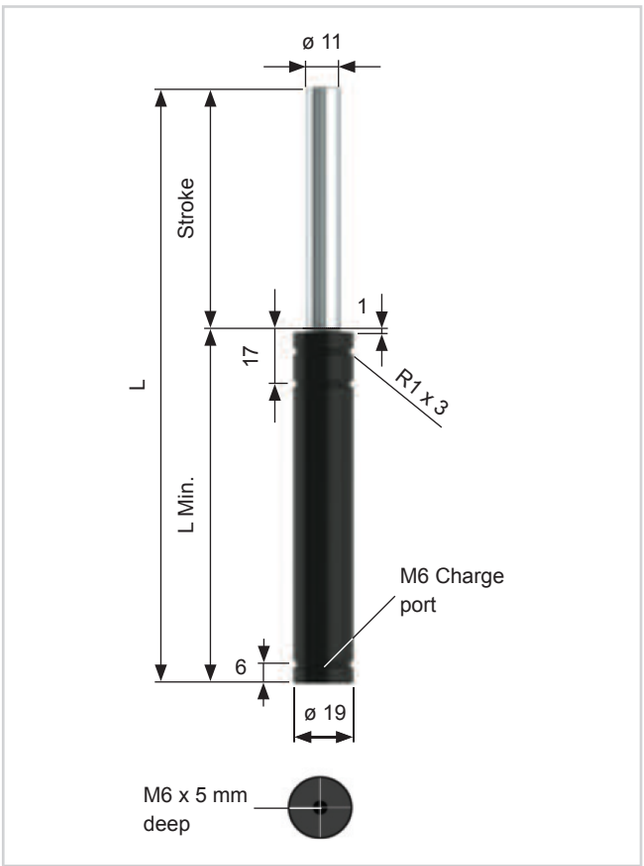
Service-Kit available

ISO

PED 97/23/EC

Type	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe-System		Overhaul
							Micro 24	CNOMO	
EX.00170.	11	19	170	7 – 125	1	DP, TH, FF			
EX.00320.	15	24,9	320	7 – 125	1	DP, TH, FF, ES			
EX.00360.	16	32	360	10 – 125	2	TH, FF, SF	•	•	•
EX.00500.	20	38	500	10 – 125	2	TH, FF, SF, SFF, ES	•	•	•
EX.00750.	25	45	750	10 – 125	2	TH, FF, SF, SFF, ES	•	•	•
EX.01000.	28	50	1000	13 – 125	3	TH, FF, SF, SFF, ES, BP	•	•	•
EX.01500.	36	63	1500	13 – 125	3	TH, FF, SF, SFF, ES, BP	•	•	•
EX.02400.	45	75	2400	16 – 125	3	TH, FF, SF, SFF, ES, BP	•	•	•
EX.04200.	60	95	4200	16 – 125	3	TH, FF, SF, SFF, ES, BP	•	•	•
EX.06600.	75	120	6600	16 – 125	3	TH, FF, SF, SFF, ES, BP	•	•	•
EX.09500.	90	150	9500	19 – 125	3	TH, FF, SF, SFF, BP	•	•	•

EX.00170.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.00170.007	**170**	250	37	44	0,002	0,06
EX.00170.010		270	40	50	0,002	0,06
EX.00170.015		270	45	60	0,004	0,07
EX.00170.019		270	49	68	0,005	0,07
EX.00170.025		270	55	80	0,006	0,08
EX.00170.038		280	68	106	0,009	0,09
EX.00170.050		280	80	130	0,012	0,10
EX.00170.063		285	93	156	0,015	0,12
EX.00170.075		285	110	185	0,018	0,14
EX.00170.080		285	115	195	0,019	0,14
EX.00170.100		280	135	235	0,024	0,16
EX.00170.125		275	160	285	0,030	0,19

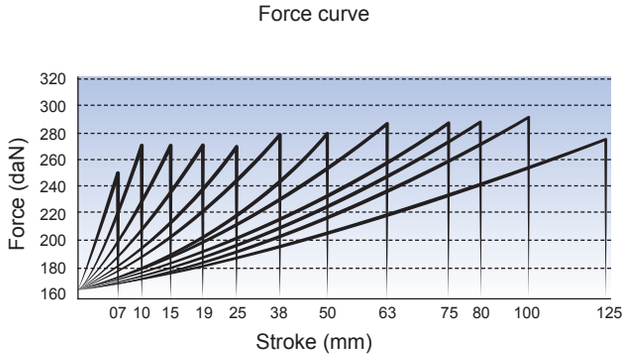
Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

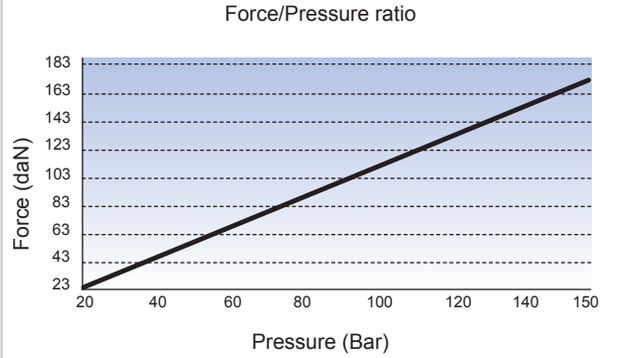
Ordering example: Type x Stroke + Mounting
EX.00170.050.FF

Ordering example with HT: HT.EX.00170.050.FF

Use only Nitrogen

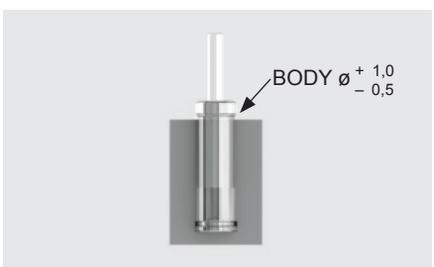
Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

(All diemensions are mm.)

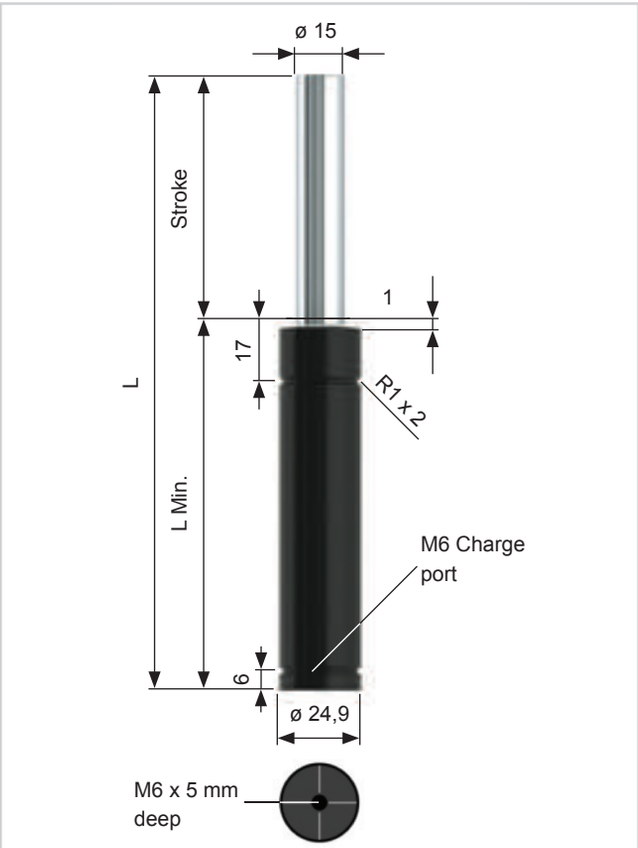


Drop-in pocket

Front Flange FF

M6 Tapped hole / Only for strokes up to 25 mm.

EX.00320.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.00320.007	**320**	480	37	44	0,004	0,10
EX.00320.010		490	40	50	0,005	0,11
EX.00320.015		510	45	60	0,007	0,12
EX.00320.019		510	49	68	0,009	0,13
EX.00320.025		520	55	80	0,011	0,14
EX.00320.038		530	68	106	0,017	0,16
EX.00320.050		530	80	130	0,022	0,19
EX.00320.063		530	93	156	0,028	0,21
EX.00320.075		530	110	185	0,034	0,24
EX.00320.080		530	115	195	0,036	0,25
EX.00320.100		530	135	235	0,044	0,29
EX.00320.125		530	160	285	0,055	0,33

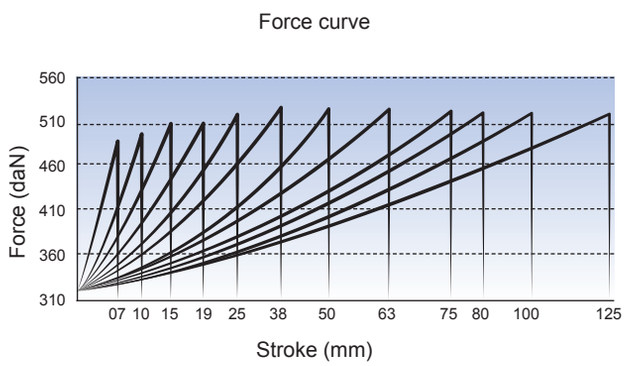
Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

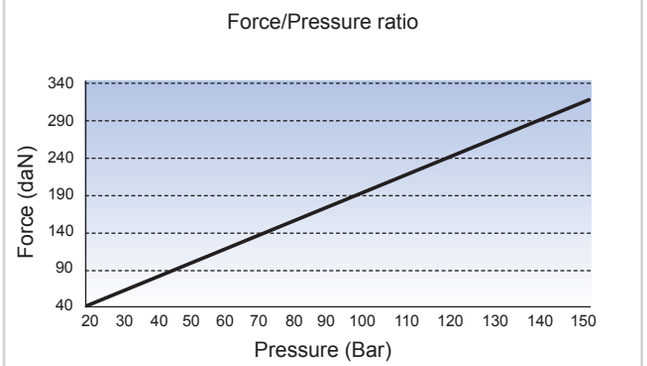
Ordering example: Type x Stroke + Mounting
EX.00320.050.FF

Ordering example with HT: HT.EX.00320.050.FF

Use only Nitrogen

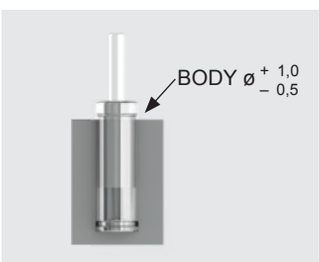
Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

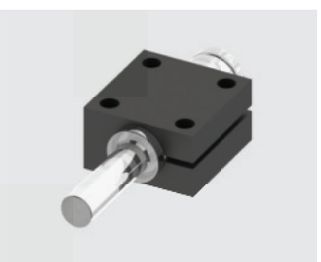
(All dimensions are mm.)



Drop-in pocket

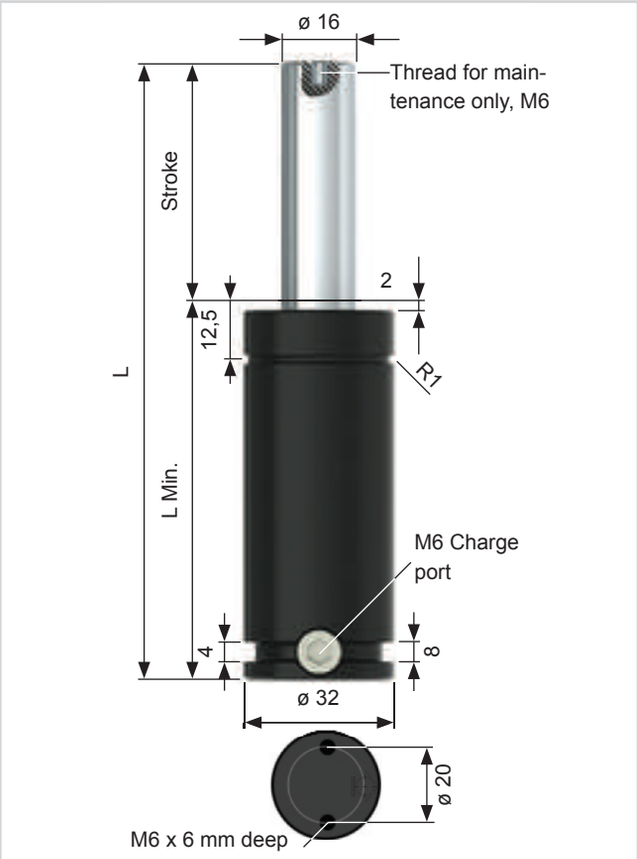
Front Flange FF

**M6 Tapped hole /
Only for strokes up to 25 mm.**



End Support 25 ES

EX.00360.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.00360.010	**360**	520	40	50	0,01	0,17
EX.00360.013		510	43	56	0,01	0,18
EX.00360.016		515	46	62	0,01	0,19
EX.00360.019		520	49	68	0,01	0,20
EX.00360.025		527	55	80	0,02	0,22
EX.00360.032		532	62	94	0,02	0,24
EX.00360.038		535	68	106	0,03	0,26
EX.00360.050		540	80	130	0,03	0,29
EX.00360.063		552	93	156	0,04	0,33
EX.00360.075		553	105	180	0,05	0,37
EX.00360.080		546	110	190	0,05	0,39
EX.00360.100		548	130	230	0,06	0,45
EX.00360.125		550	155	280	0,08	0,52

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
EX.00360.050.FF

Ordering example with HT: HT.EX.00360.050.FF

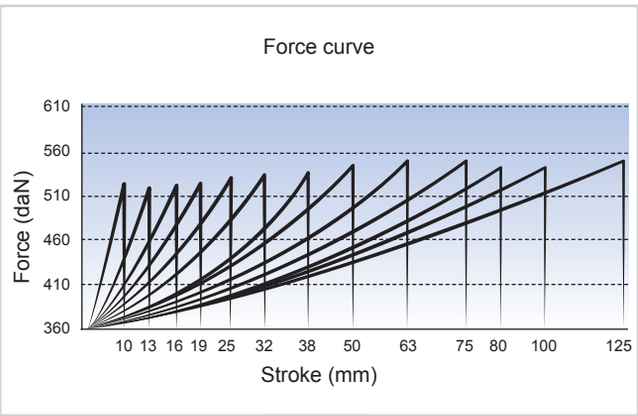
Service-Kit available

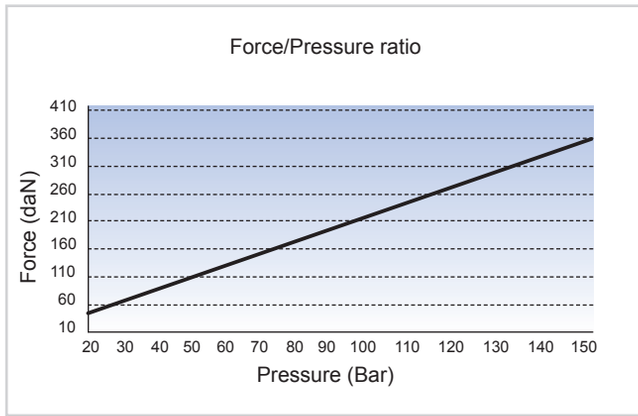
ISO

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

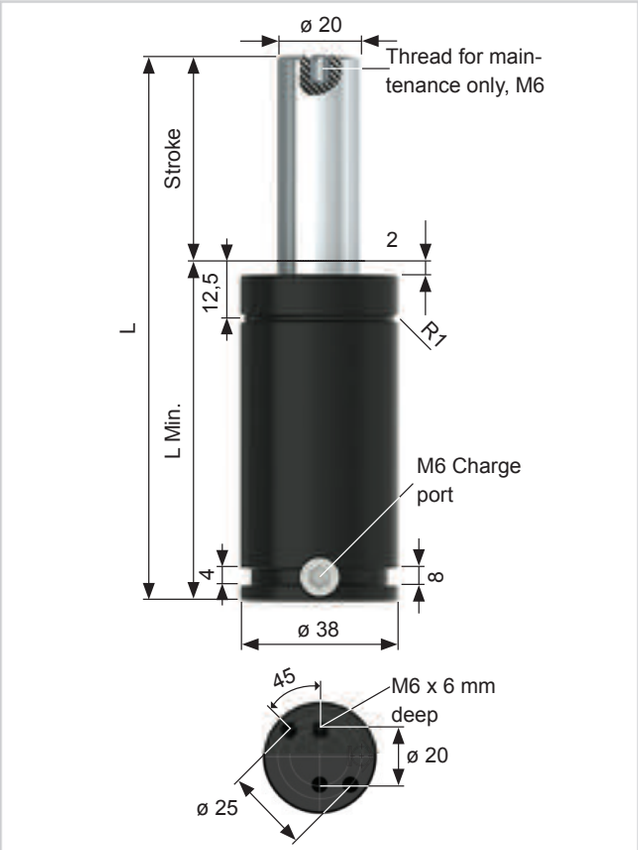
2 x M6 Tapped holes

Square Front Flange 32 SFF

Front Flange 32 FF

Square Flange 32 SF

EX.00500.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.00500.010	**500**	764	40	50	0,01	0,25
EX.00500.013		746	43	56	0,01	0,26
EX.00500.016		754	46	62	0,02	0,27
EX.00500.019		767	49	68	0,02	0,28
EX.00500.025		779	55	80	0,03	0,31
EX.00500.032		788	62	94	0,03	0,34
EX.00500.038		795	68	106	0,04	0,36
EX.00500.050		803	80	130	0,05	0,40
EX.00500.063		825	93	156	0,06	0,45
EX.00500.075		826	105	180	0,07	0,50
EX.00500.080		814	110	190	0,08	0,52
EX.00500.100		817	130	230	0,10	0,60
EX.00500.125		821	155	280	0,12	0,70

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
EX.00500.050.FF

Ordering example with HT: HT.EX.00500.050.FF

Service-Kit available

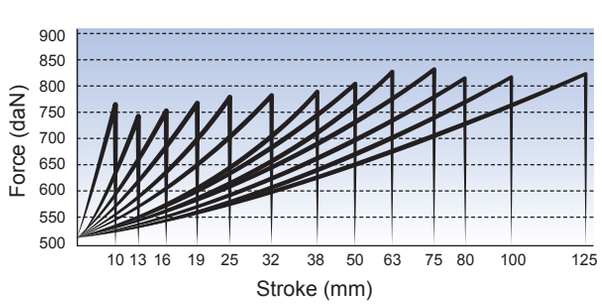
ISO

PED 97/23/EC

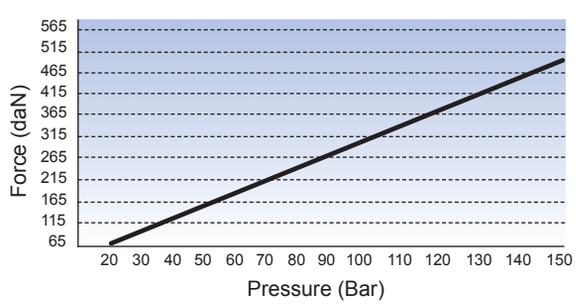
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

2 x M6 Tapped holes

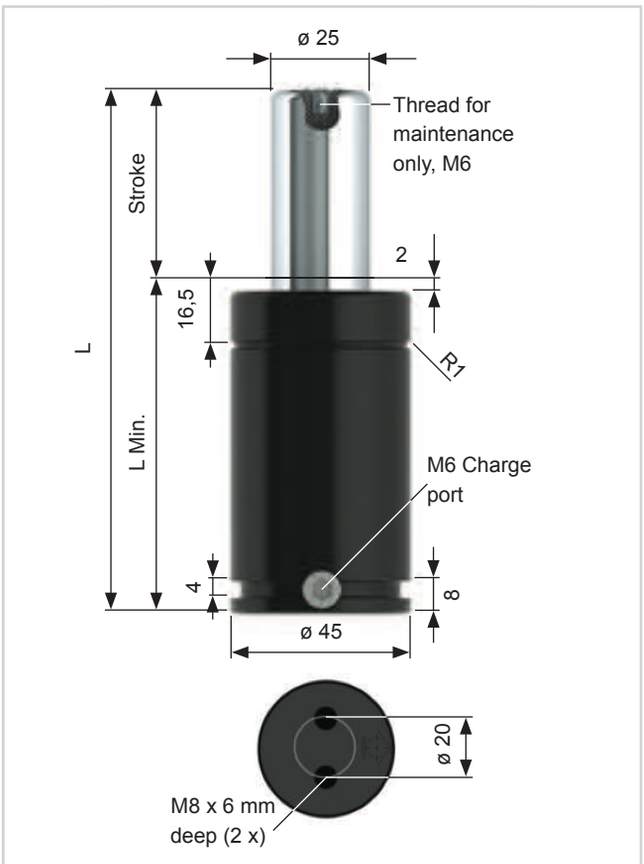
Square Front Flange 38 SFF

Front Flange 38 FF

Square Flange 38 SF

End Support 38 ES

EX.00750.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.00750.010	**750**	1105	42	52	0,02	0,37
EX.00750.013		1085	45	58	0,02	0,39
EX.00750.016		1100	48	64	0,03	0,41
EX.00750.019		1120	51	70	0,03	0,41
EX.00750.025		1145	57	82	0,04	0,45
EX.00750.032		1160	64	96	0,05	0,50
EX.00750.038		1170	70	108	0,05	0,53
EX.00750.050		1180	82	132	0,07	0,61
EX.00750.063		1220	95	158	0,09	0,69
EX.00750.075		1225	107	182	0,10	0,77
EX.00750.080		1210	112	192	0,11	0,80
EX.00750.100		1215	132	232	0,13	0,93
EX.00750.125		1220	157	282	0,17	1,09

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
EX.00750.050.FF

Ordering example with HT: HT.EX.00750.050.FF

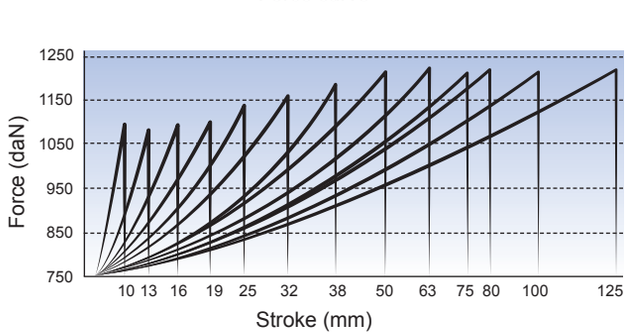
Service-Kit available

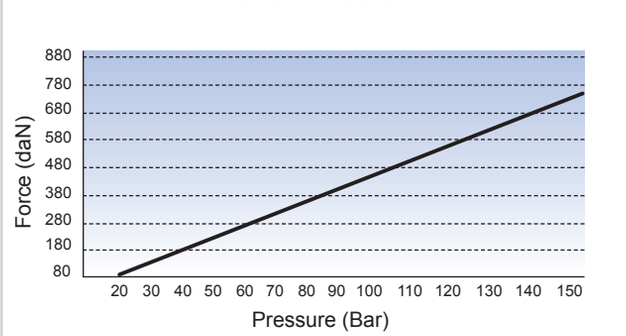
ISO

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

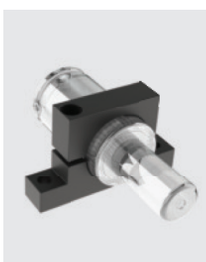
2 x M8 Tapped holes

Square Front Flange 45 SFF

Front Flange 45 FF

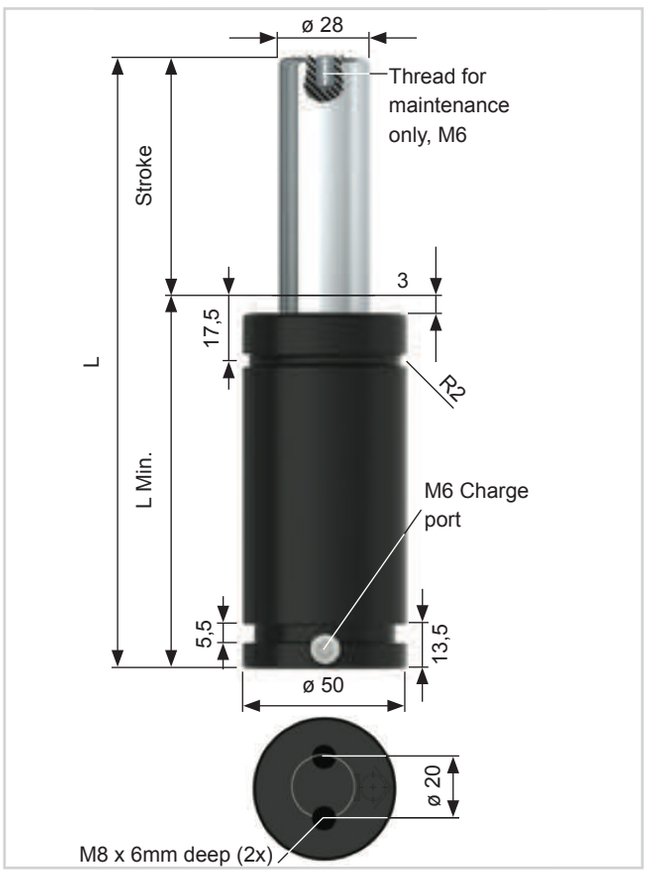
Square Flange 45 SF

Base Plate 45 BP



End Support 45 ES

EX.01000.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.01000.013	**1000**	1564	51	64	0,03	0,50
EX.01000.016		1580	54	70	0,04	0,52
EX.01000.019		1610	57	76	0,04	0,54
EX.01000.025		1630	63	88	0,05	0,59
EX.01000.032		1650	70	102	0,06	0,64
EX.01000.038		1660	76	114	0,07	0,70
EX.01000.050		1680	88	138	0,09	0,79
EX.01000.063		1730	101	164	0,11	0,89
EX.01000.075		1730	113	188	0,13	0,99
EX.01000.080		1700	118	198	0,14	1,03
EX.01000.100		1710	138	238	0,17	1,19
EX.01000.125		1715	163	288	0,21	1,39

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
EX.01000.050.FF

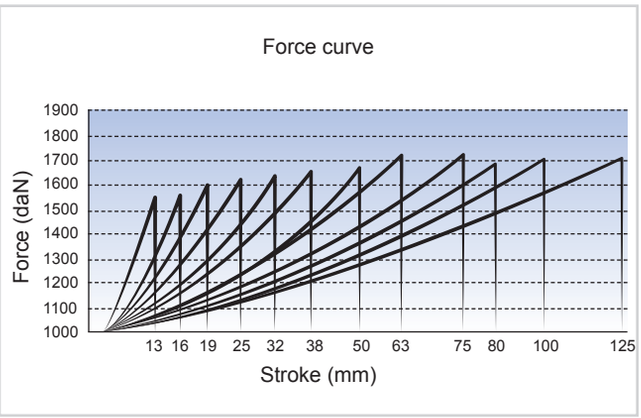
Ordering example with HT: HT.EX.01000.050.FF

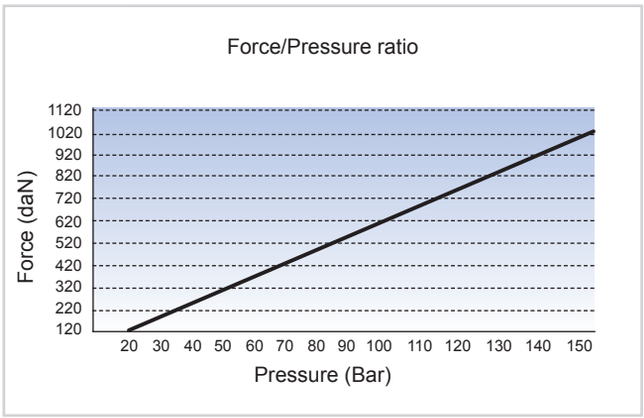
Service-Kit available

ISO

PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

2 x M8 Tapped holes

Square Front Flange 50 SFF

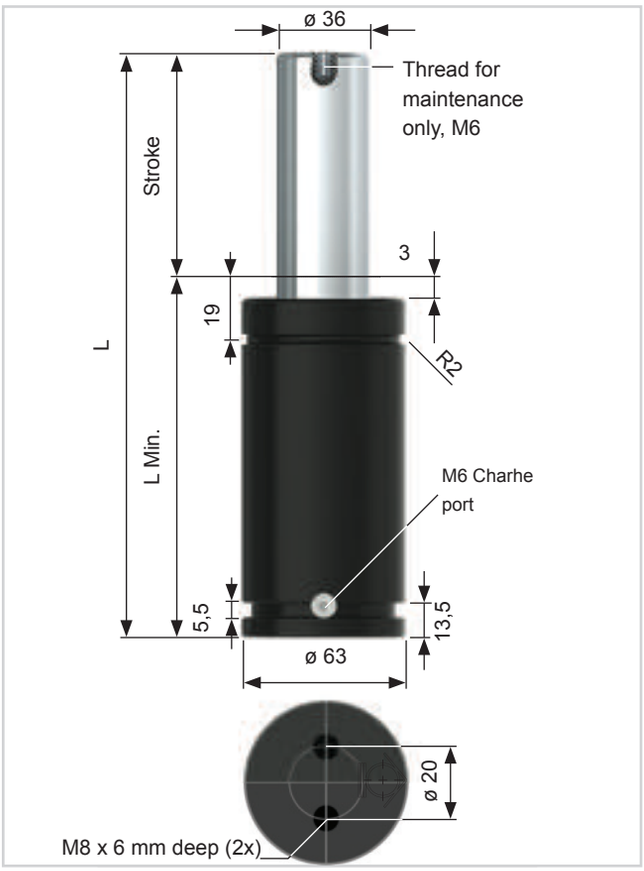
Front Flange 50 FF

Square Flange 50 SF

Base Plate 50 BP

End Support 50 ES/50 HM

EX.01500.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.01500.013	**1500**	2300	57	70	0,05	0,89
EX.01500.016		2330	60	76	0,06	0,93
EX.01500.019		2380	63	82	0,07	0,96
EX.01500.025		2430	69	94	0,08	1,03
EX.01500.032		2460	76	108	0,11	1,08
EX.01500.038		2480	82	120	0,12	1,15
EX.01500.050		2510	94	144	0,15	1,28
EX.01500.063		2580	107	170	0,19	1,43
EX.01500.075		2590	119	194	0,22	1,57
EX.01500.080		2550	124	204	0,24	1,63
EX.01500.100		2560	144	244	0,29	1,86
EX.01500.125		2580	169	294	0,36	2,15

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
EX.01500.050.FF

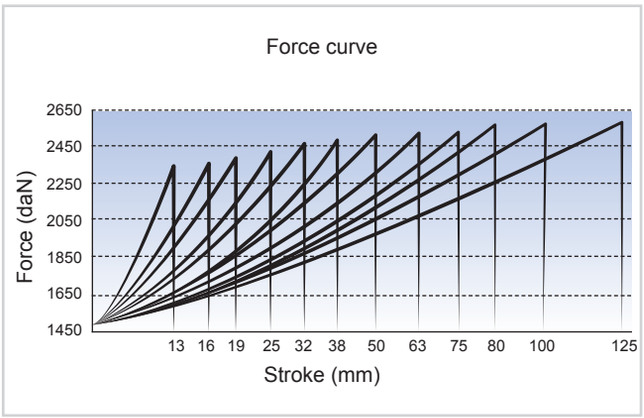
Ordering example with HT: HT.EX.01500.050.FF

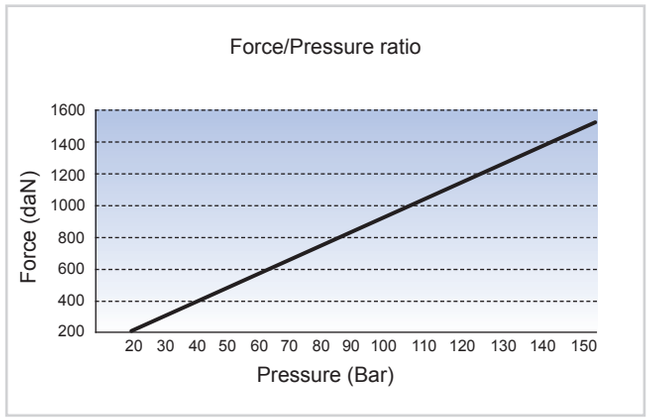
Service-Kit available

ISO

PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

2 x M8 Tapped holes

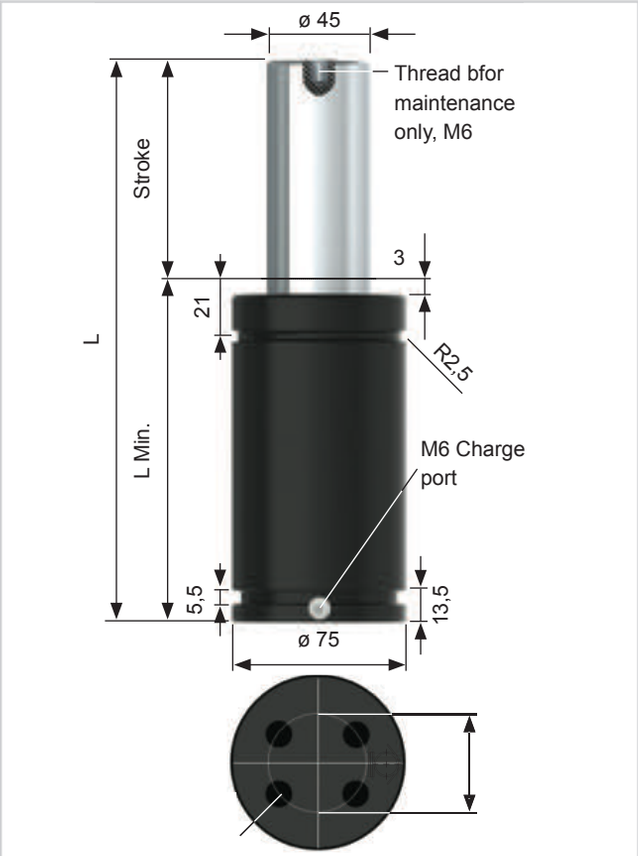
Square Front Flange 63 SFF – 63 SFFA

Front Flange 63 FF

Square Flange 63 SF

Base Plate 63 BP

EX.02400.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.02400.016	2400	3370	61	77	0,09	1,34
EX.02400.019		3460	64	83	0,10	1,38
EX.02400.025		3570	70	95	0,13	1,45
EX.02400.032		3640	77	109	0,16	1,56
EX.02400.038		3700	83	121	0,18	1,65
EX.02400.050		3780	95	145	0,23	1,84
EX.02400.063		3900	108	171	0,28	2,20
EX.02400.075		3930	120	195	0,33	2,26
EX.02400.080		3880	125	205	0,35	2,32
EX.02400.100		3920	145	245	0,43	2,66
EX.02400.125		3960	170	295	0,54	3,05

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
EX.02400.050.FF

Ordering example with HT: HT.EX.02400.050.FF

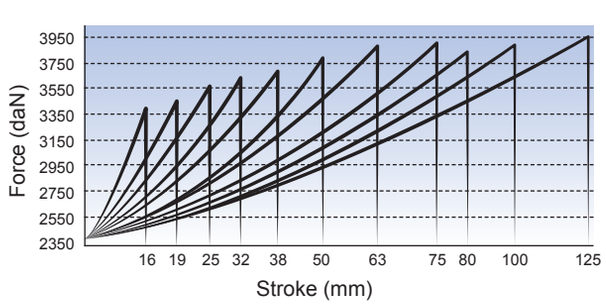
Service-Kit available

ISO

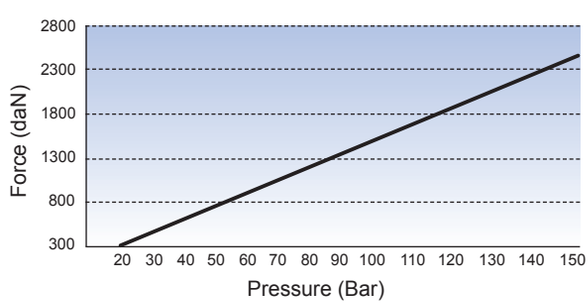
PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

4 x M8 Tapped holes

Square Front Flange 75 SFF

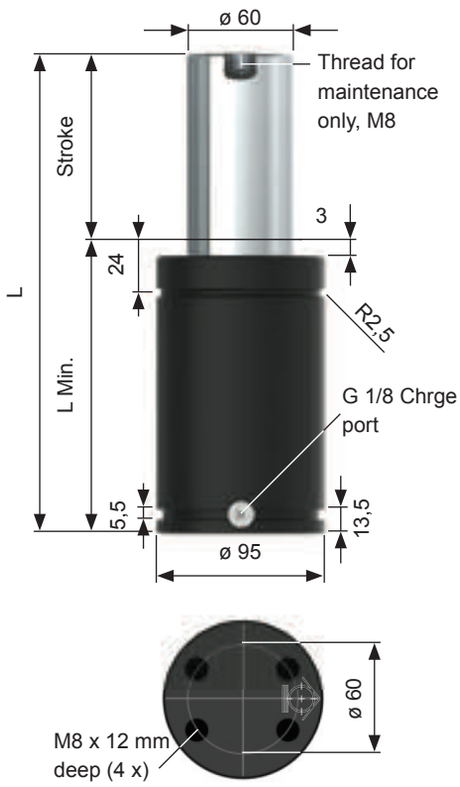
Front Flange 75 FF

Square Flange 75 SF

Base Plate 75 BP

End Support 75 ES/75 HM

EX.04200.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.04200.016	**4200**	6090	74	90	0,15	2,81
EX.04200.019		6300	77	96	0,18	2,88
EX.04200.025		6510	83	108	0,26	2,96
EX.04200.032		6426	90	122	0,30	3,13
EX.04200.038		6636	96	134	0,32	3,28
EX.04200.050		6678	108	158	0,40	3,57
EX.04200.063		6720	121	184	0,49	4,10
EX.04200.075		6804	133	208	0,58	4,20
EX.04200.080		6840	138	218	0,61	4,32
EX.04200.100		6930	158	258	0,74	4,81
EX.04200.125		6930	183	308	0,91	5,42

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
EX.04200.050.FF

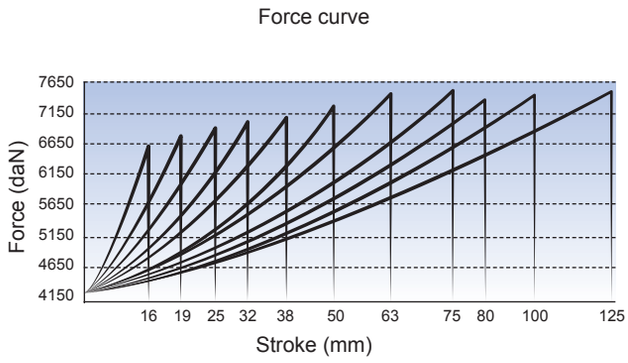
Ordering example with HT: HT.EX.04200.050.FF

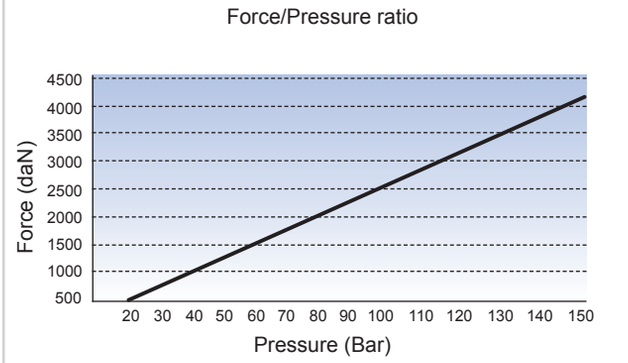
Service-Kit available

ISO

PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

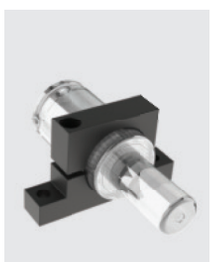
4 x M10 Tapped holes

Square Front Flange 95 SFF

Front Flange 95 FF

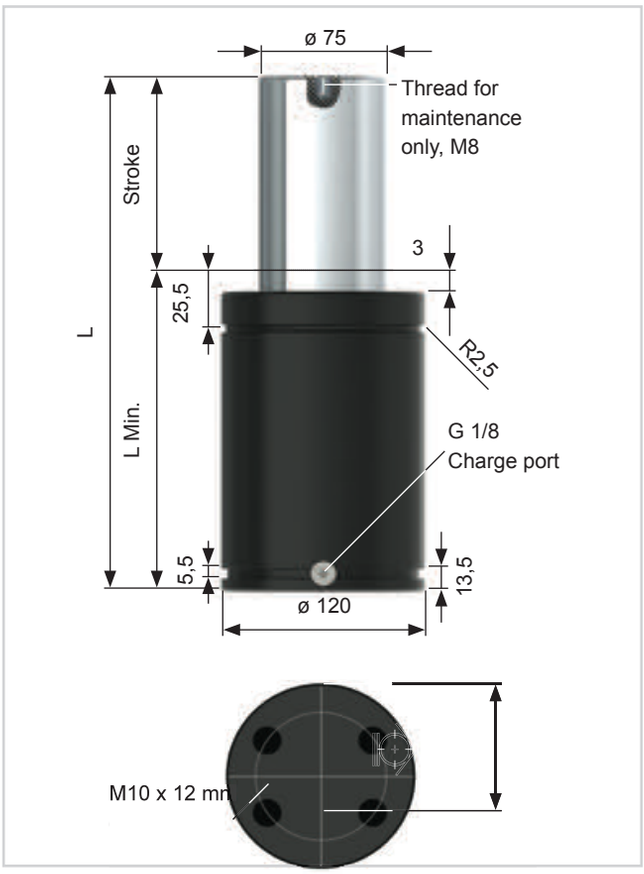
Square Flange 95 SF

Base Plate 95 BP



End Support 95 ES/95 HM

EX.06600.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.06600.016	6630	7520	84	100	0,32	5,00
EX.06600.019		7700	87	106	0,35	5,11
EX.06600.025		7940	93	118	0,42	5,34
EX.06600.032		8150	100	132	0,49	5,61
EX.06600.038		8340	106	144	0,56	5,84
EX.06600.050		8670	118	168	0,69	6,31
EX.06600.063		9030	131	194	0,83	6,81
EX.06600.075		9250	143	218	0,90	7,27
EX.06600.080		9250	148	228	1,01	7,46
EX.06600.100		9530	168	268	1,23	8,23
EX.06600.125		9800	193	318	1,50	9,19

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
EX.06600.050.FF

Ordering example with HT: HT.EX.06600.050.FF

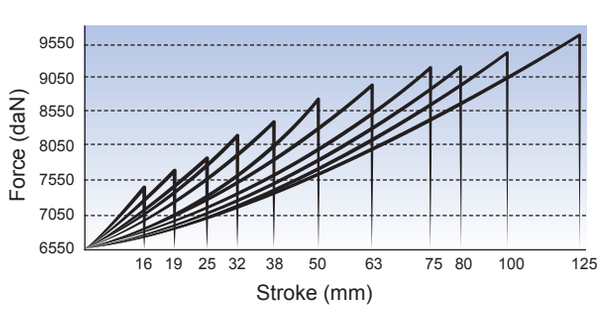
Service-Kit available

ISO

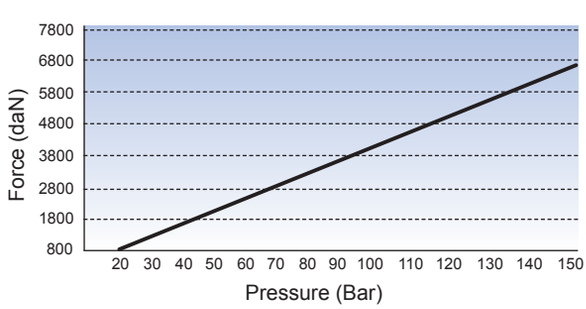
PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

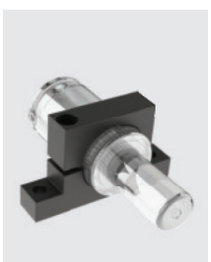
4 x M10 Tapped holes

Square Front Flange 120 SFF

Front Flange 95 FF

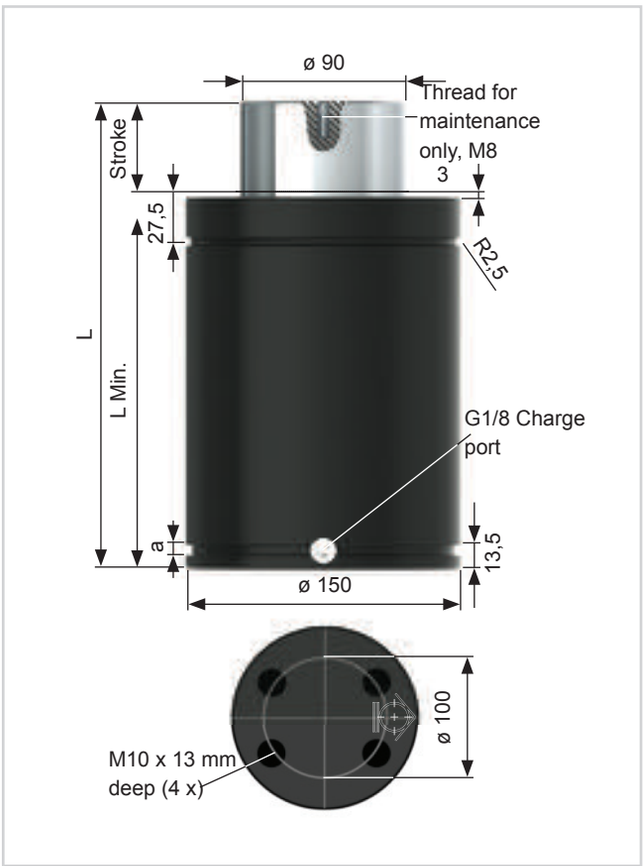
Square Flange 120 SF

Base Plate 120 BP



End Support 120 ES/120 HM

EX.09500.



Order-No.: Type/Stroke	Spring force (daN) Initial	Spring force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
EX.09500.019	**9500**	13370	97	116	0,49	9,86
EX.09500.025		13930	103	128	0,58	10,23
EX.09500.032		14060	110	142	0,70	10.67
EX.09500.038		14320	116	154	0,80	11,04
EX.09500.050		14800	128	178	0,99	11,79
EX.09500.063		15270	141	204	1,20	12,60
EX.09500.075		15510	153	228	1,39	13,35
EX.09500.080		15470	158	238	1,47	13,66
EX.09500.100		15730	178	278	1,79	14,91
EX.09500.125		16000	203	328	220	16,47

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
EX.09500.050.FF

Ordering example with HT: HT.EX.09500.050.FF

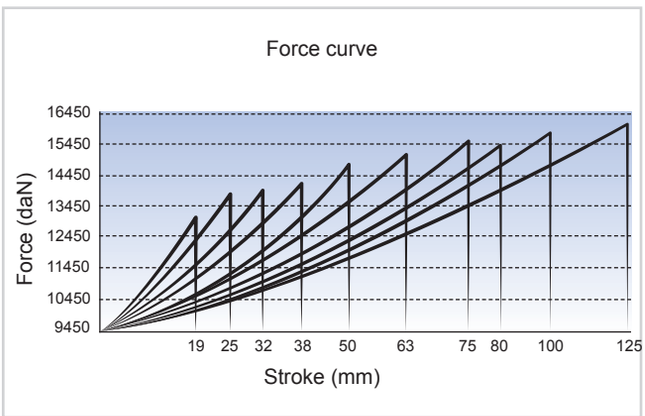
Service-Kit available

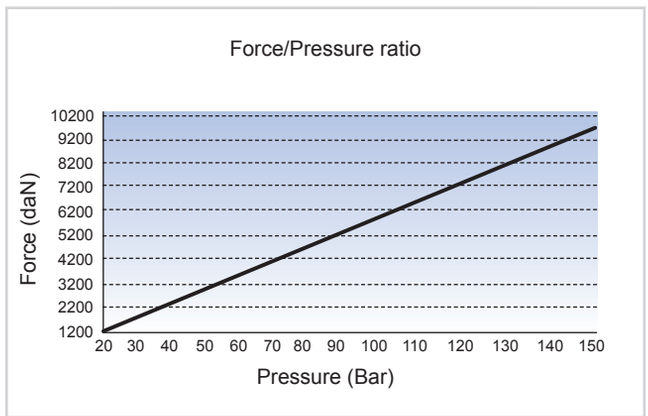
ISO

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

4 x M10 Tapped holes

Square Front Flange 150 SFF

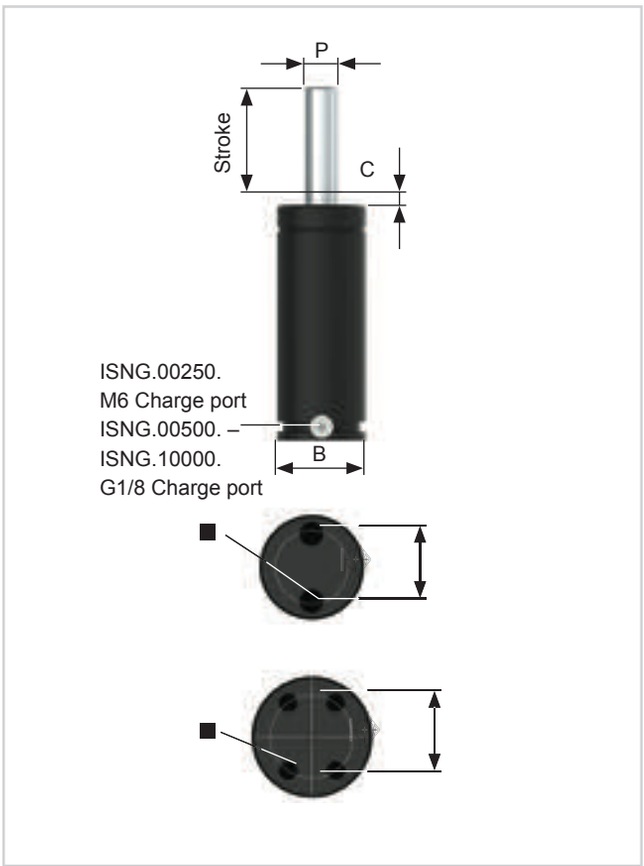
Front Flange 150 FF

Square Flange 150 SF

Base Plate 150 BP

ISNG SERIES

Overview



Type	PCD	M	Tapped hole depth
ISNG.00250.	25	M6 x 2	2 x M6 x 8 mm
ISNG.00500.	20	M8 x 2	2 x M8 x 12,5 mm
ISNG.00750.	20	M8 x 2	2 x M8 x 12,5 mm
ISNG.01500.	40	M8 x 4	4 x M8 x 13 mm
ISNG.03000.	60	M8 x 4	4 x M8 x 13 mm
ISNG.05000.	80	M10 x 4	4 x M10 x 13 mm
ISNG.07500.	100	M10 x 4	4 x M10 x 13 mm
ISNG.10000.	120	M12 x 4	4 x M12 x 16 mm

The ISNG range is the optimum design for gas spring durability and conforms to the ISO11901 gas spring standard. ISNG range includes strokes up to 300mm and incorporates longer seal unit guides and bore guided piston stops for maximum durability.

The ISNG range can be connected in series using the CNOMO hose system. Upper C-Groove and Lower U-Groove give numerous flange mounting options.

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

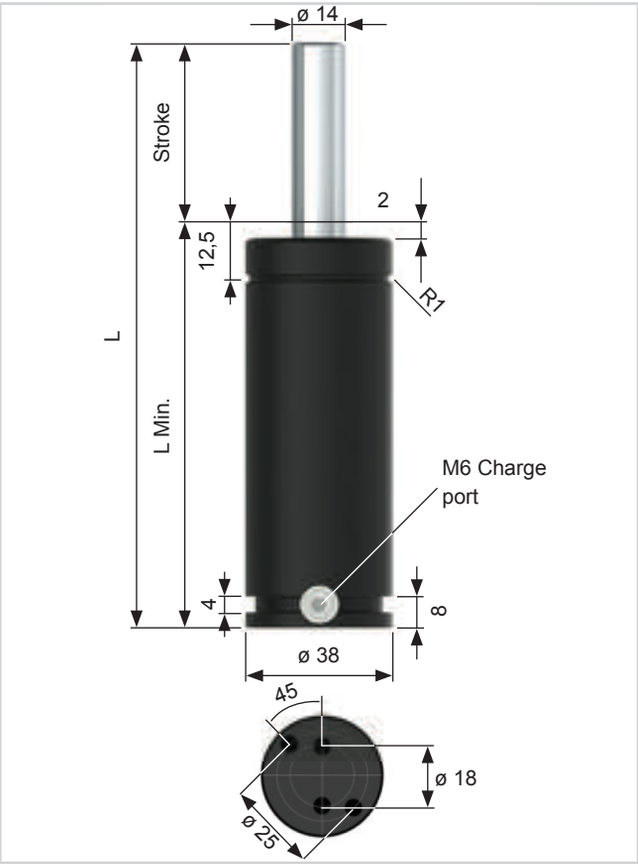
Service-Kit available

ISO 11901

PED 97/23/EC

Type	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe System		Overhaul
							Micro 24	CNOMO	
ISNG.00250.	14	38	250	10 – 125	2	TH, FF, SF, SFF, ES	•		•
ISNG.00500.	20	45	500	10 – 160	2	TH, FF, SF, SFF, ES, BP	•	•	•
ISNG.00750.	25	50	750	12,7 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
ISNG.01500.	36	75	1500	25 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
ISNG.03000.	50	95	3000	25 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
ISNG.05000.	65	120	5000	25 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
ISNG.07500.	80	150	7500	25 – 300	3	TH, FF, SF, SFF, BP	•	•	•
ISNG.10000.	95	195	10000	25 – 300	3	TH, FF, SF, SFF, BP	•	•	•

ISNG.00250.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
ISNG.00250.010	250	410	60	70	0,011	0,40
ISNG.00250.013		410	62,7	75,4	0,013	0,42
ISNG.00250.016		410	66	82	0,016	0,43
ISNG.00250.025		410	75	100	0,023	0,48
ISNG.00250.038		410	88,1	1262	0,032	0,54
ISNG.00250.050		410	100	150	0,041	0,60
ISNG.00250.063		410	113,5	177	0,051	0,67
ISNG.00250.080		410	130	210	0,062	0,75
ISNG.00250.100		410	150	250	0,077	0,85
ISNG.00250.125		410	175	300	0,096	0,97

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
ISNG.00250.050.FF

Ordering example with HT: HT.ISNG.00250.050.FF

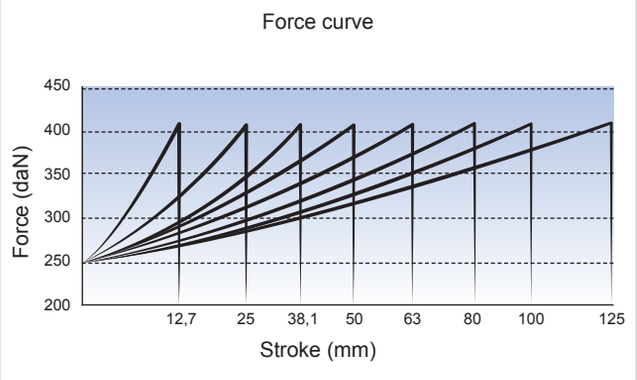
Service-Kit available

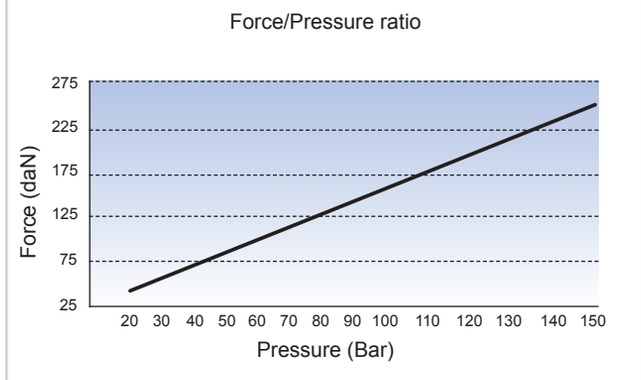
ISO 11901

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

2 x M6 Tapped holes

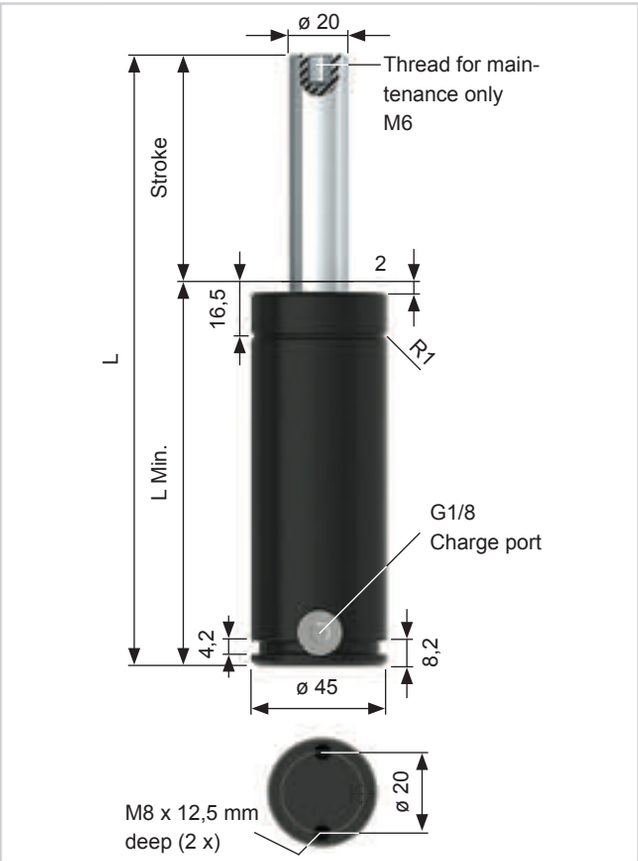
Square Front Flange 38 SFF

Front Flange 38 FF

Square Flange 38 SF

End Support 38 ES

ISNG.00500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
ISNG.00500.010	500	600	95	105	0,023	0,93
ISNG.00500.013		612	97,7	110	0,025	0,95
ISNG.00500.025		660	110	135	0,038	1,04
ISNG.00500.038		670	123,1	161,2	0,051	1,13
ISNG.00500.050		685	135	185	0,063	1,21
ISNG.00500.063		710	148,5	212	0,077	1,31
ISNG.00500.080		710	165	245	0,093	1,43
ISNG.00500.100		710	185	285	0,114	1,57
ISNG.00500.125		710	210	335	0,139	1,74
ISNG.00500.160		710	245	405	0,175	1,99

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
ISNG.00500.050.FF

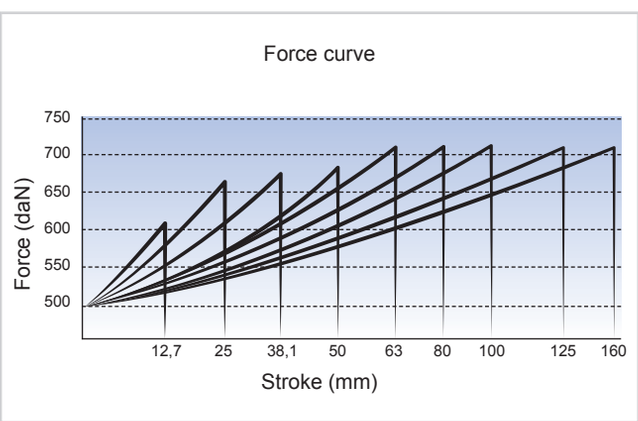
Ordering example with HT: HT.ISNG.00500.050.FF

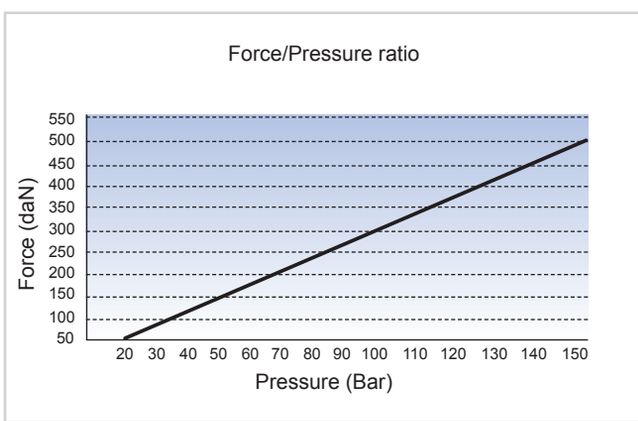
Service-Kit available

ISO 11901

PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

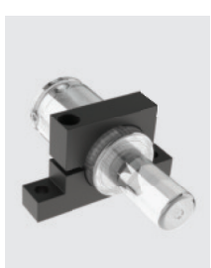
2 x M8 Tapped holes

Square Front Flange 45 SFF

Front Flange 45 FF

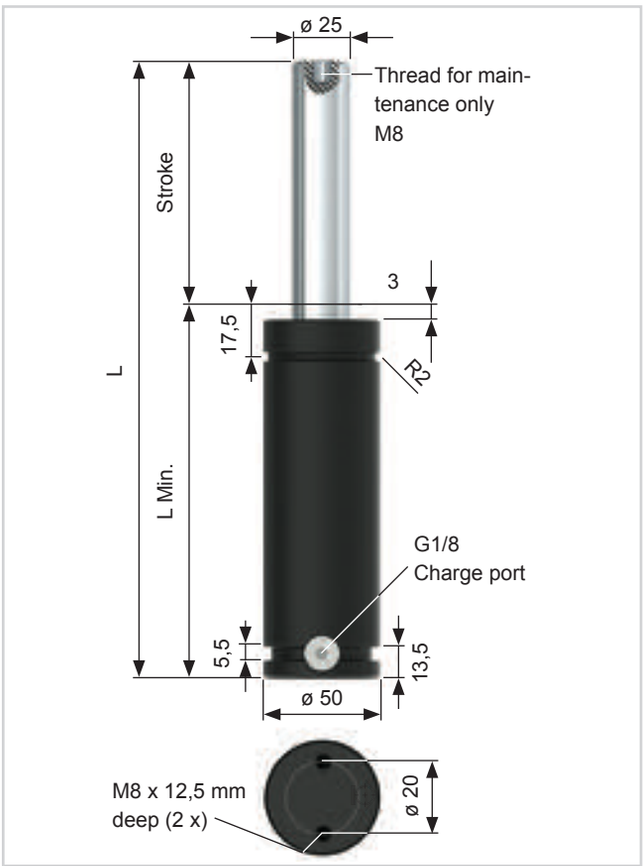
Square Flange 45 SF

Base Plate 45 BP



End Support 45 ES

ISNG.00750.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
ISNG.00750.013	750	1140	107,7	120,4	0,03	1,33
ISNG.00750.025		1160	120	145	0,04	1,44
ISNG.00750.038		1170	133,1	171,2	0,06	1,57
ISNG.00750.050		1185	145	195	0,07	1,68
ISNG.00750.063		1190	158,5	222	0,09	1,78
ISNG.00750.080		1200	175	255	0,11	1,94
ISNG.00750.100		1200	195	295	0,14	2,13
ISNG.00750.125		1200	220	345	0,17	2,37
ISNG.00750.160		1200	255	415	0,21	2,70
ISNG.00750.200		1210	295	495	0,26	3,10
ISNG.00750.250		1210	345	595	0,33	3,60
ISNG.00750.300		1210	395	695	0,39	4,10

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
ISNG.00750.050.FF

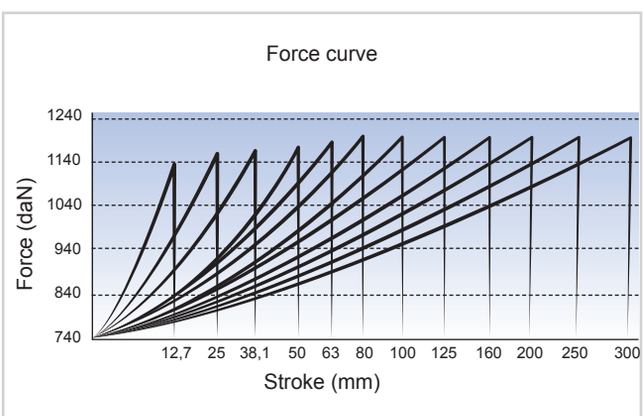
Ordering example with HT: HT.ISNG.00750.050.FF

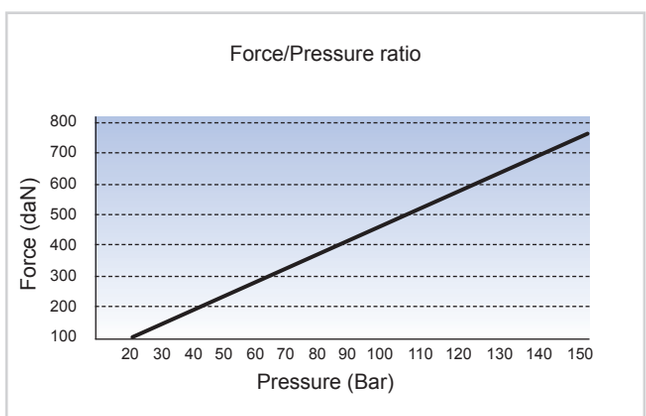
Service-Kit available

ISO 11901

PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

4 x M8 Tapped holes

Square Front Flange 50 SFF

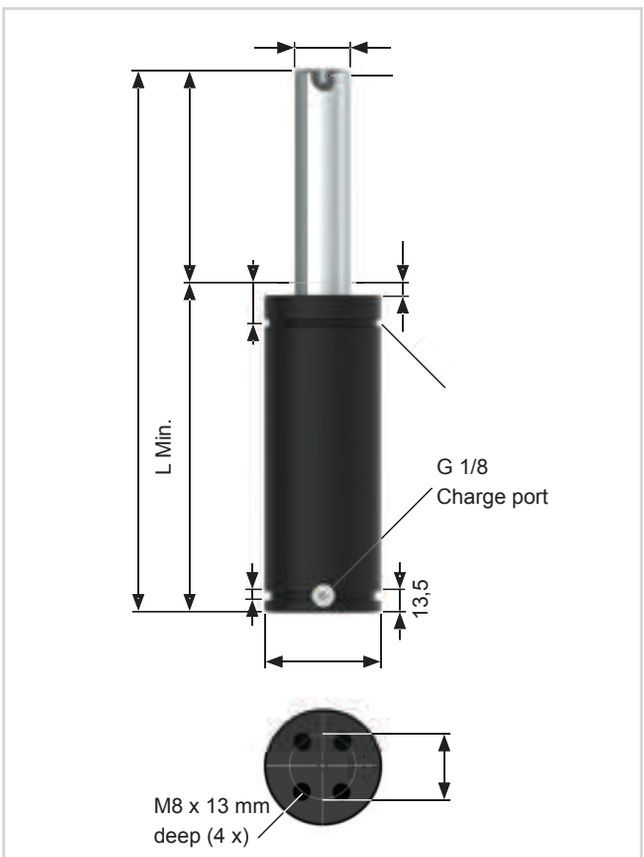
Front Flange 50 FF

Square Flange 50 SF

Base Plate 50 BP

End Support 50 ES/50 HM

ISNG.01500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
ISNG.01500.025	1500	2040	135	160	0,10	3,65
ISNG.01500.038		2060	148,1	186,2	0,15	3,89
ISNG.01500.050		2090	160	210	0,18	4,11
ISNG.01500.063		2130	173,5	237	0,22	4,35
ISNG.01500.080		2115	190	270	0,28	4,66
ISNG.01500.100		2140	210	310	0,34	5,02
ISNG.00750.125		2160	235	360	0,42	5,48
ISNG.00750.160		2165	270	430	0,53	6,12
ISNG.00750.200		2160	310	510	0,68	6,90
ISNG.00750.250		2180	360	610	0,81	7,80
ISNG.00750.300		2200	410	710	0,96	8,90

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
ISNG.01500.050.FF

Ordering example with HT: HT.ISNG.01500.050.FF

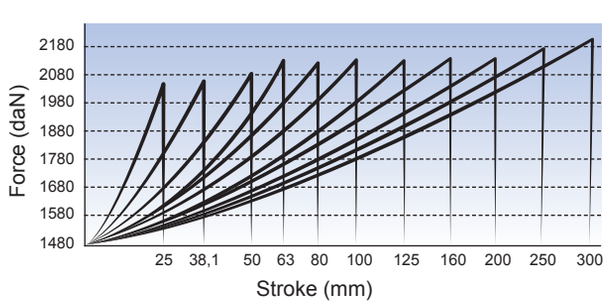
Service-Kit available

ISO 11901

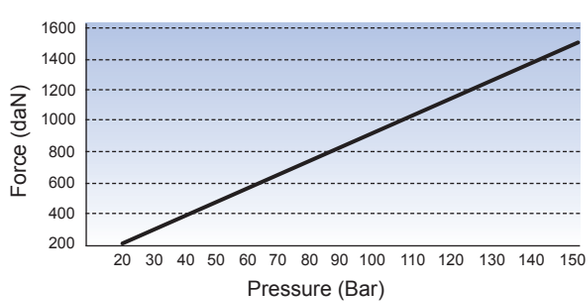
PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)


4 x M8 Tapped holes


Square Front Flange 75 SFF

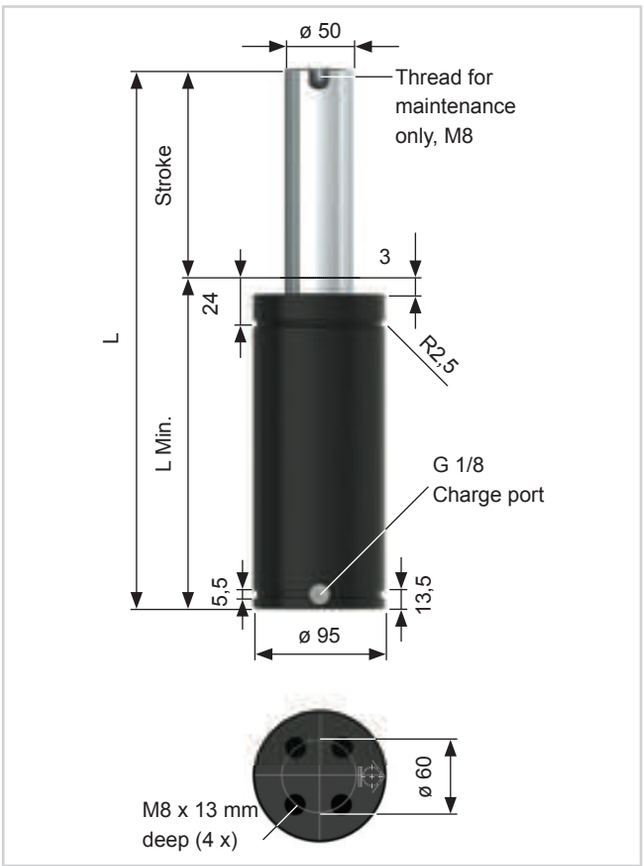

Front Flange 75 FF


Square Flange 75 SF


Base Plate 75 BP


End Support 75 ES/75 HM

ISNG.03000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
ISNG.03000.025	3000	4140	145	170	0,20	6,45
ISNG.03000.038		4210	158,1	196,2	0,26	6,87
ISNG.03000.050		4320	170	220	0,32	7,25
ISNG.03000.063		4480	183,5	247	0,38	7,67
ISNG.03000.080		4500	200	280	0,46	8,20
ISNG.03000.100		4570	220	320	0,56	8,83
ISNG.03000.125		4570	245	370	0,69	9,63
ISNG.03000.160		4580	280	440	0,87	10,74
ISNG.03000.200		4560	320	520	1,07	12,20
ISNG.03000.250		4540	370	620	1,32	13,70
ISNG.03000.300		4590	420	720	1,57	15,30

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
ISNG.03000.050.FF

Ordering example with HT: HT.ISNG.03000.050.FF

Service-Kit available

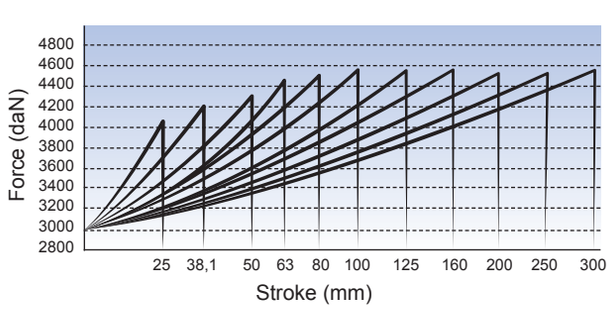
ISO 11901

PED 97/23/EC

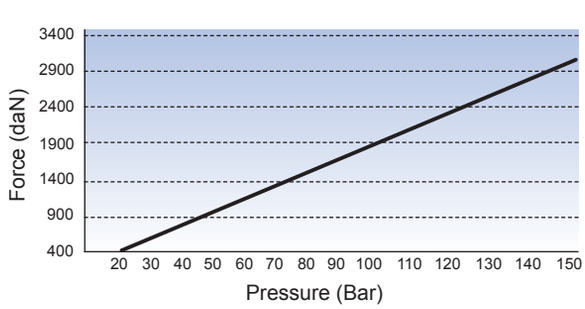
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

4 x M8 Tapped hole

Square Front Flange 95 SFF

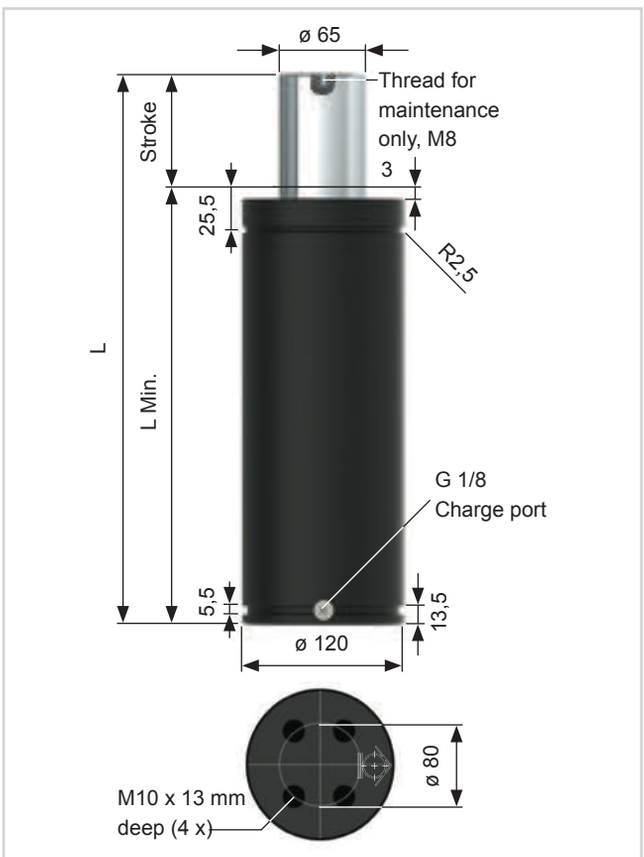
Front Flange 95 FF

Square Flange 95 SF

Base Plate 95 BP

End Support 95 ES/ 95 HM

ISNG.05000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
ISNG.05000.025	5000	6900	165	190	0,32	12,40
ISNG.05000.038		7010	178,1	216,2	0,42	13,10
ISNG.05000.050		7210	190	240	0,51	13,70
ISNG.05000.063		7450	203,5	267	0,60	14,40
ISNG.05000.080		7510	220	300	0,73	15,30
ISNG.05000.100		7550	240	340	0,89	16,40
ISNG.05000.125		7560	265	390	1,09	17,70
ISNG.05000.160		7560	300	460	1,36	19,60
ISNG.05000.200		7590	340	540	1,68	20,70
ISNG.05000.250		7560	390	640	2,07	22,40
ISNG.05000.300		7540	440	740	2,46	24,66

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
ISNG.05000.050.FF

Ordering example with HT: HT.ISNG.05000.050.FF

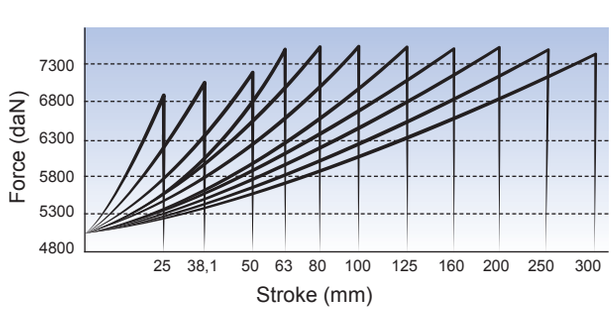
Service-Kit available

ISO 11901

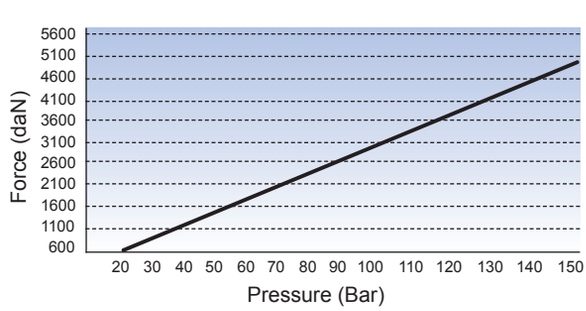
PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

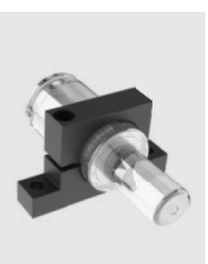

4 x M10 Tapped holes


Square Front Flange 120 SFF

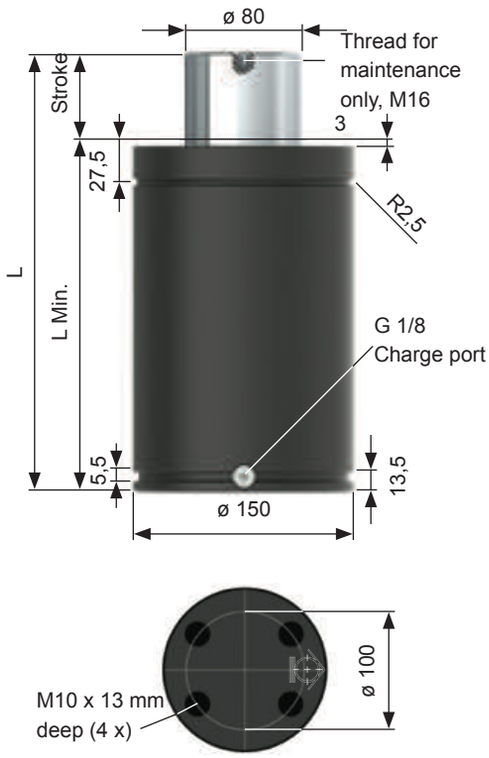

Front Flange 120 FF


Square Flange 120 SF


Base Plate 120 BP


End Support 120 ES/120 HM

ISNG.07500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
ISNG.07500.025	7500	10100	180	205	0,51	20,30
ISNG.07500.038		10500	193,1	231,2	0,67	21,40
ISNG.07500.050		10500	205	255	0,81	22,40
ISNG.07500.063		10550	218,5	282	0,98	23,50
ISNG.07500.080		10550	235	315	1,18	24,80
ISNG.07500.100		10550	255	355	1,43	26,50
ISNG.07500.125		10550	280	405	1,74	28,50
ISNG.07500.160		10530	315	475	2,17	31,40
ISNG.07500.200		10520	355	555	2,66	34,70
ISNG.07500.250		10590	405	655	3,27	38,80
ISNG.07500.300		10560	455	755	3,88	42,90

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
ISNG.07500.050.FF

Ordering example with HT: HT.ISNG.07500.050.FF

Service-Kit available

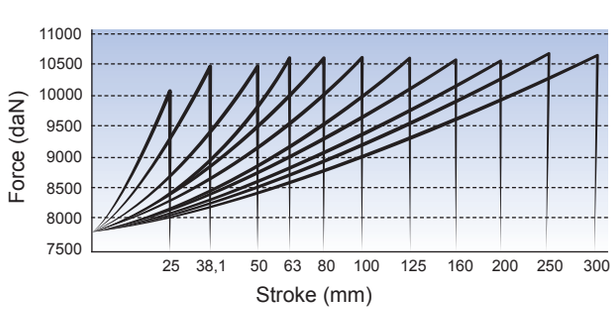
ISO

PED 97/23/EC

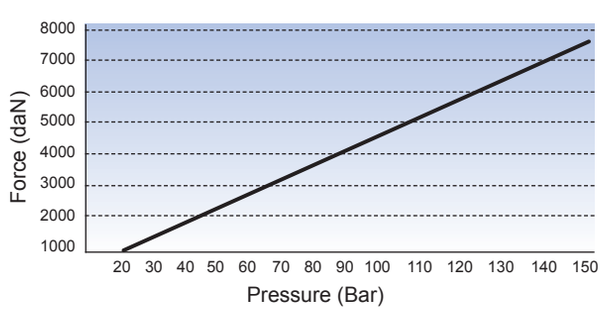
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

4 x M10 Tapped holes

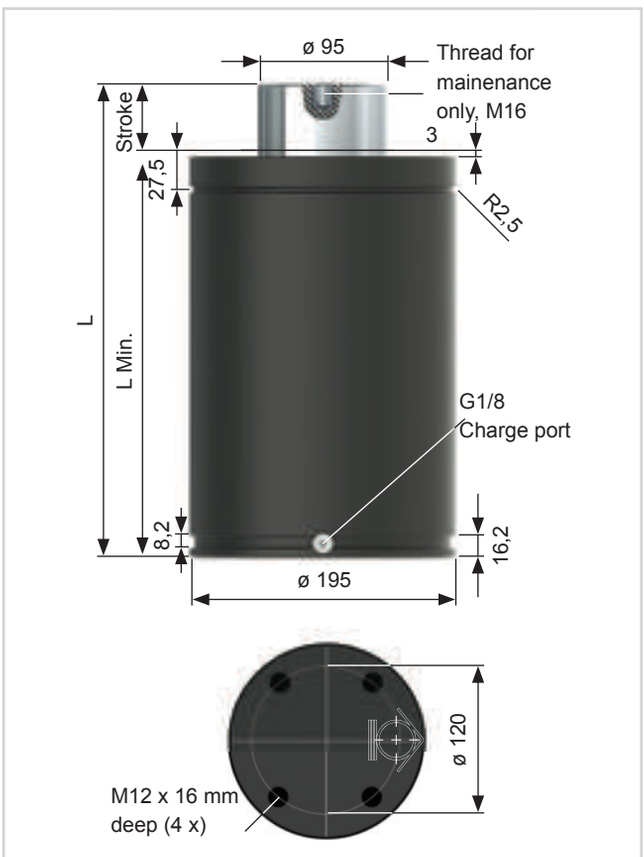
Square Front Flange 150 SFF

Front Flange 150 FF

Square Flange 150 SF

Base Plate 150 BP

ISNG.10000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
ISNG.10000.025	10000	13800	185	210	0,87	35,90
ISNG.10000.038		14300	198,1	236,2	1,13	37,60
ISNG.10000.050		14700	210	260	1,37	39,20
ISNG.10000.063		15000	223,5	287	1,64	41,00
ISNG.10000.080		15200	240	320	1,98	43,20
ISNG.10000.100		15600	260	360	2,38	45,80
ISNG.10000.125		15700	285	410	2,88	49,10
ISNG.10000.160		15800	320	480	3,59	54,50
ISNG.10000.200		16000	360	560	4,39	60,00
ISNG.10000.250		16000	410	660	5,40	66,50
ISNG.10000.300		16000	460	760	6,40	73,00

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
ISNG.10000.050.FF

Ordering example with HT: HT.ISNG.10000.050.FF

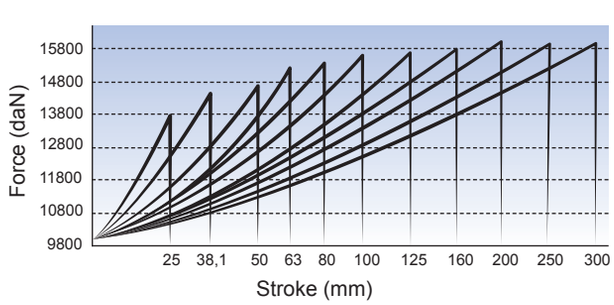
Service-Kit available

ISO 11901

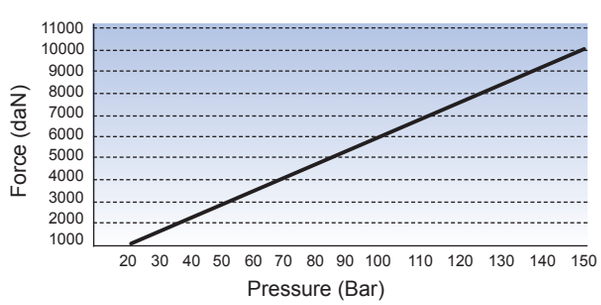
PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

4 x M12 Tapped holes

Square Front Flange 195 SFF

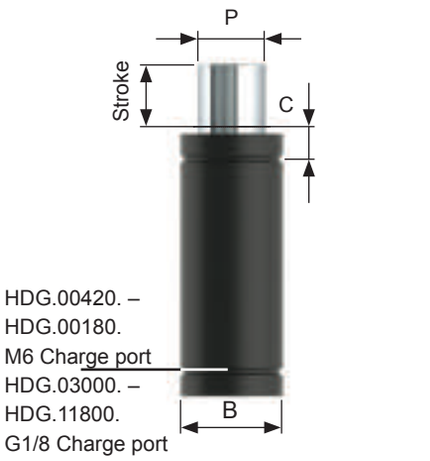
Front Flange 195 FF

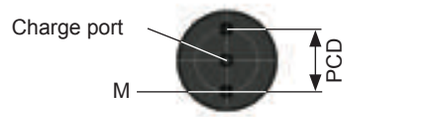
Square Flange 195 SF

Base Plate 195 BP

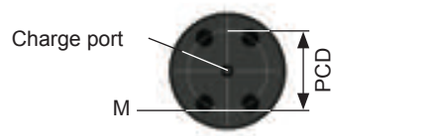
HDG SERIE

Overview





Style cylinder HDG.00750. – HDG.03000.



Style cylinder HDG.04700. – HDG.11800.

Type	PCD	M	Tapped hole depth
HDG.00420.	–	M6 x 1	–
HDG.00750.	15	M6 x 2	2 x M6 x 5,5 mm
HDG.01000.	17	M6 x 2	2 x M6 x 6,5 mm
HDG.01800.	26	M6 x 2	2 x M6 x 6,5 mm
HDG.03000.	34	M8 x 2	4 x M8 x 9 mm
HDG.04700.	40	M8 x 4	4 x M8 x 9 mm
HDG.07500.	52	M8 x 4	4 x M8 x 9 mm
HDG.11800.	68	M8 x 4	4 x M10 x 10 mm

The HDG range is a compact bore sealed gas spring, giving maximum force for the cylinder diameter.

Stroke lengths up to 50mm are available.

Upper and lower C-Grooves allow the springs to be clamped using flanges, in addition to the tapped holes in the base. It is always recommended that the springs be positively retained.

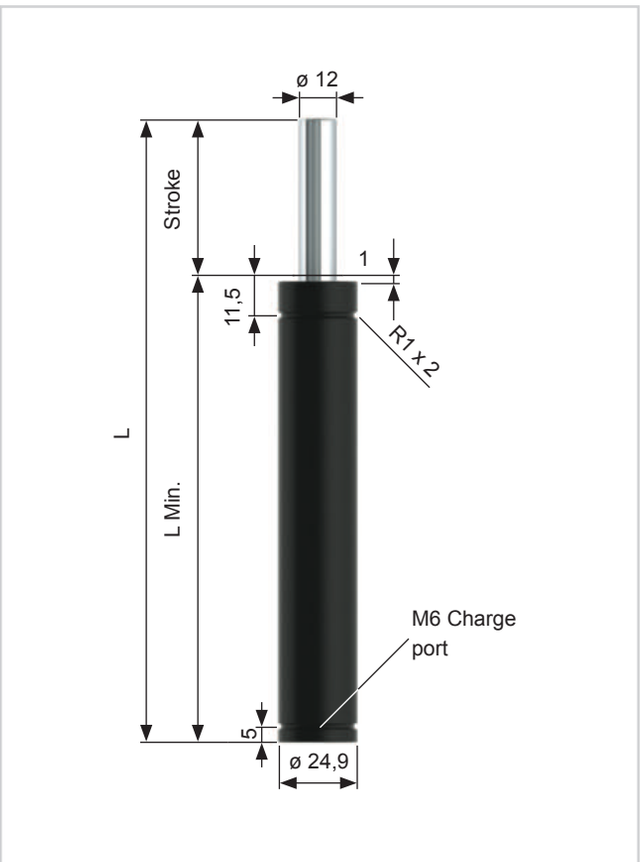
Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 0,8 m/Sek.

Service-Kit available

PED 97/23/EC

Type	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe system		Overhaul
							Micro 24	CNOMO	
HDG.00420.	12	24,9	420	6 – 50	1	DP, TH, FF, ES			•
HDG.00750.	20	32	740	6 – 50	1	TH, FF, SFF, ES			•
HDG.01000.	20	38	1060	6 – 50	0,5	TH, FF, SFF, ES			•
HDG.01800.	30	50	1800	6 – 50	0,5	TH, FF, SFF, ES			•
HDG.03000.	45	63,2	2950	6 – 50	0,5	TH, FF, SFF, ES			•
HDG.04700.	50	75	4700	10 – 50	0,5	TH, FF, SFF, ES			•
HDG.07500.	55	95	7500	10 – 50	0,5	TH, FF, SFF, ES			•
HDG.11800.	70	120	11800	10 – 50	0,5	TH, FF, SFF, ES			•

HDG.00420.



Order-No: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
HDG.00420.006	420	700	50	56	0,003	0,13
HDG.00420.010		690	60	70	0,005	0,15
HDG.00420.016		690	75	91	0,008	0,18
HDG.00420.025		690	95	120	0,011	0,22
HDG.00420.032		760	108	140	0,021	0,24
HDG.00420.040		760	125	165	0,026	0,27
HDG.00420.050		760	145	195	0,032	0,31

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
HDG.00420.050.FF

Ordering example with HT: HT.HDG.00420.050.FF

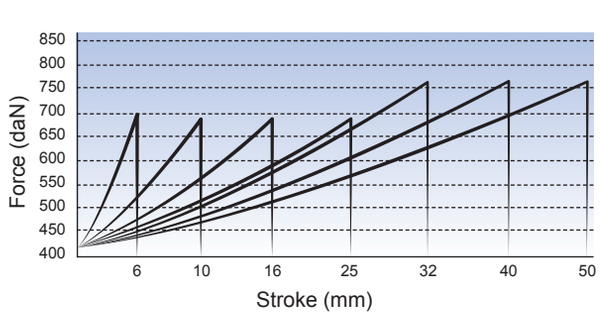
Service-Kit available

PED 97/23/EC

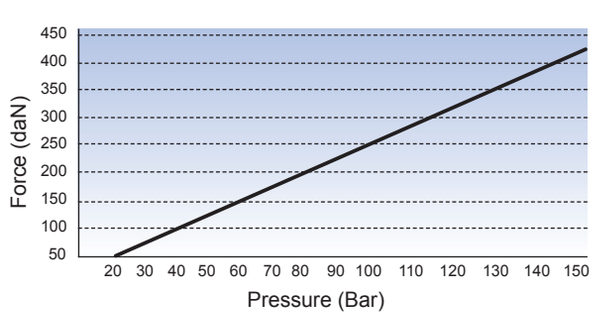
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	0,8 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

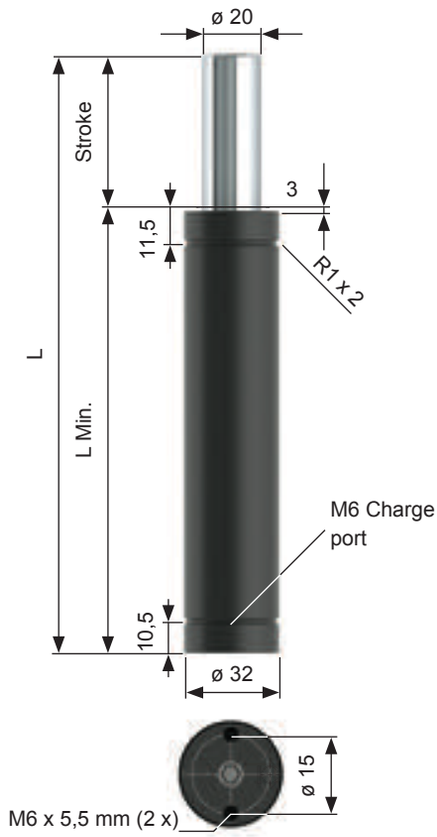
Drop-in pocket

Front Flange 25 FF

M6 Tapped hole

End Support 25 ES

HDG.00750.



Order-No: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
HDG.00750.006	740	980	57	63	0.012	0.20
HDG.00750.010		1000	65	75	0.017	0.24
HDG.00750.016		1100	77	93	0.024	0.28
HDG.00750.025		1200	95	120	0.034	0.33
HDG.00750.032		1200	108	140	0.042	0.37
HDG.00750.040		1200	125	165	0.052	0.42
HDG.00750.050		1200	145	195	0.063	0.48

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
HDG.00750.050.FF

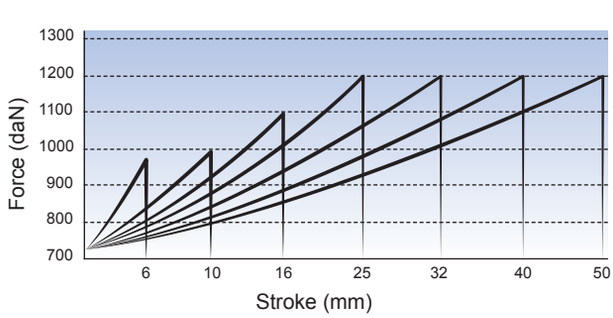
Ordering example with HT: HT.HDG.00750.050.FF

Service-Kit available

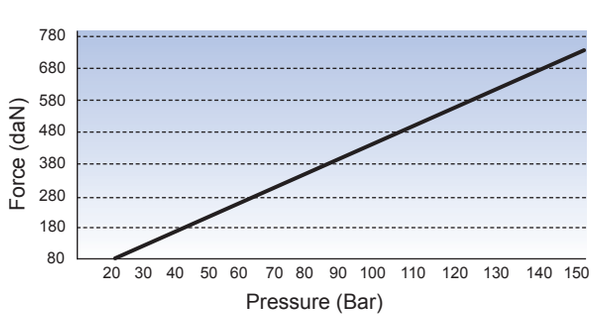
PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 0,8 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

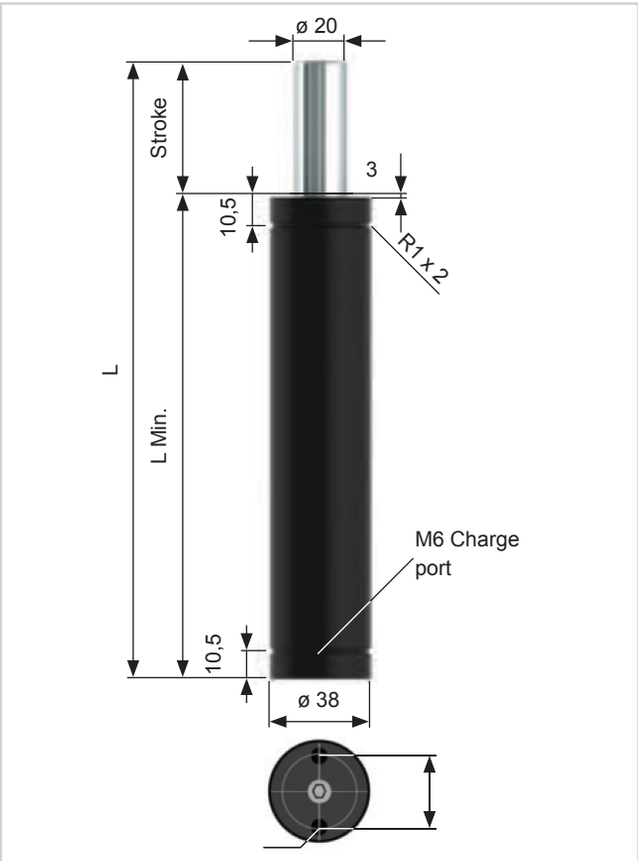
(All dimensions are mm.)

2 x M6 Tapped holes

Square Front Flange 32 SFF

Front Flange 32 FF

HDG.01000.



Order-No: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
HDG.01000.006	1060	1600	55	61	0,014	0,3
HDG.01000.010		1600	68	78	0,024	0,4
HDG.01000.016		1600	84	100	0,036	0,5
HDG.01000.025		1600	110	135	0,056	0,6
HDG.01000.032		1600	135	167	0,074	0,7
HDG.01000.040		1600	155	195	0,092	0,8
HDG.01000.050		1600	180	230	0,110	0,9

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
HDG.01000.050.FF

Ordering example with HT: HT.HDG.01000.050.FF

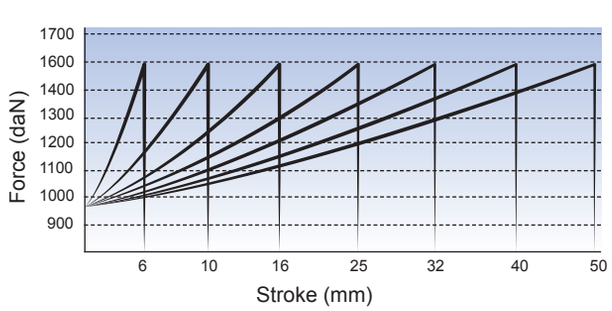
Service-Kit available

PED 97/23/EC

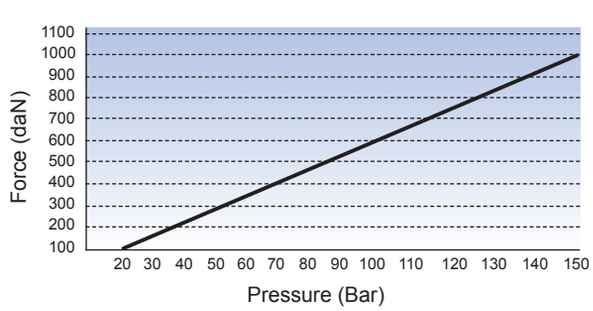
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	0,8 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

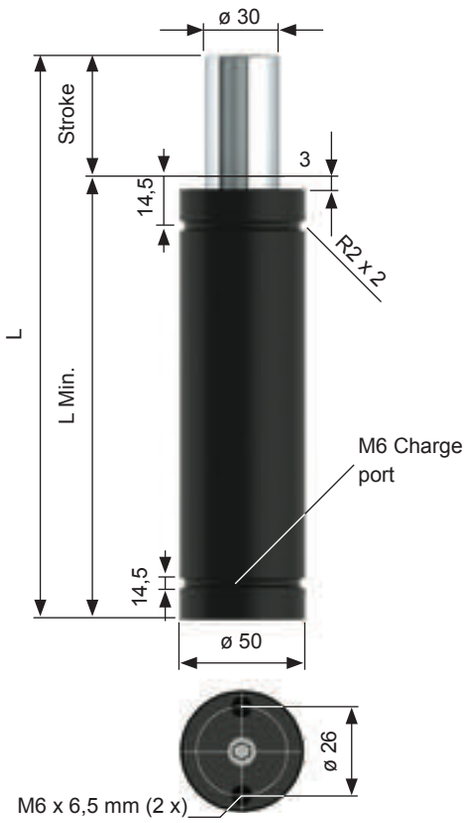
(All dimensions are mm.)

2 x M6 Tapped hole

Square Front Flange 38 SFF

Front Flange 38 FF

HDG.01800.



Order-No: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
HDG.01800.006	1800	2500	60	66	0,030	0,6
HDG.01800.010		2500	70	88	0,044	0,7
HDG.01800.016		2500	90	106	0,072	0,8
HDG.01800.025		2500	110	135	0,100	1,0
HDG.01800.032		2500	130	162	0,126	1,1
HDG.01800.040		2500	150	190	0,150	1,2
HDG.01800.050		2500	170	220	0,179	1,3

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
HDG.01800.050.FF

Ordering example with HT: HT.HDG.01800.050.FF

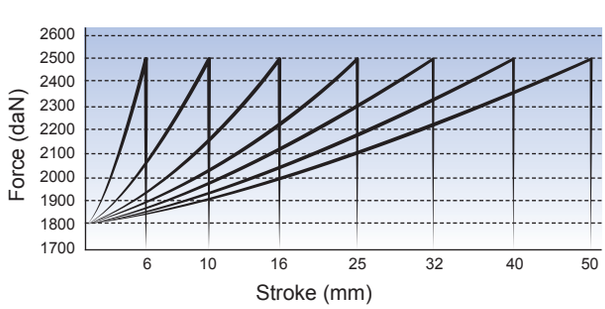
Service-Kit available

PED 97/23/EC

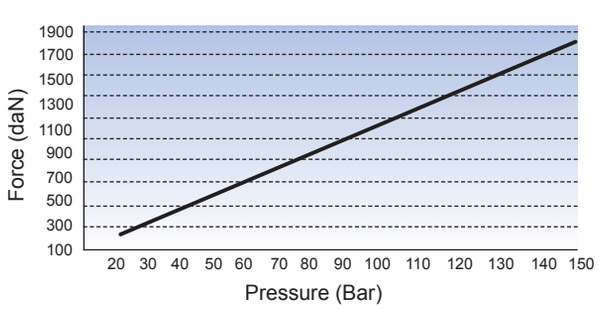
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	0,8 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

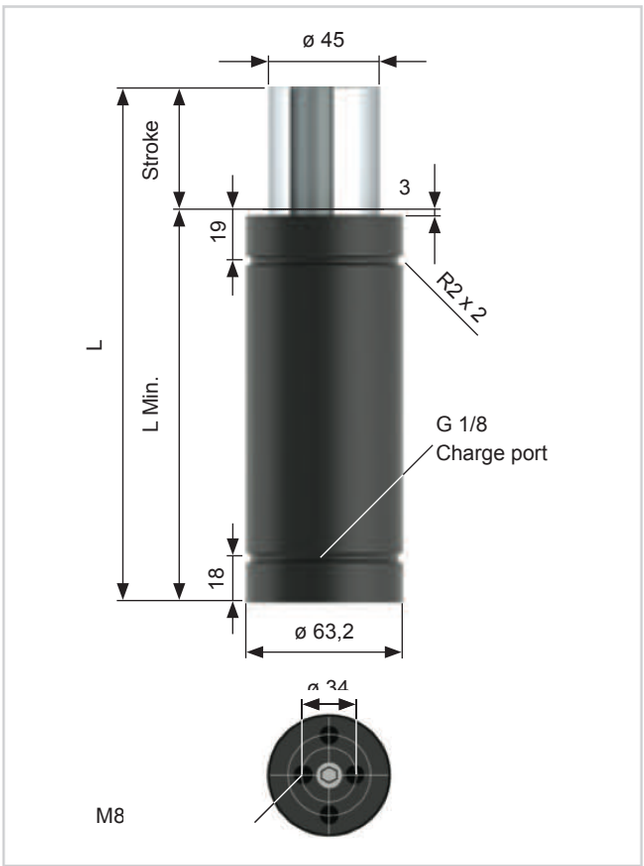
(All dimensions are mm.)

2 x M6 Tapped hole

Square Front Flange 50 SFF

Front Flange 50 FF

HDG.03000.



Order-No: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
HDG.03000.010	2950	3850	75	85	0,08	1,1
HDG.03000.016		4100	87	103	0,12	1,3
HDG.03000.025		4300	105	130	0,16	1,5
HDG.03000.032		4420	118	150	0,20	1,6
HDG.03000.040		4520	135	175	0,24	1,8
HDG.03000.050		4580	155	205	0,29	2,1

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
HDG.03000.050.FF

Ordering example with HT: HT.HDG.03000.050.FF

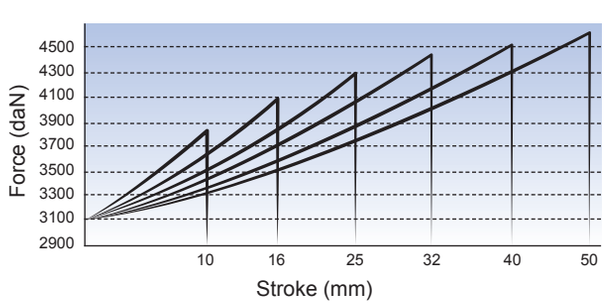
Service-Kit available

PED 97/23/EC

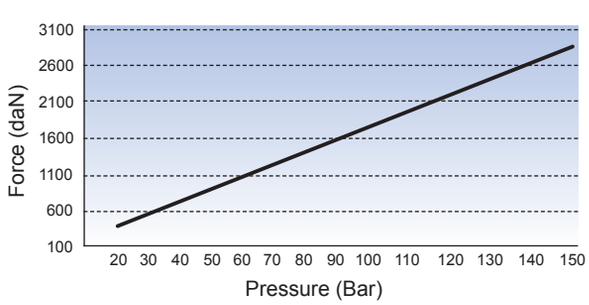
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	0,8 m/Sek.

Force curve



Force/Pressure ratio



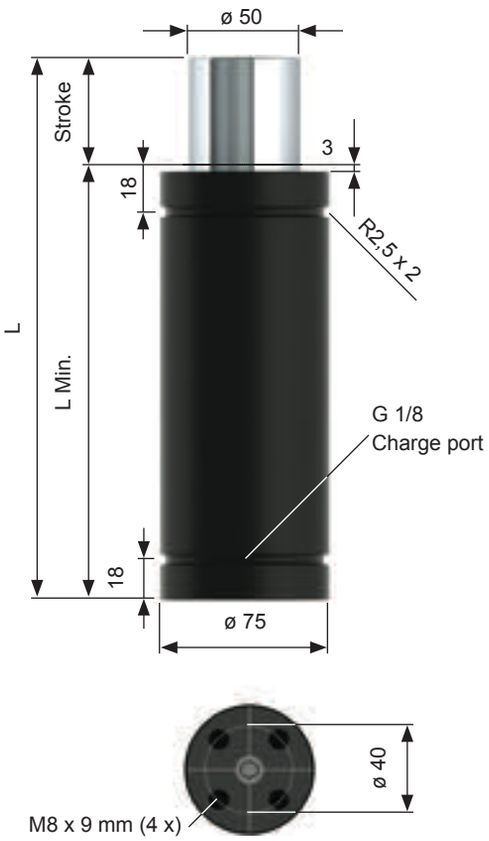
Mounting examples

(All dimensions are mm.)

4 x M8 Tapped holes

Square Front Flange 63 SFF – 63 SFFA

HDG.04700.



Order-No: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
HDG.04700.010	4700	6700	70	80	0,10	1,4
HDG.04700.016		6700	90	106	0,17	1,7
HDG.04700.025		6700	110	135	0,24	2,0
HDG.04700.032		6700	135	167	0,32	2,4
HDG.04700.040		6700	160	200	0,41	2,8
HDG.04700.050		6700	190	240	0,52	3,3

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
HDG.04700.050.FF

Ordering example with HT: HT.HDG.04700.050.FF

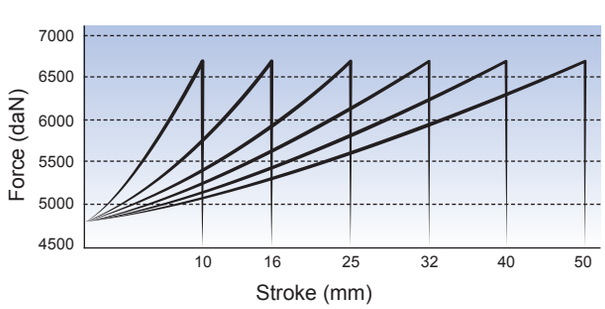
Service-Kit available

PED 97/23/EC

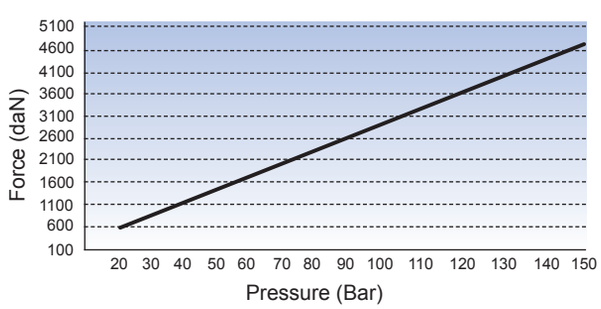
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	0,8 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

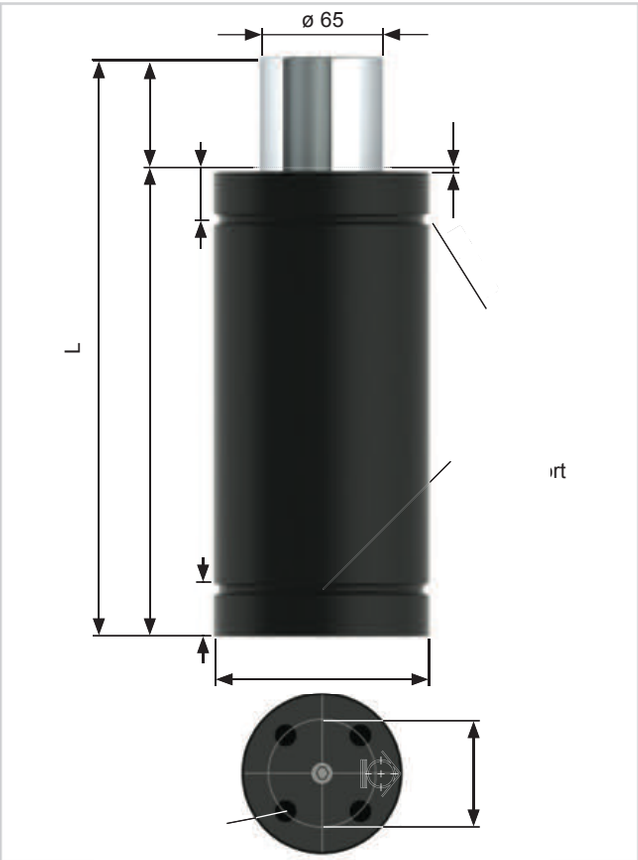
(All dimensions are mm.)

2 x M8 Tapped holes

Square Front Flange 75 SFF

Front Flange 75 FF

HDG.07500.



Order-No: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
HDG.07500.010	7500	10400	80	90	0,18	2,8
HDG.07500.016		10400	100	116	0,30	3,2
HDG.07500.025		10900	120	145	0,41	3,7
HDG.07500.032		10500	150	182	0,57	4,4
HDG.07500.040		10700	170	210	0,68	4,8
HDG.07500.050		10600	205	255	0,87	5,6

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
HDG.07500.050.FF

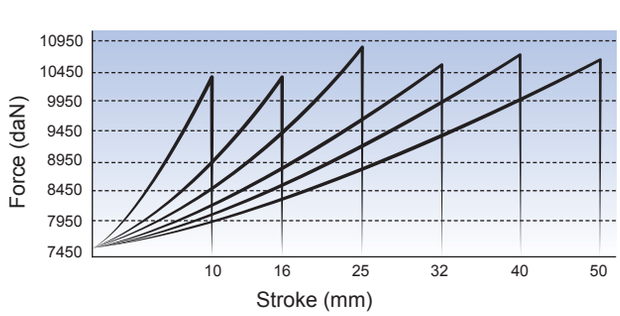
Ordering example with HT: HT.HDG.07500.050.FF

Service-Kit available

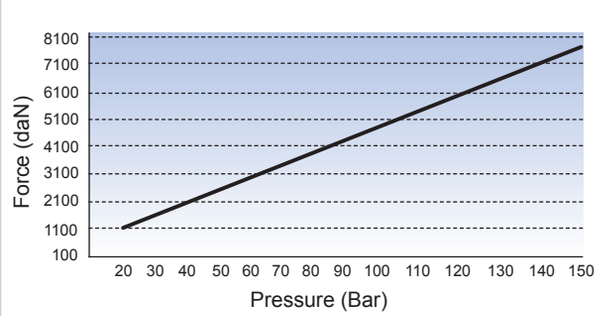
PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 0,8 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

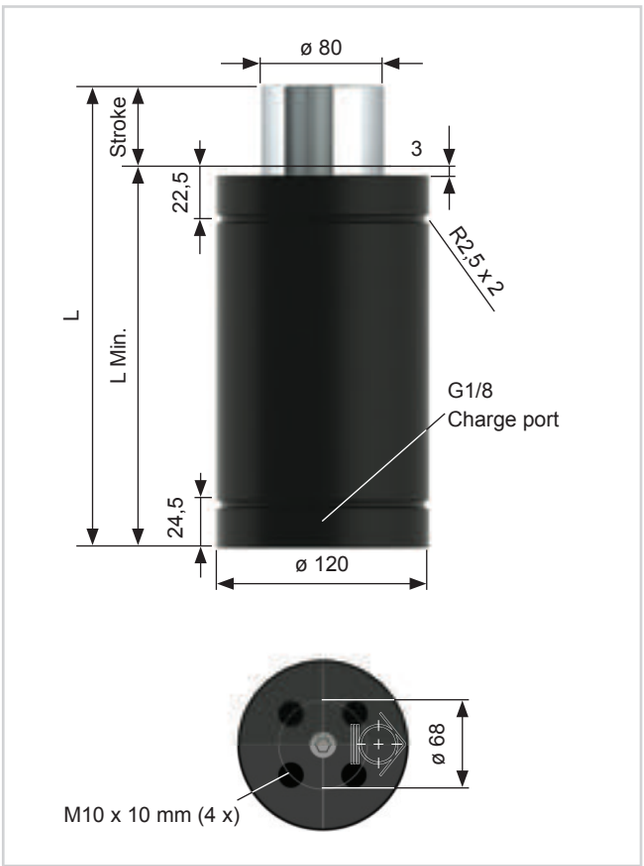
(All dimensions are mm.)

4 x M8 Tapped holes

Square Front Flange 95 SFF

Front Flange 95 FF

HDG.11800.



Order-No: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
HDG.11800.010	11800	16050	90	100	0,33	4,95
HDG.11800.016		15400	110	125	0,50	5,55
HDG.11800.025		16100	130	165	0,68	6,17
HDG.11800.032		16500	155	187	0,88	6,90
HDG.11800.040		16100	180	220	1,00	7,65
HDG.11800.050		16150	210	260	1,35	8,55

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
HDG.11800.050.FF

Ordering example with HT: HT.HDG.11800.050.FF

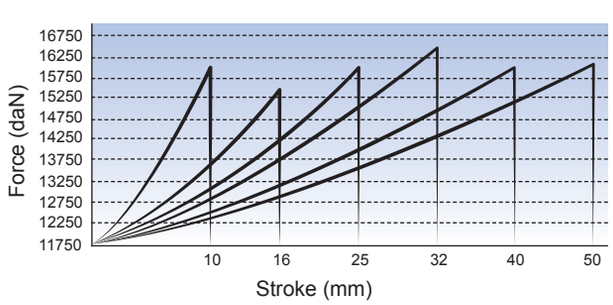
Service-Kit available

PED 97/23/EC

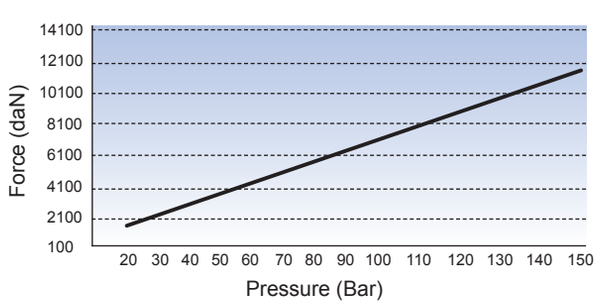
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	0,8 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

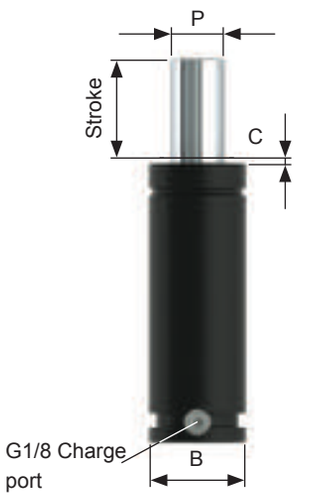
4 x M10 Tapped hole

Square Front Flange 120 SFF

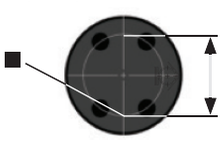
Front Flange 120 FF

MX SERIES

Overview



Style Cylinder MX.01000.



Style cylinderMX.02400. – MX.09500.

Type	PCD	ø D	Tapped hole depth
MX.01000.	20	M8 x 2	2 x M8 x 12,5 mm
MX.02400.	40	M8 x 4	4 x M8 x 13 mm
MX.04200.	60	M8 x 4	4 x M8 x 13 mm
MX.06600.	80	M10 x 4	4 x M10 x 13 mm
MX.09500.	100	M10 x 4	4 x M10 x 13 mm

The MX range combines the force of the EX range in the envelope sizes of the full height ISNG range, providing a high force durable gas spring.

MX range includes strokes up to 300mm and incorporates longer seal unit guides and bore guided piston stops for maximum durability.

The MX range can be connected in series using the CNOMO hose system. Upper C-Groove and Lower U-Groove give numerous flange mounting options.

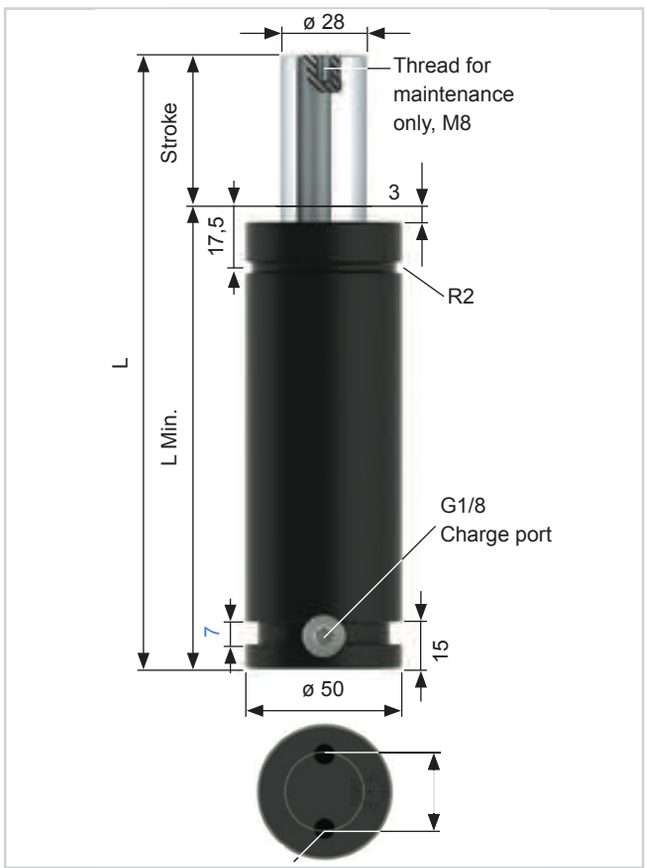
Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Service-Kit available

PED 97/23/EC

Type	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe system		Overhaul
							Micro 24	CNOMO	
MX.01000.	28	50	1000	13 – 300	3	TH, BP, FF, SFF, SF, ES	•	•	•
MX.02400.	45	75	2400	25 – 300	3	TH, BP, FF, SFF, SF, ES	•	•	•
MX.04200.	60	95	4200	25 – 300	3	TH, BP, FF, SFF, SF, ES	•	•	•
MX.06600.	75	120	6630	25 – 300	3	TH, BP, FF, SFF, SF, ES	•	•	•
MX.09500.	90	150	9500	25 – 300	3	TH, BP, FF, SFF, SF	•	•	•

MX.01000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
MX.01000.013	**920**	1120	108	121	0,06	1,17
MX.01000.025		1210	120	145	0,07	1,27
MX.01000.038		1280	133	171	0,09	1,32
MX.01000.050		1320	145	195	0,11	1,37
MX.01000.063		1350	158	221	0,13	1,58
MX.01000.075		1370	170	245	0,15	1,71
MX.01000.080		1380	175	255	0,16	1,73
MX.01000.100		1410	195	295	0,19	1,90
MX.01000.125		1430	220	345	0,23	2,11
MX.01000.150		1450	245	395	0,27	2,32
MX.01000.160		1450	255	415	0,28	2,40
MX.01000.175		1460	270	445	0,30	2,53
MX.01000.200		1470	295	495	0,34	2,74
MX.01000.250		1480	345	595	0,42	2,96
MX.01000.300		1490	395	695	0,49	3,58

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
MX.1000.050.FF

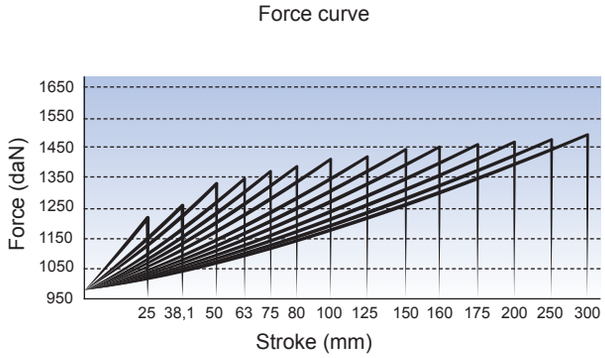
Ordering example with HT: HT.MX.1000.050.FF

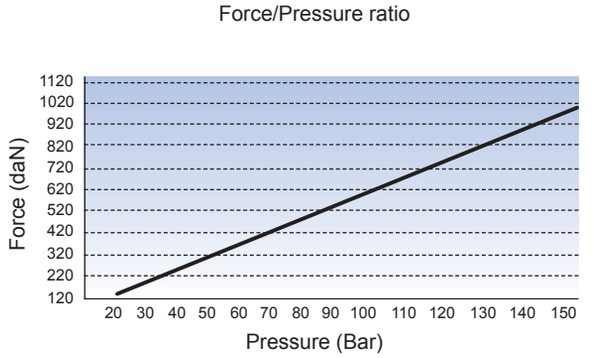
Service-Kit available

ISO

PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

(Alle dimensions are mm.)

2 x M8 Tapped holes

Square Front Flange 50 SFF

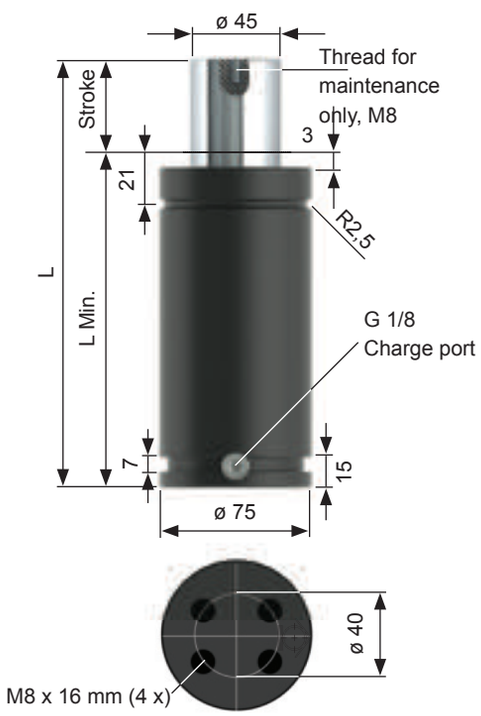
Front Flange 50 FF

Square Flange 50 SF

Base Plate 50 BP

End Support 50 ES/50 HM

MX.02400.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
MX.02400.025	2400	3710	135	160	0,23	3,1
MX.02400.038		3760	148	186	0,28	3,3
MX.02400.050		3790	160	210	0,33	3,5
MX.02400.063		3810	173	236	0,38	3,7
MX.02400.075		3830	185	260	0,43	3,89
MX.02400.080		3830	190	270	0,45	3,97
MX.02400.100		3850	210	310	0,53	4,29
MX.02400.125		3870	235	360	0,63	4,68
MX.02400.150		3880	260	410	0,73	5,07
MX.02400.160		3880	270	430	0,77	5,23
MX.02400.175		3890	285	460	0,83	5,47
MX.02400.200		3890	310	510	0,93	5,86
MX.02400.250		3900	360	610	1,17	6,65
MX.02400.300		3910	410	710	1,33	7,44

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
MX.2400.050.FF

Ordering example with HT: HT.MX.2400.050.FF

Service-Kit available

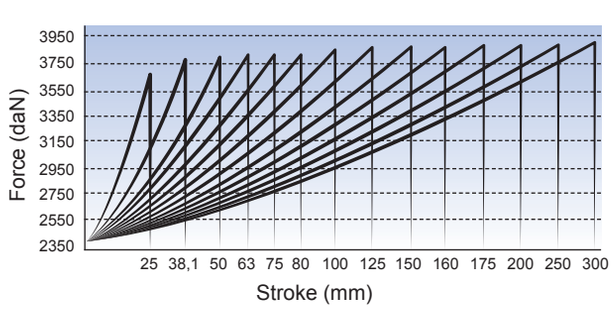
ISO

PED 97/23/EC

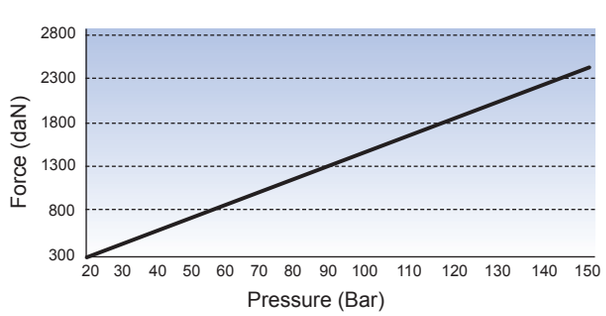
Use only Nitrogen

Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

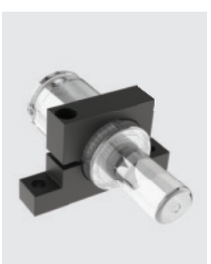
4 x M8 Tapped holes

Square Front Flange 75 SFF

Front Flange 75 FF

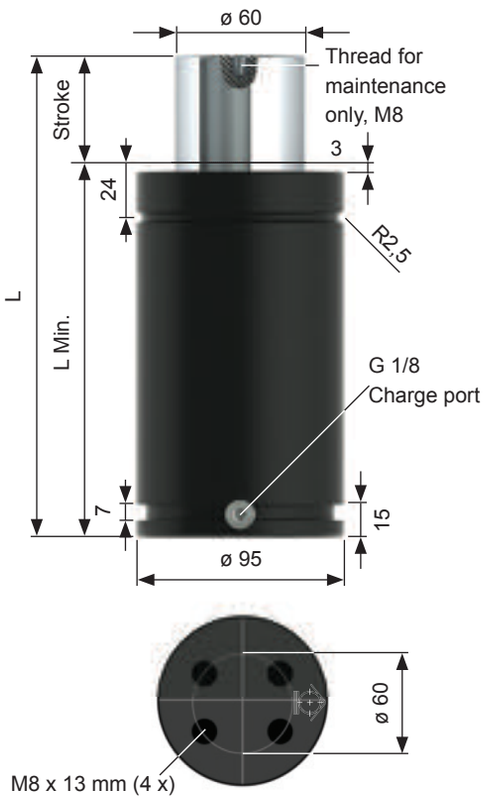
Square Flange 75 SF

Base Plate 75 BP



End Support 75 ES/75 HM

MX.04200.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
MX.04200.025	**4200**	5210	145	170	0,43	5,08
MX.04200.038		5510	158	196	0,52	5,41
MX.04200.050		5720	170	220	0,60	5,71
MX.04200.063		5900	183	246	0,68	6,05
MX.04200.075		6030	195	270	0,76	6,35
MX.04200.080		6080	200	280	0,80	6,48
MX.04200.100		6250	220	320	0,93	6,99
MX.04200.125		6400	245	370	1,10	7,63
MX.04200.150		6510	270	420	1,27	8,27
MX.04200.160		6550	280	440	1,33	8,53
MX.04200.175		6600	295	470	1,43	8,91
MX.04200.200		6680	320	520	1,60	9,55
MX.04200.250		6790	370	620	1,93	11,08
MX.04200.300		6870	420	720	2,27	12,11

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
MX.4200.050.FF

Ordering example with HT: HT.MX.4200.050.FF

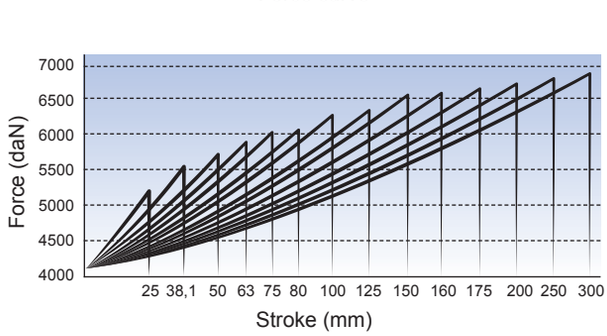
Service-Kit available

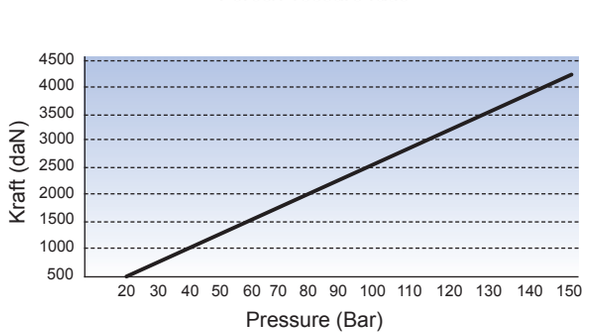
ISO

PED 97/23/EC

Use only Nitrogen

Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

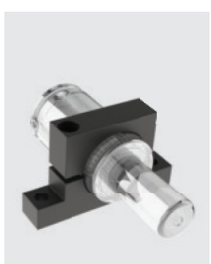
4 x M8 Tapped holes

Square Front Flange 95 SFF

Front Flange 95 FF

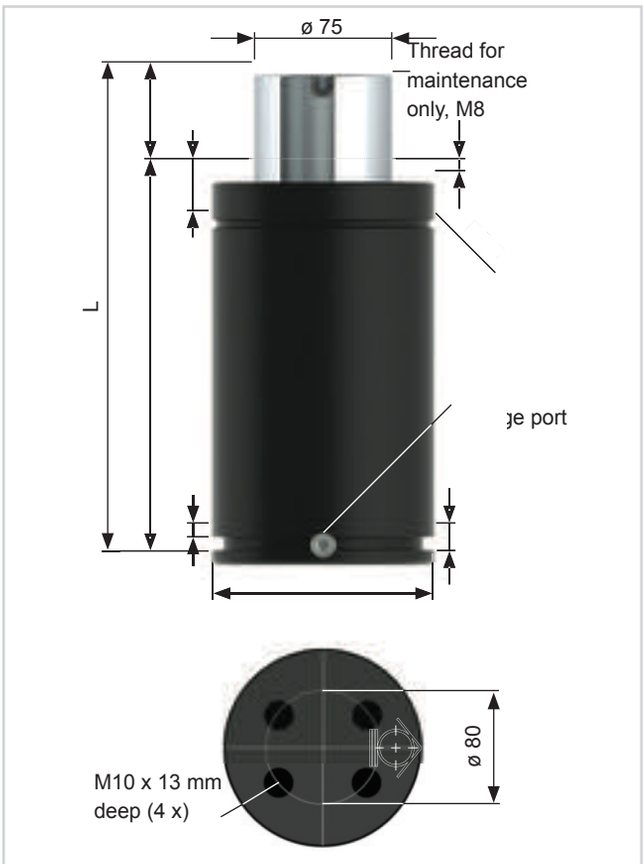
Square Flange 95 SF

Base Plate 95 BP



End Support 95 ES/95 HM

MX.06600.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
MX.06600.025	**6630**	7950	165	190	0,73	9,28
MX.06600.038		8390	178	216	0,87	9,81
MX.06600.050		8700	190	240	1,00	10,30
MX.06600.063		8970	203	266	1,13	10,83
MX.06600.075		9180	215	290	1,26	11,32
MX.06600.080		9260	220	300	1,31	11,52
MX.06600.100		9510	240	340	1,53	12,33
MX.06600.125		9760	265	390	1,79	13,35
MX.06600.150		9950	290	440	2,05	14,36
MX.06600.160		10010	300	460	2,16	14,77
MX.06600.175		10100	315	490	2,36	15,38
MX.06600.200		10220	340	540	2,58	16,40
MX.06600.250		10400	390	640	3,11	18,43
MX.06600.300		10530	440	740	3,64	20,46

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
MX.6600.050.FF

Ordering example with HT: HT.MX.6600.050.FF

Service-Kit available

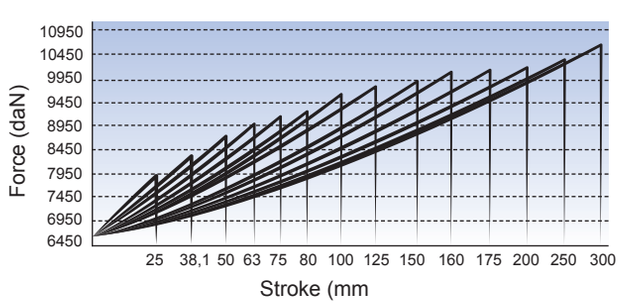
ISO

PED 97/23/EC

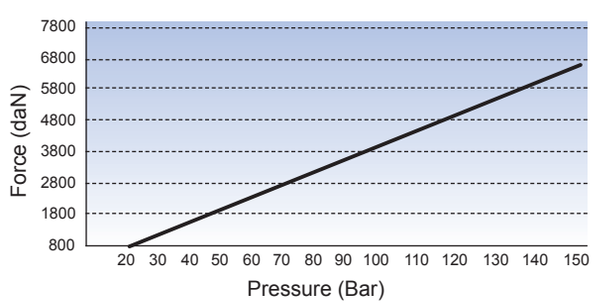
Use only Nitrogen

Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

4 x M10 Tapped holes

Square Front Flange 120 SFF

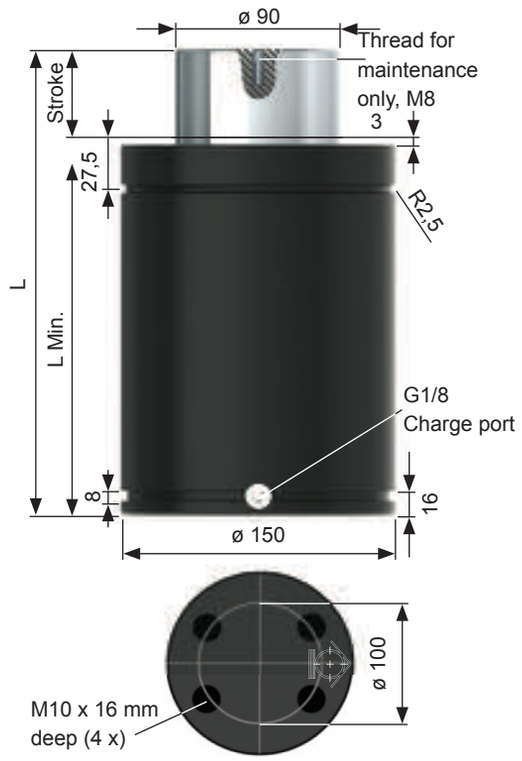
Front Flange 120 FF

Square Flange 120 SF

Base Plate 120 BP

End Support 120 ES/120 HM

MX.09500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (l)	Weight (Kg)
MX.09500.025	**9500**	11320	180	205	1,09	16,79
MX.09500.038		11900	193	231	1,30	17,70
MX.09500.050		12330	205	255	1,49	18,48
MX.09500.063		12700	218	281	1,69	19,32
MX.09500.075		12970	230	305	1,88	20,10
MX.09500.080		13080	235	315	1,96	20,42
MX.09500.100		13430	255	355	2,28	31,72
MX.09500.125		13760	280	405	2,67	23,35
MX.09500.150		14020	305	455	3,07	24,97
MX.09500.160		14100	315	475	3,23	25,62
MX.09500.175		14220	330	505	3,47	26,59
MX.09500.200		14380	355	555	3,86	28,21
MX.09500.250		14630	405	655	4,65	31,46
MX.09500.300		14820	455	755	5,44	34,70

Note:
Special stroke sizes available upon request. Also available with high temperature seal up to 130°.

Ordering example: Type x Stroke + Mounting
MX.9500.050.FF

Ordering example with HT: HT.MX.9500.050.FF

Service-Kit available

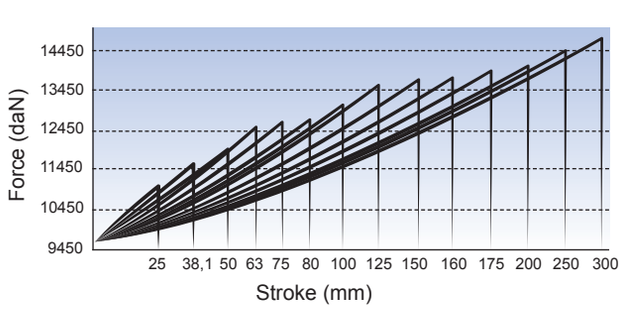
ISO

PED 97/23/EC

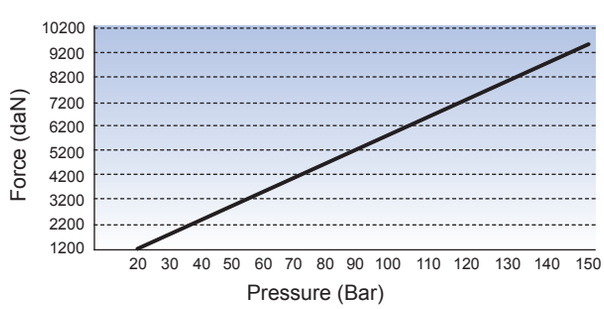
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

4 x M10 Tapped holes

Square Front Flange SFF 150

Front Flange 150 FF

Square Flange 150 SF

Base Plate 150 BP

HS GAS SPRINGS FOR HOT STAMPING

The HS Hot Stamp range of gas springs from Metrol have been specifcally designed to meet the challenges of the hot stamping environment. Metal dust and debris from the hot stamping process, pitting, scratching and corrosion of piston rods, can all lead to early failure in standard gas springs. Metrol's HS range of springs are engineered to reduce and eliminate these issues, and to provide a gas spring that can perform in the hot stamp environment without any reduction in life.

The combination of the following protective design elements results in a spring with un-paralleled performance in hot stamp applications.

Specially developed piston rods:

– High corrosion resistance
– Low friction coefficiency
– Withstands exceptional loads and wear
– High impact resistance
– High abrasion resistance

Tri-Scraper and Dual Scraper systems – ultimate seal protection

– Removes all contaminates from small dust particles to larger metal fragments
– Combination of wiper materials for increased effectiveness
– Resistant to damage from metal debris
– Flexible with side loading

High temperature seals

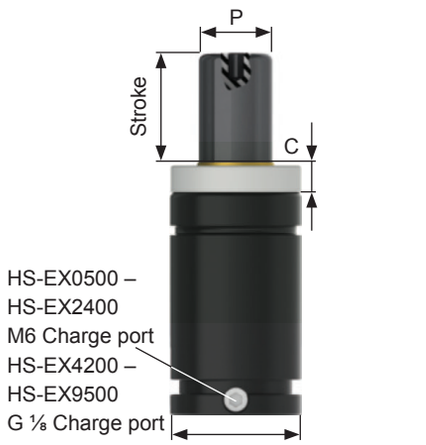
– Long life in high temperature environments

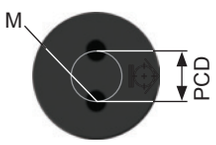
INDEX

HS (Hot Stamp) gas springs

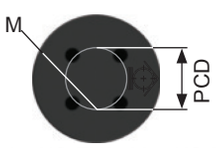
HS-EX SERIES

Overview





Style cylinder HS-EX0500 – HS-EX1500



Style cylinder HS-EX2400 – HS-EX9500

Type	PCD	M	Tapped hole depth
HS-EX.00500.	20/25	M6 x 2	6 mm
HS-EX.00750.	20	M8 x 2	6 mm
HS-EX.01000.	20	M8 x 2	6 mm
HS-EX.01500.	20	M8 x 2	6 mm
HS-EX.02400.	40	M8 x 4	6 mm
HS-EX.04200.	60	M8 x 4	12 mm
HS-EX.06600.	80	M10 x 4	12 mm
HS-EX.09500.	100	M10 x 4	13 mm

The HS-EX range of gas springs for hot stamp applications has been developed based on the EX range of gas springs, but incorporates features that are specifcally designed to overcome issues related to hot stamping.

Unique Piston Rod Treatment

– Prevents corrosion and pitting of the sealing surface
– Reduces adhesion of abrasive material

Special Tri Wiper Design

– Incorporates a metal scraper for removal of highly adhesive & abrasive metal debris
– Secondary back up rubber wiper to remove contamination

Compatible with both Cnomo and Micro hose systems.

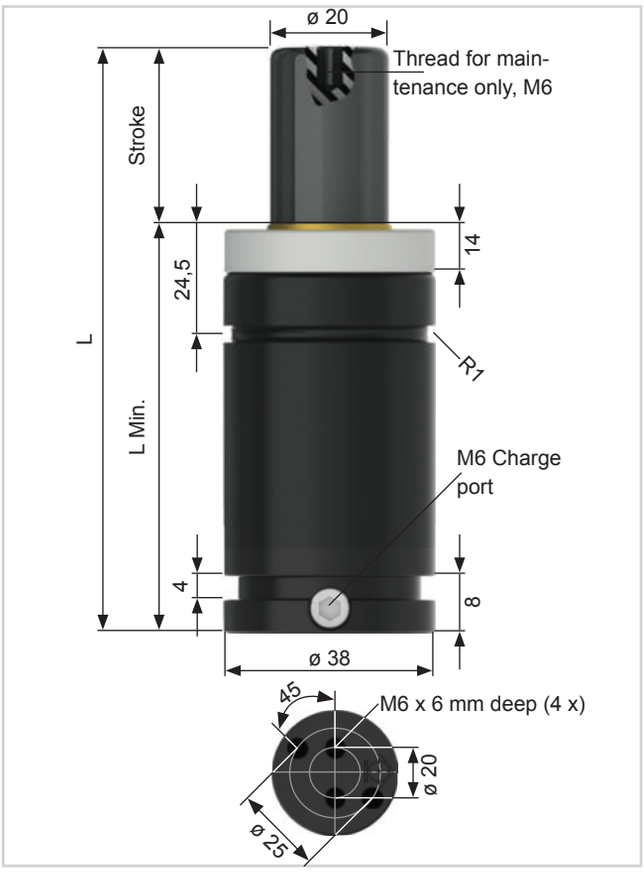
Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Service-Kit available

PED 97/23/EC

Type	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe system	
							Micro 24	CNOMO
HS-EX.00500.	20	38	500	25 – 125	14	TH, FF, SF, SFF, ES	•	•
HS-EX.00750.	25	45	750	25 – 125	14	TH, FF, SF, SFF, ES, BP	•	•
HS-EX.01000.	28	50	1000	25 – 125	15	TH, FF, SF, SFF, ES, BP	•	•
HS-EX.01500.	36	63	1500	25 – 125	15	TH, FF, SF, SFF, ES, BP	•	•
HS-EX.02400.	45	75	2400	25 – 125	15	TH, FF, SF, SFF, ES, BP	•	•
HS-EX.04200.	60	95	4200	25 – 125	15	TH, FF, SF, SFF, ES, BP	•	•
HS-EX.06600.	75	120	6600	25 – 125	15	TH, FF, SF, SFF, ES, BP	•	•
HS-EX.09500.	90	150	9500	25 – 125	15	TH, FF, SF, SFF, BP	•	•

HS-EX.00500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-EX.00500.025	500	779	67	93	0,03	0,31
HS-EX.00500.038		795	80	118	0,04	0,36
HS-EX.00500.050		803	92	143	0,05	0,40
HS-EX.00500.063		825	105	168	0,06	0,45
HS-EX.00500.080		814	122	202	0,08	0,52
HS-EX.00500.100		817	142	242	0,10	0,60
HS-EX.00500.125		821	167	292	0,12	0,70

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-EX.00500.025.FF

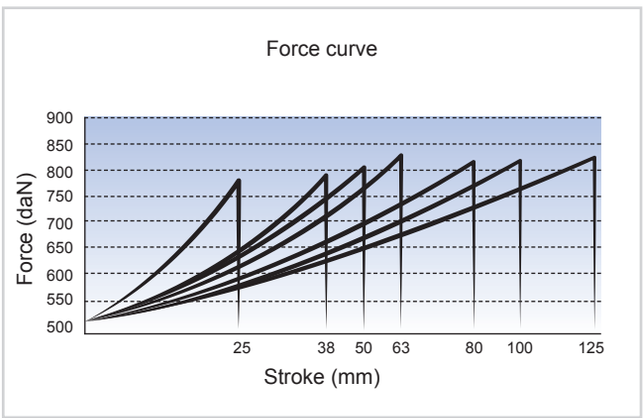
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%

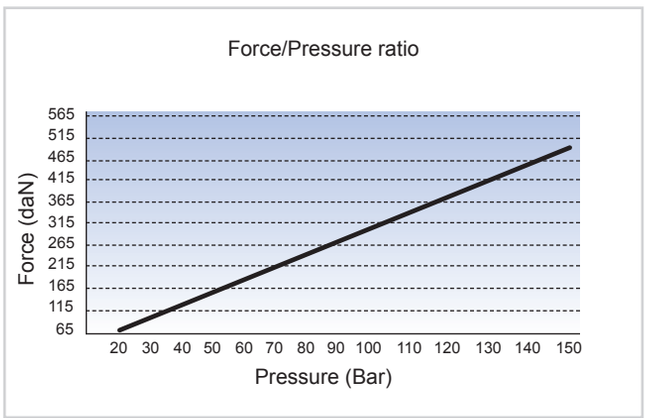
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

2 x M6 Tapped holes

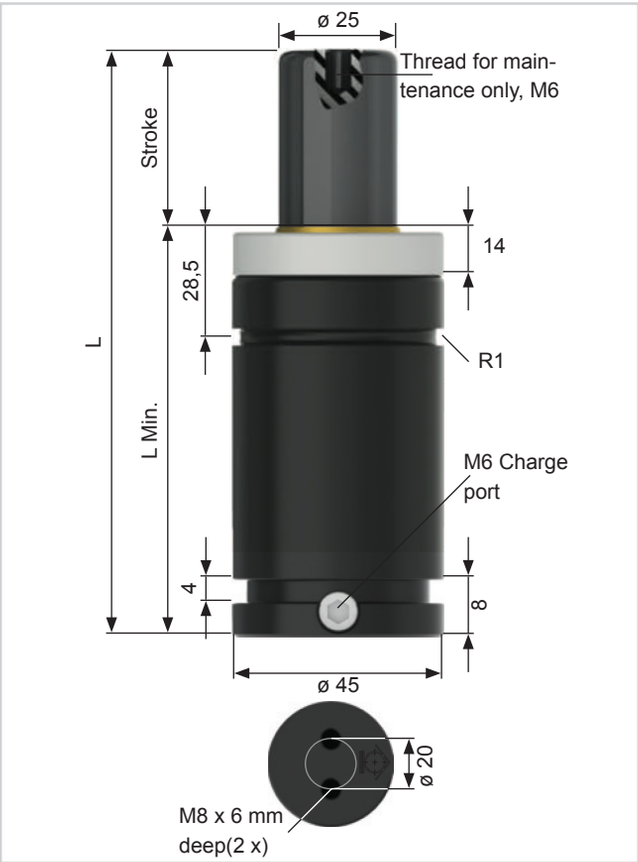
Square Front Flange 38 SFF

Front Flange 38 FF

Square Flange 38 SF

End Support 38 ES

HS-EX.00750.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-EX.00750.025	**0750**	1145	69	95	0,04	0,45
HS-EX.00750.038		1170	82	120	0,05	0,53
HS-EX.00750.050		1180	94	145	0,07	0,61
HS-EX.00750.063		1220	107	170	0,09	0,69
HS-EX.00750.080		1210	124	204	0,11	0,80
HS-EX.00750.100		1215	144	244	0,13	0,93
HS-EX.00750.125		1220	169	294	0,17	1,09

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-EX.00750.025.FF

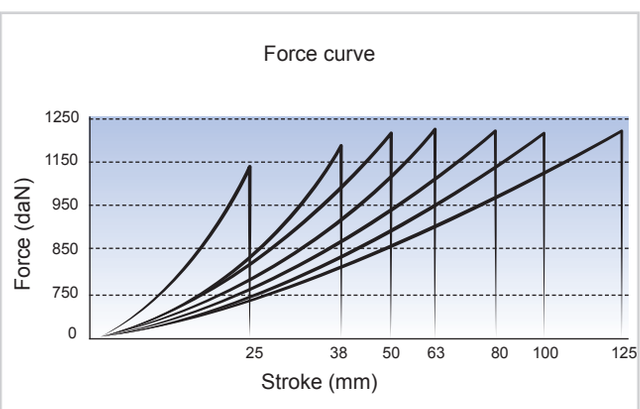
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

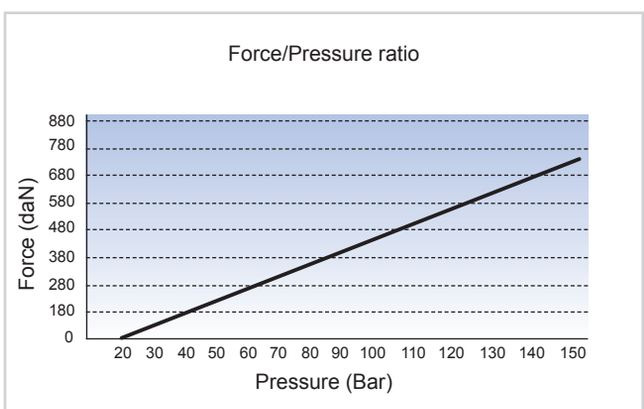
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

2 x M8 Tapped holes

Square Front Flange 45 SFF

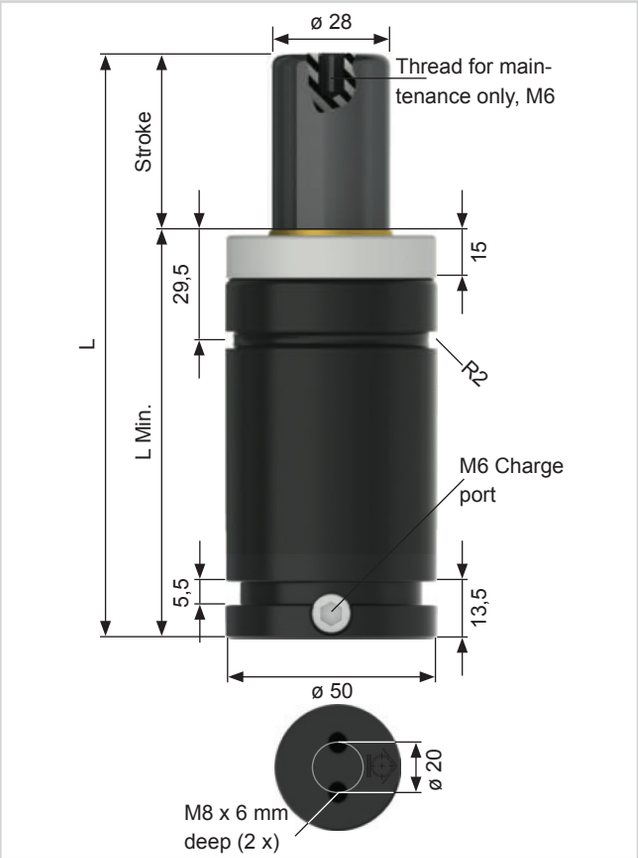
Front Flange 45 FF

Square Flange 45 SF

Base Plate 45 BP

End Support 45 ES

HS-EX.01000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-EX.01000.025	1000	1630	75	101	0,05	0,59
HS-EX.01000.038		1660	88	126	0,07	0,70
HS-EX.01000.050		1680	100	151	0,09	0,79
HS-EX.01000.063		1730	113	176	0,11	0,89
HS-EX.01000.080		1700	130	210	0,14	1,03
HS-EX.01000.100		1710	150	250	0,17	1,19
HS-EX.01000.125		1715	175	300	0,21	1,39

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-EX.01000.025.FF

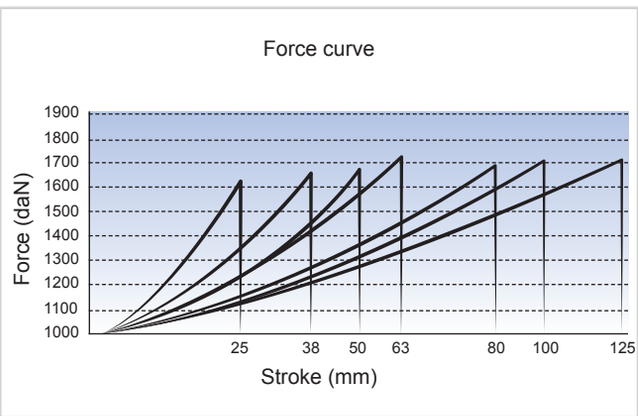
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

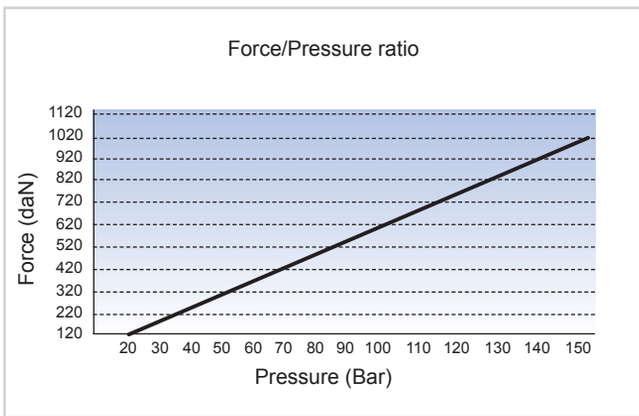
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting example

2 x M8 Tapped holes

Square Front Flange 50 SFF

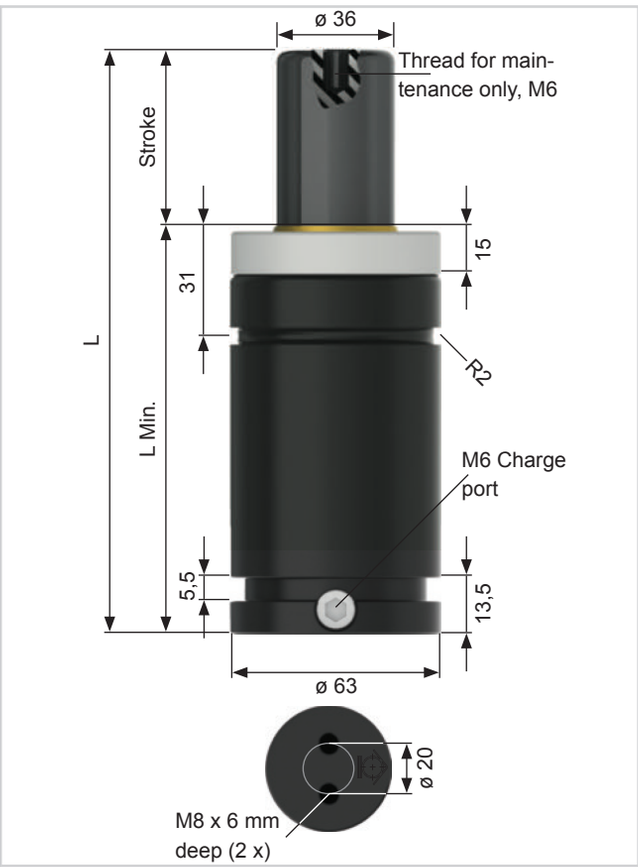
Front Flange 50 FF

Square Flange 50 SF

Base Plate 50 BP

End Support 50 ES/50 HM

HS-EX.01500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-EX.01500.025	**1500**	2430	81	107	0,08	1,03
HS-EX.01500.038		2480	94	132	0,12	1,15
HS-EX.01500.050		2510	106	157	0,15	1,28
HS-EX.01500.063		2580	119	182	0,19	1,43
HS-EX.01500.080		2550	136	216	0,24	1,63
HS-EX.01500.100		2560	156	256	0,29	1,86
HS-EX.01500.125		2580	181	306	0,36	2,15

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-EX.01500.025.FF

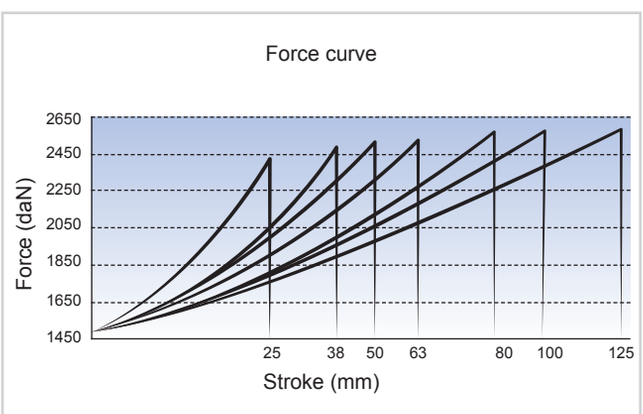
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

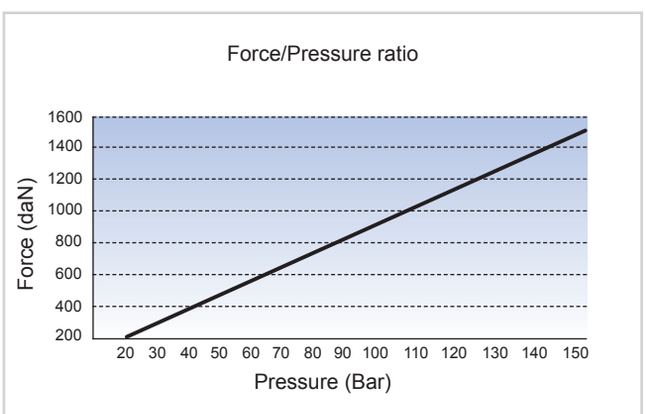
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.



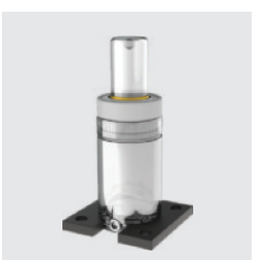


Mounting examples

2 x M8 Tapped holes

Square Front Flange 63 SFF – 63 SFF

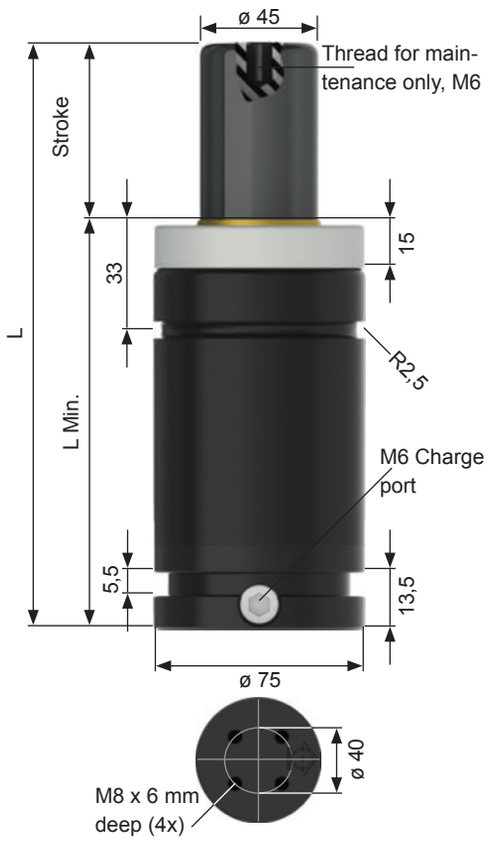
Front Flange 63 FF



Square Flange 63 SF

Base Plate 63 BP

HS-EX.02400.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-EX.02400.025	2400	3570	82	108	0,13	1,45
HS-EX.02400.038		3700	95	133	0,18	1,65
HS-EX.02400.050		3780	107	158	0,23	1,84
HS-EX.02400.063		3900	120	183	0,28	2,20
HS-EX.02400.080		3880	137	217	0,35	2,32
HS-EX.02400.100		3920	157	257	0,43	2,66
HS-EX.02400.125		3960	182	307	0,54	3,05

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-EX.02400.025.FF

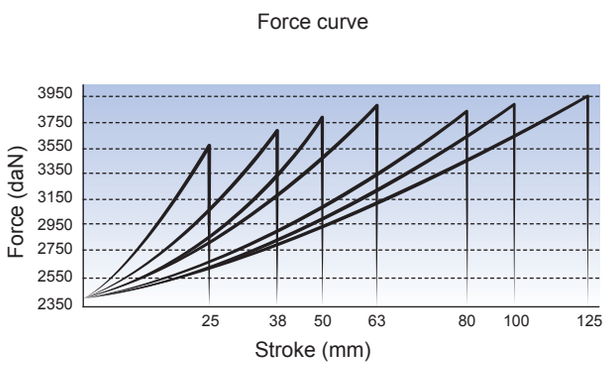
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

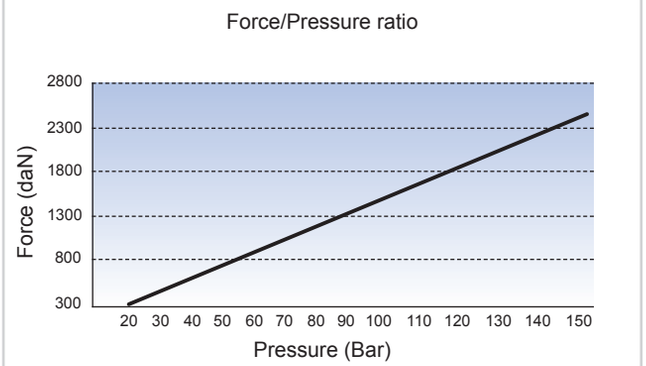
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples


4 x M8 Tapped holes


Square Front Flange 75 SFF

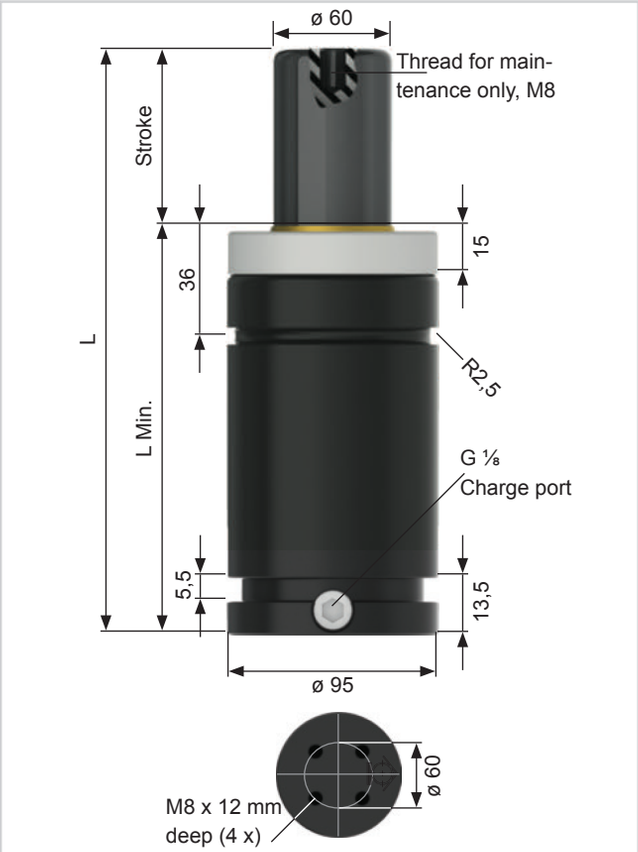

Front Flange 75 FF


Square Flange 75 SF


End Support 75 ES/75 HM


End Support 50 ES/50 HM

HS-EX.04200.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-EX.04200.025	**4200**	6620	95	121	0,26	2,96
HS-EX.04200.038		6620	108	146	0,32	3,28
HS-EX.04200.050		6620	120	171	0,40	3,57
HS-EX.04200.063		6620	133	196	0,49	4,10
HS-EX.04200.080		6620	150	230	0,61	4,32
HS-EX.04200.100		6620	170	270	0,74	4,81
HS-EX.04200.125		6620	195	320	0,91	5,42

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-EX.04200.025.FF

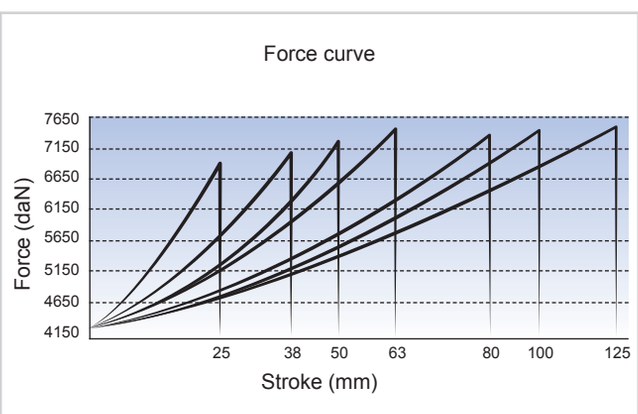
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

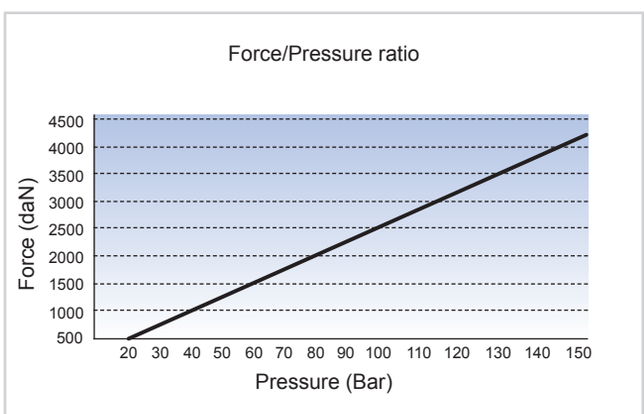
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

4 x M8 Tapped holes

Square Front Flange 95 SFF

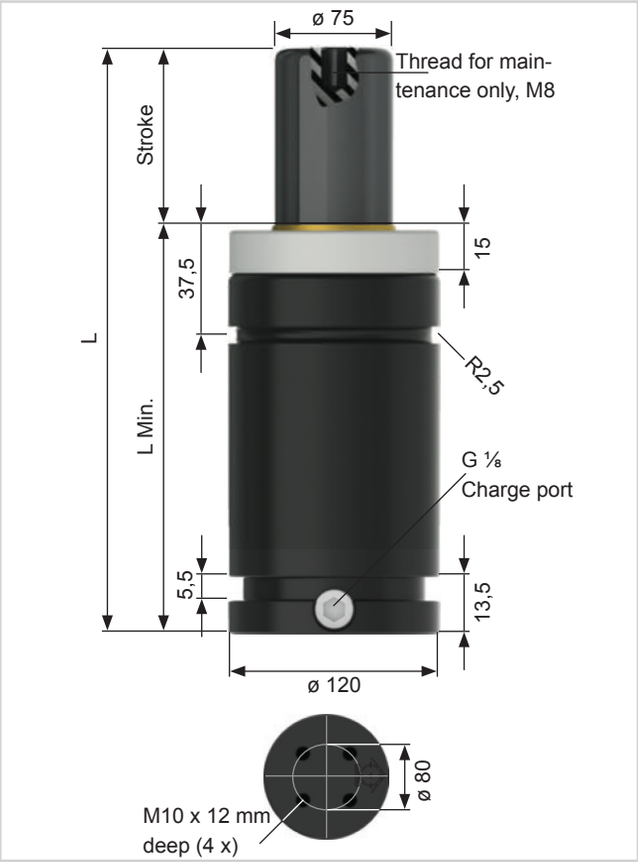
Front Flange 95 FF

Square Flange 95 SF

Base Plate 95 BP

End Support 95 ES/95 HM

HS-EX.06600.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-EX.06600.025	6630	7940	105	131	0,42	5,34
HS-EX.06600.038		8340	118	156	0,56	5,84
HS-EX.06600.050		8670	130	181	0,69	6,31
HS-EX.06600.063		9030	143	206	0,81	6,81
HS-EX.06600.080		9250	160	240	1,01	7,46
HS-EX.06600.100		9530	180	280	1,23	8,23
HS-EX.06600.125		9800	205	330	1,50	9,19

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-EX.06600.025.FF

Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

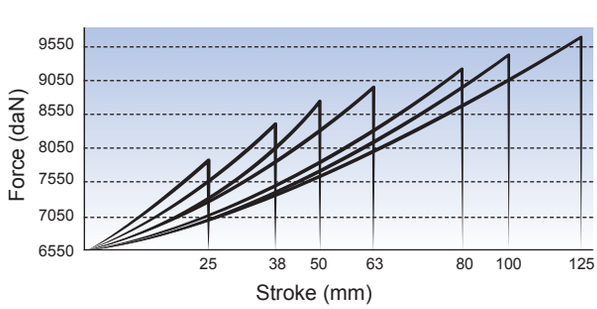
Service-Kit available

PED 97/23/EC

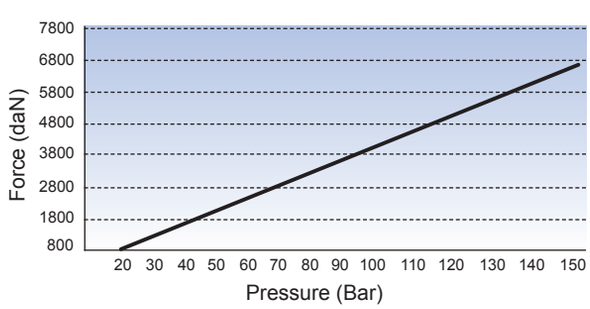
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

4 x M10 Tapped holes

Square Front Flange 120 SFF

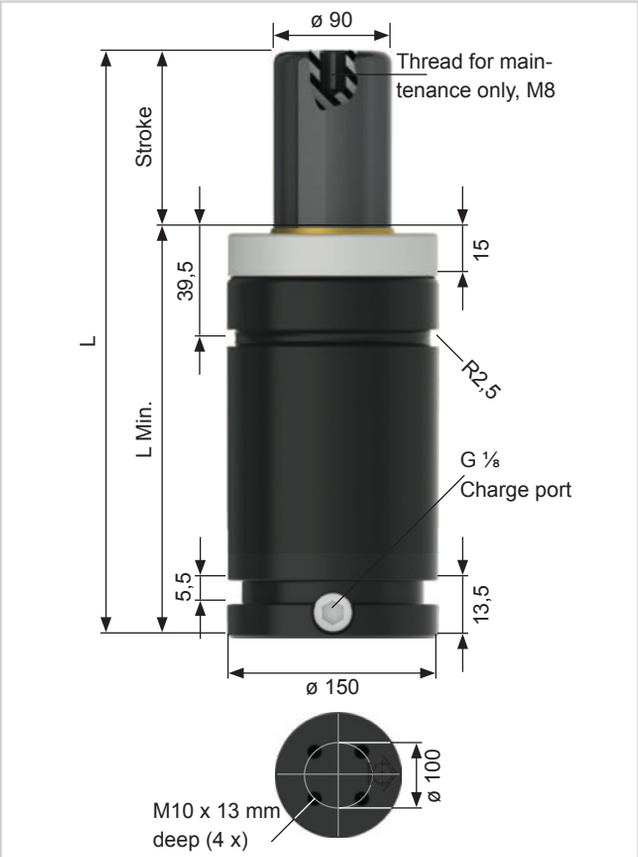
Front Flange 120 FF

Square Flange 120 SF

Base Plate 120 BP

End Support 120 ES/120 HM

HS-EX.09500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-EX.09500.025	**9500**	13930	115	141	0,58	10,23
HS-EX.09500.038		14320	128	166	0,80	11,04
HS-EX.09500.050		14800	140	191	0,99	11,79
HS-EX.09500.063		15270	153	216	1,20	12,60
HS-EX.09500.080		15470	170	250	1,47	13,66
HS-EX.09500.100		15730	190	290	1,79	14,91
HS-EX.09500.125		16000	215	340	2,20	16,47

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-EX.09500.025.FF

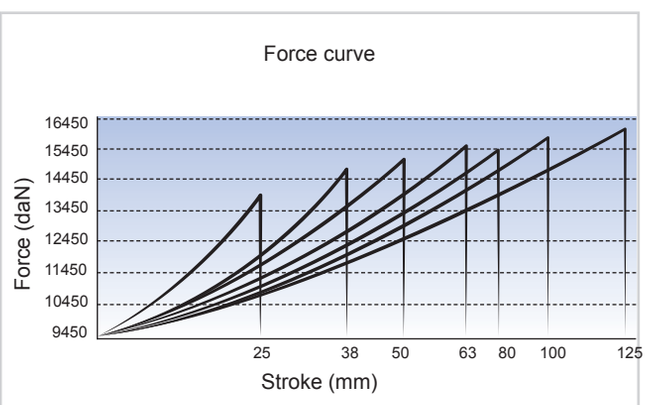
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

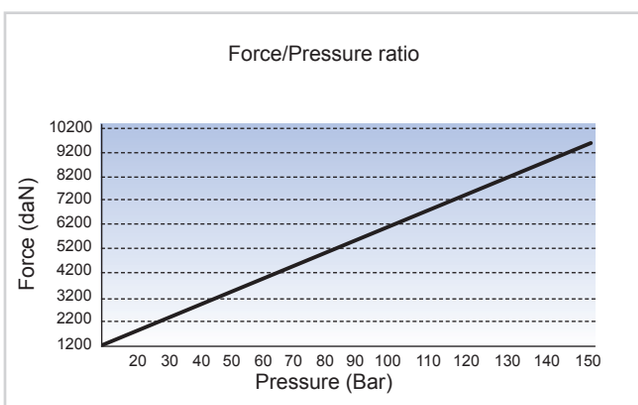
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

4 x M10 Tapped holes

Square Front Flange 150 SFF

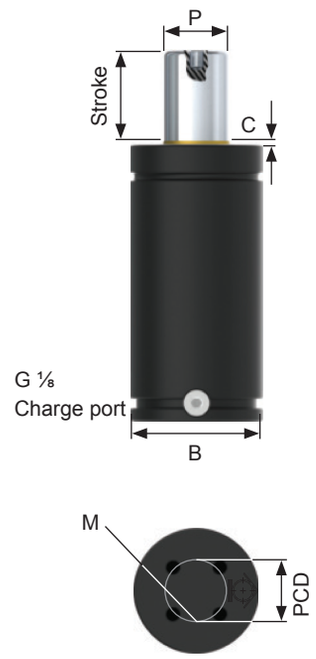
Front Flange 150 FF

Square Flange 150 SF

Base Plate 150 BP

HS-NG SERIES

Overview



Style cylinder HS-NG.01500. – HS-NG.07500.

Type	PCD	M	Tapped hole depth
HS-NG.01500.	40	M8 x 4	13 mm
HS-NG.03000.	60	M8 x 4	13 mm
HS-NG.05000.	80	M10 x 4	13 mm
HS-NG.07500.	100	M10 x 4	13 mm

The HS-NG range of gas springs for hot stamp applications has been developed based on the ISO11901 range of gas springs, but incorporates features that are specifcally designed to overcome issues related to hot stamping.

Unique Piston Rod Treatment

– Prevents corrosion and pitting of the sealing surface
– Reduces adhesion of abrasive material

Special Double Wiper Design

– Incorporates a metal scraper for removal of highly adhesive & abrasive metal debris
– Secondary back up rubber wiper to remove contamination

Compatible with both Cnomo and Micro hose systems.

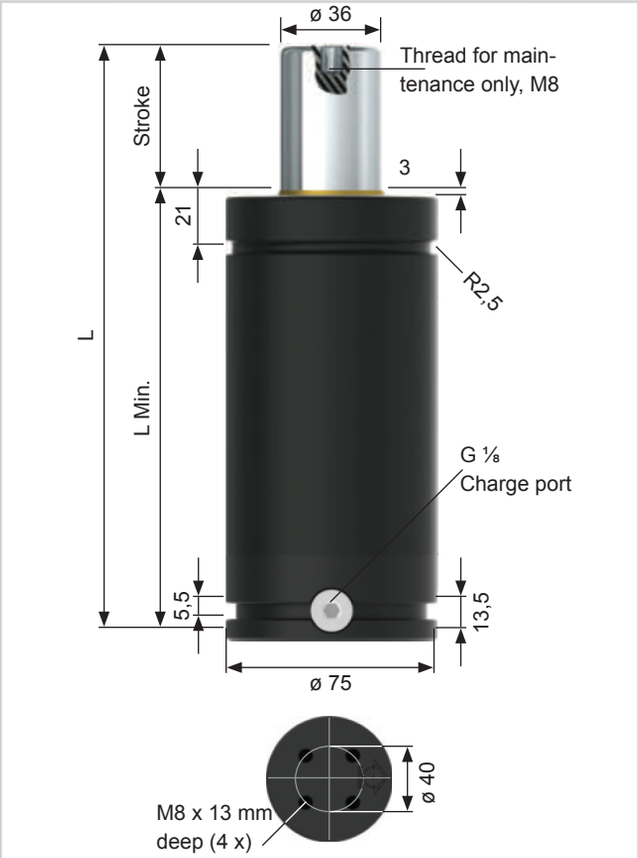
Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Service-Kit available

PED 97/23/EC

Order-No.: Type/Stroke	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe system		Overhaul
							Micro 24	CNOMO	
HS-NG.01500.	36	75	1500	25 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
HS-NG.03000.	50	95	3000	25 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
HS-NG.05000.	65	120	5000	25 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
HS-NG.07500.	80	150	7500	25 – 300	3	TH, FF, SF, SFF, BP	•	•	•

HS-NG.01500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-NG.01500.025	**1500**	2040	135	160	0,10	3,65
HS-NG.01500.038		2060	148,1	186,2	0,15	3,89
HS-NG.01500.050		2090	160	210	0,18	4,11
HS-NG.01500.063		2130	173,5	237	0,22	4,35
HS-NG.01500.080		2115	190	270	0,28	4,66
HS-NG.01500.100		2140	210	310	0,34	5,02
HS-NG.01500.125		2160	235	360	0,42	5,48
HS-NG.01500.160		2165	270	430	0,53	6,12
HS-NG.01500.200		2160	310	510	0,68	6,90
HS-NG.01500.250		2180	360	610	0,81	7,80
HS-NG.01500.300		2200	410	710	0,96	8,90

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-NG.01500.050.FF

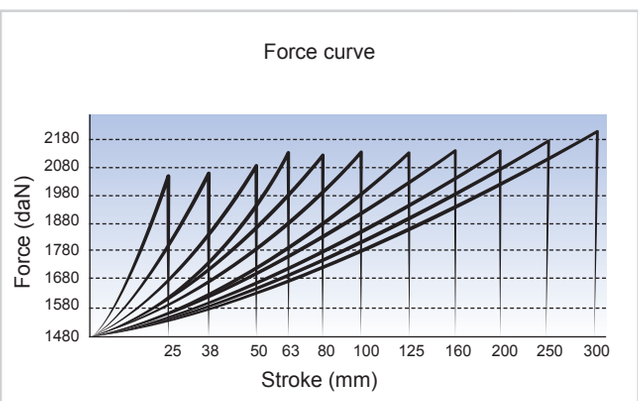
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

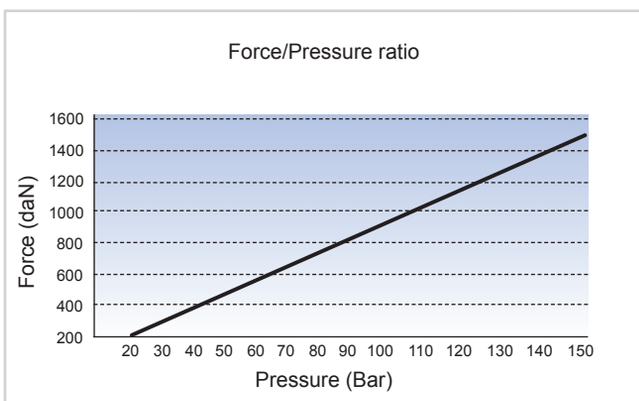
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

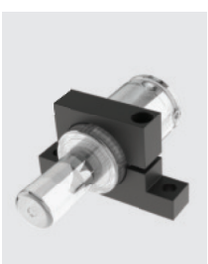
4 x M8 Tapped holes

Square Front Flange 75 SFF

Front Flange 75 FF

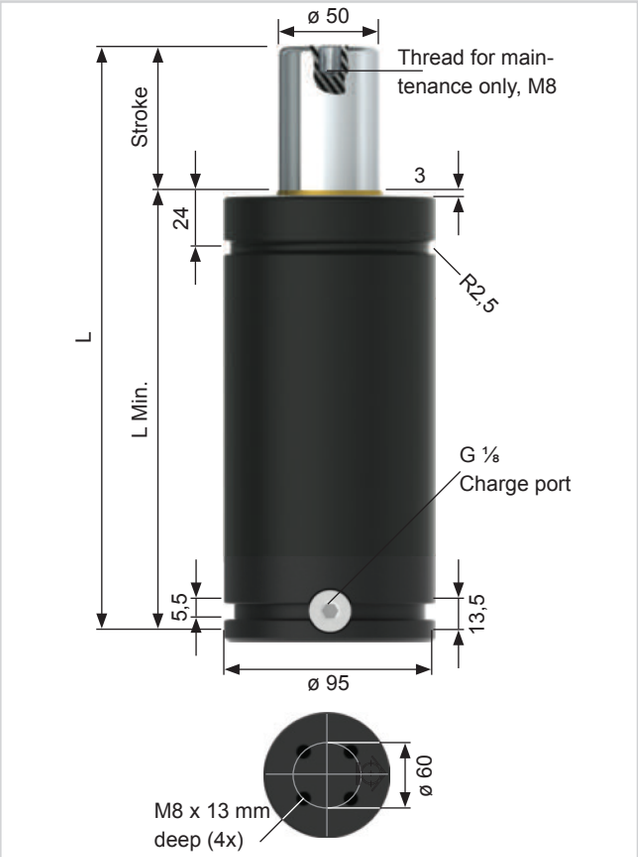
Square Flange 75 SF

Base Plate 75 BP



End Support 75 ES/75 HM

HS-NG.03000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-NG.03000.025	3000	4140	145	170	0,20	6,45
HS-NG.03000.038		4210	158,1	196,2	0,26	6,87
HS-NG.03000.050		4320	170	220	0,32	7,25
HS-NG.03000.063		4480	183,5	247	0,38	7,67
HS-NG.03000.080		4500	200	280	0,46	8,20
HS-NG.03000.100		4570	220	320	0,56	8,83
HS-NG.03000.125		4570	245	370	0,69	9,63
HS-NG.03000.160		4580	280	440	0,87	10,74
HS-NG.03000.200		4560	320	520	1,07	12,20
HS-NG.03000.250		4540	370	620	1,32	13,70
HS-NG.03000.300		4590	420	720	1,57	15,30

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-NG.03000.050.FF

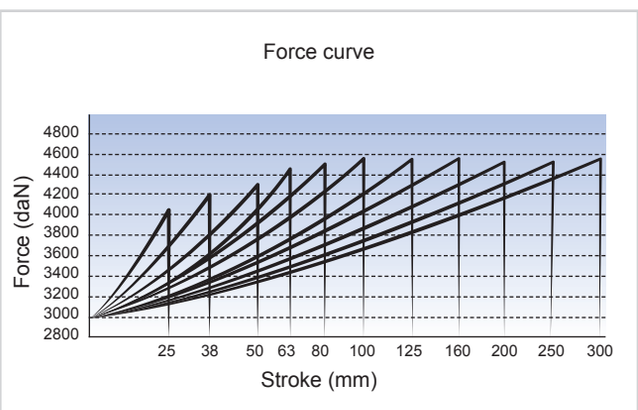
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

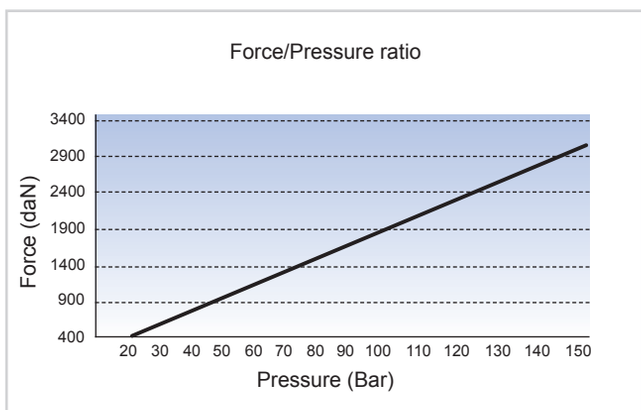
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

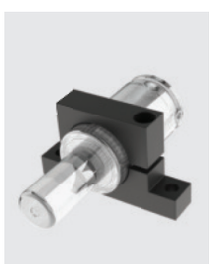

4 x M8 Tapped holes


Square Front Flange 95 SFF

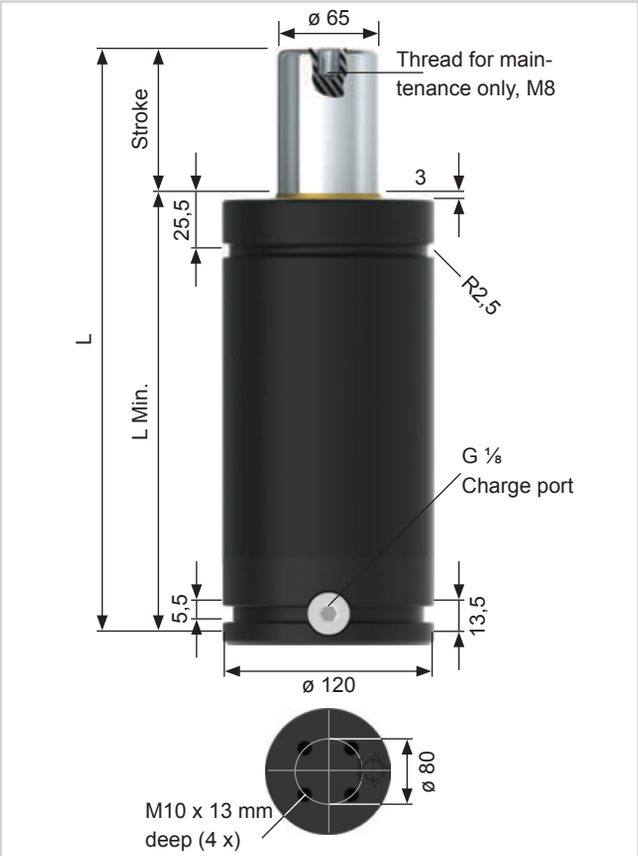

Front Flange 95 FF


Square Flange 95 SF


Base Plate 95 BP


End Support 95 ES/95 HM

HS-NG.05000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-NG.05000.025	**5000**	6900	165	190	0,32	12,40
HS-NG.05000.038		7010	178,1	216,2	0,42	13,10
HS-NG.05000.050		7210	190	240	0,51	13,70
HS-NG.05000.063		7450	203,5	267	0,60	14,40
HS-NG.05000.080		7510	220	300	0,73	15,30
HS-NG.05000.100		7550	240	340	0,89	16,40
HS-NG.05000.125		7560	265	390	1,09	17,70
HS-NG.05000.160		7560	300	460	1,36	19,60
HS-NG.05000.200		7590	340	540	1,68	20,70
HS-NG.05000.250		7560	390	640	2,07	22,40
HS-NG.05000.300		7540	440	740	2,46	24,66

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-NG.05000.050.FF

Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

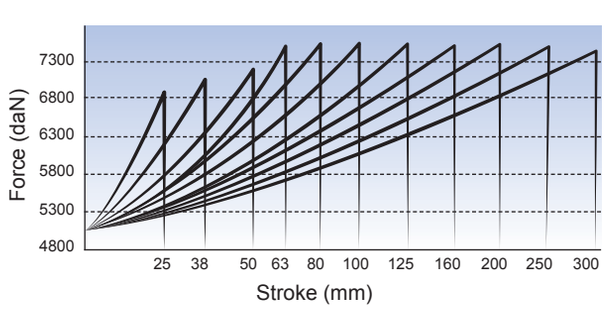
Service-Kit available

PED 97/23/EC

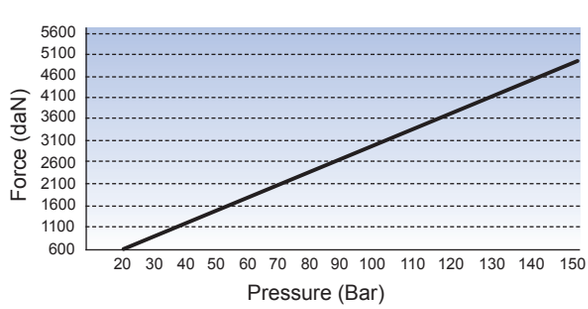
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

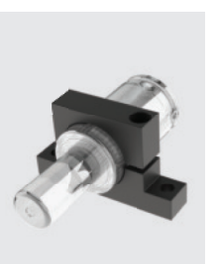
4 x M10 Tapped holes

Square Front Flange 120 SFF

Front Flange 120 FF

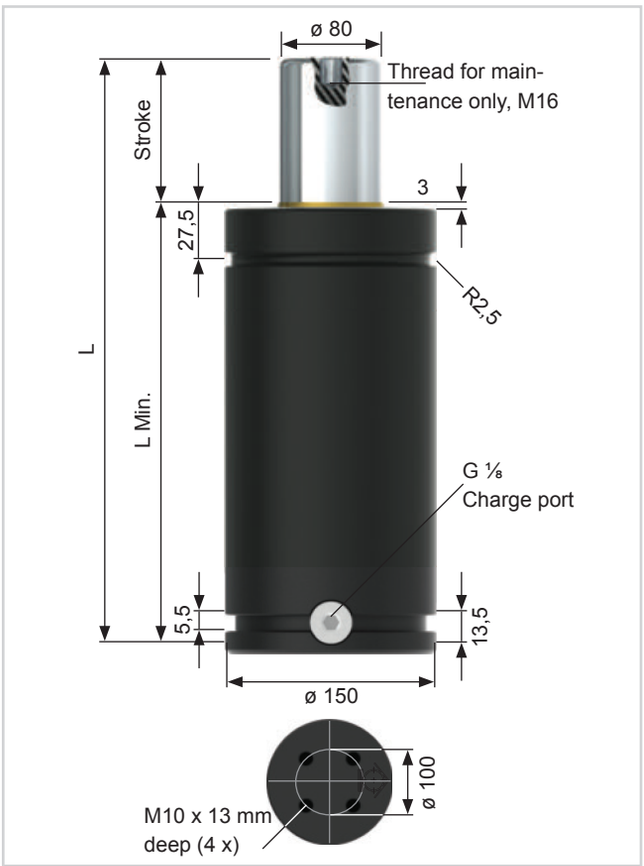
Square Flange 120 SF

Base Plate 120 BP



End Support 120 ES/120 HM

HS-NG.07500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-NG.07500.025	7500	10100	180	205	0,51	20,30
HS-NG.07500.038		10500	193,1	231,2	0,67	21,40
HS-NG.07500.050		10500	205	255	0,81	22,40
HS-NG.07500.063		10550	218,5	282	0,98	23,50
HS-NG.07500.080		10550	235	315	1,18	24,80
HS-NG.07500.100		10550	255	355	1,43	26,50
HS-NG.07500.125		10550	280	405	1,74	28,50
HS-NG.07500.160		10530	315	475	2,17	31,40
HS-NG.07500.200		10520	355	555	2,66	34,70
HS-NG.07500.250		10590	405	655	3,27	38,80
HS-NG.07500.300		10560	455	755	3,88	42,90

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-NG.07500.050.FF

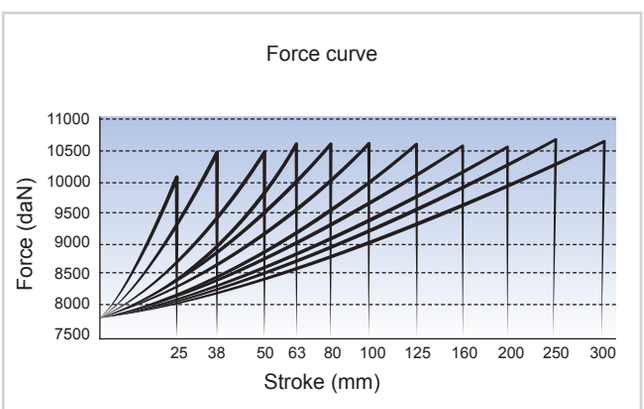
Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

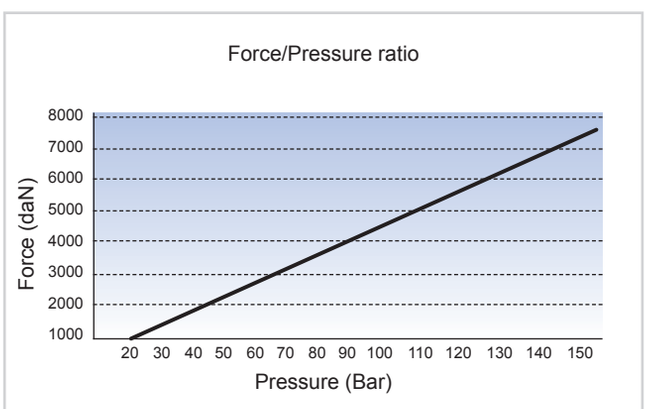
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.





Mounting examples

4 x M10 Tapped holes

Square Front Flange 150 SFF

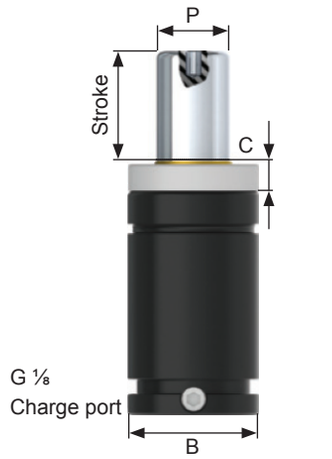
Front Flange 150 FF

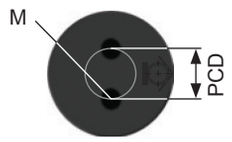
Square Flange 150 SF

Base Plate 150 BP

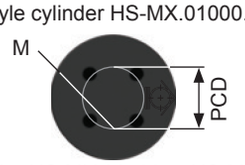
HS-MX SERIE

Overview





Style cylinder HS-MX.01000.



Style cylinder HS-MX.02400. – HS-MX.09500.

Type	PCD	M	Tapped hole depth
HS-MX.01000.	20	M8 x 2	12,5 mm
HS-MX.02400.	40	M8 x 4	13 mm
HS-MX.04200.	60	M8 x 4	13 mm
HS-MX.06600.	80	M10 x 4	13 mm
HS-MX.09500.	40	M10 x 4	13 mm

The HS-MX range of gas springs for hot stamp applications has been developed based on the EX range of gas springs, but incorporates features that are specifcally designed to overcome issues related to hot stamping.

Unique Piston Rod Treatment

– Prevents corrosion and pitting of the sealing surface
– Reduces adhesion of abrasive material

Special Tri Wiper Design

– Incorporates a metal scraper for removal of highly adhesive & abrasive metal debris
– Secondary back up rubber wiper to remove contamination

Compatible with both Cnomo and Micro hose systems.

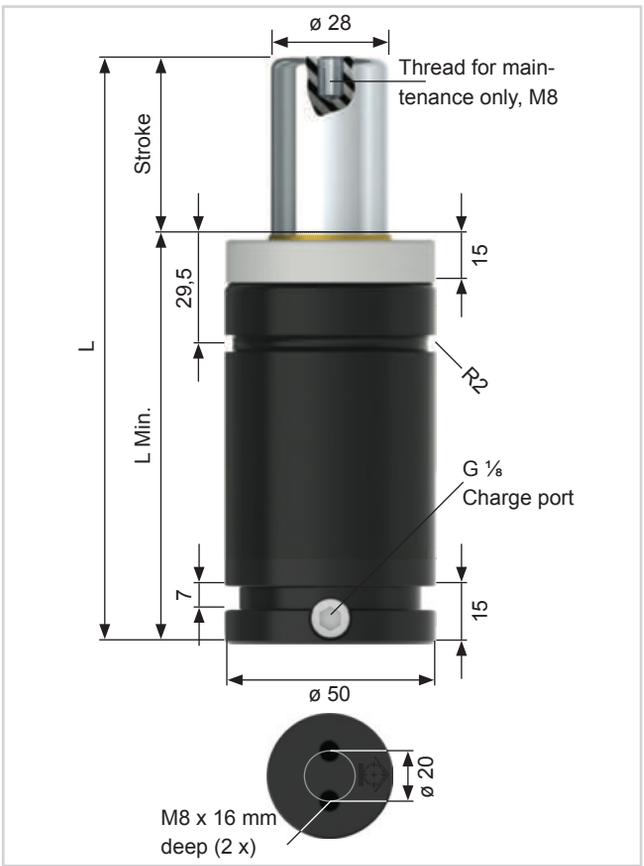
Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.

Service-Kit available

PED 97/23/EC

Order-No.: Type/Stroke	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe System		Overhaul
							Micro 24	CNOMO	
HS-MX.01000.	28	50	1000	13 – 300	15	TH, BP, FF, SFF, SF, ES	•	•	•
HS-MX.02400.	45	75	2400	25 – 300	15	TH, BP, FF, SFF, SF, ES	•	•	•
HS-MX.04200.	60	95	4200	25 – 300	15	TH, BP, FF, SFF, SF, ES	•	•	•
HS-MX.06600.	75	120	6600	25 – 300	15	TH, BP, FF, SFF, SF, ES	•	•	•
HS-MX.09500.	90	150	9500	25 – 300	15	TH, BP, FF, SFF, SF	•	•	•

HS-MX.01000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-MX.01000.025	920	1210	120	145	0,07	1,27
HS-MX.01000.038		1280	133	171	0,09	1,32
HS-MX.01000.050		1320	145	195	0,11	1,37
HS-MX.01000.063		1350	158	221	0,13	1,58
HS-MX.01000.075		1370	170	245	0,15	1,71
HS-MX.01000.080		1380	175	255	0,16	1,73
HS-MX.01000.100		1410	195	295	0,19	1,90
HS-MX.01000.125		1430	220	345	0,23	2,11
HS-MX.01000.150		1450	245	395	0,27	2,32
HS-MX.01000.160		1450	255	415	0,28	2,40
HS-MX.01000.175		1460	270	445	0,30	2,53
HS-MX.01000.200		1470	295	495	0,34	2,74
HS-MX.01000.250		1480	345	595	0,42	2,96
HS-MX.01000.300		1490	395	695	0,49	3,58

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-MX.01000.050.FF

Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

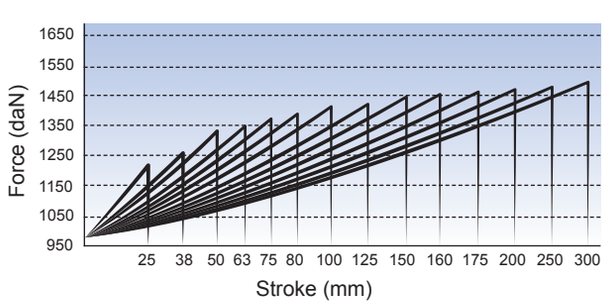
Service-Kit available

PED 97/23/EC

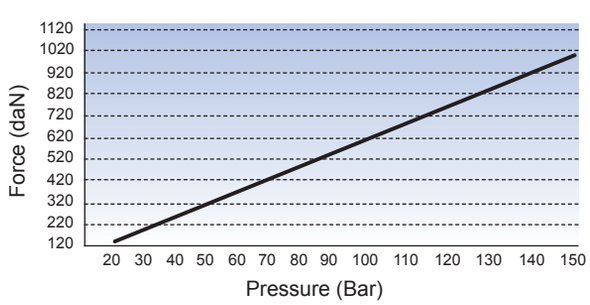
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

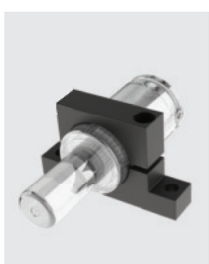

2 x M8 Tapped holes


Square Front Flange 50 SFF

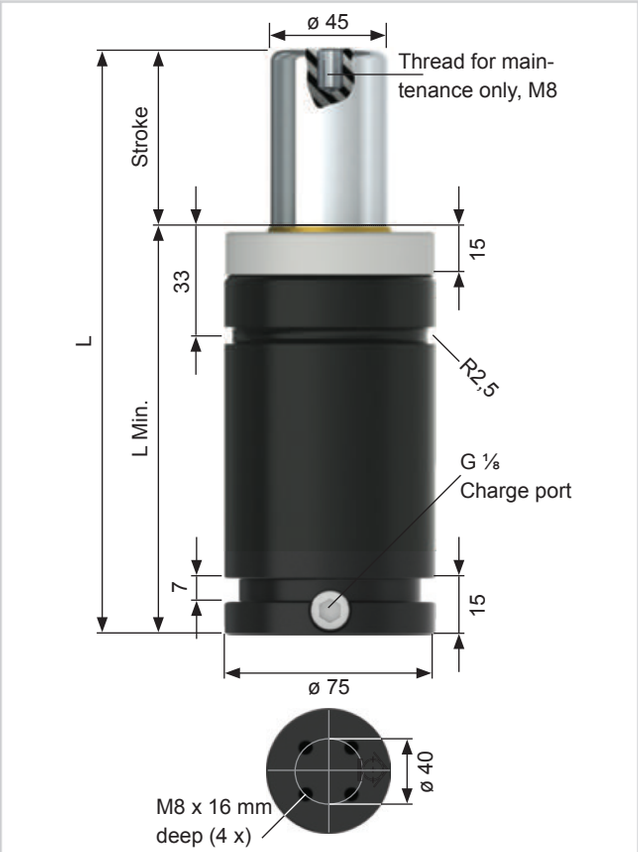

Front Flange 50 FF


Square Flange 50 SF


Base Plate 50 BP


End Support 50 ES/50 HM

HS-MX.02400.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-MX.02400.025	2400	3710	135	160	0,23	3,10
HS-MX.02400.038		3760	148	186	0,28	3,30
HS-MX.02400.050		3790	160	210	0,33	3,50
HS-MX.02400.063		3810	173	236	0,38	3,70
HS-MX.02400.075		3830	185	260	0,43	3,89
HS-MX.02400.080		3830	190	270	0,45	3,97
HS-MX.02400.100		3850	210	310	0,53	4,29
HS-MX.02400.125		3870	235	360	0,63	4,68
HS-MX.02400.150		3880	260	410	0,73	5,07
HS-MX.02400.160		3880	270	430	0,77	5,23
HS-MX.02400.175		3890	285	460	0,83	5,47
HS-MX.02400.200		3890	310	510	0,93	5,86
HS-MX.02400.250		3900	360	610	1,17	6,65
HS-MX.02400.300		3910	410	710	1,33	7,44

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-MX.02400.050.FF

Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

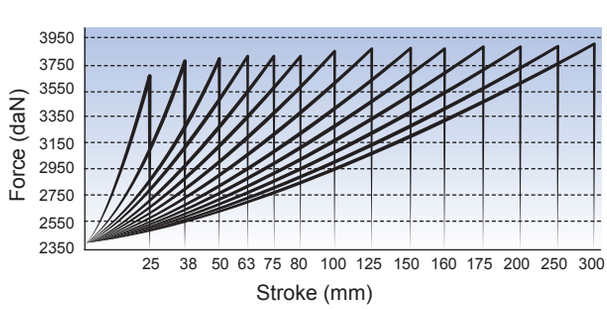
Service-Kit available

PED 97/23/EC

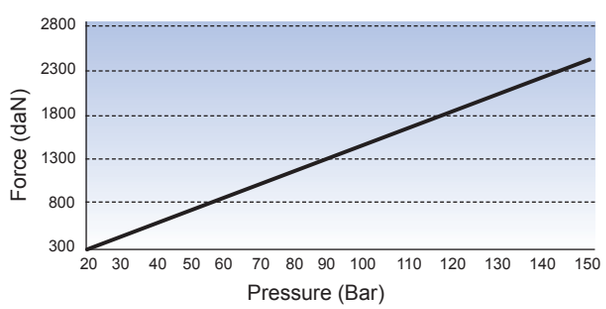
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples


2 x M8 Tapped holes


Square Front Flange 75 SFF

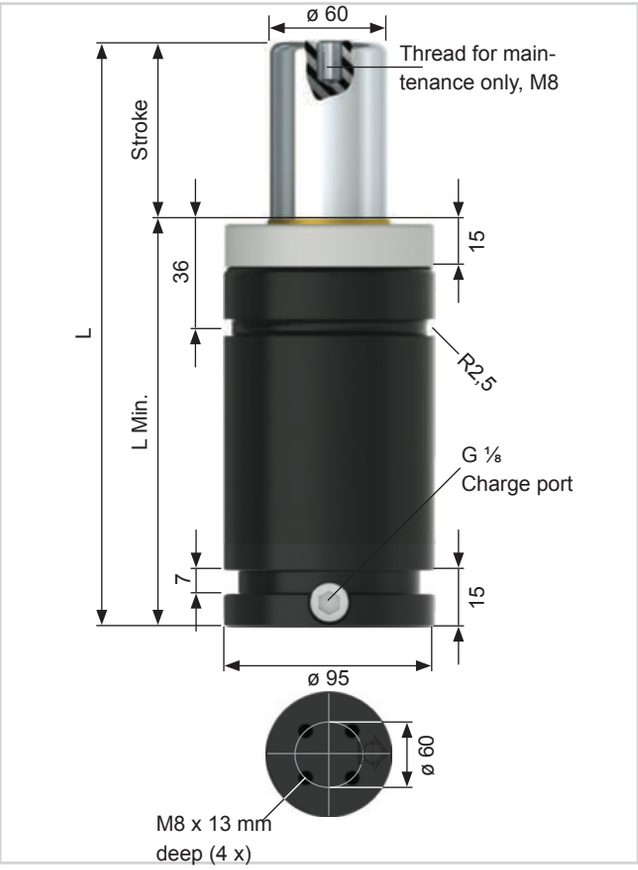

Front Flange 75 FF


Square Flange 75 SF


Base Plate 75 BP


End Support 75 ES/75 HM

HS-MX.04200.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-MX.04200.025	**4200**	5210	145	170	0,43	5,08
HS-MX.04200.038		5510	158	196	0,52	5,41
HS-MX.04200.050		5720	170	220	0,60	5,71
HS-MX.04200.063		5900	183	246	0,68	6,05
HS-MX.04200.075		6030	195	270	0,76	6,35
HS-MX.04200.080		6080	200	280	0,80	6,48
HS-MX.04200.100		6250	220	320	0,93	6,99
HS-MX.04200.125		6400	245	370	1,10	7,63
HS-MX.04200.150		6510	270	420	1,27	8,27
HS-MX.04200.160		6550	280	440	1,33	8,53
HS-MX.04200.175		6600	295	470	1,43	8,91
HS-MX.04200.200		6680	320	520	1,60	9,55
HS-MX.04200.250		6790	370	620	1,93	11,08
HS-MX.04200.300		6870	420	720	2,27	12,11

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-MX.04200.050.FF

Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

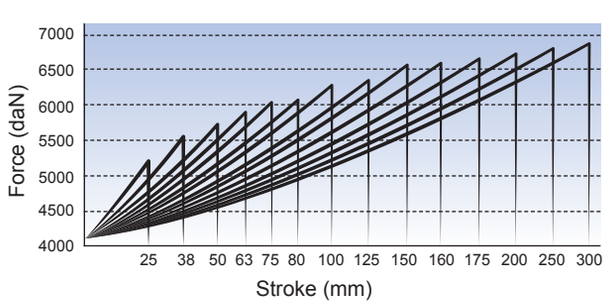
Service-Kit available

PED 97/23/EC

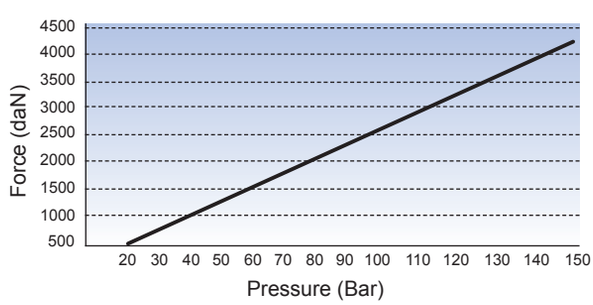
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

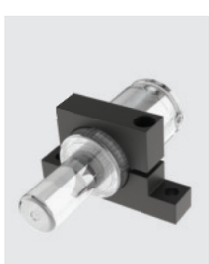

4 x M8 Tapped holes


Square Front Flange 95 SFF

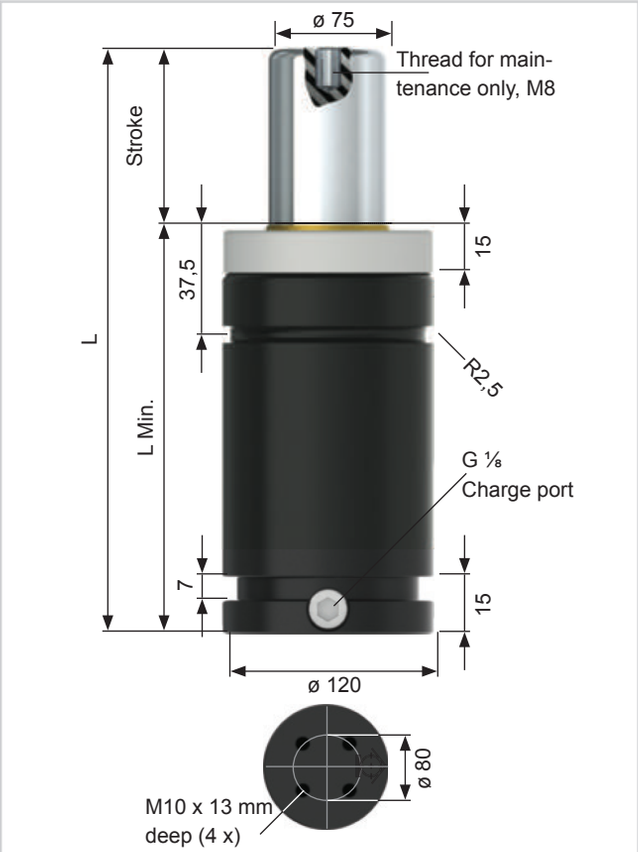

Front Flange 95 FF


Square Flange 95 SF


Base Plate 95 BP


End Support 95 ES/95 HM

HS-MX.06600.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-MX.06600.025	6630	7950	165	190	0,73	9,28
HS-MX.06600.038		8390	178	216	0,87	9,81
HS-MX.06600.050		8700	190	240	1,00	10,30
HS-MX.06600.063		8970	203	266	1,13	10,83
HS-MX.06600.075		9180	215	290	1,26	11,32
HS-MX.06600.080		9260	220	300	1,31	11,52
HS-MX.06600.100		9510	240	340	1,53	12,33
HS-MX.06600.125		9760	265	390	1,79	13,35
HS-MX.06600.150		9950	290	440	2,05	14,36
HS-MX.06600.160		10010	300	460	2,16	14,77
HS-MX.06600.175		10100	315	490	2,36	15,38
HS-MX.06600.200		10220	340	540	2,58	16,40
HS-MX.06600.250		10400	390	640	3,11	18,43
HS-MX.06600.300		10530	440	740	3,64	20,46

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-MX.06600.050.FF

Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

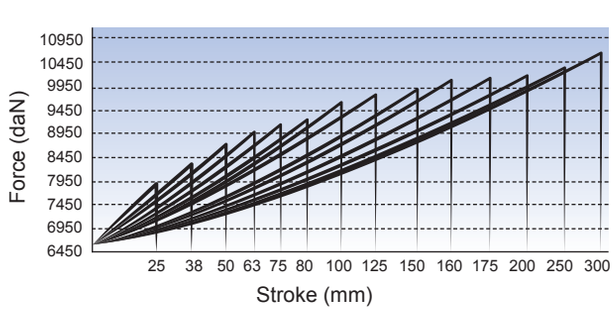
Service-Kit available

PED 97/23/EC

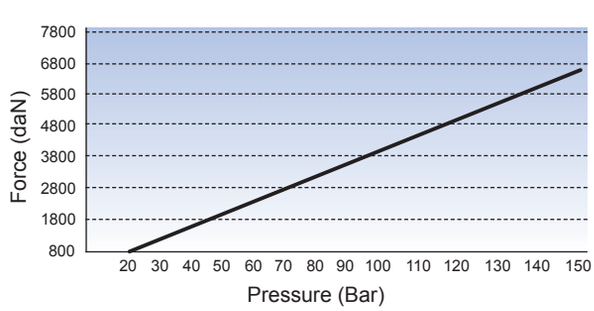
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

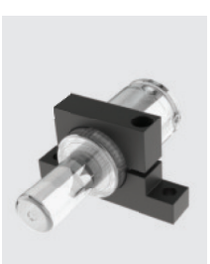

4 x M10 Tapped holes


Square Front Flange 120 SFF

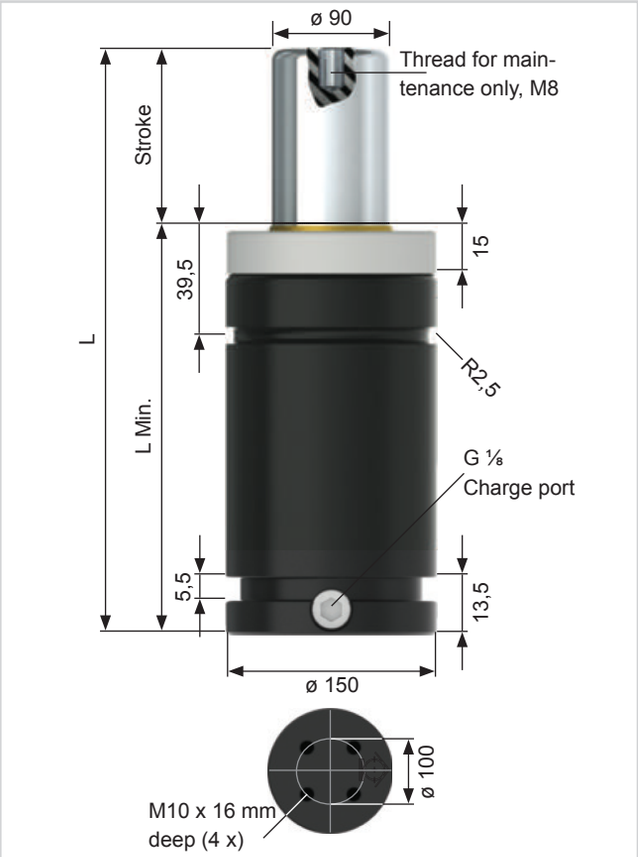

Front Flange 120 FF


Square Flange 120 SF


Base Plate 120 BP


End Support 120 ES/120 HM

HS-MX.09500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
HS-MX.09500.025	9500	11320	180	205	1,09	16,79
HS-MX.09500.038		11900	193	231	1,30	17,70
HS-MX.09500.050		12330	205	255	1,49	18,48
HS-MX.09500.063		12700	218	281	1,69	19,32
HS-MX.09500.075		12970	230	305	1,88	20,10
HS-MX.09500.080		13080	235	315	1,96	20,42
HS-MX.09500.100		13430	255	355	2,28	21,72
HS-MX.09500.125		13760	280	405	2,67	23,35
HS-MX.09500.150		14020	305	455	3,07	24,97
HS-MX.09500.160		14100	315	475	3,23	25,62
HS-MX.09500.175		14220	330	505	3,47	26,59
HS-MX.09500.200		14380	355	555	3,86	28,21
HS-MX.09500.250		14630	405	655	4,65	31,46
HS-MX.09500.300		14820	455	755	5,44	34,70

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
HS-MX.09500.050.FF

Please note:
Do not use 100% of stroke, please leave a minimum of 5mm or 10%.

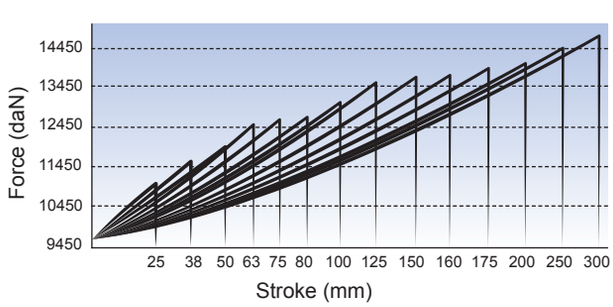
Service-Kit available

PED 97/23/EC

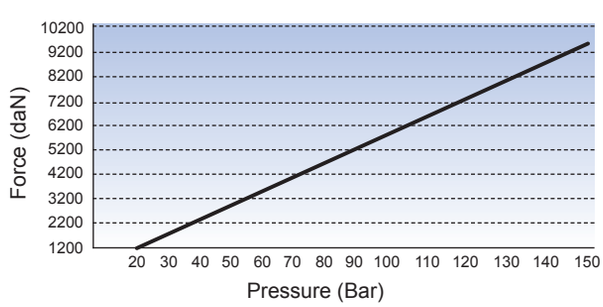
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	20 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



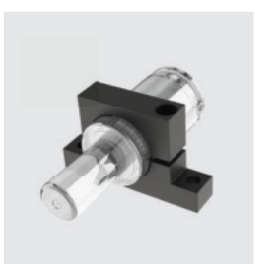
Mounting examples

4 x M10 Tapped holes

Square Front Flange 150 SFF

Front Flange 150 FF

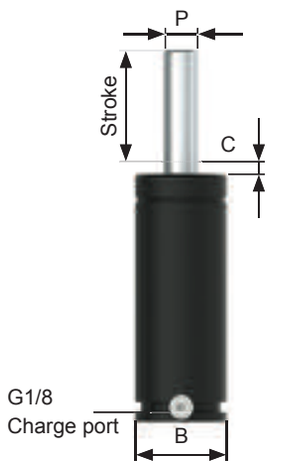
Square Flange 150 SF

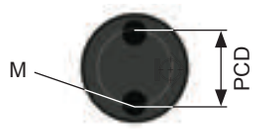


Base Plate 150 BP

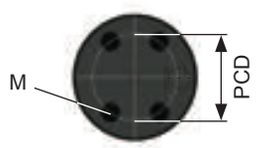
RSNG SERIES

Overview





Style cylinder RSNG.00750



Style cylinder RSNG.01500 – RSNG.07500

Type	PCD	M	Tapped hole depth
RSNG.00750.	20	M8 x2	2 x M8 x 12,5 mm
RSNG.01500.	40	M8 x 4	4 x M8 x 13 mm
RSNG.03000.	60	M8 x 4	4 x M8 x 13 mm
RSNG.05000.	80	M10 x 4	4 x M10 x 13 mm
RSGN.07500.	100	M10 x 4	4 x M10 x 13mm

The RSNG gas spring reduces shock loading on the initial contact and provides damping on the return stroke.
The RSNG dimensions are based on the ISNG (ISO) dimensions and are interchangeable. RSNG range includes strokes up to 300mm.
The RSNG range can be connected in series using the CNOMO hose system. Upper C-Groove and Lower U-Groove give numerous flange mounting options.
The RSNG must be mounted piston side up.

Use only Nitrogen

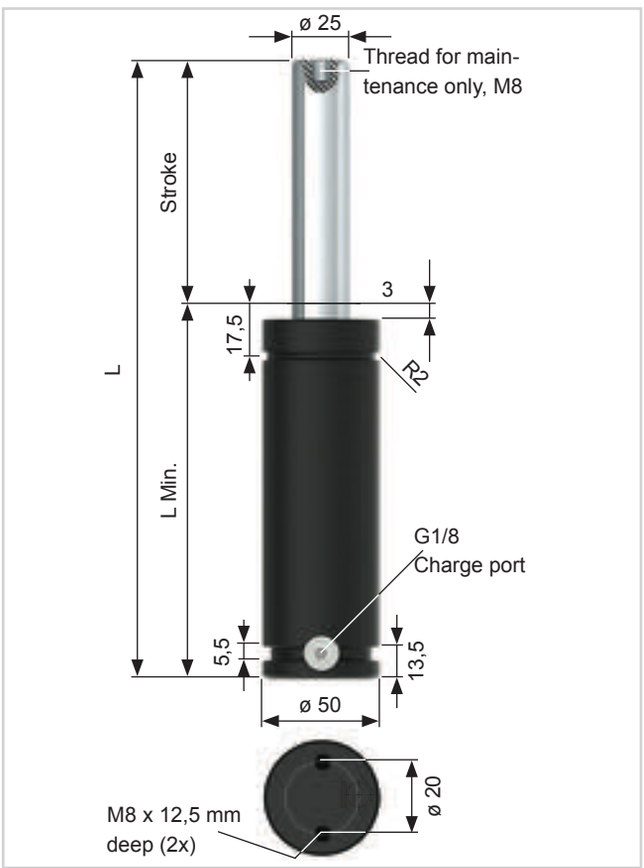
Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	50 Bar	1,6 m/Sek.

Service-Kit available

PED 97/23/EC

Order-No.: Type/Stroke	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe system		Overhaul
							Micro 24	CNOMO	
RSNG.00750.	25	50	750	12,7 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
RSNG.01500.	36	75	1500	25 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
RSNG.03000.	50	95	3000	25 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
RSNG.05000.	65	120	5000	25 – 300	3	TH, FF, SF, SFF, ES, BP	•	•	•
RSNG.07500.	80	150	7500	25 – 300	3	TH, FF, SF, SFF, BP	•	•	•

RSNG.00750.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
RSNG.00750.025		1160	120	145	0,04	1,44
RSNG.00750.038		1170	133,1	171,2	0,06	1,57
RSNG.00750.050		1185	145	195	0,07	1,68
RSNG.00750.063		1190	158,5	222	0,09	1,78
RSNG.00750.080		1200	175	255	0,11	1,94
RSNG.00750.100		1200	195	295	0,14	2,13
RSNG.00750.125		1200	220	345	0,17	2,37
RSNG.00750.160		1200	255	415	0,21	2,70
RSNG.00750.200		1210	295	495	0,26	3,10
RSNG.00750.250		1210	345	595	0,33	3,60
RSNG.00750.300		1210	395	695	0,39	4,10

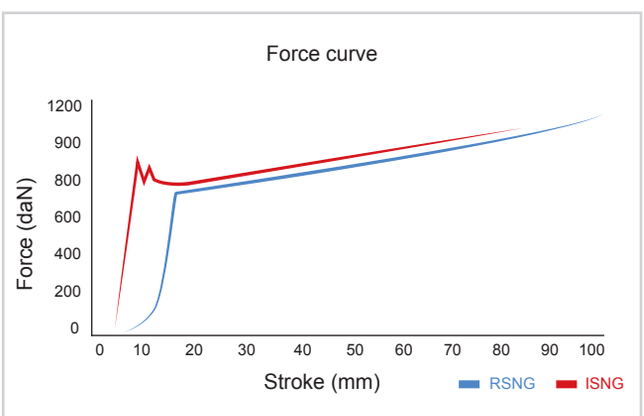
Note:
Special stroke sizes available upon request.

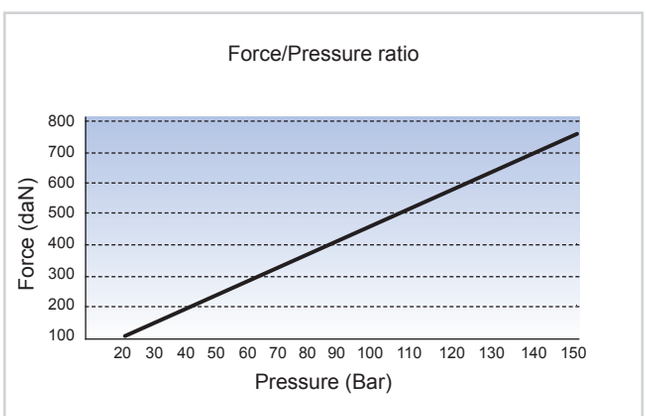
Ordering example: Type x Stroke + Mounting
RSNG.00750.050.FF

Service-Kit available

PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

Must be mounted rod side up. (All dimensions are mm.)

4 x M8 Tapped holes

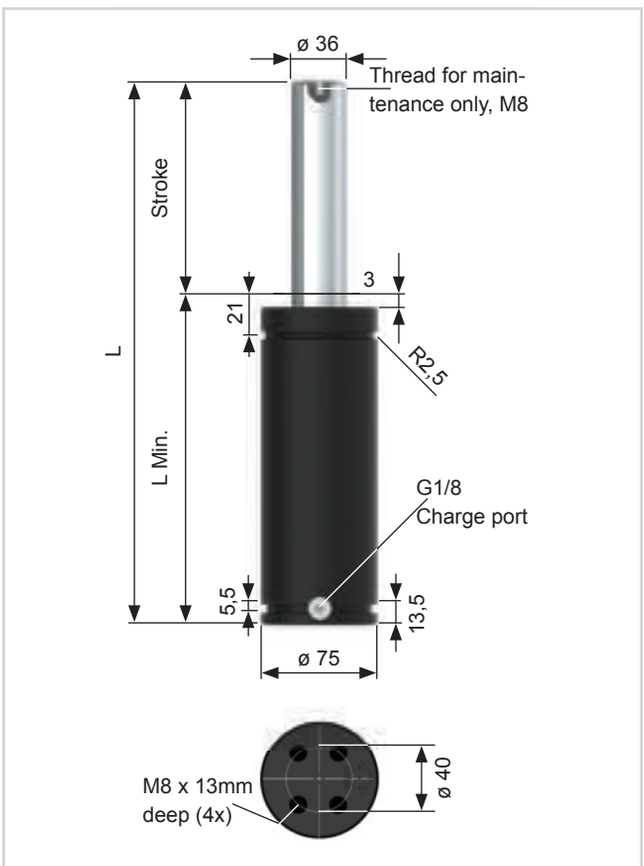
Square Front Flange 50 SFF

Front Flange 50 FF

Square Flange 50 SF

Base Plate 50 BP

RSNG.01500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
RSNG.01500.025	**1500**	2040	135	160	0,10	3,65
RSNG.01500.038		2060	148,1	186,2	0,15	3,89
RSNG.01500.050		2090	160	210	0,18	4,11
RSNG.01500.063		2130	173,5	237	0,22	4,35
RSNG.01500.080		2115	190	270	0,28	4,66
RSNG.01500.100		2140	210	310	0,34	5,02
RSNG.01500.125		2160	235	360	0,42	5,48
RSNG.01500.160		2165	270	430	0,53	6,12
RSNG.01500.200		2160	310	510	0,68	6,90
RSNG.01500.250		2180	360	610	0,81	7,80
RSNG.01500.300		2200	410	710	0,96	8,90

Note:
Special stroke sizes available upon request.

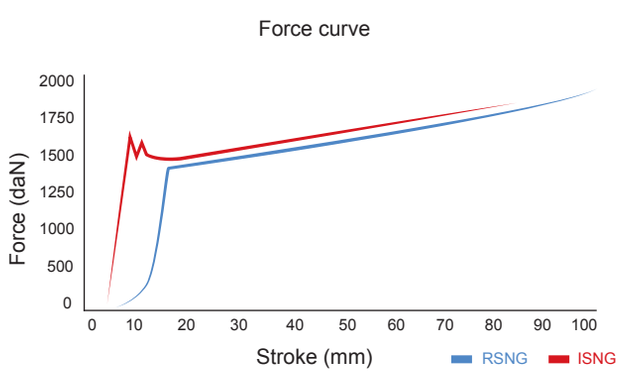
Ordering example: Type x Stroke + Mounting
RSNG.01500.050.FF

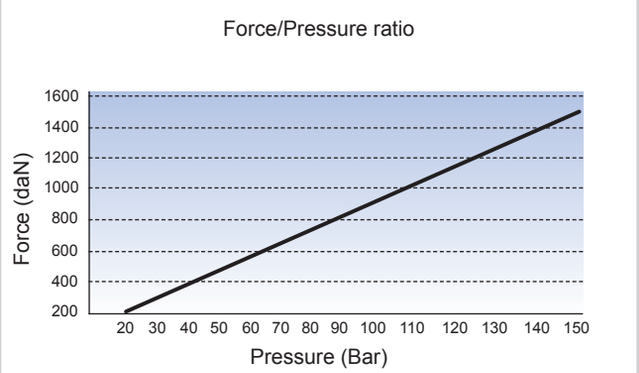
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure: 150 Bar	Min. pressure: 20 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

Must be mounted rod side up. (All dimensions are mm.)

4 x M10 Tapped holes

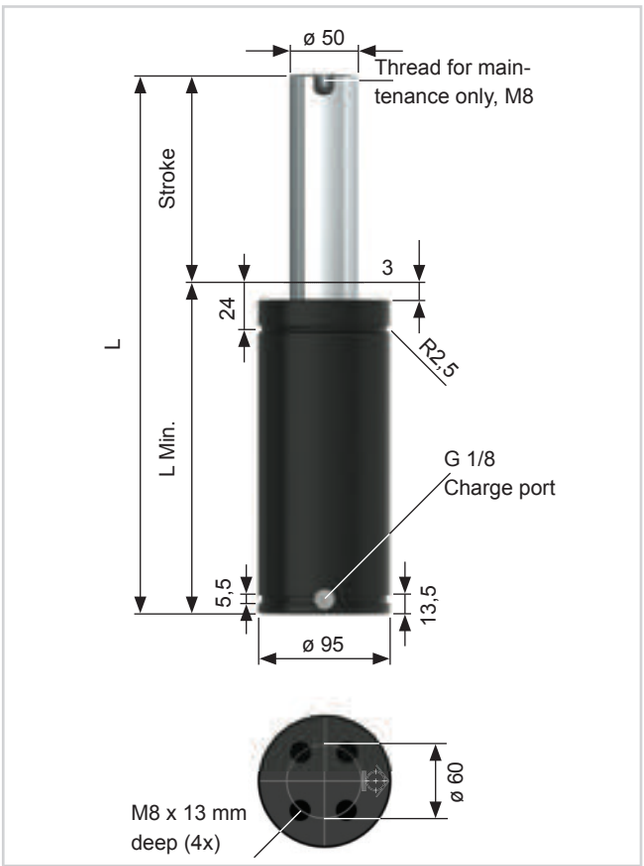
Square Front Flange 75 SFF

Front Flange 75 FF

Square Flange 75 SF

Base Plate 75 BP

RSNG.03000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
RSNG.03000.025	**3000**	4140	145	170	0,20	6,45
RSNG.03000.038		4210	158,1	196,2	0,26	6,87
RSNG.03000.050		4320	170	220	0,32	7,25
RSNG.03000.063		4480	183,5	247	0,38	7,67
RSNG.03000.080		4500	200	280	0,46	8,20
RSNG.03000.100		4570	220	320	0,56	8,83
RSNG.03000.125		4570	245	370	0,69	9,63
RSNG.03000.160		4580	280	440	0,87	10,74
RSNG.03000.025		4560	320	520	1,07	12,20
RSNG.03000.025		4540	370	620	1,32	13,70
RSNG.03000.025		4590	420	720	1,57	15,30

Note:
Special stroke sizes available upon request.

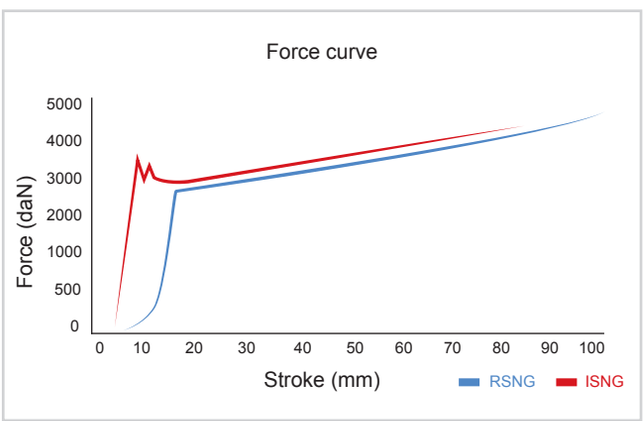
Ordering example: Type x Stroke + Mounting
RSNG.03000.050.FF

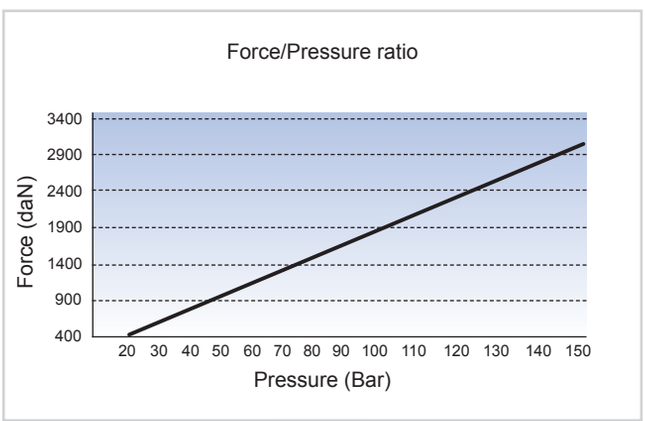
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	50 Bar	1,6 m/Sek.





Mounting examples

Must be mounted rod side up. (All dimensions are mm.)

4 x M8 Tapped holes

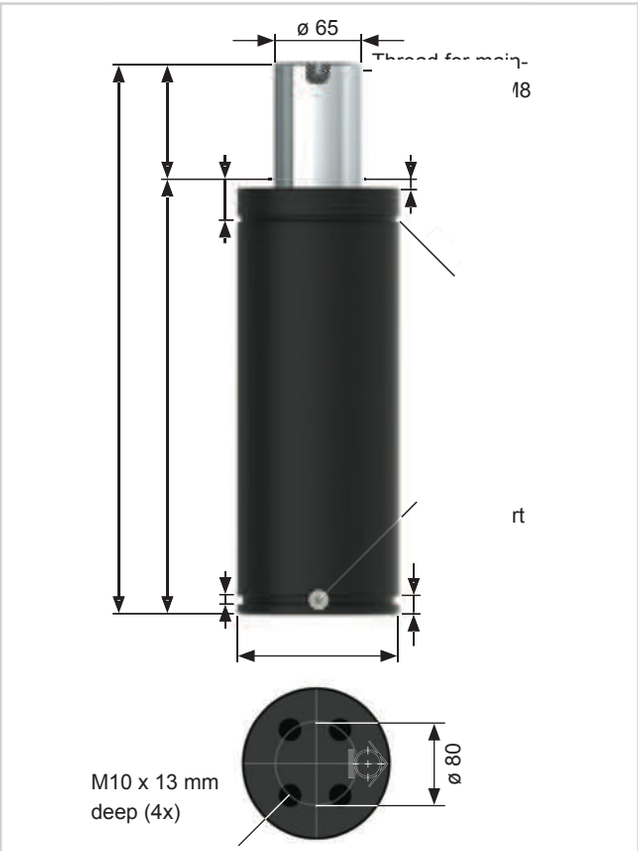
Square Front Flange 95 SFF

Front Flange 95 FF

Square Flange 95 SF

Base Plate 95 BP

RSNG.05000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
RSNG.05000.025	**5000**	6900	165	190	0,32	12,40
RSNG.05000.038		7010	178,1	216,2	0,42	13,10
RSNG.05000.050		7210	190	240	0,51	13,70
RSNG.05000.063		7450	203,5	267	0,60	14,40
RSNG.05000.080		7510	220	300	0,73	15,30
RSNG.05000.100		7550	240	340	0,89	16,40
RSNG.05000.125		7560	265	390	1,09	17,70
RSNG.05000.160		7560	300	460	1,36	19,60
RSNG.05000.200		7590	340	540	1,68	20,70
RSNG.05000.250		7560	390	640	2,07	22,40
RSNG.05000.300		7540	440	740	2,46	24,66

Note:
Special stroke sizes available upon request.

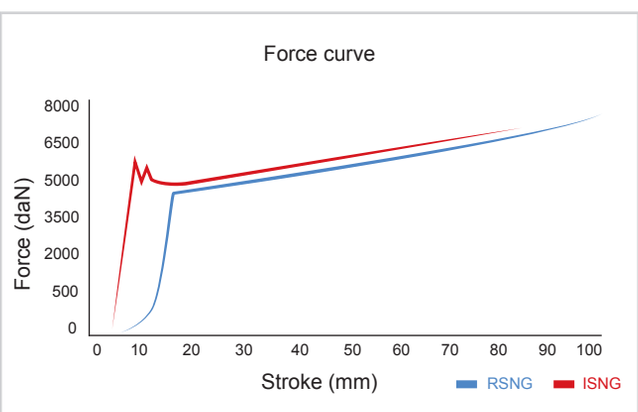
Ordering example: Type x Stroke + Mounting
RSNG.0500.050.FF

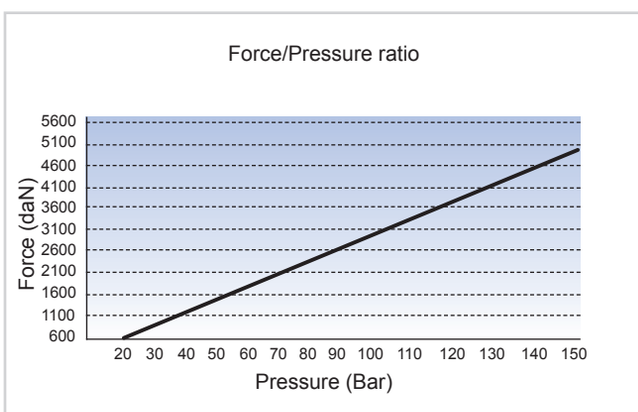
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure: 150 Bar	Min. pressure: 50 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

Must be mounted rod side up. (All dimensions are mm.)

4 x M10 Tapped holes

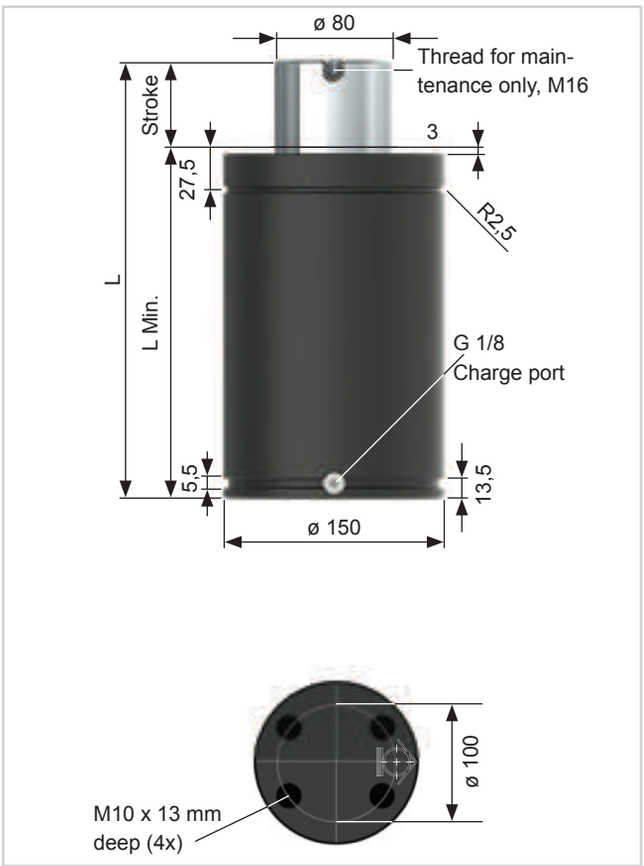
Square Front Flange 120 SFF

Front Flange 120 FF

Square Flange 120 SF

Base Plate 120 BP

RSNG.07500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
RSNG.07500.025	**7500**	10100	180	205	0,51	20,30
RSNG.07500.038		10500	193,1	231,2	0,67	21,40
RSNG.07500.050		10500	205	255	0,81	22,40
RSNG.07500.063		10550	218,5	282	0,98	23,50
RSNG.07500.080		10550	235	315	1,18	24,80
RSNG.07500.100		10550	255	355	1,43	26,50
RSNG.07500.125		10550	280	405	1,74	28,50
RSNG.07500.160		10530	315	475	2,17	31,40
RSNG.07500.200		10520	355	555	2,66	34,70
RSNG.07500.250		10590	405	655	3,27	38,80
RSNG.07500.300		10560	455	755	3,88	42,90

Note:
Special stroke sizes available upon request.

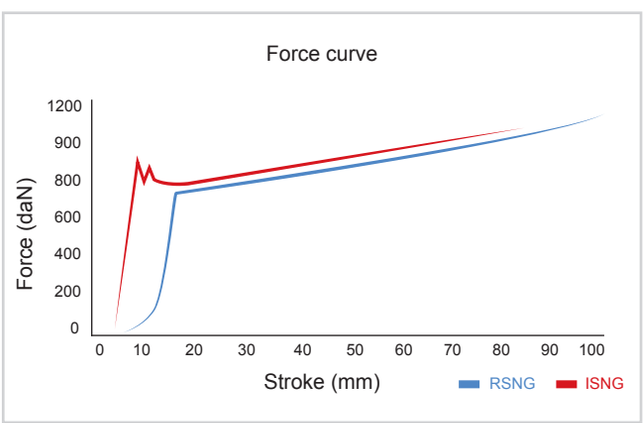
Ordering example: Type x Stroke + Mounting
RSNG.07500.050.FF

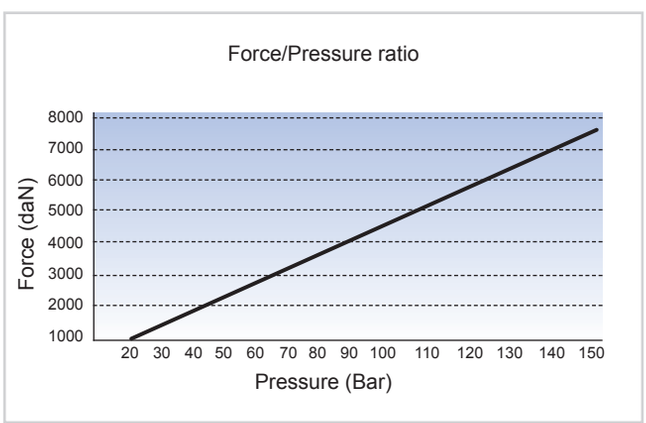
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	50 Bar	1,6 m/Sek.





Mounting examples

Must be mounted rod side up. (All dimensions are mm.)

4 x M10 Tapped holes

Square Front Flange 150 SFF

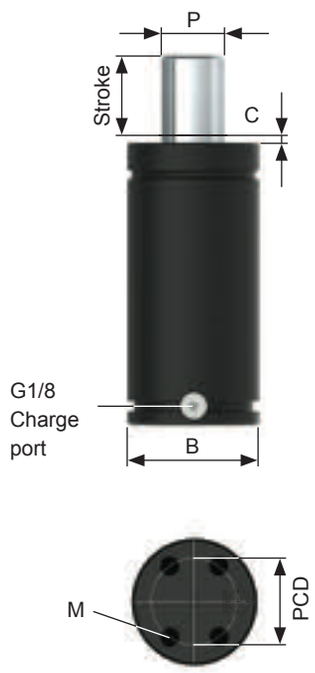
Front Flange 150 FF

Square Flange 150 SF

Base Plate 150 BP

DSNG SERIES

Overview



Style cylinder DSNG1500 – DSNG7500

Type	PCD	M	Tapped hole depth
DSNG.01500.	40	M8 x 4	2 x M8 x 13 mm
DSNG.03000.	60	M8 x 4	4 x M8 x 13 mm
DSNG.05000.	80	M10 x 4	4 x M10 x 13 mm
DSNG.07500.	100	M10 x 4	4 x M10 x 13 mm

The DSNG Die Separation Spring is designed for slow return of the piston rod so during each press cycle only a fraction of the stroke is used, reducing the force required by the press and the wear on the gas spring.
The DSNG dimensions are based on the ISNG (ISO) dimensions and are interchangeable.
Stroke lengths up to 300mm are available.
Upper C-Groove and Lower U-Groove give numerous flange mounting options.

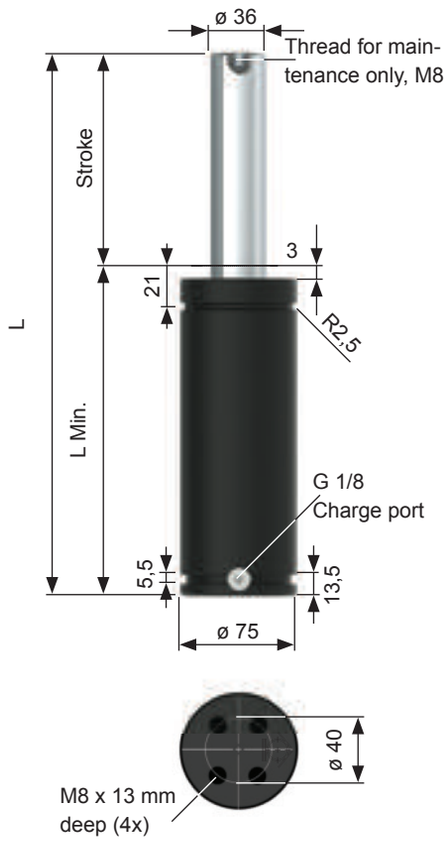
Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 50 Bar	Max. piston velocity: 1,6 m/Sek.

Service-Kit available

PED 97/23/EC

Order-No.: Type/Stroke	P	B	Initial force (daN)	Stroke range	C	Mounting options	Pipe system		Overhaul
							Micro 24	CNOMO	
DSNG.01500.	36	75	1500	25 – 300	3	TH, FF, SF, SFF, BP			•
DSNG.03000.	50	95	3000	25 – 300	3	TH, FF, SF, SFF, BP			•
DSNG.05000.	65	120	5000	25 – 300	3	TH, FF, SF, SFF, BP			•
DSNG.07500.	80	150	7500	25 – 300	3	TH, FF, SF, SFF, BP			•

DSNG.01500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
DSNG.01500.025	1500	2040	135	160	0,10	3,65
DSNG.01500.038		2060	148,1	186,2	0,15	3,89
DSNG.01500.050		2090	160	210	0,18	4,11
DSNG.01500.063		2130	173,5	237	0,22	4,35
DSNG.01500.080		2115	190	270	0,28	4,66
DSNG.01500.100		2140	210	310	0,34	5,02
DSNG.01500.125		2160	235	360	0,42	5,48
DSNG.01500.160		2165	270	430	0,53	6,12
DSNG.01500.200		2160	310	510	0,68	6,90
DSNG.01500.250		2180	360	610	0,81	7,80
DSNG.01500.300		2200	410	710	0,96	8,90

Note:
Special stroke sizes available upon request.

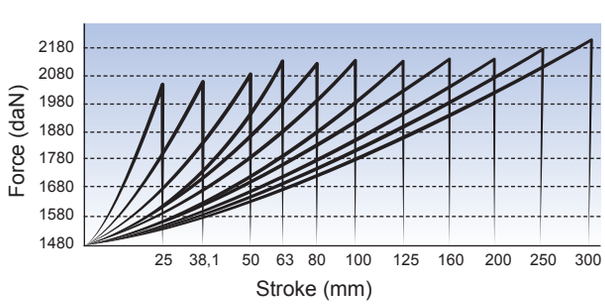
Ordering example: Type x Stroke + Mounting
DSNG.01500.050.FF

Service-Kit available

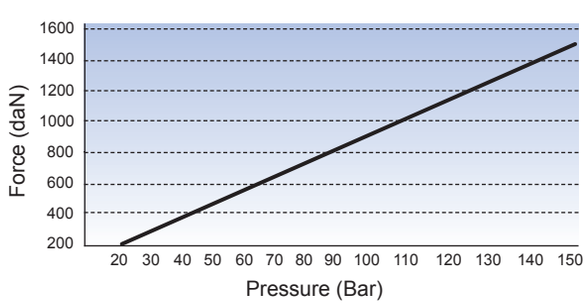
PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 50 Bar	Max. piston velocity: 1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

4 x M10 Tapped hole

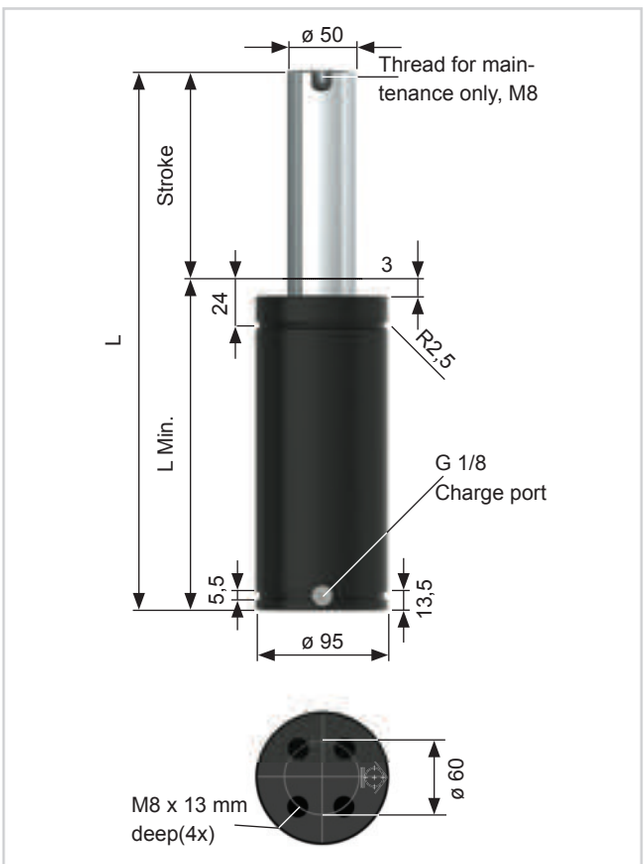
Square Front Flange 75 SFF

Front Flange 75 FF

Square Flange 75 SF

Base Plate 75 BP

DSNG.03000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
DSNG.03000.025	3000	4140	145	170	0,20	6,45
DSNG.03000.038		4210	158,1	196,2	0,26	6,87
DSNG.03000.050		4320	170	220	0,32	7,25
DSNG.03000.063		4480	183,5	247	0,38	7,67
DSNG.03000.080		4500	200	280	0,46	8,20
DSNG.03000.100		4570	220	320	0,56	8,83
DSNG.03000.125		4570	245	370	0,69	9,63
DSNG.03000.160		4580	280	440	0,87	10,74
DSNG.03000.200		4560	320	520	1,07	12,20
DSNG.03000.250		4540	370	620	1,32	13,70
DSNG.03000.300		4590	420	720	1,57	15,30

Note:
Special stroke sizes available upon request.

Ordering example: Type x Stroke + Mounting
DSNG.03000.050.FF

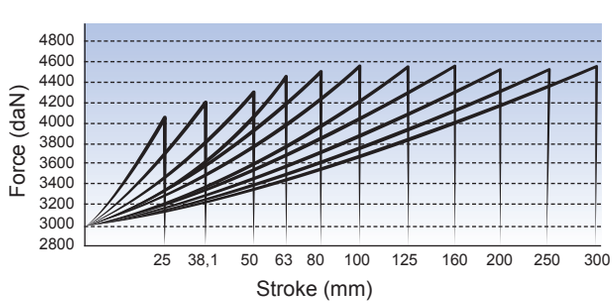
Service-Kit available

PED 97/23/EC

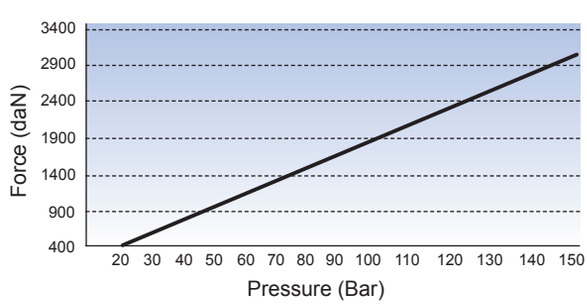
Use only Nitrogen

Max. pressure:	Min. pressure:	Max. piston velocity:
150 Bar	50 Bar	1,6 m/Sek.

Force curve



Force/Pressure ratio



Mounting examples

(All dimensions are mm.)

4 x M8 Tapped holes

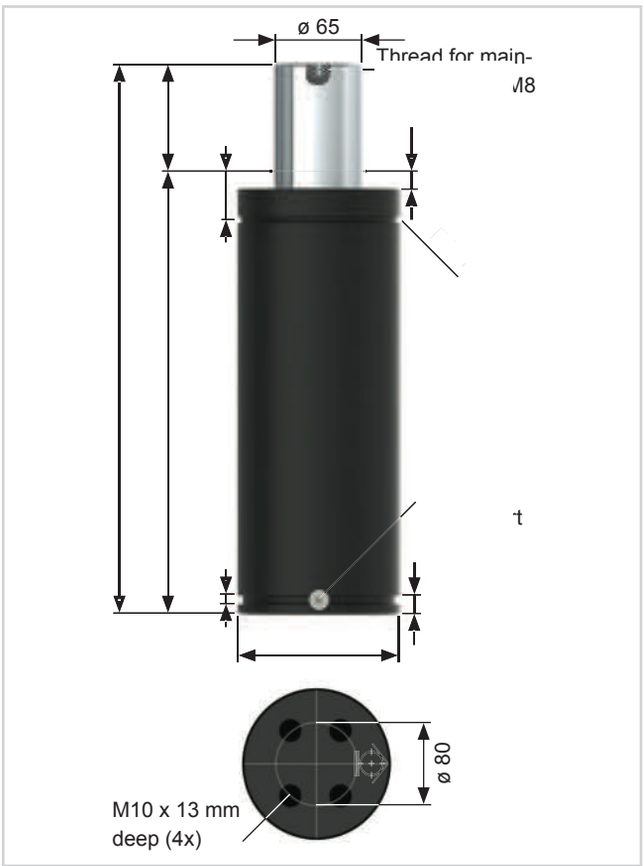
Square Front Flange 95 SFF

Front Flange 95 FF

Square Flange 95 SF

Base Plate 95 BP

DSNG.05000.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
DSNG.05000.025	5000	6900	165	190	0,32	12,40
DSNG.05000.038		7010	178,1	216,2	0,42	13,10
DSNG.05000.050		7210	190	240	0,51	13,70
DSNG.05000.063		7450	203,5	267	0,60	14,40
DSNG.05000.080		7510	220	300	0,73	15,30
DSNG.05000.100		7550	240	340	0,89	16,40
DSNG.05000.125		7560	265	390	1,09	17,70
DSNG.05000.160		7560	300	460	1,36	19,60
DSNG.05000.200		7590	340	540	14,68	20,70
DSNG.05000.250		7560	390	640	2,07	22,40
DSNG.05000.300		7540	440	740	2,46	24,66

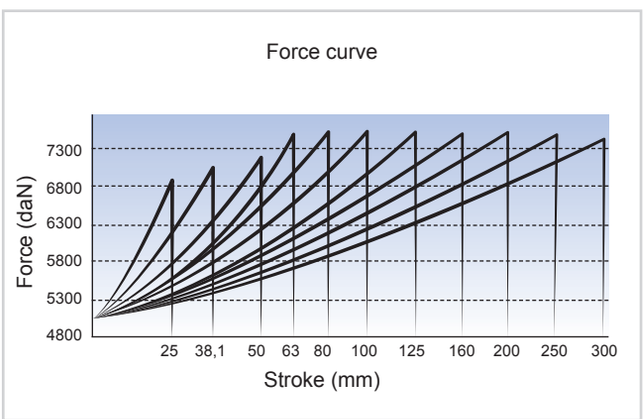
Note:
Special stroke sizes available upon request.

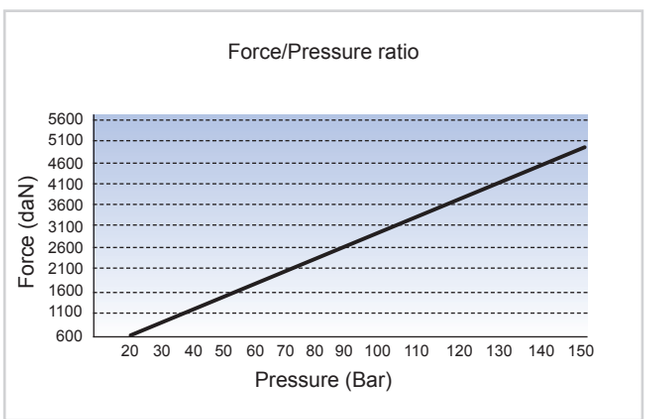
Ordering example: Type x Stroke + Mounting
DSNG.07500.050.FF

Service-Kit available

PED 97/23/EC

Use only Nitrogen		
Max. pressure: 150 Bar	Min. pressure: 50 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

4 x M10 Tapped holes

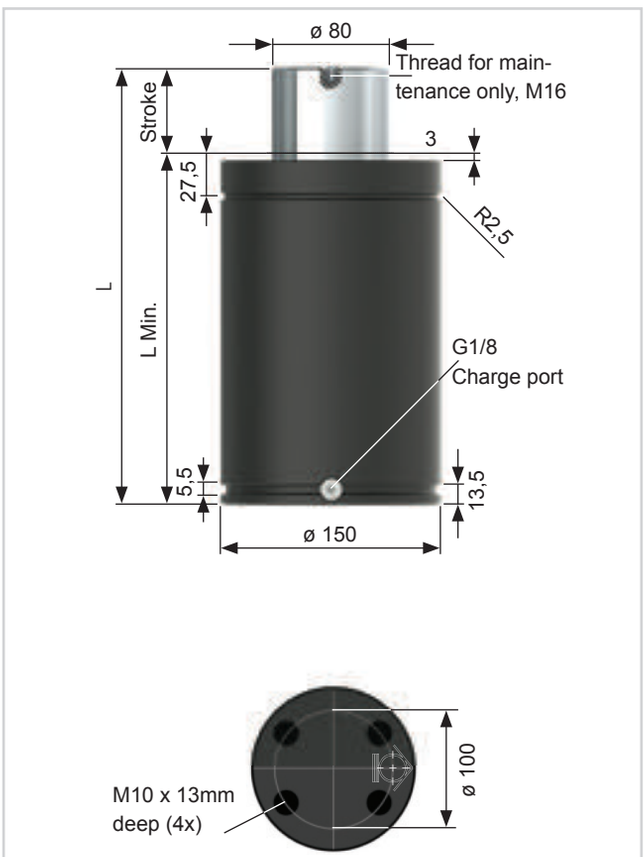
Square Front Flange 120 SFF

Front Flange 120 FF

Square Flange 1120 SF

Base Plate 120 BP

DSNG.07500.



Order-No.: Type/Stroke	Force (daN) Initial	Force (daN) Maximum	L Min.	L	Gas Vol. (L)	Weight (Kg)
DSNG.07500.025	**7500**	10100	180	205	0,51	20,30
DSNG.07500.038		10500	193,1	231,2	0,67	21,40
DSNG.07500.050		10500	205	255	0,81	22,40
DSNG.07500.063		10550	218,5	282	0,98	23,50
DSNG.07500.080		10550	235	315	1,18	24,80
DSNG.07500.100		10550	255	355	1,43	26,50
DSNG.07500.125		10550	280	405	1,74	28,50
DSNG.07500.160		10530	315	475	2,17	31,40
DSNG.07500.200		10520	355	555	2,66	34,70
DSNG.07500.250		10590	405	655	3,27	38,80
DSNG.07500.300		10560	455	755	3,88	42,90

Note:
Special stroke sizes available upon request.

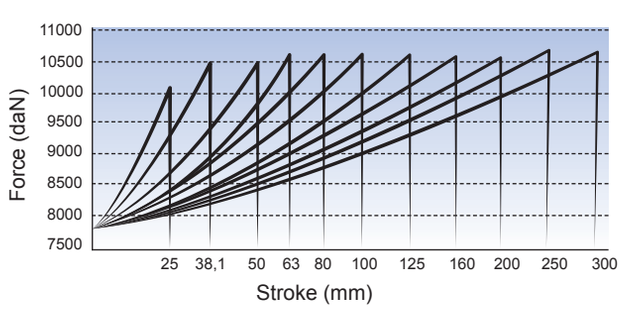
Ordering example: Type x Stroke + Mounting
DSNG.07500.050.FF

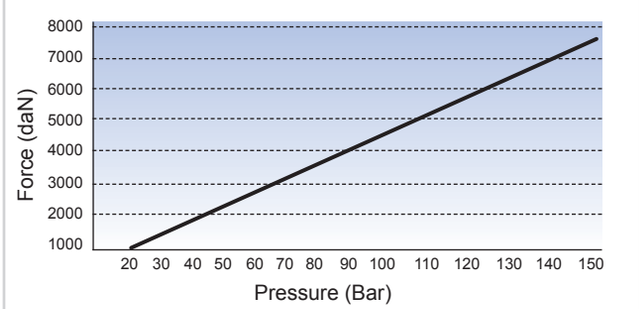
Service-Kit available

PED 97/23/EC

Use only Nitrogen

Max. pressure: 150 Bar	Min. pressure: 50 Bar	Max. piston velocity: 1,6 m/Sek.





Mounting examples

(All dimensions are mm.)

4 x M10 Tapped hole

Square Front Flange 150 SFF

Front Flange 150 FF

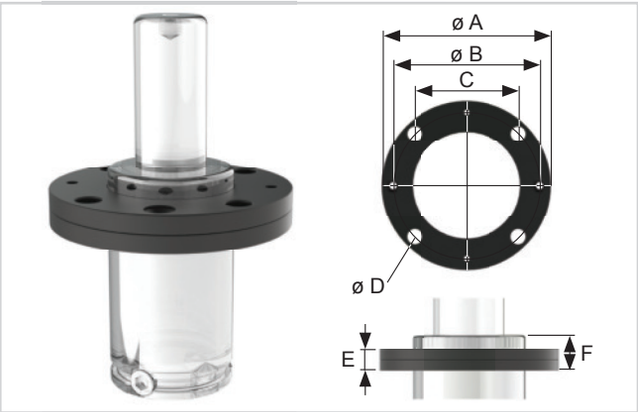
Square Flange 150 SF

Base Plate 150 BP

FASTENING ACCESSORIES

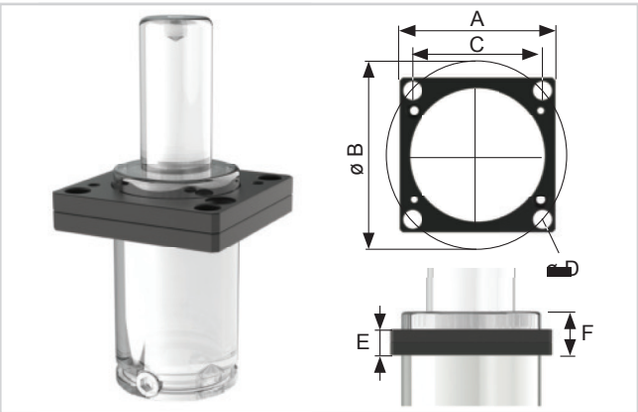
For the HSNG-Series only

Front Flange (FF)



FF-Type	ø A	ø B	C	ø D	E	F
38 FF	68	56,5	40	7	9	15
45 FF	86	70,7	50	9	13	21
50 FF	95	80	56,5	9	13	21
63 FF	122	104	73,5	11	16	26
75 FF	122	104	73,5	11	16	26
95 FF	150	130	92	13,5	18	30
120 FF	175	155	109,5	13,5	21	33
150 FF	220	195	138	17,5	27	38

Square Front Flange (SFF)

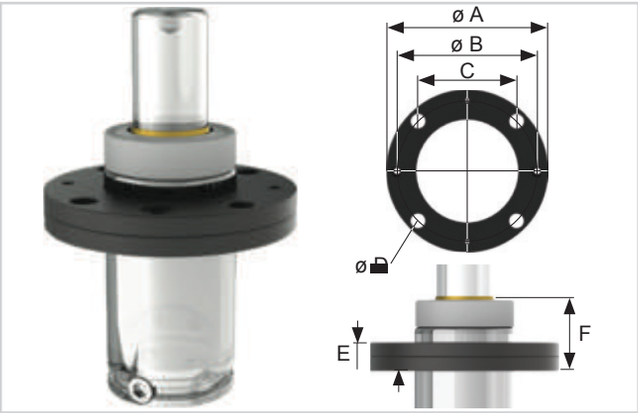


FF-Type	ø A	ø B	C	ø D	E	F
38 SFF	52	56,5	40	7	9	15
45 SFF	64	70,7	50	9	13	21
50 SFF	70	80	56,5	9	13	21
63 SFF	90	104	73,5	11	16	24
75 SFF	90	104	73,5	11	16	26
95 SFF	110	130	92	13,5	18	30
120 SFF	130	155	109,5	13,5	21	33
150 SFF	162	195	138	17	27	38

FASTENING ACCESSORIES

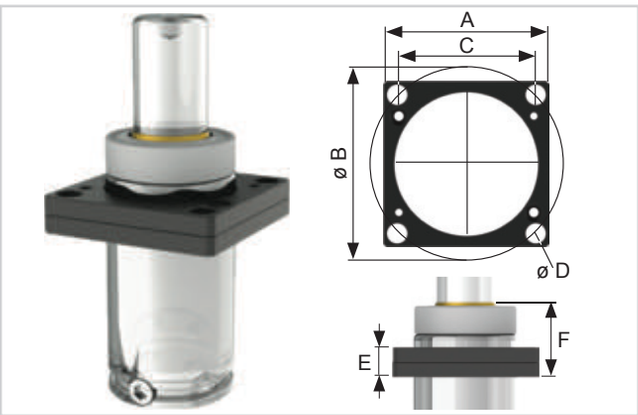
For the HS-EX and HS-MX-Series only

Front Flange (FF)



FF-Type	ø A	ø B	C	ø D	E	F
38 FF	68	56,5	40	7	9	27
45 FF	86	70,7	50	9	13	33
50 FF	95	80	56,5	9	13	33
63 FF	122	104	73,5	11	16	39
75 FF	122	104	73,5	11	16	39
95 FF	150	130	92	13,5	18	32
120 FF	175	155	109,5	13,5	21	45
150 FF	220	195	138	17,5	27	50

Square Front Flange (SFF)

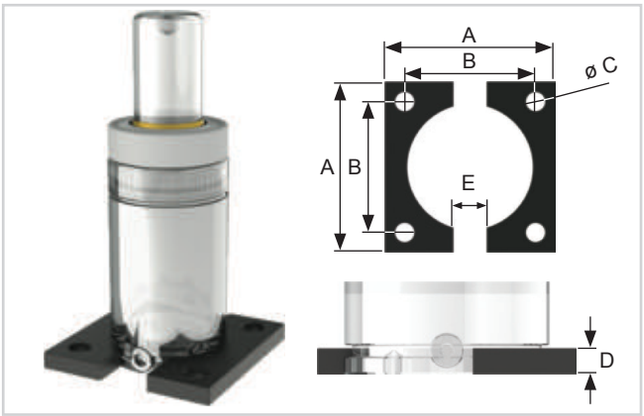


FF-Type	ø A	ø B	C	ø D	E	F
38 SFF	52	56,5	40	7	9	27
45 SFF	64	70,7	50	9	13	33
50 SFF	70	80	56,5	9	13	33
63 SFF	90	104	73,5	11	16	36
75 SFF	90	104	73,5	11	16	38
95 SFF	110	130	92	13,5	18	42
120 SFF	130	155	109,5	13,5	21	45
150 SFF	162	195	138	17,5	27	50

FASTENING ACCESSORIES

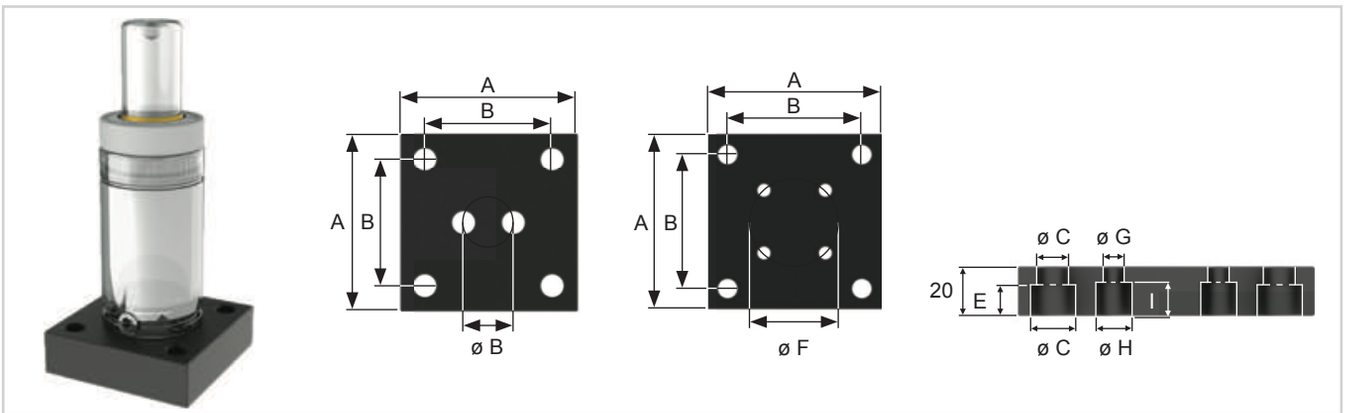
For the full HS (Hot Stamp) gas spring series

Square Flange (SF)



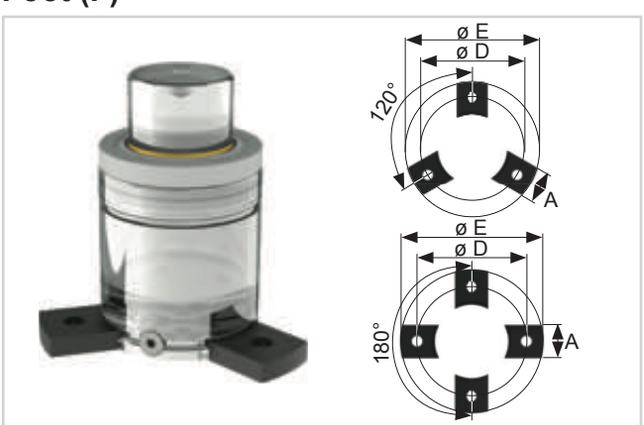
FF-Type	ø A	ø B	C	ø D	E
38 FF	55	40	7	7	12
45 FF	70	50	9	7	20
50 FF	75	56,5	9	12	24
63 FF	100	73,5	11	12	24
75 FF	100	73,5	11	12	24
95 FF	120	92	13,5	12	24
120 FF	140	109,5	13,5	12	24
150 FF	190	138	17,5	12	24

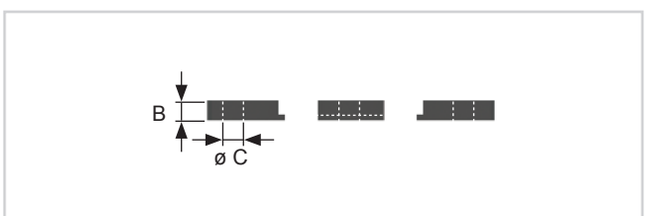
Base Plate (BP)



BP-Type	A	B	ø C	ø D	E	ø F	ø G	ø H	I
45 BP	70	50	9	15	12	20	9	15	14
50 BP	75	56,5	9	15	12	20	9	15	14
63 BP	100	73,5	10,5	18	12	20	9	15	12
75 BP	100	73,5	11	18	12	40	9	15	14
95 BP	120	92	13,5	20	13	60	9	15	14
120 BP	140	109,5	13,5	20	13	80	11	18	15
150 BP	190	138	17,5	26	17	100	11	18	15

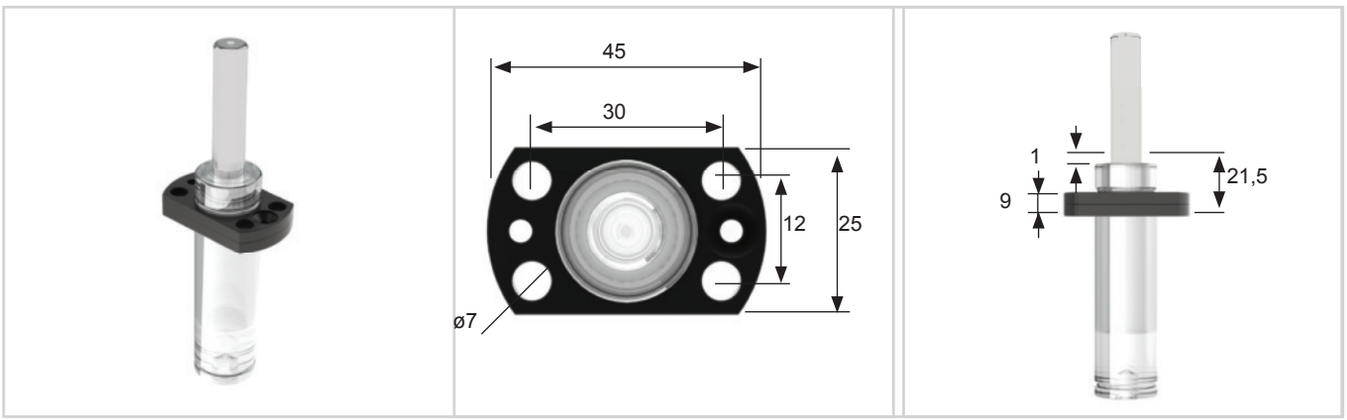
Foot (F)



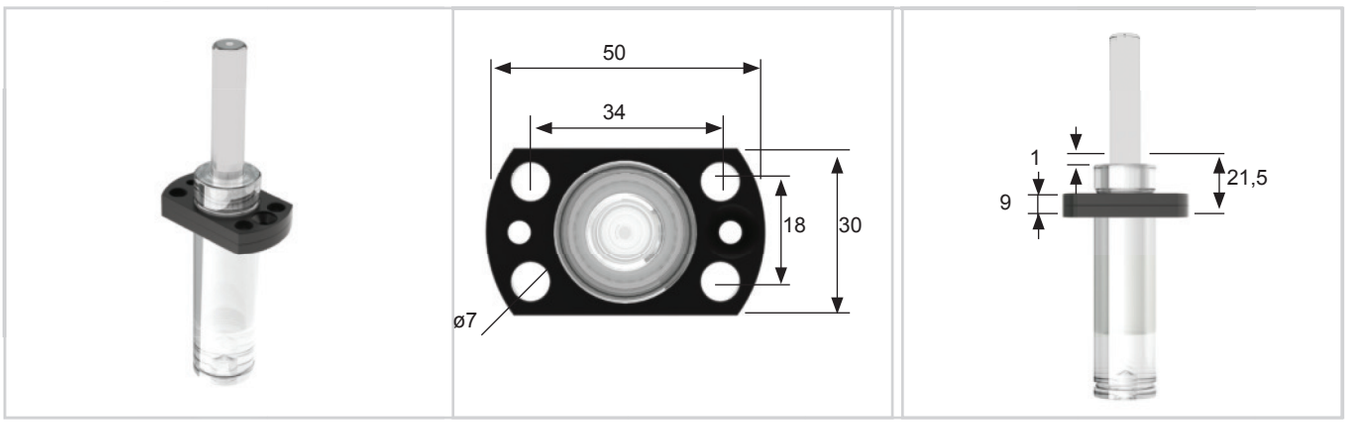


F-Type	A	B	C	D	E
45 F	25	7	9	70,7	95,8
50 F	30	12	9	80	110
75 F	30	12	11	104	134
95 F	40	12	13	130	170
120 F	50	12	13	155	195
150 F	60	12	17	184	220

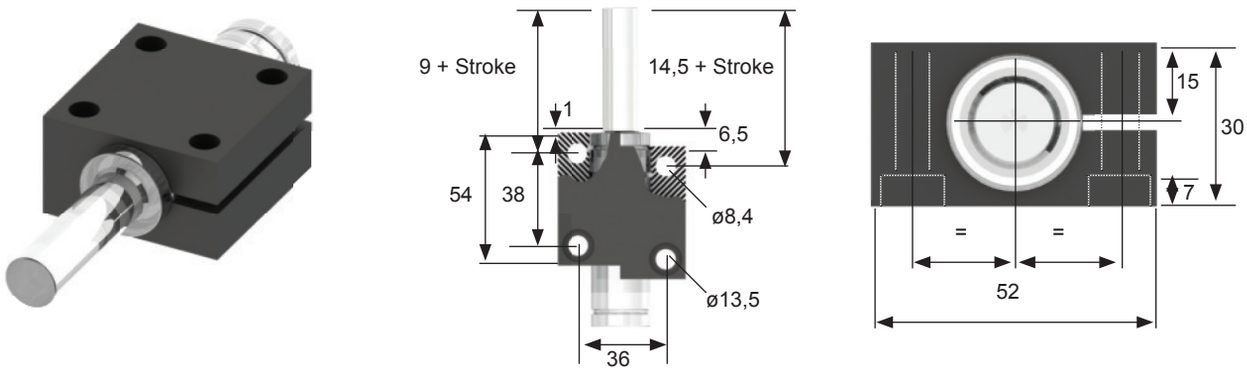
Front Flange 19FF



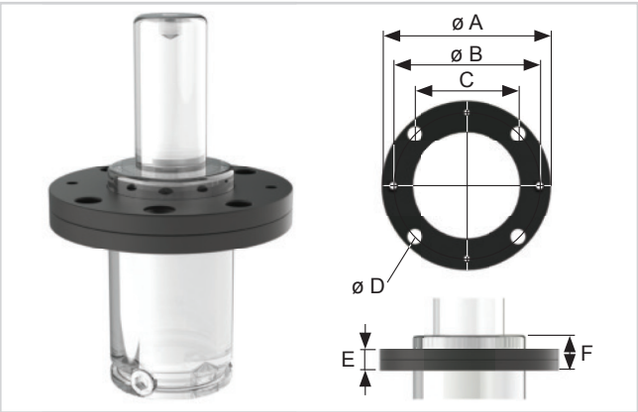
Front Flange 25FF



End Support 25ES

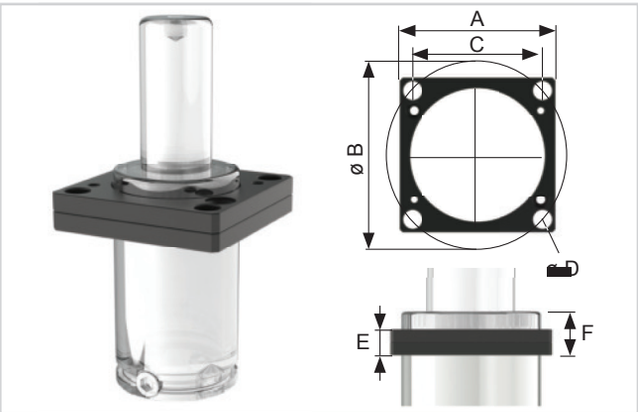


Front Flange (FF)



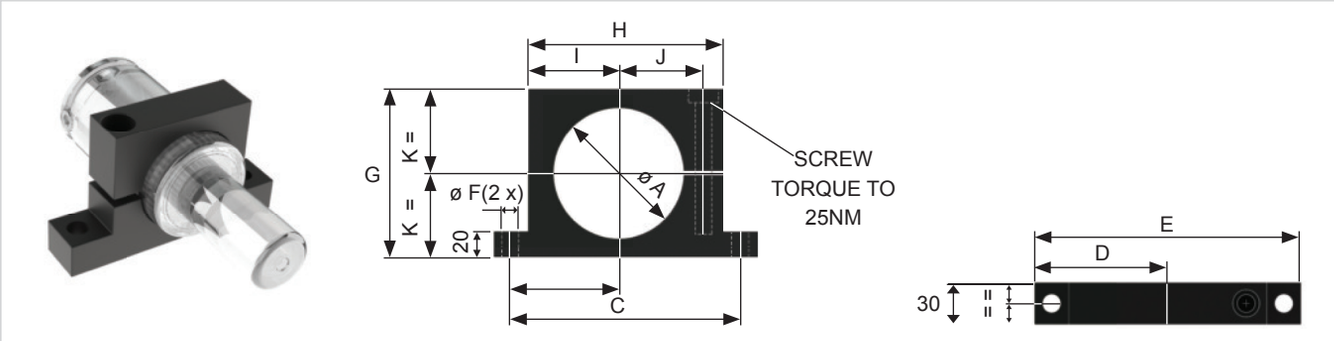
FF-Type	ø A	ø B	C	ø D	E	F
19 FF	For full Dimension see page 13					
25 FF	For full Dimension see page 10 & 14					
32 FF	60	49,5	35	7	9	15
38 FF	68	56,5	40	7	9	15
45 FF	86	70,7	50	9	13	21
50 FF	95	80	56,5	9	13	21
63 FF	122	104	73,5	11	16	26
75 FF	122	104	73,5	11	16	26
95 FF	150	130	92	13,5	18	30
120 FF	175	155	109,5	13,5	21	33
150 FF	220	195	138	17,5	27	38
195 FF	290	240,4	170	17,5	27	44

Square Front Flange (SFF)



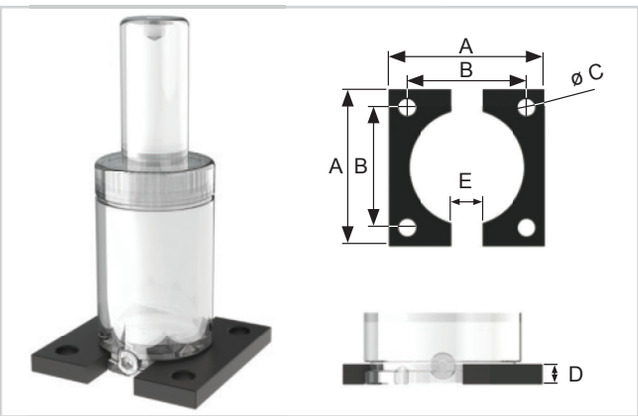
SFF-Type	A	ø B	C	ø D	E	F
32 SFF	45	49,5	35	7	9	15
38 SFF	52	56,5	40	7	9	15
45 SFF	64	70,7	50	9	13	21
50 SFF	70	80	56,5	9	13	21
63 SFF	90	104	73,5	11	16	24
75 SFF	90	104	73,5	11	16	26
95 SFF	110	130	92	13,5	18	30
120 SFF	130	155	109,5	13,5	21	33
150 SFF	162	195	138	17,5	27	38
195 SFF	210	240,4	170	17,5	27	44

End Support



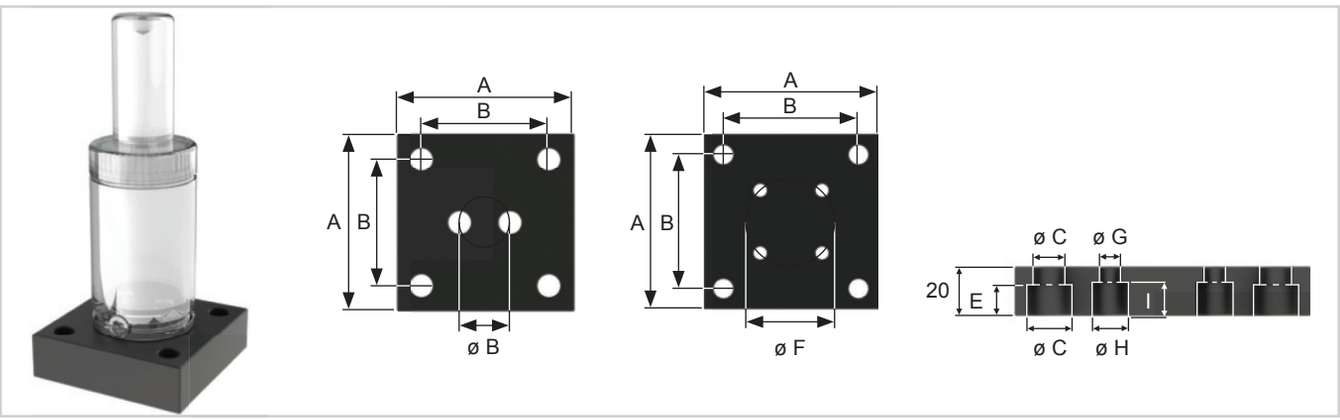
ES-Type	ø A	B	C	D	E	ø F	G	H	I	Screw	J	K
38 ES	38	34	77	43	95	9	55	59	25	M6	25	27,5
45 ES	45	37,5	82	46	100	9	60	66	29	M8	29	30
50 ES	50	50	110	60	130	9	80	90	40	M8	37,5	40
75 ES	75	63,5	137	75	160	11	105	115	52,5	M10	50	52,5
95 ES	95	80	170	92,5	195	13	125	145	67,5	M12	62,5	62,5
120 ES	120	92,5	195	105	220	13,5	148	165	77,5	M12	76,2	74

Square Flange (SF)



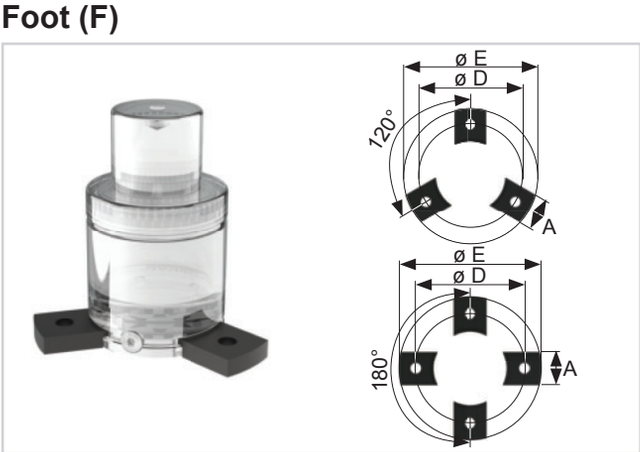
SF-Type	A	B	ø C	D	E
32 SF	50	35	7	7	12
38 SF	55	40	7	7	12
45 SF	70	50	9	7	20
50 SF	75	56,5	9	12	24
63 SF	100	73,5	11	12	24
75 SF	100	73,5	11	12	24
95 SF	120	92	13,5	12	24
120 SF	140	109,5	13,5	12	24
150 SF	190	138	17	12	24
195 SF	210	170	17,5	13	24

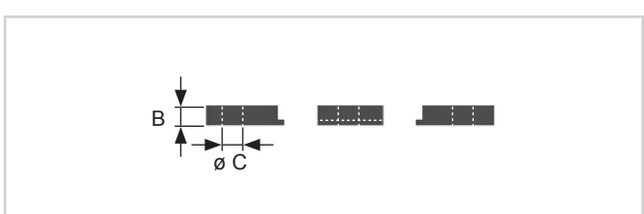
Base Plate (BP)



BP-Type	A	B	ø C	ø D	E	ø F	ø G	ø H	I
45 BP	70	50	9	15	12	20	9	15	14
50 BP	75	56,5	9	15	12	20	9	15	14
63 BP	100	73,5	10,5	18	12	20	9	15	12
75 BP	100	73,5	11	18	12	40	9	15	14
95 BP	120	92	13,5	20	13	60	9	15	14
120 BP	140	109,5	13,5	20	13	80	11	18	15
150 BP	190	138	17,5	26	17	100	11	18	15

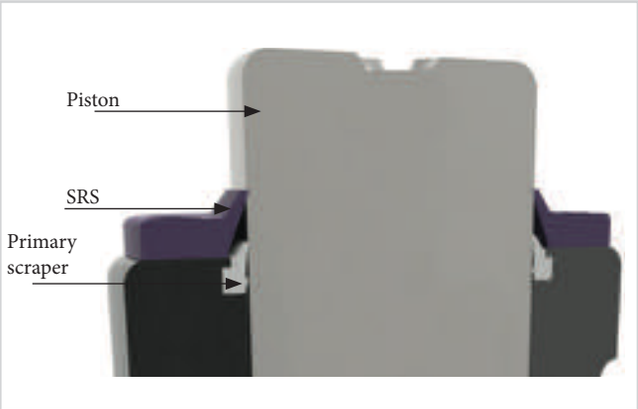
Foot (F)





F-Type	A	B	C	D	E
45 F	25	7	9	70,7	95,8
50 F	30	12	9	80	110
75 F	30	12	11	104	134
95 F	40	12	13	130	170
120 F	50	12	13	155	195
150 F	60	12	17	184	220

SRS, SECONDARY ROD SCRAPER



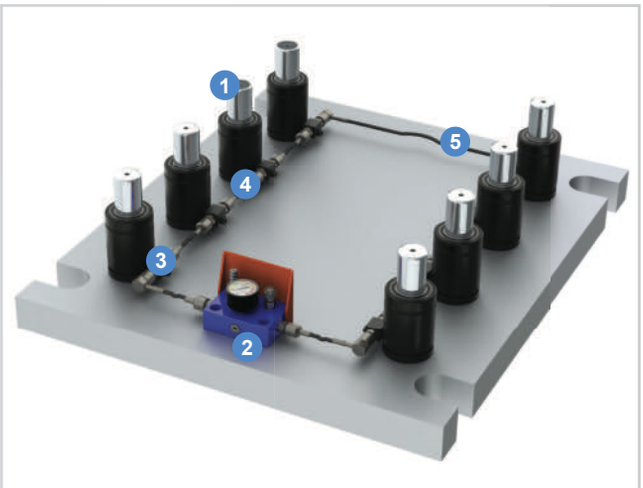
The secondary rod scraper SRS has been designed to increase performance of gas springs in strong polluted environments. SRS is made of polyurethane and has the perfect fitting for most Metrol gas springs. The secondary rod scraper can be ordered with the spring or separately.

Benefits:

– Die modifcation not required
– Minimal reduction in stroke length when fitted
– Available with Front Flange assemblies
– Easily removed for gas spring overhaul and maintenance

Type	Rod ø	Height SRS	Mini-Series	EX-Series	ISNG-Series	MX-Series	RSNG-Series	DSNG-Series
SRS.8	8mm	3mm	NG0					
SRS.11	11mm	3mm		EX.0170				
SRS.12	12mm	3mm	NG1					
SRS.15	15mm	3mm		EX.0320				
SRS.16	16mm	6mm		EX.0360				
SRS.20	20mm	6mm		EX.0500				
SRS.20.A	20mm	6mm			ISNG.0500			
SRS.25	25mm	6mm		EX.0750				
SRS.25.A	25mm	6mm			ISNG.0750		RSNG.0750	
SRS.28	28mm	6mm		EX.1000		MX.1000		
SRS.36	36mm	6,5mm		EX.1500				
SRS.36.A	36mm	6,5mm			ISNG.1500		RSNG.1500	DSNG.1500
SRS.45	45mm	7mm		EX.2400		MX.2400		
SRS.50	50mm	7mm			ISNG.3000		RSNG.3000	DSNG.3000
SRS.60	60mm	7mm		EX.4200		MX.4200		
SRS.65	65mm	7mm			ISNG.5000		RSNG.5000	DSNG.5000
SRS.75	75mm	7mm		EX.6600		MX.6600		
SRS.80	80mm	7mm			ISNG.7500		RSNG.7500	DSNG.7500
SRS.90	90mm	9mm		EX.9500		MX.9500		

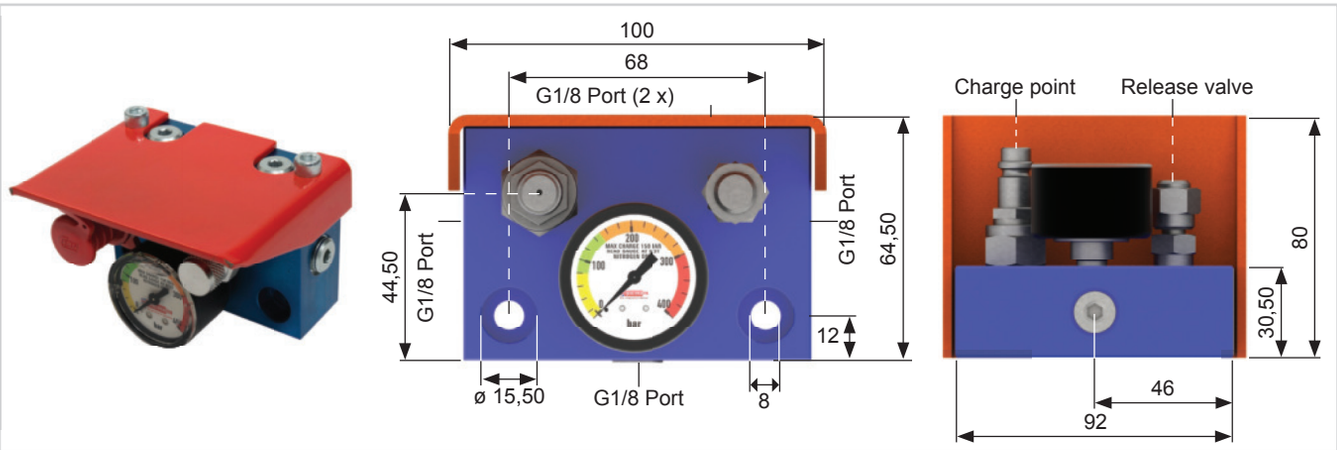
CNOMO HOSE SYSTEM



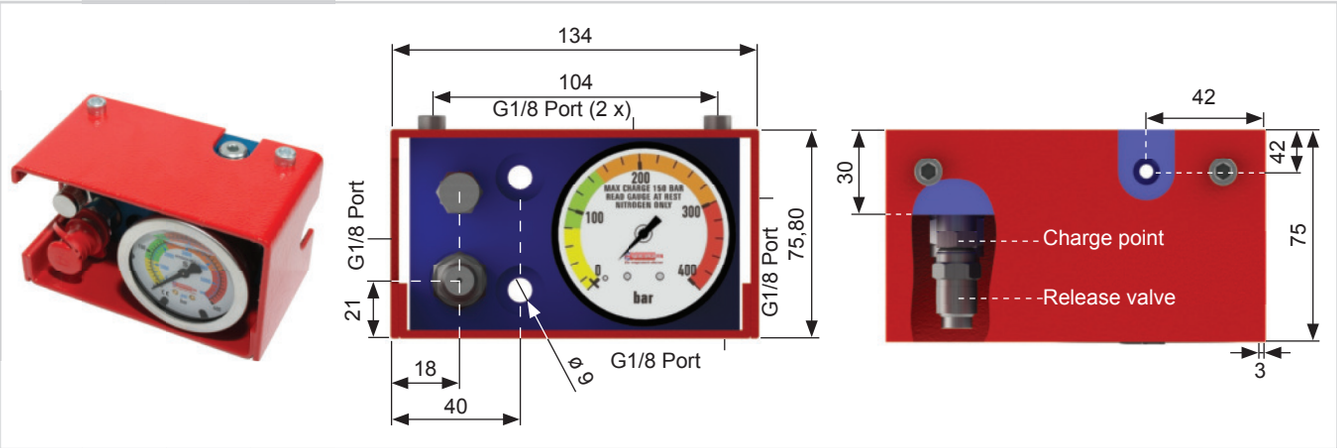
Number	Description
1	Gas spring
2	Control panel
3	MET:1053
4	MET:1040
5	Hose: MET:1012

CONTROL PANEL FOR CNOMO- AND MICRO24-SYSTEM

MET 111

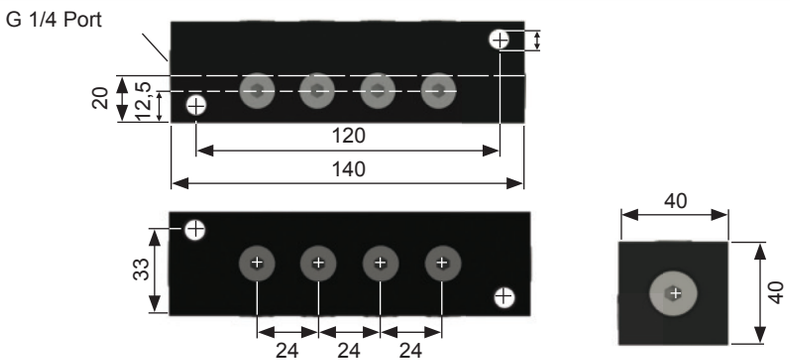


MET 222

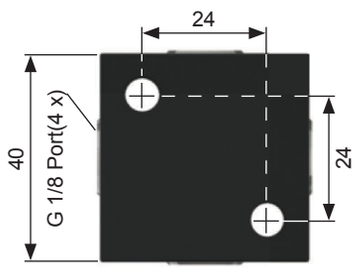


ADAPTOR

MET 1060-14 Way

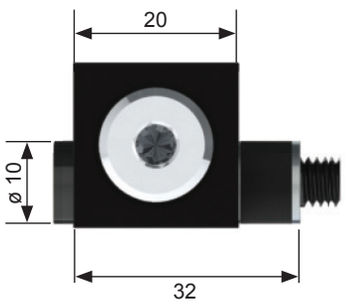


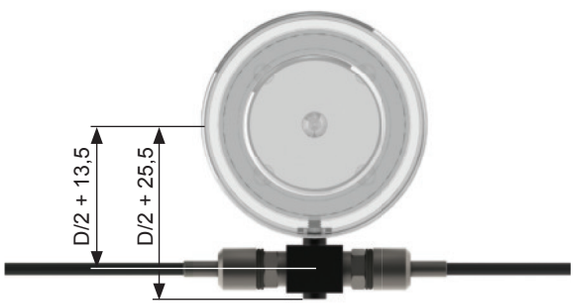
MET1061-4 Way

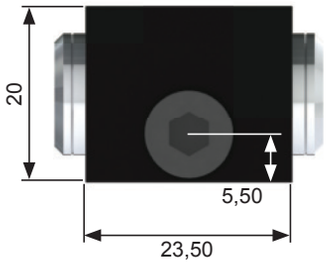


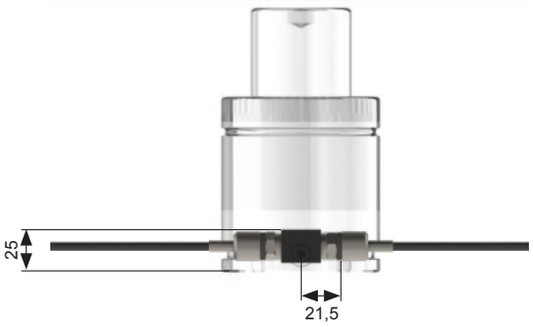
GAS SPRING CONNECTION M6 PORT

MET 1054



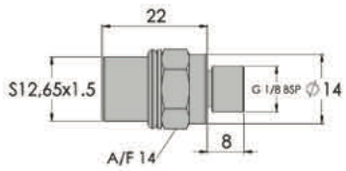




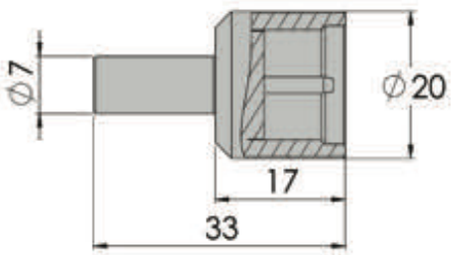


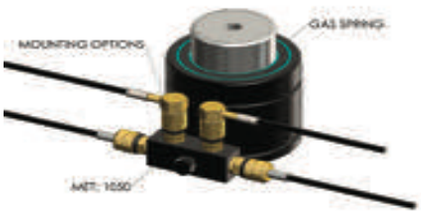
GAS SPRING CONNECTION

MET 1040

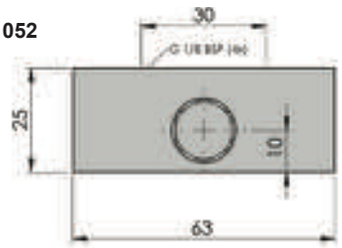


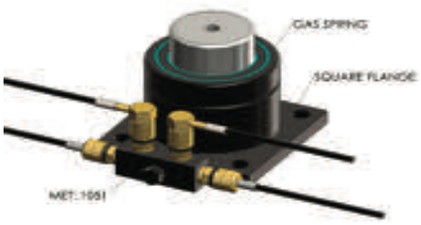
MET 1012



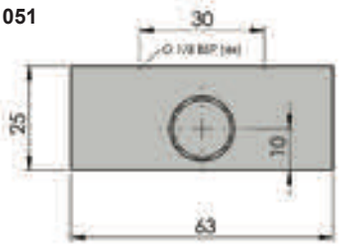


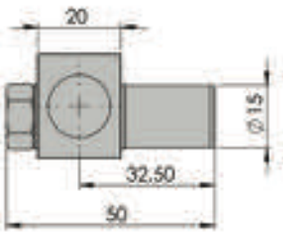
MET 1052



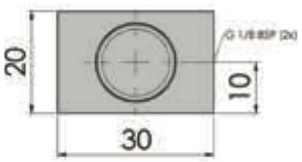


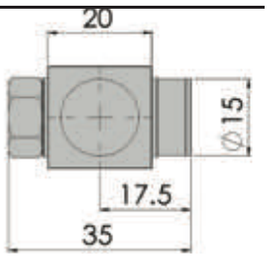
MET 1051



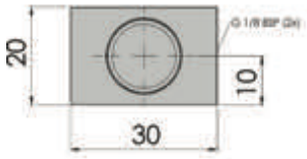


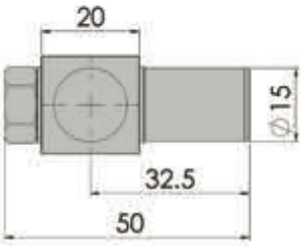
MET 1052



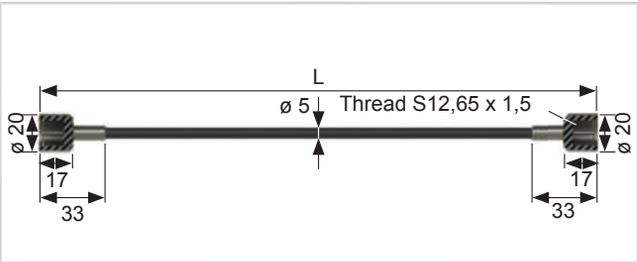


MET 1053



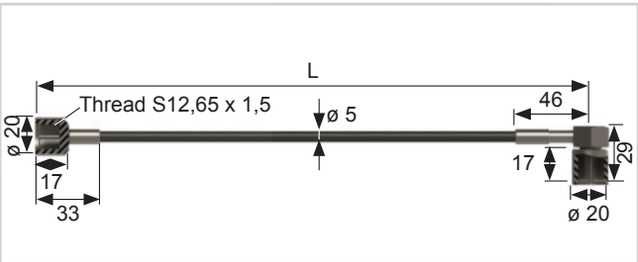


Kevlar braided hose with straight fittings



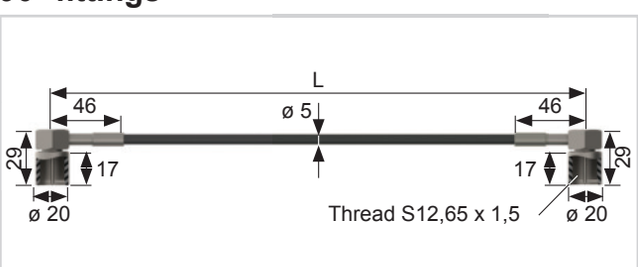
Order-No.:	Length (L)
MET 1000	200
MET 1001	300
MET 1002	400
MET 1003	500
MET 1004	600
MET 1005	800
MET 1006	1000
MET 1007	1200
MET 1008	1500
MET 1009	2000
MET 1010	2500
MET 1011	3000
MET 1012	Customer Specification
Minimum length 100 mm	

Kevlar braided hose with straight / compact 90° fittings



Order-No.:	Length (L)
MET 1013	200
MET 1014	300
MET 1015	400
MET 1016	500
MET 1017	600
MET 1018	800
MET 1019	1000
MET 1020	1200
MET 1021	1500
MET 1022	2000
MET 1023	2500
MET 1024	3000
MET 1025	Customer Specification
Minimum length 100 mm	

Kevlar braided hose with compact 90° / 90° fittings



Order-No.:	Length (L)
MET 1026	200
MET 1027	300
MET 1028	400
MET 1029	500
MET 1030	600
MET 1031	800
MET 1032	1000
MET 1033	1200
MET 1034	1500
MET 1035	2000
MET 1036	2500
MET 1037	3000
MET 1038	Customer Specification
Minimum length 100 mm	

All dimensions are mm.

MICRO 24 HOSE SYSTEM

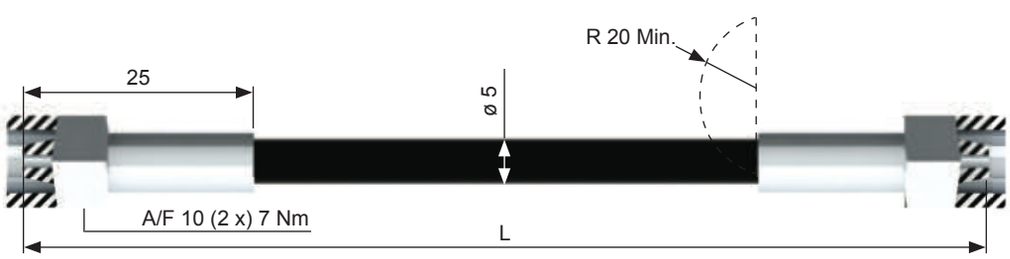
Note:
The micro hose system is primarily used with M6 ports or where space is limited. The dual seal system prevents leaking and gives protection against vibration and rotation.

External dimension:	5 mm
Volume:	3 ml/m
Min. bend radius:	20 mm
Temperature Range:	20°C bis 80°C
Max. working pressure:	475 bar

Custom hose lengths for the Micro range can be specifed.

Material:
Polyamide Black, perforated

Order-No.	Length (L)
MET 2020	100
MET 2021	200
MET 2022	300
MET 2023	400
MET 2024	630
MET 2025	800
MET 2026	1000
MET 2027	1500
MET 2028	2000
MET 2030	Customer specification
Minimum length 80 mm	

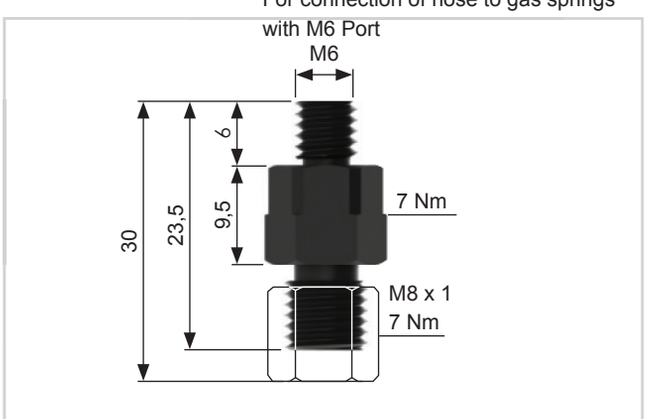


MICRO 24 HOSE ADAPTORS

The following adapters are used to connect Micro Hose 24.

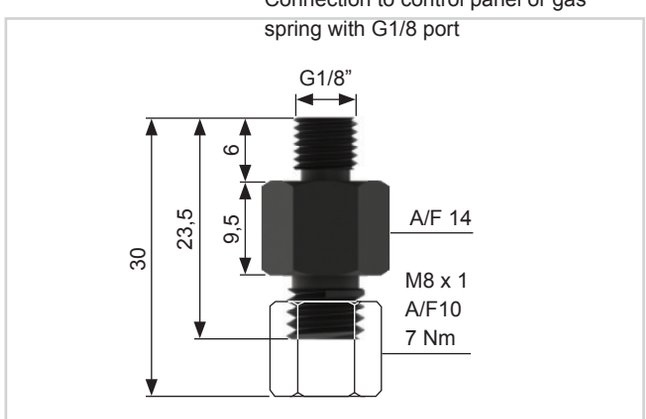
MET: 2001

For connection of hose to gas springs with M6 Port



MET: 2002

Connection to control panel or gas spring with G1/8 port

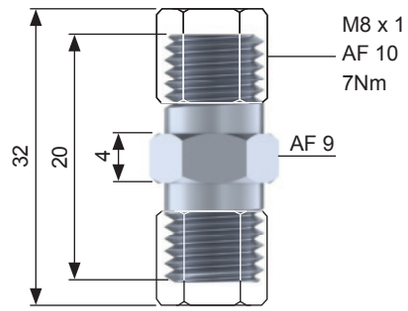


All dimensions are mm.

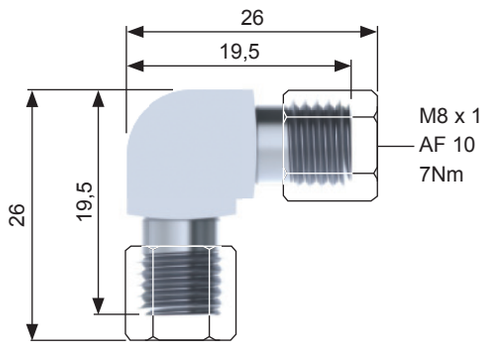
MICRO 24 HOSE ADAPTORS

The following adapters are used to connect Micro Hose 24.

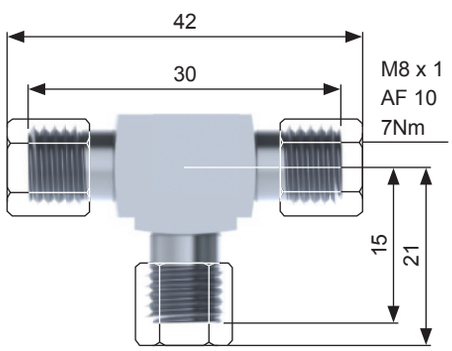
MET: 2004



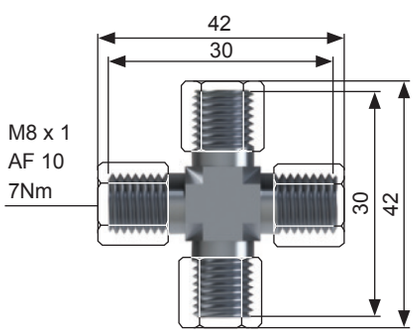
MET: 2005



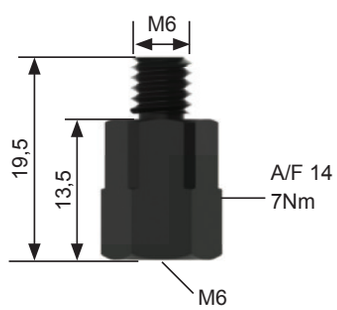
MET: 2006



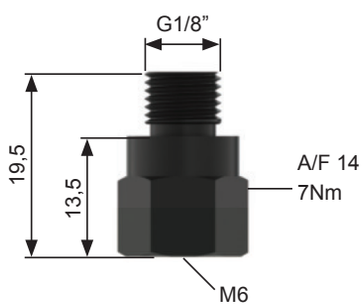
MET: 2007



MET: 2008 Adapter for connection of M6 Port when using T-adapter on the Micro Hose System.



MET: 2009 Adapter for Connection of G1/8 Port when using T-adaptr on the Micro Hose System.

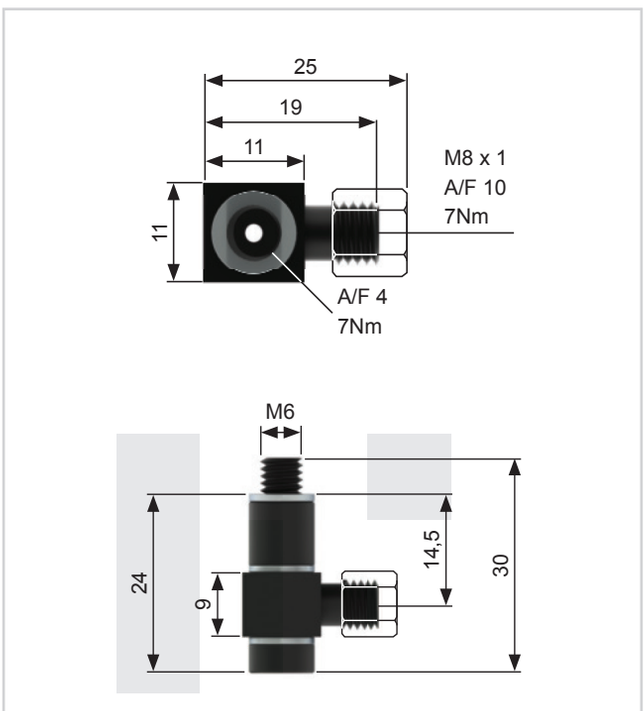


All dimensions are mm.

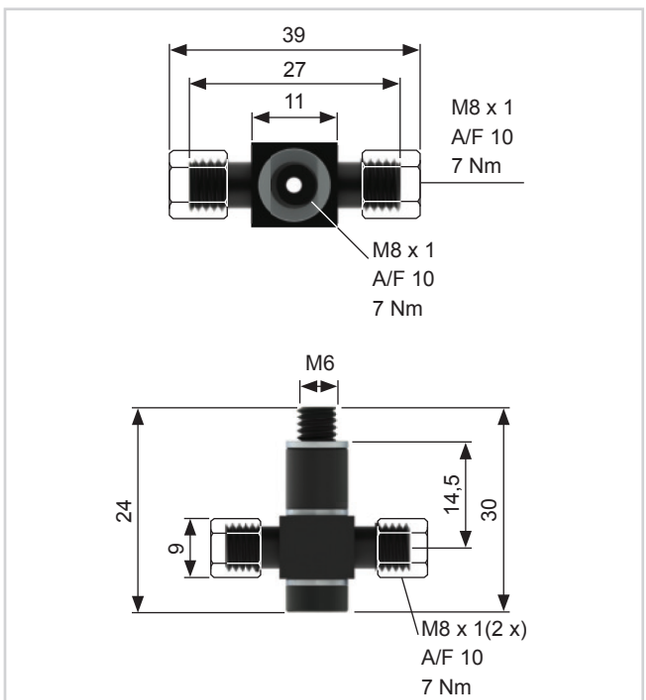
MICRO 24 HOSE ADAPTORS - GAS SPRING CONNECTION - M6 PORT

The following adapters are used to connect Micro Hose 24.

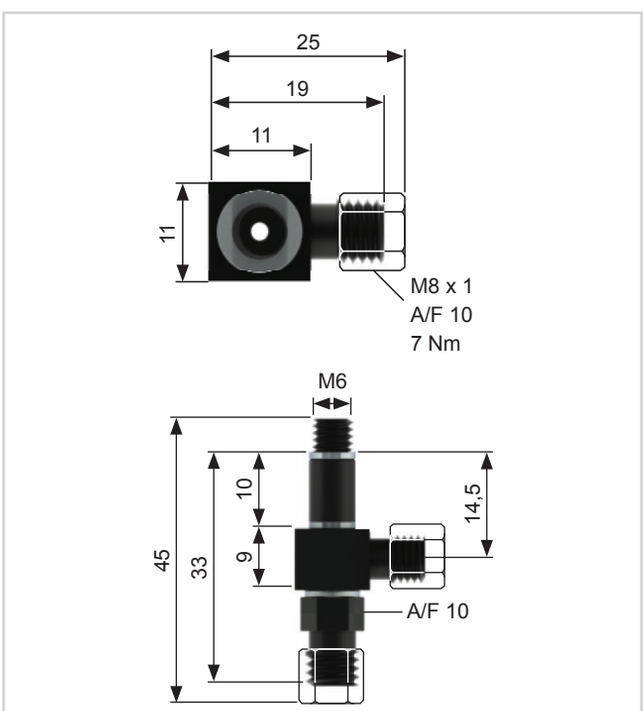
MET: 2010



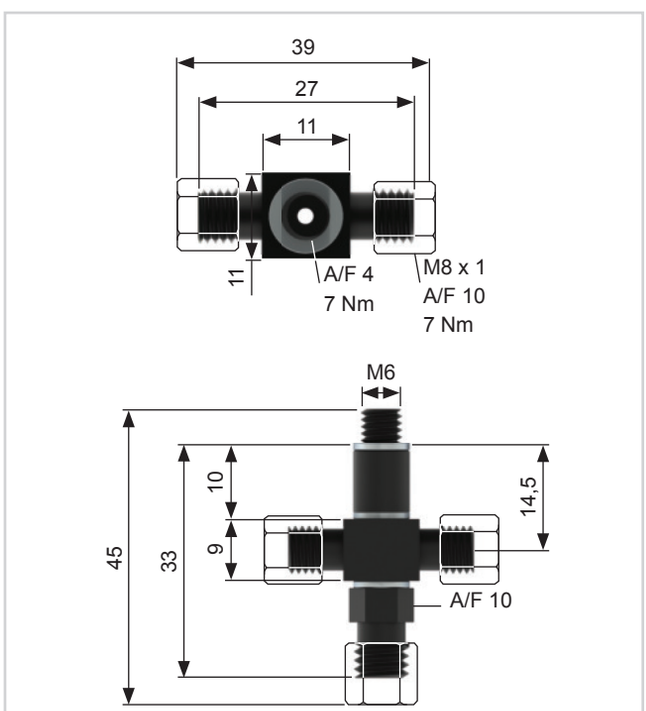
MET: 2011



MET: 2012

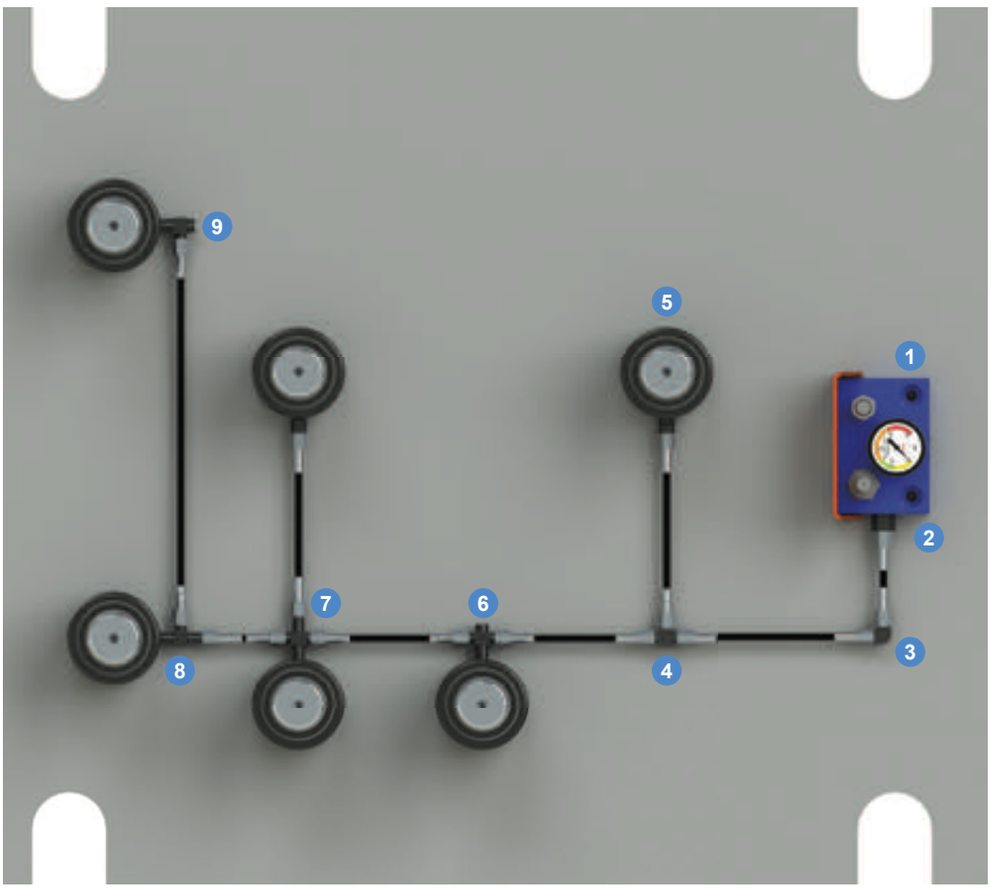


MET: 2013



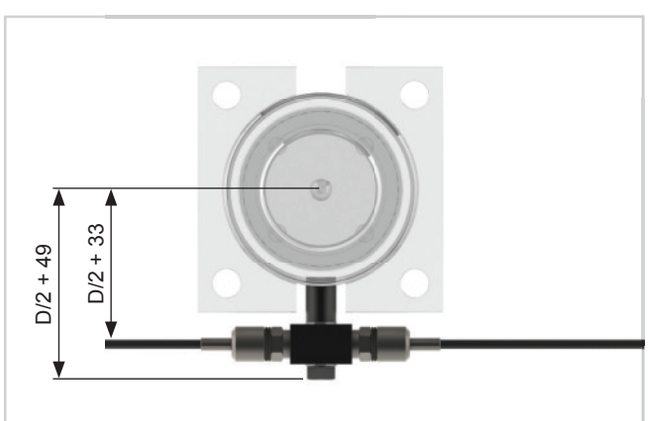
All dimensions are mm.

MICRO HOSE SYSTEM EXAMPLES



Number	Item
1	MET:111 Control Panel
2	MET:2002
3	MET:2009
4	MET:2006
5	MET:2001
6	MET:2011
7	MET:2013
8	MET:2012
9	MET:2010

For gas springs with flange, use MET: 2008.



GAS SPRING INSTALLATION - HOSE INSTALLATION GUIDELINES

Never exceed maximum values given for pressure and temperature for the hoses.

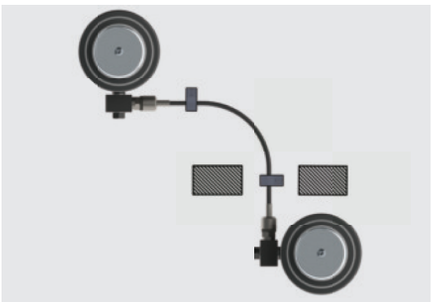
Make sure all hoses and couplings are perfectly clean before ftting.

Select a hose length that will allow for a certain amount of movement

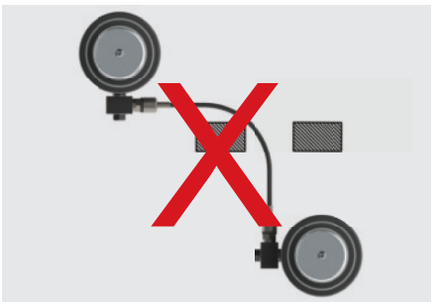
The longitudinal marking on the hose must not be twisted after fitting.

Select hose couplings that avoid sharp bends in the hose.

Never go below the recommended minimum bend radius of the hose



Fix the hose correctly to avoid mechanical damage.



ACCESSORIES

MET: 8200 Hose & shut off valve
MET: 8202 Charge unit
MET: 8205 Female charge fitting

MET: 8221 D63 Manometer

MET: 8222 48 Manometer

MET: 8204 Male charge fitting

MET: 8200 Hose & shut off valve

MET: 8201 Regulator

MET: 8202 Charge unit - G1/8

MET: 8205 Female charge fitting

MET: 8206 M6 Charge adaptor

MET: 8208 M8 Charge adaptor

GAS SPRINGS TEST STANDS - TESTING & MAINTENANCE

MET 8220: Bench mounted test stand
Designed to measure the initial gas spring force with an accurate easy to read digital display.

Nitro-Spring Service kits

Kit includes:
– Complete seal unit
– Retaining clip & dust seal
– Grease
– Oil bottle
– Plug & valve

* See gas spring data page for overhaul kit part number (e.g. EX.00360).

MET: 8101 G1/8 Port

MET: 8102 M6 Port

Important safety information:

Only trained and certified persons should attempt to carry out maintenance work on gas springs.

GAS SPRING TOOL KIT

MET: 8216
Provides all necessary equipment to overhaul and maintain Nitro-Springs.

Tool kit includes:

MET: 8013 Degassing tool

MET: 8005 M6 Valve tool

T-Bar: MET: 9005 – M6
MET: 8017 – M8

MET: 8009 Pipe system degassing tool

MET: 8206 M6 Charge adapter

MET: 8208 M8 Charge adapter

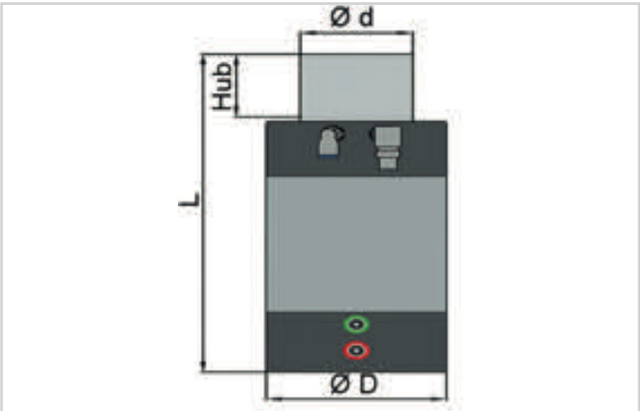
MET: 8205 Female charge fitting

MET: 8003 Demontage-WZ

MET: 8000 Seal unit depressor

MET: 8217 Leak detector spray

CONTROLLABLE GAS SPRINGS KPC

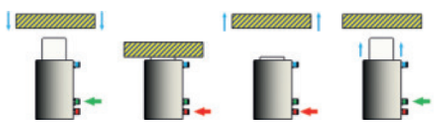


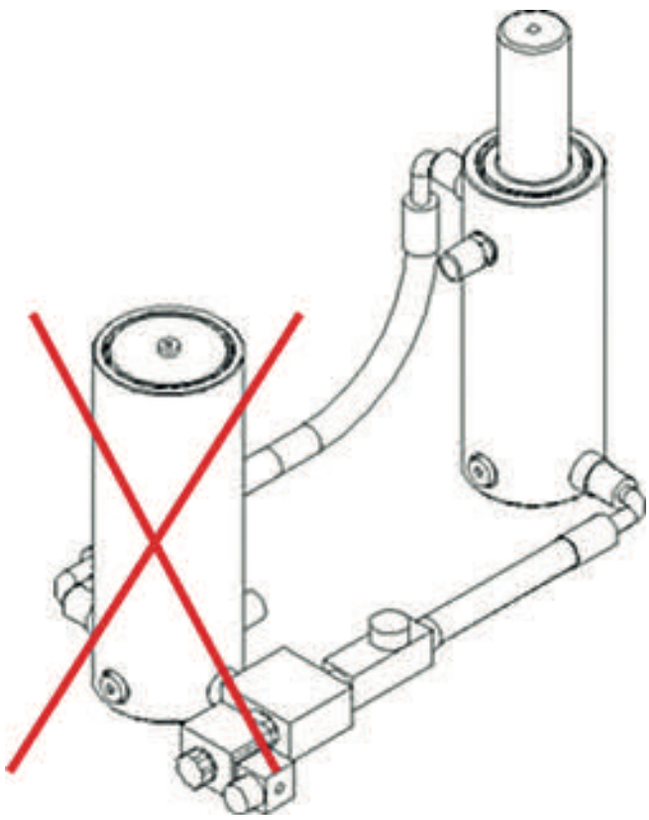
Controllable gas springs enable the piston rod to stop at UT.

The signal for stopping and retracting the piston rod is defined by the user and activated pneumatically (normally though press control).

This controllable gas spring enables stroke rates of 30 strokes/min - **without cooling!**

Space-saving and cost effective, as cooling jackets, cooling units or passive gas springs are not necessary.





	Spring force initial (daN)	Stroke length (mm) *												
		10	20	30	40	50	60	70	80	90	100	110	120	140
KPC-1000	1000	•	•	•	•	•	•	•	•	•	•		•	•
KPC-1500	1500	•	•	•	•	•	•	•	•	•	•		•	
KPC-3000	3000	•	•	•	•	•	•	•	•	•	•	•		
KPC-5000	5000	•	•	•	•	•	•	•	•	•	•			
KPC-6000	6000	•	•	•	•	•	•	•	•	•				
KPC-7500	7500	•	•	•	•	•	•	•	•					

Lifter with gas spring

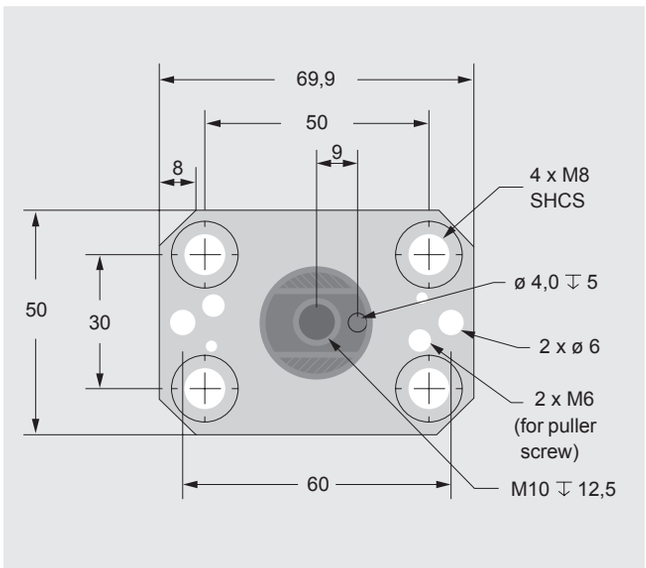
INDEX

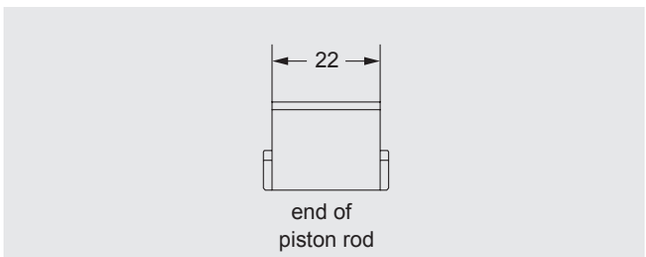
Lifter with gas spring

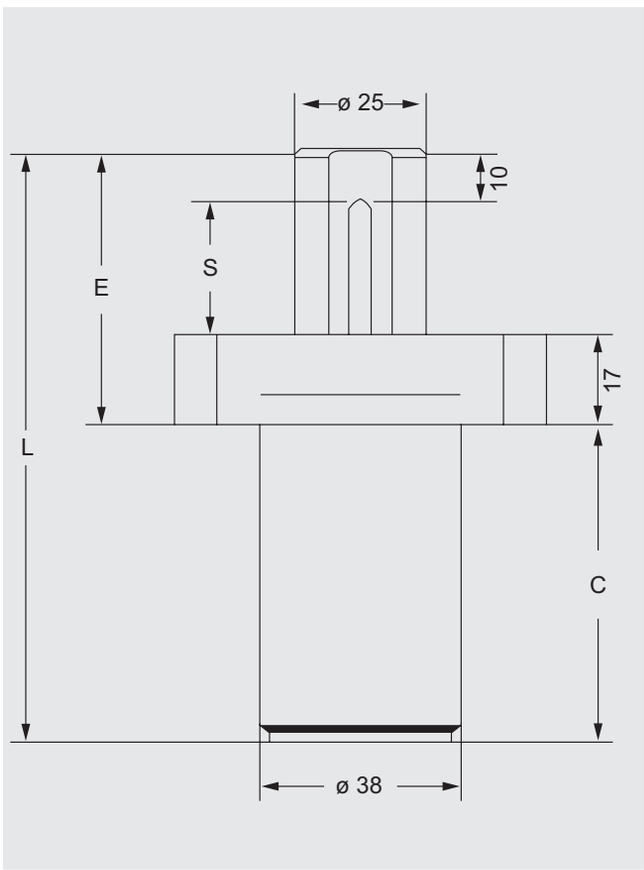
LIFTER WITH GAS SPRING

Order-No.: 777.090.Stroke

Ordering Example: Stroke = 25
777.090.025







Order-No.: Type/Stroke	Stroke (S)	C	E	L
777.090.025	**25**	60	52	112
777.090.038	**38**	73	65	138
777.090.050	**50**	85	77	162
777.090.080	**80**	118	107	225
777.090.100	**100**	138	127	265
777.090.125	**125**	163	152	315

TWO-PILLAR-LIFTER WITH GAS SPRING

Order-No.: 666.00170.Stroke

Note:
Special stroke sizes available upon request.

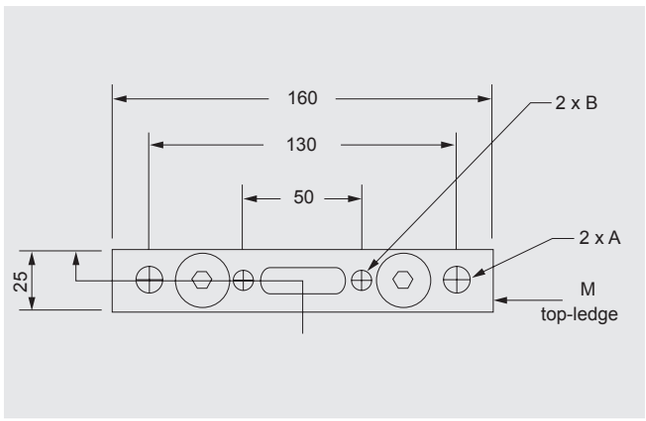
Ordering Example: Stroke = 25
666.00170.025

Order-No.: Type/Stroke	T* mm	C	E	K
666.00170.025	23	41	64	18
666.00170.038	36	54	77	18
666.00170.050	48	66	89	18
666.00170.063	61,5	82,5	102,5	18
666.00170.080	78	99	119	18
666.00170.100	98	119	139	18
666.00170.125	198	227	239	26

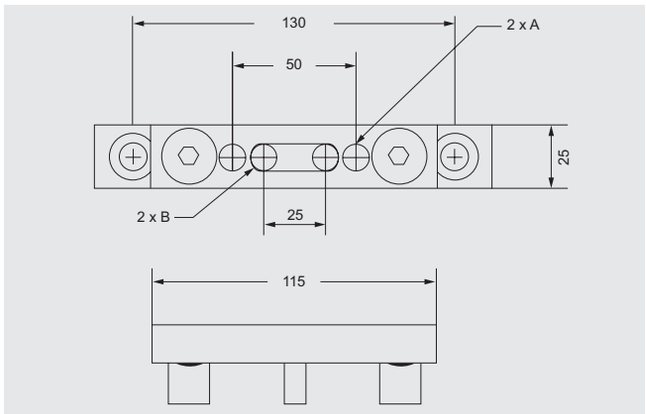
*Pretension of the gas spring: 2 mm

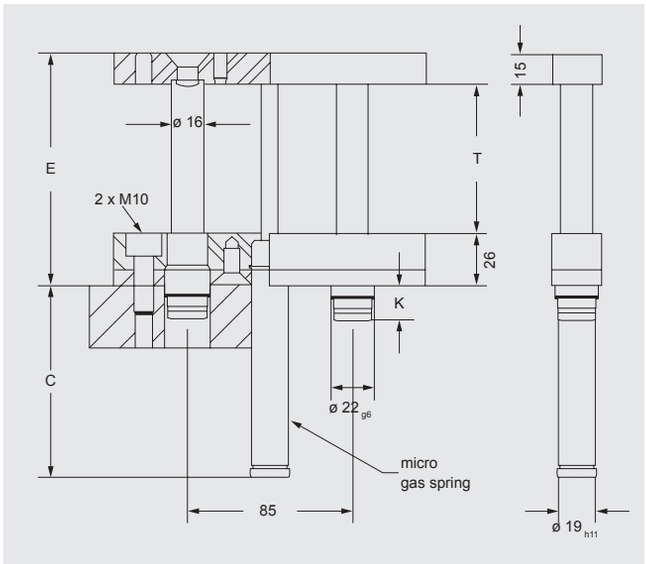
Initial force	
Pressure (bar)	**theoretical lifting force (daN)**
177	89
150	75
125	63
100	50
75	38
50	25
34	17

Standard-top-ledge



M1 top-ledge option





Spring Elements

HELICAL SPRINGS ACCORDING TO ISO 10243 AND POLYURETHANE SPRINGS

Permanent research and development plus strict control of the manufacturing process, according to ISO 9001, ensure a product with outstanding accuracy of dimension, durability and reliability.

Test series regarding the reliability enabled the declaration of the durability, depending on the pitch of the spring and the recommendations for use. Due to numerous variables in working conditions, the durability can not be guaranteed.

Special helical springs to DIN ISO 10243 are available in four grades for high cyclic and constant loads. The specially rolled wire profile is manufactured from high quality heat treated alloy steel.

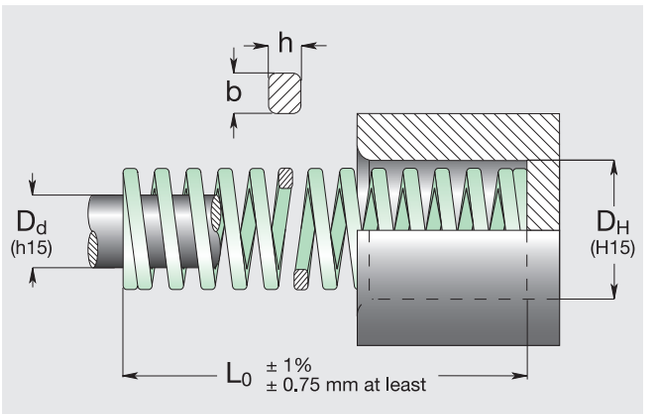
Polyurethane springs are preferential implemented where high spring forces and good resilient damping behaviour are required. Our polyurethane springs are available in 80, 90 and 95 Shore A.

INDEX

Spring Elements

HIGH PERFORMANCE COMPRESSION SPRING, LIGHT GREEN

Order-No: 4115.D_H.L_0



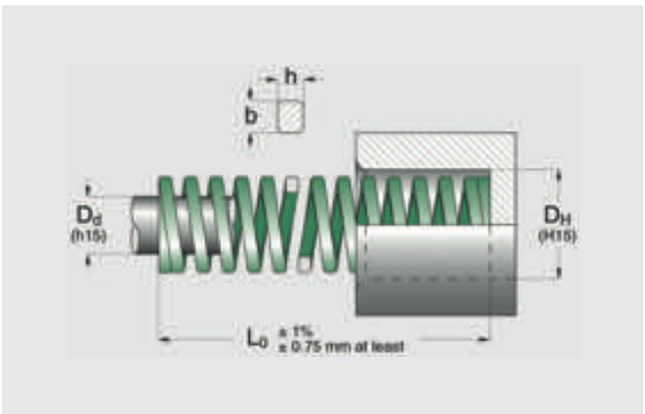
Ordering example: D_H = 20, L_0 = 25
4115.20.025

Order-No.:	D_H	D_d	L_0	±10%	A 13% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 45% L_0 300-500.000		D 62% L_0 100-200.000		E do not use
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4115.20.025	**20**	10	**25**	32,1	1,8	58	4,2	135	6,3	202	8,7	279	14
4115.20.032	**20**	10	**32**	24,7	2,3	57	5,4	133	8,1	200	11,2	277	18
4115.20.038	**20**	10	**38**	20,7	2,9	60	6,6	137	9,9	205	13,6	282	22
4115.20.044	**20**	10	**44**	17,8	3,4	61	7,8	139	11,7	208	16,1	287	26
4115.20.051	**20**	10	**51**	15,3	3,9	60	9,0	138	13,5	207	18,6	285	30
4115.20.064	**20**	10	**64**	12,1	4,9	59	11,4	138	17,1	207	23,6	286	38
4115.20.076	**20**	10	**76**	10,2	5,9	60	13,5	138	20,3	207	27,9	285	45
4115.20.089	**20**	10	**89**	8,6	6,9	59	15,9	137	23,9	206	32,9	283	53
4115.20.102	**20**	10	**102**	7,5	8,1	61	18,6	140	27,9	209	38,4	288	62
4115.20.115	**20**	10	**115**	6,7	9,1	61	21,0	141	31,5	211	43,4	291	70
4115.20.127	**20**	10	**127**	6,1	10,0	61	23,1	141	34,7	212	47,7	291	77
4115.20.139	**20**	10	**139**	5,5	11,1	61	25,5	140	38,3	211	52,7	290	85
4115.20.152	**20**	10	**152**	5,1	12,1	62	27,9	142	41,9	214	57,7	294	93
4115.20.305	**20**	10	**305**	2,5	24,4	61	56,4	141	84,6	212	116,6	292	188
4115.25.025	**25**	12,5	**25**	52,7	1,8	95	4,2	221	6,3	332	8,7	458	14
4115.25.032	**25**	12,5	**32**	40	2,3	92	5,4	216	8,1	324	11,2	448	18
4115.25.038	**25**	12,5	**38**	33,3	2,9	97	6,6	220	9,9	330	13,6	453	22
4115.25.044	**25**	12,5	**44**	28,6	3,3	94	7,5	215	11,3	323	15,5	443	25
4115.25.051	**25**	12,5	**51**	24,7	3,9	96	9,0	222	13,5	333	18,6	459	30
4115.25.064	**25**	12,5	**64**	19,4	4,9	95	11,4	221	17,1	332	23,6	458	38
4115.25.076	**25**	12,5	**76**	16,3	5,9	96	13,5	220	20,3	331	27,9	455	45
4115.25.089	**25**	12,5	**89**	15,9	6,9	96	15,9	221	23,9	332	32,9	457	53
4115.25.102	**25**	12,5	**102**	12,1	7,9	96	18,3	221	27,5	333	37,8	457	61
4115.25.115	**25**	12,5	**115**	10,8	9,1	98	21,0	227	31,5	340	43,4	469	70
4115.25.127	**25**	12,5	**127**	9,8	10,0	98	23,1	226	34,7	340	47,7	467	77
4115.25.139	**25**	12,5	**139**	8,9	11,1	99	25,5	227	38,3	341	52,7	469	85
4115.25.152	**25**	12,5	**152**	8,1	12,1	98	27,9	226	41,9	339	57,7	467	93
4115.25.178	**25**	12,5	**178**	6,9	14,2	98	32,7	226	49,1	339	67,6	466	109
4115.25.203	**25**	12,5	**203**	6,1	16,1	98	37,2	227	55,8	340	76,9	469	124
4115.25.305	**25**	12,5	**305**	4	24,4	98	56,4	226	84,6	338	116,6	466	188
4115.32.038	**32**	16	**38**	43,8	2,9	127	6,6	289	9,9	434	13,6	596	22
4115.32.044	**32**	16	**44**	37,5	3,4	128	7,8	293	11,7	439	16,1	604	26
4115.32.051	**32**	16	**51**	32,3	4,0	129	9,3	300	14,0	452	19,2	620	31
4115.32.064	**32**	16	**64**	25,4	5,1	130	11,7	297	17,6	447	24,2	615	39
4115.32.076	**32**	16	**76**	21,3	6,1	130	14,1	300	21,2	452	29,1	620	47
4115.32.089	**32**	16	**89**	18,1	7,3	132	16,8	304	25,2	456	34,7	628	56
4115.32.102	**32**	16	**102**	15,8	8,3	131	19,2	303	28,8	455	39,7	627	64
4115.32.115	**32**	16	**115**	13,9	9,5	132	21,9	304	32,9	457	45,3	630	73
4115.32.127	**32**	16	**127**	12,6	10,5	132	24,3	306	36,5	460	50,2	633	81
4115.32.139	**32**	16	**139**	11,4	11,6	132	26,7	304	40,1	457	55,2	629	89
4115.32.152	**32**	16	**152**	10,5	12,6	132	29,1	306	43,7	459	60,1	631	97
4115.32.178	**32**	16	**178**	8,9	14,8	132	34,2	304	51,3	457	70,7	629	114
4115.32.203	**32**	16	**203**	7,8	17,0	133	39,3	307	59,0	460	81,2	633	131
4115.32.254	**32**	16	**254**	6,2	21,2	131	48,9	303	73,4	455	101,1	627	163
4115.32.305	**32**	16	**305**	5,2	25,6	133	59,1	307	88,7	461	122,1	635	197

Order-No.:	D_H	D_d	L_0	±10%	A 13% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 45% L_0 300-500.000		D 62% L_0 100-200.000		E do not use
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4115.40.051	**40**	20	**51**	50,8	3,4	173	7,8	396	11,7	594	16,1	818	26
4115.40.064	**40**	20	**64**	39,7	4,4	175	10,2	405	15,3	607	21,1	838	34
4115.40.076	**40**	20	**76**	33,1	5,2	172	12,0	397	18,0	596	24,8	821	40
4115.40.089	**40**	20	**89**	28,1	6,2	174	14,4	405	21,6	607	29,8	837	48
4115.40.102	**40**	20	**102**	24,5	7,2	176	16,5	404	24,8	608	34,1	835	55
4115.40.115	**40**	20	**115**	21,6	8,2	177	18,9	408	28,4	613	39,1	845	63
4115.40.127	**40**	20	**127**	19,5	9,1	177	21,0	410	31,5	614	43,4	846	70
4115.40.139	**40**	20	**139**	17,8	9,9	176	22,8	406	34,2	609	47,1	838	76
4115.40.152	**40**	20	**152**	16,3	10,9	178	25,2	411	37,8	616	52,1	849	84
4115.40.178	**40**	20	**178**	13,8	12,9	178	29,7	410	44,6	615	61,4	847	99
4115.40.203	**40**	20	**203**	12,1	14,7	178	33,9	410	50,9	616	70,1	848	113
4115.40.254	**40**	20	**254**	9,7	18,5	179	42,6	413	63,9	620	88,0	854	142
4115.40.305	**40**	20	**305**	8	22,2	178	51,3	410	77,0	616	106,0	848	171
4115.50.064	**50**	25	**64**	80,2	4,8	385	11,1	890	16,7	1339	22,9	1837	37
4115.50.076	**50**	25	**76**	66,9	5,9	395	13,5	903	20,3	1358	27,9	1867	45
4115.50.089	**50**	25	**89**	56,6	6,9	391	15,9	900	23,9	1353	32,9	1862	53
4115.50.102	**50**	25	**102**	40,3	8,1	399	18,6	917	27,9	1375	38,4	1893	62
4115.50.115	**50**	25	**115**	43,5	9,1	396	21,0	914	31,5	1370	43,4	1888	70
4115.50.127	**50**	25	**127**	39,3	10,1	397	23,4	920	35,1	1379	48,4	1902	78
4115.50.139	**50**	25	**139**	35,8	11,1	397	25,5	913	38,3	1371	52,7	1887	85
4115.50.152	**50**	25	**152**	32,8	12,2	400	28,2	925	42,3	1387	58,3	1912	94
4115.50.178	**50**	25	**178**	27,8	14,3	398	33,0	917	49,5	1376	68,2	1896	110
4115.50.203	**50**	25	**203**	24,2	16,4	397	37,8	915	56,7	1372	78,1	1890	126
4115.50.254	**50**	25	**254**	19,2	20,7	397	47,7	916	71,6	1375	98,6	1893	159
4115.50.305	**50**	25	**305**	16	25,0	400	57,6	922	86,4	1382	119,0	1904	192

HIGH PERFORMANCE COMPRESSION SPRING DIN ISO 10243, GREEN

Order-No.: 4111.D_H.L_0



Ordering example: D_H = 10, L_0 = 25
4111.10.025

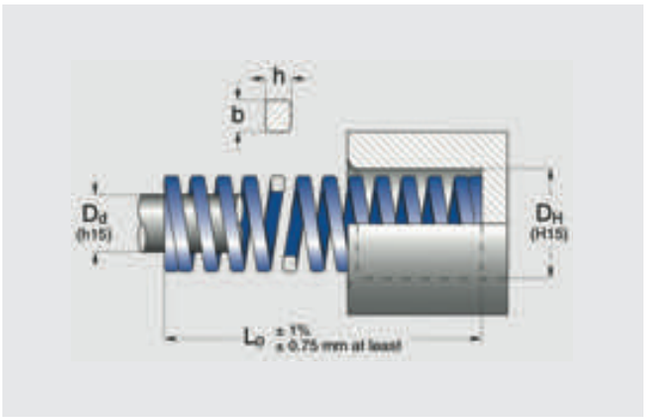
Order-No.:	D_H	D_d	L_0	±10%	A 25% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 35% L_0 300-500.000		D 40% L_0 100-200.000		E do not use
	b x h												
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4111.10.025	10	5	25	10,0	6,3	63	7,5	75	8,8	88	10,0	100	13,5
4111.10.032	10	5	32	8,5	8,0	68	9,6	82	11,2	95	12,8	109	17,5
4111.10.038	10	5	38	6,8	9,5	65	11,4	78	13,3	90	15,2	103	20,8
4111.10.044	10	5	44	6,0	11,0	66	13,2	79	15,4	92	17,6	106	23,9
4111.10.051	10	5	51	5,0	12,8	64	15,3	77	17,9	89	20,4	102	28,9
4111.10.064	10	5	64	4,3	16,0	69	19,2	83	22,4	96	25,6	110	36,1
4111.10.076	10	5	76	3,2	19,0	61	22,8	73	26,6	85	30,4	97	43,2
4111.10.305	1,7 x 1,1		305	1,1	76,3	84	91,5	101	107,0	117	122,0	134	178,0
4111.13.025	12,5	6,3	25	17,9	6,3	113	7,5	134	8,8	157	10,0	179	13,2
4111.13.032	12,5	6,3	32	16,4	8,0	131	9,6	157	11,2	184	12,8	210	18,0
4111.13.038	12,5	6,3	38	13,6	9,5	129	11,4	155	13,3	181	15,2	207	21,0
4111.13.044	12,5	6,3	44	12,1	11,0	133	13,2	160	15,4	186	17,6	213	24,0
4111.13.051	12,5	6,3	51	11,4	12,8	146	15,3	174	17,9	203	20,4	233	28,7
4111.13.064	12,5	6,3	64	9,3	16,0	149	19,2	179	22,4	208	25,6	238	35,8
4111.13.076	12,5	6,3	76	7,1	19,0	135	22,8	162	26,6	189	30,4	216	42,7
4111.13.089	12,5	6,3	89	5,4	22,3	120	26,7	144	31,2	168	35,6	192	50,4
4111.13.102	12,5	6,3	102	4,1	25,5	105	30,6	125	35,7	146	40,8	167	58,4
4111.13.305	2,4 x 1,4		305	1,4	76,3	107	91,5	128	107,0	149	122,0	171	172,0
4111.16.025	16	8	25	23,4	6,3	147	7,5	176	8,8	205	10,0	234	12,6
4111.16.032	16	8	32	22,9	8,0	183	9,6	220	11,2	256	12,8	293	16,4
4111.16.038	16	8	38	19,3	9,5	183	11,4	220	13,3	257	15,2	293	19,7
4111.16.044	16	8	44	17,1	11,0	188	13,2	226	15,4	263	17,6	301	22,5
4111.16.051	16	8	51	15,7	12,8	201	15,3	240	17,9	280	20,4	320	26,3
4111.16.064	16	8	64	10,7	16,0	171	19,2	205	22,4	240	25,6	274	33,3
4111.16.076	16	8	76	10,0	19,0	190	22,8	228	26,6	266	30,4	304	40,2
4111.16.089	16	8	89	8,6	22,3	192	26,7	230	31,2	268	35,6	306	47,6
4111.16.102	16	8	102	7,8	25,5	199	30,6	239	35,7	278	40,8	318	55,4
4111.16.115	16	8	115	6,6	28,8	190	34,5	228	40,3	266	46,0	304	60,8
4111.16.305	3,2 x 1,5		305	2,5	76,3	191	91,5	229	107,0	267	122,0	305	165,0
4111.20.025	20	10	25	55,8	6,3	352	7,5	419	8,8	488	10,0	558	12,1
4111.20.032	20	10	32	45,0	8,0	360	9,6	432	11,2	504	12,8	576	15,3
4111.20.038	20	10	38	33,3	9,5	316	11,4	380	13,3	443	15,2	506	18,9
4111.20.044	20	10	44	30,0	11,0	330	13,2	396	15,4	462	17,6	528	21,5
4111.20.051	20	10	51	24,5	12,8	314	15,3	375	17,9	437	20,4	500	25,0
4111.20.064	20	10	64	20,0	16,0	320	19,2	384	22,4	448	25,6	512	31,1
4111.20.076	20	10	76	16,0	19,0	304	22,8	365	26,6	426	30,4	486	37,3
4111.20.089	20	10	89	14,0	22,3	312	26,7	374	31,2	436	35,6	498	44,5
4111.20.102	20	10	102	12,0	25,5	306	30,6	367	35,7	428	40,8	490	51,1
4111.20.115	20	10	115	10,9	28,8	314	34,5	376	40,3	439	46,0	501	58,2
4111.20.127	20	10	127	9,5	31,8	302	38,1	362	44,5	422	50,8	483	64,9
4111.20.139	20	10	139	8,4	35,0	294	42,0	353	48,7	409	56,0	470	71,5
4111.20.152	20	10	152	7,5	38,0	285	45,6	342	53,2	399	60,8	456	78,8
4111.20.305	4,0 x 2,1		305	4,0	76,3	305	91,5	366	107,0	427	122,0	488	157,0

Order-No.:	D_H	D_d	L_0	±10%	A 25% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 35% L_0 300-500.000		D 40% L_0 100-200.000		E do not use
	b x h												
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4111.25.025	**25**	12,5	**25**	100,0	6,3	630	7,5	750	8,8	875	10,0	1000	11,9
4111.25.032	**25**	12,5	**32**	80,3	8,0	642	9,6	771	11,2	899	12,8	1028	16,0
4111.25.038	**25**	12,5	**38**	62,0	9,5	589	11,4	707	13,3	825	15,2	942	18,3
4111.25.044	**25**	12,5	**44**	52,9	11,0	582	13,2	698	15,4	815	17,6	931	21,4
4111.25.051	**25**	12,5	**51**	44,0	12,8	563	15,3	673	17,9	785	20,4	898	24,9
4111.25.064	**25**	12,5	**64**	35,2	16,0	563	19,2	676	22,4	788	25,6	901	31,4
4111.25.076	**25**	12,5	**76**	28,0	19,0	532	22,8	638	26,6	745	30,4	851	37,5
4111.25.089	**25**	12,5	**89**	24,0	22,3	535	26,7	641	31,2	748	35,6	854	43,5
4111.25.102	**25**	12,5	**102**	21,1	25,5	538	30,6	646	35,7	753	40,8	861	51,1
4111.25.115	**25**	12,5	**115**	18,7	28,8	539	34,5	645	40,3	753	46,0	860	58,1
4111.25.127	**25**	12,5	**127**	16,7	31,8	531	38,1	636	44,5	742	50,8	848	64,1
4111.25.139	**25**	12,5	**139**	15,3	35,0	536	42,0	643	48,7	744	56,0	857	70,4
4111.25.152	**25**	12,5	**152**	14,0	38,0	532	45,6	638	53,2	745	60,8	851	77,1
4111.25.178	**25**	12,5	**178**	12,5	44,5	556	53,4	668	62,3	779	71,2	890	93,1
4111.25.203	**25**	12,5	**203**	10,4	50,8	528	60,9	633	71,1	739	81,2	844	103,0
4111.25.305	**5,4 x 2,7**		**305**	7,0	76,3	534	91,5	641	107,0	747	122,0	854	156,0
4111.32.038	**32**	16	**38**	94,0	9,5	893	11,4	1072	13,3	1250	15,2	1429	18,3
4111.32.044	**32**	16	**44**	79,5	11,0	875	13,2	1049	15,4	1224	17,6	1399	21,5
4111.32.051	**32**	16	**51**	67,0	12,8	858	15,3	1025	17,9	1196	20,4	1367	25,5
4111.32.064	**32**	16	**64**	53,0	16,0	848	19,2	1018	22,4	1187	25,6	1357	31,9
4111.32.076	**32**	16	**76**	44,0	19,0	836	22,8	1003	26,6	1170	30,4	1338	38,6
4111.32.089	**32**	16	**89**	37,2	22,3	830	26,7	993	31,2	1159	35,6	1324	46,5
4111.32.102	**32**	16	**102**	32,0	25,5	816	30,6	979	35,7	1142	40,8	1306	53,2
4111.32.115	**32**	16	**115**	29,0	28,8	835	34,5	1001	40,3	1167	46,0	1334	60,0
4111.32.127	**32**	16	**127**	25,0	31,8	795	38,1	953	44,5	1111	50,8	1270	66,7
4111.32.139	**32**	16	**139**	23,0	35,0	805	42,0	966	48,7	1119	56,0	1288	71,8
4111.32.152	**32**	16	**152**	21,5	38,0	817	45,6	980	53,2	1144	60,8	1307	78,5
4111.32.178	**32**	16	**178**	18,2	44,5	810	53,4	972	62,3	1134	71,2	1296	94,4
4111.32.203	**32**	16	**203**	15,8	50,8	803	60,9	962	71,1	1123	81,2	1283	107,0
4111.32.254	**32**	16	**254**	12,5	63,5	794	76,2	953	88,9	1111	102,0	1270	136,0
4111.32.305	**6,8 x 3,3**		**305**	10,3	76,3	786	91,5	942	107,0	1100	122,0	1257	163,0
4111.40.051	**40**	20	**51**	92,0	12,8	1178	15,3	1408	17,9	1642	20,4	1877	25,5
4111.40.064	**40**	20	**64**	73,0	16,0	1168	19,2	1402	22,4	1635	25,6	1869	31,4
4111.40.076	**40**	20	**76**	63,0	19,0	1197	22,8	1436	26,6	1676	30,4	1915	37,8
4111.40.089	**40**	20	**89**	51,0	22,3	1137	26,7	1362	31,2	1589	35,6	1816	44,3
4111.40.102	**40**	20	**102**	43,0	25,5	1097	30,6	1316	35,7	1535	40,8	1754	50,7
4111.40.115	**40**	20	**115**	39,6	28,8	1140	34,5	1366	40,3	1594	46,0	1822	58,1
4111.40.127	**40**	20	**127**	37,0	31,8	1177	38,1	1410	44,5	1645	50,8	1880	64,6
4111.40.139	**40**	20	**139**	32,0	35,0	1120	42,0	1344	48,7	1557	56,0	1792	70,1
4111.40.152	**40**	20	**152**	28,0	38,0	1064	45,6	1277	53,2	1490	60,8	1702	76,6
4111.40.178	**40**	20	**178**	25,2	44,5	1121	53,4	1346	62,3	1570	71,2	1794	90,4
4111.40.203	**40**	20	**203**	22,7	50,8	1153	60,9	1382	71,1	1613	81,2	1843	102,0
4111.40.254	**40**	20	**254**	17,0	63,5	1080	76,2	1295	88,9	1511	102,0	1727	129,0
4111.40.305	**8,1 x 4,0**		**305**	14,8	76,3	1129	91,5	1354	107,0	1580	122,0	1806	156,0
4111.50.064	**50**	25	**64**	156,0	16,0	2496	19,2	2995	22,4	3494	25,6	3994	31,0
4111.50.076	**50**	25	**76**	125,0	19,0	2375	22,8	2850	26,6	3325	30,4	3800	37,2
4111.50.089	**50**	25	**89**	109,0	22,3	2431	26,7	2910	31,2	3395	35,6	3880	43,6
4111.50.102	**50**	25	**102**	94,0	25,5	2397	30,6	2876	35,7	3356	40,8	3835	50,3
4111.50.115	**50**	25	**115**	81,0	28,8	2333	34,5	2795	40,3	3260	46,0	3726	58,1
4111.50.127	**50**	25	**127**	71,0	31,8	2258	38,1	2705	44,5	3156	50,8	3607	63,7
4111.50.139	**50**	25	**139**	66,5	35,0	2328	42,0	2793	48,7	3235	56,0	3724	69,5
4111.50.152	**50**	25	**152**	60,0	38,0	2280	45,6	2736	53,2	3192	60,8	3648	76,5
4111.50.178	**50**	25	**178**	52,0	44,5	2314	53,4	2777	62,3	3240	71,2	3702	91,9
4111.50.203	**50**	25	**203**	44,0	50,8	2235	60,9	2680	71,1	3126	81,2	3573	105,0
4111.50.254	**50**	25	**254**	35,0	63,5	2223	76,2	2667	88,9	3112	102,0	3556	131,0
4111.50.305	**10,9 x 5,3**		**305**	28,5	76,3	2175	91,5	2608	107,0	3042	122,0	3477	155,0
4111.63.076	**63**	38	**76**	189,0	19,0	3591	22,8	4309	26,6	5027	30,4	5746	36,5
4111.63.089	**63**	38	**89**	158,0	22,3	3523	26,7	4219	31,2	4922	35,6	5625	43,4
4111.63.102	**63**	38	**102**	131,0	25,5	3341	30,6	4009	35,7	4677	40,8	5345	49,7
4111.63.115	**63**	38	**115**	116,0	28,8	3341	34,5	4002	40,3	4669	46,0	5336	55,6
4111.63.127	**63**	38	**127**	103,0	31,8	3275	38,1	3924	44,5	4578	50,8	5232	62,7
4111.63.152	**63**	38	**152**	84,3	38,0	3203	45,6	3844	53,2	4485	60,8	5125	77,1
4111.63.178	**63**	38	**178**	71,5	44,5	3182	53,4	3818	62,3	4454	71,2	5091	92,2
4111.63.203	**63**	38	**203**	61,7	50,8	3134	60,9	3758	71,1	4384	81,2	5010	103,0
4111.63.254	**63**	38	**254**	47,0	63,5	2985	76,2	3581	88,9	4178	102,0	4775	130,0
4111.63.305	**11,0 x 7,8**		**305**	38,2	76,3	2915	91,5	3495	107,0	4078	122,0	4660	157,0

HIGH PERFORMANCE COMPRESSION SPRING DIN ISO 10243, BLUE

Order-No.: 4112.D_H.L_0

Order-No.:	D_H	D_d	L_0	±10%	A 25% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 35% L_0 300-500.000		D 40% L_0 100-200.000		E do not use
	b x h												
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4112.10.025	**10**	5	**25**	16,0	6,3	101	7,5	120	8,4	135	9,4	150	10,2
4112.10.032	**10**	5	**32**	13,0	8,0	104	9,6	125	10,8	140	12,0	156	14,2
4112.10.038	**10**	5	**38**	11,9	9,5	113	11,4	136	12,8	153	14,3	170	16,8
4112.10.044	**10**	5	**44**	10,3	11,0	113	13,2	136	14,9	153	16,5	170	19,4
4112.10.051	**10**	5	**51**	8,9	12,8	114	15,3	136	17,2	153	19,1	170	23,4
4112.10.064	**10**	5	**64**	7,5	16,0	120	19,2	144	21,6	162	24,0	180	28,2
4112.10.076	**10**	5	**76**	5,3	19,0	101	22,8	121	25,7	136	28,5	151	34,2
4112.10.305	**1,9 x 1,3**		**305**	1,6	76,3	122	91,5	146	103,0	165	114,0	183	134,0
4112.13.025	**12,5**	6,3	**25**	30,0	6,3	189	7,5	225	8,4	253	9,4	282	11,9
4112.13.032	**12,5**	6,3	**32**	24,8	8,0	198	9,6	238	10,8	268	12,0	298	16,2
4112.13.038	**12,5**	6,3	**38**	21,4	9,5	203	11,4	244	12,8	274	14,3	306	18,7
4112.13.044	**12,5**	6,3	**44**	18,5	11,0	204	13,2	244	14,9	275	16,5	305	21,3
4112.13.051	**12,5**	6,3	**51**	15,5	12,8	198	15,3	237	17,2	267	19,1	296	25,6
4112.13.064	**12,5**	6,3	**64**	12,1	16,0	194	19,2	232	21,6	261	24,0	290	32,4
4112.13.076	**12,5**	6,3	**76**	10,2	19,0	194	22,8	233	25,7	262	28,5	291	39,0
4112.13.089	**12,5**	6,3	**89**	8,4	22,3	187	26,7	224	30,0	252	33,4	281	45,9
4112.13.102	**12,5**	6,3	**102**	6,3	25,5	161	30,6	193	34,4	217	38,3	241	52,3
4112.13.305	**2,5 x 1,5**		**305**	2,1	76,3	160	91,5	192	103,0	216	114,0	240	153,0
4112.16.025	**16**	8	**25**	49,4	6,3	311	7,5	371	8,4	417	9,4	464	10,5
4112.16.032	**16**	8	**32**	37,1	8,0	297	9,6	356	10,8	401	12,0	445	13,2
4112.16.038	**16**	8	**38**	33,9	9,5	322	11,4	386	12,8	435	14,3	485	17,2
4112.16.044	**16**	8	**44**	30,0	11,0	330	13,2	396	14,9	446	16,5	495	19,4
4112.16.051	**16**	8	**51**	26,4	12,8	338	15,3	404	17,2	454	19,1	504	24,2
4112.16.064	**16**	8	**64**	20,5	16,0	328	19,2	394	21,6	443	24,0	492	29,2
4112.16.076	**16**	8	**76**	17,8	19,0	338	22,8	406	25,7	457	28,5	507	36,3
4112.16.089	**16**	8	**89**	15,2	22,3	339	26,7	406	30,0	457	33,4	508	41,7
4112.16.102	**16**	8	**102**	13,5	25,5	344	30,6	413	34,4	465	38,3	517	48,9
4112.16.115	**16**	8	**115**	11,8	28,8	340	34,5	407	38,8	458	43,1	509	53,1
4112.16.305	**3,2 x 2,0**		**305**	4,8	76,3	366	91,5	439	103,0	494	114,0	549	142,0
4112.20.025	**20**	10	**25**	98,0	6,3	617	7,5	735	8,4	827	9,4	921	10,5
4112.20.032	**20**	10	**32**	72,6	8,0	581	9,6	697	10,8	784	12,0	871	13,9
4112.20.038	**20**	10	**38**	56,0	9,5	532	11,4	638	12,8	718	14,3	801	16,6
4112.20.044	**20**	10	**44**	47,5	11,0	523	13,2	627	14,9	705	16,5	784	18,8
4112.20.051	**20**	10	**51**	41,7	12,8	534	15,3	638	17,2	718	19,1	796	23,1
4112.20.064	**20**	10	**64**	32,3	16,0	517	19,2	620	21,6	698	24,0	775	27,5
4112.20.076	**20**	10	**76**	25,1	19,0	477	22,8	572	25,7	644	28,5	715	33,8
4112.20.089	**20**	10	**89**	22,0	22,3	491	26,7	587	30,0	661	33,4	735	39,7
4112.20.102	**20**	10	**102**	19,8	25,5	505	30,6	606	34,4	682	38,3	758	47,3
4112.20.115	**20**	10	**115**	18,1	28,8	521	34,5	624	38,8	703	43,1	780	52,5
4112.20.127	**20**	10	**127**	16,6	31,8	528	38,1	632	42,9	712	47,6	790	56,9
4112.20.139	**20**	10	**139**	15,1	35,0	529	42,0	634	46,9	708	52,5	793	62,1
4112.20.152	**20**	10	**152**	13,2	38,0	500	45,6	600	51,3	677	57,0	750	67,6
4112.20.305	**4,1 x 2,4**		**305**	6,1	76,3	465	91,5	558	103,0	628	114,0	698	143,0
4112.25.025	**25**	12,5	**25**	147,0	6,3	926	7,5	1103	8,4	1240	9,4	1382	10,2
4112.25.032	**25**	12,5	**32**	118,0	8,0	944	9,6	1133	10,8	1274	12,0	1416	13,7
4112.25.038	**25**	12,5	**38**	93,0	9,5	884	11,4	1060	12,8	1193	14,3	1330	15,7
4112.25.044	**25**	12,5	**44**	80,8	11,0	889	13,2	1067	14,9	1200	16,5	1333	18,2
4112.25.051	**25**	12,5	**51**	68,6	12,8	878	15,3	1050	17,2	1181	19,1	1310	21,7
4112.25.064	**25**	12,5	**64**	53,0	16,0	848	19,2	1018	21,6	1145	24,0	1272	26,0
4112.25.076	**25**	12,5	**76**	43,2	19,0	821	22,8	985	25,7	1108	28,5	1231	32,3
4112.25.089	**25**	12,5	**89**	38,2	22,3	852	26,7	1020	30,0	1147	33,4	1276	38,0
4112.25.102	**25**	12,5	**102**	33,0	25,5	842	30,6	1010	34,4	1136	38,3	1264	43,0
4112.25.115	**25**	12,5	**115**	28,0	28,8	806	34,5	966	38,8	1087	43,1	1207	48,6
4112.25.127	**25**	12,5	**127**	25,9	31,8	824	38,1	987	42,9	1110	47,6	1233	53,7
4112.25.139	**25**	12,5	**139**	23,2	35,0	812	42,0	974	46,9	1088	52,5	1218	59,4
4112.25.152	**25**	12,5	**152**	20,8	38,0	790	45,6	948	51,3	1067	57,0	1186	63,8
4112.25.178	**25**	12,5	**178**	17,8	44,5	792	53,4	951	60,1	1069	66,8	1189	76,6
4112.25.203	**25**	12,5	**203**	15,8	50,8	803	60,9	962	68,5	1082	76,1	1202	88,4
4112.25.305	**5,4 x 3,3**		**305**	10,2	76,3	778	91,5	933	103,0	1050	114,0	1167	135,0



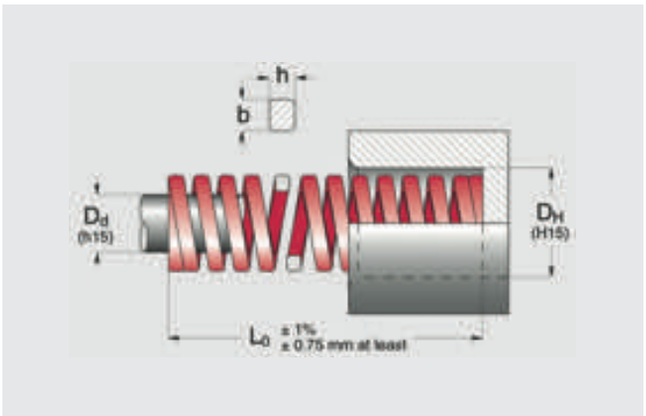
Ordering example: D_H = 10, L_0 = 25
4112.10.025

Order-No.:	D_H	D_d	L_0	±10%	A 25% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 35% L_0 300-500.000		D 40% L_0 100-200.000		E do not use
	b x h												
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4112.32.038	**32**	16	**38**	185,0	9,5	1758	11,4	2109	12,8	2373	14,3	2646	16,3
4112.32.044	**32**	16	**44**	158,0	11,0	1738	13,2	2086	14,9	2346	16,5	2607	18,9
4112.32.051	**32**	16	**51**	134,0	12,8	1715	15,3	2050	17,2	2306	19,1	2559	23,1
4112.32.064	**32**	16	**64**	99,0	16,0	1584	19,2	1901	21,6	2138	24,0	2376	28,5
4112.32.076	**32**	16	**76**	80,5	19,0	1530	22,8	1835	25,7	2065	28,5	2294	34,2
4112.32.089	**32**	16	**89**	69,1	22,3	1541	26,7	1845	30,0	2076	33,4	2308	40,4
4112.32.102	**32**	16	**102**	58,8	25,5	1499	30,6	1799	34,4	2024	38,3	2252	48,0
4112.32.115	**32**	16	**115**	51,5	28,8	1483	34,5	1777	38,8	1999	43,1	2220	54,3
4112.32.127	**32**	16	**127**	44,8	31,8	1425	38,1	1707	42,9	1920	47,6	2132	59,2
4112.32.139	**32**	16	**139**	42,3	35,0	1481	42,0	1777	46,9	1984	52,5	2221	65,3
4112.32.152	**32**	16	**152**	37,8	38,0	1436	45,6	1724	51,3	1939	57,0	2155	73,0
4112.32.178	**32**	16	**178**	32,5	44,5	1446	53,4	1736	60,1	1952	66,8	2171	84,5
4112.32.203	**32**	16	**203**	28,9	50,8	1468	60,9	1760	68,5	1980	76,1	2199	96,9
4112.32.254	**32**	16	**254**	21,4	63,5	1359	76,2	1631	85,7	1835	95,3	2039	121,0
4112.32.305	**6,8 x 4,0**		**305**	18,3	76,3	1396	91,5	1674	103,0	1884	114,0	2094	147,0
4112.40.051	**40**	20	**51**	182,0	12,8	2330	15,3	2785	17,2	3130	19,1	3476	21,4
4112.40.064	**40**	20	**64**	140,0	16,0	2240	19,2	2688	21,6	3024	24,0	3360	26,8
4112.40.076	**40**	20	**76**	108,0	19,0	2052	22,8	2462	25,7	2770	28,5	3078	32,7
4112.40.089	**40**	20	**89**	90,7	22,3	2023	26,7	2422	30,0	2724	33,4	3029	39,0
4112.40.102	**40**	20	**102**	81,0	25,5	2066	30,6	2479	34,4	2788	38,3	3102	44,1
4112.40.115	**40**	20	**115**	71,8	28,8	2068	34,5	2477	38,8	2787	43,1	3095	50,6
4112.40.127	**40**	20	**127**	62,7	31,8	1994	38,1	2389	42,9	2687	47,6	2985	55,9
4112.40.139	**40**	20	**139**	57,5	35,0	2013	42,0	2415	46,9	2697	52,5	3019	61,8
4112.40.152	**40**	20	**152**	51,6	38,0	1961	45,6	2353	51,3	2647	57,0	2941	67,5
4112.40.178	**40**	20	**178**	44,1	44,5	1962	53,4	2355	60,1	2649	66,8	2946	77,2
4112.40.203	**40**	20	**203**	36,7	50,8	1864	60,9	2235	68,5	2514	76,1	2793	91,8
4112.40.254	**40**	20	**254**	30,1	63,5	1911	76,2	2294	85,7	2580	95,3	2869	113,0
4112.40.305	**8,2 x 4,7**		**305**	24,6	76,3	1877	91,5	2251	103,0	2532	114,0	2814	138,0
4112.50.064	**50**	25	**64**	209,0	16,0	3344	19,2	4013	21,6	4514	24,0	5016	28,2
4112.50.076	**50**	25	**76**	168,0	19,0	3192	22,8	3830	25,7	4309	28,5	4788	34,9
4112.50.089	**50**	25	**89**	140,0	22,3	3122	26,7	3738	30,0	4205	33,4	4676	39,2
4112.50.102	**50**	25	**102**	119,0	25,5	3035	30,6	3641	34,4	4097	38,3	4558	47,3
4112.50.115	**50**	25	**115**	106,0	28,8	3053	34,5	3657	38,8	4114	43,1	4569	52,6
4112.50.127	**50**	25	**127**	97,0	31,8	3085	38,1	3696	42,9	4158	47,6	4617	59,8
4112.50.139	**50**	25	**139**	87,0	35,0	3045	42,0	3654	46,9	4081	52,5	4568	65,1
4112.50.152	**50**	25	**152**	80,0	38,0	3040	45,6	3648	51,3	4104	57,0	4560	70,8
4112.50.178	**50**	25	**178**	69,5	44,5	3093	53,4	3711	60,1	4175	66,8	4643	84,2
4112.50.203	**50**	25	**203**	59,8	50,8	3038	60,9	3642	68,5	4097	76,1	4551	96,5
4112.50.229	**50**	25	**229**	50,9	57,3	2917	68,7	3497	77,3	3934	85,9	4372	108,0
4112.50.254	**50**	25	**254**	43,9	63,5	2788	76,2	3345	85,7	3763	95,3	4184	122,0
4112.50.305	**11,1 x 5,8**		**305**	38,6	76,3	2945	91,5	3532	103,0	3973	114,0	4416	147,0
4112.63.076	**63**	38	**76**	312,0	19,0	5928	22,8	7114	25,7	8003	28,5	8892	30,7
4112.63.089	**63**	38	**89**	260,0	22,3	5798	26,7	6942	30,0	7810	33,4	8684	36,5
4112.63.102	**63**	38	**102**	221,0	25,5	5636	30,6	6763	34,4	7608	38,3	8464	43,6
4112.63.115	**63**	38	**115**	187,0	28,8	5386	34,5	6452	38,8	7258	43,1	8060	48,9
4112.63.127	**63**	38	**127**	168,0	31,8	5342	38,1	6401	42,9	7201	47,6	7997	54,2
4112.63.152	**63**	38	**152**	136,0	38,0	5168	45,6	6202	51,3	6977	57,0	7752	65,7
4112.63.178	**63**	38	**178**	114,0	44,5	5073	53,4	6088	60,1	6849	66,8	7615	76,5
4112.63.203	**63**	38	**203**	100,0	50,8	5080	60,9	6090	68,5	6851	76,1	7610	88,0
4112.63.229	**63**	38	**229**	89,2	57,3	5111	68,7	6128	77,3	6894	85,9	7662	104,0
4112.63.254	**63**	38	**254**	78,4	63,5	4978	76,2	5974	85,7	6721	95,3	7472	112,0
4112.63.305	**11,5 x 9,1**		**305**	64,7	76,3	4937	91,5	5920	103,0	6660	114,0	7402	134,0

HIGH PERFORMANCE COMPRESSION SPRING DIN ISO 10243, RED

Order-No.: 4113.D_H.L_0

Order-No.:	D_H	D_d	L_0	±10%	A 25% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 35% L_0 300-500.000		D 40% L_0 100-200.000		E do not use
	b x h												
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4113.10.025	**10**	5	**25**	22,1	5,0	111	6,3	139	6,9	152	7,5	166	9,2
4113.10.032	**10**	5	**32**	17,5	6,4	112	8,0	140	8,8	154	9,6	168	12,1
4113.10.038	**10**	5	**38**	17,1	7,6	130	9,5	162	10,5	179	11,4	195	13,2
4113.10.044	**10**	5	**44**	15,0	8,8	132	11,0	165	12,1	182	13,2	198	15,1
4113.10.051	**10**	5	**51**	12,8	10,2	131	12,8	164	14,0	180	15,3	196	19,5
4113.10.064	**10**	5	**64**	10,7	12,8	137	16,0	171	17,6	188	19,2	205	21,8
4113.10.076	**10**	5	**76**	7,5	15,2	114	19,0	143	20,9	157	22,8	171	27,9
4113.10.305	**1,9 x 1,5**		**305**	2,1	61,0	128	76,3	160	83,9	176	91,5	192	127,0
4113.13.025	**12,5**	6,3	**25**	42,1	5,0	211	6,3	265	6,9	289	7,5	316	9,8
4113.13.032	**12,5**	6,3	**32**	33,2	6,4	212	8,0	266	8,8	292	9,6	319	13,6
4113.13.038	**12,5**	6,3	**38**	29,3	7,6	223	9,5	278	10,5	306	11,4	334	14,6
4113.13.044	**12,5**	6,3	**44**	24,6	8,8	216	11,0	271	12,1	298	13,2	325	18,1
4113.13.051	**12,5**	6,3	**51**	19,6	10,2	200	12,8	251	14,0	275	15,3	300	22,3
4113.13.064	**12,5**	6,3	**64**	15,0	12,8	192	16,0	240	17,6	264	19,2	288	27,3
4113.13.076	**12,5**	6,3	**76**	13,2	15,2	201	19,0	251	20,9	276	22,8	301	33,1
4113.13.089	**12,5**	6,3	**89**	11,4	17,8	203	22,3	254	24,5	279	26,7	304	38,9
4113.13.102	**12,5**	6,3	**102**	8,4	20,4	171	25,5	214	28,1	236	30,6	257	43,8
4113.13.305	**2,4 x 1,9**		**305**	2,8	61,0	171	76,3	214	83,9	235	91,5	256	140,0
4113.16.025	**16**	8	**25**	75,7	5,0	379	6,3	477	6,9	520	7,5	568	8,4
4113.16.032	**16**	8	**32**	52,8	6,4	338	8,0	422	8,8	465	9,6	507	10,5
4113.16.038	**16**	8	**38**	48,5	7,6	369	9,5	461	10,5	507	11,4	553	13,6
4113.16.044	**16**	8	**44**	42,8	8,8	377	11,0	471	12,1	518	13,2	565	15,9
4113.16.051	**16**	8	**51**	37,1	10,2	378	12,8	475	14,0	520	15,3	568	18,9
4113.16.064	**16**	8	**64**	30,3	12,8	388	16,0	485	17,6	533	19,2	582	24,9
4113.16.076	**16**	8	**76**	25,7	15,2	391	19,0	488	20,9	537	22,8	586	29,2
4113.16.089	**16**	8	**89**	21,7	17,8	386	22,3	484	24,5	531	26,7	579	34,5
4113.16.102	**16**	8	**102**	19,3	20,4	394	25,5	492	28,1	541	30,6	591	39,1
4113.16.115	**16**	8	**115**	15,7	23,0	361	28,8	452	31,6	497	34,5	542	44,0
4113.16.305	**3,1 x 2,5**		**305**	7,1	61,0	433	76,3	542	83,9	596	91,5	650	104,0
4113.20.025	**20**	10	**25**	216,0	5,0	1080	6,3	1361	6,9	1485	7,5	1620	8,3
4113.20.032	**20**	10	**32**	168,0	6,4	1075	8,0	1344	8,8	1478	9,6	1613	10,9
4113.20.038	**20**	10	**38**	129,0	7,6	980	9,5	1226	10,5	1348	11,4	1471	12,5
4113.20.044	**20**	10	**44**	112,0	8,8	986	11,0	1232	12,1	1355	13,2	1478	15,0
4113.20.051	**20**	10	**51**	94,0	10,2	959	12,8	1203	14,0	1318	15,3	1438	17,6
4113.20.064	**20**	10	**64**	72,1	12,8	923	16,0	1154	17,6	1269	19,2	1384	22,6
4113.20.076	**20**	10	**76**	59,7	15,2	907	19,0	1134	20,9	1248	22,8	1361	27,5
4113.20.089	**20**	10	**89**	50,5	17,8	899	22,3	1126	24,5	1236	26,7	1348	31,7
4113.20.102	**20**	10	**102**	44,2	20,4	902	25,5	1127	28,1	1240	30,6	1353	37,5
4113.20.115	**20**	10	**115**	38,4	23,0	883	28,8	1106	31,6	1214	34,5	1325	42,6
4113.20.127	**20**	10	**127**	34,1	25,4	866	31,8	1084	34,9	1191	38,1	1299	45,5
4113.20.139	**20**	10	**139**	31,0	28,0	868	35,0	1085	38,2	1185	42,0	1302	50,1
4113.20.152	**20**	10	**152**	28,2	30,4	857	38,0	1072	41,8	1179	45,6	1286	55,8
4113.20.305	**4,0 x 3,3**		**305**	15,0	61,0	915	76,3	1145	83,9	1258	91,5	1373	114,0
4113.25.025	**25**	12,5	**25**	375,0	5,0	1875	6,3	2363	6,9	2578	7,5	2813	8,5
4113.25.032	**25**	12,5	**32**	297,0	6,4	1901	8,0	2376	8,8	2614	9,6	2851	11,0
4113.25.038	**25**	12,5	**38**	219,0	7,6	1664	9,5	2081	10,5	2289	11,4	2497	12,6
4113.25.044	**25**	12,5	**44**	187,0	8,8	1646	11,0	2057	12,1	2263	13,2	2468	14,8
4113.25.051	**25**	12,5	**51**	156,0	10,2	1591	12,8	1997	14,0	2188	15,3	2387	17,9
4113.25.064	**25**	12,5	**64**	123,0	12,8	1574	16,0	1968	17,6	2165	19,2	2362	23,1
4113.25.076	**25**	12,5	**76**	99,0	15,2	1505	19,0	1881	20,9	2069	22,8	2257	26,3
4113.25.089	**25**	12,5	**89**	84,0	17,8	1495	22,3	1873	24,5	2056	26,7	2243	30,5
4113.25.102	**25**	12,5	**102**	73,0	20,4	1489	25,5	1862	28,1	2048	30,6	2234	37,3
4113.25.115	**25**	12,5	**115**	65,0	23,0	1495	28,8	1872	31,6	2056	34,5	2243	41,9
4113.25.127	**25**	12,5	**127**	57,7	25,4	1466	31,8	1835	34,9	2015	38,1	2198	46,2
4113.25.139	**25**	12,5	**139**	52,7	28,0	1476	35,0	1845	38,2	2014	42,0	2213	49,3
4113.25.152	**25**	12,5	**152**	47,8	30,4	1453	38,0	1816	41,8	1998	45,6	2180	55,7
4113.25.178	**25**	12,5	**178**	41,0	35,6	1460	44,5	1825	49,0	2007	53,4	2189	65,1
4113.25.203	**25**	12,5	**203**	35,8	40,6	1453	50,8	1819	55,8	1999	60,9	2180	74,5
4113.25.305	**5,5 x 4,2**		**305**	22,9	61,0	1397	76,3	1747	83,9	1921	91,5	2095	110,0



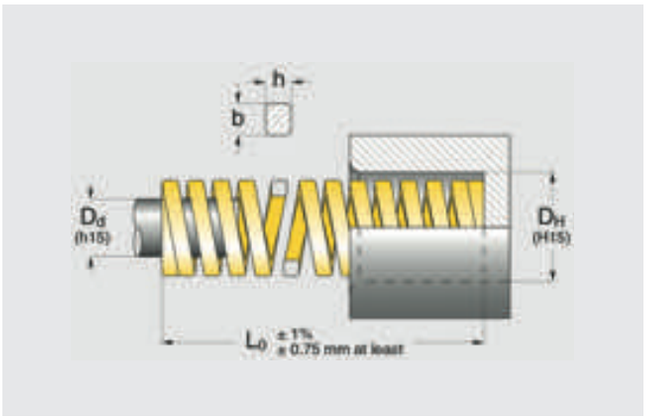
Ordering example: D_H = 10, L_0 = 25
4113.10.025

Order-No.:	D_H	D_d	L_0	±10%	A 25% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 35% L_0 300-500.000		D 40% L_0 100-200.000		E do not use
	b x h												
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4113.32.038	32	16	38	388,0	7,6	2949	9,5	3686	10,5	4055	11,4	4423	12,5
4113.32.044	32	16	44	324,0	8,8	2851	11,0	3564	12,1	3920	13,2	4277	14,9
4113.32.051	32	16	51	272,0	10,2	2774	12,8	3482	14,0	3815	15,3	4162	17,8
4113.32.064	32	16	64	212,0	12,8	2714	16,0	3392	17,6	3731	19,2	4070	22,4
4113.32.076	32	16	76	172,0	15,2	2614	19,0	3268	20,9	3595	22,8	3922	26,1
4113.32.089	32	16	89	141,0	17,8	2510	22,3	3144	24,5	3451	26,7	3765	30,8
4113.32.102	32	16	102	122,0	20,4	2489	25,5	3111	28,1	3422	30,6	3733	36,8
4113.32.115	32	16	115	107,0	23,0	2461	28,8	3082	31,6	3384	34,5	3692	41,4
4113.32.127	32	16	127	93,0	25,4	2362	31,8	2957	34,9	3248	38,1	3543	44,4
4113.32.139	32	16	139	86,0	28,0	2408	35,0	3010	38,2	3287	42,0	3612	48,5
4113.32.152	32	16	152	78,0	30,4	2371	38,0	2964	41,8	3260	45,6	3557	54,8
4113.32.178	32	16	178	67,2	35,6	2392	44,5	2990	49,0	3289	53,4	3588	63,6
4113.32.203	32	16	203	59,1	40,6	2399	50,8	3002	55,8	3299	60,9	3599	72,5
4113.32.254	32	16	254	46,4	50,8	2357	63,5	2946	69,9	3241	76,2	3536	92,8
4113.32.305	7,1 x 5,4		305	38,0	61,0	2318	76,3	2899	83,9	3187	91,5	3477	112,0
4113.40.051	40	20	51	350,0	10,2	3570	12,8	4480	14,0	4909	15,3	5355	17,0
4113.40.064	40	20	64	269,0	12,8	3443	16,0	4304	17,6	4734	19,2	5165	21,9
4113.40.076	40	20	76	219,0	15,2	3329	19,0	4161	20,9	4577	22,8	4993	26,7
4113.40.089	40	20	89	190,0	17,8	3382	22,3	4237	24,5	4650	26,7	5073	31,3
4113.40.102	40	20	102	163,0	20,4	3325	25,5	4157	28,1	4572	30,6	4988	37,1
4113.40.115	40	20	115	142,0	23,0	3266	28,8	4090	31,6	4491	34,5	4899	41,0
4113.40.127	40	20	127	128,0	25,4	3251	31,8	4070	34,9	4470	38,1	4877	46,5
4113.40.139	40	20	139	115,0	28,0	3220	35,0	4025	38,2	4396	42,0	4830	51,1
4113.40.152	40	20	152	105,0	30,4	3192	38,0	3990	41,8	4389	45,6	4788	56,1
4113.40.178	40	20	178	89,0	35,6	3168	44,5	3961	49,0	4357	53,4	4753	67,4
4113.40.203	40	20	203	77,0	40,6	3126	50,8	3912	55,8	4299	60,9	4689	76,2
4113.40.254	40	20	254	61,0	50,8	3099	63,5	3874	69,9	4261	76,2	4648	96,2
4113.40.305	8,4 x 6,2		305	51,0	61,0	3111	76,3	3891	83,9	4278	91,5	4667	115,0
4113.50.064	50	25	64	413,0	12,8	5286	16,0	6608	17,6	7269	19,2	7930	22,4
4113.50.076	50	25	76	339,0	15,2	5153	19,0	6441	20,9	7085	22,8	7729	26,5
4113.50.089	50	25	89	288,0	17,8	5126	22,3	6422	24,5	7049	26,7	7690	31,5
4113.50.102	50	25	102	245,0	20,4	4998	25,5	6248	28,1	6872	30,6	7497	37,6
4113.50.115	50	25	115	215,0	23,0	4945	28,8	6192	31,6	6799	34,5	7418	42,7
4113.50.127	50	25	127	192,0	25,4	4877	31,8	6106	34,9	6706	38,1	7315	47,5
4113.50.139	50	25	139	168,0	28,0	4704	35,0	5880	38,2	6422	42,0	7056	51,8
4113.50.152	50	25	152	154,0	30,4	4682	38,0	5852	41,8	6437	45,6	7022	57,8
4113.50.178	50	25	178	134,0	35,6	4770	44,5	5963	49,0	6559	53,4	7156	68,5
4113.50.203	50	25	203	117,0	40,6	4750	50,8	5944	55,8	6532	60,9	7125	77,6
4113.50.254	50	25	254	89,0	50,8	4521	63,5	5652	69,9	6217	76,2	6782	97,9
4113.50.305	11,1 x 7,6		305	73,0	61,0	4453	76,3	5570	83,9	6123	91,5	6680	121,0
4113.63.076	63	38	76	618,0	15,2	9394	19,0	11742	20,9	12916	22,8	14090	24,7
4113.63.089	63	38	89	515,0	17,8	9167	22,3	11485	24,5	12605	26,7	13751	30,0
4113.63.102	63	38	102	438,0	20,4	8935	25,5	11169	28,1	12286	30,6	13403	35,1
4113.63.115	63	38	115	370,0	23,0	8510	28,8	10656	31,6	11701	34,5	12765	37,5
4113.63.127	63	38	127	333,0	25,4	8458	31,8	10589	34,9	11630	38,1	12687	45,9
4113.63.152	63	38	152	269,0	30,4	8178	38,0	10222	41,8	11244	45,6	12266	56,5
4113.63.178	63	38	178	226,0	35,6	8046	44,5	10057	49,0	11063	53,4	12068	66,8
4113.63.203	63	38	203	198,0	40,6	8039	50,8	10058	55,8	11053	60,9	12058	78,8
4113.63.254	63	38	254	155,0	50,8	7874	63,5	9843	69,9	10827	76,2	11811	102,0
4113.63.305	11,6 x 12,3		305	128,0	61,0	7808	76,3	9766	83,9	10736	91,5	11712	122,0

HIGH PERFORMANCE COMPRESSION SPRING DIN ISO 10243, YELLOW

Order-No.: 4114.D_H.L_0

Order-No.:	D_H	D_d	L_0	±10%	A 25% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 35% L_0 300-500.000		D 40% L_0 100-200.000		E do not use
	b x h												
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4114.10.025	10	5	25	36,8	4,3	158	5,0	184	5,6	207	6,3	232	7,7
4114.10.032	10	5	32	27,9	5,4	151	6,4	179	7,2	201	8,0	223	10,6
4114.10.038	10	5	38	23,7	6,5	154	7,6	180	8,6	203	9,5	225	12,6
4114.10.044	10	5	44	19,2	7,5	144	8,8	169	9,9	190	11,0	211	13,8
4114.10.051	10	5	51	16,5	8,7	144	10,2	168	11,5	189	12,8	211	16,2
4114.10.064	10	5	64	13,2	10,9	144	12,8	169	14,4	190	16,0	211	20,4
4114.10.076	10	5	76	10,9	12,9	141	15,2	166	17,1	186	19,0	207	25,2
4114.10.305	1,9 x 1,6		305	2,6	51,9	135	61,0	159	68,6	178	76,3	198	111,0
4114.13.025	12,5	6,3	25	58,5	4,3	252	5,0	293	5,6	329	6,3	369	8,1
4114.13.032	12,5	6,3	32	43,9	5,4	237	6,4	281	7,2	316	8,0	351	9,9
4114.13.038	12,5	6,3	38	36,0	6,5	234	7,6	274	8,6	308	9,5	342	12,9
4114.13.044	12,5	6,3	44	30,3	7,5	227	8,8	267	9,9	300	11,0	333	14,1
4114.13.051	12,5	6,3	51	26,2	8,7	228	10,2	267	11,5	301	12,8	335	17,4
4114.13.064	12,5	6,3	64	21,2	10,9	231	12,8	271	14,4	305	16,0	339	21,0
4114.13.076	12,5	6,3	76	17,1	12,9	221	15,2	260	17,1	292	19,0	325	26,4
4114.13.089	12,5	6,3	89	14,5	15,1	219	17,8	258	20,0	290	22,3	323	31,5
4114.13.102	12,5	6,3	102	12,7	17,3	220	20,4	259	23,0	291	25,5	324	36,0
4114.13.305	2,6 x 2,0		305	4,3	51,9	223	61,0	262	68,6	295	76,3	328	111,0
4114.16.025	16	8	25	118,0	4,3	507	5,0	590	5,6	664	6,3	743	8,5
4114.16.032	16	8	32	89,0	5,4	481	6,4	570	7,2	641	8,0	712	11,0
4114.16.038	16	8	38	72,1	6,5	469	7,6	548	8,6	616	9,5	685	13,2
4114.16.044	16	8	44	60,9	7,5	457	8,8	536	9,9	603	11,0	670	14,7
4114.16.051	16	8	51	52,3	8,7	455	10,2	533	11,5	600	12,8	669	17,7
4114.16.064	16	8	64	41,2	10,9	449	12,8	527	14,4	593	16,0	659	21,9
4114.16.076	16	8	76	34,1	12,9	440	15,2	518	17,1	583	19,0	648	27,8
4114.16.089	16	8	89	29,5	15,1	445	17,8	525	20,0	591	22,3	658	31,2
4114.16.102	16	8	102	25,6	17,3	443	20,4	522	23,0	588	25,5	653	37,9
4114.16.115	16	8	115	22,4	19,6	439	23,0	515	25,9	580	28,8	645	44,5
4114.16.305	3,2 x 2,9		305	8,4	51,9	436	61,0	512	68,6	576	76,3	641	113,0
4114.20.025	20	10	25	293,0	4,3	1260	5,0	1465	5,6	1648	6,3	1846	6,9
4114.20.032	20	10	32	224,0	5,4	1210	6,4	1434	7,2	1613	8,0	1792	9,4
4114.20.038	20	10	38	177,0	6,5	1151	7,6	1345	8,6	1513	9,5	1682	12,0
4114.20.044	20	10	44	149,0	7,5	1118	8,8	1311	9,9	1475	11,0	1639	13,5
4114.20.051	20	10	51	128,0	8,7	1114	10,2	1306	11,5	1469	12,8	1638	16,2
4114.20.064	20	10	64	99,0	10,9	1079	12,8	1267	14,4	1426	16,0	1584	21,2
4114.20.076	20	10	76	81,7	12,9	1054	15,2	1242	17,1	1397	19,0	1552	24,7
4114.20.089	20	10	89	69,5	15,1	1049	17,8	1237	20,0	1392	22,3	1550	28,8
4114.20.102	20	10	102	60,6	17,3	1048	20,4	1236	23,0	1391	25,5	1545	34,8
4114.20.115	20	10	115	53,0	19,6	1039	23,0	1219	25,9	1371	28,8	1526	39,0
4114.20.127	20	10	127	47,5	21,6	1026	25,4	1207	28,6	1357	31,8	1511	43,0
4114.20.139	20	10	139	43,0	23,8	1023	28,0	1204	31,3	1345	35,0	1505	45,3
4114.20.152	20	10	152	39,0	25,8	1006	30,4	1186	34,2	1334	38,0	1482	50,4
4114.20.305	4,1 x 3,8		305	21,2	51,9	1100	61,0	1293	68,6	1455	76,3	1618	103,0
4114.25.025	25	12,5	25	459,0	4,3	1974	5,0	2295	5,6	2582	6,3	2892	7,3
4114.25.032	25	12,5	32	374,0	5,4	2020	6,4	2394	7,2	2693	8,0	2992	10,7
4114.25.038	25	12,5	38	300,0	6,5	1950	7,6	2280	8,6	2580	9,5	2850	12,0
4114.25.044	25	12,5	44	244,0	7,5	1830	8,8	2147	9,9	2416	11,0	2684	14,4
4114.25.051	25	12,5	51	208,0	8,7	1810	10,2	2122	11,5	2392	12,8	2662	17,4
4114.25.064	25	12,5	64	161,0	10,9	1755	12,8	2061	14,4	2318	16,0	2576	21,4
4114.25.076	25	12,5	76	131,0	12,9	1690	15,2	1991	17,1	2240	19,0	2489	26,9
4114.25.089	25	12,5	89	111,0	15,1	1676	17,8	1976	20,0	2220	22,3	2475	30,9
4114.25.102	25	12,5	102	96,3	17,3	1666	20,4	1965	23,0	2210	25,5	2456	36,7
4114.25.115	25	12,5	115	85,7	19,6	1680	23,0	1971	25,9	2217	28,8	2468	40,3
4114.25.127	25	12,5	127	76,3	21,6	1648	25,4	1938	28,6	2180	31,8	2426	45,1
4114.25.139	25	12,5	139	66,0	23,8	1571	28,0	1848	31,3	2066	35,0	2310	47,6
4114.25.152	25	12,5	152	63,5	25,8	1638	30,4	1930	34,2	2172	38,0	2413	53,5
4114.25.178	25	12,5	178	53,9	30,3	1633	35,6	1919	40,1	2159	44,5	2399	63,9
4114.25.203	25	12,5	203	47,0	34,5	1622	406,0	1908	45,7	2147	50,8	2388	70,2
4114.25.305	5,4 x 4,6		305	30,9	51,9	1604	61,0	1885	68,6	2121	76,3	2358	110,0

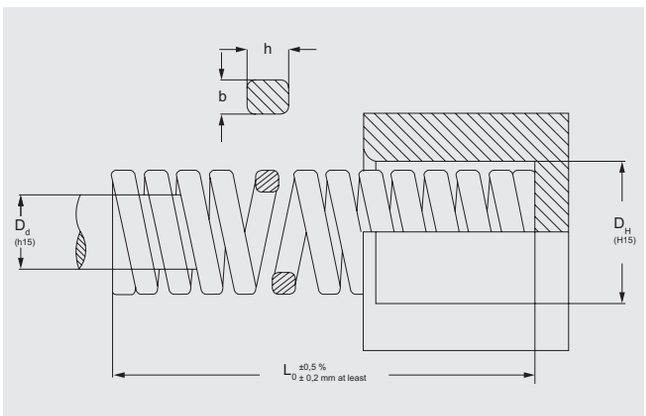


Ordering example: D_H = 10, L_0 = 25
4114.10.025

Order-No.:	D_H	D_d	L_0	±10%	A 25% L_0 +3.000.000		B 30% L_0 ~1.500.000		C 35% L_0 300-500.000		D 40% L_0 100-200.000		E do not use
	b x h												
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm
4114.32.038	32	16	38	480,0	6,5	3120	7,6	3648	8,6	4128	9,5	4560	11,4
4114.32.044	32	16	44	390,0	7,5	2925	8,8	3432	9,9	3861	11,0	4290	13,7
4114.32.051	32	16	51	320,0	8,7	2784	10,2	3264	11,5	3680	12,8	4096	15,6
4114.32.064	32	16	64	269,0	10,9	2934	12,8	3446	14,4	3876	16,0	4307	20,0
4114.32.076	32	16	76	219,0	12,9	2825	15,2	3329	17,1	3745	19,0	4161	24,4
4114.32.089	32	16	89	180,0	15,1	2723	17,8	3209	20,0	3611	22,3	4021	29,7
4114.32.102	32	16	102	155,0	17,3	2682	20,4	3162	23,0	3557	25,5	3953	35,1
4114.32.115	32	16	115	140,0	19,6	2744	23,0	3220	25,9	3623	28,8	4032	39,0
4114.32.127	32	16	127	124,0	21,6	2678	25,4	3150	28,6	3543	31,8	3943	42,8
4114.32.139	32	16	139	112,0	23,8	2673	28,0	3144	31,3	3512	35,0	3931	48,6
4114.32.152	32	16	152	102,0	25,8	2632	30,4	3101	34,2	3488	38,0	3876	52,4
4114.32.178	32	16	178	88,2	30,3	2672	35,6	3140	40,1	3532	44,5	3925	60,9
4114.32.203	32	16	203	76,0	34,5	2622	40,6	3086	45,7	3471	50,8	3861	69,2
4114.32.254	32	16	254	60,8	43,2	2627	50,8	3089	57,2	3475	63,5	3861	88,1
4114.32.305	7,3 x 5,9		305	49,0	51,9	2543	61,0	2989	68,6	3363	76,3	3739	104,0
4114.40.051	40	20	51	628,0	8,7	5464	10,2	6406	11,5	7206	12,8	8038	15,0
4114.40.064	40	20	64	487,0	10,9	5308	12,8	6234	14,4	7013	16,0	7792	19,5
4114.40.076	40	20	76	379,0	12,9	4889	15,2	5761	17,1	6481	19,0	7201	23,3
4114.40.089	40	20	89	321,0	15,1	4847	17,8	5714	20,0	6428	22,3	7158	26,7
4114.40.102	40	20	102	281,0	17,3	4861	20,4	5732	23,0	6449	25,5	7166	33,8
4114.40.115	40	20	115	245,0	19,6	4802	23,0	5635	25,9	6339	28,8	7056	36,2
4114.40.127	40	20	127	221,0	21,6	4774	25,4	5613	28,6	6315	31,8	7028	40,7
4114.40.139	40	20	139	195,0	23,8	4641	28,0	5460	31,3	6103	35,0	6825	44,5
4114.40.152	40	20	152	168,0	25,8	4334	30,4	5107	34,2	5746	38,0	6384	49,6
4114.40.178	40	20	178	150,0	30,3	4545	35,6	5340	40,1	6015	44,5	6675	59,9
4114.40.203	40	20	203	132,0	34,5	4554	40,6	5359	45,7	6029	50,8	6706	67,1
4114.40.254	40	20	254	107,0	43,2	4622	50,8	5436	57,2	6115	63,5	6795	86,3
4114.40.305	8,4 x 7,5		305	87,8	51,9	4557	61,0	5356	68,6	6025	76,3	6699	104,0
4114.50.064	50	25	64	709,0	10,9	7728	12,8	9075	14,4	10210	16,0	11344	19,3
4114.50.076	50	25	76	572,0	12,9	7379	15,2	8694	17,1	9781	19,0	10868	24,2
4114.50.089	50	25	89	475,0	15,1	7173	17,8	8455	20,0	9512	22,3	10593	28,0
4114.50.102	50	25	102	405,0	17,3	7007	20,4	8262	23,0	9295	25,5	10328	33,5
4114.50.115	50	25	115	352,0	19,6	6899	23,0	8096	25,9	9108	28,8	10138	38,6
4114.50.127	50	25	127	316,0	21,6	6826	25,4	8026	28,6	9030	31,8	10049	41,4
4114.50.139	50	25	139	289,0	23,8	6878	28,0	8092	31,3	9046	35,0	10115	47,3
4114.50.152	50	25	152	239,0	25,8	6166	30,4	7266	34,2	8174	38,0	9082	50,2
4114.50.178	50	25	178	215,0	30,3	6515	35,6	7654	40,1	8611	44,5	9568	61,1
4114.50.203	50	25	203	187,0	34,5	6452	40,6	7592	45,7	8541	50,8	9500	67,7
4114.50.254	50	25	254	153,0	43,2	6610	50,8	7772	57,2	8744	63,5	9716	87,0
4114.50.305	11,5 x 9,0		305	127,0	51,9	6591	61,0	7747	68,6	8715	76,3	9690	104,0
4114.63.076	63	38	76	952,0	12,9	12280	15,2	14470					15,5
4114.63.089	63	38	89	819,0	15,1	12360	17,8	14580					20,0
4114.63.102	63	38	102	700,0	17,3	12110	20,4	14280	23,0	16065	25,5	17850	30,7
4114.63.115	63	38	115	620,0	19,6	12152	23,0	14260	25,9	16043	28,8	17860	34,9
4114.63.127	63	38	127	565,0	21,6	12204	25,4	14351	28,6	16145	31,8	17967	38,0
4114.63.152	63	38	152	458,0	25,8	11816	30,4	13923	34,2	15664	38,0	17404	47,2
4114.63.178	63	38	178	384,0	30,3	11635	35,6	13670	40,1	15379	44,5	17088	55,8
4114.63.203	63	38	203	337,0	34,5	11627	40,6	13682	45,7	15392	50,8	17120	64,8
4114.63.254	63	38	254	263,0	43,2	11362	50,8	13360	57,2	15030	63,5	16701	86,7
4114.63.305	11,6 x 14,9		305	218,0	51,9	11314	61,0	13298	68,6	14960	76,3	16633	106,0

HIGH PERFORMANCE COMPRESSION SPRING, WHITE

Order-No.: 4116.D_h.L_0



Note:
The diameters are comparable with the high performance compression springs DIN ISO 10243. The special flat wound wire cross section brings a reduction of the medium winding diameter for the same winding ratio with an edge-wound spring. Consequently, the high performance compression spring white has a 6x larger starting spring force than the high performance compression spring DIN ISO 10243 colour code “yellow”.

Ordering example: D_H = 16, L_0 = 20
4116.16.020

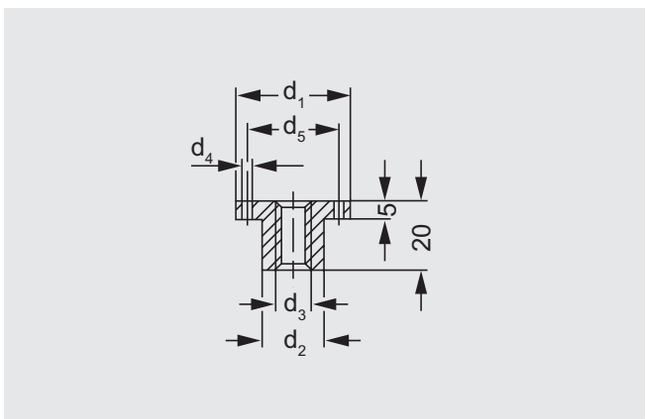
Order-No.:	D_h	D_d	L_0	±10%	Max.		E do not use
	b x h						
	mm	mm	mm	N/mm	mm	N	mm
4116.16.020	**16**	6,3	**20**	1818	2,2	4000	3
4116.16.035	**16**	6,3	**35**	1000	4	4000	5,5
4116.16.050	**16**	6,3	**50**	615	6,5	3998	8
4116.16.075	**16**	6,3	**75**	400	10	4000	12,5
4116.16.100	**4,6 x 5,0**		**100**	286	14	4004	16,3
4116.19.025	**19**	8	**25**	2400	2,5	6000	3,4
4116.19.040	**19**	8	**40**	1333	4,5	5998	5,9
4116.19.050	**19**	8	**50**	1000	6	6000	7,8
4116.19.075	**19**	8	**75**	600	10	6000	12,4
4116.19.100	**5,1 x 6,5**		**100**	429	14	6006	16,5
4116.25.030	**25**	10	**30**	4800	2,5	12000	3
4116.25.050	**25**	10	**50**	2400	5	12000	5,9
4116.25.075	**25**	10	**75**	1500	8	12000	9,5
4116.25.100	**25**	10	**100**	1000	12	12000	14,7
4116.25.125	**6,9 x 9,1**		**125**	857	14	11998	16,9
4116.32.035	**32**	12,5	**35**	6667	3	20001	3,7
4116.32.050	**32**	12,5	**50**	3636	5,5	19998	6,3
4116.32.075	**32**	12,5	**75**	2222	9	19998	11,3
4116.32.100	**32**	12,5	**100**	1538	13	19994	14,9
4116.32.125	**32**	12,5	**125**	1250	16	20000	18,3
4116.32.150	**9,25 x 10,8**		**150**	1053	19	20007	21,7
4116.38.040	**38**	16	**40**	7143	3,5	25000	4,5
4116.38.050	**38**	16	**50**	5000	5	25000	5,9
4116.38.075	**38**	16	**75**	2778	9	25002	10,4
4116.38.100	**38**	16	**100**	1923	13	24999	15
4116.38.150	**38**	16	**150**	1316	19	25004	22,4
4116.38.200	**10,5 x 12,6**		**200**	926	27	25002	29,9

THREADED DISC FOR COMPRESSION SPRINGS

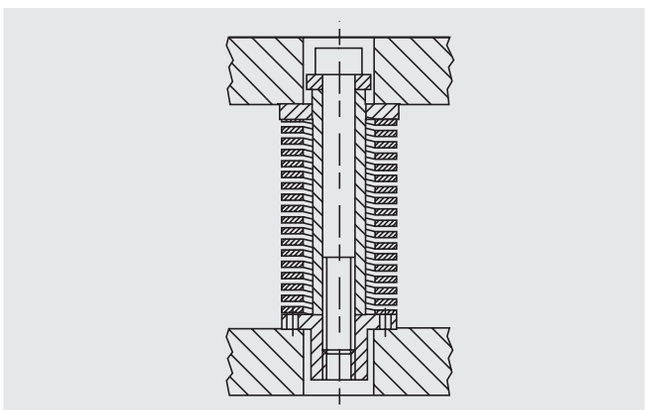
Order-No.: 4134.d_1

Material:
CK 45 heat treated

Ordering example: d_1 = 20
4134.020



Mounting example



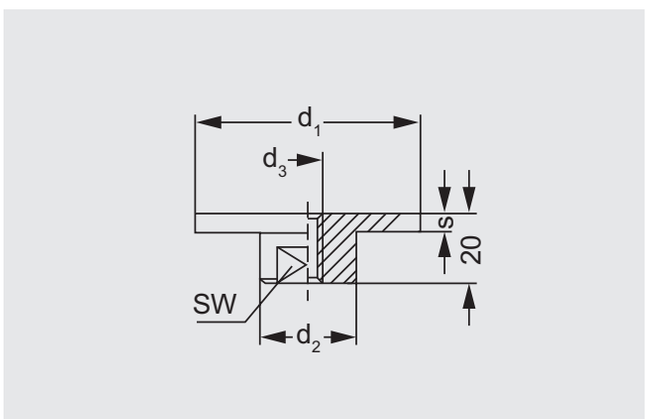
Order-No.:	d_1	d_2	d_3	d_4	d_5
4134.020	**20**	10	M6	3,2	14
4134.025	**25**	12,5	M8	4,2	20
4134.032	**32**	16	M10	4,2	25
4134.040	**40**	20	M12	4,2	30
4134.050	**50**	25	M16	4,2	40

THREADED DISC FOR ELASTOMER SPRINGS

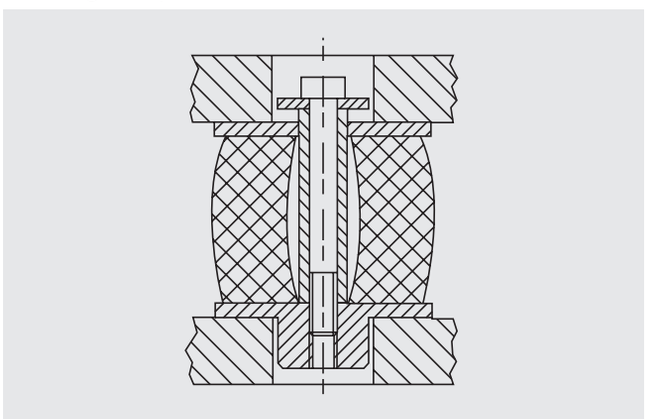
Order-No.: 541.Spring ø

Material:
St 37

Ordering example: Spring ø = 25
541.025



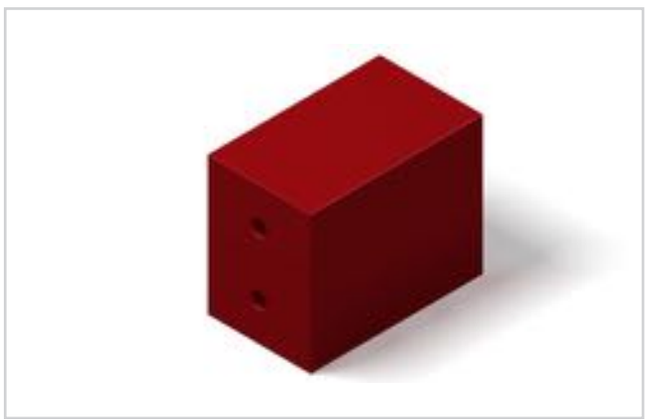
Mounting example



Spring ø	25	32	40	50	63	80	100
d_1	32	40	50	60	78	98	120
d_2	18	18	18	20	20	26	26
d_3	M6	M8	M8	M10	M10	M12	M12
SW	14	14	14	17	17	22	22
s	5	5	5	6	8	10	12

SETTING-UP BUMPER 95 SHORE A, SQUARE

Order-No.: 251.a.b



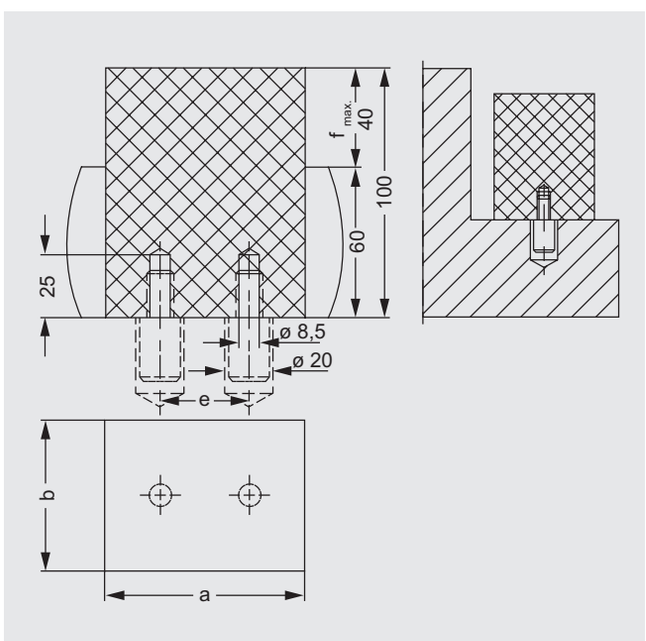
Implementation:

1. When setting up slowly move the ram into the bottom position.
2. Clamp the tool, then move the ram back to the top position (with the setting up bumper compressed to a height of 60 mm).
3. After setting up, remove the setting up bumpers and place them in the storage hole on the tool.

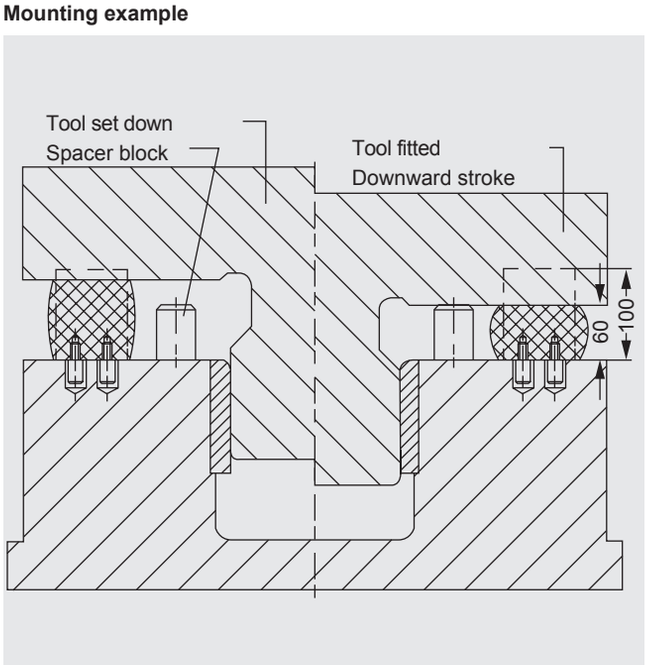
Note:

Setting up bumpers are used for setting down and setting up tools and replace shear pins.
Setting up bumpers are not suitable for continuous use. To prevent damage when setting down tools, ensure that the setting up bumpers are large enough to withstand 1.5 times the weight of the tool.

Ordering example: a = 80, b = 60
251.080.060



Mounting example



Order-No.:	a	b	e	Load capacity (daN)*	Plus admissible tool weight (kg)**
251.080.060	**80**	**60**	36	2700	7100
251.100.080	**100**	**80**	50	6200	16500
251.125.100	**125**	**100**	60	8600	22900
251.180.100	**180**	**100**	100	13600	36200

* f = 20

**for 4 setting up bumpers f = 20/ safety factor 1,5

POLYURETHANE-TUBULAR-SPRING 70 SHORE A, WHITE

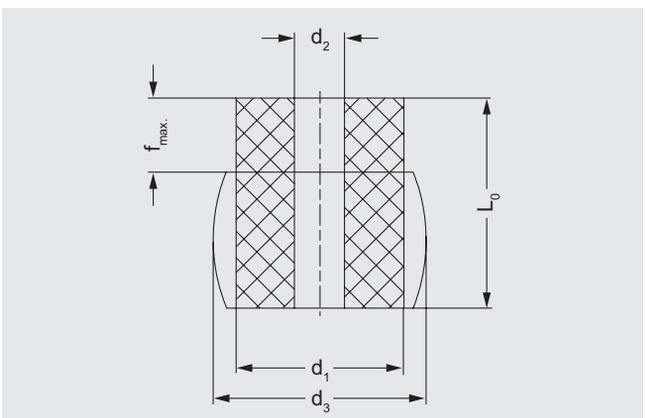
Order-No.: 514.d_1.L_0

Order-No.:	d_1	L_0	d_2	d_3	f max.
514.016.012	16	12	6,5	21	4,8
514.016.016	16	16	6,5	21	6,4
514.016.020	16	20	6,5	21	8
514.016.025	16	25	6,5	21	10
514.020.016	20	16	8,5	26	6,4
514.020.020	20	20	8,5	26	8
514.020.025	20	25	8,5	26	10
514.020.032	20	32	8,5	26	12,8
514.025.020	25	20	10,5	32	8
514.025.025	25	25	10,5	32	10
514.025.032	25	32	10,5	32	12,8
514.025.040	25	40	10,5	32	16
514.032.032	32	32	13,5	42	12,8
514.032.040	32	40	13,5	42	16
514.032.050	32	50	13,5	42	20
514.032.063	32	63	13,5	42	25,2
514.040.032	40	32	13,5	52	12,8
514.040.040	40	40	13,5	52	16
514.040.050	40	50	13,5	52	20
514.040.063	40	63	13,5	52	25,2
514.040.080	40	80	13,5	52	32
514.050.032	50	32	17	65	12,8
514.050.040	50	40	17	65	16
514.050.050	50	50	17	65	20
514.050.063	50	63	17	65	25,2
514.050.080	50	80	17	65	32
514.050.100	50	100	17	65	40
514.063.032	63	32	17	81	12,8
514.063.040	63	40	17	81	16
514.063.050	63	50	17	81	20
514.063.063	63	63	17	81	25,2
514.063.080	63	80	17	81	32
514.063.100	63	100	17	81	40
514.063.125	63	125	17	81	50
514.080.032	80	32	21	104	12,8
514.080.040	80	40	21	104	16
514.080.050	80	50	21	104	20
514.080.063	80	63	21	104	25,2
514.080.080	80	80	21	104	32
514.080.100	80	100	21	104	40
514.080.125	80	125	21	104	50
514.100.032	100	32	21	130	12,8
514.100.040	100	40	21	130	16
514.100.050	100	50	21	130	20
514.100.063	100	63	21	130	25,2
514.100.080	100	80	21	130	32
514.100.100	100	100	21	130	40
514.100.125	100	125	21	130	50
514.125.032	125	32	27	160	12,8
514.125.040	125	40	27	160	16
514.125.050	125	50	27	160	20
514.125.063	125	63	27	160	25,2
514.125.080	125	80	27	160	32
514.125.100	125	100	27	160	40
514.125.125	125	125	27	160	50
514.125.160	125	160	27	160	64

Material:
Polyurethane, polyesters 70 Shore A

Note:
The physical properties of polyurethane elastomers means that they have a tendency to settle. The extent of such settlement is dependent on the internal heat of friction, speed and number of load changes, the spring travel and the Shore hardness. Settlement may be as much as 4 to 7% of the spring length L0.

Ordering example: a = 80, b = 60
251.080.060



TUBULAR SPRING ELEMENT, RUBBER 70 SHORE A, BLACK

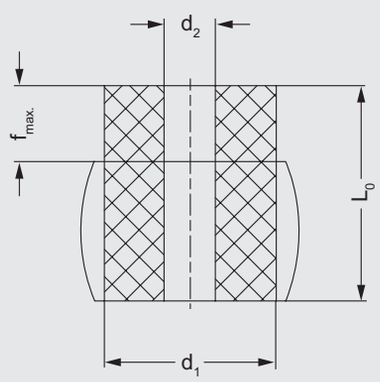
Order-No.: 515.d_1.L_0

Order-No.:	d_1	L_0	d_2	d_3	f max.
515.016.012	16	12	6,5	21	4,8
515.016.016	16	16	6,5	21	6,4
515.016.020	16	20	6,5	21	8
515.016.025	16	25	6,5	21	10
515.020.016	20	16	8,5	26	6,4
515.020.020	20	20	8,5	26	8
515.020.025	20	25	8,5	26	10
515.020.032	20	32	8,5	26	12,8
515.025.020	25	20	10,5	32	8
515.025.025	25	25	10,5	32	10
515.025.032	25	32	10,5	32	12,8
515.025.040	25	40	10,5	32	16
515.032.032	32	32	13,5	42	12,8
515.032.040	32	40	13,5	42	16
515.032.050	32	50	13,5	42	20
515.032.063	32	63	13,5	42	25,2
515.040.032	40	32	13,5	52	12,8
515.040.040	40	40	13,5	52	16
515.040.050	40	50	13,5	52	20
515.040.063	40	63	13,5	52	25,2
515.040.080	40	80	13,5	52	32
515.050.032	50	32	17	65	12,8
515.050.040	50	40	17	65	16
515.050.050	50	50	17	65	20
515.050.063	50	63	17	65	25,2
515.050.080	50	80	17	65	32
515.050.100	50	100	17	65	40
515.063.032	63	32	17	81	12,8
515.063.040	63	40	17	81	16
515.063.050	63	50	17	81	20
515.063.063	63	63	17	81	25,2
515.063.080	63	80	17	81	32
515.063.100	63	100	17	81	40
515.063.125	63	125	17	81	50
515.080.032	80	32	21	104	12,8
515.080.040	80	40	21	104	16
515.080.050	80	50	21	104	20
515.080.063	80	63	21	104	25,2
515.080.080	80	80	21	104	32
515.080.100	80	100	21	104	40
515.080.125	80	125	21	104	50
515.100.032	100	32	21	130	12,8
515.100.040	100	40	21	130	16
515.100.050	100	50	21	130	20
515.100.063	100	63	21	130	25,2
515.100.080	100	80	21	130	32
515.100.100	100	100	21	130	40
515.100.125	100	125	21	130	50
515.125.032	125	32	27	160	12,8
515.125.040	125	40	27	160	16
515.125.050	125	50	27	160	20
515.125.063	125	63	27	160	25,2
515.125.080	125	80	27	160	32
515.125.100	125	100	27	160	40
515.125.125	125	125	27	160	50
515.125.160	125	160	27	160	64

Material:
Tensile strength acc. to DIN 53504: ≥ 12 N/mm²
Elongation at break acc. to DIN 53504: ≥ 250 %
Bulk density acc. to DIN 53479: 1.37 g/cm³
Compression set acc. to DIN 53517: ≤ 20 % (24 h/70 °C)
Temperature scope: -20 °C to 80 °C, short-term to max. 120 °C

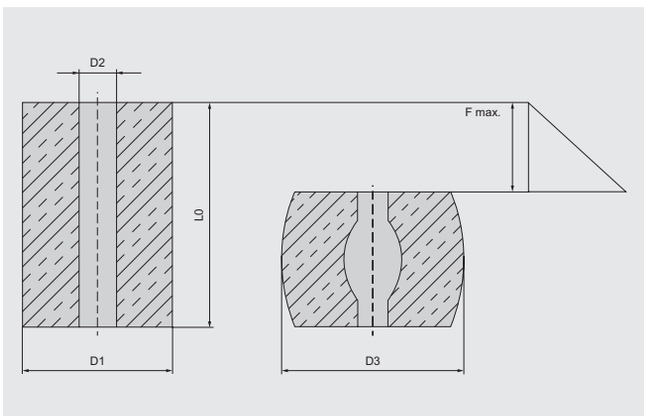
Note:
The physical properties of elastomere springs means that they have a tendency to settle. The extent of such settlement is dependent on the internal heat of friction, speed and number of load changes, the spring travel and the Shore hardness. Settlement may be as much as 3 to 5% of the spring length L0.

Ordering example: a = 80, b = 60
251.080.060



POLYURETHANE-SPRING 80 SHORE A, GREEN

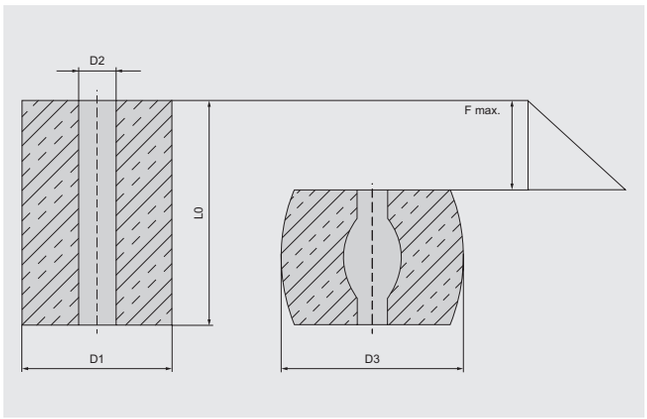
Order-No.: 511.D1.L0



Order-No.:	D1	L0	D2	D3	F max.	F max. (N)
511.016.012	**16**	**12,5**	6,5	21	4,3	1020
511.016.016	**16**	**16**	6,5	21	5,6	980
511.016.020	**16**	**20**	6,5	21	7	950
511.016.025	**16**	**25**	6,5	21	8,7	940
511.020.016	**20**	**16**	8,5	26	5,6	1530
511.020.020	**20**	**20**	8,5	26	7	1510
511.020.025	**20**	**25**	8,5	26	8,7	1500
511.020.032	**20**	**32**	8,5	26	10,6	1490
511.025.020	**25**	**20**	10,5	32	7	2600
511.025.025	**25**	**25**	10,5	32	8,7	2550
511.025.032	**25**	**32**	10,5	32	10,6	2520
511.025.040	**25**	**40**	10,5	32	14	2500
511.032.032	**32**	**32**	13,5	42	10,6	3900
511.032.040	**32**	**40**	13,5	42	14	3850
511.032.050	**32**	**50**	13,5	42	17,5	3820
511.032.063	**32**	**63**	13,5	42	22	3800
511.040.032	**40**	**32**	13,5	52	10,6	6700
511.040.040	**40**	**40**	13,5	52	14	6600
511.040.050	**40**	**50**	13,5	52	17,5	6550
511.040.063	**40**	**63**	13,5	52	22	6500
511.040.080	**40**	**80**	13,5	52	28	6480
511.050.032	**50**	**32**	17	65	10,6	10800
511.050.040	**50**	**40**	17	65	14	10400
511.050.050	**50**	**50**	17	65	17,5	10200
511.050.063	**50**	**63**	17	65	22	10000
511.050.080	**50**	**80**	17	65	28	9950
511.050.100	**50**	**100**	17	65	35	9900
511.063.032	**63**	**32**	17	81	11,2	18650
511.063.040	**63**	**40**	17	81	14	18000
511.063.050	**63**	**50**	17	81	17,5	17500
511.063.063	**63**	**63**	17	81	22	17000
511.063.080	**63**	**80**	17	81	28	16500
511.063.100	**63**	**100**	17	81	35	16200
511.063.125	**63**	**125**	17	81	43,7	16000
511.080.032	**80**	**32**	21	104	11,2	31500
511.080.040	**80**	**40**	21	104	14	30100
511.080.050	**80**	**50**	21	104	17,5	29900
511.080.063	**80**	**63**	21	104	22	28800
511.080.080	**80**	**80**	21	104	28	28300
511.080.100	**80**	**100**	21	104	35	28100
511.080.125	**80**	**125**	21	104	43,7	28000
511.100.032	**100**	**32**	21	130	10,6	56000
511.100.040	**100**	**40**	21	130	14	52000
511.100.050	**100**	**50**	21	130	17,5	50000
511.100.063	**100**	**63**	21	130	22	47500
511.100.080	**100**	**80**	21	130	28	45000
511.100.100	**100**	**100**	21	130	35	43300
511.100.125	**100**	**125**	21	130	43,7	41500
511.125.032	**125**	**32**	27	160	10,6	92000
511.125.040	**125**	**40**	27	160	14	85000
511.125.050	**125**	**50**	27	160	17,5	80000
511.125.063	**125**	**63**	27	160	22	75000
511.125.080	**125**	**80**	27	160	28	71000
511.125.100	**125**	**100**	27	160	35	70500
511.125.125	**125**	**125**	27	160	43,7	70000
511.125.160	**125**	**160**	27	160	56	68000

POLYURETHANE-SPRING 90 SHORE A, YELLOW

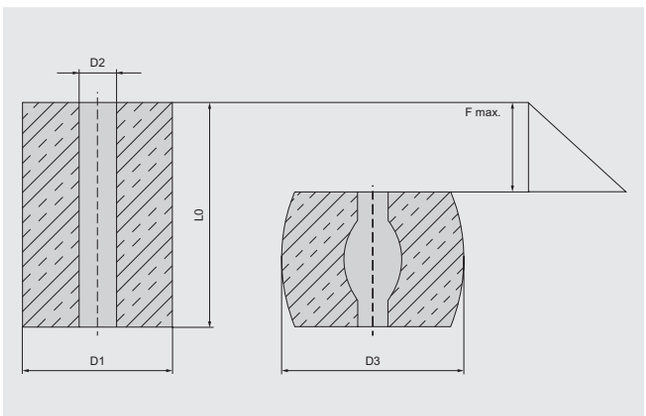
Order-No.: 512.D1.L0



Order-No.:	D1	L0	D2	D3	F max.	F max. (N)
512.016.012	**16**	**12,5**	6,5	21	3,6	1680
512.016.016	**16**	**16**	6,5	21	4,8	1650
512.016.020	**16**	**20**	6,5	21	6	1620
512.016.025	**16**	**25**	6,5	21	7,5	1580
512.020.016	**20**	**16**	8,5	26	4,8	2600
512.020.020	**20**	**20**	8,5	26	6	2550
512.020.025	**20**	**25**	8,5	26	7,5	2530
512.020.032	**20**	**32**	8,5	26	9,6	2500
512.025.020	**25**	**20**	10,5	32	6	4300
512.025.025	**25**	**25**	10,5	32	7,5	4200
512.025.032	**25**	**32**	10,5	32	9,6	4150
512.025.040	**25**	**40**	10,5	32	12	4120
512.032.032	**32**	**32**	13,5	42	9,6	6400
512.032.040	**32**	**40**	13,5	42	12	6350
512.032.050	**32**	**50**	13,5	42	15	6300
512.032.063	**32**	**63**	13,5	42	18,9	3250
512.040.032	**40**	**32**	13,5	52	9,6	11000
512.040.040	**40**	**40**	13,5	52	12	10900
512.040.050	**40**	**50**	13,5	52	15	10800
512.040.063	**40**	**63**	13,5	52	18,9	10750
512.040.080	**40**	**80**	13,5	52	24	10700
512.050.032	**50**	**32**	17	65	9,6	17400
512.050.040	**50**	**40**	17	65	12	17300
512.050.050	**50**	**50**	17	65	15	17000
512.050.063	**50**	**63**	17	65	18,9	16650
512.050.080	**50**	**80**	17	65	24	16500
512.050.100	**50**	**100**	17	65	30	16400
512.063.032	**63**	**32**	17	81	9,6	30100
512.063.040	**63**	**40**	17	81	12	39500
512.063.050	**63**	**50**	17	81	15	28900
512.063.063	**63**	**63**	17	81	18,9	28000
512.063.080	**63**	**80**	17	81	24	27500
512.063.100	**63**	**100**	17	81	30	27300
512.063.125	**63**	**125**	17	81	37,5	26800
512.080.032	**80**	**32**	21	104	9,6	53000
512.080.040	**80**	**40**	21	104	12	50500
512.080.050	**80**	**50**	21	104	15	48000
512.080.063	**80**	**63**	21	104	18,9	46500
512.080.080	**80**	**80**	21	104	24	45500
512.080.100	**80**	**100**	21	104	30	44900
512.080.125	**80**	**125**	21	104	37,5	44000
512.100.032	**100**	**32**	21	130	9,6	90000
512.100.040	**100**	**40**	21	130	12	84800
512.100.050	**100**	**50**	21	130	15	81000
512.100.063	**100**	**63**	21	130	18,9	78000
512.100.080	**100**	**80**	21	130	24	75000
512.100.100	**100**	**100**	21	130	30	73000
512.100.125	**100**	**125**	21	130	37,5	71000
512.125.032	**125**	**32**	27	160	9,6	150000
512.125.040	**125**	**40**	27	160	12	142500
512.125.050	**125**	**50**	27	160	15	132000
512.125.063	**125**	**63**	27	160	18,9	125000
512.125.080	**125**	**80**	27	160	24	118000
512.125.100	**125**	**100**	27	160	30	115000
512.125.125	**125**	**125**	27	160	37,5	113000
512.125.160	**125**	**160**	27	160	48	111300

POLYURETHANE-SPRING 95 SHORE A, RED

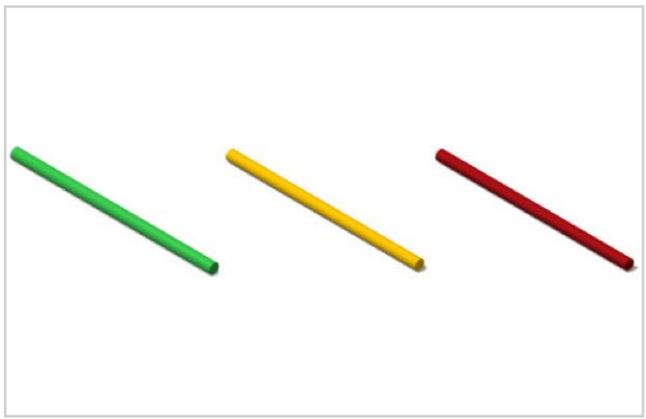
Order-No.: 513.D1.L0

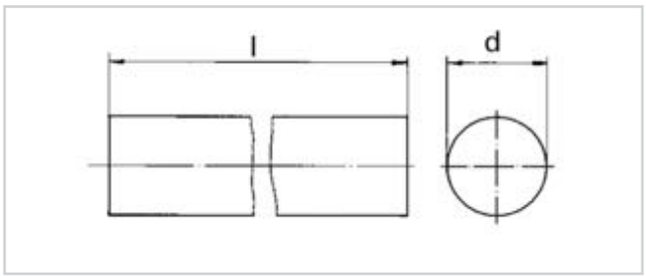


Order-No.:	D1	L0	D2	D3	F max.	F max. (N)
513.016.012	**16**	**12,5**	6,5	21	3,1	2000
513.016.016	**16**	**16**	6,5	21	4	1920
513.016.020	**16**	**20**	6,5	21	5	1900
513.016.025	**16**	**25**	6,5	21	6,2	1870
513.020.016	**20**	**16**	8,5	26	4	3050
513.020.020	**20**	**20**	8,5	26	5	3000
513.020.025	**20**	**25**	8,5	26	6,2	2980
513.020.032	**20**	**32**	8,5	26	8	2950
513.025.020	**25**	**20**	10,5	32	5	5100
513.025.025	**25**	**25**	10,5	32	6,2	5080
513.025.032	**25**	**32**	10,5	32	8	5020
513.025.040	**25**	**40**	10,5	32	10	5000
513.032.032	**32**	**32**	13,5	42	8	7600
513.032.040	**32**	**40**	13,5	42	10	7500
513.032.050	**32**	**50**	13,5	42	12	7480
513.032.063	**32**	**63**	13,5	42	15,7	7450
513.040.032	**40**	**32**	13,5	52	8	13000
513.040.040	**40**	**40**	13,5	52	10	12700
513.040.050	**40**	**50**	13,5	52	12,5	12500
513.040.063	**40**	**63**	13,5	52	15,7	12450
513.040.080	**40**	**80**	13,5	52	20	12430
513.050.032	**50**	**32**	17	65	8	21000
513.050.040	**50**	**40**	17	65	10	20100
513.050.050	**50**	**50**	17	65	12,5	19600
513.050.063	**50**	**63**	17	65	15,7	19200
513.050.080	**50**	**80**	17	65	20	19100
513.050.100	**50**	**100**	17	65	25	19050
513.063.032	**63**	**32**	17	81	8	37000
513.063.040	**63**	**40**	17	81	10	35900
513.063.050	**63**	**50**	17	81	12,5	34000
513.063.063	**63**	**63**	17	81	15,7	33000
513.063.080	**63**	**80**	17	81	20	32000
513.063.100	**63**	**100**	17	81	25	31800
513.063.125	**63**	**125**	17	81	31,2	31600
513.080.032	**80**	**32**	21	104	8	62500
513.080.040	**80**	**40**	21	104	10	59000
513.080.050	**80**	**50**	21	104	12,5	58000
513.080.063	**80**	**63**	21	104	15,7	55000
513.080.080	**80**	**80**	21	104	20	54000
513.080.100	**80**	**100**	21	104	25	53000
513.080.125	**80**	**125**	21	104	31,2	52000
513.100.032	**100**	**32**	21	130	8	110000
513.100.040	**100**	**40**	21	130	10	102500
513.100.050	**100**	**50**	21	130	12,5	9500
513.100.063	**100**	**63**	21	130	15,7	9200
513.100.080	**100**	**80**	21	130	20	8900
513.100.100	**100**	**100**	21	130	25	8700
513.100.125	**100**	**125**	21	130	31,2	8600
513.125.032	**125**	**32**	27	160	8	178000
513.125.040	**125**	**40**	27	160	10	168000
513.125.050	**125**	**50**	27	160	12,5	157000
513.125.063	**125**	**63**	27	160	15,7	150000
513.125.080	**125**	**80**	27	160	20	142000
513.125.100	**125**	**100**	27	160	25	135000
513.125.125	**125**	**125**	27	160	31,2	133000
513.125.160	**125**	**160**	27	160	40	130000

POLYURETHANE-ROUND-ROD

Order-No.: 531.Shore A.d





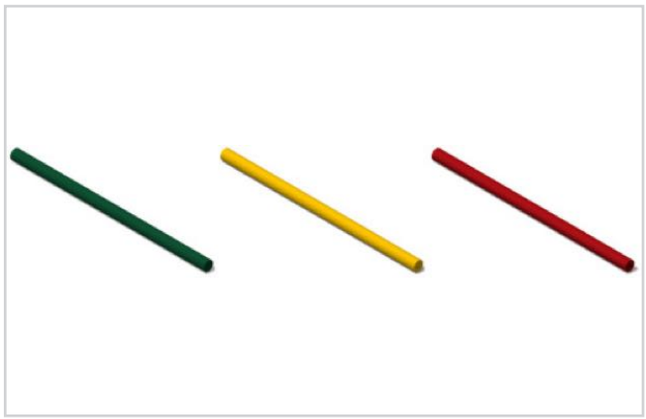
d	l	340	500
2		•	
3		•	
4		•	
5		•	
6		•	
7		•	
8		•	
10		•	
12		•	
16		•	
20		•	
25		•	
32			•
40			•
50			•
63			•
80			•
100			•
125			•
140			•
150			•
160			•
180			•
200			•

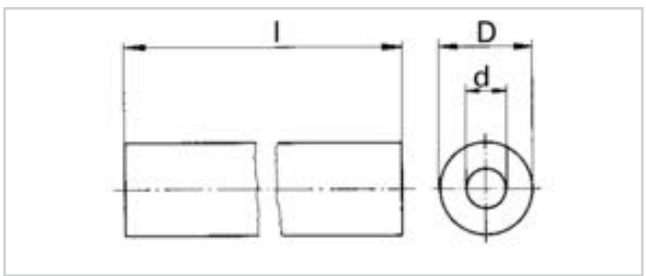
Execution:
The round-rod is available in 3 Shore hardnesses:
.5.=80 Shore A = green
.6.=90 Shore A = yellow
.7.=95 Shore A = red

Ordering example: 90 Shore A d =16
531.6.016

POLYURETHANE-HOLLOW-ROUND-ROD

Order No.: 532.Shore A.D





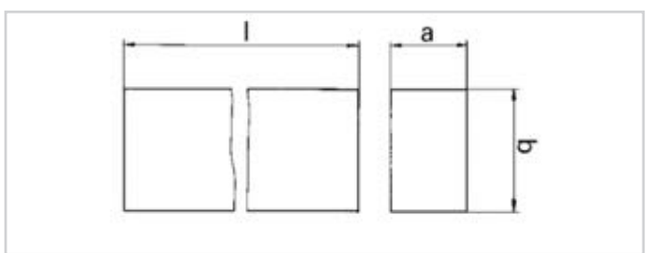
D	d	l	340	500
16	6,5		•	
20	8,5		•	
25	10,5		•	
32	13,5			•
40	13,5			•
50	17			•
63	17			•
80	21			•
100	21			•
125	27			•
140	50			•
150	50			•
160	50			•
180	50			•
200	50			•

Execution:
The hollow-round-rod is available in 3 Shore hardnesses:
.5.=80 Shore A = green
.6.=90 Shore A = yellow
.7.=95 Shore A = red

Ordering example: 90 Shore A D =16
532.6.016

POLYURETHANE-SQUARE-ROD

Order-No.: 534.Shore A.a.b.l



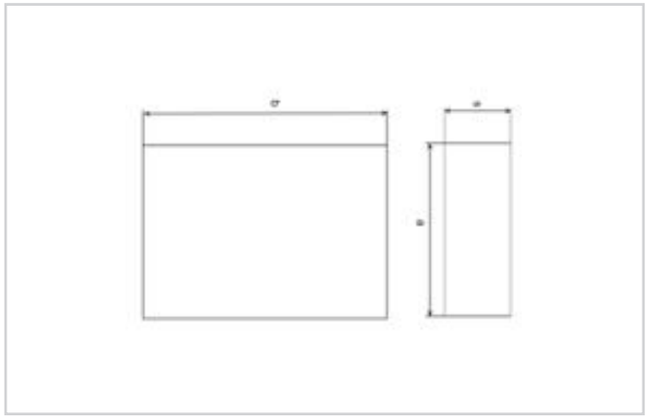
Execution:
The square-rod is available in 3 Shore hardnesses:
.5.=80 Shore A = green
.6.=90 Shore A = yellow
.7.=95 Shore A = red

Ordering example: 90 Shore A, a = 10, b = 10, l = 1000
534.6.010.010.1000

a	b	l	250	500	1000
8	8				•
8	15				•
8	25				•
8	50				•
10	10				•
10	15				•
10	25				•
10	50				•
12	12				•
12	20				•
12	30				•
12	50				•
15	15		•	•	•
15	25				•
15	40				•
15	50				•
20	20				•
20	30				•
20	40				•
20	50				•
22	22		•	•	•
25	25				•
25	40				•
25	60				•
25	80				•
30	30		•	•	•
40	40				•
40	60		•	•	•
45	45		•	•	•
50	50		•	•	•
50	180		•	•	•
60	60		•	•	•
60	80		•	•	•
80	80		•	•	•
80	100		•	•	•
100	100		•	•	•
100	125		•	•	•
100	180		•	•	•
125	125		•	•	•

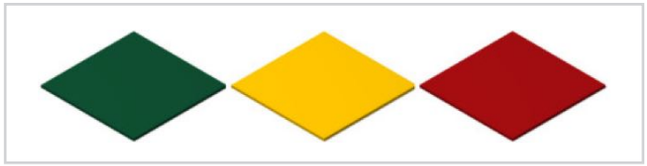
POLYURETHANE-PLATE

Order-No.: 533.Shore A.s.a.b



Execution:
The plate is available in 3 Shore hardnesses:
.5.=80 Shore A = green
.6.=90 Shore A = yellow
.7.=95 Shore A = red

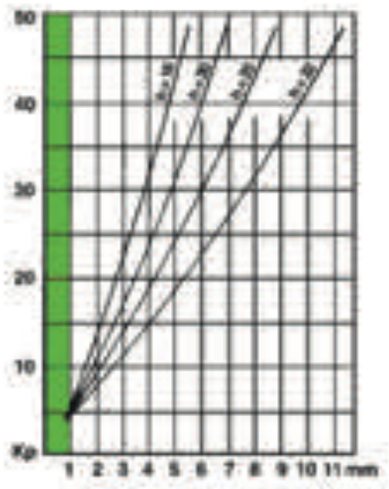
Ordering example: 80 Shore A = 5, s = 10, a = 250, b = 50
533.5.001.0250.0250



s	a x b 250 x 250	a x b 250 x 500	a x b 500 x 500	a x b 500 x 1000	a x b 1000 x 1000
1	•	•	•	•	
2	•	•	•	•	
3	•	•	•	•	
4	•	•	•	•	
5	•	•	•	•	
6	•	•	•	•	
7	•	•	•	•	
8	•	•	•	•	•
10	•	•	•	•	•
12	•	•	•	•	•
15	•	•	•	•	•
20	•	•	•	•	•
25	•	•	•	•	•
30	•	•	•	•	•
40	•	•	•	•	•
50	•	•	•	•	•
60	•	•	•	•	
70	•	•	•	•	
80	•	•	•	•	

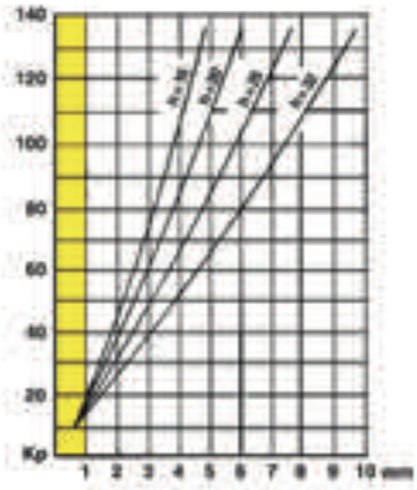
FORCE DIAGRAM 1

80 Shore A / Green



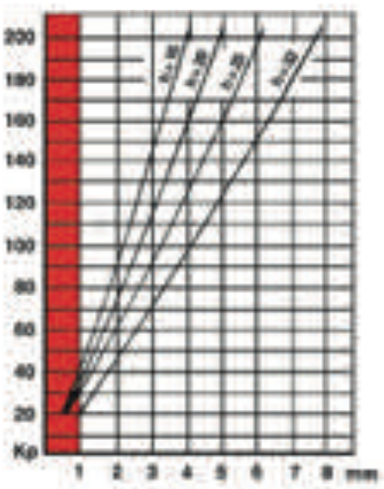
ø 16 - 80 SH
35% di compres. max

90 Shore A / Yellow

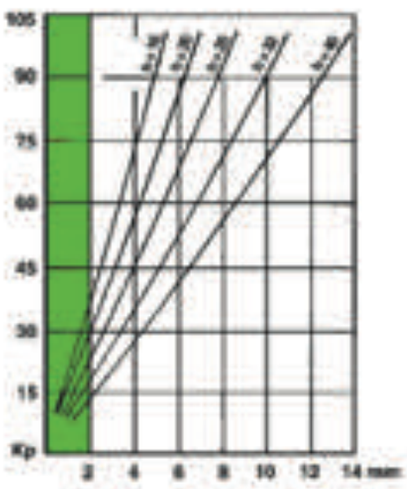


ø 16 - 90 SH
30% di compres. max

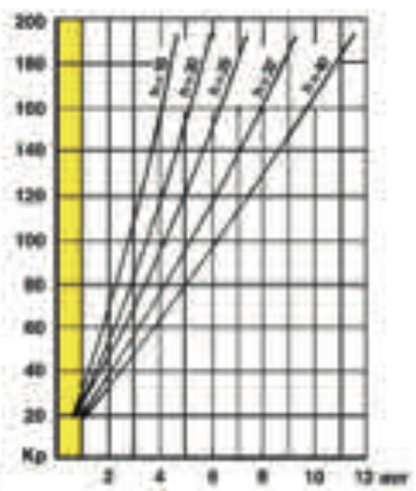
95 Shore A / Red



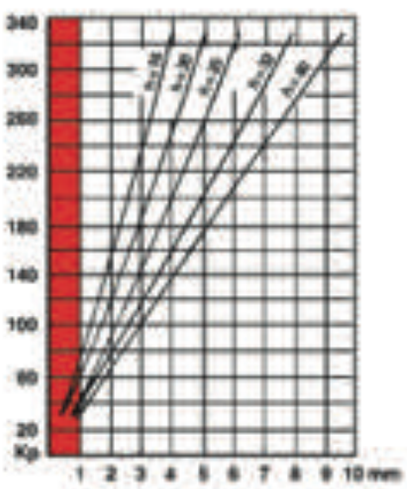
ø 16 - 95 SH
25% di compres. max



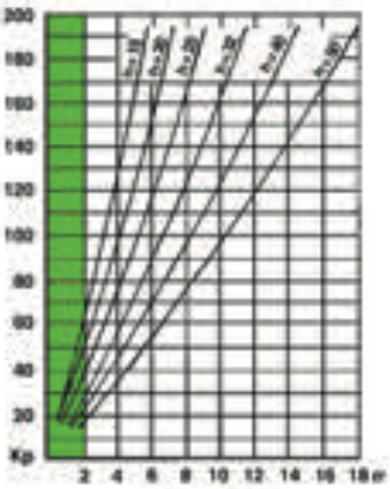
ø 20 - 80 SH
35% di compres. max



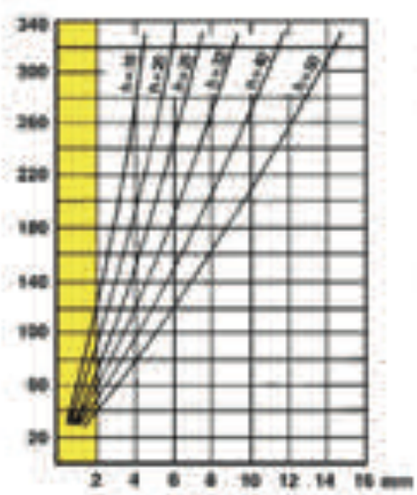
ø 20 - 90 SH
30% di compres. max



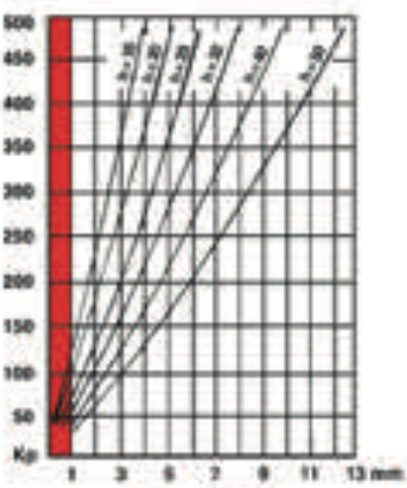
ø 20 - 95 SH
25% di compres. max



ø 25 - 80 SH
35% di compres. max



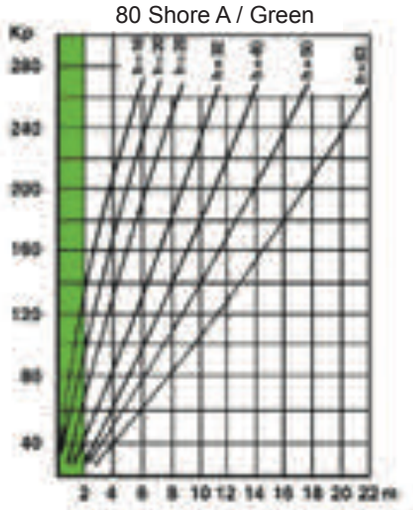
ø 25 - 90 SH
30% di compres. max



ø 25 - 95 SH
25% di compres. max

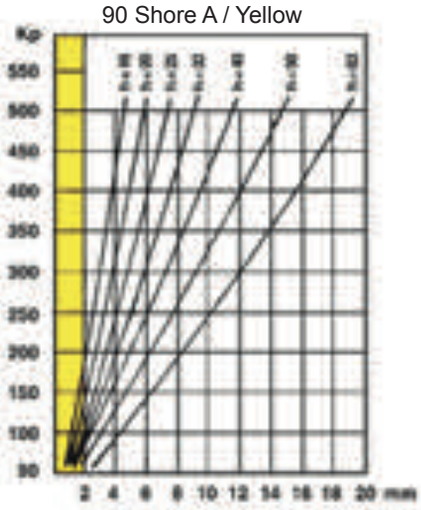
FORCE DIAGRAM 2

80 Shore A / Green



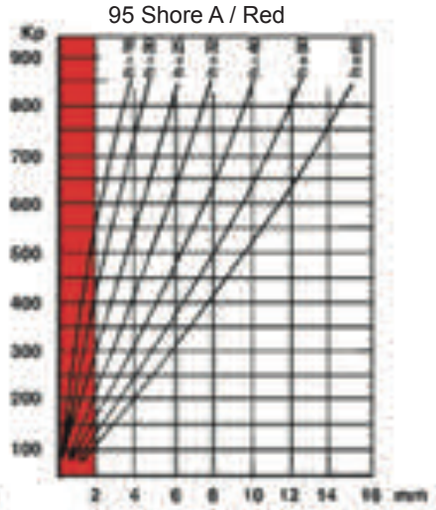
ø 32 - 80 SH
35% di compres. max

90 Shore A / Yellow

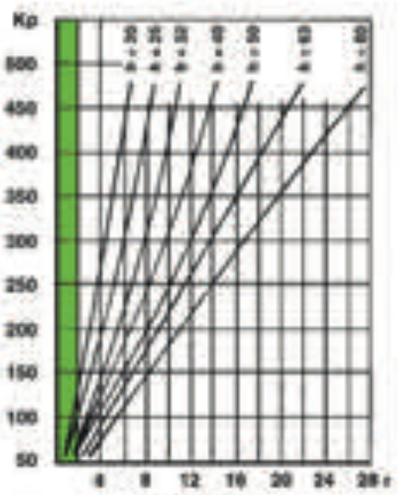


ø 32 - 90 SH
30% di compres. max

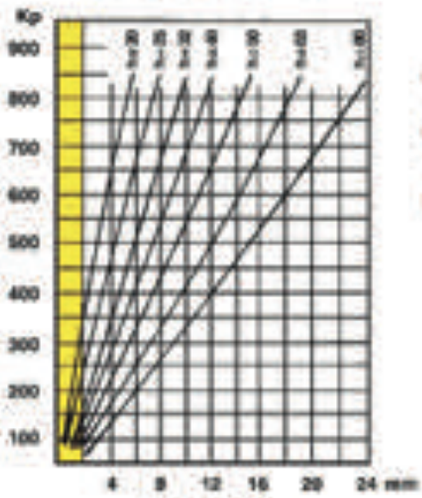
95 Shore A / Red



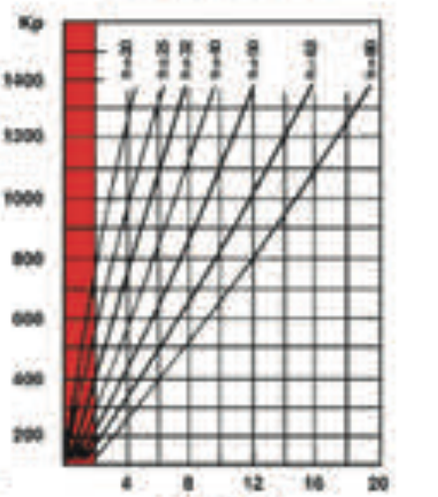
ø 32 - 95 SH
25% di compres. max



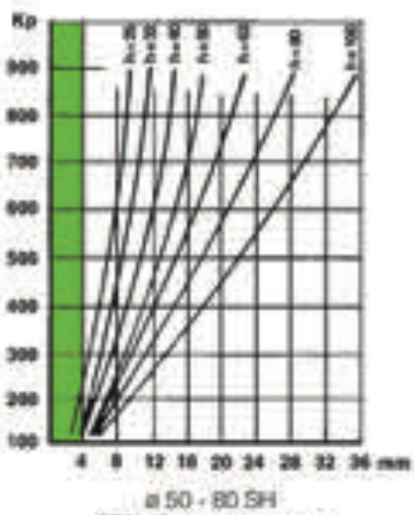
ø 40 - 80 SH
35% di compres. max



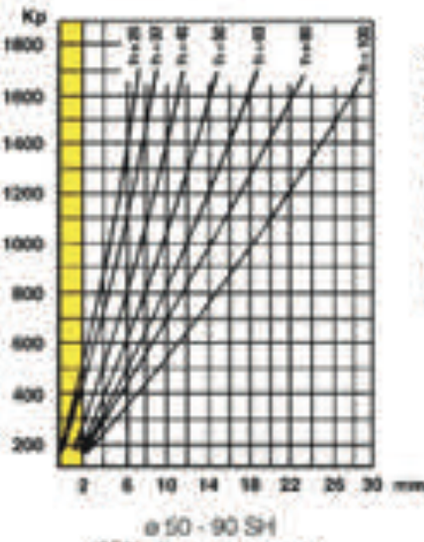
ø 40 - 90 SH
30% di compres. max



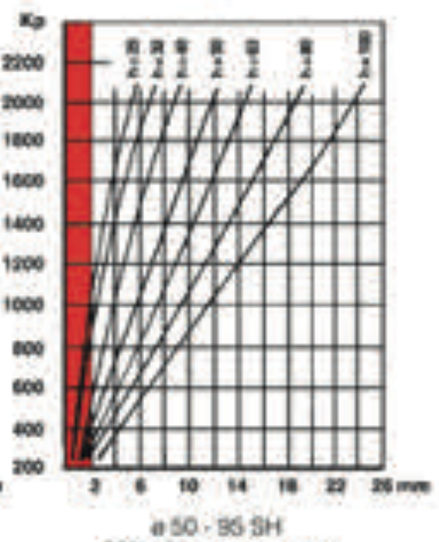
ø 40 - 95 SH
25% di compres. max



ø 50 - 80 SH
35% di compres. max



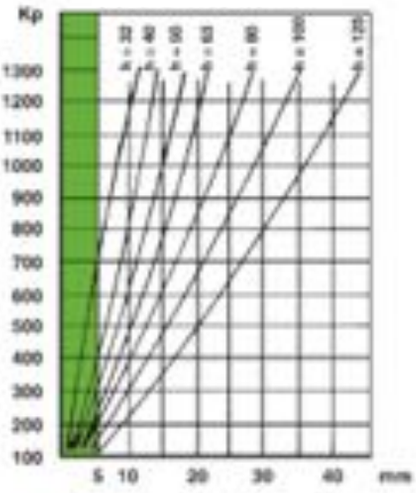
ø 50 - 90 SH
30% di compres. max



ø 50 - 95 SH
25% di compres. max

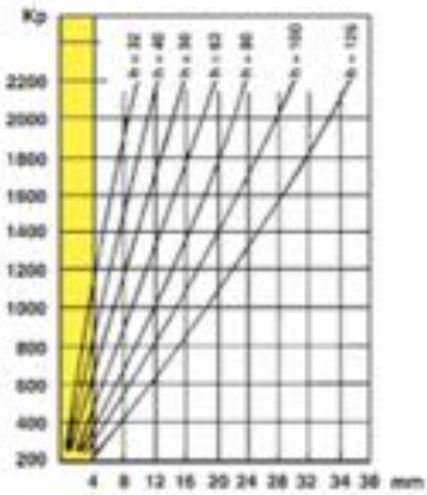
FORCE DIAGRAM 3

80 Shore A / Green



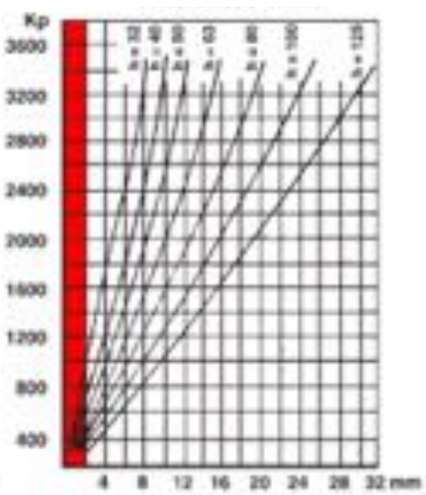
ø 63 - 80 SH
35% di compres. max

90 Shore A / Yellow

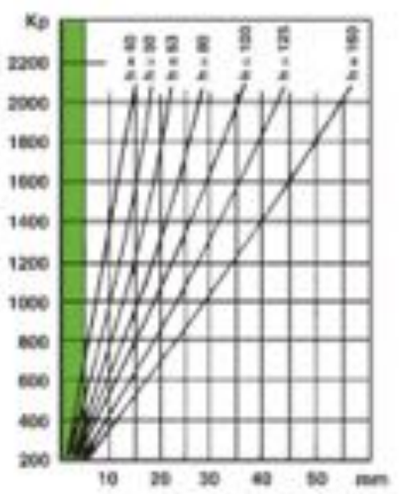


ø 63 - 90 SH
30% di compres. max

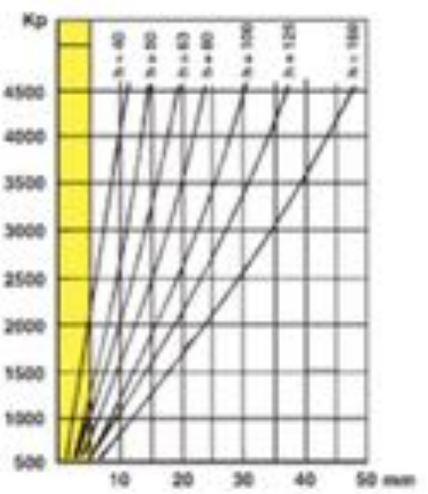
95 Shore A / Red



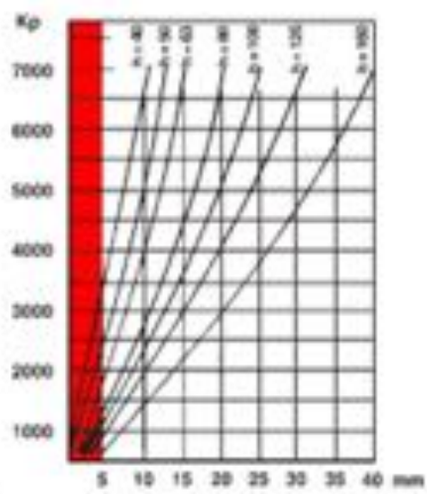
ø 63 - 95 SH
25% di compres. max



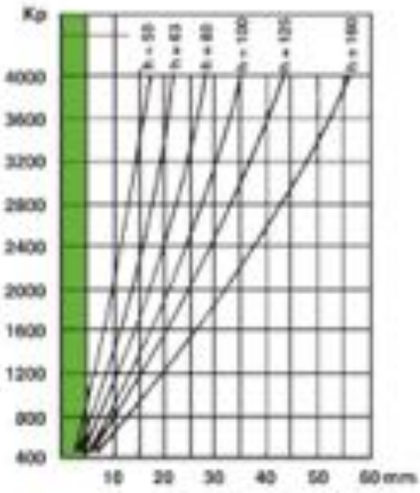
ø 80 - 80 SH
35% di compres. max



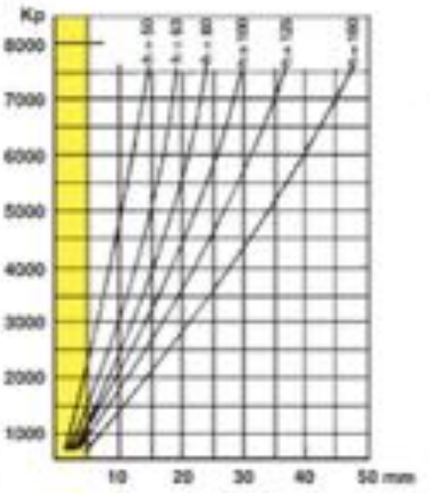
ø 80 - 90 SH
30% di compres. max



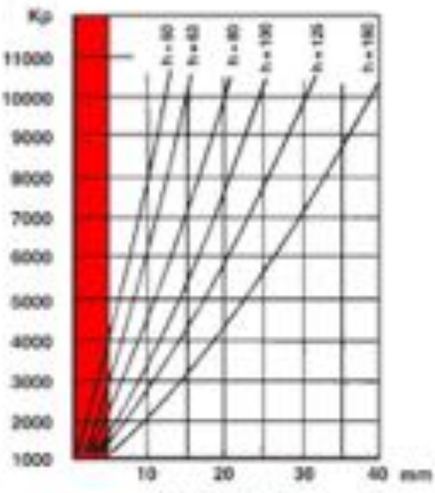
ø 80 - 95 SH
25% di compres. max



ø 100 - 80 SH
35% di compres. max



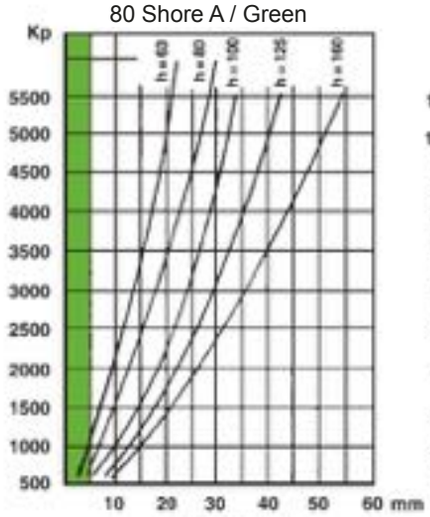
ø 100 - 90 SH
30% di compres. max



ø 100 - 95 SH
25% di compres. max

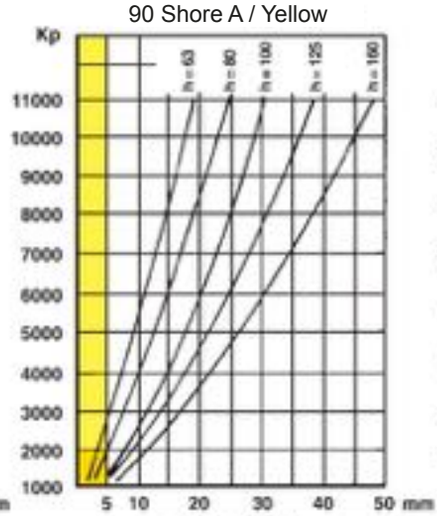
FORCE DIAGRAM 4

80 Shore A / Green



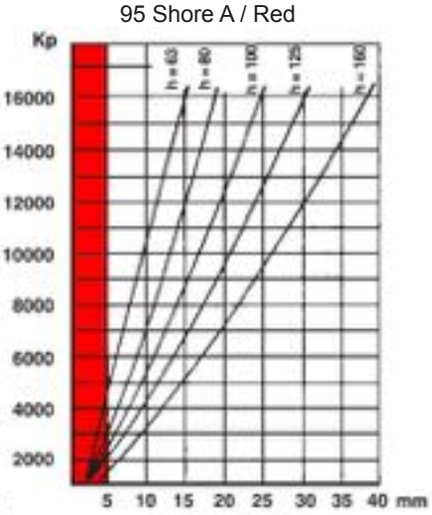
ø 125 - 80 SH
35% di compres. max

90 Shore A / Yellow



ø 125 - 90 SH
30% di compres. max

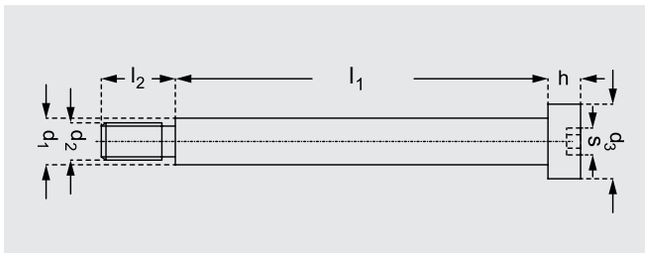
95 Shore A / Red



ø 125 - 95 SH
25% di compres. max

SHOULDER SCREW

Order-No.: 4124.d_1.l_1



Material:
High tensile steel, heat treated to 12.9 ISO 898-1.

Note:
Tightening torque: at M5 = 7 Nm
at M6 = 13 Nm
at M8 = 32 Nm
at M10 = 65 Nm
at M12 = 120 Nm
at M16 = 290 Nm
at M20 = 500 Nm

Ordering example: d_1 = 8, l_1 = 40
4124.080.040

	d_1	6	8	10	12	16	20	24
	d_2	M5	M6	M8	M10	M12	M16	M20
	d_3	10	13	16	18	24	30	36
	h	4,5	5,5	7	9	11	14	16
	s	3	4	5	6	8	10	12
	l_2	9,5	11	13	16	18	22	27
l_1	10	•	•					
	12	•	•					
	16	•	•	•	•			
	20	•	•	•	•			
	25	•	•	•	•	•		
	30	•	•	•	•	•		
	35	•	•	•	•	•		
	40	•	•	•	•	•	•	
	45			•	•	•	•	
	50		•	•	•	•	•	•
	55			•	•	•	•	
	60			•	•	•	•	•
	65			•	•	•	•	
	70			•	•	•	•	•
	80			•	•	•	•	•
	90				•	•	•	•
	100				•	•	•	•
	120					•	•	•

SPRING AND SPACER UNIT, WITH HEXAGON SOCKET COUNTERSUNK HEAD CAP SCREW

Order-No.: 4126.d_1.l_1.l_2

Material:
Spacer tube: Steel, hardened

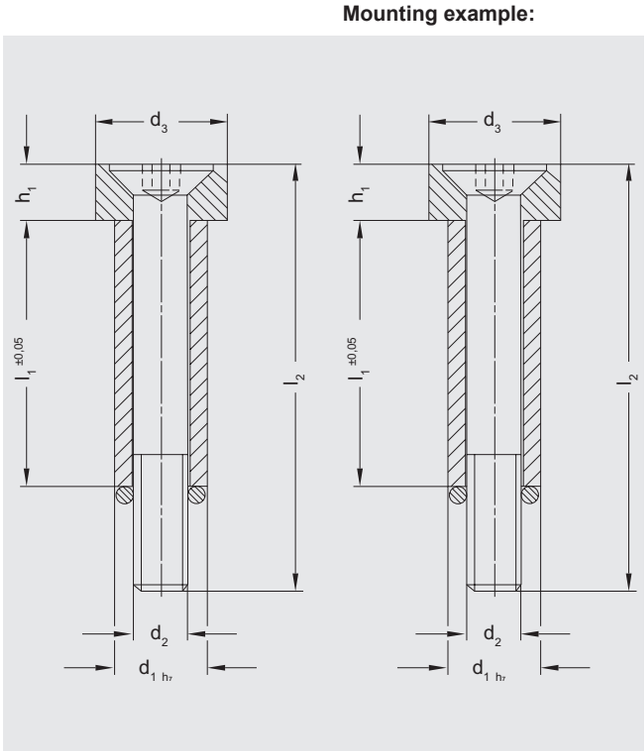
Execution:
Outside diameter ground, Tolerance: h7, Countersunk head cap screw DIN EN ISO 10642

Note:
These units can be used as an alternative to shoulder screws.
Advantages:
Precision length adjustments by way of grinding.
Furthermore, the unit can be used as spring- or spacer unit (see mounting example).
The units are supplied with a retaining O-ring which must be removed before application.
Tightening torque: at M6 = 12 Nm
at M8 = 28 Nm
at M10 = 56 Nm
at M12 = 98 Nm
at M16 = 240 Nm

Ordering example: d_1 = 10, l_1 = 20, l_2 = 35
4126.010.035

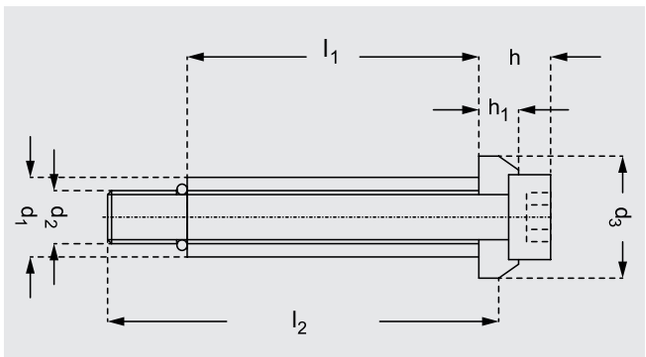
	d_1	10	12,5	15	17,5	23
	d_2	M6	M8	M10	M12	M16
	d_3	15	19	23	27	34
	h	10	13	15	18	24
	h_1	6	8	10	12	16
				l_2		
l_1	20	35				
	25	40	45			
	30	45	50	55	60	
	35	50	55	60	70	
	40	55	60	65	70	
	45	60	70	70	80	
	50	65	70	80	80	90
	55		80	80	90	90
	60		80	90	90	100
	70		90	100	100	110
	80		100	110	110	120
	90			120	120	140
	100					140
	110					150
	120					150

Mounting example:



SPRING AND SPACER UNIT

Order-No.: 4125.d_1.l_1.l_2



Material:
Spacer tube: Steel, hardened

Execution:
Outside diameter ground, Tolerance: h7, Socket cap screw DIN EN ISO 4762

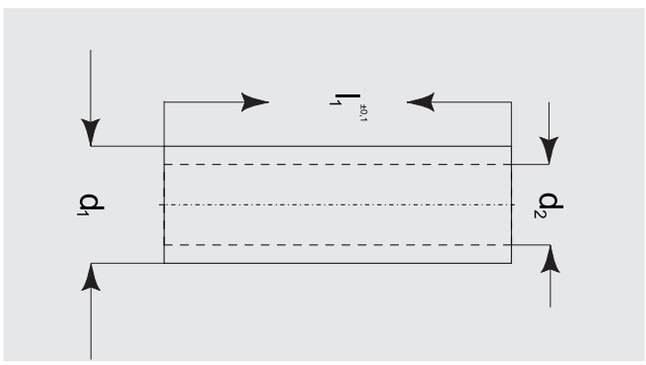
Note:
These units can be used as an alternative to shoulder screws.
Advantages:
Precision length adjustments by way of grinding.
Furthermore, the unit can be used as spring- or spacer unit (see mounting example).
The units are supplied with a retaining O-ring which must be removed before application.
Tightening torque: at M6 = 13 Nm
at M8 = 32 Nm
at M10 = 65 Nm
at M12 = 120 Nm
at M16 = 290 Nm

Ordering example: d_1 = 12,5, l_1 = 55, l_2 = 70
4125.125.055.070

	d_1	10		12,5		15		17,5		23	
	d_2	M6		M8		M10		M12		M16	
	d_3	15		19		23		27		34	
	h	10		13		15		18		24	
	h_1	5,5	l_2	6,5	l_2	7,5	l_2	9	l_2	11	l_2
	20	•	35	•	35						
	25	•	40								
	30	•	45	•	45	•	50	•	50		
	35	•	50	•	50	•	55				
	40	•	55	•	55	•	60	•	60		
	45	•	60	•	60	•	65	•	65		
	50	•	65	•	65	•	70	•	70	•	80
	55	•	70	•	70	•	75	•	80		
	60	•	80	•	80	•	80	•	90	•	90
l_1	70	•	90	•	90	•	90	•	100	•	100
	80	•	100	•	100	•	100	•	110	•	110
	90	•	110	•	110	•	110	•	120	•	120
	100			•	120	•	120	•	130	•	130
	110							•	140	•	140
	120					•	140	•	150	•	150
	140							•	180	•	180
	150									•	180
	160									•	200

SPACER TUBE

Order-No.: 4121.d_1.l_1



Material:
St 35.4 case-hardened

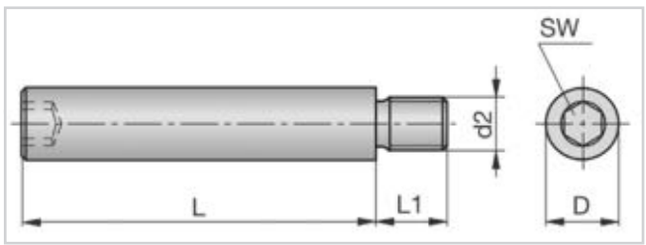
Note:
Other lengths upon request.

Ordering example: d_1 = 16, l_1 = 63
4121.16.063

	d_1	10	12	13	16	19	20	25	30	32	35	36
	d_2	6,4	8,4	9	11	12	13	17	22	22	23	26
l_1	27	•	•									
	30			•	•	•						
	33	•	•		•		•					
	38	•	•		•		•					
	40			•	•	•						
	44	•	•		•		•					
	48	•	•		•		•	•				
	50			•	•	•	•	•	•			
	61	•	•		•		•	•				
	63		•	•	•	•	•	•	•			
	70							•	•			
	72	•	•		•		•	•	•		•	•
	80	•	•	•	•	•	•	•	•		•	•
	90		•		•		•	•	•		•	•
	95							•		•		
	100		•	•	•	•	•	•	•		•	•
	105							•		•		
	115							•				
	125				•	•	•	•	•	•	•	•
	135							•				
	145								•	•		
	150				•		•	•	•		•	•
	155							•				
	165									•		
	175							•	•		•	•
	185									•		
	195							•				
	200				•		•	•	•		•	•
	205									•		
	215							•				
	225							•	•	•	•	•
	235							•				
	245									•		
	250							•	•		•	•
	255							•				

GUIDE PIN

Order-No.: 1756.D.l



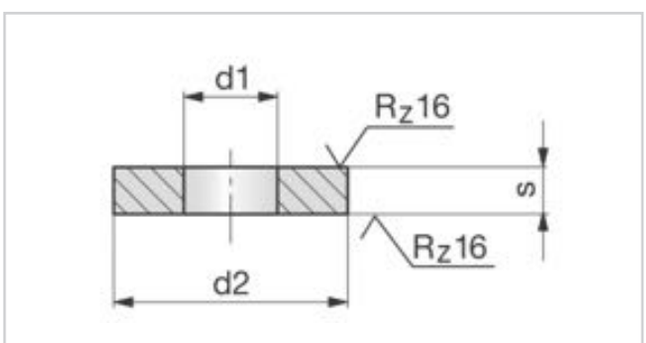
D	6	8	10	13	16	20	25
d_2	M4	M6	M8	M10	M12	M16	M20
L1	6	9	15	15	18	25	30
SW	3	4	5	6	8	10	14
L							
20	•	•	•				
25	•	•	•				
32	•	•	•	•	•		
40	•	•	•	•	•		
50		•	•	•	•	•	•
63			•	•	•	•	•
80				•	•	•	•
95				•	•	•	•
118					•	•	•
140					•	•	•
180					•	•	•

Ordering example: d = 8, l = 40
1756.08.040

WASHER FOR SCREWS M6 – M36

Order-No.: 4122.d_1.d_2.s

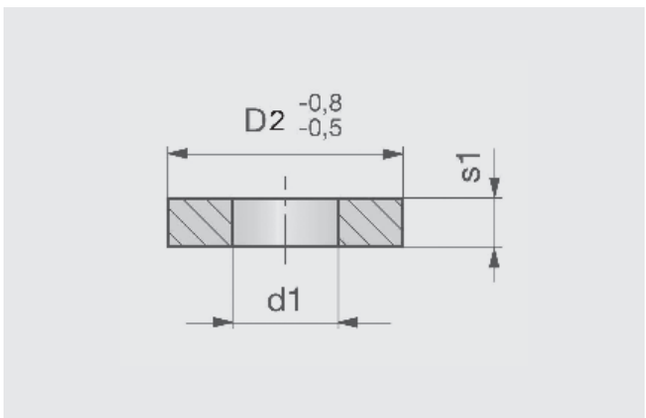
Ordering example: d_1 = 17, d_2 = 35, s = 4
4122.170.35.04



d_1	6,4	8,4	8,4	8,5	9	10,5	10,5	10,5	10,5	11	12,5	13	13	13	13,4	16,4	17	17	17	17
d_2	17	17	23	20	26	25	25	26	28	36	28	30	30	46	23	26	35	35	36	36
s	3	3	4	4	4	4	5	4	4	6	4	5	6	8	4	4	4	6	4	13
d_1	17	17	17	17	20,4	21	21	21	21	21	21	22	25	25	25	26	26	31	37	
d_2	37	38	40	58	30	42	44	45	45	46	49	68	46	55	56	58	80	68	80	
s	6	6	6	10	5	8	8	8	16	6	6	12	10	10	10	6	12	8	8	

TRUST WASHER FOR COMPRESSION SPRINGS, TYPE 7

Order-No.: 4128. Spring Ø



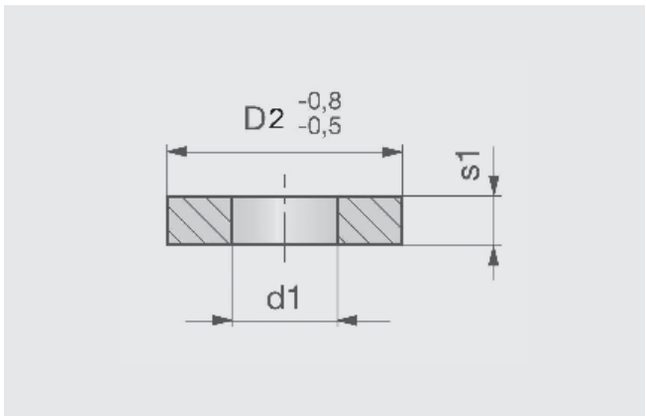
Material:
Surface hardened

Ordering example: Spring ø = 20
4128.20.

Spring Ø	20	25	32	40	50	63
d_1	10,5	12,5	16,5	20,5	25,5	35,5
d_2	25	25	38	38	50	65
s_1	4	4	5	5	6	8

TRUST WASHER FOR ELASTOMER SPRINGS, TYPE 6

Order-No.: 542. Spring Ø



Material:
Surface hardened

Ordering example: Spring ø = 25
542.25.

Spring Ø	25	32	40	50	63	80	100	125
d_1	10,5	13,5	13,5	16,5	16,5	20,5	20,5	26
d_2	32	40	50	60	80	100	120	150
s_1	4	5	5	6	8	10	12	15

TECARIM 1500 YELLOW – PRODUCT RANGE

KTEC.1500.D.L / KTEC.1500.a.b.L

Ordering example: Round-rod: D = 30, L = 1000
KTEC.1500.030.1000
Plate: a = 10, b = 580, L = 580
KTEC.1500.010.580.580

Round-rod		
D (mm)	**Toleranz (mm)**	**L**
30	0,2 – 1,4	1000
40	0,2 – 1,4	1000
50	0,3 – 1,9	1500
65	0,3 – 2,5	1000
79	0,4 – 2,8	1000
100	0,6 – 3,5	1000
110	0,7 – 3,9	1000
150	0,8 – 5,3	850
180	1 – 6,5	600

Plate		
a x b (mm)	**Toleranz (mm)**	**L**
10 x 580	0,5 – 1,5	580
30 x 300	0,5 – 3,5	900
50 x 300	0,5 – 3,5	800
60 x 300	0,5 – 5,0	800
80 x 300	0,5 – 7,0	600
100 x 300	0,5 – 7,0	500
150 x 300	0,5 – 7,0	350

Accessories

INDEX

Accessories

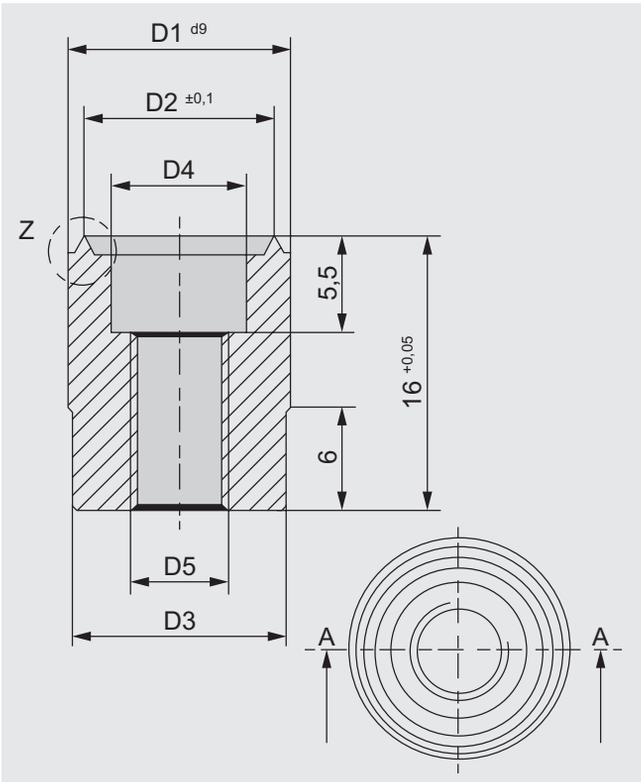
VISUAL LOCATOR SETTING PUNCH

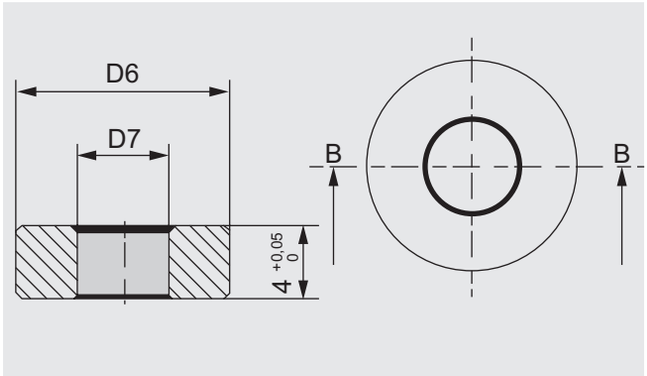
Order-No.: 39v-863-D1

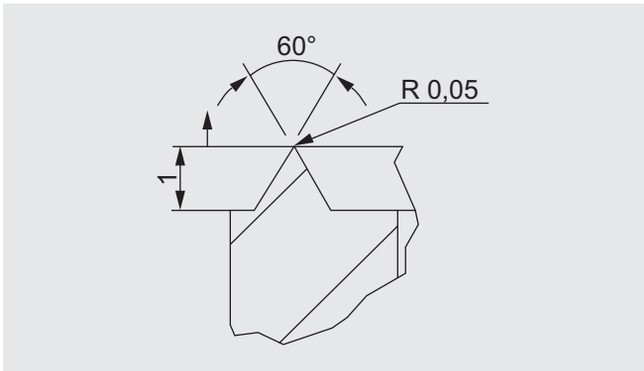
Material:
1.2210 WS cold worked steel
Temperature resistance: min. 200°C
Hard and tough tool steel with medium wear resistance. Schnitt- und Piercing/blanking dies for low to medium load.

Hardness: 60 ± 2 HRC

Ordering example: D_1 = A10,
39v-863-A10







D1	D2	D3	D4	D5	D6	D7	D8
A10	8,0	9,5	6	M4	9	4,2	M3
A13	11,2	12,5	8	M5	12	5,2	M4

SPRING PLUG

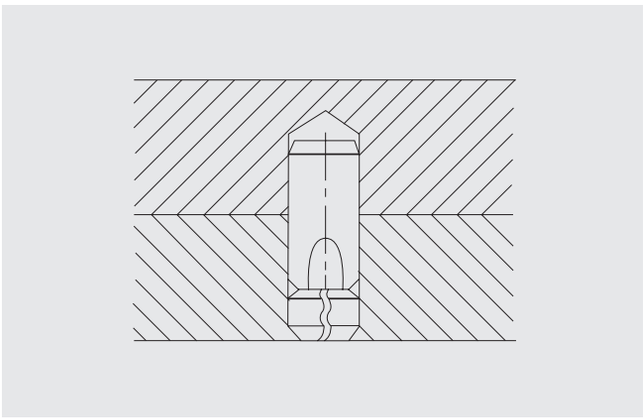
Order-No.: SWA.D

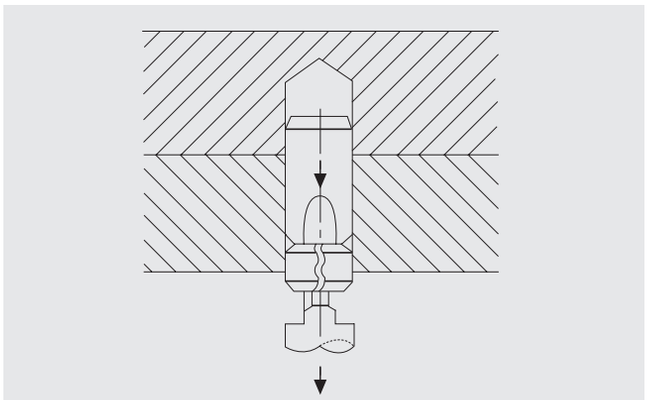
Material:
Spring steel

Note:
Spring plugs prevent dowel pin fall-out.

Ordering example: D = 10
SWA10

Mounting example:





Compared to using a screw plug, tapping is not neccessary plus, dowel pins can be removed directly, when necesarry, when using a spring plug.

Order-No.:	*Pullout force N (kgf)	D	d	L
SWA06	392 (40)	**6**	4,4	6
SWA08	1373 (140)	**8**	5,6	8
SWA10	2354 (240)	**10**	6,4	12
SWA12	1765 (180)	**12**	8,0	12
SWA13	1716 (175)	**13**	9,0	12
SWA16	1422 (145)	**16**	11,0	12
SWA20	1471 (150)	**20**	15,0	12

*Pullout force is the average value of 10 repeated pull-outs from a H7 hole.The pullout force will vary depending on factors including the D dimension tolerance of the spring plugs, and the surface roughness and tolerance of press-fit holes.

ISOLAT

Order-No.: K5000.ISOLAT

Insulating immersion bath:
For storage and shipping, the punches of high-quality tools and sensitive ground precision components have to be protected against mechanical damage and corrosion.
ISOLAT, as a special insulating tool guarantees a steady temperature of the insulating compo ISOLOX TG through automatical temperature control, using a thermostat.
When used correctly, the insulating compo ISOLOX avoids overheating and disturbing odor.

– always usable
– airtight insulating
– applied and removed fast
– currently the most inexpensive insulating tool
  for shank tools up to 300 mm length and for circular saws
  up to 1300 mm (/)
– through automatical temperature control with thermostat
  and consistent temperature distribution in the aluminium crucible
  avoids disturbing odor.
– low power demand
– universally useable through practical oriented design
– tried and tested in industry and trade

Descrption:
Stable metal construction with aluminium crucible, with thermostat und indicator lamp, cover, cable for protection (1,5 m), heating of the bottom part of the crucible.

Special accessories:
Adjustable mount for saws for efficient insulation of the toothed rim on circular saws.

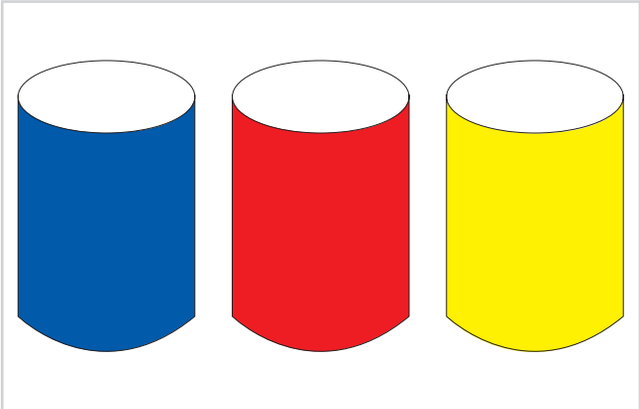
Technical specifications:

External dimensions:	450 x 190 x 130 mm
Internal dimensions:	375 x 145 x 85 mm
Carrying capacity:	ca. 3,5 kg
Range of adjustment:	50 – 200°C infinitely variable
Tension:	230 volt
Performance:	800 watt
Finish:	blue, hammer finish

Note:
Bigger insulation tools are available in approx. 100 variations with immersion length up to 2,500 mm.

ISOLOX

Order-No.: K5000.ISOLOX.kg



Unit kg
25
10
5

Dyes:

For fast colouring of Isolox TG.
Available in blue, red or yellow. Vividly coloured, can be mixed with one another.
Signing below the colour coating stays visible.
Sufficient for colouring approx. 25 kg.

Thermoplastic immersion compo:

This insulating compo encloses immersed parts air-tight and gapless. At a steady temperature between 150 – 165°C, the coating thickness can be defined. The parts are insulated very fast, plus ISOLOX can be removed very easily.

– odor-free and innocuous for the skin
– transparent
– colourable in yellow, blue and red, can also be mixed (signing below the colour coating stays visible)
– impact resistant and tough elastic
– after the removal of the coating, a thin oil film protects the item against corrosion untill the final usage
– easy and fast removal from the item
– reusable

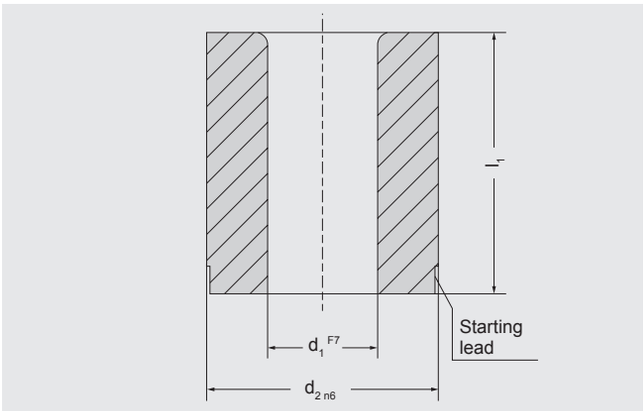
DRILL BUSH DIN 179, WITHOUT COLLAR

Order-No.: B11.d_1.L_1

Material:
Case hardened steel.
Hardness: 740 ± 40 HV10

Execution:
Diameters d1 and d2 precision ground.

Ordering example: d_1 = 8,2, L_1 = 20
B11.0820.020



d_1*	d_2	short l_1	medium l_1	long l_1
0,4 – 1,0	3	**6**	**9**	**–**
1,1 – 1,8	4	**6**	**9**	**–**
1,9 – 2,6	5	**6**	**9**	**–**
2,7 – 3,3	6	**8**	**12**	**16**
3,4 – 4,0	7	**8**	**12**	**16**
4,1 – 5,0	8	**8**	**12**	**16**
5,1 – 6,0	10	**10**	**16**	**20**
6,1 – 8,0	12	**10**	**16**	**20**
8,1 – 10,0	15	**12**	**20**	**25**
10,1 – 12,0	18	**12**	**20**	**25**
12,1 – 15,0	22	**16**	**28**	**36**
15,1 – 18,0	26	**16**	**28**	**36**
18,1 – 22,0	30	**20**	**36**	**45**
22,1 – 26,0	35	**20**	**36**	**45**
26,1 – 30,0	42	**25**	**45**	**56**
30,1 – 35,0	48	**25**	**45**	**56**
35,1 – 42,0	55	**30**	**56**	**67**
42,1 – 48,0	62	**30**	**56**	**67**
48,1 – 55,0	70	**30**	**56**	**67**
55,1 – 63,0	78	**35**	**67**	**78**

*Gradation d_1 = 0,1 mm

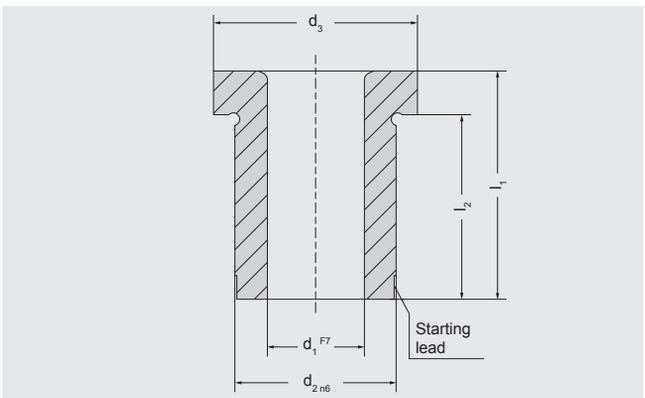
DRILL BUSH DIN 179, WITH COLLAR

Order-No.: B12.d_1.L_1

Material:
Case hardened steel.
Hardness: 740 ± 40 HV10

Execution:
Diameters d1 and d2 precision ground.

Ordering example: d_1 = 8,2, L_1 = 20
B12.0820.020

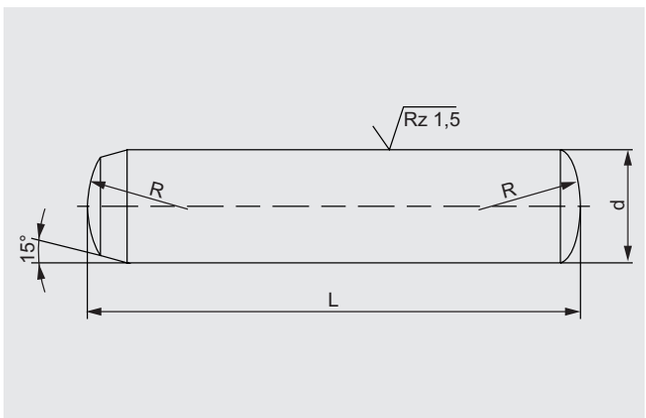


d_1*	d_2	d_3	short		medium		long	
			l_1	l_2	l_1	l_2	l_1	l_2
0,4 – 1,0	3	6	**6**	4	**9**	7	**–**	–
1,1 – 1,8	4	7	**6**	4	**9**	7	**–**	–
1,9 – 2,6	5	8	**6**	4	**9**	7	**–**	–
2,7 – 3,3	6	9	**8**	5,5	**12**	9,5	**16**	13,5
3,4 – 4,0	7	10	**8**	5,5	**12**	9,5	**16**	13,5
4,1 – 5,0	8	11	**8**	5,5	**12**	9,5	**16**	13,5
5,1 – 6,0	10	13	**10**	7	**16**	13	**20**	17
6,1 – 8,0	12	15	**10**	7	**16**	13	**20**	17
8,1 – 10,0	15	18	**12**	9	**20**	17	**25**	22
10,1 – 12,0	18	22	**12**	8	**20**	16	**25**	21
12,1 – 15,0	22	26	**16**	12	**28**	24	**36**	32
15,1 – 18,0	26	30	**16**	12	**28**	24	**36**	32
18,1 – 22,0	30	34	**20**	15	**36**	31	**45**	40
22,1 – 26,0	35	39	**20**	15	**36**	31	**45**	40
26,1 – 30,0	42	46	**25**	20	**45**	40	**56**	51
30,1 – 35,0	48	52	**25**	20	**45**	40	**56**	51
35,1 – 42,0	55	59	**30**	25	**56**	51	**67**	62
42,1 – 48,0	62	66	**30**	24	**56**	50	**67**	61
48,1 – 55,0	70	74	**30**	24	**56**	50	**67**	61
55,1 – 63,0	78	82	**35**	29	**67**	61	**78**	72

*Gradation d_1 = 0,1 mm

DOWEL PIN ISO 8734, TOL. M5, WITHOUT EXTRACTING THREAD

Order-No.: 331.d.l



Material:
Steel, hardened.
Hardness: 60 ± 2 HRC

Execution:
Hardened and ground to finest finish.
Whereas DIN EN ISO 8734 stipulates ISO Class 6 for dowels, this pins are produced to m5.

Ordering example: d = 4, L = 36
331.0400.036

d	R	L	6	8	10	12	14	16	18	20	24	28	32	36	40	45	50	55	60	70	80	90	100	120	130	140
1	1			•	•	•																				
1,5	1,6		•	•	•	•	•	•	•																	
2	2		•	•	•	•	•	•	•	•	•	•	•	•												
2,5	2,5		•	•	•	•	•	•	•	•	•	•	•	•												
3	3		•	•	•	•	•	•	•	•	•	•	•	•	•	•										
4	4		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•							
5	5			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•					
6	6				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
8	8				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
10	10							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
12	12													•	•	•	•	•	•	•	•	•	•	•	•	
14	16													•	•	•	•	•	•	•	•	•	•	•		
16	16														•	•	•	•	•	•	•	•	•	•		•
20	20																	•	•	•	•	•	•	•		•

DOWEL PIN ISO 8735, TOL. M5, WITH INTERNAL EXTRACTING THREAD

Order-No.: 3321.d.l.

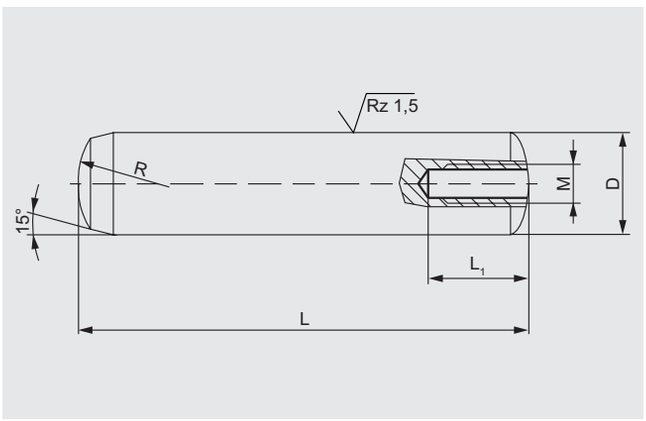
Material:
Steel, hardened.
Hardness: 60 ± 2 HRC

Execution:
Hardened and ground to finest finish.
Whereas DIN EN ISO 8734 stipulates ISO Class 6 for dowels, this pins are produced to m5. Contrary to DIN, this dowel pins are case hardened and have a weaker thread. As a result, the wall thickness at the thread is bigger and thus more stable.

Ordering example: d = 8, L = 24
3321.0800.024

DOWEL PIN ISO 8735, TOL. M5, WITH INTERNAL EXTRACTING THREAD, NITRIDED

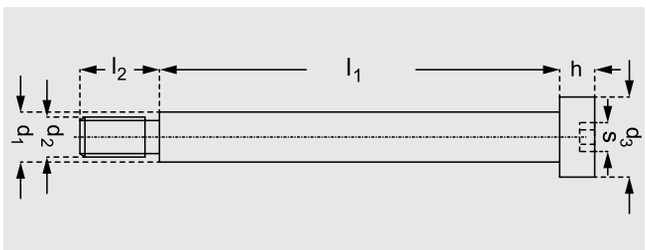
Order-No.: 3322.d.l.



D	M	L_1	R	L	16	18	20	24	28	32	36	40	45	50	55	60	70	80	90	100	120
6	4	2,1	6		•	•	•	•	•	•	•	•	•	•	•	•					
8	5	2,6	8				•	•	•		•	•	•	•	•	•	•	•	•	•	
10	6	3	10					•	•	•	•	•	•	•	•	•	•	•	•	•	
12	6	3,8	12						•	•	•	•	•	•	•	•	•	•	•	•	•
14	8	4	16							•	•	•	•	•	•	•	•	•	•	•	•
16	8	4,7	16							•	•	•	•	•	•	•	•	•	•	•	•
20	10	6	20								•	•	•	•	•	•	•	•	•	•	•
25	16	6	25										•	•	•	•	•	•	•	•	•

SHOULDER SCREW

Order-No.: 4124.d_1.L_1



Material:
High tensile steel, heat treated to 12.9 ISO 898-1. d_1 ground, heads knurled.

Note:
Tightening torque: bei M5 = 7 Nm
bei M6 = 13 Nm
bei M8 = 32 Nm
bei M10 = 65 Nm
bei M12 = 120 Nm
bei M16 = 290 Nm
bei M20 = 500 Nm

Ordering example: d_1 = 8, L_1 = 40
4124.080.040

	d_1	6	8	10	12	16	20	24
	d_2	M5	M6	M8	M10	M12	M16	M20
	d_3	10	13	16	18	24	30	36
	h	4,5	5,5	7	9	11	14	16
	s	3	4	5	6	8	10	12
	l_2	9,5	11	13	16	18	22	27
l_1	10	•	•					
	12	•	•					
	16	•	•	•	•			
	20	•	•	•	•			
	25	•	•	•	•	•		
	30	•	•	•	•	•		
	35	•	•	•	•	•		
	40	•	•	•	•	•	•	
	45			•	•	•	•	
	50		•	•	•	•	•	•
	55			•	•	•	•	
	60			•	•	•	•	•
	65			•	•	•	•	
	70			•	•	•	•	•
	80			•	•	•	•	•
	90				•	•	•	•
	100				•	•	•	•
	120					•	•	•

SPRING AND SPACER UNIT

Order-No.: 4125.d_1.l_1

Material:
Spacer tube: Steel, hardened.

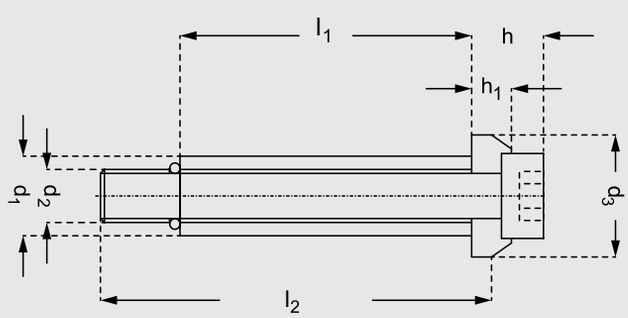
Execution: Outside diameter ground, Tolerance: h7 Socket cap screw DIN EN ISO 4762

Note:
The spring and spacer unit 4125. can be used as an alternative to shoulder screws.

Advantages:
Precision length adjustments by way of grinding.
The units are supplied with a retaining O-ring which must be removed before application.

Tightening torque: bei M6 = 13 Nm
bei M8 = 32 Nm
bei M10 = 65 Nm
bei M12 = 120 Nm
bei M16 = 290 Nm

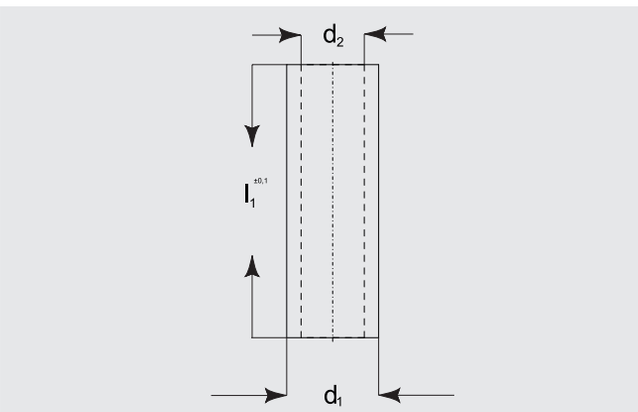
Ordering example: d_1 = 12,5, l_1 = 55, l_2 = 70
4125.125.055.070



	d_1	10		12,5		15		17,5		23	
	d_2	M6		M8		M10		M12		M16	
	d_3	15		19		23		27		34	
	h	10		13		15		18		24	
	h_1	5,5	l_2	6,5	l_2	7,5	l_2	9	l_2	11	l_2
l_1	20	•	35	•	35						
	25	•	40								
	30	•	45	•	45	•	50	•	50		
	35	•	50	•	50	•	55				
	40	•	55	•	55	•	60	•	60		
	45	•	60	•	60	•	65	•	65		
	50	•	65	•	65	•	70	•	70	•	80
	55	•	70	•	70	•	75	•	80		
	60	•	80	•	80	•	80	•	90	•	90
	70	•	90	•	90	•	90	•	100	•	100
	80	•	100	•	100	•	100	•	110	•	110
	90	•	110	•	110	•	110	•	120	•	120
	100			•	120	•	120	•	130	•	130
	110							•	140	•	140
	120					•	140	•	150	•	150
	140							•	180	•	180
	150									•	180
	160									•	200

SPACER TUBE

Order-No.: 4121.d_1.l_1



Material:
St 35.4, case-hardened.

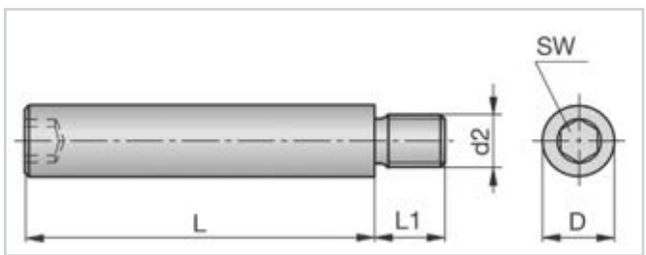
Note:
Other lengths upon request.

Ordering example: d_1 = 16, l_1 = 63
4121.16.063

	d_1	10	12	13	16	19	20	25	30	32	35	36
	d_2	6,4	8,4	9	11	12	13	17	22	22	23	26
l_1	27	•	•									
	30			•	•	•						
	33	•	•		•		•					
	38	•	•		•		•					
	40			•	•	•						
	44	•	•		•		•					
	48	•	•		•		•	•				
	50			•	•	•	•	•	•			
	61	•	•		•		•	•				
	63		•	•	•	•	•	•	•			
	70							•	•			
	72	•	•		•		•	•	•		•	•
	80	•	•	•	•	•	•	•	•		•	•
	90		•		•		•	•	•		•	•
	95							•		•		
	100		•	•	•	•	•	•	•		•	•
	105							•		•		
	115							•				
	125				•	•	•	•	•	•	•	•
	135							•				
	145								•	•		
	150				•		•	•	•		•	•
	155							•				
	165									•		
	175							•	•		•	•
	185									•		
	195							•				
	200				•		•	•	•		•	•
	205									•		
	215							•				
	225							•	•	•	•	•
	235							•				
	245									•		
	250							•	•		•	•
	255							•				

GUIDE PIN

Order-No.: 1756.D.l

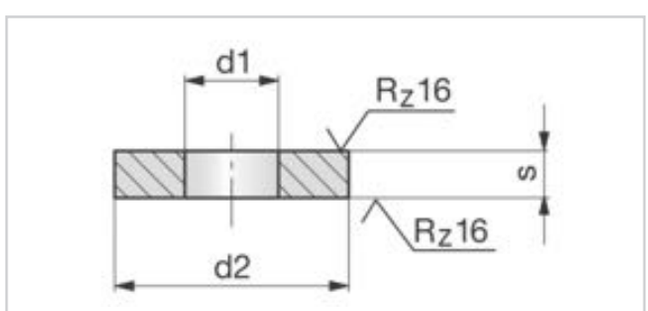


D	6	8	10	13	16	20	25
d_2	M4	M6	M8	M10	M12	M16	M20
L_1	6	9	15	15	18	25	30
SW	3	4	5	6	8	10	14
L							
20	•	•	•				
25	•	•	•				
32	•	•	•	•	•		
40	•	•	•	•	•		
50		•	•	•	•	•	•
63			•	•	•	•	•
80				•	•	•	•
95				•	•	•	•
118					•	•	•
140					•	•	•
180					•	•	•

Ordering example: d = 8, l = 40
1756.08.040

WASHER

Order-No.: 4122.d_1.d_2.s

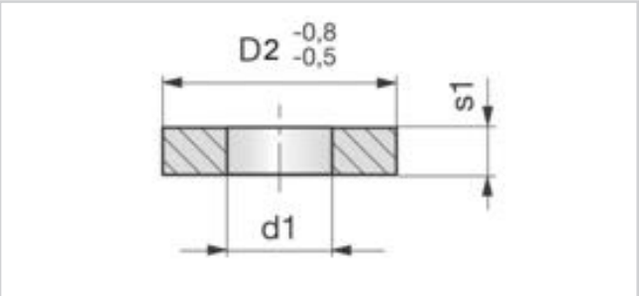


Ordering example: d_1 = 17, d_2 = 35, s = 6
4122.170.35.04

d_1	6,4	8,4	8,4	8,5	9	10,5	10,5	10,5	10,5	11	12,5	13	13	13	13,4	16,4	17	17	17	17
d_2	17	17	23	20	26	25	25	26	28	36	28	30	30	46	23	26	35	35	36	36
s	3	3	4	4	4	4	5	4	4	6	4	5	6	8	4	4	4	6	4	13
d_1	17	17	17	17	20,4	21	21	21	21	21	21	22	25	25	25	26	26	31	37	
d_2	37	38	40	58	30	42	44	45	45	46	49	68	46	55	56	58	80	68	80	
s	6	6	6	10	5	8	8	8	16	6	6	12	10	10	10	6	12	8	8	

TRUST WASHER FOR COMPRESSION SPRINGS, TYPE 7

Order-No.: 4128. Spring Ø

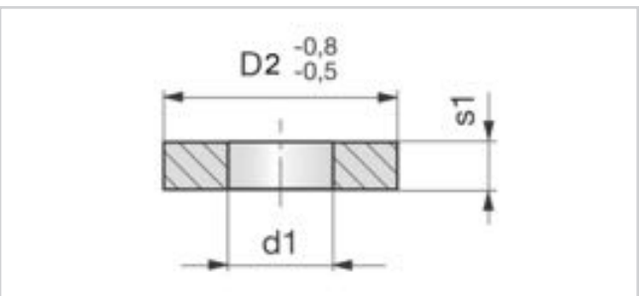


Ordering example: Spring ø = 20
4128.020

Order-No.:	Spring ø	d_1	d_2	s_1
4128.020	**20**	10,5	25	4
4128.025	**25**	12,5	25	4
4128.032	**32**	16,5	38	5
4128.040	**40**	20,5	38	5
4128.050	**50**	25,5	50	6
4128.063	**63**	35,5	65	8

TRUST WASHER FOR ELASTOMER SPRINGS, TYPE 6

Order-No.: 542. Spring ø

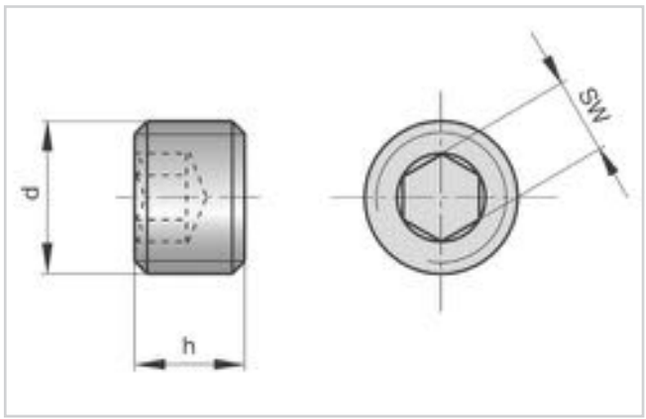


Ordering example: Spring ø = 25
542.025

Order-No.:	Spring ø	d_1	d_2	s_1
542.025	**25**	10,5	32	4
542.032	**32**	13,5	40	5
542.040	**40**	13,5	50	5
542.050	**50**	16,5	60	6
542.063	**63**	16,5	80	8
542.080	**80**	20,5	100	10
542.100	**100**	20,5	120	12
542.125	**125**	26	150	15

PIPE PLUG

Order-No.: 4127.M



Description:
These set screws can be used as adjustable spring stops. They are available for all customary spring sizes from ø 10 up to ø 40. The set screws are suitable for springs 4111. up to 4114.

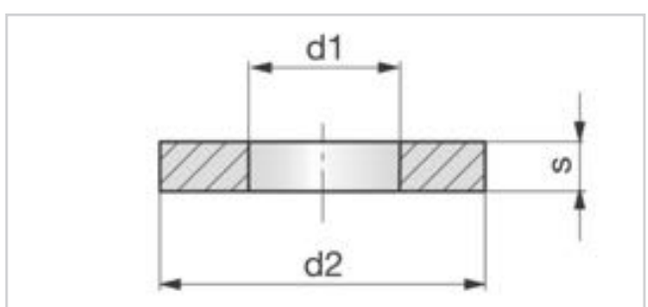
Their use offers the following advantages:
– Adjustable spring tension from under the bottom bolster, without any dismantling.
– Exchange of springs without dismantling.
– Through-holes instead of blind holes for spring accommodation.

Ordering example: M = M12
4127.12

d	M 12 x 1,5	M 14 x 1,5	M 18 x 1,5	M 22 x 1,5	M 28 x 1,5	M 35 x 1,5	M 42 x 1,5
h	10	10	10	10	12	12	12
sw	6	6	8	8	10	10	10
Spring ø	10	12,5	16	20	25	32	40
D_h	10,5	12,5	16,5	20,5	26,5	33,5	40,3

SHOCK ABSORBING WASHER 90 SHORE A

Order-No.: 543.d_1.d_2.s



Ordering example: d_1 = 8,5, d_2 = 20, s = 3
543.08.020.03

d_1	10,5	6,4	11	13	8,5	14	15,5	12	10,5	13	14	17	18	22	21	13,5	25	18	23,5	21
d_2	15	16	17	19	20	23	23	24	25	25	26	26	27	28	30	32	32	32	34	35
s	4	3	3	4	3	4	4	5	4	4	5	4	4	6	5	4	6	7	4	7
d_1	26	17	21	13,5	32	27	31	37	32	17	26	37	32	17	37	42	21	21	27	
d_2	35	38	38	40	40	41	42	46	49	50	50	53	60	63	65	70	80	100	125	
s	6	5	6	5	6	7	6	6	8	6	6	8	10	6	10	10	10	10	10	

DAMPER, HEAVY-DUTY

Order-No.: 544.d_1.d_2.L_0

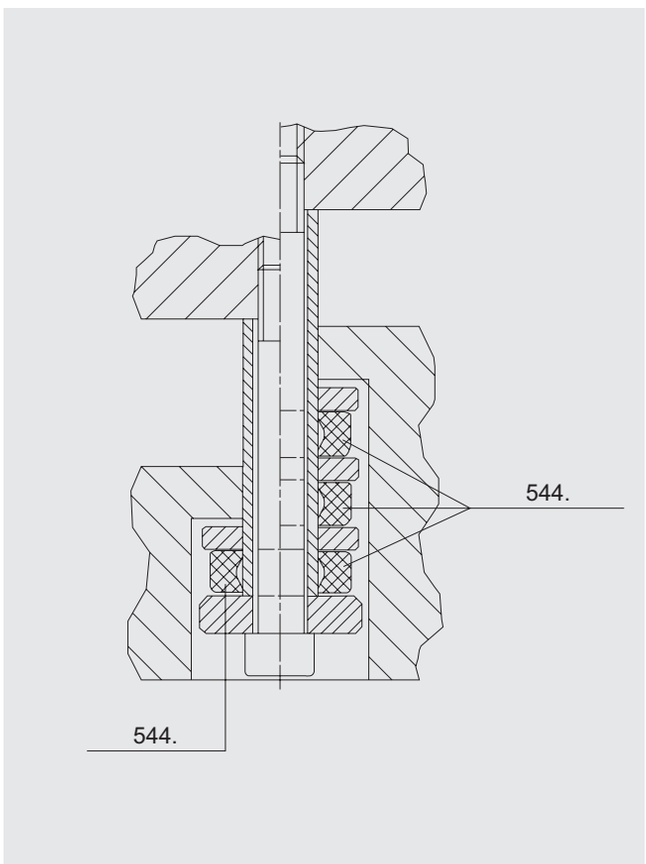
Material:
Co-Polyester-Elastomer
Technical data:
Surroundings: Resistant to microbes, seawater, chemicals.
No absorption of water and no swelling.
Grease and oil resistant.
Approved temperature range: -40°C to +90°C

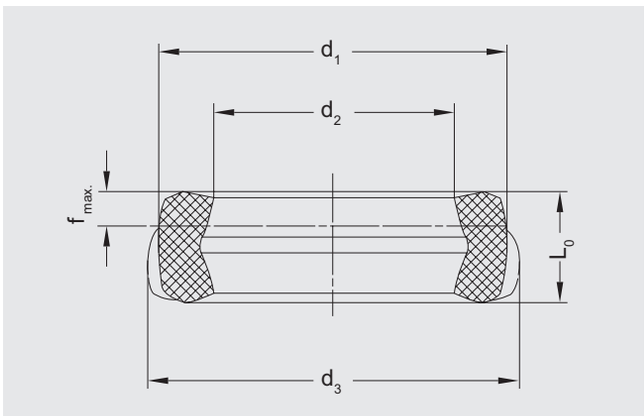
Note:
The co-polyester elastomer dampers, heavy-duty, are used as hold-down dampers in the automotive and white goods industry. Increasing return stroke speeds and the related stresses on screws and bolts in moveable, suspended tool parts are absorbed by the hold-down dampers. Reduced noise emission is a further additional positive sideeffect.

Benefits:
- High absorption of force and energy
- Slight settlement
- Energy absorption between 5 Nm and 269 Nm
- Long service life and high level of operating safety
- Noise reduction
- High degree of effectiveness

Ordering example: d_1 = 26,4, d_2 = 16,3 , L_0 = 7,8
544.0264.0163.078

Mounting example:





Order-No.:	d_1	d_2	d_3	L_0	$F_{max.}$ (N) (static < 0,1)	$f_{max.}$	W (Nm/stroke (s))*	socket cap screw
544.0264.0163.078	**26,4**	**16,3**	28,4	**7,8**	5500	2	5	M10
544.0321.0203.108	**32,1**	**20,3**	35,1	**10,8**	9000	4,4	14,2	M12
544.0458.0253.170	**45,8**	**25,3**	49,8	**17**	20000	4,9	44,6	M16
544.0546.0303.213	**54,6**	**30,3**	61,8	**21,3**	30000	7,6	81,9	M20
544.0618.0363.215	**61,8**	**36,3**	69,9	**21,5**	46000	8,2	126,5	M24
544.0785.0423.294	**78,5**	**42,3**	89	**29,4**	75000	11,4	269	M30

*Total energy per stoke

DAMPER, LIGHT-DUTY

Order-No: 545.d_1.d_2.L_0

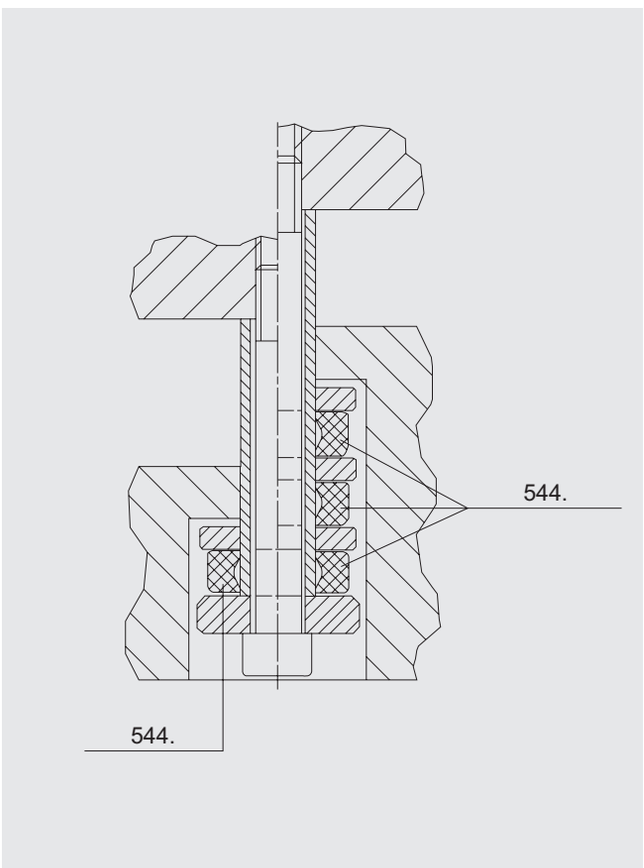
Material:
Co-Polyester-Elastomer
Technical data:
Surroundings: Resistant to microbes, seawater, chemicals.
No absorption of water and no swelling.
Grease and oil resistant.
Approved temperature range: -40°C to +90°C

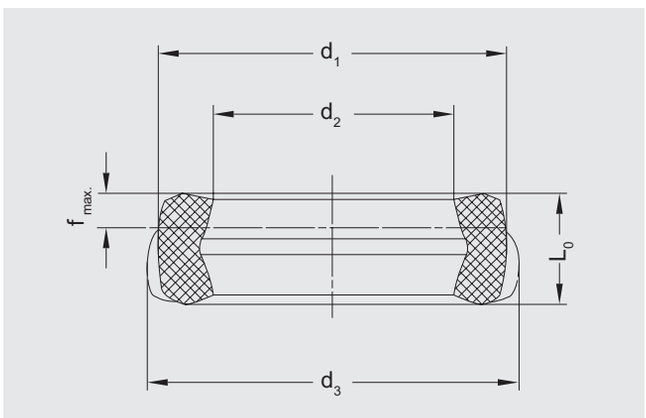
Note:
Dampers, light duty , made of co-polyester elastomer are found in the elevating units in progressive dies in the automotive and white goods industry. The increasing stresses on screws and bolts as well as noise emission are reduced by the light duty dampers.

Benefits:
- High absorption of force and energy
- Long service life and high level of operating safety
- Noise reduction
- High degree of effectiveness

Ordering example: d_1 = 23,6, d_2 = 16,3 , L_0 = 7,3
545.0236.0163.073

Mounting example:





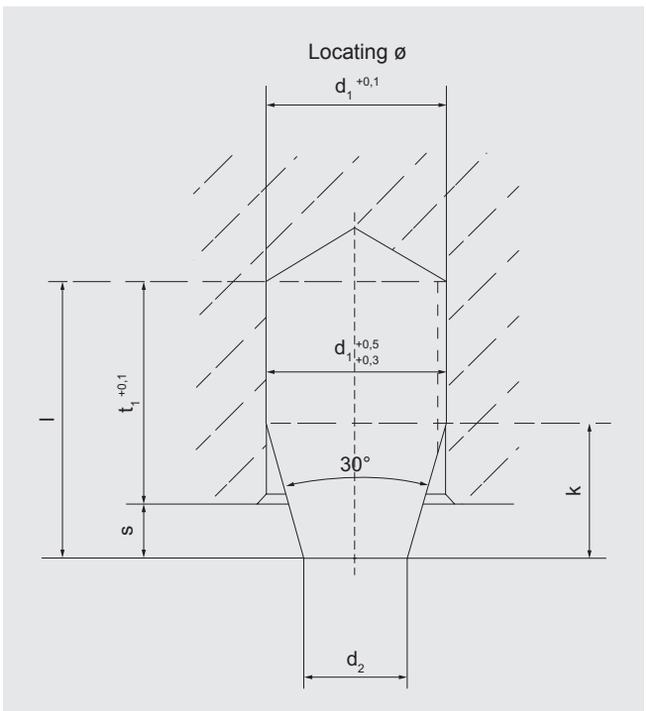
Order-No.:	d_1	d_2	d_3	L_0	L_1*	Stroke (s)	f max. (N)	f max.	W (Nm/stro-ke (s))**	W_h (Nm/h)***	socket cap screw
545.0236.0163.073	**23,6**	**16,3**	25,3	**7,3**	6,6	1,9	3000	2	3	7500	M10

*Dimension L1 is the slump which must be taken into account for the design.
**W = Total energy per stroke
*** W_h = Total energy per hour

COMPRESSION PAD 90 SHORE A

Order-No.: 521.d_1

Ordering-Example: d_1 = 30
521.030



d_1	d_2	l	k	t_1	Compressive force (N)	at s
6	3,6	9,5	4,5	8	100	1,5
10	6	15,5	7,5	13	450	2,5
16	9,5	25	12	21	1500	4
24	18	25	10	21	3000	4
30	20	35	19	30	3000	5
32	24	32	14	26	12000	6
39,5	30	40	16	34	25000	6

COUNTER VIEW

Order-No.: S7710.

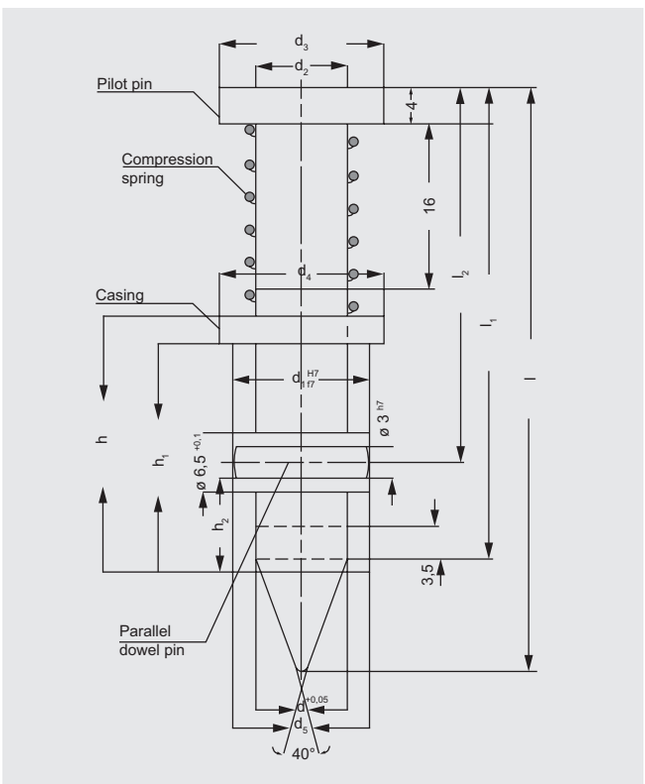
Note:
– seven digit display, non-resettable
– max. operational temperature 120 °C
– front side can be marked for tool identification
– incl. mounting screws
– monitors the productivity of a moulding tool
– an installation in the mould parting surface provides a good reading of the counted values

PILOT UNIT ACCORDING TO DAIMLER-STANDARD

Order-No.: 555.d

Note:
The pilot unit consists of: Pilot pin, sleeve, compression spring, dowel pin.
The pilot unit provides exact positioning of sheet metal parts.
There are 2 sizes.
The pilot unit 10 can be used for a hole diameter of 5 to 10 mm and is available as a finished item, 9.8 mm diameter.
Smaller diameters have to be ground by the tool making department.
The pilot unit 16 (2276.2.) is used for diameter > 10 - 16 mm and is available as a finished item, 15.8 mm diameter.

Ordering example: d = 9,8
555.0980



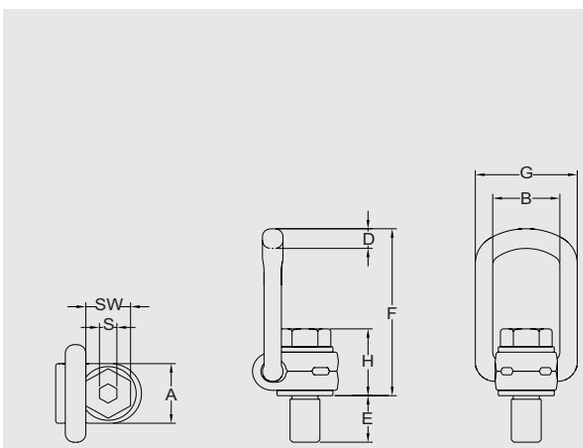
Order-No.:	d	d_1	d_2	d_3	d_4	d_5	h	h_1	h_2	l_1	l_2	l	Spring force preloaded (daN)	Spring force pressed (daN)
555.0980	**9,8**	10	10	18	18	15	28	25	12	47,5	39,3	63,2	4,9	6,2
555.1580	**15,8**	16	16	24	30	26	28	25	12	54,5	46,3	72,5	4,8	5,6

HOISTING SNAP LINK APLB QUALITY 10

Order-No.: 713.15

Note:
– All hoisting snap links with permission and H-stamp of BG
– All hoisting snap links meet the requirements of the machine guidelines
– All hoisting snap links meet the requirements of the ASME B30.26
– Each forged part plus screw with traceability code
– Quality 10
– Full load bearing up to 90°
– 100 % crack-checked

Ordering example: M = M8, t = 0,3
713.15.008.003



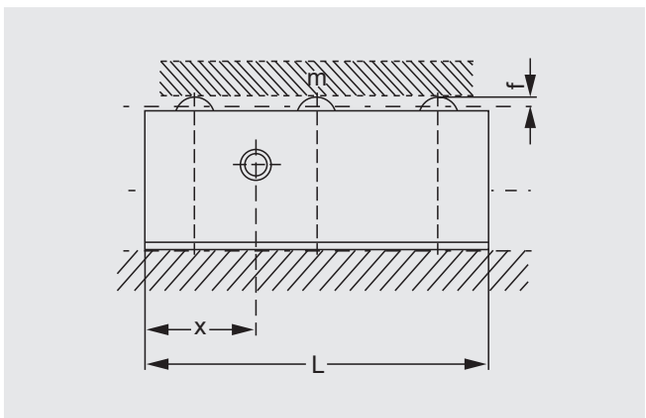
Order-No.:	Threads mm (M)	Maximum load tonnes (t)	Dimensions (mm)									Weight kg/pce	Tightening torque Nm
			B	E	A	G	D	F	H	S	SW		
713.15.008.003	**M8 x 1,25**	**0,3**	35	16	30	55	10,0	85	35	6	13	0,20	30
713.15.010.006	**M10 x 1,50**	**0,6**	35	21	30	55	10,0	85	36	8	17	0,30	60
713.15.012.010	**M12 x 1,75**	**1**	37	24	33	57	13,5	98	44	8	19	0,50	100
713.15.014.012	**M14 x 2,00**	**1,2**	37	24	33	57	13,5	98	45	10	22	0,50	120
713.15.016.015	**M16 x 2,00**	**1,5**	37	29	33	57	13,5	98	46	10	24	0,50	150
713.15.018.020	**M18 x 2,00**	**2**	54	31	50	82	16,5	140	57	12	30	1,30	200
713.15.020.025	**M20 x 2,50**	**2,5**	54	36	50	82	16,5	140	57	12	30	1,30	250
713.15.024.040	**M24 x 3,00**	**4**	54	41	50	82	16,5	140	59	14	36	1,40	400
713.15.027.040	**M27 x 3,00**	**4**	65	48	60	99	22,5	170	79	17	41	2,80	400
713.15.030.050	**M30 x 3,50**	**5**	65	53	60	99	22,5	170	81	17	46	3,10	500
713.15.036.070	**M36 x 4,00**	**7**	65	60	60	99	22,5	178	88	22	55	3,30	700
713.15.036.080	**M36 x 4,00**	**8**	85	62	77	124	26,5	225	101	22	55	5,80	800
713.15.042.100	**M42 x 4,50**	**10**	85	72	77	124	26,5	225	104	24	65	6,30	1.000
713.15.042.150	**M42 x 4,50**	**15**	104	64	95	158	36,0	256	112	24	65	10,80	1.500
713.15.048.200	**M48 x 5,00**	**20**	104	75	95	158	36,0	259	120	27	75	11,60	2.000

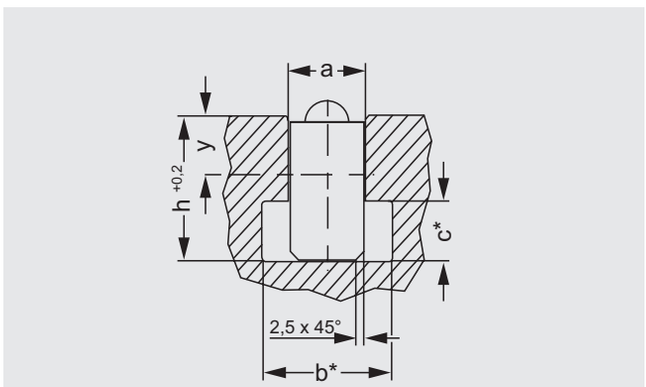
BALL BEARING RAIL

Order-No.: 7351.a.L

Note:
The ball bearing rails are pushed into the DIN 650 T-shaped grooves in the press table and are fixed in place by the clamping piece. The size and number of the ball bearing rails is determined by the size of the Tshaped groove and the load-bearing capacity required. Once the tool is clamped in place, it lies on the press table and the clamping pressure presses the ball bearings into the holes.

Ordering example: a = 18, L = 105
7351.018.105





Order-No.:	a	Maximum load m (daN)	L	Number of balls	Ball diameter	f	b*	c*	h	x	y
7351.018.105	**18**	75	**105**	3	10	1,5	30	12	30	35	14,5
7351.018.140	**18**	100	**140**	4	10	1,5	30	12	30	35	14,5
7351.018.175	**18**	125	**175**	5	10	1,5	30	12	30	35	14,5
7351.018.210	**18**	150	**210**	6	10	1,5	30	12	30	35	14,5
7351.018.280	**18**	200	**280**	8	10	1,5	30	12	30	35	14,5
7351.018.350	**18**	250	**350**	10	10	1,5	30	12	30	35	14,5
7351.022.120	**22**	120	**120**	3	12	1,5	37	16	38	40	14,5
7351.022.160	**22**	160	**160**	4	12	1,5	37	16	38	40	14,5
7351.022.200	**22**	200	**200**	5	12	1,5	37	16	38	40	14,5
7351.022.240	**22**	240	**240**	6	12	1,5	37	16	38	40	14,5
7351.022.320	**22**	320	**320**	8	12	1,5	37	16	38	40	14,5
7351.022.400	**22**	400	**400**	10	12	1,5	37	16	38	40	14,5
7351.028.135	**28**	190	**135**	3	15	1,5	46	20	48	45	19
7351.028.180	**28**	250	**180**	4	15	1,5	46	20	48	45	19
7351.028.225	**28**	320	**225**	5	15	1,5	46	20	48	45	19
7351.028.270	**28**	380	**270**	6	15	1,5	46	20	48	45	19
7351.028.360	**28**	500	**360**	8	15	1,5	46	20	48	45	19
7351.028.450	**28**	630	**450**	10	15	1,5	46	20	48	45	19
7351.036.150	**36**	300	**150**	3	20	1,5	56	25	61	50	24,5
7351.036.200	**36**	400	**200**	4	20	1,5	56	25	61	50	24,5
7351.036.250	**36**	500	**250**	5	20	1,5	56	25	61	50	24,5
7351.036.300	**36**	600	**300**	6	20	1,5	56	25	61	50	24,5
7351.036.400	**36**	800	**400**	8	20	1,5	56	25	61	50	24,5
7351.036.500	**36**	1000	**500**	10	20	1,5	56	25	61	50	24,5

*T-shaped grooves are not absolutely necessary.

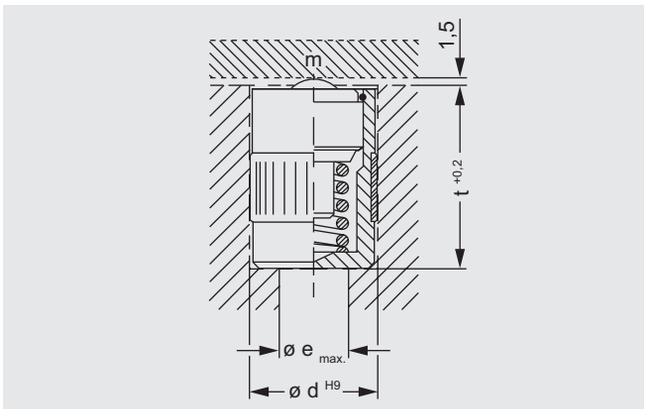
BALL BEARING INSERT WITHOUT COLLAR

Order-No.: 7352.d

Order-No.:	d	Load capacity m (daN)	Ball diameter	e	t
7352.020	**20**	25	10	10	30
7352.024	**24**	40	12	14	38
7352.030	**30**	63	15	20	44
7352.040	**40**	100	20	30	53

Note:
The supporting ball bearings raise the object to be moved (tool) away from the table surface and replace the surface friction with rolling friction. This significantly reduces the force required to move the tool.

Ordering example: d = 20
7352.020



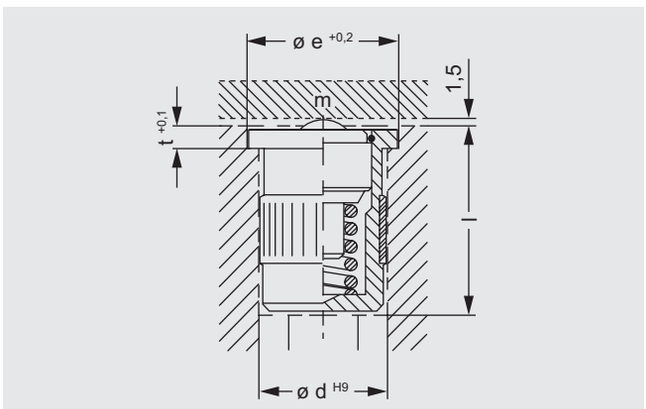
BALL BEARING INSERT WITH COLLAR

Order-No.: 7353.d

Order-No.:	d	Load capacity m (daN)	Ball diameter	e	t	l
7352.020	**20**	25	10	25	3,5	31
7352.024	**24**	40	12	30	4	39
7352.030	**30**	63	15	35	5	45
7352.040	**40**	100	20	50	6	54

Note:
The supporting ball bearings raise the object to be moved (tool) away from the table surface and replace the surface friction with rolling friction. This significantly reduces the force required to move the tool.

Ordering example: d = 20
7353.020



LIFTER PIN FOR PRESS TOOL STRIPS

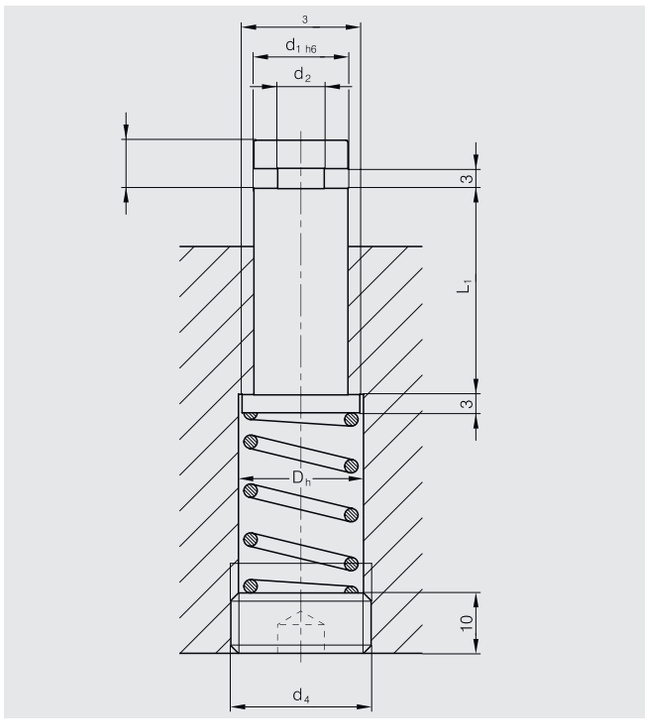
Order-No.: 4123.d_1.L_1

Material:
Nr. 1.7131, case-hardened

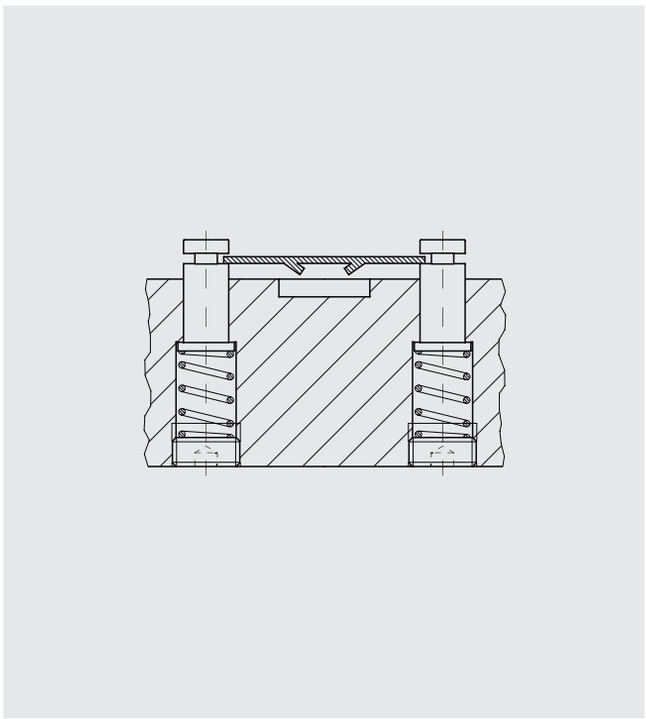
Execution:
Ground

Note:
Combination progression dies with certain forming stages can be equipped advantageously with springloaded lifter pins. Lifter pins can be used to assume the double function of lifting and guiding the strip. The amount of lift is a function of the counterbore-depth.

Ordering example: d_1 = 8, L_1 = 20,
4123.08.020



Mounting example:

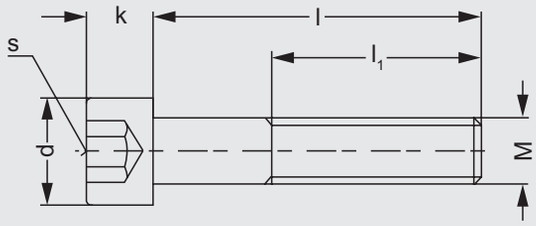


d_1	8	8	8	8	10	10	10	10	13	13	13	13	16	16	16
d_2	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8
d_3	10	10	10	10	12	12	12	12	16	16	16	16	20	20	20
D_h	10,5	10,5	10,5	10,5	12,5	12,5	12,5	12,5	16,5	16,5	16,5	16,5	20,5	20,5	20,5
d_4	M12 x 1,5	M12 x 1,5	M12 x 1,5	M12 x 1,5	M14 x 1,5	M14 x 1,5	M14 x 1,5	M14 x 1,5	M18 x 1,5	M18 x 1,5	M18 x 1,5	M18 x 1,5	M22 x 1,5	M22 x 1,5	M22 x 1,5
d_1	8	8	8	8	10	10	10	10	13	13	13	13	16	16	16
L_1	**20**	**25**	**32**	**40**	**25**	**32**	**40**	**50**	**25**	**32**	**40**	**50**	**32**	**40**	**50**

HEXAGON SOCKET HEAD CAP SCREW, DIN EN ISO 4762

Order-No.: 7400.12.M.l

Ordering example: M = M3, l = 8
7400.12.003.008



Order-No.:	M	l	l_1	d	k	s
7400.12.003.008	M3	8	6	5,5	3	2,5
7400.12.004.010	M4	10	8	7	4	3
7400.12.006.010	M6	10	7	10	6	5
7400.12.006.020	M6	20	17	10	6	5
7400.12.006.025	M6	25	22	10	6	5
7400.12.006.030	M6	30	27	10	6	5
7400.12.006.035	M6	35	24	10	6	5
7400.12.006.040	M6	40	24	10	6	5
7400.12.006.045	M6	45	24	10	6	5
7400.12.006.050	M6	50	24	10	6	5
7400.12.006.055	M6	55	24	10	6	5
7400.12.006.060	M6	60	24	10	6	5
7400.12.006.070	M6	70	24	10	6	5
7400.12.006.080	M6	80	24	10	6	5
7400.12.006.085	M6	85	24	10	6	5
7400.12.006.090	M6	90	24	10	6	5
7400.12.006.100	M6	100	24	10	6	5
7400.12.006.160	M6	160	24	10	6	5
7400.12.006.200	M6	200	24	10	6	5
7400.12.008.016	M8	16	12	13	8	6
7400.12.008.030	M8	30	26	13	8	6
7400.12.008.035	M8	35	31	13	8	6
7400.12.008.040	M8	40	28	13	8	6
7400.12.008.045	M8	45	28	13	8	6
7400.12.008.050	M8	50	28	13	8	6
7400.12.008.055	M8	55	28	13	8	6
7400.12.008.060	M8	60	28	13	8	6
7400.12.008.070	M8	70	28	13	8	6
7400.12.008.075	M8	75	28	13	8	6
7400.12.008.080	M8	80	28	13	8	6
7400.12.008.090	M8	90	28	13	8	6
7400.12.008.100	M8	100	28	13	8	6
7400.12.008.110	M8	110	28	13	8	6
7400.12.008.120	M8	120	28	13	8	6
7400.12.010.030	M10	30	25	16	10	8
7400.12.010.035	M10	35	30	16	10	8
7400.12.010.040	M10	40	35	16	10	8
7400.12.010.045	M10	45	32	16	10	8
7400.12.010.050	M10	50	32	16	10	8
7400.12.010.055	M10	55	32	16	10	8
7400.12.010.060	M10	60	32	16	10	8
7400.12.010.065	M10	65	32	16	10	8
7400.12.010.070	M10	70	32	16	10	8
7400.12.010.075	M10	75	32	16	10	8
7400.12.010.080	M10	80	32	16	10	8
7400.12.010.090	M10	90	32	16	10	8
7400.12.010.100	M10	100	32	16	10	8
7400.12.010.110	M10	110	32	16	10	8
7400.12.010.120	M10	120	32	16	10	8
7400.12.010.130	M10	130	32	16	10	8
7400.12.010.150	M10	150	32	16	10	8
7400.12.010.180	M10	180	32	16	10	8
7400.12.010.220	M10	220	32	16	10	8
7400.12.012.040	M12	40	35	18	12	10
7400.12.012.045	M12	45	40	18	12	10
7400.12.012.050	M12	50	45	18	12	10
7400.12.012.055	M12	55	36	18	12	10
7400.12.012.060	M12	60	36	18	12	10
7400.12.012.070	M12	70	36	18	12	10
7400.12.012.080	M12	80	36	18	12	10
7400.12.012.090	M12	90	36	18	12	10
7400.12.012.100	M12	100	36	18	12	10

7400.12.012.110	**M12**	**110**	36	18	12	10
7400.12.012.120	**M12**	**120**	36	18	12	10
7400.12.012.130	**M12**	**130**	36	18	12	10
7400.12.012.140	**M12**	**140**	36	18	12	10
7400.12.012.150	**M12**	**150**	36	18	12	10
7400.12.012.180	**M12**	**180**	36	18	12	10
7400.12.012.220	**M12**	**220**	36	18	12	10
7400.12.016.040	**M16**	**40**	34	24	16	14
7400.12.016.050	**M16**	**50**	44	24	16	14
7400.12.016.060	**M16**	**60**	54	24	16	14
7400.12.016.065	**M16**	**65**	44	24	16	14
7400.12.016.070	**M16**	**70**	44	24	16	14
7400.12.016.080	**M16**	**80**	44	24	16	14
7400.12.016.090	**M16**	**90**	44	24	16	14
7400.12.016.100	**M16**	**100**	44	24	16	14
7400.12.016.110	**M16**	**110**	44	24	16	14
7400.12.016.120	**M16**	**120**	44	24	16	14
7400.12.016.130	**M16**	**130**	44	24	16	14
7400.12.016.140	**M16**	**140**	44	24	16	14
7400.12.016.150	**M16**	**150**	44	24	16	14
7400.12.016.160	**M16**	**160**	44	24	16	14
7400.12.016.180	**M16**	**180**	44	24	16	14
7400.12.016.200	**M16**	**200**	44	24	16	14
7400.12.016.220	**M16**	**220**	44	24	16	14
7400.12.016.240	**M16**	**240**	44	24	16	14
7400.12.016.260	**M16**	**260**	44	24	16	14
7400.12.016.280	**M16**	**280**	44	24	16	14
7400.12.016.300	**M16**	**300**	44	24	16	14
7400.12.020.100	**M20**	**100**	52	30	20	17
7400.12.020.110	**M20**	**110**	52	30	20	17
7400.12.020.120	**M20**	**120**	52	30	20	17
7400.12.020.130	**M20**	**130**	52	30	20	17
7400.12.020.140	**M20**	**140**	52	30	20	17
7400.12.020.150	**M20**	**150**	52	30	20	17
7400.12.020.160	**M20**	**160**	52	30	20	17
7400.12.020.180	**M20**	**180**	52	30	20	17
7400.12.020.190	**M20**	**190**	52	30	20	17
7400.12.020.200	**M20**	**200**	52	30	20	17
7400.12.020.220	**M20**	**220**	52	30	20	17
7400.12.020.230	**M20**	**230**	52	30	20	17
7400.12.020.240	**M20**	**240**	52	30	20	17
7400.12.020.260	**M20**	**260**	52	30	20	17
7400.12.020.280	**M20**	**280**	52	30	20	17
7400.12.020.300	**M20**	**300**	52	30	20	17
7400.12.024.120	**M24**	**120**	60	36	24	19
7400.12.024.130	**M24**	**130**	60	36	24	19
7400.12.024.140	**M24**	**140**	60	36	24	19
7400.12.024.150	**M24**	**150**	60	36	24	19
7400.12.024.160	**M24**	**160**	60	36	24	19
7400.12.024.180	**M24**	**180**	60	36	24	19
7400.12.024.200	**M24**	**200**	60	36	24	19
7400.12.030.140	**M30**	**140**	72	45	30	22
7400.12.030.160	**M30**	**160**	72	45	30	22

MECHANICAL PRESSURE SWITCH S4250

Order-No.: S4250.

Note:

Mechanical pressure switch as diaphragm- or piston execution with a switch output as change-over contact for transformation of pneumatic and hydarulical pressures into an electrical switching signal.
An adjustig screw enables an easy configuration of the switching point. Factory switching point settings are optional.
Additionally, the S4250 series has an adjustable hysteresis, which makes this switch interesting for different applications.
The switch with diaphragm is suitable for media compressed air, neutral fluids or self-lubricating fluids. The standard piston version can be used for self-lubricating fluids, other media upon request. Normally, the process connection consists of glanvanised steel with ¼ thread. Other threads and materials are optional. The switch can be installed in any mounting position.

Attributes:

– adjustable hysteresis
– angled box IP 65
– changeover contact
– different thread variations
– diaphragm versions up to 16 bar
– piston versions up to 320 bar
– RoHS-compliant

Fields of application:

– mechanical enineering
– plant enginieering
– hydraulics
– pneumatics

Adjustment range (bar)[3]	Overload limit (bar)	reproducibility (bar)[1]	measuring principle	switch function changeover contact
0,2..2	60[2]	± 0,04	diaphragm	S4250B071001
0,5..8		± 0,16		S4250B144001
1..16		± 0,32		S4250B076001
10..30	350[2]	± 0,6	piston	S4250B153001
10..80		± 1,6		S4250B866001
10..120		± 2,4		S4250B866001
10.. 160		± 3,2		S4250B082001
20..200		± 4,0		S4250B083001
20..250		± 5,0		S4250B084001
30..320		± 6,4		S4250B085001

[1] The reproducibility refers to the room temperature.
[2] Higher pressures available upon request.
[3] Different adjustment ranges upon request.

ELECTRIC PRESSURE SWITCH WITH FOUR-DIGIT LED DISPLAY

Order-No.: DRSEW25

Note:

Electric pressure switches with SC400/SC410/S420 display are used for continous pressure monitoring. The configuration of the switching point and the re-switching point without pressurisation and the configuration of the contact function (NO/NC), the damping, delay and n-/p-switch is possible. Additionally, authorised personel is able to change the switching point in the menu. For S2410 and S2420 series, the spread of the analog signal up to 20% of the range, is possible.

Switching currents from a few µA up to 500 mA can be switched from output transistors. Long term proved ceramic- or thin film cells provide a good non-repeatability and duarbility, even at high numbers of load cycles. The rotatable display and the optional also rotatable port allow the usage even under challenging mounting conditions.

Due to the high-quality stainless steel case, the tecsis SC400/SC410/SC420 are also suitable for usage under adverse environmental conditions. For higher pressure ranges all parts which touch the medium, consist of stainless steel, therefore the electric pressure switch has almost no media restrictions. The SC400/SC410/SC420 can be versatile used for measuring tasks in hydraulics and pneumatics. When used outdoors, we recommend to use the protection cap AZM90X101010.

Attributes:

– Range from -1 up to 700 bar
– Sensor element thin film cell or ceramic
– Repeatability 0,2 % of the range
– Switching point, reset point and switch function (NO/NC) configurable
– scalable analog output
– p- or n-switching configurable
– integrated password protection
– Damping adjustable up to 2000 ms
– Delay of the switch signal up to 99,99 s
– Min- and max- value-memory

Fields of application:

– hydraulic aggregate
– Vakuum conveyor technology
– Vakuum lifting technology
– Clamping pressure control

Sensor element	Adjustment range (bar)	Overload limit (bar)	Bursting pressure (bar)
Ceramic cell	-1..2	5	6
	-1..3	5	6
	-1..5	10	12
	-1..10	20	25
	0..2	5	6
	0..5	10	12
	0..10	20	25
	0..20	40	50
	0..50	100	120
Thin film cell	0..100	200	800
	0..160	320	1000
	0..250	500	1200
	0..400	800	1700
	0..600	1000	2400
	0..700	1000	2400

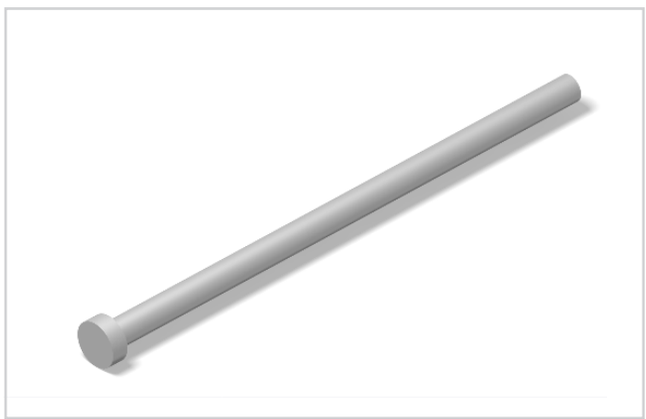
Ejectors

INDEX

Ejectors

EJECTOR PIN DIN 1530, SHAPE AH, HARDENED

Order-No.: 1011.d_1.L

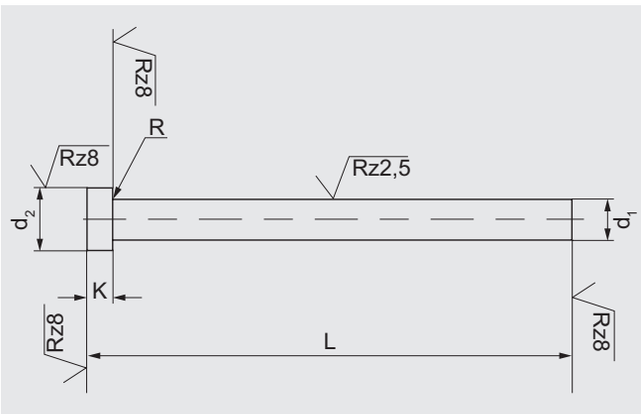


Material:
WS
Hardness: Shaft 60 ± 2 HRC | Head 45 ± 5 HRC

Execution:
DIN 1530, Shank hardened and precision ground. Head hot upset-forged.

Ordering example: d_1 = 4, L = 50
1011.0400.050

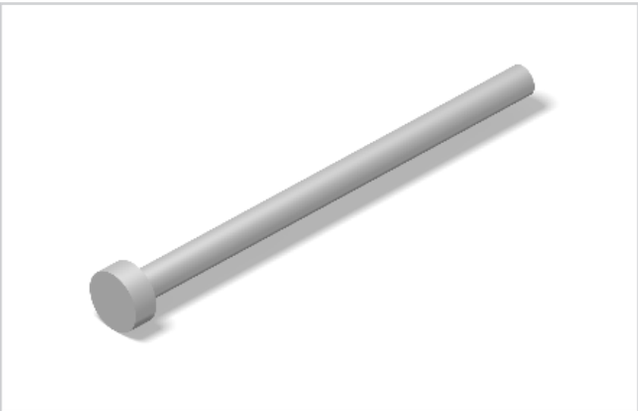
d_1	d_2	K	R	L															
				40	60	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600
1	2,5	1,2	0,2	•	•	•	•	•	•										
1,1				•	•	•	•	•	•										
1,2				•	•	•	•	•	•										
1,3	3	1,5		•	•	•	•	•	•										
1,4				•	•	•	•	•	•										
1,5				•	•	•	•	•	•										
1,6				•	•	•	•	•	•										
1,7				•	•	•	•	•	•										
1,8				•	•	•	•	•	•										
1,9				•	•	•	•	•											
2	4	2		•	•	•	•	•	•	•	•								
2,2							•	•	•	•	•								
2,5	5		0,3	•	•	•	•	•	•	•	•								
2,7							•	•	•	•	•								
3	6	3		•	•	•	•	•	•	•	•	•	•						
3,2							•	•	•	•	•	•							
3,5	7						•	•	•	•	•	•							
3,7							•	•	•	•	•	•							
4	8			•	•	•	•	•	•	•	•	•	•						
4,2							•	•	•	•	•	•							
4,5							•	•	•	•	•	•							
4,7							•	•	•	•	•	•							



d1	d2	K	R	L														
				40	60	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600
5	10			•	•	•	•	•	•	•	•	•	•	•	•				
5,2							•	•	•	•	•	•	•						
5,5							•	•	•	•	•	•	•						
6	12	5	0,5	•	•	•	•	•	•	•	•	•	•	•	•				
6,2							•	•	•	•	•	•	•						
6,5							•	•	•	•	•	•	•	•					
7							•	•	•	•	•	•	•	•					
8	14				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
8,2							•	•	•	•	•	•	•	•	•				
8,5							•	•	•	•	•	•	•	•					
9							•	•	•	•	•	•	•	•					
10	16					•	•	•	•	•	•	•	•	•	•	•	•	•	
10,2							•	•	•	•	•	•	•	•					
10,5							•	•	•	•	•	•	•	•					
11									•	•	•	•	•	•					
12	18	7	0,8			•	•	•	•	•	•	•	•	•	•	•			
12,2								•	•	•	•	•	•						
12,5							•	•	•	•	•	•	•	•					
14	22					•	•	•	•	•	•	•	•	•	•	•			
16							•	•	•	•	•	•	•	•	•	•			
18	24								•	•	•	•	•	•					
20	26	8	1,1						•	•	•	•	•	•	•	•			

EJECTOR PIN DIN 1530, SHAPE A, NITRIDED

Order-No.: 1012. d_1.L

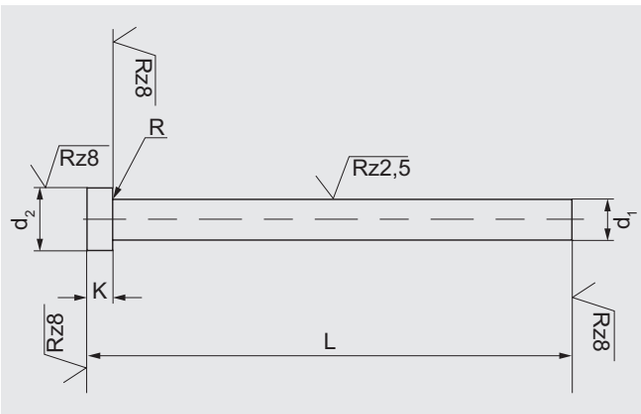


Material:
NWA
Hardness: Shaft* ≥ 950 HV 0,3| Kopf 45 ± 5 HRC
*Owing to thinness of nitrided skin, hardness testing on shank restricted to Vickers only. Test load = 3 N max.
Core strength ≥ 1400 N/mm²

Execution:
DIN 1530, Shank nitrided and precision ground. Head hot upset-forged.

Ordering example: d_1 = 4,5, L = 100
1012.0450.100

d_1	d_2	K	R	L										
				100	125	160	200	250	315	400	500	630	800	1000
1,5	3	1,5	0,2	•	•	•	•	•						
2	4	2		•	•	•	•	•	•	•				
2,2				•	•	•	•	•	•					
2,4				•	•	•	•	•	•					
2,5	5		0,3	•	•	•	•	•	•					
2,7				•	•	•	•	•	•					
2,9				•	•	•	•	•	•					
3	6	3		•	•	•	•	•	•	•	•			
3,2				•	•	•	•	•	•	•				
3,4				•	•	•	•	•	•					
3,5	7			•	•	•	•	•	•	•	•	•		
3,7				•	•	•	•	•	•	•				
3,9				•	•	•	•	•	•					
4	8			•	•	•	•	•	•	•	•	•	•	
4,2				•	•	•	•	•	•	•	•		•	
4,4				•	•	•	•	•	•					
4,5				•	•	•	•	•	•	•	•		•	
4,7				•	•	•	•	•	•					
4,9				•	•	•	•	•	•					
5	10			•	•	•	•	•	•	•	•	•	•	
5,2				•	•	•	•	•	•	•	•	•	•	
5,4				•	•	•	•	•	•					
5,5				•	•	•	•	•	•	•	•	•	•	
5,7				•	•	•	•	•	•					
5,9				•	•	•	•	•	•					
6	12	5	0,5	•	•	•	•	•	•	•	•	•	•	•



d1	d2	K	R	L										
				100	125	160	200	250	315	400	500	630	800	1000
6,2	12	5	0,5	•	•	•	•	•	•	•	•	•	•	
6,5				•	•	•	•	•	•	•	•	•	•	
6,7				•	•	•	•	•	•					
6,9				•	•	•	•	•	•					
7				•	•	•	•	•	•	•	•	•	•	
7,2				•	•	•	•	•	•					
7,8				•	•	•	•	•	•					
8	14			•	•	•	•	•	•	•	•	•	•	•
8,2				•	•	•	•	•	•	•	•	•	•	
8,4				•	•	•	•	•	•					
8,5				•	•	•	•	•	•	•	•	•		
9				•	•	•	•	•	•	•	•	•		
9,7				•	•	•	•	•	•					
10	16			•	•	•	•	•	•	•	•	•	•	•
10,2				•	•	•	•	•	•	•	•	•	•	
10,5				•	•	•	•	•	•	•	•	•		
11				•	•	•	•	•	•	•	•	•		
12	18	7	0,8	•	•	•	•	•	•	•	•	•	•	•
12,2				•	•	•	•	•	•	•	•	•	•	
12,5				•	•	•	•	•	•	•	•	•	•	
14	22			•	•	•	•	•	•	•	•	•	•	•
16				•	•	•	•	•	•	•	•	•	•	•
18	24			•	•	•	•	•	•	•	•	•	•	•
20	26	8	1,1		•	•	•	•	•	•	•	•	•	•
25	32	10				•	•	•	•	•	•	•	•	•
32	40						•	•	•	•	•	•	•	•

EJECTOR PIN DIN 1530, SHAPE D, HARDENED

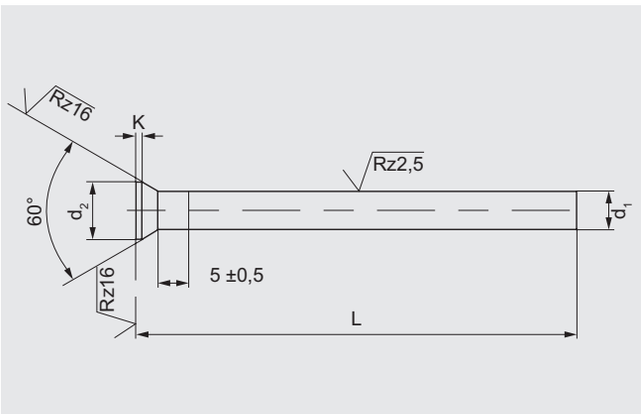
Order-No.: 1021.d_1.L

Material:
WS
Hardness: Shaft 60 ± 2 HRC | Head 45 ± 5 HRC

Execution:
DIN 1530 shape D, Shank hardened and precision ground. Head hot upset-forged.

Ordering example: d_1 = 5,5, L = 80
1021.0550.080

d_1	d_2	K	L									
			40	60	71	80	100	125	160	200	250	315
0,8	1,4	0,5					•	•	•	•		
0,9	1,6						•	•	•	•		
1	1,8		•	•	•	•	•	•	•	•		
1,1					•		•	•	•	•		
1,2	2				•		•	•	•	•		
1,25							•	•	•	•		
1,3					•		•	•	•	•		
1,4	2,2				•		•	•	•	•		
1,5			•	•	•	•	•	•	•	•		
1,6	2,5				•		•	•	•	•		
1,7					•		•	•	•	•		
1,75							•	•	•	•		
1,8	2,8				•		•	•	•	•		
1,9					•		•	•	•	•		
2	3		•	•	•	•	•	•	•	•	•	
2,1	3,2				•		•	•	•	•		
2,2					•		•	•	•	•	•	
2,25							•	•	•	•		
2,3	3,5				•		•	•	•	•		
2,4					•		•	•	•	•		
2,5			•	•	•	•	•	•	•	•	•	
2,6	4				•		•	•	•	•		
2,7					•		•	•	•	•	•	
2,75					•		•	•	•	•		
2,8					•		•	•	•	•		
2,9					•		•	•	•	•		
3	4,5		•	•	•	•	•	•	•	•	•	•
3,1					•		•	•	•	•		
3,2					•		•	•	•	•		



d1	d2	K	L									
			40	60	71	80	100	125	160	200	250	315
3,25					•		•	•	•	•		
3,5	5				•	•	•	•	•	•	•	•
3,6					•		•	•	•	•		
3,75							•	•	•	•		
4	5,5		•	•	•	•	•	•	•	•	•	•
4,1					•		•	•	•	•		
4,2					•		•	•	•	•		
4,25							•	•	•	•		
4,5	6				•		•	•	•	•		
4,6					•		•	•	•	•		
5	6,5		•	•	•	•	•	•	•	•	•	•
5,1					•		•	•	•	•		
5,2					•		•	•	•	•		
5,25							•	•	•	•		
5,5	7			•	•	•	•	•	•	•	•	•
6	8		•	•	•	•	•	•	•	•	•	•
6,2		1				•	•	•	•	•	•	•
6,5	9	1			•	•	•	•	•	•	•	•
7					•	•	•	•	•	•	•	•
7,5	10				•		•	•	•	•	•	•
8				•	•	•	•	•	•	•	•	•
8,2							•	•	•	•	•	•
8,5	11				•		•	•	•	•	•	•
9					•		•	•	•	•	•	•
10	12				•	•	•	•	•	•	•	•
12	14					•	•	•	•	•	•	•
14	16	1,5					•	•	•	•	•	•
16	18						•	•	•	•	•	•

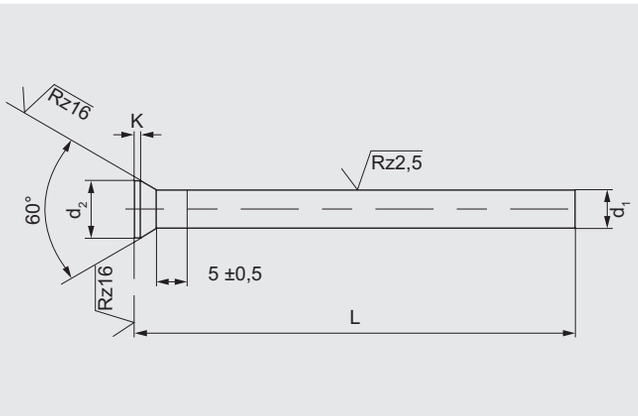
EJECTOR PIN DIN 1530, SHAPE D, NITRIDED

Order-No.: 1022.d_1.L

Material
NWA
Hardness: Shaft* ≥ 950 HV 0,3 | Head 45 ± 5 HRC
*Owing to thinness of nitrided skin, hardness testing on shank restricted to Vickers only. Test load = 3 N max.
Core strength: ≥1400 N/mm²

Execution:
According to DIN 1530, Shank nitrided and precision ground.
Head hot upset-forged.

Ordering example: d_1 = 8, L = 100
1022.0800.100



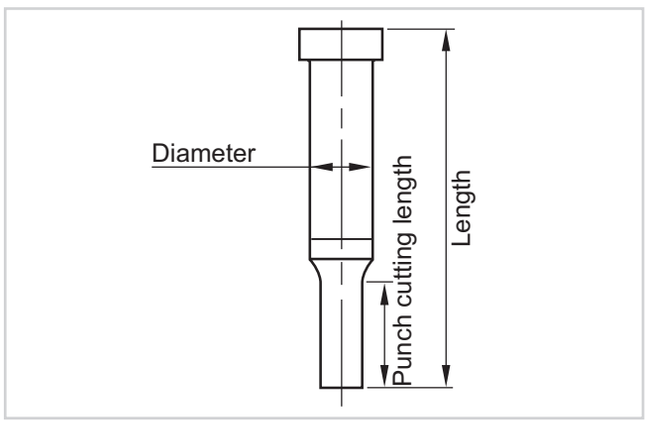
d_1	d_2	K	L					
			100	125	160	200	250	315
3	4,5	0,5	•	•	•	•	•	
4	5,5		•	•	•	•	•	•
5	6,5		•	•	•	•	•	•
6	8		•	•	•	•	•	•
8	10	1	•	•	•	•	•	•
10	12		•	•	•	•	•	•
12	14		•	•	•	•	•	•
14	16	1,5			•	•	•	•
16	18				•	•	•	•

Ground precision components

INDEX

Ground precision components

INDEX
Punches



Type
1 = DIN 9861
2 = ISO 8020
3 = DIN 9844
4 = tapered head 30°
5 = tapered head
6 = heavy execution
7 = BL-light duty
8 = BL-heavy duty

Shape
0 = Blank
1 = Round
2 = Slot
3 = Square
4 = Rectangle
5 = Rectangle R
customer specifi-
cation

P

W

S 212. 13 . 90 . 25 . 0890 . 0560 .0

Punch

1 = Without ejector pin
2 = With ejector pin

Diameter

Length

Punch cutting length

Anti-rotation element
0 = 0°
90 = 90°
180 = 180°
270 = 270°

PUNCH DIN 9861, WITHOUT EJECTOR PIN

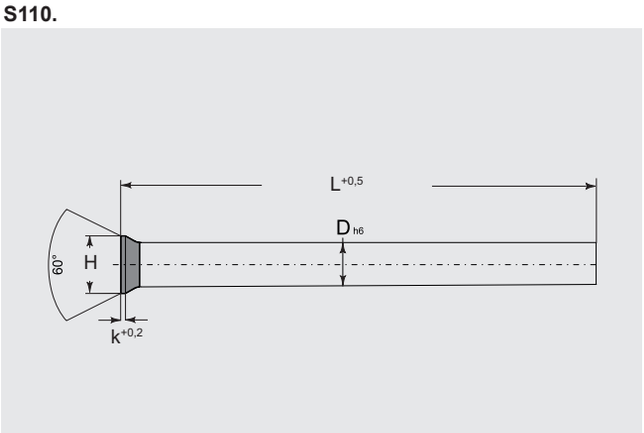
Order-No.: S110.D.L / Order-No.: S11..D.L.L_2.P

Material: HSS / Hardness: Shaft 64 ± 2 HRC / Head 52 ± 3 HRC

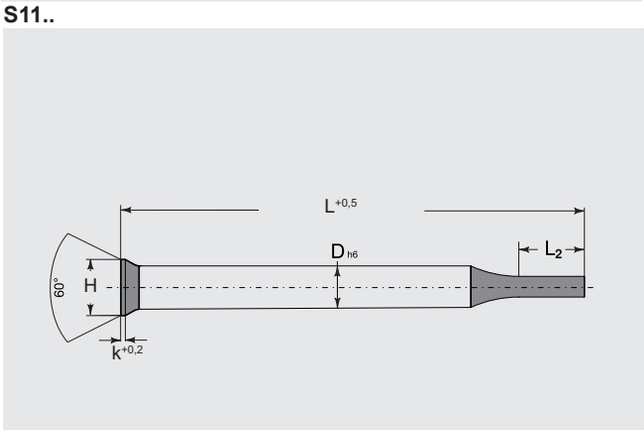
Excution:
Head hot upset-forged and tempered. Shaft and head subsequently precision plunge-ground for perfect concentricity and full interchangeability with replacement punches.

Ordering examples: S110.D.L = S110.0350.080
S11..D.L.L_2.P = S111.0750.080.13.0500

S110.

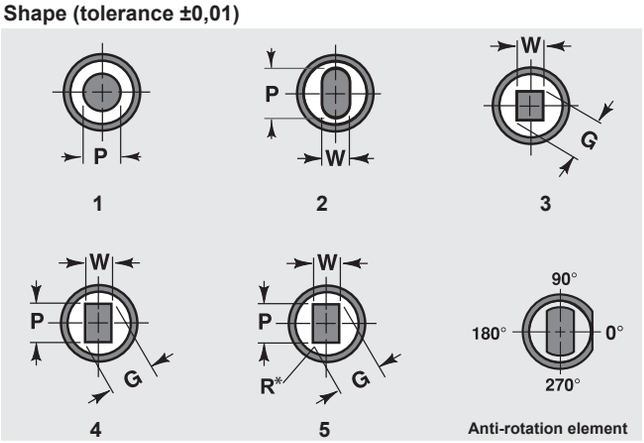


S11..



D	D Gradation	H	k	L	L_2	P
0,50	0,05	0,90	0,2	Stock length: 71, 80, 100 mm. Other lengths and diameters upon request	8, 10, 13, 16, 19, 20, 25, 30 (x Customer requirement)	< d_1 (Customer specification)
0,55		1,00				
0,60		1,10				
0,65		1,20				
0,7 + 0,75		1,30				
0,80 + 0,85		1,40	0,4			
0,89 + 0,95		1,60				
1,0 + 1,1	0,1	1,80	0,5			
1,2 + 1,3		2,00				
1,4 + 1,5		2,20				
1,6 + 1,7		2,50				
1,8 + 1,9		2,80				
2,00		3,00				
2,1 + 2,2		3,20				
2,3 – 2,5		3,50				
2,6 – 2,9		4,00				
3,0 – 3,4		4,50				
3,5 – 3,9		5,00				
4,0 – 4,4		5,50				
4,5 – 4,9		6,00				
5,0 – 5,4		6,50				
5,5 – 5,9		7,00				
6,0 – 6,4		8,00				
6,5 – 6,9		9	1			
7,0 – 7,4						
7,5 – 7,9		10				
8,0 – 8,4						
8,5 – 8,9		11				
9,0 – 9,4						
9,5 – 9,9		12				
10,0 – 10,4						
10,5 – 10,9		13				
11,0 – 11,4						
11,5 – 11,9		14				
12,0 – 12,4						
12,5 – 12,9		15				
13,0 – 13,4			1,5			
13,5 – 13,9		16				
14,0 – 14,4						
14,5 + 15,0	0,5	17,00				
15,5 + 16,0		18,00				
16,5 + 17,0		19,00				
17,5 + 18,0		20,00				
18,5 + 19,0		21,00				
19,5 + 20,0		22,00				

Shape (tolerance ±0,01)



*** Customer requirement**

PUNCH DIN 9861, WITH EJECTOR PIN

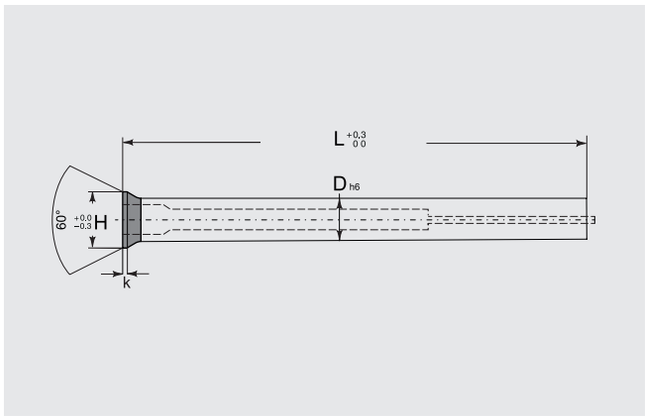
Order-No.: S120.D.L / Order-No.: S12..D.L.L_2.P

Material:
HSS
Hardness: Shaft 64 ± 2 HRC / Head 52 ± 3 HRC

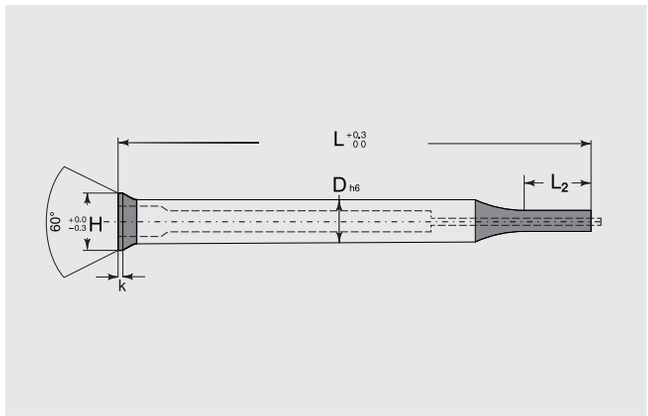
Execution:
Head hot upset-forged and tempered. Shaft and head subsequently precision plunge-ground for perfect concentricity and full interchangeability with replacement punches.

Ordering examples: S120.D.L = S120.0800.0871
S12..D.L.L_2.P = S121.0800.071.10.0350

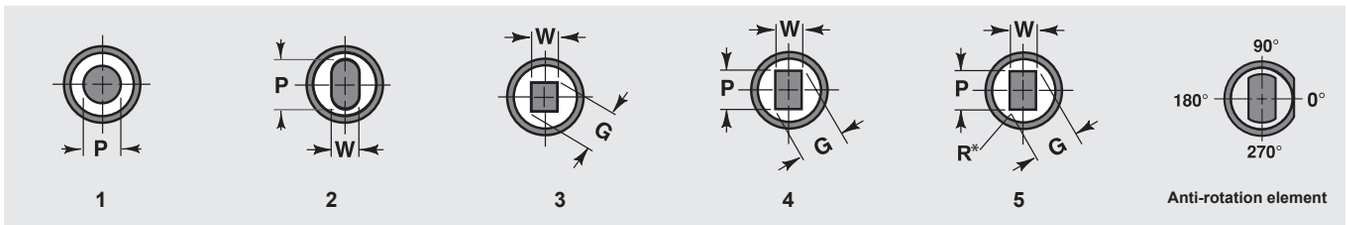
S120.



S12..



Shape (tolerance ±0,01)



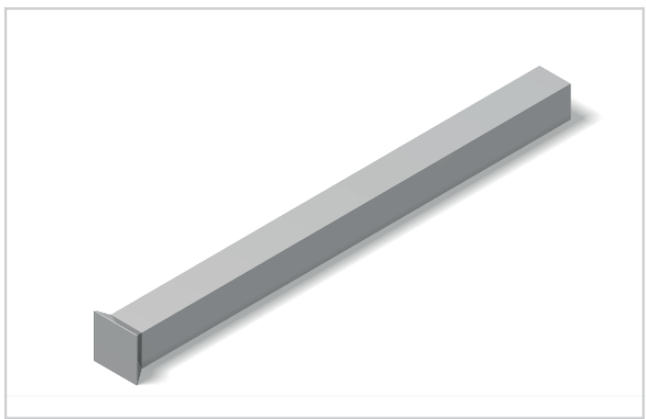
*** Customer requirement**

D	H	k	L	L_2	P	G* max.
5,00	6,50	0,5	**Stock length: 71, 80, 100 mm. Other lengths and diameters upon request.**	**8, 10, 13, 16, 19, 20, 25, 30 (x Customer requirement)**	**1,6 – 4,9**	4,9
6,00	8,00	0,5			**2,5 – 5,9**	5,9
8,00	10,00	1,0			**2,5 – 7,9**	7,9
10,00	12,00	1,0			**4,0 – 9,9**	9,9
12,00	14,00	1,0			**5,0 – 11,9**	11,9
13,00	15,00	1,0			**5,0 – 12,9**	12,9
14,00	16,00	1,5			**5,0 – 13,9**	13,9
16,00	18,00	1,5			**8,0 – 15,9**	15,9
18,00	20,00	1,5			**8,0 – 17,9**	17,9
20,00	22,00	1,5			**12,0 – 19,9**	19,9

*G = P

PUNCH WITH HEAD, SQUARE AND RECTANGULAR, SHAPE B

Order-No.: S1100.a/b

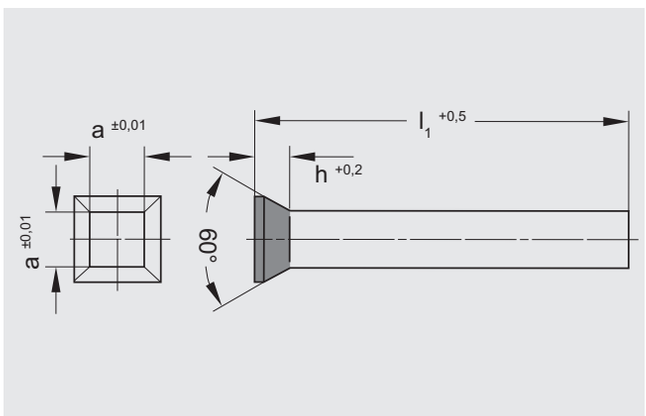


Material:
HSS
Hardness: Shaft 64 + 2 HRC / Head 52 HRC

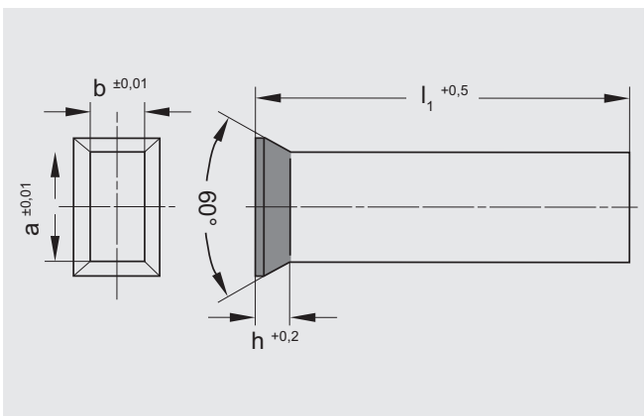
Execution:
Shaft ground.
Head hot upset forged, ground upon request.

Ordering example: a/b = 1
S1100.001

square



rectangular



a	b	h	l_1
1 – 8	1	1,2	71
2 – 10	2	1,4	71
3 – 12	3	1,8	71
4 – 12	4	1,8	71
5 – 15	5	1,8	71
6 – 20	6	2	71
7 – 24	7	2,8	71
8 – 24	8	2,8	71
9 – 28	9	2,8	71
10 – 34	10	2,8	71
12 – 34	12	2,8	71

*Stock length 71 mm other lengths and diameters upon request

PUNCH WITH TAPERED HEAD 30°, WITHOUT EJECTOR PIN

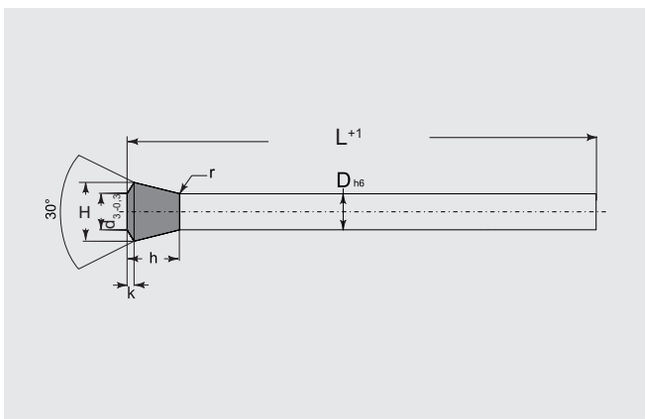
Order-No.: S410.D.L / Order-No.: S41..D.L.L_1.P.W

Material:
HSS
Hardness: Shaft 58 + 2 HRC / Head ≤ 52 HRC

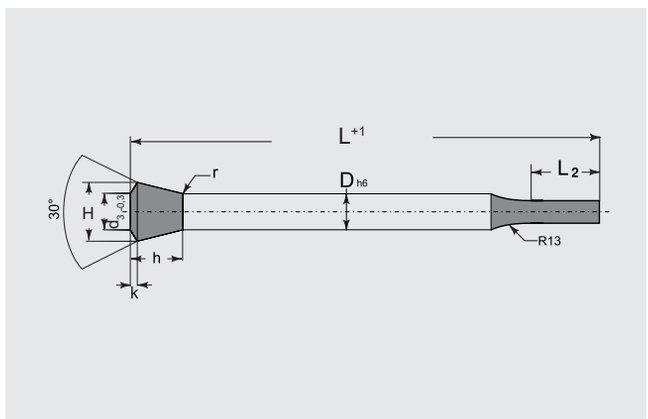
Execution:
Head hot upset-forged and tempered. Shaft and head subsequently precision plunge-ground for perfect concentricity and full interchangeability with replacement punches.

Ordering examples: S410.D.L = S410.09.100
S41..D.L.L_1.P.W = S412.09.100.10.0400.0780

S410.

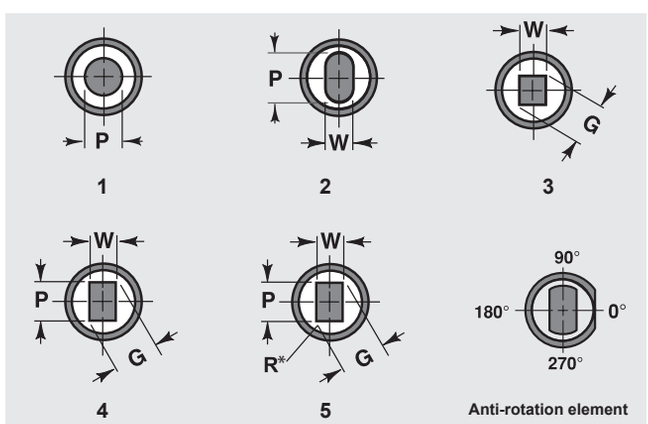


S41..



D	Head					L	L_2	stepped	
	H	d_3	h	k	r			P min.	W/G max.
5	8,55	5	7	1	1	Stock length: 71, 80, 90, 100, 120 mm other lengths and diameters upon request.	8, 10, 13, 16, 19, 20, 25, 30 (x Customer requirement)	1	4,9
6	9,75	6	8	1,5	1,5			1,6	5,9
7	11,8	7	10	1,5	1,5			1,8	6,9
8	12,8	8	10	1,5	1,5			2	7,9
8,5	13,9	8,5	11	1,5	1,5			2,2	8,4
9	14,4	9	11	1,5	1,5			2,6	8,9
9,5	14,8	9,4	11	1,5	1,5			3	9,5
10	15,9	10	12	1,5	1,5			3,5	9,9
11	17,5	11	13	1,5	1,5			3,8	10,9
12	18,7	12	14	1,5	1,5			4,2	11,9
13	20,2	13	15	1,5	1,5			4,5	12,9
14	21,8	14	16	2	2			4,8	13,9
15	23,3	15	17	2	2			5,2	14,9
16	24,6	16	18	2	2			6	15,9
17	26,1	17	19	2	2			6,8	16,9
18	27,6	18	20	2	2			7,2	17,9
20	30,7	20	22	2	2			8	19,9

Shape (tolerance ±0,01)



*** Customer requirement**

PUNCH WITH TAPERED HEAD 30°, WITH EJECTOR PIN

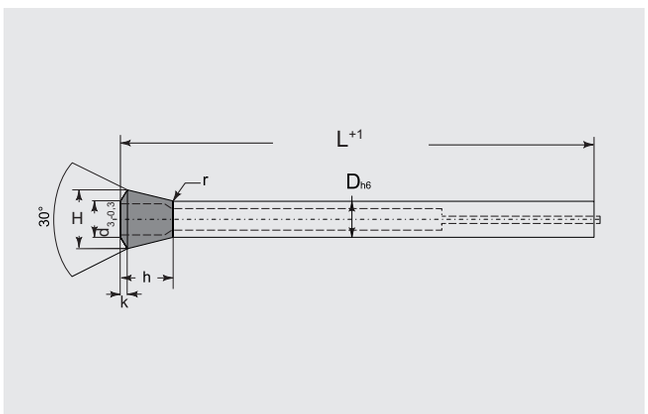
Order-No.: S420.D.L / Order-No.: S42..D.L.L_2.P.W

Material:
HSS
Hardness: Shaft 58 + 2 HRC / Head ≤ 52 HRC

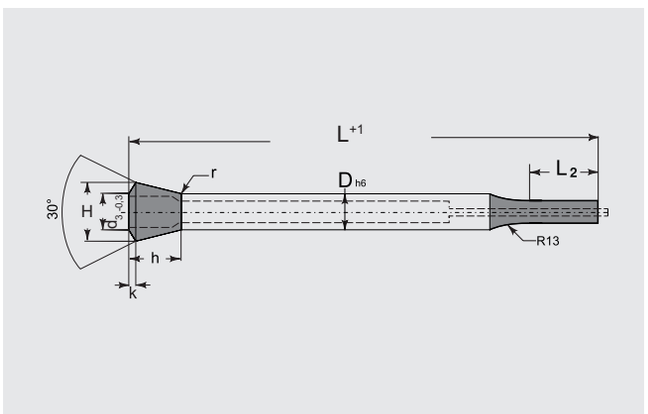
Execution:
Head hot upset-forged and tempered. Shaft and head subsequently precision plunge-ground for perfect concentricity and full interchangeability with replacement punches.

Ordering examples: S420.D.L = S420.09.100
S42..D.L.L_2.P.W = S420.09.100.10.0350.0480

S420.

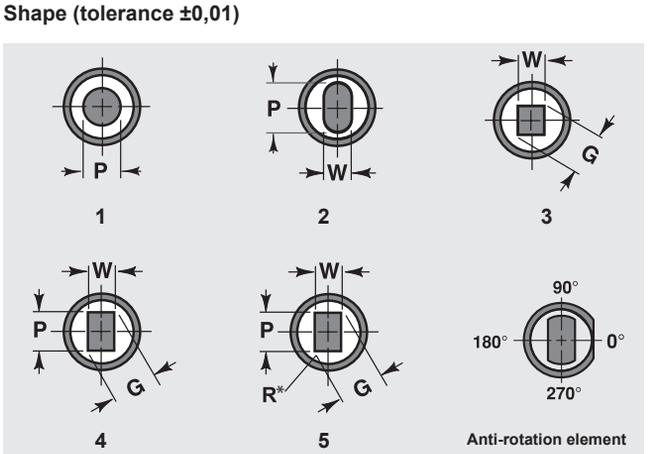


S42..



D	Head					L	L_2	stepped	
	H	d_3	h	k	r			P	W max.
6	9,75	6	8	1,5	1,5	Stock length: 71, 80, 90, 100, 120 mm Other lengths and diameters on request.	8, 10, 13, 16, 19, 20, 25, 30	2,5 – 5,9	5,9
7	11,8	7	10	1,5	1,5			2,5 – 6,9	6,9
8	12,8	8	10	1,5	1,5			2,5 – 7,9	7,9
9	14,4	9	11	1,5	1,5			2,5 – 8,9	8,9
10	15,9	10	12	1,5	1,5			4 – 9,9	9,9
11	17,5	11	13	1,5	1,5			4 – 10,9	10,9
12	18,7	12	14	1,5	1,5			4 – 11,9	11,9
13	20,2	13	15	1,5	1,5			5 – 12,9	12,9
14	21,8	14	16	2	2			5 – 13,9	13,9
15	23,3	15	17	2	2			5 – 14,9	14,9
16	24,6	16	18	2	2			8 – 15,9	15,9
17	26,1	17	19	2	2			8 – 16,9	16,9
18	27,6	18	20	2	2			8 – 17,9	17,9
20	30,7	20	22	2	2			12 – 19,9	19,9

Shape (tolerance ±0,01)



*** Customer requirement**

PUNCH WITH TAPERED HEAD, WITHOUT EJECTOR PIN

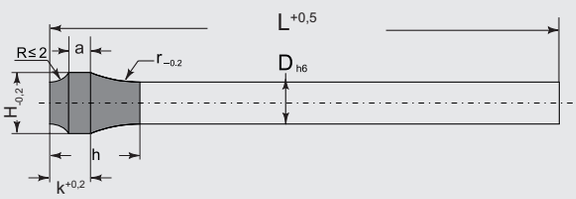
Order-No.: S510.D.L

Material:
HSS
Hardness: Shaft 62-66 HRC / Head 45-55 HRC

Execution: Shaft precision ground. Head subsequently hot upset-forged and tempered.

Ordering example: S510.D.L = S510.0410.080

S510.



D	Head					
	H	h	k	a	r	L
2	3	4,8	3	1	3,5	71, 80, 100 (x = Customer requirement)
2,1	3,2	5,28	3	1	5	
2,2	3,2	5,18	3	1	5	
2,3	3,5	5,37	3	1	5	
2,4	3,5	5,28	3	1	5	
2,5	3,5	5,18	3	1	5	
2,6	4	5,93	3	1	6,5	
2,7	4	5,83	3	1	6,5	
2,8	4	5,73	3	1	6,5	
2,9	4	5,62	3	1	6,5	
3	4,5	6,03	3	1	6,5	
3,1	4,5	5,93	3	1	6,5	
3,2	4,5	5,89	3	1	6,5	
3,3	4,5	5,73	3	1	6,5	
3,4	4,5	5,63	3	1	6,5	
3,5	5	6,38	3	1	8	
3,6	5	6,27	3	1	8	
3,7	5	6,16	3	1	8	
3,8	5	6,04	3	1	8	
3,9	5	5,92	3	1	8	
4	5,5	7,38	4	1,5	8	
4,1	5,5	7,27	4	1,5	8	
4,2	5,5	7,16	4	1,5	8	
4,3	5,5	7,04	4	1,5	8	
4,4	5,5	6,92	4	1,5	8	
4,5	6	7,38	4	1,5	8	
4,6	6	7,27	4	1,5	8	
4,7	6	7,16	4	1,5	8	
4,8	6	7,04	4	1,5	8	
4,9	6	6,93	4	1,5	8	
5	7	8,36	4	1,5	10	
5,1	7	8,25	4	1,5	10	
5,2	7	8,15	4	1,5	10	
5,3	7	8,03	4	1,5	10	
5,4	7	7,93	4	1,5	10	
5,5	8	8,84	4	1,5	10	
5,6	8	8,75	4	1,5	10	
5,7	8	8,66	4	1,5	10	

D	Head					
	H	h	k	a	r	L
5,8	8	8,56	4	1,5	10	71, 80, 100 (x = Customer requirement)
5,9	8	8,46	4	1,5	10	
6	9	9,27	4	1,5	10	
6,1	9	9,19	4	1,5	10	
6,2	9	9,1	4	1,5	10	
6,3	9	9,02	4	1,5	10	
6,4	9	8,93	4	1,5	10	
6,5	10	10,24	4	1,5	12	
7	10	9,81	4	1,5	12	
7,5	11	10,24	4	1,5	12	
8	11	9,81	4	1,5	12	
8,5	13	11,9	4	1,5	15	
9	13	11,48	4	1,5	15	
9,5	14	11,9	4	1,5	15	
10	14	11,48	4	1,5	15	
10,5	15	11,9	4	1,5	15	
11	15	11,48	4	1,5	15	
11,5	16	11,9	4	1,5	15	
12	16	11,48	4	1,5	15	
12,5	17	11,9	4	1,5	15	
13	17	11,48	4	1,5	15	
13,5	18	11,9	4	1,5	15	
14	18	11,48	4	1,5	15	
14,5	19	11,9	4	1,5	15	
15	19	11,48	4	1,5	15	
15,5	20	11,9	4	1,5	15	
16	20	11,48	4	1,5	15	
16,5	21	11,9	4	1,5	15	
17	21	11,48	4	1,5	15	
17,5	22	11,9	4	1,5	15	
18	22	11,48	4	1,5	15	
18,5	23	11,9	4	1,5	15	
19	23	11,48	4	1,5	15	
19,5	25	12,66	4	1,5	15	
20	25	12,29	4	1,5	15	

PUNCH WITH TAPERED HEAD, WITHOUT EJECTOR PIN

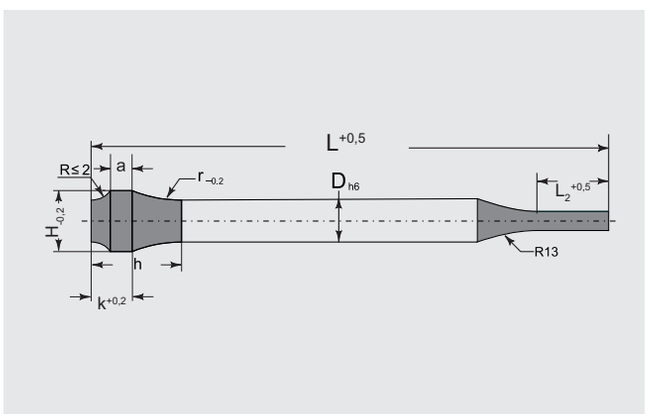
Order-no.: S51..D.L.L_2.P.W

Material:
HSS
Hardness: Shaft 62-66 HRC / Head 45-55 HRC

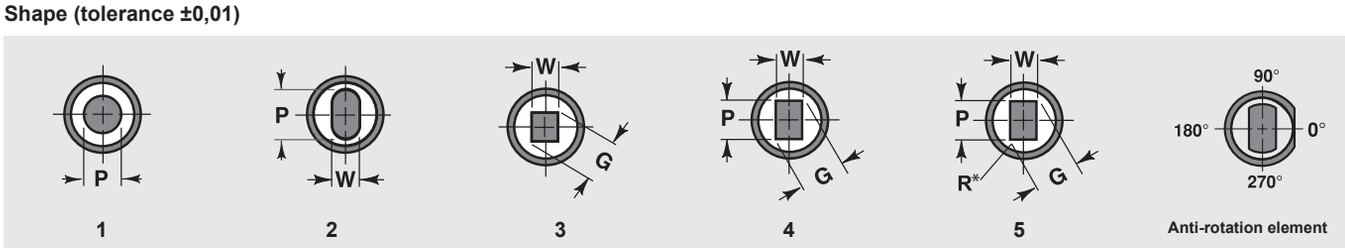
Execution: Shaft precision ground. Head subsequently hot upset-forged and tempered.

Ordering example: S51..D.L.L_2.P.W = S512.8.71.10.0400.0600

S51..



Shape (tolerance ±0,01)



*** Customer requirement**

D	Head					L	L_2	stepped		
								Round	Shape	
	H	h	k	a	r			P	Min W	Max P/G
5	7	8,25	4	1,5	10	71, 80, 90, 100 (x = Customer requirement)	8, 10, 13, 16, 19, 20, 25, 30 (x = Customer requirement)	P = Customer specification	1,6	5
6	9	9,19	4	1,5	10				1,6	6
8	11	9,72	4	1,5	12				2,5	8
10	14	11,4	4	1,5	15				3,2	10
13	17	11,4	4	1,5	15				4,5	13
16	20	11,4	4	1,5	15				6	16
20	25	12,22	4	1,5	15				8	20

PUNCH WITH TAPERED HEAD, WITH EJECTOR PIN

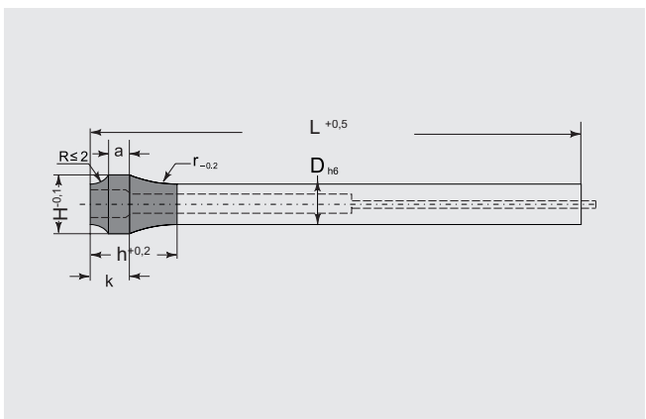
Order-No.: S520.D.L / Order-No.: S52..d_1.L.L_2.P.W

Material:
HSS
Hardness: Shaft 62-66 HRC / Head 45-55 HRC

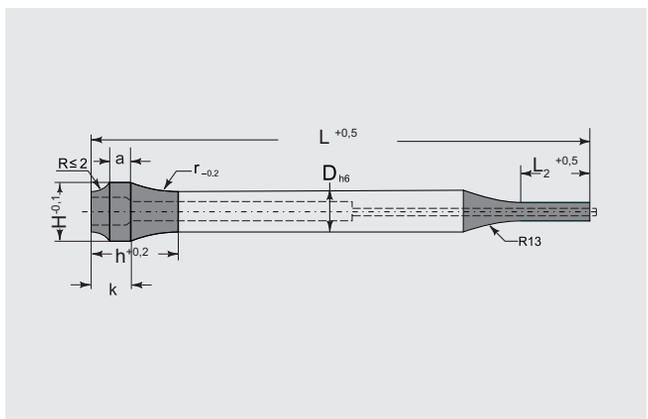
Execution:
Shaft precision ground. Head subsequently hot upset-forged and tempered.

Ordering examples: S520.D.L = S520.10.90
S52..D_1.L.L_2.P.W = S521.10.90.10.0560.0650

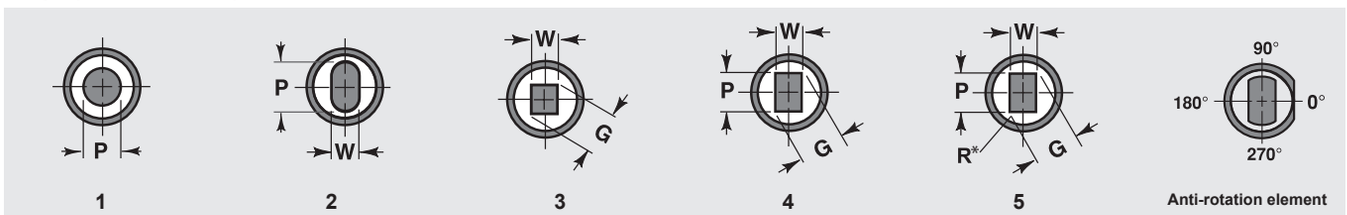
S520.



S52..



Shape (tolerance ±0,01)

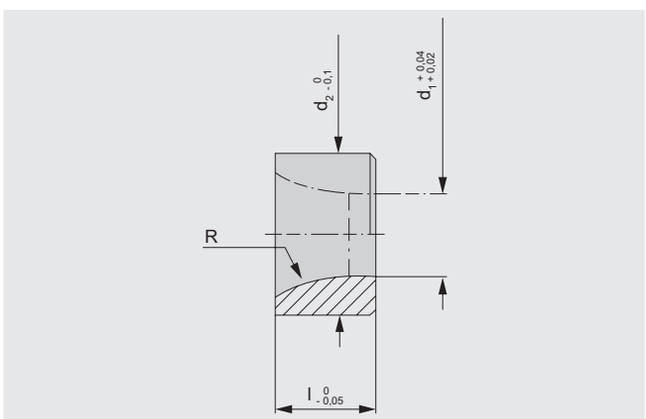


*** Customer requirement**

D	Head					L	L_2	P	Shape	
	H	h	k	a	r				Min W	Max P/G
5	7	8,25	4	1,5	10	71, 80, 90, 100 (x = Customer requirement)	8, 10, 13, 16, 19, 20, 25, 30 (x = Customer requirement)	1,6 – 4,9	1,6	4,9
6	9	9,19	4	1,5	10			2,4 – 5,9	1,6	5,9
8	11	9,72	4	1,5	12			3,2 – 7,9	2,5	7,9
10	14	11,4	4	1,5	15			4,5 – 9,9	3,2	9,9
13	17	11,4	4	1,5	15			6 – 12,9	4,5	12,9
16	20	11,4	4	1,5	15			8 – 15,9	6	15,9
20	25	12,22	4	1,5	15			10 – 19,9	8	19,9

HOLDING SLEEVE FOR PUNCH WITH TAPERED HEAD

Order-No.: S599.d_1

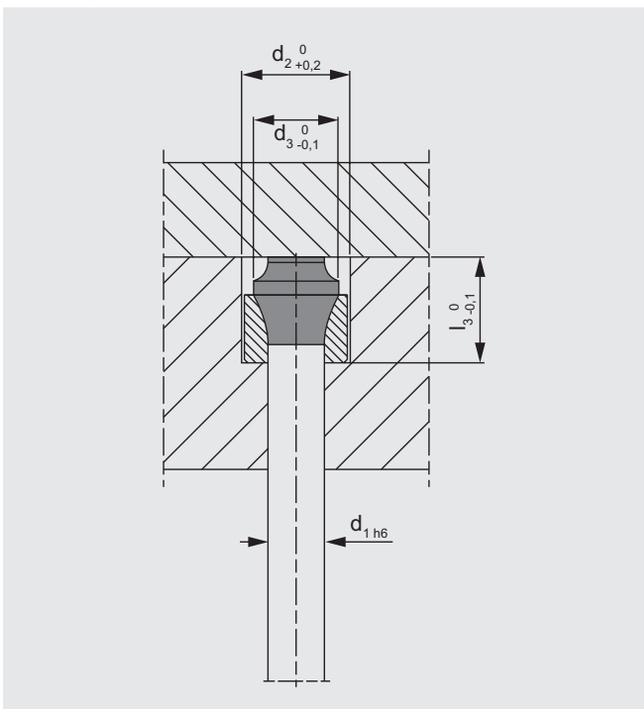


Material:
Tool steel 1.2312

Note:
Replaces the time-consuming insertion of the tapered contour into the punch retainer.

Ordering example: d_1 = 10
S599.010

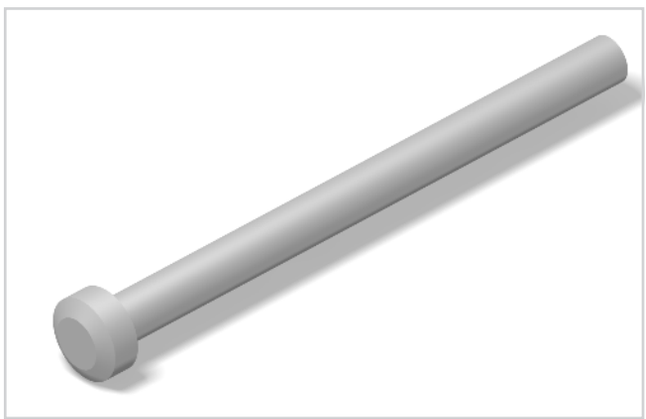
Mounting example:



Order-No.:	d_1	d_2	d_3	l_3	R
S599.03	**3**	6	4,5	7	6,5
S599.04	**4**	7	5,5	8	8
S599.05	**5**	9	7	11	10
S599.055	**5,5**	10	8		
S599.06	**6**	11	9		
S599.065	**6,5**	12	10		12
S599.07	**7**				
S599.075	**7,5**	13	11		
S599.08	**8**			12	
S599.085	**8,5**	15	13		
S599.09	**9**				
S599.010	**10**	16	14	13	15
S599.012	**12**	18	16		
S599.014	**14**	20	18		
S599.016	**16**	22	20		

PUNCH DIN 9844, SHAPE A

Order-No.: S310.D.L

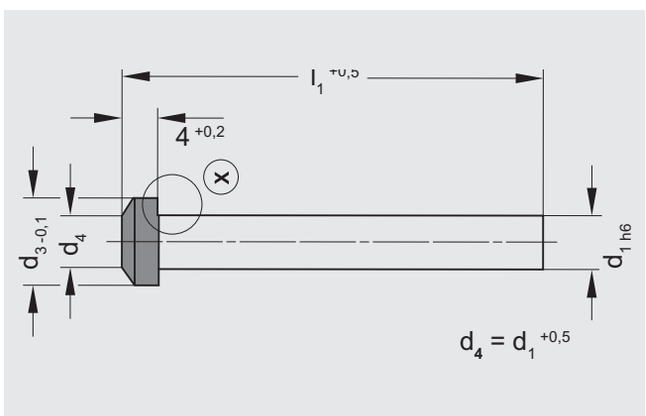


Material:
HSS
Hardness: Shaft 64 ± 2 HRC / Head 52 ± 3 HRC

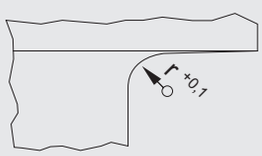
Execution:
Punch head hot upset-forged. Shaft and shoulder precision plunge-ground.

Ordering example: S310.D.L = S310.0590.71

S310.



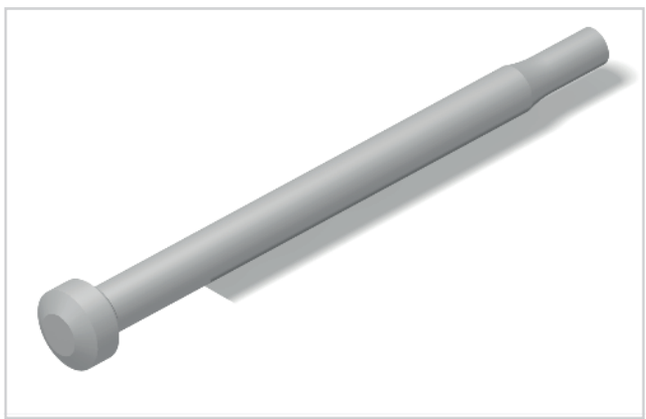
Detail X



d_1	Gradation d_1	d_3	r	L
2 – 2,2	0,1	3,6	0,2	**Stock length: 71, 90 & 112 mm Other lengths and diameters upon request.**
2,3 – 2,5	0,1	4	0,2	
2,6 – 2,8	0,1	4,5	0,3	
2,9 – 3,2	0,1	5	0,3	
3,3 – 3,5	0,1	6	0,3	
3,6 – 4	0,1	7	0,3	
4,1 – 4,5	0,1	8	0,5	
4,6 – 5	0,1	8,5	0,5	
5,1 – 5,4	0,1	9	0,5	
5,5 – 5,9	0,1	9,5	0,5	
6 – 6,4	0,1	10	0,5	
6,5 – 7	0,5	10,8	0,7	
7,5 – 8	0,5	12	0,7	
8,5 – 9	0,5	13	0,7	
9,5 – 10	0,5	14,5	0,7	
10,5 – 11	0,5	16	1	
11,5 – 12,5	0,5	18	1	
13 – 14,5	0,5	20	1	
15 – 16	0,5	22	1	

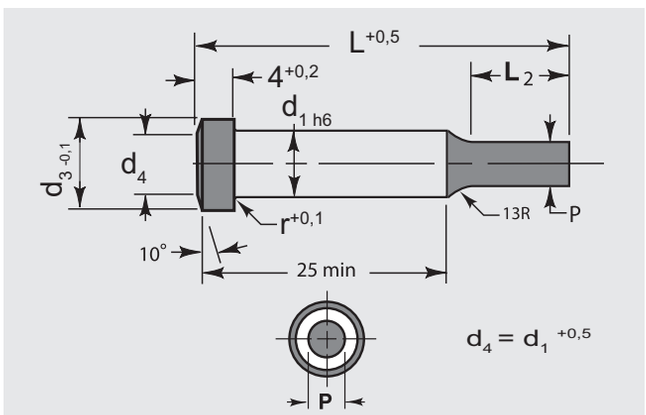
PUNCH DIN 9844, SHAPE B

Order-No.: S311.D.L.L_2.P



Ordering example:
S311.D.L.L_2.P = S311.0500.112.7.0450

S311.



d_1	d_3	r	L	L_2	P
2	3,6	0,2	**71, 90 & 112 (x = Customer requirement)**	**7**	**0,1 – 1,9**
2,5	4	0,2		**7**	**1,95 – 2,4**
3,2	5	0,3		**7**	**2,5 – 3,1**
4	7	0,3		**7**	**3,2 – 3,9**
5	8,5	0,3		**7**	**4 – 4,9**
6,3	10	0,3		**16**	**5 – 6,2**
8	12	0,5		**16**	**6,3 – 7,9**
10	14,5	0,5		**16**	**8 – 9,9**
12,5	18	0,5		**16**	**10 – 12,4**
16	22	0,5		**16**	**12,5 – 15,9**

PUNCH ISO 8020, WITHOUT EJECTOR PIN

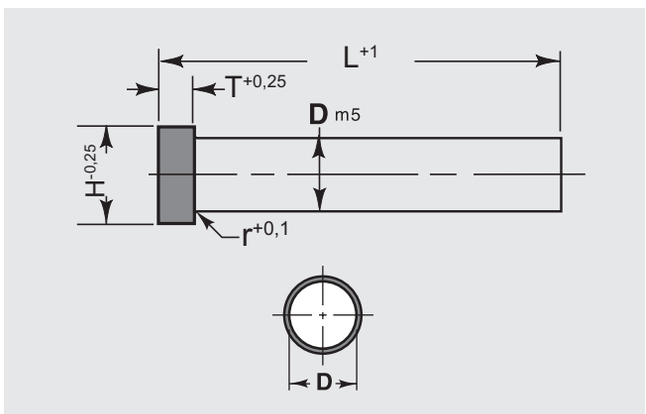
Order-No.: S210.D.L / Order-No.: S21..D.L.L_2.P.W

Material:
HSS
Hardness: Shaft 64 ± 2 HRC / Head 52 ± 5 HRC

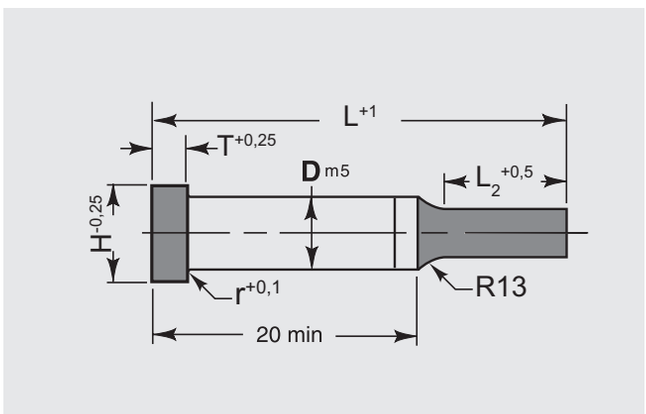
Execution:
Punch head hot upset-forged. Shoulder and shaft fine ground.

Ordering examples: S210.D.L = S210.8.90
S21..D.L.L_2.P.W = S212.8.90.13.0380.0600

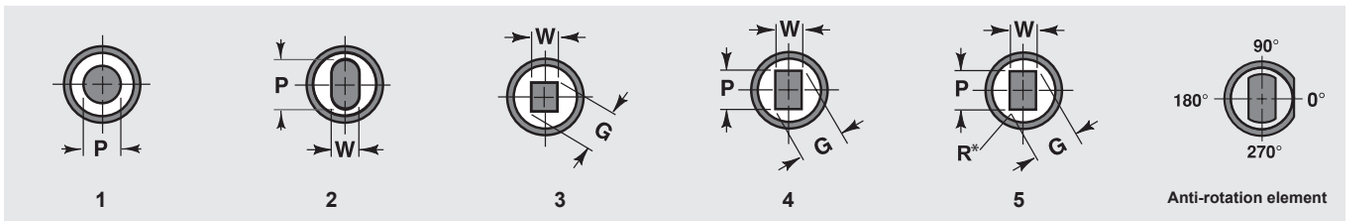
S210.



S21..



Shape (tolerance ±0,01)



*** Customer requirement**

D	Head		L_2*		L											stepped		
																Round	Shape	
	H	T	Std.	Alt.	50	56	60	63	70	71	80	90	100	110	120	P	MinW	Max P/G
4	6	3	8	13	•	•	•	•	•	•	•	•	•	•	•	1,6 – 3,99	1,6	4
5	8	5	13	19	•	•	•	•	•	•	•	•	•	•	•	1.6 – 4,99	1,6	5
6	9	5	13	19	•	•	•	•	•	•	•	•	•	•	•	2,4 – 5,99	1,6	6
8	11	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	3,2 – 7,99	2,5	8
10	13	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	4,5 – 9,99	3,2	10
13	16	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	6 – 12,99	4,5	13
16	19	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	8 – 15,99	6	16
20	23	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	10 – 19,99	8	20
25	28	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	12 – 24,99	9	25
32	35	5	25	30		•	•	•	•	•	•	•	•	•	•	16 – 31,99	10	32
40	43	5	25	30				•	•	•	•	•	•			20 – 39,99	10	40
45	48	5	25	30				•	•	•	•	•	•			25 – 44,99	10	45
50	53	5	25	30				•	•	•	•	•	•			30 – 49,99	10	50
56	59	5	25	30				•	•	•	•	•	•			35 – 55,99	11	56
63	66	5	25	30				•	•	•	•	•	•			40 – 62,99	12	63

▲ L_2 only standard dimensions
*other dimensions upon request.

PUNCH ISO 8020, WITH EJECTOR PIN

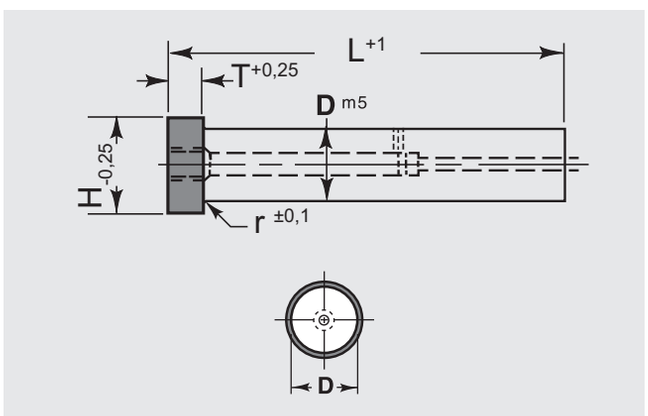
Order-No.: S220.D.L / Order-No.: S22..D.L.L_2.P.W

Material:
HSS
Hardness: Shaft 64 ± 2 HRC / Head 52 ± 5 HRC

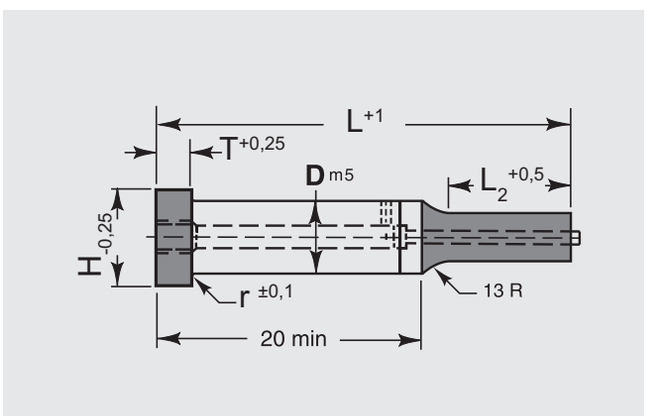
Execution:
Punch head hot upset-forged. Shoulder and shaft fine ground.

Ordering examples: S220.D.L = S220.13.71
S22..D.L.L_2.P.W = S222.13.71.10.0980.0890

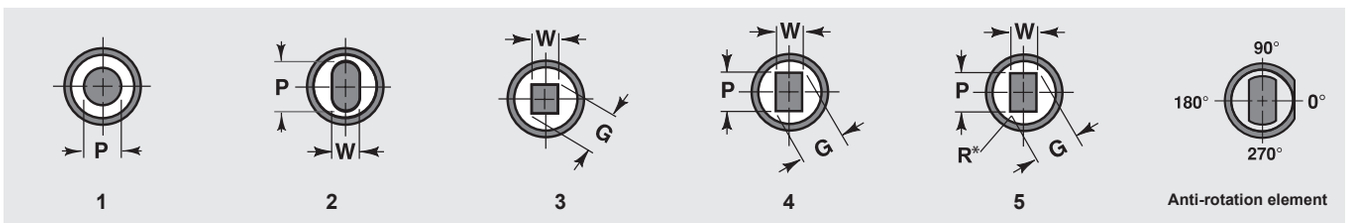
S220.



S22..



Shape (tolerance ±0,01)



*** Customer requirement**

D	Head		L_2*		L											stepped		
																Round	Shape	
	H	T	Std.	Alt.	50	56	60	63	70	71	80	90	100	110	120	P	Min W	Max P/G
5	8	5	13	19	•	•	•	•	•	•	•	•	•	•	•	1.6 – 4,99	1,6	5
6	9	5	13	19	•	•	•	•	•	•	•	•	•	•	•	2,4 – 5,99	2,4	6
8	11	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	3,2 – 7,99	3,2	8
10	13	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	4,5 – 9,99	4,5	10
13	16	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	6 – 12,99	6	13
16	19	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	8 – 15,99	7,2	16
20	23	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	10 – 19,99	8	20
25	28	5	19	25	▲	•	•	•	•	•	•	•	•	•	•	12 – 24,99	9	25
32	35	5	25	30		•	•	•	•	•	•	•	•	•	•	16 – 31,99	10	32
40	43	5	25	30			▲	•	•	•	•	•	•			20 – 39,99	10	40
45	48	5	25	30			▲	•	•	•	•	•	•			25 – 44,99	10	45
50	53	5	25	30			▲	•	•	•	•	•	•			30 – 49,99	10	50
56	59	5	25	30			▲	•	•	•	•	•	•			35 – 55,99	11	56
63	66	5	25	30			▲	•	•	•	•	•	•			40 – 62,99	12	63

▲ L_2 only standard dimensions
*other dimensions upon request.

PUNCH WITH EJECTOR PIN, STEPPED, LONG POINT

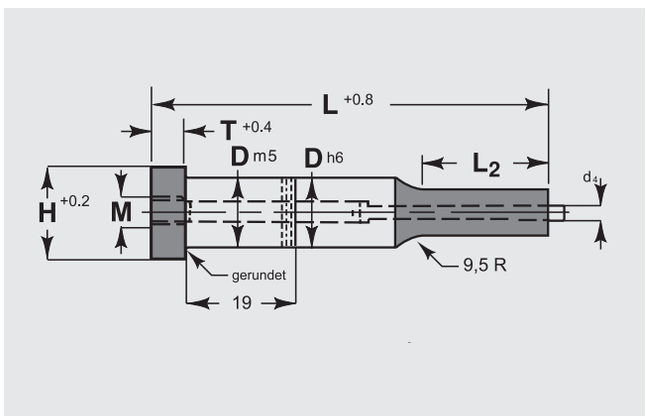
Order-No.: S93..D.L.L_2.P.W

Material:
HSS
Hardness: Shaft 64±2 HRC / Head 52±3 HRC

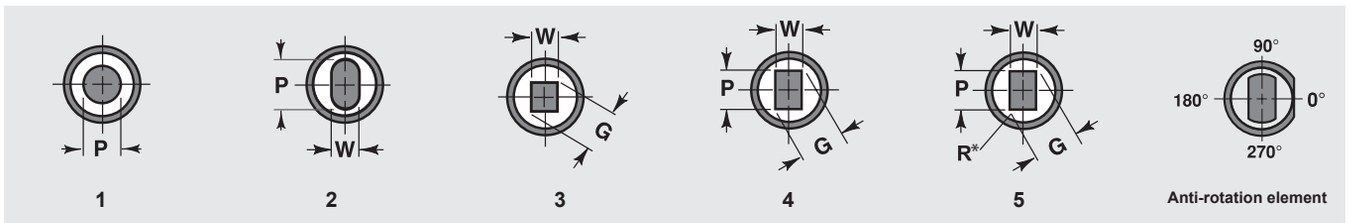
Execution:
Punch head hot upset-forged. Shaft and shoulder precision plunge-ground.
Key flats parallel with longest size of shape, unless otherwise specified.

Ordering example: Shape 2, D = 8, L = 80, L_2 = 28, P= 4,5, W= 5,6
S932.8.80.28.0450.0560

S93..



Shape (tolerance ±0,01)



*** Customer requirement**

D	Head		d_4	L_2	M	L				stepped		
										Round P	Shape	
	H	T				60	71	80	90		Min W	Max P/G
5	8	5	0,9	17,5	M3	•	•			1,6 – 4,9	1,6	4
6	9	5	0,9	25	M3	•	•	•	•	2,3 – 5,9	2,3	5
8	11	5	1,3	28	M4	•	•	•	•	3,2 – 7,9	3,2	7
10	13	5	1,6	28	M4	•	•	•	•	4,8 – 9,9	4,8	9
13	16	5	1,6	28	M5	•	•	•	•	4,8 – 12,9	4,5	12
16	19	6,4	2,1	28	M5	•	•	•	•	4,5 – 15,9	4,5	15
20	24	6,4	2,6	28	M6	•	•	•	•	5,5 – 19,9	4,5	19
25	29	6,4	2,6	28	M6	•	•	•	•	6,5 – 24,9	6,5	24,9

PUNCH WITH EJECTOR PIN, STEPPED, SHORT POINT

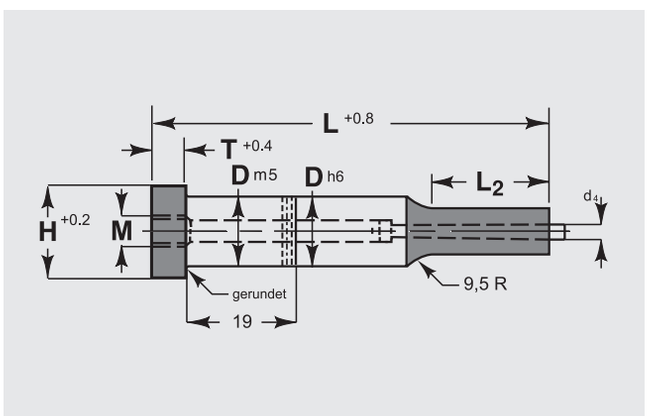
Order-No.: S94..D.L.L_2.P.W

Material:
HSS
Hardness: Shaft 64±2 HRC / Head 52±3 HRC

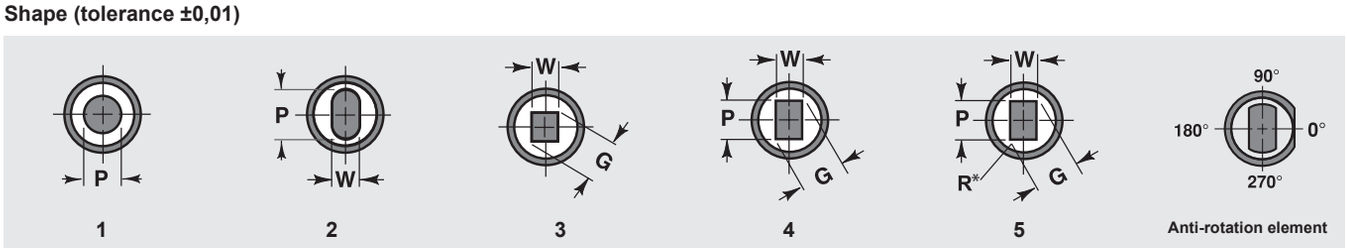
Execution:
Punch head hot upset-forged. Shaft and shoulder precision plunge-ground.
Key flats parallel with longest size of shape, unless otherwise specified.

Ordering example: Form 2, D = 8, L = 80, L_2 = 13, P = 4,5, W = 5,6
S942.8.80.13.0450.0560

S94..



Shape (tolerance ±0,01)



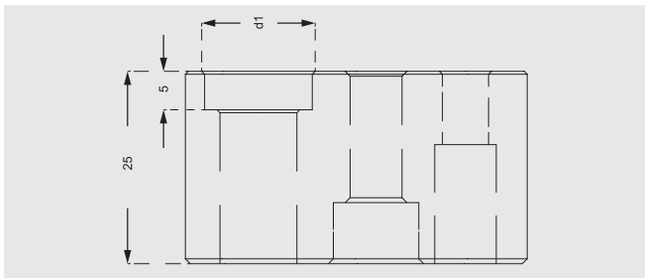
1 2 3 4 5 Anti-rotation element

*** Customer requirement**

D	Head		d_4	L_2	M	L				stepped		
										Round P	Shape	
	H	T				60	71	80	90		MinW	Max P/G
5	8	5	0,9	7	M3	•	•			1,6 – 4,9	1,6	4
6	9	5	0,9	7	M3	•	•	•	•	2,3 – 5,9	2,3	5
8	11	5	1,3	13	M4	•	•	•	•	3,2 – 7,9	3,2	7
10	13	5	1,6	13	M4	•	•	•	•	4,8 – 9,9	4,8	9
13	16	5	1,6	13	M5	•	•	•	•	4,8 – 12,9	4,5	12
16	19	6,4	2,1	13	M5	•	•	•	•	4,5 – 15,9	4,5	15
20	24	6,4	2,6	13	M6	•	•	•	•	5,5 – 19,9	4,5	19
25	29	6,4	2,6	13	M6	•	•	•	•	6,5 – 24,9	6,5	24,9

TRIANGLE RETAINER, FOR PUNCHES ISO 8020

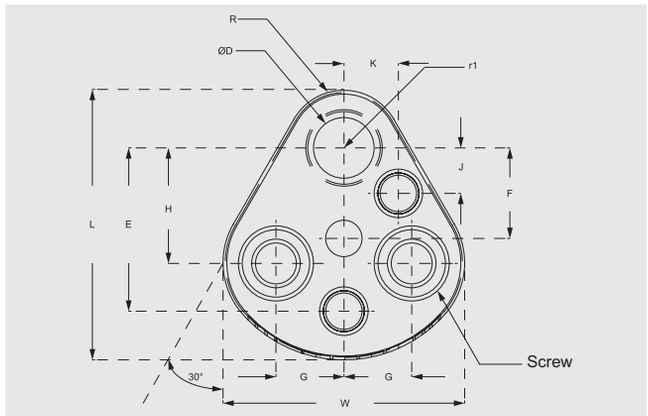
Order-No.: S231.D. / Order-No.: S232.D.

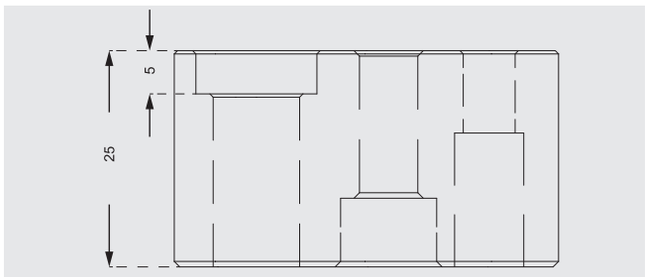


Ordering example: D = 10
S231.010.

D	r_1	L	W	R	H	J	K	G	E	F	Scr.
10	14	44,5	39,9	9,5	19,05	7,5	9	11,12	26,924	16	M8
13	17	50,8	48,3	12,7	19,05	6,5	12	14,27	29,972	16	M8
16	20	54	51,6	14,3	19,05	6	13,5	15,87	31,75	16	M8
20	24	60,3	58,2	17,5	19,05	5	16,5	17,47	33,528	20,5	M10
25	29	69,9	66,5	22,2	23,82	7	22	19,84	40,64	25	M12
32	36	69,9	66,5	22,2	23,82	7	22	19,84	40,64	27,5	M12

S231. without anti-rotation element

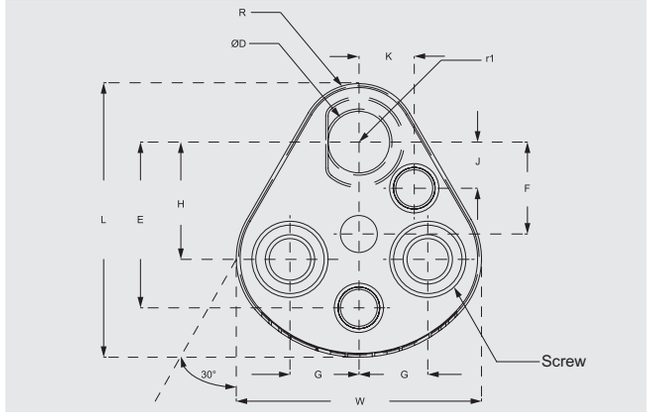




Ordering example: D = 10
S232.010.

D	r_1	L	W	R	H	J	K	G	E	F	Scr.
10	7	44,5	39,9	9,5	19,05	7,5	9	11,12	26,924	16	M8
13	8,5	50,8	48,3	12,7	19,05	6,5	12	14,27	29,972	16	M8
16	10	54	51,6	14,3	19,05	6	13,5	15,87	31,75	16	M8
20	12	60,3	58,2	17,5	19,05	5	16,5	17,47	33,528	20,5	M10
25	14,5	69,9	66,5	22,2	23,82	7	22	19,84	40,64	25	M12
32	18	69,9	66,5	22,2	23,82	7	22	19,84	40,64	27,5	M12

S232. with anti-rotation element

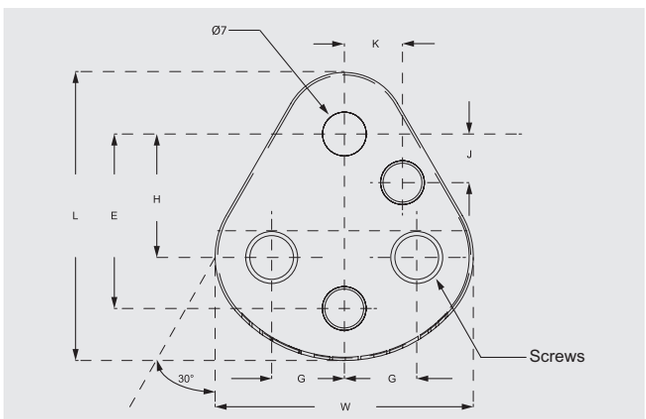


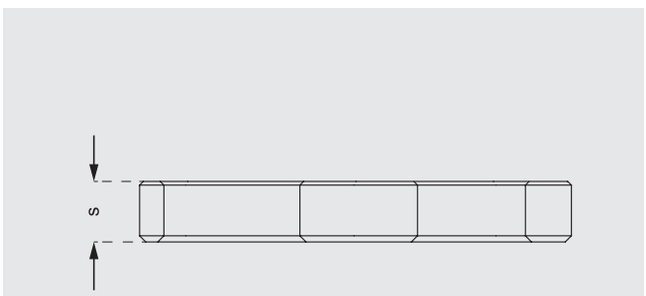
PRESSURE PLATES FOR PUNCHES ISO 8020

Order-No.: S233.D.s.

Ordering example: D = 10, s = 4,8
S233.010.48

S233.



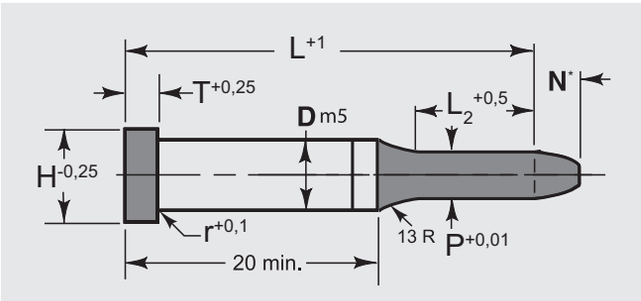


Order-No.:	D	s	L	W	R	H	J	K	G	E	F	Screw
S233.010	**10**	**1,8 4,8 6**	44,5	39,9	9,5	19,05	7,5	9	11,12	26,924	16	M8
S233.013	**13**	**1,8 4,8 6**	50,8	48,3	12,7	19,05	6,5	12	14,27	29,972	16	M8
S233.016	**16**	**1,8 4,8 6**	54	51,6	14,3	19,05	6	13,5	15,87	31,75	16	M8
S233.020	**20**	**1,8 4,8 6**	60,3	58,2	17,5	19,05	5	16,5	17,47	33,528	20,5	M10
S233.025	**25**	**1,8 4,8 6**	69,9	66,5	22,2	23,82	7	22	19,84	40,64	25	M12
S233.032	**32**	**1,8 4,8 6**	69,9	66,5	22,2	23,82	7	22	19,84	40,64	27,5	M12

PILOT PIN WITH TAPERED TIP

Order-No.: S216.D.L.L_2.P

S216.



Material: HSS / Hardness: Shaft 64 ± 2 HRC / Head 52 ± 5 HRC

Execution:
Punch head hot upset-forged. Shoulder and shaft fine ground.

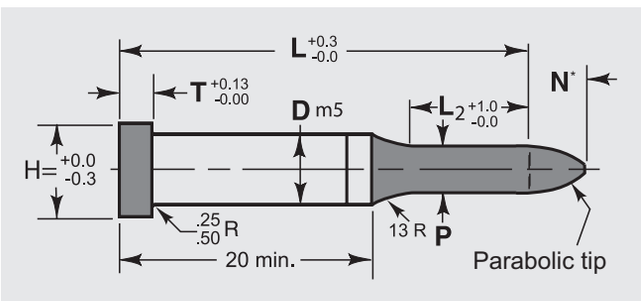
Ordering example: S216.D.L.L_2.P = S216.10.82.21.0680

D	Head		L_2			L								N* Dim.	P
	H	T	std.	alt.		63	71	80	90	100	110	125	140		
5	8	5	13			•	•							4	1,0 – 4,9
6	9	5	13			•	•	•						5	1,6 – 5,9
8	11	5	13			•	•	•	•					6	2,5 – 7,9
10	13	5	13	19		•	•	•	•	•	•			8	4,0 – 9,9
13	16	5	13	19		•	•	•	•	•	•	•		10	5,0 – 12,9
16	19	5	13	19	25		•	•	•	•	•	•	•	15	8,0 – 15,9
20	23	5	13	19	25		•	•	•	•	•	•	•	20	12,0 – 19,9
25	28	5	13	19	25		•	•	•	•	•	•	•	25	16,5 – 24,9
32	35	5	19	25				•	•	•	•	•	•	30	20,0 – 31,9

PILOT PIN WITH PARABOLIC TIP

Order-No.: S217.D.L.L_2.P

S217.



Material: HSS / Hardness: Shaft 64 ± 2 HRC / Head 52 ± 5 HRC

Execution:
Punch head hot upset-forged. Shoulder and shaft fine ground.

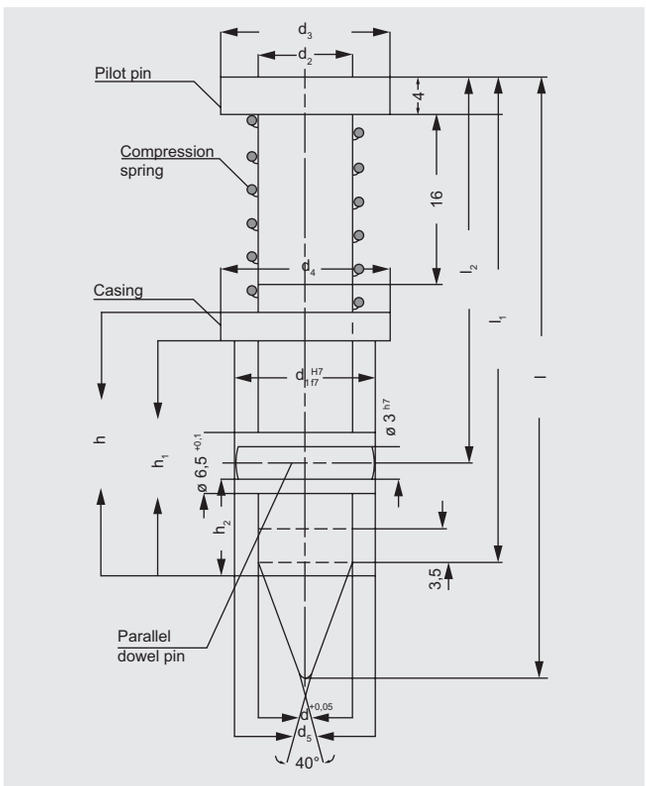
Ordering example: S217.D.L.L_2.P = S217.10.82.21.0680

D	Head		L_2		L								N* Dim.	P
	H	T	Std.	Alt.	65	72	73	82	92	102	112	127		
8	11	5	21	27	•	•	•	•	•	•	•		7	2,45 – 8
10	13	5	21	27	•	•	•	•	•	•	•	•	8	4,85 – 10
13	16	5	21	27	•	•	•	•	•	•	•	•	10	6,30 – 13
16	19	5	21	27	•	•	•	•	•	•	•	•	15	9,95 – 16
20	23	5	21	27	•	•	•	•	•	•	•	•	20	13,60 – 20
25	28	5	21	27	•	•	•	•	•	•	•		25	17,25 – 25
32	35	5	21	32	•	•	•	•	•	•	•		30	20,85 – 32

*special dimensions upon request.

PILOT UNIT ACCORDING TO DAIMLER-STANDARD

Order-No.: 555.d.



Note:
The pilot unit consists of:
Pilot pin, sleeve, compression spring, dowel pin.
The pilot unit provides exact positioning of sheet metal parts.
There are 2 sizes.
The pilot unit 10 (2276.1.) can used for a hole diameter of 5 to 10 mm and is available as a finished item, 9.8 mm diameter.
The pilot unit 16 (2276.2.) is used for diameter > 10 - 16 mm and is available as a finished item, 15.8 mm diameter.
Smaller diameters have to be ground by the tool making department.

Ordering example: d = 9,8,
555.0980.

Order-No.:	d	d_1	d_2	d_3	d_4	d_5	h	h_1	h_2	l_1	l_2	l	Spring force preloaded (daN)	Spring force pressed (daN)
555.0980	**9,8**	10	10	18	18	15	28	25	12	47,5	39,3	63,2	4,9	6,2
555.1580	**15,8**	16	16	24	30	26	28	25	12	54,5	46,3	72,5	4,8	5,6

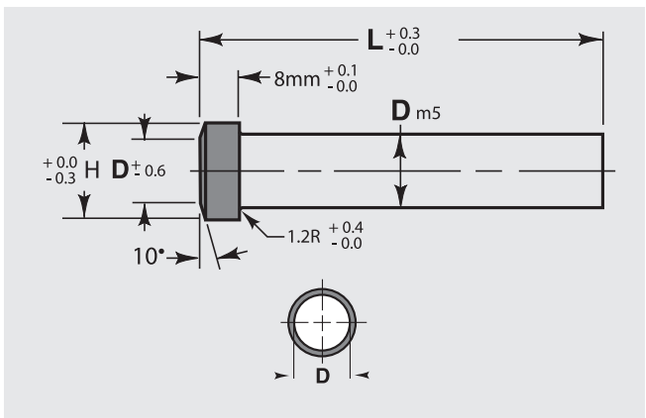
PUNCH, HEAVY EXECUTION, WITHOUT EJECTOR PIN

Order-No.: S610.D.L / Order-No.: S61..D.L.L_2.P.W

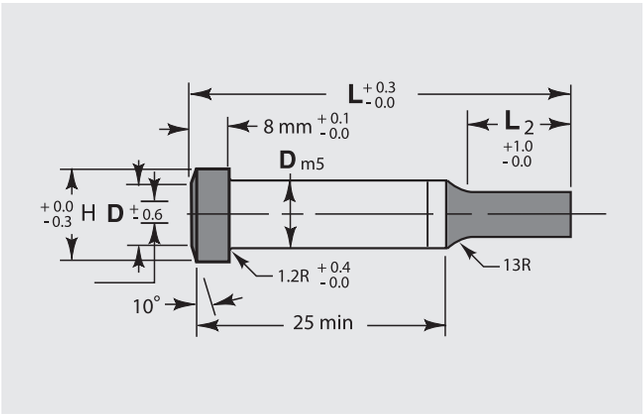
Material:
CP11 – 411

Ordering examples: S610.D.L = S610.10.90
S61..D.L.L_2.P.W = S612.10.90.19.0680.0400

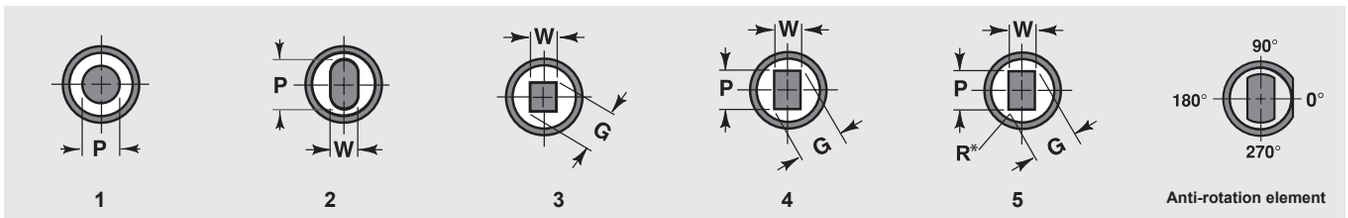
S610.



S61...



Shape (tolerance ±0,01)



*** Customer requirement**

D	L_2			L						stepped		
										Round P	Shape	
	Std.	Alt.	Alt.	50	63	71	80	90	100		Min. W	Max. P/G
8	13	10		•	•	•	•	•	•	2,1 – 5,97	2,1	5,97
10	19	10		•	•	•	•	•	•	2,1 – 9,97	2,1	9,97
13	19	13	25	•	•	•	•	•	•	5 – 12,97	4,5	12,97
16	19	13	25	•	•	•	•	•	•	8 – 15,97	6	15,97
20	19	13	25	•	•	•	•	•	•	13 – 19,97	8	19,97
25	19	13	25	•	•	•	•	•	•	16 – 24,97	10	24,97

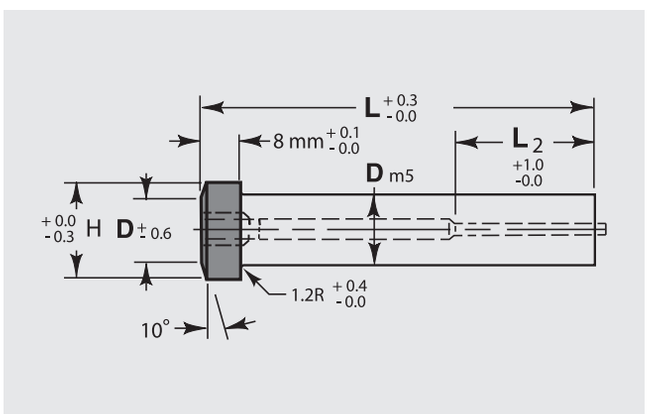
PUNCH, HEAVY EXECUTION, WITH EJECTOR PIN

Order-No.: S620.D.L / Order-No.: S62..D.L.L_2.P.W

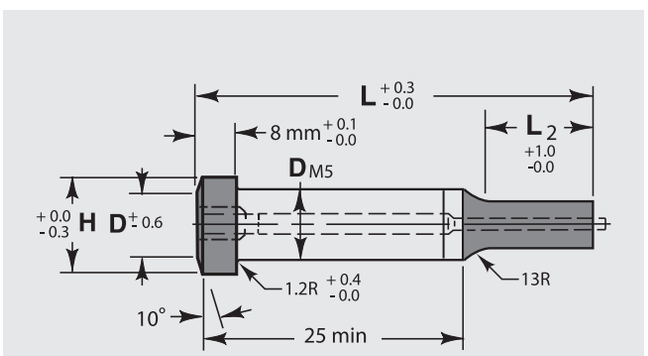
Material:
CP11 – 411

Ordering examples: S620.D.L = S620.10.90
S62..D.L.L_2.P.W = S622.10.90.13.0800.0600

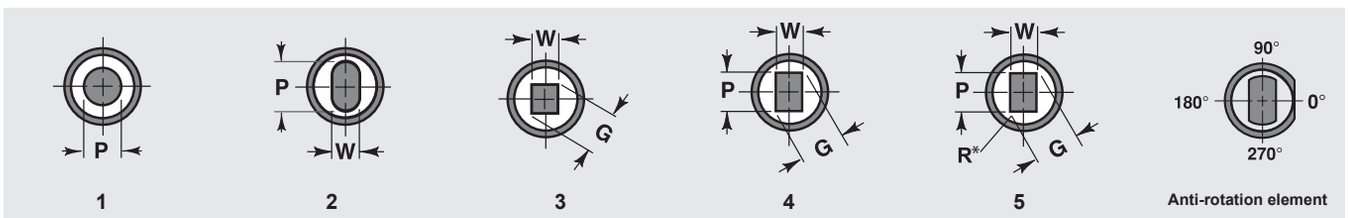
S620.



S62...



Shape (tolerance ±0,01)



*** Customer requirement**

D	H	L_2		L						stepped		
										Round P	Shape	
		Std.	Alt.	50	60	63	80	90	100		Min. W	Max. P/G
8	13	13	19	•	•	•	•	•	•	4 – 7,99	4	8
10	15	13	19	•	•	•	•	•	•	5 – 9,99	5	10
13	18	13	19	•	•	•	•	•	•	6 – 12,99	6	13
16	21	19	25	•	•	•	•	•	•	10 – 15,99	6	16
20	25	19	25	•	•	•	•	•	•	13 – 19,99	6	20
25	30	19	25	•	•	•	•	•	•	18 – 24,99	6	25

BALL LOCK PUNCH, LIGHT DUTY, WITHOUT EJECTOR PIN

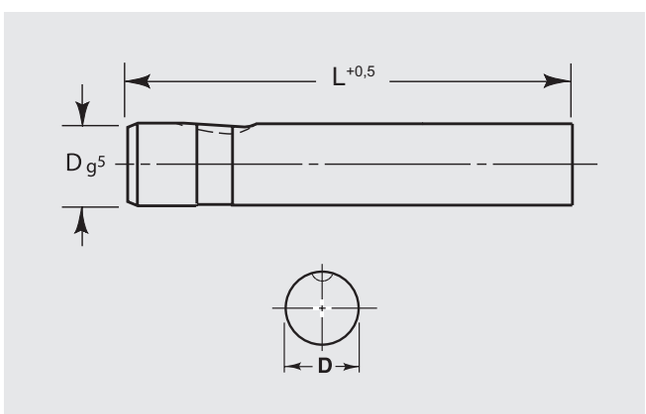
Order-No.: S710.D.L / Order-No.: S71..D.L.L_2.P.W

Material:
HSS
Hardness: Shaft 64 ± 2 HRC

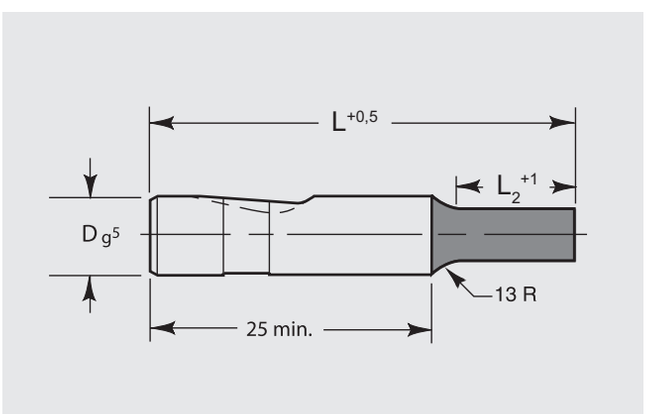
Execution:
Shaft fine ground.
Special dimensions on request

Ordering examples: S710.D.L = S710.16.100
S71..D.L.L_2.P.W = S712.16.100.19.1300.1000

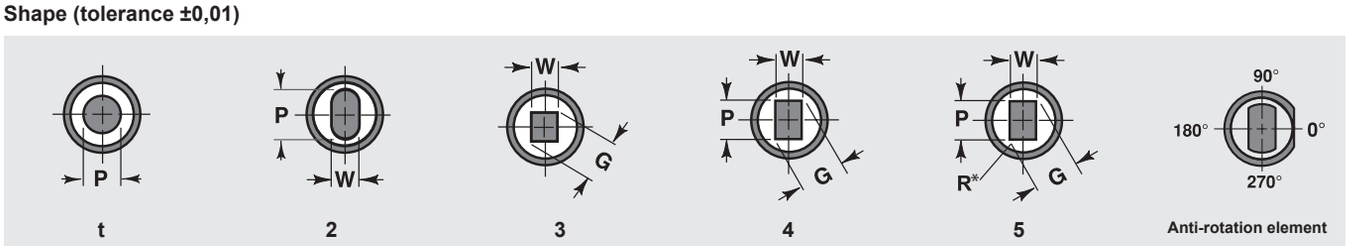
S710.



S71...



Shape (tolerance ±0,01)



*** Customer request**

D	L_2			L					stepped		
									Round	Shape	
	Std.	Alt.	Alt.	63	71	80	90	100	P	Min. W	Max. P/G
6	13	10		•	•	•	•	•	2,1 – 5,97	2,1	5,97
10	19	10		•	•	•	•	•	2,1 – 9,97	2,1	9,97
13	19	13	25	•	•	•	•	•	5 – 12,97	4,5	12,97
16	19	13	25	•	•	•	•	•	8 – 15,97	6	15,97
20	19	13	25	•	•	•	•	•	13 – 19,97	8	19,97
25	19	13	25	•	•	•	•	•	16 – 24,97	10	24,97
32	19	13	25		•	•	•	•	24 – 31,97	12,5	31,97
38	25	19	30			•	•	•	30 – 37,97	14	37,97

BALL LOCK PUNCH, LIGHT DUTY, WITH EJECTOR PIN

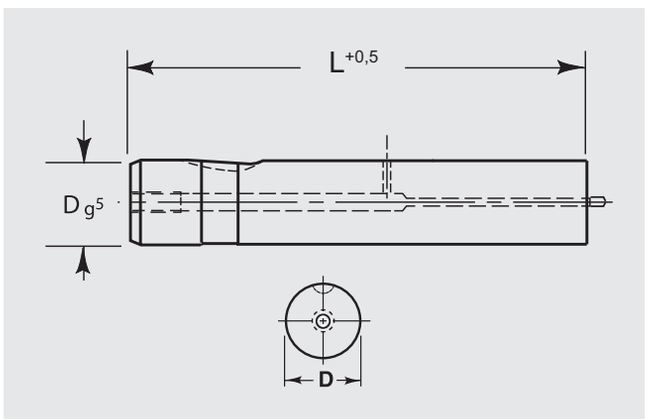
Order-No.: S720.D.L / Order-No.: S72..D.L.L_2.P.W

Material:
HSS
Hardness: Shaft 64 ± 2 HRC

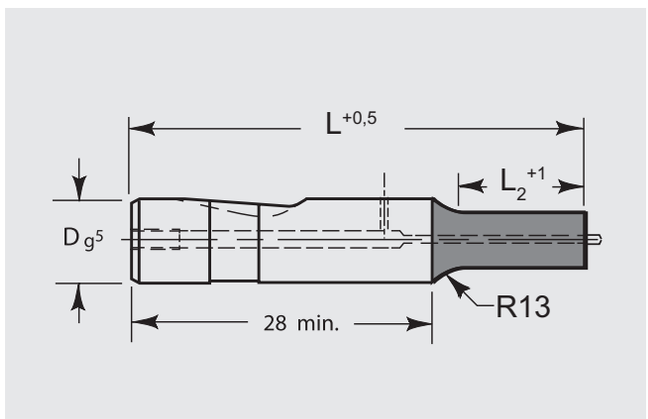
Execution:
Shaft fine ground.
Special dimensions on request

Ordering examples: S720.D.L = S720.16.90
S72..D.L.L_2.P.W = S722.16.90.19.1400.0800

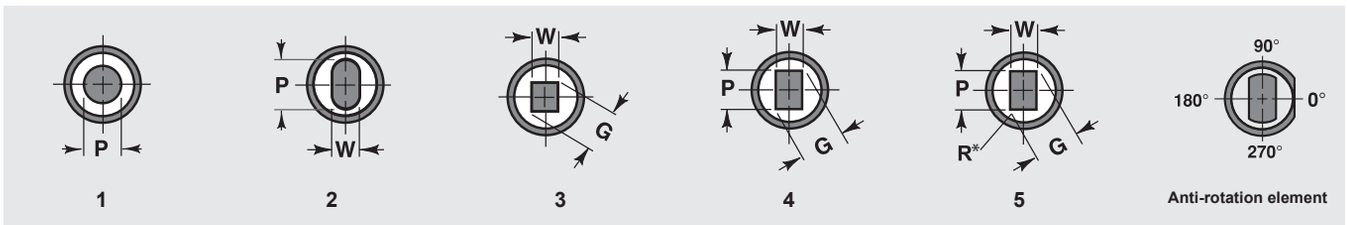
S720.



S72...



Shape (tolerance ±0,01)



1 2 3 4 5

Anti-rotation element

*** Customer request**

D	L_2			L					stepped		
									Round	Shape	
	Std.	Alt.	Alt.	63	71	80	90	100	P	Min. W	Max. P/G
6	13	10		•	•	•	•	•	2,1 – 5,97	2,1	5,97
10	19	10		•	•	•	•	•	2,1 – 9,97	2,1	9,97
13	19	13	25	•	•	•	•	•	5 – 12,97	4,5	12,97
16	19	13	25	•	•	•	•	•	8 – 15,97	6	15,97
20	19	13	25	•	•	•	•	•	13 – 19,97	8	19,97
25	19	13	25	•	•	•	•	•	16 – 24,97	10	24,97
32	19	13	25		•	•	•	•	24 – 31,97	12,5	31,97
38	25	19	30			•	•	•	30 – 37,97	14	37,97

BALL LOCK PUNCH, LIGHT DUTY, AUTOMOTIVE-STANDARD, WITH/WITHOUT EJECTOR PIN

Order-No.: Z710./Z71.. / Order-No.: Z720/Z72..

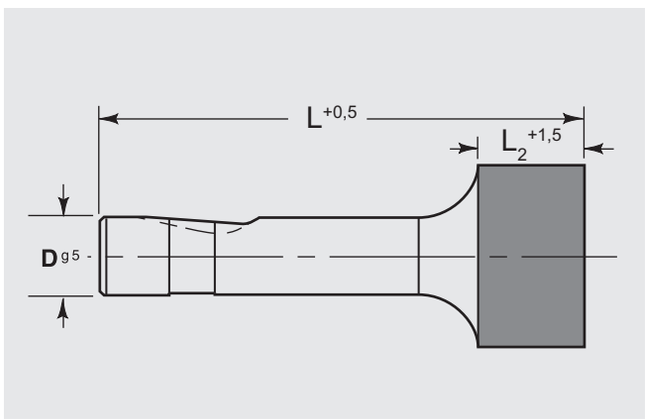
Material:
HSS
Hardness: Shaft 64 ± 2 HRC

Execution:
Shaft fine ground.
Special dimensions on request

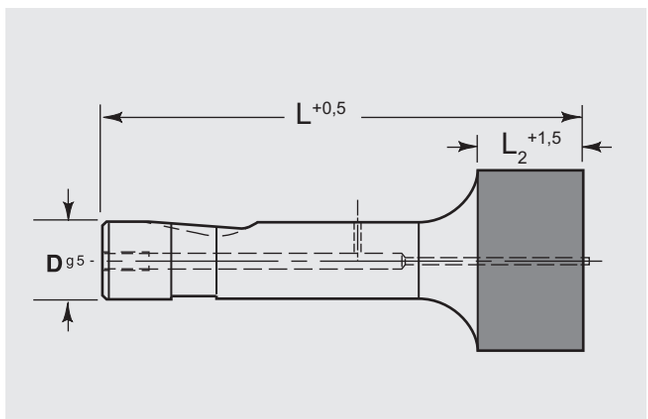
Ordering example without ejector pin:
Blank: Z710.D.L. = Z710.20.100
Stepped: Z71Form.D.L.L_2.P.W = Z712.20.100.25.2800.1200

Ordering example with ejector pin:
Blank: Z720.D.L. = Z720.20.100
Stepped: Z72Form.D.L.L_2.P.W = Z722.20.100.25.2800.1200

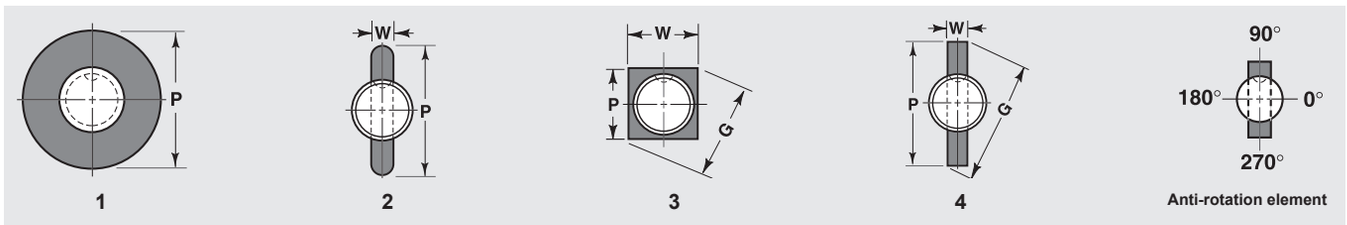
Z710./Z71.. without ejector pin



Z720./Z72.. with ejector pin



Shape (tolerance ±0,01)



D	L_2	L				stepped		
						Round P	Shape	
		71	80	90	100		Min. W	Max P/G
13	20	•	•	•	•	13,1 – 32	5	32
16	25	•	•	•	•	16,1 – 38	6	38
20	25	•	•	•	•	20,1 – 40	8	40
25	25	•	•	•	•	25,1 – 44	10	44
32	32		•	•	•	32,1 – 50	11,5	50

BALL LOCK PUNCH, HEAVY DUTY, WITHOUT EJECTOR PIN

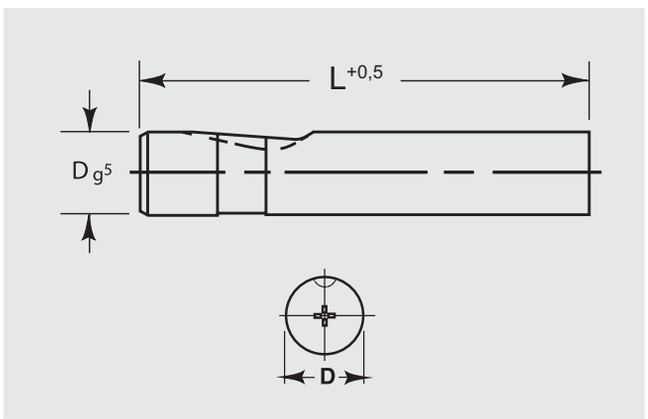
Order-No.: S810.D.L / Order-No.: S81...D.L.L_2.P.w

Material:
HSS
Hardness: Shaft 64 ± 2 HRC

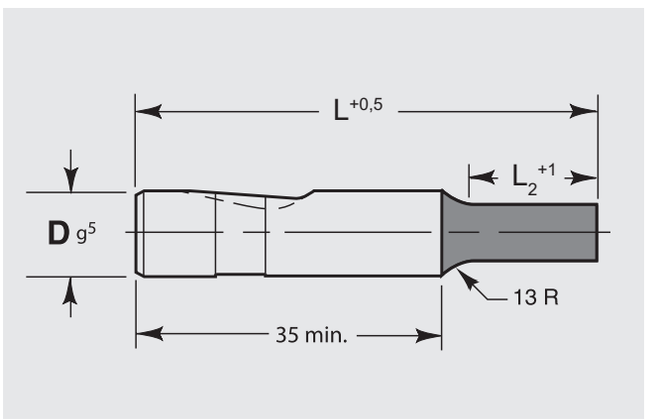
Execution:
Shaft fine ground.
Special dimensions on request

Ordering example: S810.D.L = S810.16.100
S81...D.L.L_2.P.w = S812.16.100.19.1200.0800

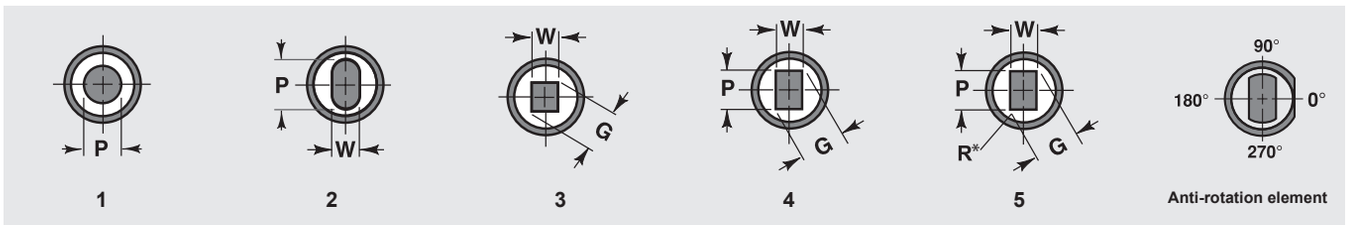
S810.



S81..



Shape (tolerance ±0,01)



*** Customer request**

D	L_2			L					stepped		
									Round P	Shape	
	Std.	Alt.	Alt.	63	71	80	90	100		Min. W	Max. P/G
10	19	10		•	•	•	•	•	2,1 – 9,97	2,1	9,97
13	19	13		•	•	•	•	•	5 – 12,97	4,5	12,97
16	19	13		•	•	•	•	•	8 – 15,97	6	15,97
20	19	13		•	•	•	•	•	12 – 19,97	8	19,97
25	19	13	25		•	•	•	•	16 – 24,97	10	24,97
32	19	13	25		•	•	•	•	24 – 31,97	12,5	31,97
40	25	19	30			•	•	•	30 – 39,97	14	39,97

BALL LOCK PUNCH, HEAVY DUTY, WITH EJECTOR PIN

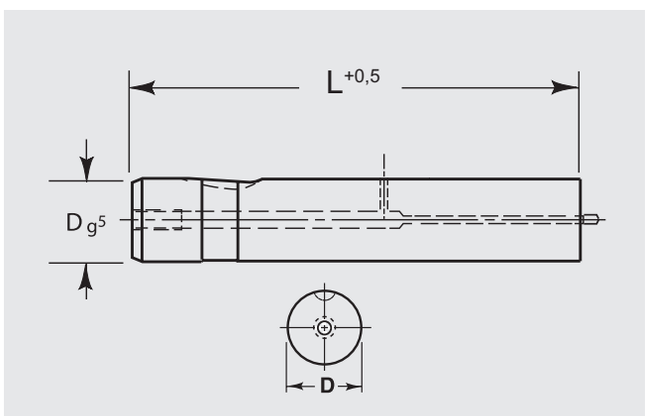
Order-No.: S820.D.L / Order-No.: S82..D.L.L_2.P.W.

Material:
HSS
Hardness: Shaft 64 ± 2 HRC

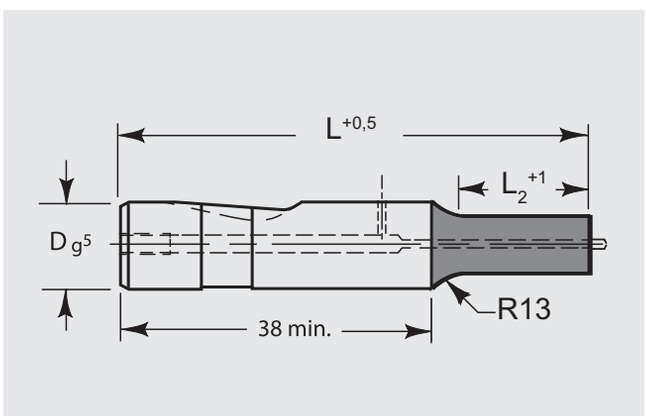
Execution:
Shaft fine ground.
Special dimensions on request.

Ordering example: S820.D.L = S820.16.100
S82..D.L.L_2.P.W. = S822.16.100.19.1200.0800

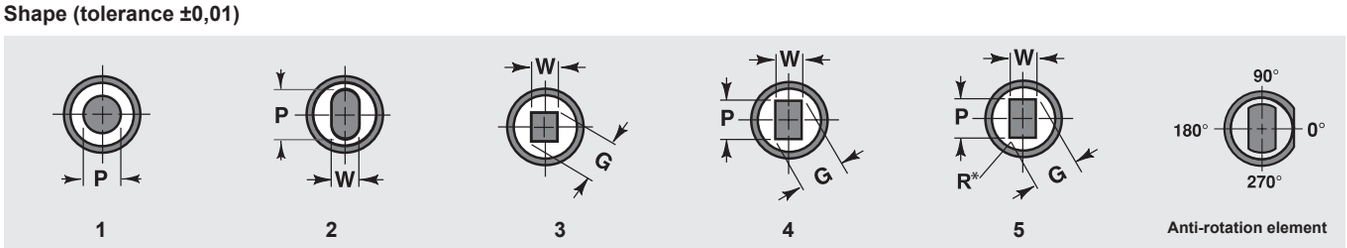
S820.



S82..



Shape (tolerance ±0,01)



1 2 3 4 5 Anti-rotation element

*** Customer request**

D	L_2			L					stepped		
									Round P	Shape	
	Std.	Alt.	Alt.	63	71	80	90	100		Min. W	Max. P/G
10	19	10		•	•	•	•	•	2,1 – 9,97	2,1	9,97
13	19	13		•	•	•	•	•	5 – 12,97	4,5	12,97
16	19	13		•	•	•	•	•	8 – 15,97	6	15,97
20	19	13		•	•	•	•	•	12 – 19,97	8	19,97
25	19	13	25		•	•	•	•	16 – 24,97	10	24,97
32	19	13	25		•	•	•	•	24 – 31,97	12,5	31,97
40	25	19	30			•	•	•	30 – 39,97	14	39,97

BALL LOCK PUNCH, HEAVY DUTY, AUTOMOTIVE-STANDARD, WITH/WITHOUT EJECTOR PIN

Order-No.: Z810./Z81.... / Order-No.: Z820./Z82..

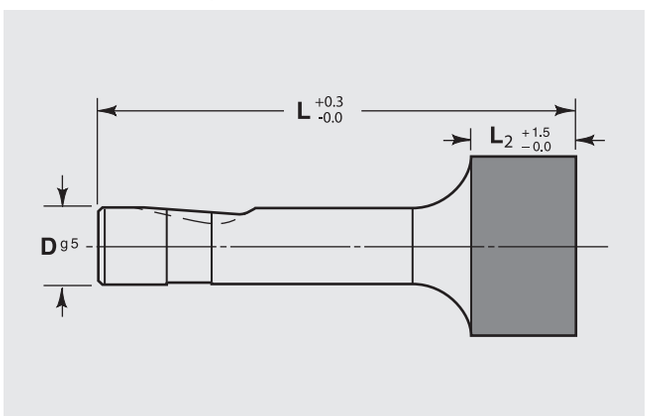
Material:
HSS
Hardness: Shaft 64 ± 2 HRC

Execution:
Shaft fine ground.
Special dimensions on request.

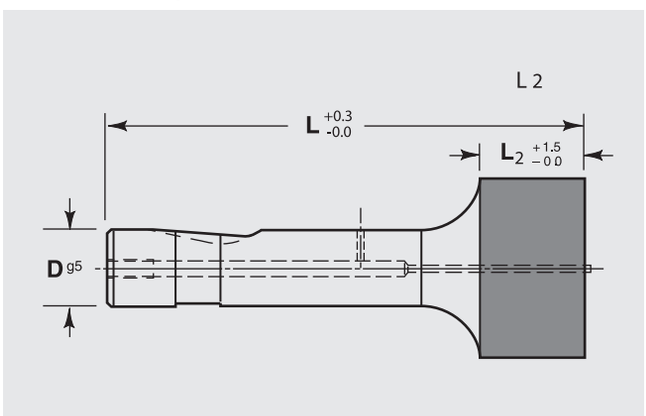
Ordering example without ejector pin:
Blank: Z810.D.L. = Z810.20.100
Stepped: Z81Form.D.L.L_2.P.W = Z812.20.100.25.2800.1200

Ordering example with ejector pin:
Blank: Z820.D.L. = Z820.20.100
Stepped: Z82Form.D.L.L_2.P.W = Z822.20.100.25.2800.1200

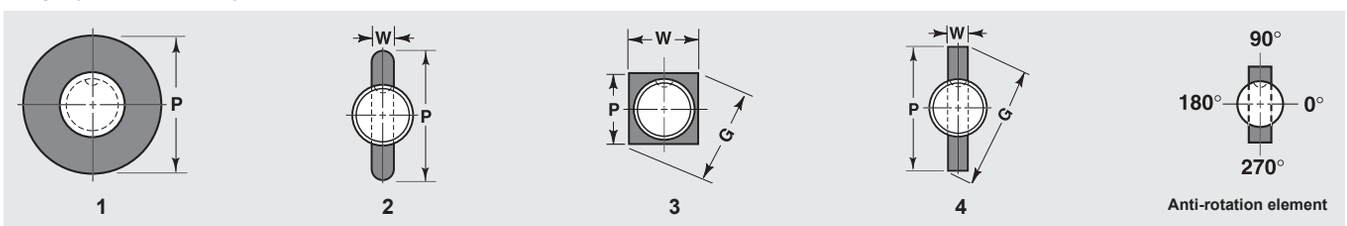
Z810./Z81.. without ejector pin



Z820./Z82.. with ejector pin



Shape (tolerance ±0,01)



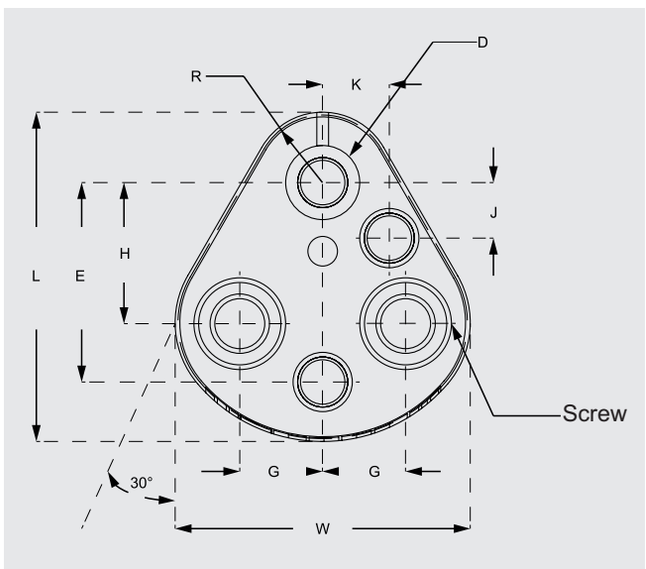
D	L_2	L				stepped		
						Round P	Shape	
		71	80	90	100		Min. W	Max P/G
13	20	•	•	•	•	13,1 – 32	5	32
16	25	•	•	•	•	16,1 – 38	6	38
20	25	•	•	•	•	20,1 – 40	8	40
25	25	•	•	•	•	25,1 – 44	10	44
32	32	•	•	•	•	32,1 – 50	11,5	50
40	32		•	•	•	40,1 – 56	14	56

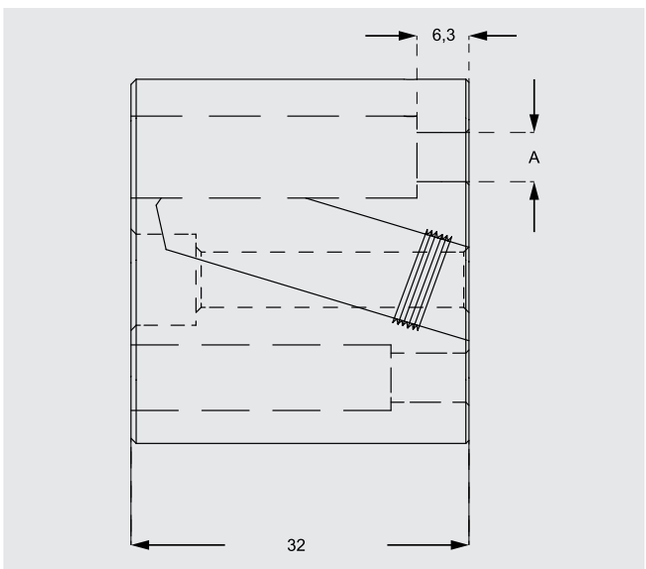
RETAINER FOR BALL-LOCK PUNCHES, LIGHT DUTY

Order-No.: S730.D

Ordering example: D = 6
S730.006

S730. light duty





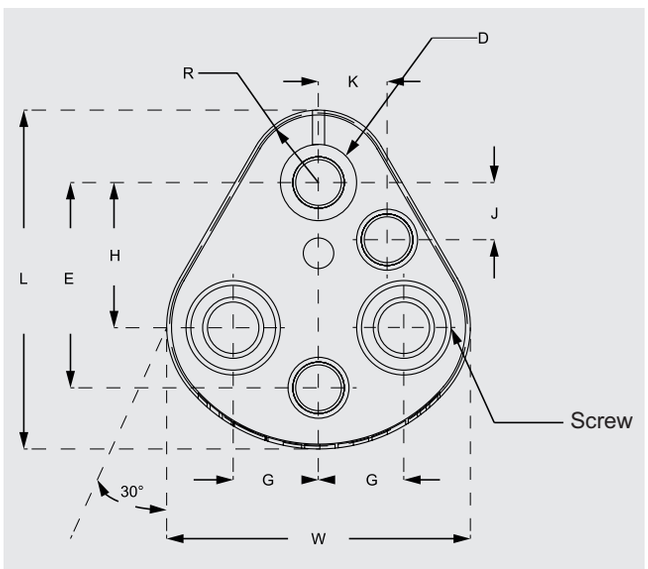
Order-No.:	D	E	G	L	W	R	H	J	K	A	Screw
S730.006	**6**	23	11,1	41,3	37,8	8	19	9	8	3	M6
S730.010	**10**	26,924	11,12	44,5	39,9	9,5	19,05	7,5	9	6	M8
S730.013	**13**	29,972	14,24	50,8	48,3	12,7	19,05	6,5	12	6	M8
S730.016	**16**	31,75	15,87	54	51,6	14,3	19,05	6	13,5	6	M6
S730.020	**20**	33,528	17,47	60,3	58,2	17,5	19,05	5	16,5	6	M10
S730.025	**25**	40,64	19,84	69,9	66,5	22,2	23,82	7	22	6	M12

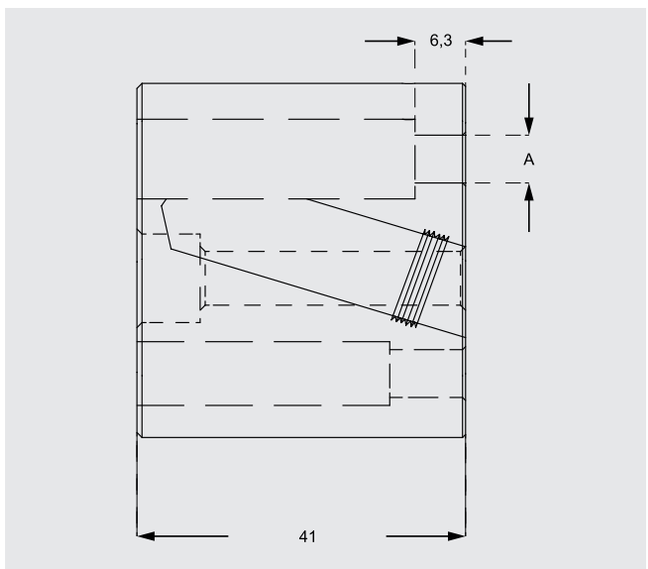
RETAINER FOR BALL-LOCK PUNCHES, HEAVY DUTY

Order-No.: S830.D

Ordering example: D = 10
S830.010

S830. heavy duty

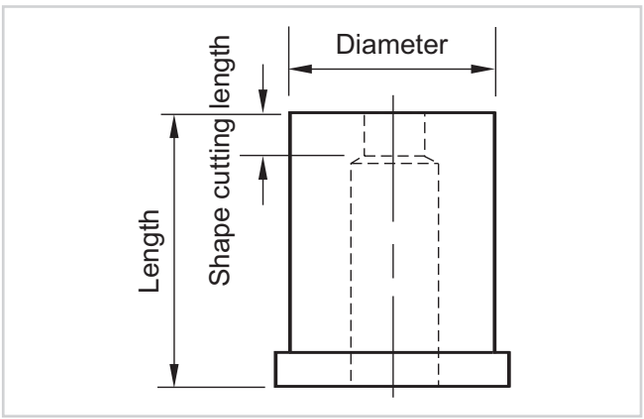




Order-No.:	D	E	G	L	W	R	H	J	K	A	Screw
S830.010	**10**	26,924	11,12	44,5	39,9	9,5	19,05	7,5	9	6	M8
S830.013	**13**	29,972	14,27	50,8	48,3	12,7	19,05	6,5	12	6	M8
S830.016	**16**	31,75	15,87	54	51,6	14,3	19,05	6	13,5	6	M8
S830.020	**20**	33,528	17,47	60,3	58,2	17,5	19,05	5	16,5	6	M10
S830.025	**25**	40,64	19,84	69,9	66,5	22,2	23,82	7	22	6	M12
S830.032	**32**	40,64	19,84	69,9	66,5	22,2	23,82	7	22	6	M12
S830.040	**40**	43,993	24	77,4	77,8	26	27	10	26	6	M12

INDEX

Matrices



Type
2 = DIN 9845
3 = ISO 8977
4 = Guide bush DIN 9845
5 = Guide bush ISO 8978
7 = Automotive standard

Shape
0 = Blank
1 = Round
2 = Slot
3 = Square
4 = Rectangle
5 = Rectangle R
customer specification

P

W

B 322 . 20 . 32 . 8 . 0980 . 0890 . 0

Matrices/ Guide bushes

1 = Without shoulder
2 = With shoulder

Diameter

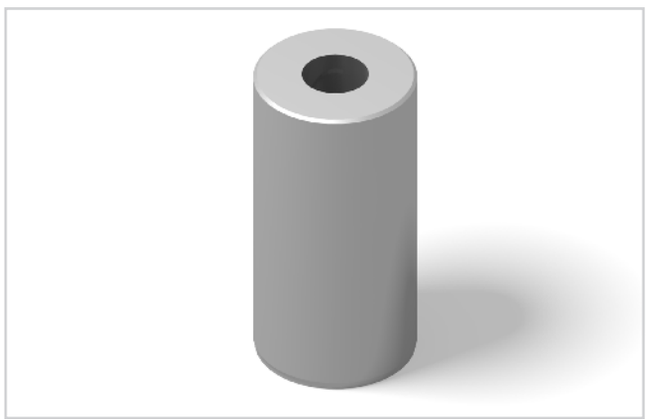
Length

Shape cutting length

Anti-rotation element
0 = 0°
90 = 90°
180 = 180°
270 = 270°
1 = 0° und 180°
3 = Pin Ø 3
4 = Pin Ø 4
5 = Pin Ø 5

MATRIX WITHOUT COLLAR DIN 9845, SHAPE A

Order-No.: B21.d_1.l_1

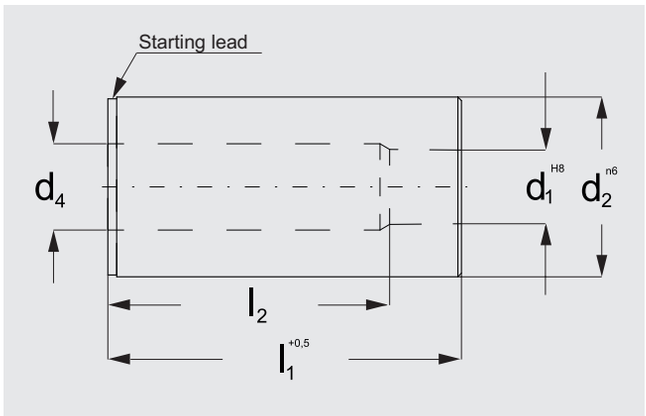


Material:
HSS, hardened
Hardness: 62 ± 2 HRC

Execution:
Diameters d1, d2 and face surfaces ground.

Ordering example: d_1 = 6,2, l_1 = 20
B21.0620.020

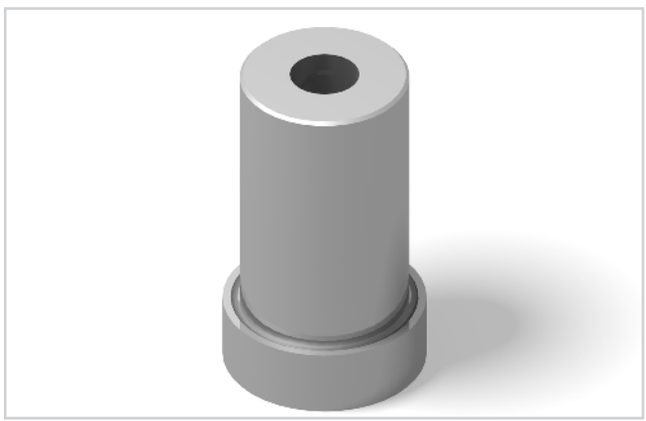
B21.



d_1	Gradation	d_2	d_4	short		long	
				l_1	l_2	l_1	l_2
0,5 – 1,0		5	$d_1^{+0,3}$	**20**	18	**–**	–
1,1 – 2,0		6	$d_1^{+0,3}$	**20**	17	**28**	25
2,1 – 3,0		7	$d_1^{+0,5}$	**20**	17	**28**	25
3,1 – 4,0		8	$d_1^{+0,5}$	**20**	17	**28**	25
4,1 – 5,0		10	$d_1^{+0,7}$	**20**	16	**28**	24
5,1 – 6,0	0,1	12	$d_1^{+0,7}$	**20**	16	**28**	24
6,1 – 8,0		15	$d_1^{+0,7}$	**20**	16	**28**	24
8,1 – 10,0		18	d_1^{+1}	**20**	16	**28**	24
10,1 – 12,0		22	d_1^{+1}	**20**	15	**28**	23
12,1 – 15,0		26	d_1^{+1}	**20**	15	**28**	23
15,1 – 18,0		30	d_1^{+1}	**–**	–	**28**	23

MATRIX WITH COLLAR DIN 9845, SHAPE B

Order-No.: B22.d_1.l_1

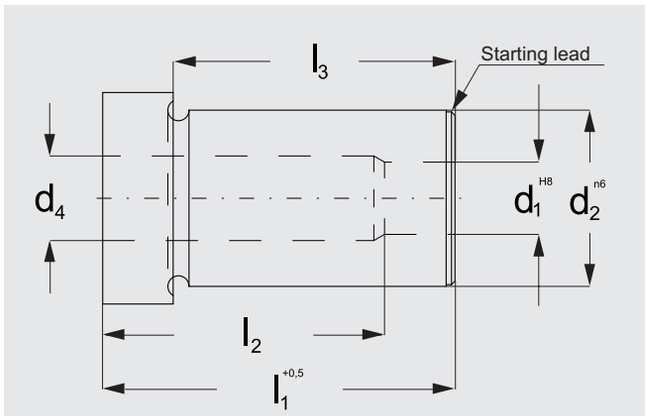


Material:
HSS, hardened
Hardness: 62 ± 2 HRC

Execution:
Diameters d1, d2 and face surfaces ground.

Ordering example: d_1 = 8,0, l_1 = 20
B22.0800.020

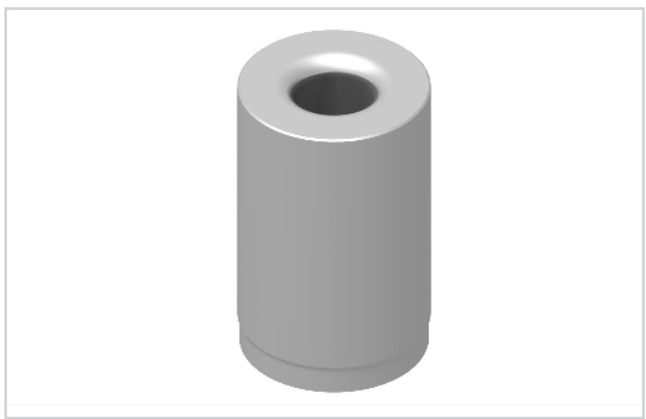
B22.



d_1	Gradation	d_2	d_3	d_4	short			long		
					l_1	l_2	l_3	l_1	l_2	l_3
0,5 – 1,0		5	7	$d_1^{+0,3}$	**20**	18	16	**–**	–	
1,1 – 2,0		6	8	$d_1^{+0,3}$	**20**	17	16	**28**	25	24
2,1 – 3,0		7	9	$d_1^{+0,5}$	**20**	17	16	**28**	25	24
3,1 – 4,0		8	10	$d_1^{+0,5}$	**20**	17	16	**28**	25	24
4,1 – 5,0		10	12	$d_1^{+0,7}$	**20**	16	16	**28**	24	24
5,1 – 6,0	0,1	12	14	$d_1^{+0,7}$	**20**	16	16	**28**	24	24
6,1 – 8,0		15	17	$d_1^{+0,7}$	**20**	16	16	**28**	24	24
8,1 – 10,0		18	20	d_1^{+1}	**20**	16	16	**28**	24	24
10,1 – 12,0		22	24	d_1^{+1}	**20**	15	16	**28**	23	24
12,1 – 15,0		26	28	d_1^{+1}	**20**	15	16	**28**	23	24
15,1 – 18,0		30	32	d_1^{+1}	**–**	–	–	**28**	23	24

GUIDE BUSH DIN 9845, SHAPE C

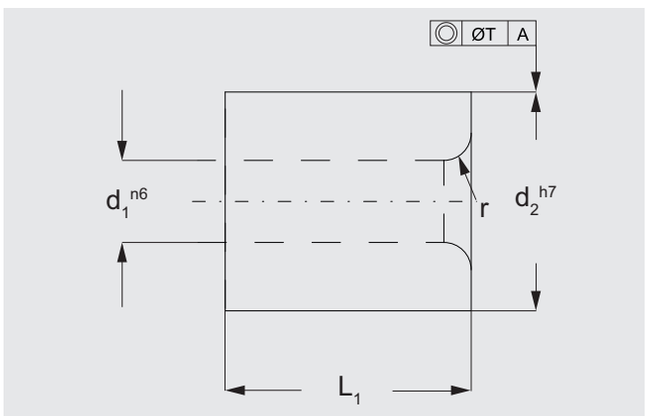
Order-No.: B41.d_1.L_1



Material:
Case hardened steel
Hardness: 740 ± 40 HV 10

Ordering example: d_1 = 4,5, L_1 = 16
B41.0450.016

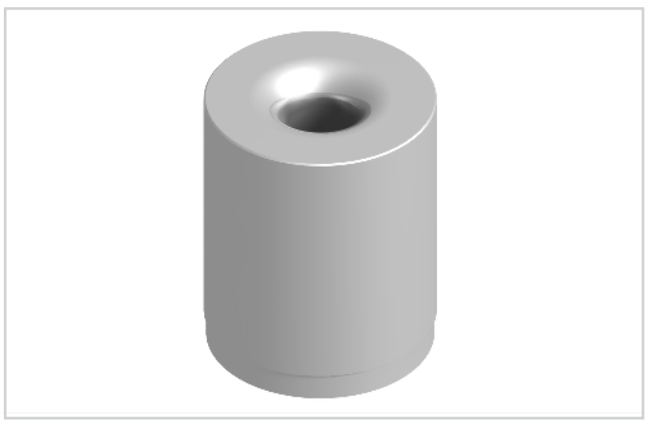
B41.



d_1	Gradation d_1	d_2	t	L_1	r
0,5 – 1	0,1	5	0,01	**9**	1
1,1 – 2	0,1	6	0,01	**12**	1
2,1 – 3	0,1	7	0,01	**12**	1
3,1 – 4	0,1	8	0,01	**12**	1
4,1 – 5	0,1	10	0,01	**16**	1
5,1 – 6	0,1	12	0,02	**16**	1,5
6,1 – 8	0,1	15	0,02	**20**	1,5
8,1 – 10	0,1	18	0,02	**20**	2
10,1 – 12	0,1	22	0,02	**28**	2
12,1 – 15	0,1	26	0,02	**28**	2
15,1 – 18	0,5	30	0,02	**36**	2

GUIDE BUSH ISO 8978

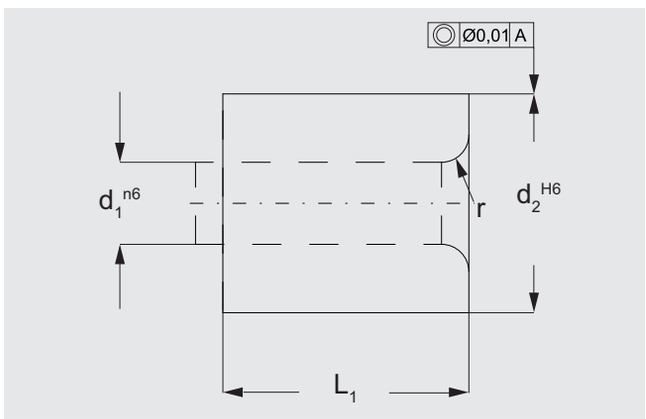
Order-No.: B51.d_1.d_2



Material:
WS, hardened
Hardness: 60 ± 2 HRC

Ordering example: d_1 = 5,1 , d_2 = 13
B51.0510.013

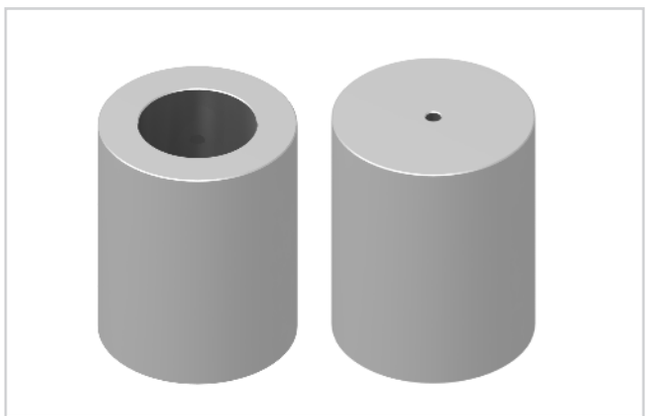
B51.



d_1	Gradation d_1	d_2	L_1	r
1 – 2,4	0,1	5	**8**	1
1,6 – 3	0,1	6	**12,5**	1
2 – 3,5	0,1	8	**12,5**	1,5
3 – 5	0,1	10	**16**	2
4 – 7,2	0,1	13	**16**	2
6 – 8,8	0,1	16	**20**	2
7,5 – 11,3	0,1	20	**20**	2,5
11 – 16,6	0,1	25	**25**	2,5
15 – 20	0,5	32	**25**	4
18 – 27	0,5	40	**32**	4
26 – 36	0,5	50	**40**	4

MATRIX ISO 8977, WITHOUT SHOULDER

Order-No.: B310. / Order-No.: B31...

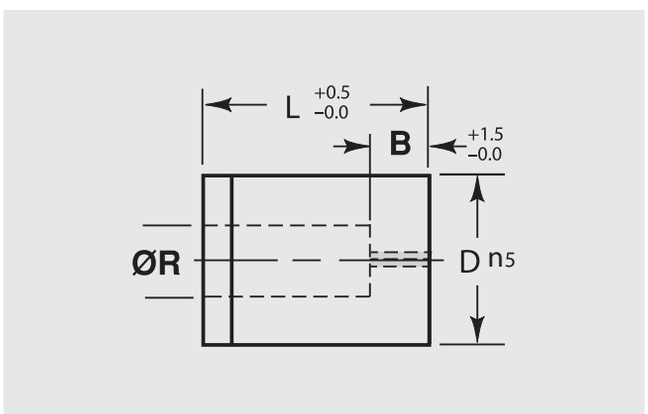


Material:
HSS, hardened:
Hardness: 62 ± 2 HRC

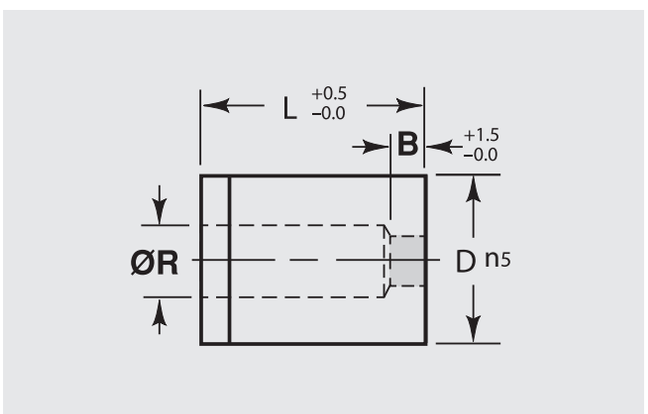
Execution:
Diameter d2, starting lead and face surfaces ground.
Special dimensions upon request.

Ordering example: B310.D.L = B310.22.25
B31...D.L.B.P.W
B312.22.25.8.1000.0800

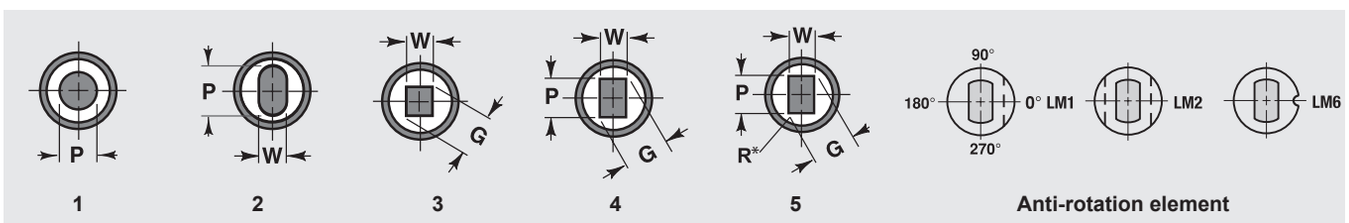
B310.



B31...



Shape (tolerance ±0,01)

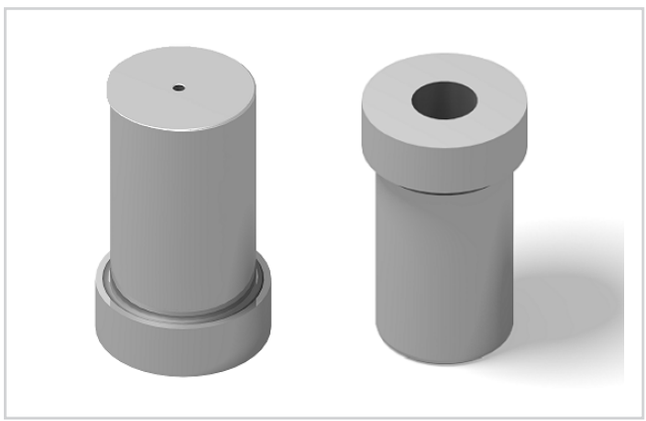


D	Ø R	B**		L									Round	Shape	
		Std.	Alt.	16	19	20	22	25	28	30	32	35	P	min. W	Max. P/G
5	2,8	2		▲	▲	▲	▲	▲					1 – 2,4	–	–
6	3,5	3		▲	▲	▲	▲	▲					1,6 – 3,0	–	–
8	4	4	8	•	▲	•	•	•	•	•	•	•	1,5 – 3,2	–	–
10	5,8	4	8	•	▲	•	•	•	•	•	•	•	1,5 – 5	1,5	5
13	8	5	8			•	•	•	•	•	•	•	1,5 – 7,2	1,5	7,2
16	9,5	5	8			•	•	•	•	•	•	•	5 – 8,8	1,9	8,8
20	12	8	12			•	•	•	•	•	•	•	7 – 11	1,9	11
22	15	8	12			•	•	•	•	•	•	•	9 – 14	1,9	14
25	17,3	8	12			•	•	•	•	•	•	•	11 – 16,5	1,9	16,5
32	20,7	8	12			•	•	•	•	•	•	•	13 – 20	4	20
38	27	8	12			•	•	•	•	•	•	•	16 – 26	4	26
40	27,7	8	12			•	•	•	•	•	•	•	16 – 26	4	26
45	36	8	12				▲	▲	▲	▲	▲	▲	19 – 35	8	35
50	41	8	12				•	•	•	•	•	•	22 – 40	9	40
56	46	8	12				▲	▲	▲	▲	▲	▲	25 – 45	10	45
63	51	8	12				▲	▲	▲	▲	▲	▲	28 – 50	11	50
71	57	8	12				▲	▲	▲	▲	▲	▲	31 – 56	12	56
76	61	8	12				▲	▲	▲	▲	▲	▲	39 – 60	15	60

* Customer request / ▲ upon request
** other dimensions upon request

MATRIX ISO 8977, WITH SHOULDER

Order-No.: B320. / Order-No.: B32...

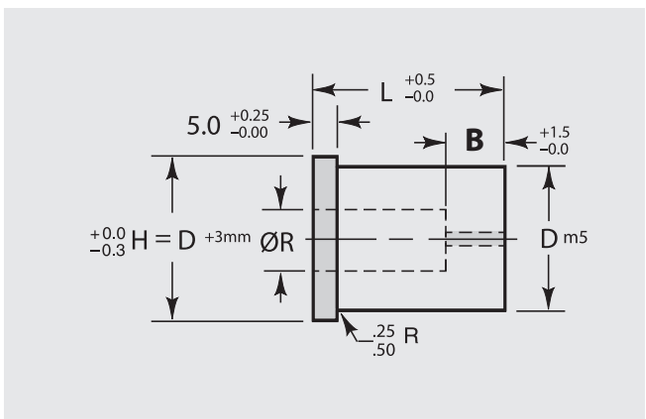


Material:
HSS, hardened:
Hardness: 62 ± 2 HRC

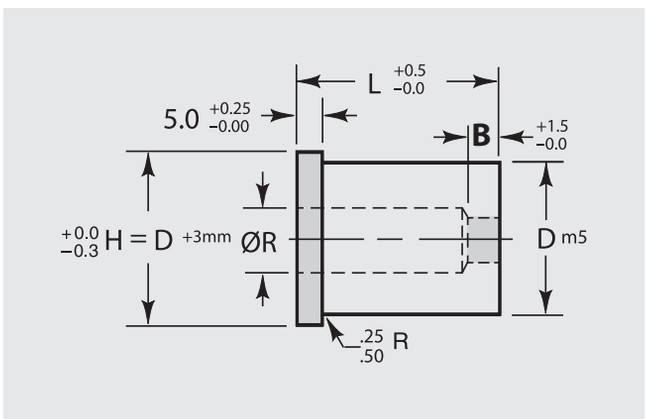
Execution:
Diameter d2, starting lead and face surfaces ground.
Special dimensions upon request.

Ordering example: B320.D.L = B320.22.25
B32...D.L.B.P.W
B322.22.25.8.1200.0800

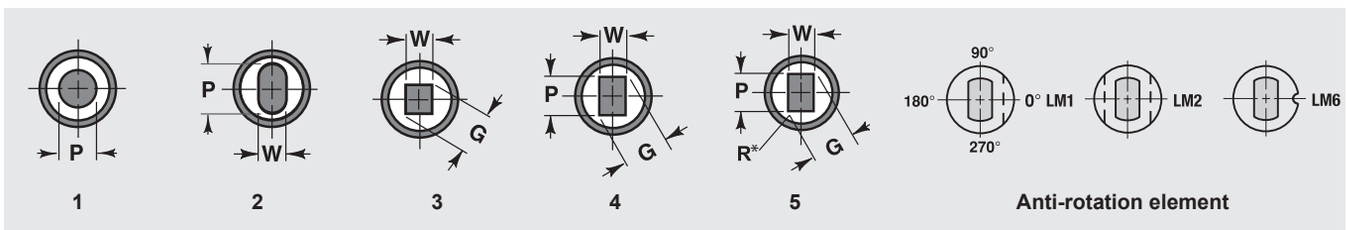
B320.



B32..



Shape (tolerance ±0,01)



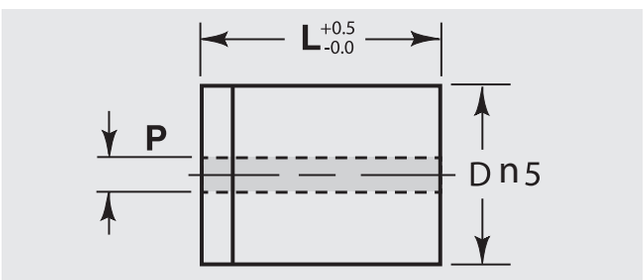
*** Customer request**

D	Ø R	B*		L									Round	Shape	
		Std.	Alt.	16	19	20	22	25	28	30	32	35	P	min. W	Max. P/G
5	2,8	2		▲	▲	▲	▲	▲					1 – 2,4	–	–
6	3,5	3		▲	▲	▲	▲	▲					1,6 – 3,0	–	–
8	4	4	8	•	▲	•	•	•	•	•	•	•	1,5 – 3,2	–	–
10	5,8	4	8	•	▲	•	•	•	•	•	•	•	1,5 – 5	1,5	5
13	8	5	8			•	•	•	•	•	•	•	1,5 – 7,2	1,5	7,2
16	9,5	5	8			•	•	•	•	•	•	•	5 – 8,8	1,9	8,8
20	12	8	12			•	•	•	•	•	•	•	7 – 11	1,9	11
22	15	8	12			•	•	•	•	•	•	•	9 – 14	1,9	14
25	17,3	8	12			•	•	•	•	•	•	•	11 – 16,5	1,9	16,5
32	20,7	8	12			•	•	•	•	•	•	•	13 – 20	4	20
38	27	8	12			•	•	•	•	•	•	•	16 – 26	4	26
40	27,7	8	12			•	•	•	•	•	•	•	16 – 26	4	26
45	36	8	12				▲	▲	▲	▲	▲	▲	19 – 35	8	35
50	41	8	12				•	•	•	•	•	•	22 – 40	9	40
56	46	8	12				▲	▲	▲	▲	▲	▲	25 – 45	10	45
63	51	8	12				▲	▲	▲	▲	▲	▲	28 – 50	11	50
71	57	8	12				▲	▲	▲	▲	▲	▲	31 – 56	12	56
76	61	8	12				▲	▲	▲	▲	▲	▲	39 – 60	15	60

MATRIX, AUTOMOTIVE STANDARD, WITHOUT SHOULDER

Order-No.: B710.D.L

B710.



Material:
HSS, hardened
Hardness: 62 ± 2 HRC

Execution:
Diameter d2 and face surfaces ground.
Special dimensions upon request.

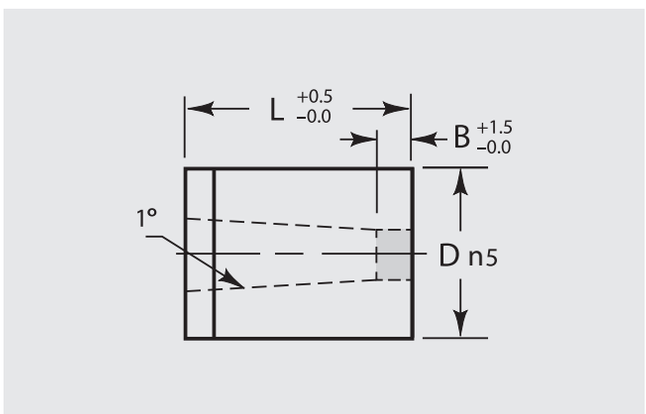
Ordering example: D = 8, L = 20
B710.08.20

D	L						P
	20	22	25	28	30	32	
8	•	•	•	•	•	•	1
10	•	•	•	•	•	•	1
13	•	•	•	•	•	•	1,2
16	•	•	•	•	•	•	1,2
20	•	•	•	•	•	•	1,5
22	•	•	•	•	•	•	1,5
25	•	•	•	•	•	•	1,5
32	•	•	•	•	•	•	1,5
38	•	•	•	•	•	•	1,5
40	•	•	•	•	•	•	1,5
50	•	•	•	•	•	•	1,5

MATRIX, AUTOMOTIVE STANDARD, WITHOUT SHOULDER

Order-No.: B71..D.L.B.P.W

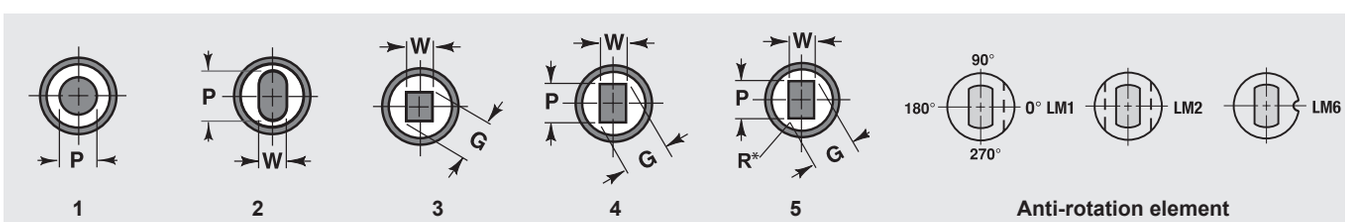
B71...



Ordering example: D = 10, L = 13, B = 4, P = 6,0 W = 3,0
B712.10.13.4.0600.0300

D	B			L									Round P	Shape	
	Std	Alt	Alt	13	16	19	20	22	25	28	30	32	35		Min. W	Max. P/G
10	4	5	3	•	•	•	•	•	•	•	•	•	•	1,6 – 6,8	1,3	6,8
13	5	8	3	•	•	•	•	•	•	•	•	•	•	3,0 – 8,8	1,9	8,8
16	5	8	3			•	•	•	•	•	•	•	•	7,4 – 10,8	1,9	10,8
20	5	10	3			•	•	•	•	•	•	•	•	9,5 – 13,6	1,9	13,6
22	6	10	3			•	•	•	•	•	•	•	•	10,5 – 15,0	1,9	15
25	6	10	3			•	•	•	•	•	•	•	•	12,0 – 17,0	1,9	17
32	6	12	3			•	•	•	•	•	•	•	•	16,0 – 22,0	4	22
38	6	12	3			•	•	•	•	•	•	•	•	18,0 – 27,0	4	27
40	8	12	3			•	•	•	•	•	•	•	•	18,0 – 27,0	4	27

Shape (tolerance ±0,01)



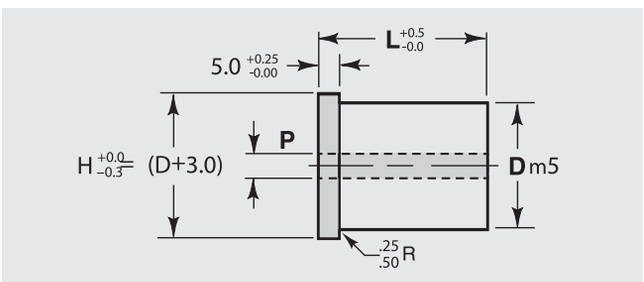
1 2 3 4 5 Anti-rotation element

*** Customer requirement**

MATRIX, AUTOMOTIVE STANDARD, WITH SHOULDER

Order-No.: B720.D.L

B720.



Material:
HSS, hardened
Hardness: 62 ± 2 HRC

Execution:
Diameter d2 and face surfaces ground.
Special dimensions upon request.

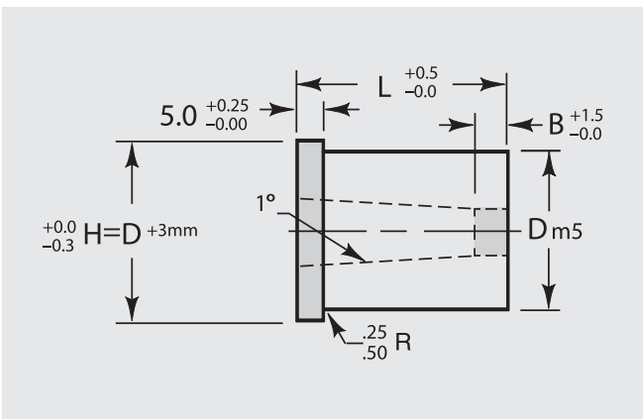
Ordering example: D=22, L=25
B720.22.25

D	L						P
	20	22	25	28	30	32	
8	•	•	•	•	•	•	1
10	•	•	•	•	•	•	1
13	•	•	•	•	•	•	1,2
16	•	•	•	•	•	•	1,2
20	•	•	•	•	•	•	1,5
22	•	•	•	•	•	•	1,5
25	•	•	•	•	•	•	1,5
32	•	•	•	•	•	•	1,5
38	•	•	•	•	•	•	1,5
40	•	•	•	•	•	•	1,5
50	•	•	•	•	•	•	1,5

MATRIX, AUTOMOTIVE STANDARD, WITH SHOULDER

Order-No.: B72..D.L.B.P.W

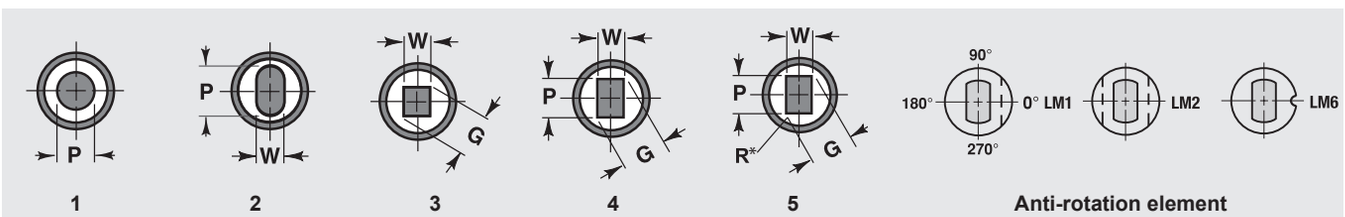
B72..



Ordering example: D = 10, L = 13, B = 4, P = 6,0 W = 3,0
B722.10.13.4.0600.0300

D	B			L									Round P	Shape Min. W	Shape Max. P/G
	Std	Alt	Alt	13	16	19	20	22	25	28	30	32	35			
10	4	5	3	•	•	•	•	•	•	•	•	•	•	1,6 – 6,8	1,3	6,8
13	5	8	3	•	•	•	•	•	•	•	•	•	•	3,0 – 8,8	1,9	8,8
16	5	8	3			•	•	•	•	•	•	•	•	7,4 – 10,8	1,9	10,8
20	5	10	3			•	•	•	•	•	•	•	•	9,5 – 13,6	1,9	13,6
22	6	10	3			•	•	•	•	•	•	•	•	10,5 – 15,0	1,9	15
25	6	10	3			•	•	•	•	•	•	•	•	12,0 – 17,0	1,9	17
32	6	12	3			•	•	•	•	•	•	•	•	16,0 – 22,0	4	22
38	6	12	3			•	•	•	•	•	•	•	•	18,0 – 27,0	4	27
40	8	12	3			•	•	•	•	•	•	•	•	18,0 – 27,0	4	27

Shape (tolerance ±0,01)



1 2 3 4 5 Anti-rotation element

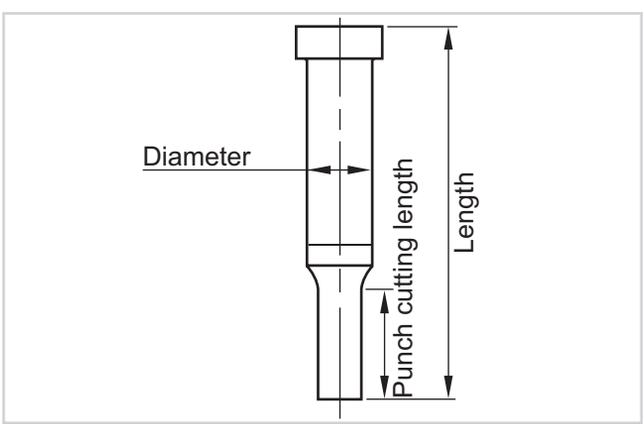
*** Customer requirement**

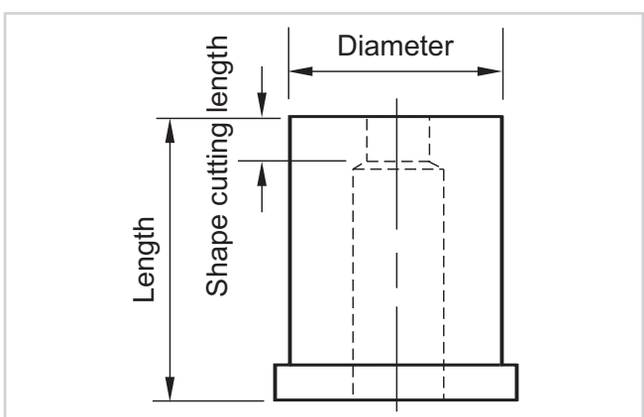
INDEX

Special dimensions

OVERVIEW SPECIAL DIMENSIONS

Special dimensions





Punch =

S Type Shape.Diameter . Length . Shape cutting length . Dimensions of the special shapes

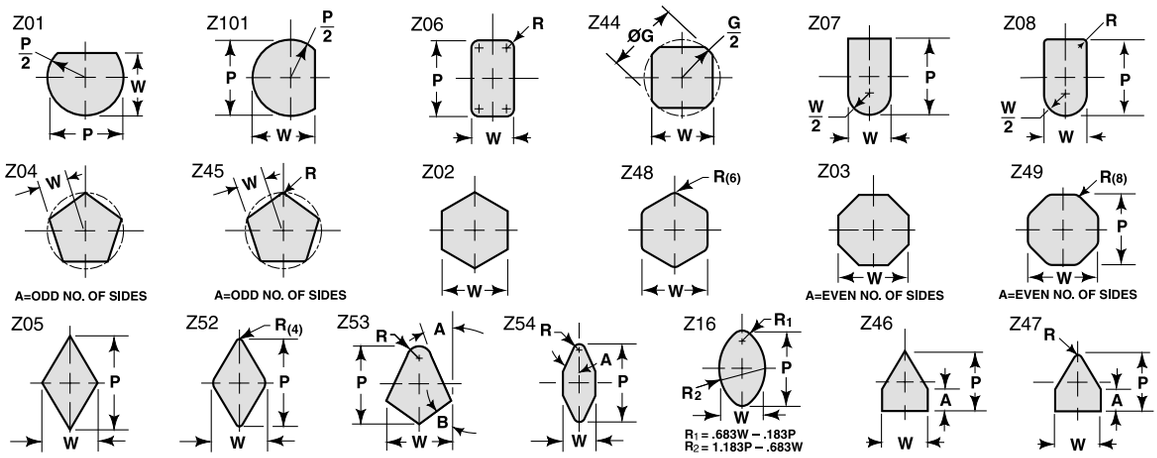
S21Z10.10.100.19.P.W.R

Matrix =

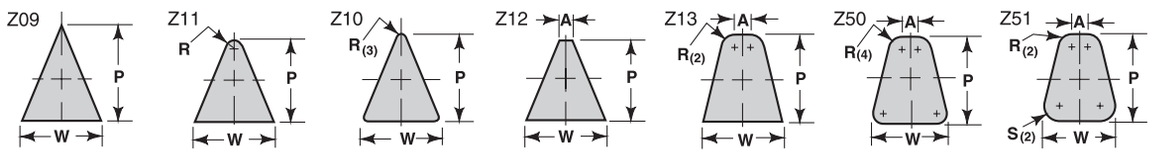
B Type Shape.Diameter . Length . Shape cutting length . Dimensions of the special shapes

B31Z10.22.25.8.P.W.R

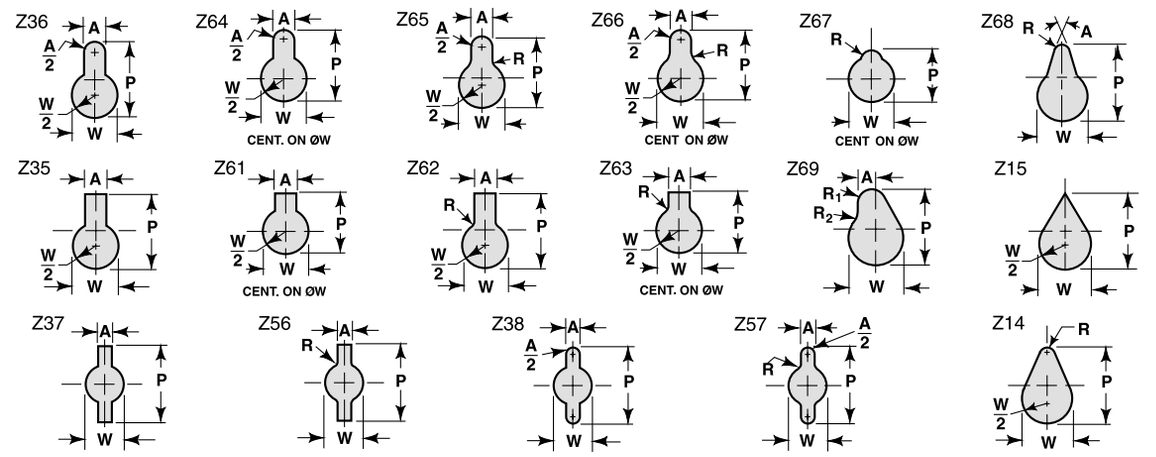
STANDARD SPECIAL DIMENSIONS

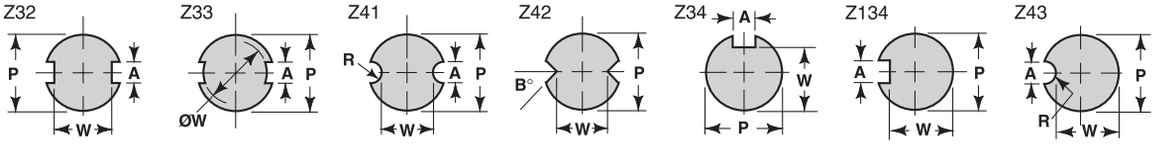


TRIANGLES AND TRAPEZES

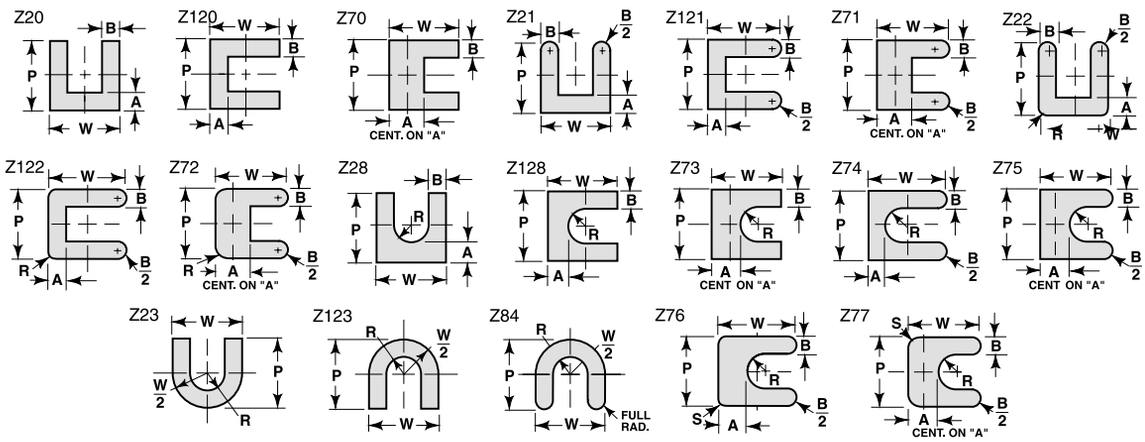


KEY-HOLE SHAPES AND DROPS

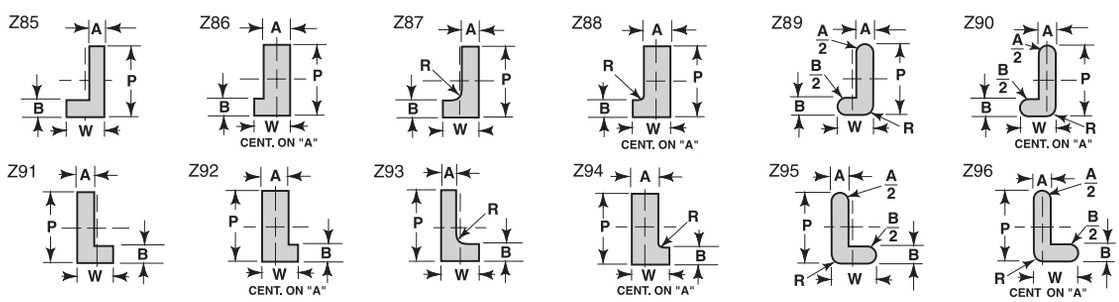




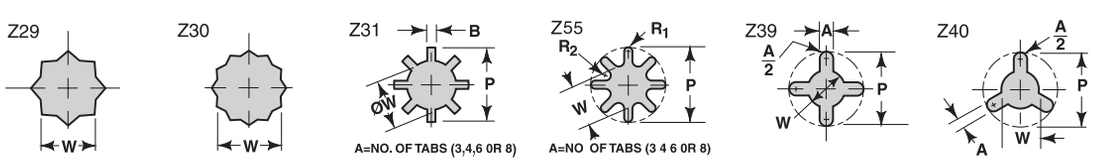
U-SHAPES



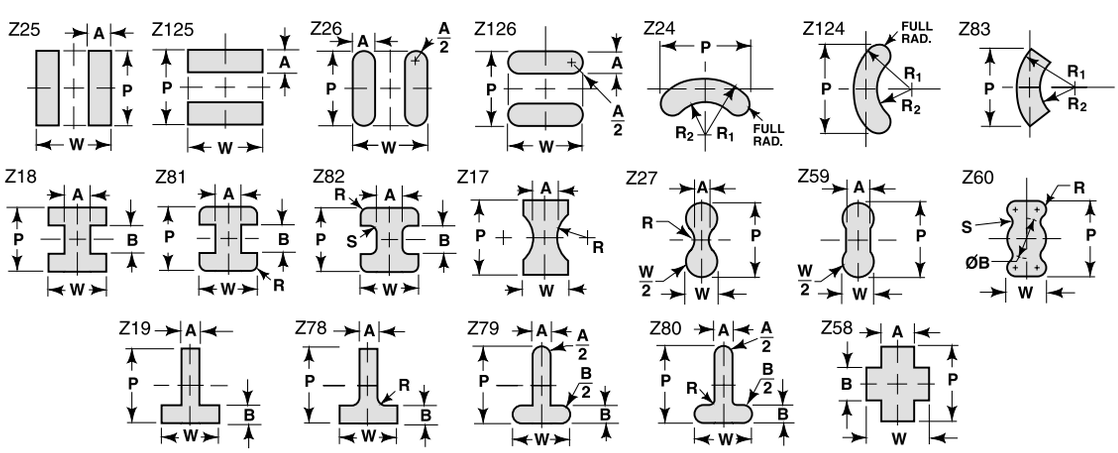
L-SHAPES



POLYGONS

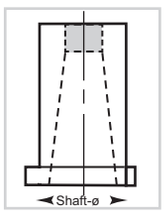


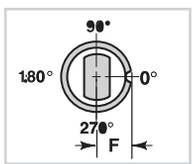
COLLECTION



Matrices with shoulder

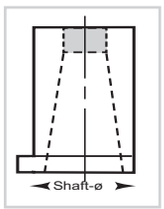
VDS 1-3 **Dowel pin slot** **Ordering example VDS-pin-ø4 at 0° :** B321.16.35.5.0710.02

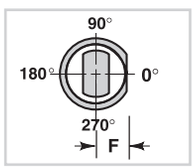




			Shaft diameter / body diameter matrices with shoulder									
			8	10	13	16	20	22	25	32	40	50
VDS 1	Pen ø 3	F =	5,5	6,5	8	9,5	11,5	12,5	14	17,5	21,5	26,5
VDS 2	Pen ø 4	F =	6	7	8,5	10	12	13	14,5	18	22	27
VDS 3	Pen ø 6	F =	7	8	9,5	11	13	14	15,5	19	23	28

VDS 4 **Flush with the shaft**

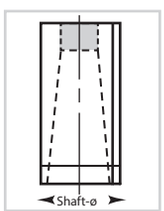


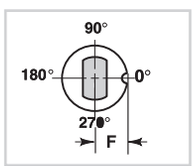


Ordering example VDS 4 at 0°: B321.20.32.80825.04
Ordering example 2x VDS 4 bei 90° & 270°: B321.20.32.8.0825.90.270.4

Matrices without shoulder

VDS 1-3 **Dowel pin slot** **Ordering example VDS-pin-ø6 at 0° :** B311.20.35.5.0710.03

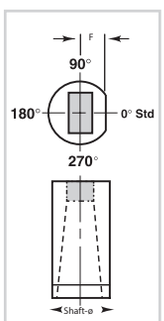


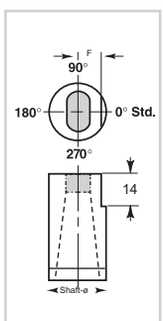


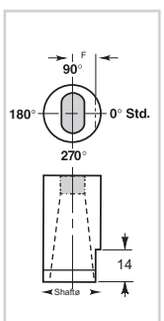
			Shaft diameter / body diameter matrices without shoulder								
			10	13	16	20	22	25	32	40	50
VDS 1	Pen ø 3	F =	5	6,5	8	10	11	12,5	16	20	25
VDS 2	Pen ø 4	F =	6	7,2	8	10	11	12,5	16	20	25
VDS 3	Pen ø 6	F =	7	8,2	9	11	12	13,5	16	20	25

Surfaces

VDS 4 **VDS 5** **VDS 6**



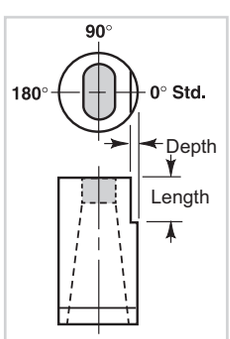




Ordering example VDS 5 14mm top at 0°: B311.20.32.80825.05
Ordering example 2x VDS 4 at 90° & 270°: B311.20.32.80825.90.270.4

		Shaft diameter / body diameter matrices without shoulder								
		10	13	16	20	22	25	32	40	50
VDS 4	F =	4	5,5	7	8,5	9,5	11	14	18	23
VDS 5	F =	4	5,5	7	8,5	9,5	11	14	18	23
VDS 6	F =	4	5,5	7	8,5	9,5	11	14	18	23

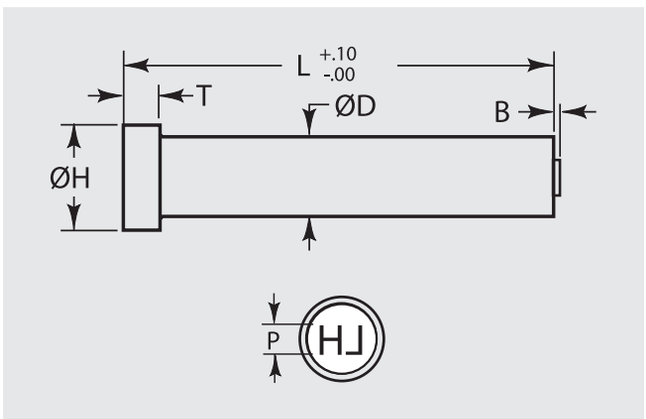
Dimensions according to customer specification for matrices without shoulder



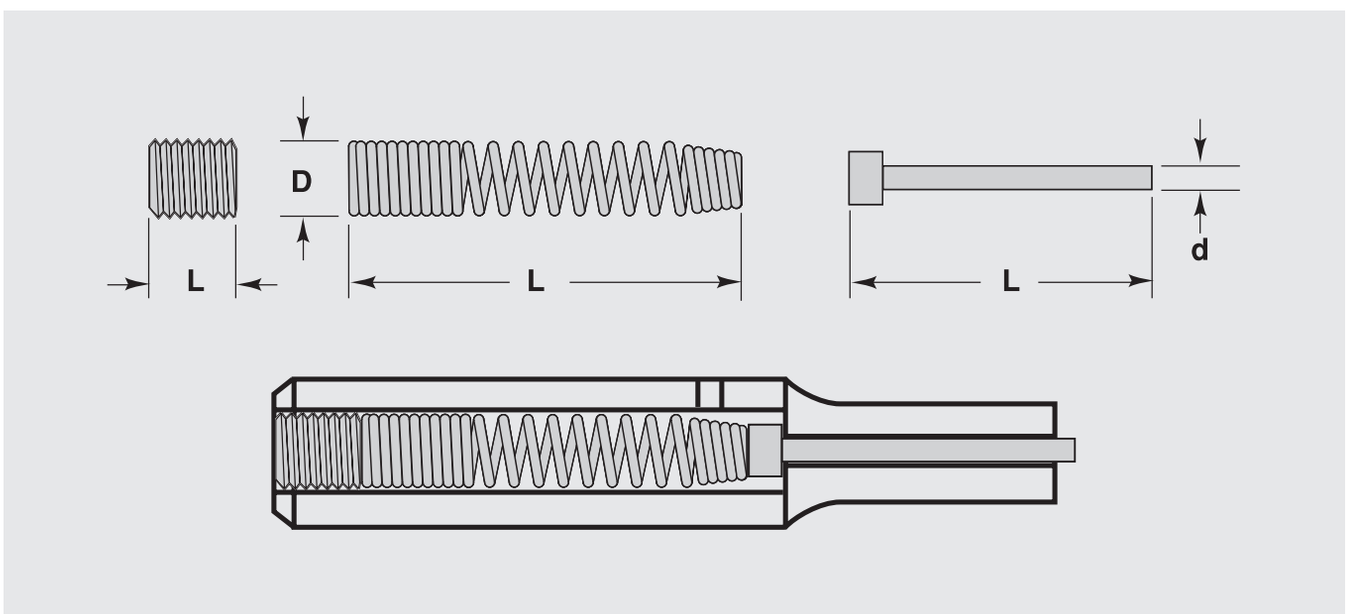
	Depth	Length
X81	1,5	13
X82	1,5	16
X83	1,5	20
X85	2,5	13
X86	2,5	16
X87	2,5	20
X89	Customer requirement	

Ordering example VDS depth 1,5, L16 at 0°: B311.20.25.5.0550.X82
Please quote degree value and position (top/bottom)

EMBOSSING DIE WITH POSITIVE AND NEGATIVE CONTOUR

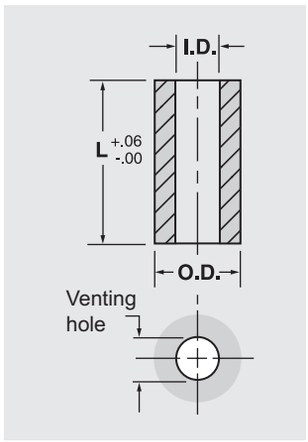


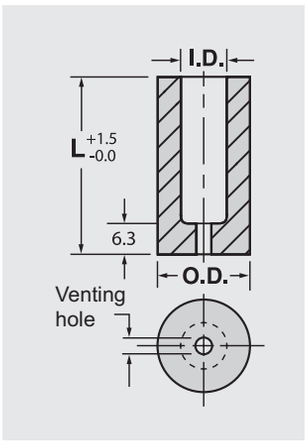
EJECTOR PIN

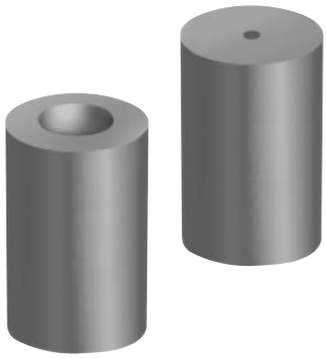


	Punch-Execution		Screw Size/Length	Spring			Ejector pin		
	Head	Ball-Lock		Hole-D	D	L	Hole	L	d
K2M	5		2,5 x 4,0	2,2	2,1	50	0,5	28	0,43
K3M	6	6	3,0 x 3,0	2,52	2,4	63	0,68	35	0,68
K4M	8		4,0 x 4,0	3,52	3,3	73	1,04	49	1,04
K6M	10-13	10-16	5,0 x 5,0	4,45	4,3	73	1,47	49	1,47
K9M	16-20-25	20-25	6,0 x 6,0	5,52	5	80	2,26	56,5	2,26
K12M	32 & >	32 & >	8,0 x 8,0	7,12	7	80	3,05	56,6	3,05

POLYURETHANE WIPERS







I.D. mm	O.D. mm	Length L mm	Number	Shear force per stroke in kg 4mm	7mm	10mm		I.D. mm	O.D. mm	Length L mm	Number	Shear force per stroke in kg 3mm	6,5mm	9,5mm
5	18	35	O-005	125	200			5	18	35	M-005	125	200	
		45	O-005A	115	175					45	M-005A	115	175	
		55	O-005B	105	150					55	M-005B	105	150	
6	19	35	O-006	140	240			6	19	35	M-006	140	240	
		45	O-006A	135	230					45	M-006A	135	230	
		55	O-006B	110	190	240				55	M-006B	110	190	240
		65	O-006C	90	130	200				65	M-006C	90	130	200
8	21	35	O-008	160	250			8	21	35	M-008	160	250	
		45	O-008A	150	225					45	M-008A	150	225	
		55	O-008B	135	200					55	M-008B	135	200	
		65	O-008C	120	185	290				65	M-008C	120	185	290
		75	O-008D	100	165	270				75	M-008D	100	165	270
10	23	35	O-010	210	350			10	23	35	M-010	210	350	
		38	O-010A	190	310					38	M-010A	190	310	
		45	O-010B	175	385					45	M-010B	175	385	
		47	O-010C	160	270					47	M-010C	160	270	
		55	O-010D	145	250	325				55	M-010D	145	250	325
		65	O-010E	130	220	290				65	M-010E	130	220	290
		75	O-010F	115	190	265				75	M-010F	115	190	265
13	26	35	O-013	260	390			13	26	35	M-013	260	390	
		38	O-013A	225	360					38	M-013A	225	360	
		45	O-013B	215	340					45	M-013B	215	340	
		47	O-013C	165	270					47	M-013C	165	270	
		55	O-013D	150	240	300				55	M-013D	150	240	300
		65	O-013E	130	200	250				65	M-013E	130	200	250
		75	O-013F	105	160	200				75	M-013F	105	160	200
16	30	35	O-016	300	460			16	30	35	M-016	300	460	
		38	O-016A	260	420					38	M-016A	260	420	
		45	O-016B	240	390					45	M-016B	240	390	
		47	O-016C	235	385					47	M-016C	235	385	
		55	O-016D	220	360	460				55	M-016D	220	360	460
		65	O-016E	200	330	420				65	M-016E	200	330	420
		75	O-016F	170	290	360				75	M-016F	170	290	360
20	38	38	O-020	280	420			20	38	38	M-020	280	420	
		47	O-020A	240	390					47	M-020A	240	390	
		55	O-020B	22	350	550				55	M-020B	22	350	550
		65	O-020C	165	300	450				65	M-020C	165	300	450
		75	O-020D	150	270	400				75	M-020D	150	270	400
25	50	35	O-025	1200	1800			25	50	35	M-025	1200	1800	
		38	O-025A	1100	1600					38	M-025A	1100	1600	
		45	O-025B	1000	1500					45	M-025B	1000	1500	
		47	O-025C	900	1400					47	M-025C	900	1400	
		55	O-025D	700	1150	1650				55	M-025D	700	1150	1650
		65	O-025E	600	1000	1450				65	M-025E	600	1000	1450
		75	O-025F	500	850	1300				75	M-025F	500	850	1300

Lifting aids

KREITZBERG LIFTING AIDS

The strict guidelines of our quality control ensure, that our lifting aids are subject to close monitoring.

According to the different lifting aids, tests like Magnaflux, magnetic particle inspection, 100% crack testing and the inspection of the mechanical resistance (tensile & pressure test) are performed, the welding seams are examined with contrast media.

All components contain the CE-label and are equipped with a documented test label.

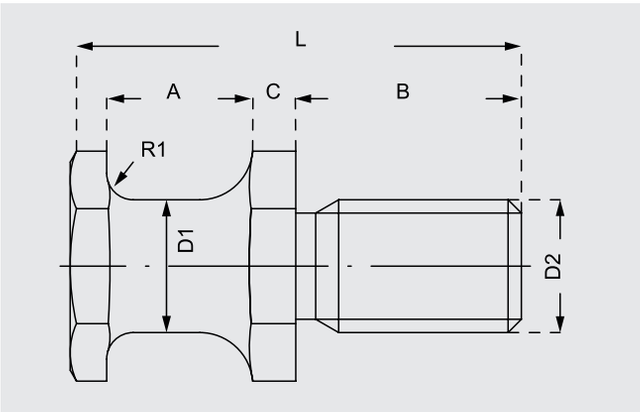
100% control – 100% quality

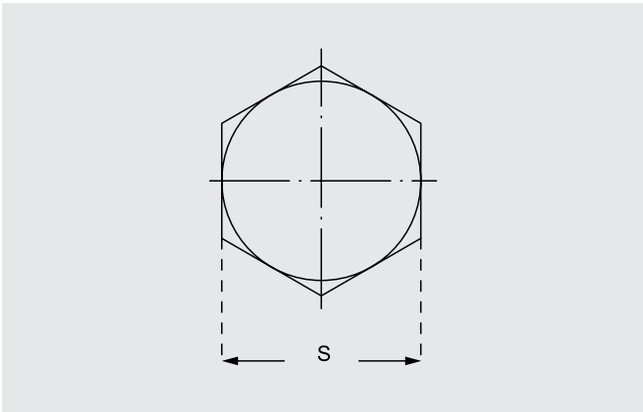
INDEX
Lifting aids

SCREW-IN LIFTER STUD VDI 3366

Order-No: 742.12.D2

Ordering example: D2 = M16
742.12.016





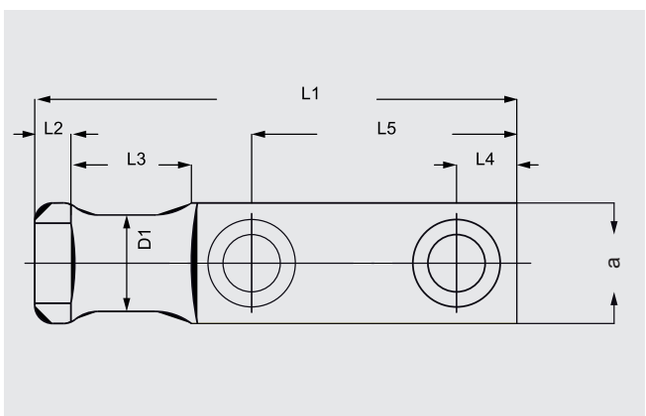
Order-No.:	Lifting capacity kg	D1	D2	A	B	C	L	S
742.12.016	320	16	**M16**	20	28	5,5	58	24
742.12.020	500	20	**M20**	22	34	6,5	68	30
742.12.024	1000	25	**M24**	25	38	8	78	36
742.12.030	1500	32	**M30**	32	45	10	95	41
742.12.036	2500	40	**M36**	40	56	12	118	50

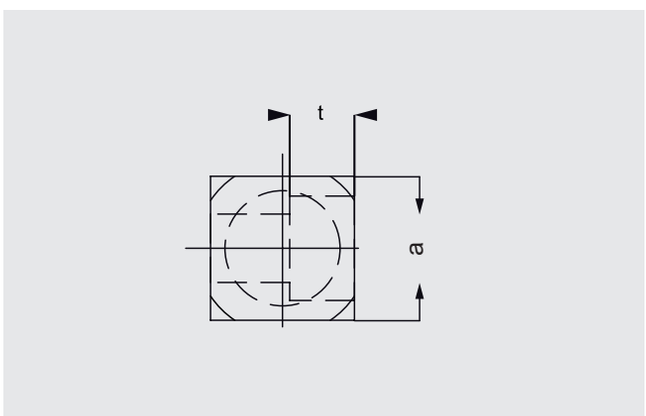
LIFTER STUD VDI 3366

Order-No: 7111.a

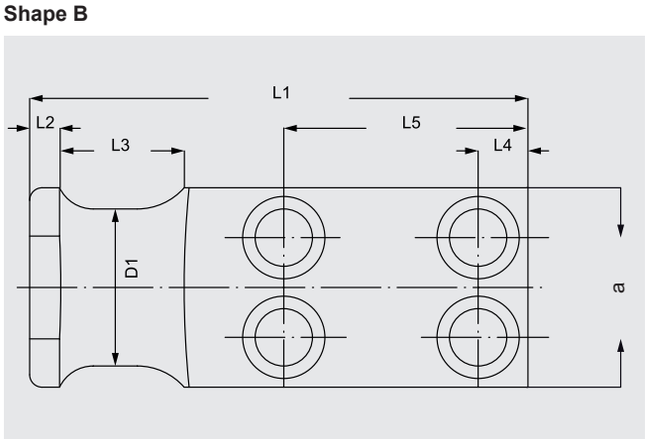
Ordering example: a = 20
7111.020

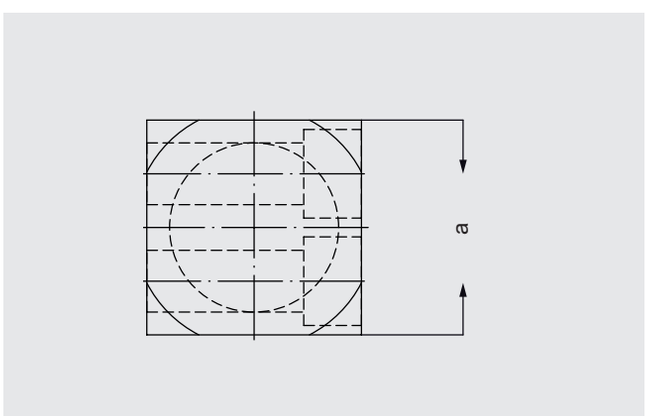
Shape A





Shape B

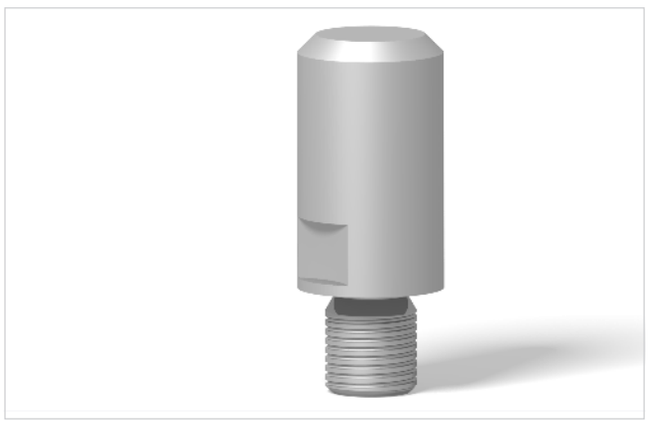


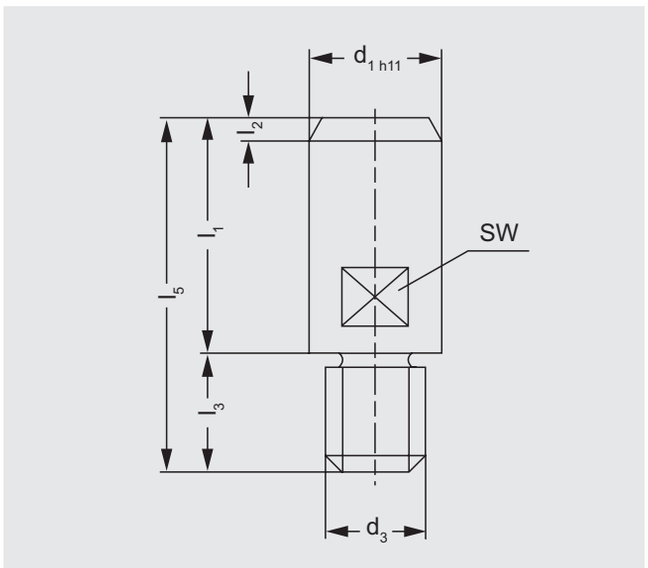


Order-No.:	Lifting capacity kg	D1	L1	L2	L3	L4	L5	a	H	t	Shape	Screws DIN 912 8.8
7111.020	320	16	80	6	20	10	44	**20**	6	9	A	M8 x 25
7111.025	630	20	90	8	25	10	47	**25**	8	11	A	M10 x 30
7111.035	1250	25	100	8	30	12	50	**35**	10	13	A	M12 x 40
7111.040	2000	32	120	10	32	16	62	**40**	10	17,5	A	M16 x 45
7111.050	3200	40	140	10	40	18	72	**50**	12	21,5	A	M20 x 60
7111.060	5000	50	160	12	45	22	81	**60**	14	25,5	A	M24 x 70
7111.080	8000	63	200	12	50	20	98	**80**	16	21,5	B	M20 x 90
7111.100	12500	80	250	15	65	25	125	**100**	18	25,5	B	M24 x 110
7111.120	20000	100	300	15	80	30	155	**120**	20	32	B	M30 x 130

DIE SET SHANK, STRAIGHT

Order-No.: 7112.11.d_1.d_3



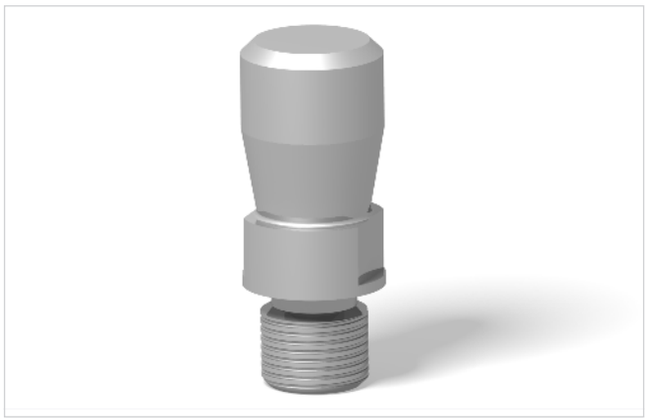


Ordering example: d_1 = 20, d_3 = M16 x 1,5
7112.11.20.016

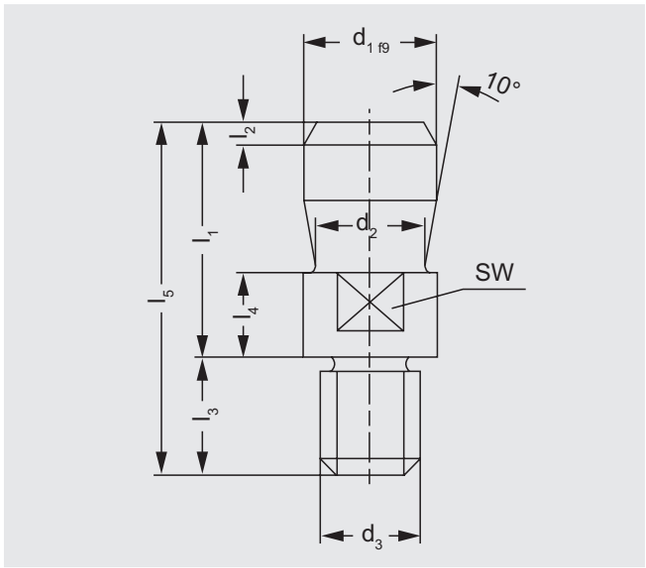
Order-No.:	d_1	d_3	l_1	l_2	l_3	l_5	SW
7112.11.20.016	**20**	**M16 x 1,5**	40	3	18	58	17
7112.11.25.016	**25**	**M16 x 1,5**	45	4	23	68	21
7112.11.25.020	**25**	**M20 x 1,5**	45	4	23	68	21
7112.11.32.020	**32**	**M20 x 1,5**	56	4	23	79	27
7112.11.32.024	**32**	**M24 x 1,5**	56	4	23	79	27
7112.11.40.024	**40**	**M24 x 1,5**	70	5	23	93	36
7112.11.40.030	**40**	**M30 x 2**	70	5	23	93	36
7112.11.50.030	**50**	**M30 x 2**	80	6	28	108	41
7112.11.65.042	**65**	**M42 x 3**	100	8	28	128	55

THREADED DIE SET SHANK DIN ISO 10242-1

Order-No.: 7112.d_1.d_3



Ordering example: d_1 = 20, d_3 = M16 x 1,5
7112.20.016



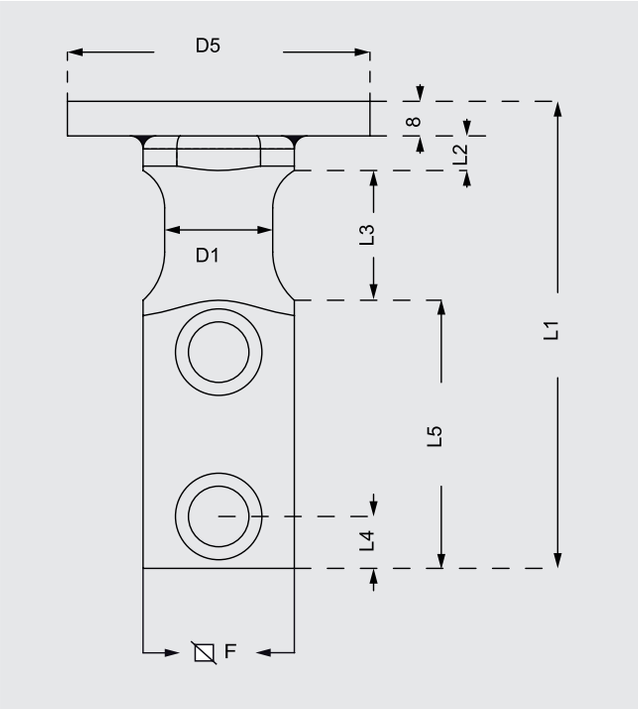
Order-No.:	d_1	d_2	d_3	l_1	l_2	l_3	l_4	l_5	SW
7112.20.016	**20**	15	**M16 x 1,5**	40	2	18	12	58	17
7112.25.016	**25**	20	**M16 x 1,5**	45	2,5	23	16	68	21
7112.25.020	**25**	20	**M20 x 1,5**	45	2,5	23	16	68	21
7112.32.020	**32**	25	**M20 x 1,5**	56	3	23	16	79	27
7112.32.024	**32**	25	**M24 x 1,5**	56	3	23	16	79	27
7112.40.024	**40**	32	**M24 x 1,5**	70	4	23	26	93	36
7112.40.027	**40**	32	**M27 x 2**	70	4	23	26	93	36
7112.40.030	**40**	32	**M30 x 2**	70	4	23	26	93	36
7112.50.030	**50**	42	**M30 x 2**	80	5	28	26	108	41
7112.65.042	**65**	53	**M42 x 3**	100	8	28	26	128	55

LIFTER STUD WITH CABLE SECURING DEVICE

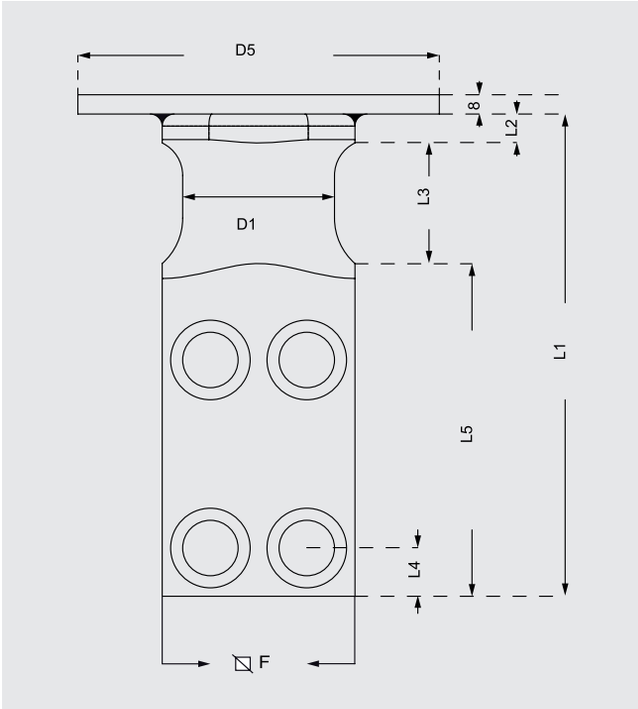
Order-No.: 7113.F

Ordering example: F = 20
7113.020

Shape A



Shape B



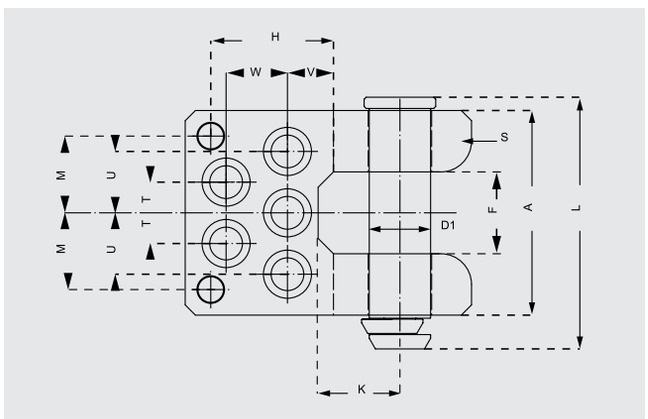
Order-No.:	Lifting capacity kg	D_1	D_5	L_1	L_2	L_3	L_4	L_5	F	Shape	Screws DIN 912 8.8
7113.020	320	16	60	80	6	20	10	44	**20**	A	M8 x 25
7113.025	630	20	70	90	8	25	10	47	**25**	A	M10 x 30
7113.035	1250	25	701	100	8	30	12	50	**35**	A	M12 x 40
7113.040	2000	32	110	120	10	32	16	62	**40**	A	M16 x 45
7113.050	3200	40	110	140	10	40	18	72	**50**	A	M20 x 60
7113.060	5000	50	150	160	12	45	22	81	**60**	A	M24 x 70
7113.080	8000	63	150	200	13	50	20	98	**80**	B	M20 x 90
7113.100	12500	80	150	250	15	65	25	125	**100**	B	M24 x 110
7113.120	20000	100	150	300	15	80	30	155	**120**	B	M30 x 130

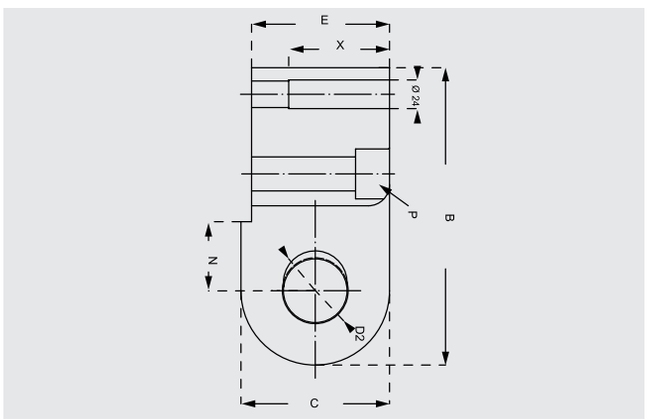
LIFTING FLANGE WITH BOLT WITH SAFETY RING, TO BMW-STANDARD

Order-No.: 7221.D2

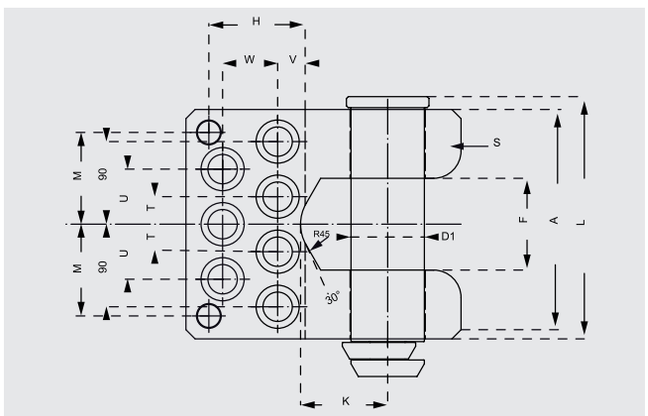
Ordering example: D2 = 32
7221.032

Shape A





Shape C

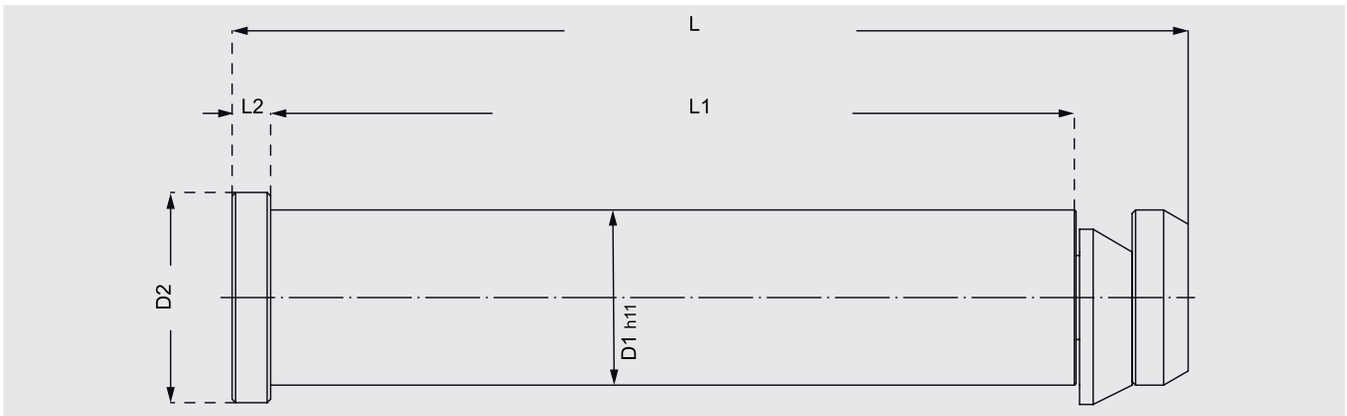


Order-No.:	Max. carrying cap. kg	D_1	D_2	A	B	C	E	F	H	K	L	M	N	P	S	T	U	V	W	X	Shape	Screws DIN 912 8.8
7221.032	3200	30	**32**	126	185	80	75	50	85	50	158	45	40	12	16	20	40	30	35	40	A	M16 x 80
7221.042	4500	40	**42**	150	210	100	95	60	87	55	187	52	50	12	20	22,5	45	25	40	60	A	M20 x 100
7221.052	8000	50	**52**	175	240	120	115	75	95	70	220	62,5	60	16	24	25	50	35	45	80	A	M24 x 120
7221.062	10000	60	**62**	200	280	140	130	80	120	80	246	75	65	20	30	30	60	45	60	95	A	M30 x 140
7221.082	18000	80	**82**	250	300	160	150	100	105	95	305	100	90	20	30	30	60	30	60	115	C	M30 x 160

Spare part bolt 7221.1.
Example: for lifting flange 7221.032 ► spare part bolt 7221.1.032

SPARE PART BOLT FOR LIFTING FLANGE, TO BMW-STANDARD

Order-No.: 7221.1.xxx

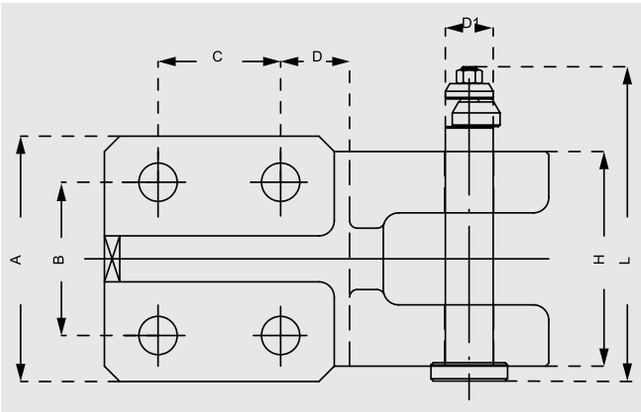


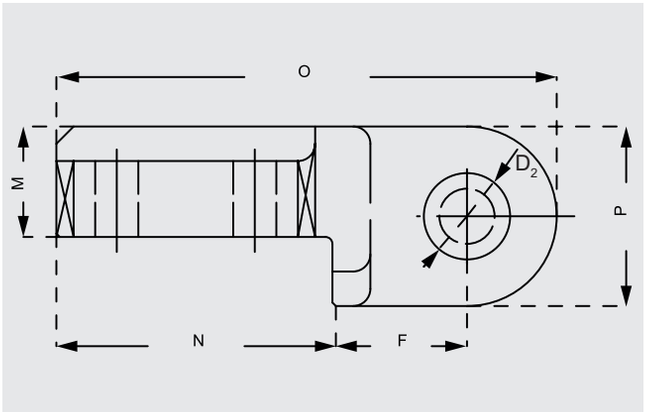
Order-No.:	Max. carrying cap. kg	D_1	D_2	L	L_1	L_2
7221.1.032	3200	30	40	158	129	10
7221.1.042	4500	40	50	187	155	10
7221.1.052	8000	50	60	220	180	11
7221.1.062	10000	60	70	246	205	11
7221.1.082	18000	80	90	305	255	12

LIFTING FLANGE WITH BOLT WITH SAFETY RING

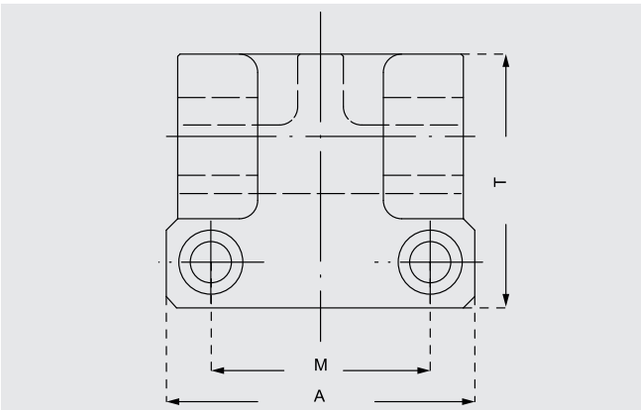
Order-No.: 7222.D2

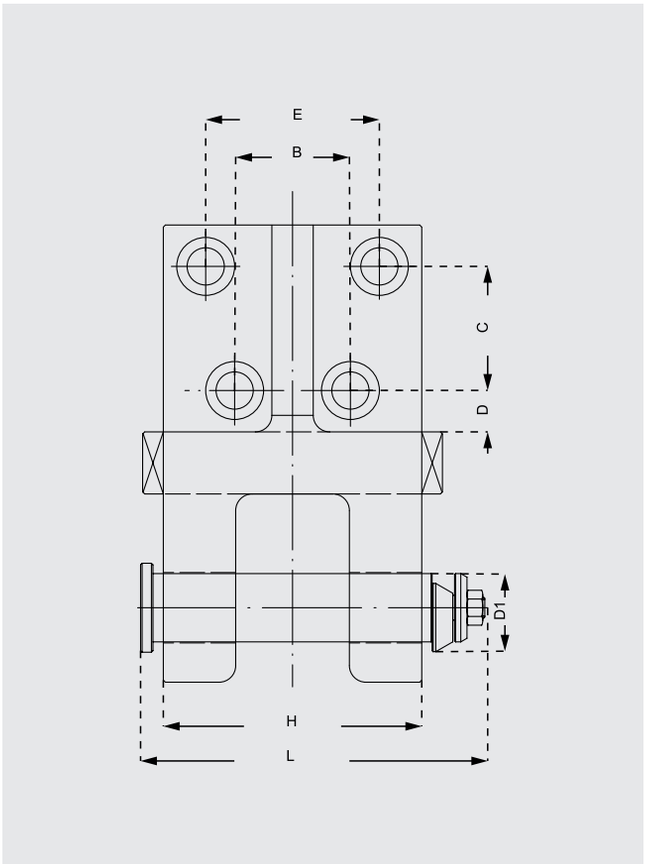
Shape A

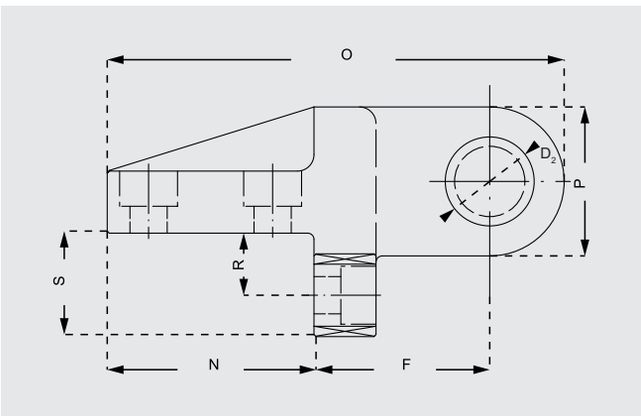




Shape B



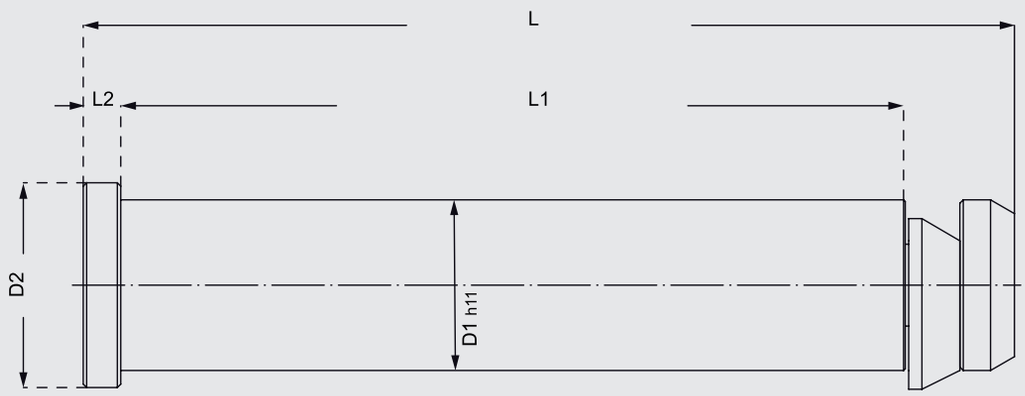




Order-No.:	Max. carrying cap. kg	A	B	C	D	D_1	E	F	D_2	H	L	M	N	O	P	R	S	T	Shape	Screw DIN 912 8.8
7222.016	600	80	50	40	22,5	15,6		32	**16**	70	102,5	32	80	145	52				A	M12 x 45
7222.021	1000	90	60	40	27,5	20,6		42	**21**	79	113,5	36	90	160	56				A	M16 x 55
7222.026	2000	100	65	65	32,5	25,6		60	**26**	90	128,5	50	120	215	70				A	M20 x 80
7222.034	4000	135	56	60	20	33	84	85	**34**	125	166,5	96	100	221	72	30	50	111	B	M16 x 45
7222.044	7000	180	80	70	30	43	110	100	**44**	160	210,5	130	125	270	90	35	60	140	B	M20 x 60

DIE LIFTING BOLT WITH SAFETY RING, VDI 3366

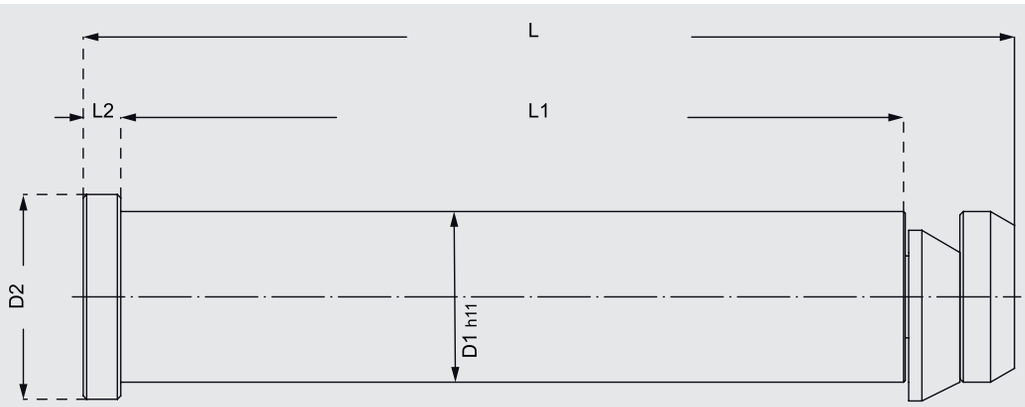
Order-No.: 7211.D1



Order-No.:	Max. carrying cap. kg	D1	D2	L	L1	L2
7211.032	3200	**32**	40	175	145	10
7211.040	5000	**40**	50	225	188	10
7211.050	8000	**50**	60	273	230	11
7211.063	12500	**63**	75	347	295	14
7211.076	31500	**76**	95	422	360	15

DIE LIFTING BOLT WITH SAFETY RING AND SPRING, CNOMO-STANDARD

Order-No.: 7212.D1



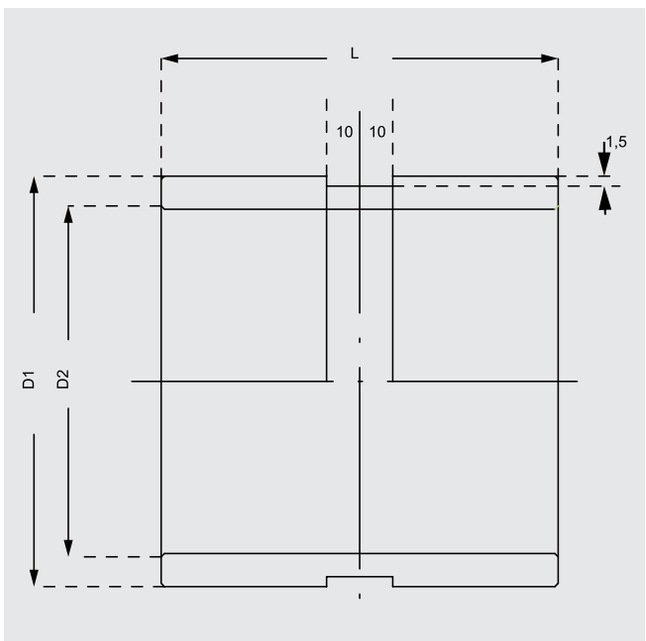
Order-No.:	Max. carrying cap kg	D1	D2	L	L1	L2
7212.032	6000	**32**	40	154	132	6
7212.040	9000	**40**	50	197,5	170	8
7212.050	14000	**50**	63	247,5	212	10
7212.063	22500	**63**	80	309	265	12

BUSH FOR DIE LIFTING BOLT

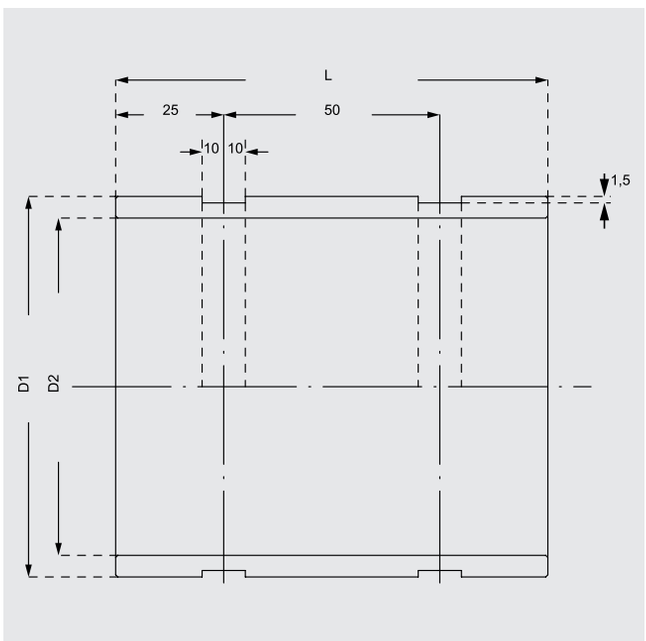
Order-No.: 7213.D1

Ordering example: D1 = 44
7213.044

Shape A



Shape B



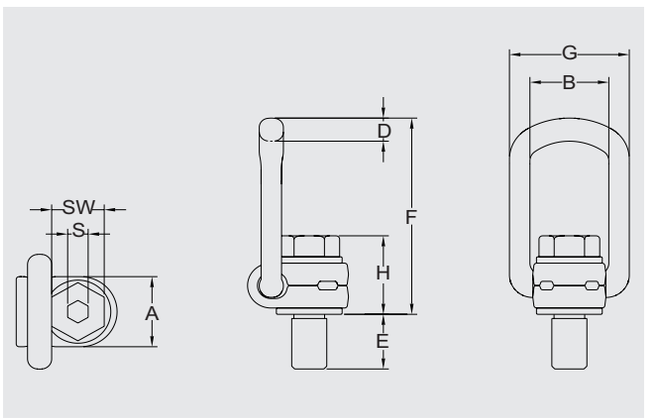
Order-No.:	D1	D2	L	Shape
7213.044	**44**	34	40	A
7213.052	**52**	42	50	A
7213.062	**62**	52	60	A
7213.075	**75**	65	80	A
7213.100	**100**	78	100	B
7213.105	**105**	78	100	B

HOISTING SNAP LINK APLB QUALITY 10

Order-No.: 713.15.

Note:
– All hoisting snap links with permission and H-stamp of BG
– All hoisting snap links meet the requirements of the machine guidelines
– All hoisting snap links meet the requirements of the ASME B30.26
– Each forged part plus screw with traceability code
– Quality 10
– Full load bearing up to 90°
– 100 % crack-checked

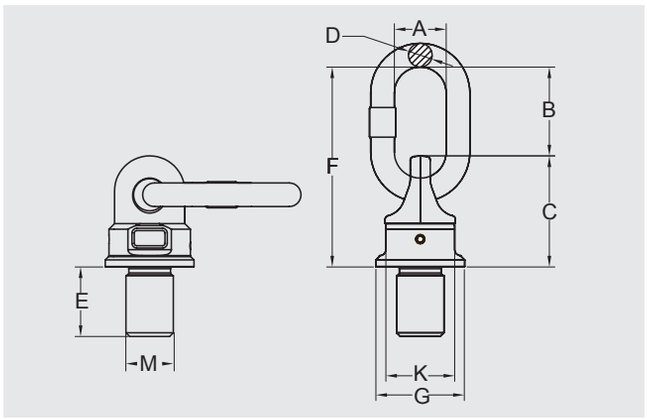
Ordering example: M = M8, t = 0,3
713.15.008.003

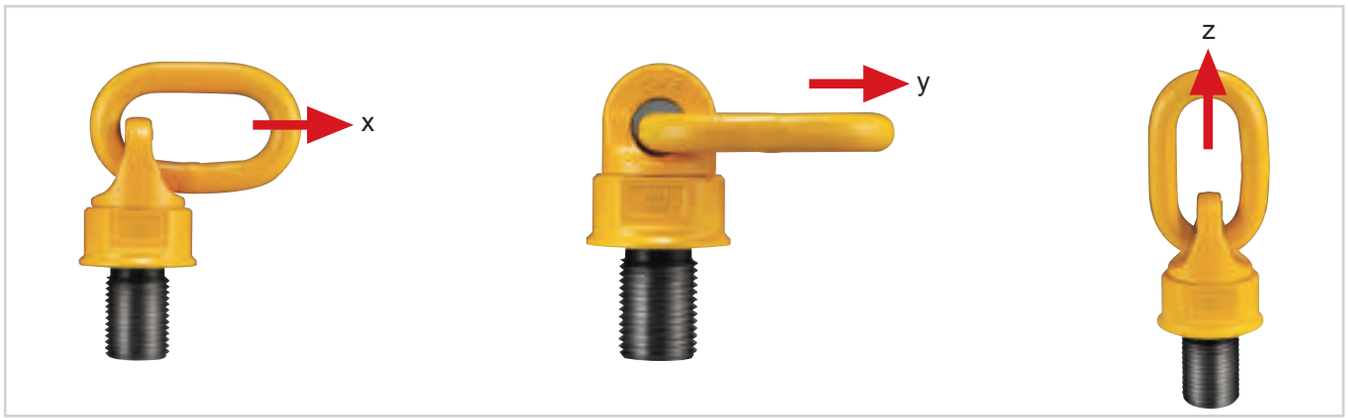


Order-No.:	Threads (M)	Maximum load tonnes (t)	Dimensions (mm)									Weight kg/pce	Tightening torque Nm
			B	E	A	G	D	F	H	S	SW		
713.15.008.003	**M8 x 1,25**	**0,3**	35	16	30	55	10,0	85	35	6	13	0,20	30
713.15.010.006	**M10 x 1,50**	**0,6**	35	21	30	55	10,0	85	36	8	17	0,30	60
713.15.012.010	**M12 x 1,75**	**1**	37	24	33	57	13,5	98	44	8	19	0,50	100
713.15.014.012	**M14 x 2,00**	**1,2**	37	24	33	57	13,5	98	45	10	22	0,50	120
713.15.016.015	**M16 x 2,00**	**1,5**	37	29	33	57	13,5	98	46	10	24	0,50	150
713.15.018.020	**M18 x 2,00**	**2**	54	31	50	82	16,5	140	57	12	30	1,30	200
713.15.020.025	**M20 x 2,50**	**2,5**	54	36	50	82	16,5	140	57	12	30	1,30	250
713.15.024.040	**M24 x 3,00**	**4**	54	41	50	82	16,5	140	59	14	36	1,40	400
713.15.027.040	**M27 x 3,00**	**4**	65	48	60	99	22,5	170	79	17	41	2,80	400
713.15.030.050	**M30 x 3,50**	**5**	65	53	60	99	22,5	170	81	17	46	3,10	500
713.15.036.070	**M36 x 4,00**	**7**	65	60	60	99	22,5	178	88	22	55	3,30	700
713.15.036.080	**M36 x 4,00**	**8**	85	62	77	124	26,5	225	101	22	55	5,80	800
713.15.042.100	**M42 x 4,50**	**10**	85	72	77	124	26,5	225	104	24	65	6,30	1.000
713.15.042.150	**M42 x 4,50**	**15**	104	64	95	158	36,0	256	112	24	65	10,80	1.500
713.15.048.200	**M48 x 5,00**	**20**	104	75	95	158	36,0	259	120	27	75	11,60	2.000

UNIVERSAL ROTARY EYEBOLT

Order-No: 713.14.M



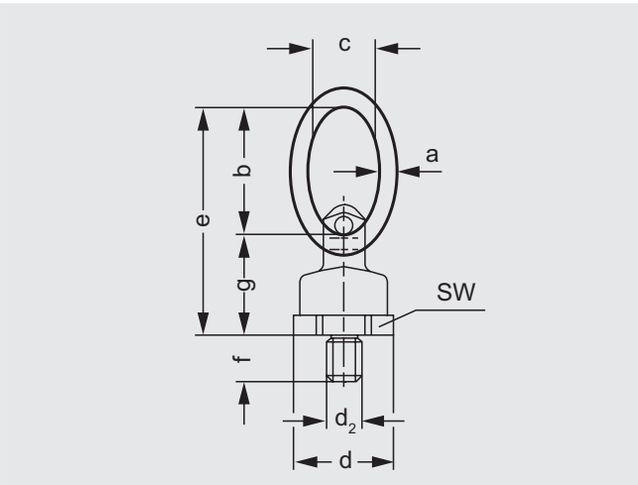


Ordering example: M = M8
713.14.008

Order-No.:	Maximum load tonnes x (y) [z]	Threads M	Dimensions (mm)								Weight kg
			A	B	C	D	E	F	G	K	
713.14.008	0,3 (0,4) [0,6]	**M8**	29	32	44	8	12	75	35	30	0,2
713.14.010	0,45 (0,6) [0,9]	**M10**	29	32	44	8	15	75	35	30	0,3
713.14.012	0,6 (0,7) [1,2]	**M12**	35	50	54	10	16	104	40	36	0,4
713.14.016	1,3 (1,5) [2,6]	**M16**	38	50	65	13	24	114	46	41	0,6
713.14.020	2 (2,5) [4]	**M20**	38	56	79	13	30	135	62	55	1,4
713.14.024	3,5 (4) [7]	**M24**	40	68	104	18	36	172	78	70	2,6
713.14.030	6 (7,5) [10]	**M30**	50	86	92	22	50	207	90	80	4,9
713.14.036	8 (10) [15]	**M36**	50	86	92	22	54	207	90	80	5,0
713.14.042	12 (13) [17]	**M42**	65	90	94	26	63	209	98	84	5,5
713.14.048	13 (16) [18]	**M48**	65	90	94	26	68	209	98	84	5,8
713.14.052	14 (20) [25]	**M52**	70	120	120	32	78	270	120	94	10,5
713.14.056	16 (22) [28]	**M56**	70	120	120	32	84	270	120	94	10,7
713.14.064	16 (25) [28]	**M64**	70	120	120	32	84	270	120	94	11,6
713.14.072	31,5 (40) [50]	**M72**	90	130	160	46	106	340	170	145	30,6
713.14.080	35 (48) [50]	**M80**	90	130	160	46	120	340	170	145	31,9
713.14.090	40 (50) [50]	**M90**	90	130	160	46	136	340	170	145	33,9

UNIVERSAL ROTARY SAFETY EYEBOLT WITH OVAL RING

Order-No.: 7142.d_2



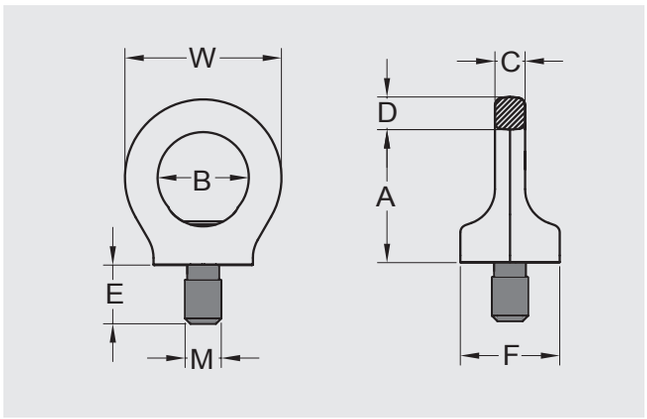
Note:
The unviversal rotary safety eyebolts with oval ring with double ball bearing for smooth non-jerking action tipping, rotating and turning. Also rotates 90° in direction of screwing in with full load. Not suitable for extended rotational movement when fully loaded. The special design avoids damage to lifting elements and the valuable load when turning. For ring hoists, slings, cables, hooks etc.
Ensure even screw-in surface, threads must be screwed in completely.

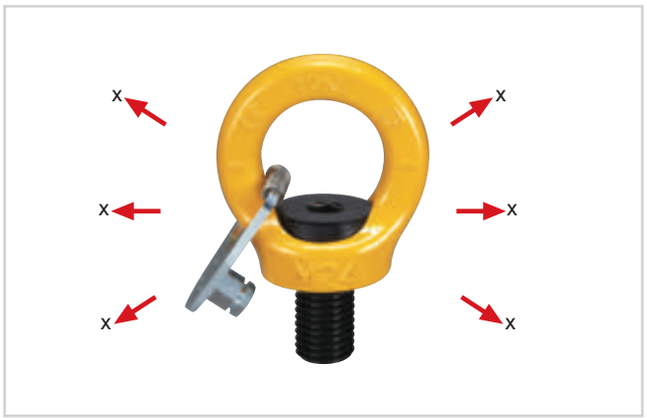
Ordering example: d_2 = M12
7142.012

Order-No.:	Rated carrying capacity (t)	d_2	f	a	b	c	d	e	g	SW
7142.012	0,63	**M12**	18	9	65	35	40	105	41	36
7142.016	1,5	**M16**	24	11	65	35	46	115	50	41
7142.020	2,5	**M20**	30	13	75	40	61	135	61	55
7142.024	4,0	**M24**	36	16	95	45	78	172	77	70
7142.030	5,0	**M30**	45	21	130	60	95	223	93	85
7142.036	8,0	**M36**	54	24	140	65	100	242	102	90

LIFTING EYE BOLT, 360°-ROTATABLE, WITH LOCK PLATE

Order-No.: 713.11.M



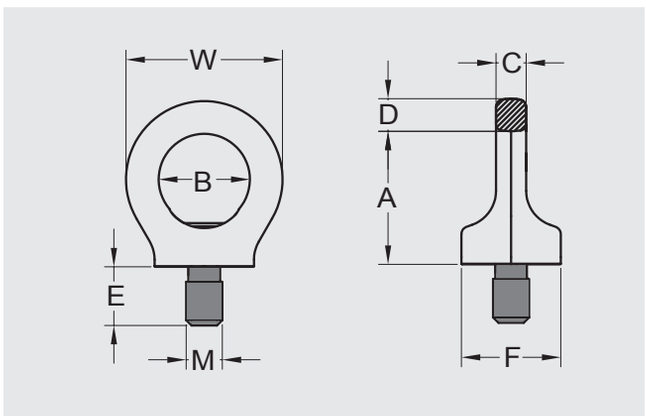


Ordering example: M = M8
713.11.008

Order-No.:	Maximum load tonnes x (z)	Threads M	Dimensions (mm)								Weight kg
			A	B	C	D	E	F	S	W	
713.11.008	0,3 (1)	**M8**	36	25	8	11	12	25	6	44	0,1
713.11.010	0,4 (1)	**M10**	36	25	8	11	15	25	6	44	0,1
713.11.012	0,75 (2)	**M12**	42	30	10	13	18	33	8	52	0,2
713.11.016	1,5 (4)	**M16**	51	35	14	13	24	35	10	61	0,3
713.11.020	2,3 (6)	**M20**	57	40	16	17	30	44	12	70	0,5
713.11.024	3,2 (8)	**M24**	70	48	19	21	36	52	14	84	0,9
713.11.030	4,5 (12)	**M30**	86	60	24	26	45	62	17	108	1,7
713.11.036	7,0 (16)	**M36**	103	72	29	32	54	78	22	130	2,9
713.11.042	9,0 (24)	**M42**	120	82	34	38	63	88	24	150	4,6
713.11.048	12,0 (32)	**M48**	137	94	38	43	72	104	27	168	7,0

LIFTING EYE BOLT, HIGH TENSILE, ROTATABLE

Order-No.: 713.10.M



Ordering example: M = M8
713.10.008

Order-No.:	Maximum load tonnes x (z)	Threads M	Dimensions (mm)								Weight kg
			A	B	C	D	E	F	S	W	
713.10.008	0,3 (1)	**M8**	36	25	8	11	12	25	6	44	0,1
713.10.010	0,4 (1)	**M10**	36	25	8	11	15	25	6	44	0,1
713.10.012	0,75 (2)	**M12**	42	30	10	13	18	33	8	52	0,2
713.10.016	1,5 (4)	**M16**	51	35	14	13	24	35	10	61	0,3
713.10.020	2,3 (6)	**M20**	57	40	16	17	30	44	12	70	0,5
713.10.024	3,2 (8)	**M24**	70	48	19	21	36	52	14	84	0,9
713.10.030	4,5 (12)	**M30**	86	60	24	26	45	62	17	108	1,7
713.10.036	7,0 (16)	**M36**	103	72	29	32	54	78	22	130	2,9
713.10.042	9,0 (24)	**M42**	120	82	34	38	63	88	24	150	4,6
713.10.048	12,0 (32)	**M48**	137	94	38	43	72	104	27	168	7,0

Cam slide units

INDEX

Cam slide units

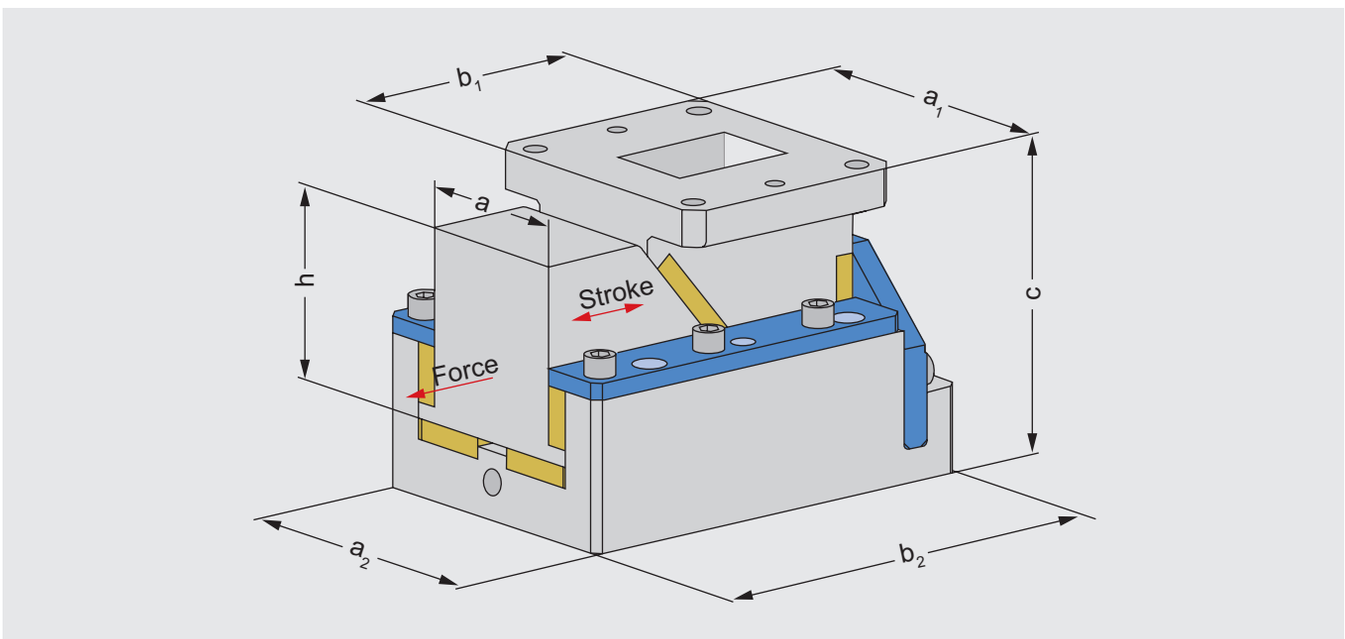
CAM SLIDE UNIT HIGH VOLUME PREMIUM

Order-No.: K16.12.00.a.stroke.2

Material slide plane:
steel hardened / bronze with solid lubricant

Execution:
Driver, slide, slide bed: GGG60
Slide return with gas spring
Clearance 0,03 mm
A position hole is tolerated for assembly.

Ordering example: width a= 65, stroke=40
K16.12.00.065.040.2

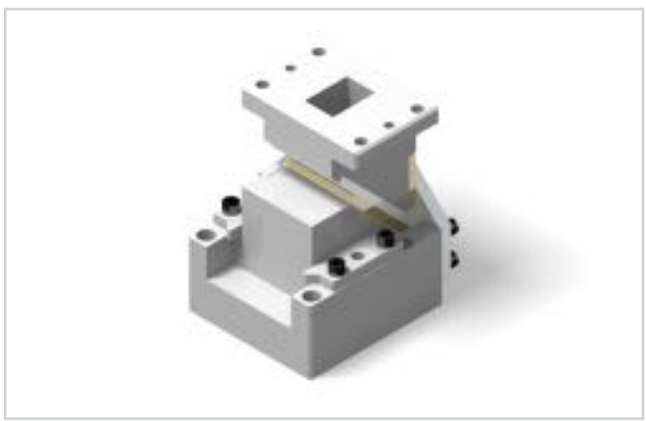


Order-No.:	max. working stroke	max. working force	working surface a	working surface h	slide dimensions[1] c	mounting surface top a_1	mounting surface top b_1	Mounting surface bottom a_2	Mounting surface bottom b_2
			width	height	height	width	length	width	length
K16.12.00.065.040.2	**40 mm**	175,5 kN	**65 mm**	90 mm	161 mm	130 mm	89 mm	134 mm	200 mm
K16.12.00.065.060.2	**60 mm**	175,5 kN	**65 mm**	90 mm	161 mm	130 mm	109 mm	134 mm	230 mm
K16.12.00.065.080.2	**80 mm**	224,3 kN	**65 mm**	115 mm	186 mm	130 mm	149 mm	134 mm	265 mm
K16.12.00.065.100.2	**100 mm**	263,3 kN	**65 mm**	135 mm	207 mm	130 mm	169 mm	134 mm	305 mm
K16.12.00.100.040.2	**40 mm**	270,0 kN	**100 mm**	90 mm	161 mm	175 mm	89 mm	185 mm	200 mm
K16.12.00.100.060.2	**60 mm**	270,0 kN	**100 mm**	90 mm	161 mm	175 mm	109 mm	185 mm	230 mm
K16.12.00.100.080.2	**80 mm**	345,0 kN	**100 mm**	115 mm	186 mm	175 mm	149 mm	185 mm	265 mm
K16.12.00.100.100.2	**100 mm**	405,0 kN	**100 mm**	135 mm	207 mm	175 mm	169 mm	185 mm	305 mm
K16.12.00.150.040.2	**40 mm**	405,0 kN	**150 mm**	90 mm	161 mm	250 mm	89 mm	260 mm	205 mm
K16.12.00.150.060.2	**60 mm**	405,0 kN	**150 mm**	90 mm	161 mm	250 mm	109 mm	260 mm	235 mm
K16.12.00.150.080.2	**80 mm**	517,5 kN	**150 mm**	115 mm	186 mm	250 mm	149 mm	260 mm	270 mm
K16.12.00.150.100.2	**100 mm**	607,5 kN	**150 mm**	135 mm	207 mm	250 mm	169 mm	260 mm	310 mm

[1]in closed position

CAM SLIDE UNIT LOW VOLUME

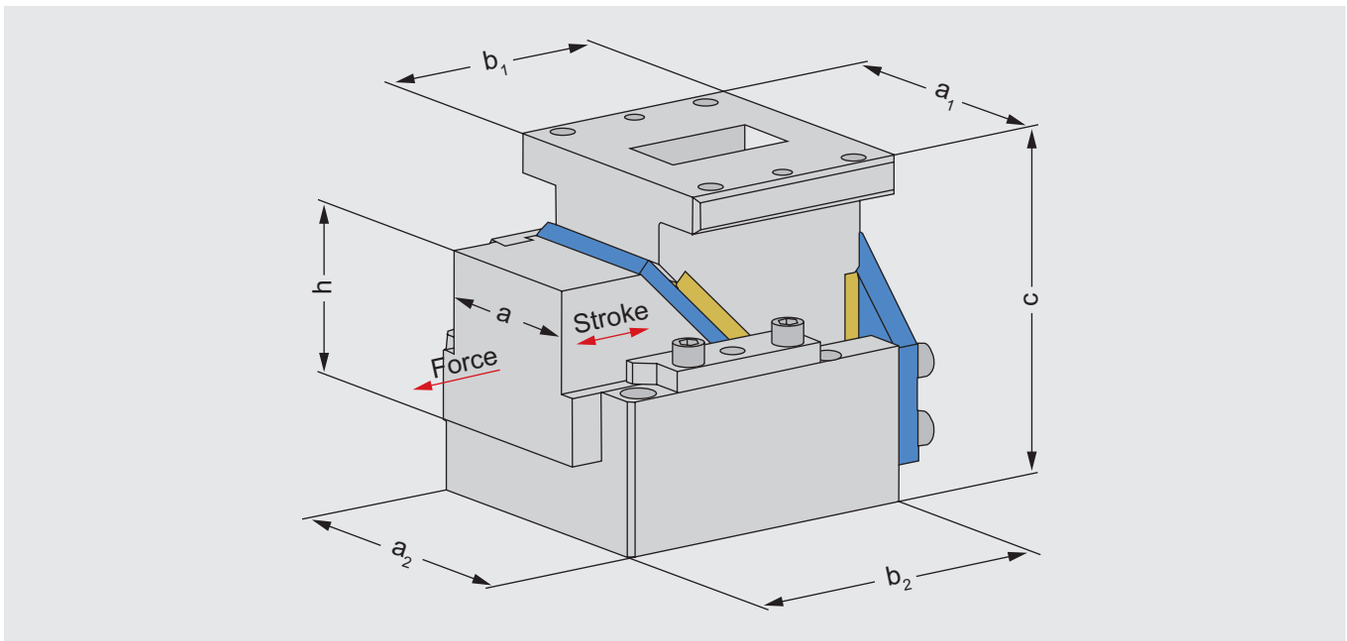
Order-No.: K16.14.00.a.stroke.1 / K16.14.00.a.stroke.*



Material slide plane:
steel, hardened / bronze with solid lubricant

Execution:
Driver, slide, slide bed: GGG45
Slide return with gas spring (.2) or compression spring (.1)
Clearance 0,03 mm
To ensure a secure return, all Cam Slide Units have an automatic retract.

Ordering example: width a= 100, stroke=60, w. gas spring:
K16.14.00.100.060.2



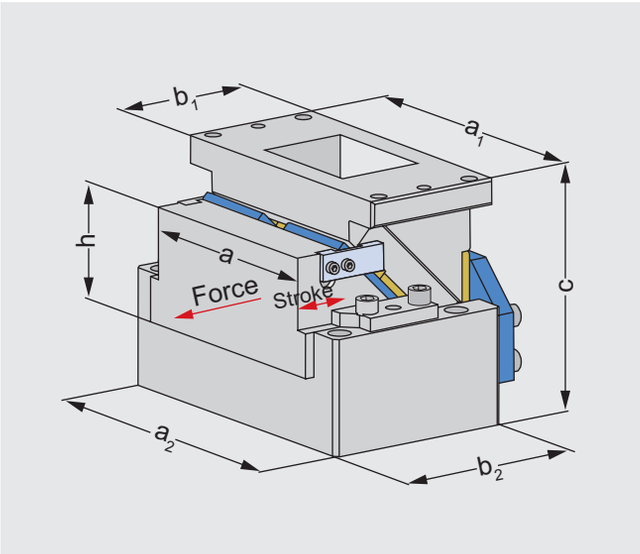
Note:
Ordering option *:
1 = Return with compression spring
2 = Return with gas spring

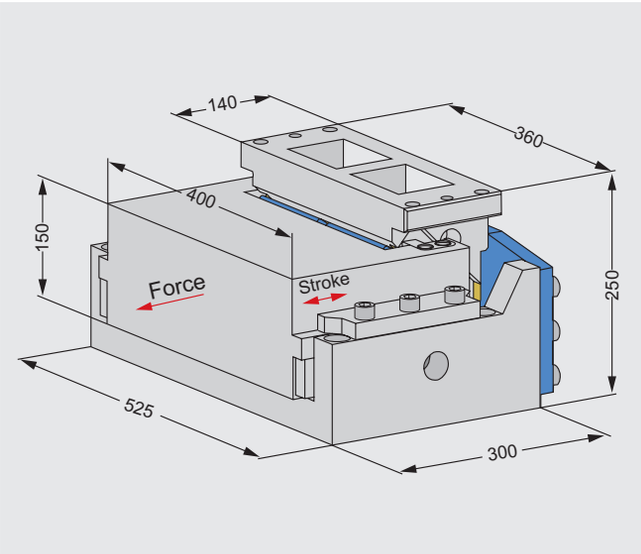
Order-No.:	max. working stroke	max. working force	working surface a	working surface h	slide dimensions c	Mounting surface top a_1	Mounting surface top b_1	Mounting surface bottom a_2	Mounting surface bottom b_2
			width	height	height	width	length	width	length
K16.14.00.052.025.1	**25 mm**	27 kN	**52 mm**	65 mm	140 mm	98 mm	80 mm	98 mm	120 mm
K16.14.00.052.040.1	**40 mm**	27 kN	**52 mm**	65 mm	140 mm	98 mm	90 mm	98 mm	135 mm
K16.14.00.052.060.1	**60 mm**	27 kN	**52 mm**	65 mm	140 mm	98 mm	110 mm	98 mm	180 mm
K16.14.00.065.040.1	**40 mm**	36 kN	**65 mm**	70 mm	160 mm	130 mm	100 mm	130 mm	145 mm
K16.14.00.065.060.1	**60 mm**	36 kN	**65 mm**	70 mm	160 mm	130 mm	110 mm	130 mm	180 mm
K16.14.00.100.040.*	**40 mm**	80 kN	**100 mm**	100 mm	200 mm	175 mm	120 mm	175 mm	190 mm
K16.14.00.100.060.*	**60 mm**	80 kN	**100 mm**	100 mm	200 mm	175 mm	140 mm	175 mm	190 mm
K16.14.00.100.080.1	**80 mm**	80 kN	**100 mm**	100 mm	200 mm	175 mm	150 mm	175 mm	220 mm
K16.14.00.150.040.*	**40 mm**	120 kN	**150 mm**	100 mm	220 mm	230 mm	120 mm	260 mm	190 mm
K16.14.00.150.060.1	**60 mm**	120 kN	**150 mm**	100 mm	220 mm	230 mm	140 mm	260 mm	200 mm

[1]in closed position

CAM SLIDE UNIT LOW VOLUME

Order-No.: K16.14.00.a.stroke.* / K16.14.00.060.1





Note:

Ordering option *:

1 = Return with compression spring

2 = Return with gas spring

Order-No.:	max. working stroke	max. working force	working surface a	working surface h	slide dimensions c	Mounting surface top a_1	Mounting surface top b_1	Mounting surface bottom a_2	Mounting surface bottom b_2
			width	height	height	width	length	width	length
K16.14.00.200.040.*	**40 mm**	176 kN	**200 mm**	110 mm	240 mm	280 mm	130 mm	310 mm	200 mm
K16.14.00.200.060.1	**60 mm**	176 kN	**200 mm**	110 mm	240 mm	280 mm	150 mm	310 mm	210 mm
K16.14.00.250.040.*	**40 mm**	260 kN	**250 mm**	130 mm	270 mm	330 mm	140 mm	360 mm	200 mm
K16.14.00.250.060.*	**60 mm**	260 kN	**250 mm**	130 mm	270 mm	330 mm	160 mm	360 mm	220 mm
K16.14.00.300.040.*	**40 mm**	312 kN	**300 mm**	130 mm	270 mm	380 mm	140 mm	410 mm	200 mm
K16.14.00.300.060.*	**60 mm**	312 kN	**300 mm**	130 mm	270 mm	380 mm	160 mm	410 mm	220 mm
K16.14.00.400.060.1	**60 mm**	480 kN							

[1]in closed position

Newstark and slide units

NEWSTARK, TO GO FURTHER

The name of Newstark was born to be leader in innovation of high performance components for dies. The ideal partner to ensure technologically advanced solutions, with specifc technical know-how according with your needs for performance and quality. Newstark is a brand of Essemec S.r.l.

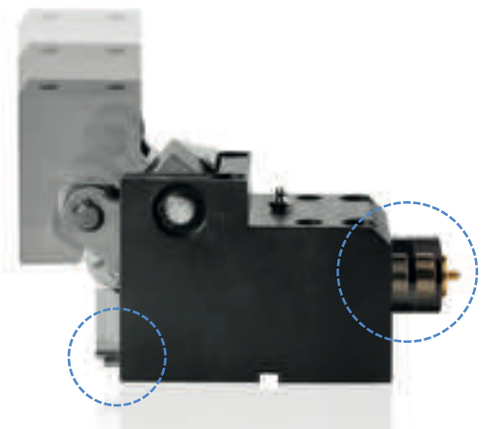
Unipersonale, company with twenty years experience in metal mechanic, thus represents the fusion of tradition-mechanical and technological innovation.

INDEX

Newstark, slide units and individual parts

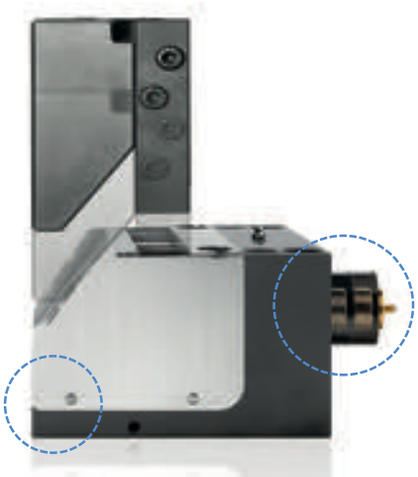
NEWSTARK MODELS

Overview



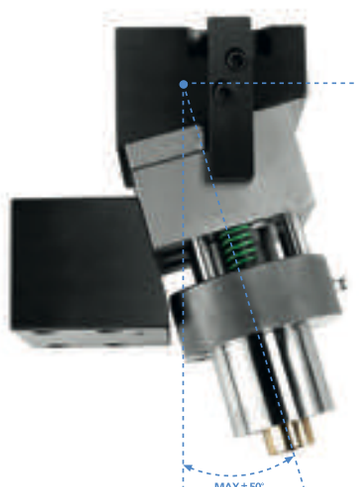
CAMMA MAE

Mechanic shearing which fits an ISO standard direct integrated punch, that can eventually be shaped to match with required geometries with power up to 30000 daN. Long stroke, maximum speed are 50 strokes per minute. Slope applications up to 50°.



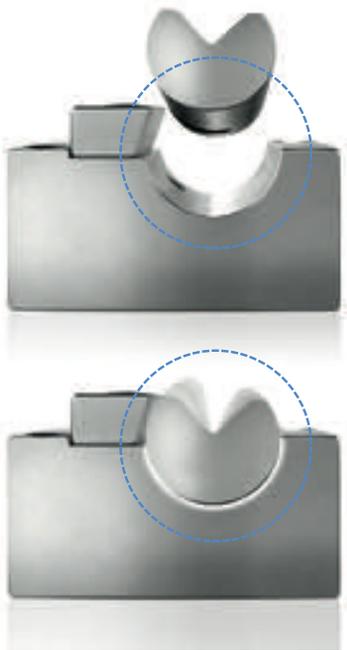
CAMMA MASE

Mechanic shearing which fits an ISO standard direct integrated punch, that can eventually be shaped to match with required geometries with power up to 30000 daN. Long stroke, maximum speed are 40 strokes per minute. Slope applications up to 30°



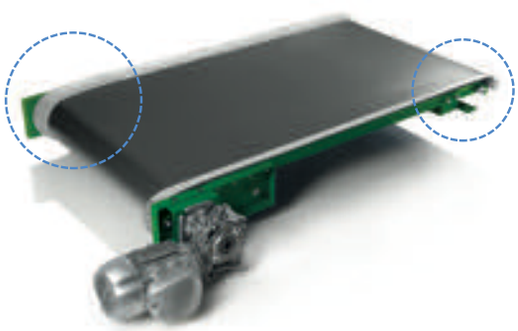
CAMMA SMEG

Mechanic shearing which fits an ISO standard direct integrated punch, that can eventually be shaped to match with required geometries. Product is custom made upon request. Maximum speed are 50 strokes per minute. Two axis slope up to 50°.



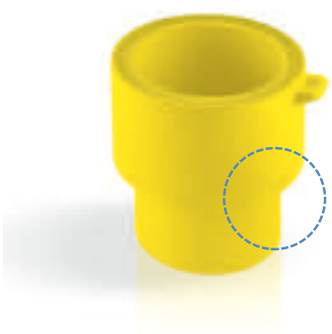
Roll

Device that allows simultaneous calibration and bending of metal sheet or steel.



Conveyors belts

Material convey system through a belt driven by electric force.



Support for die

Built and designed for the storage and transport of the die.

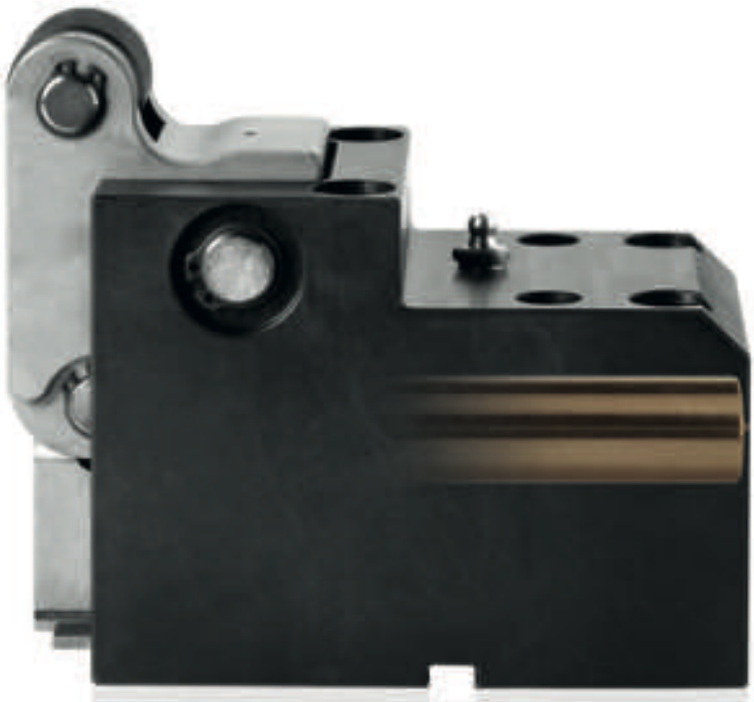
	MAE	MASE	SMEG	M/ML	MA	MAS	MASC	MASC Compact
Punch holder								
Punch	•	•	•	•				
Stripper				•				
PU-Spring	•	•	•					
Gas spring								
Punch holder plate					•	•	•	•
Power transmission								
Lever				•				
Lever-Roll	•				•			
Pestle		•	•			•	•	•
Retreat								
Metal spring			•	•				
Gas spring	•	•			•	•	•	•
Working force								
up to 5000 daN	•	•	•	•	•	•	•	•
up to 10000 daN	•	•	•		•	•	•	•
up to 17000 daN	•	•	•			•	•	•
up to 40000 daN							•	•

STRENGTHS


UNIQUENESS
1
OF THE PRODUCT
PATENT PENDING
MAXIMUM SPEED
50
50 STROKES PER MINUTE
EASINESS OF DISASSEMBLY
AND MAINTENANCE
HIGH QUALITY
MATERIALS
ANTI-ROTATION
SYSTEM
ACCURATE UNIT
LONG STROKE
SLOPE
±50°
APPLICATIONS
LONG DURATION
SECURITY
MICROSENSOR
MINIMUM SIZE

CAMMA MAE

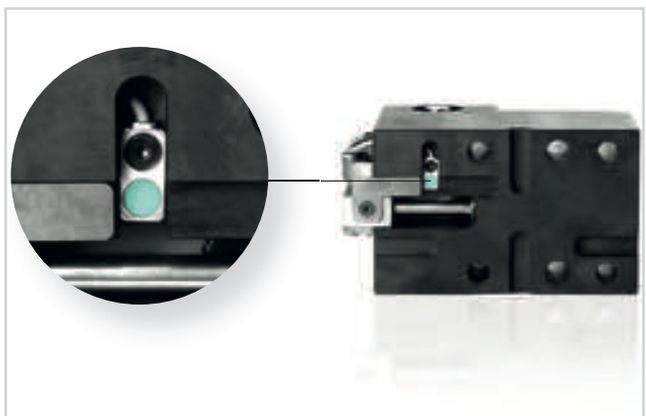
Mechanic shearing

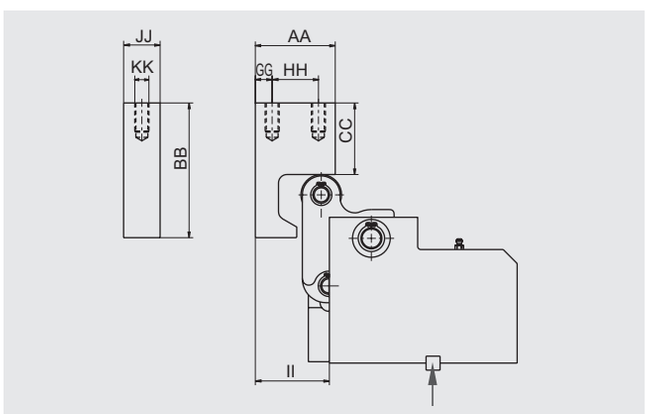


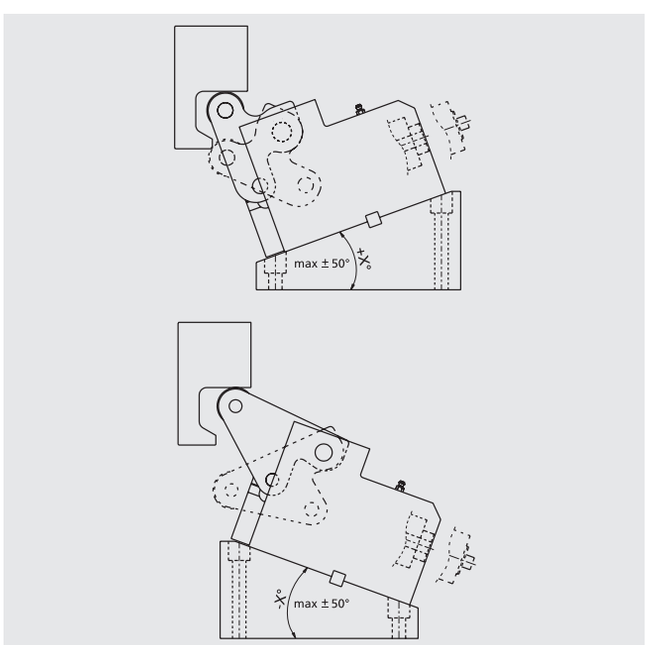
This model represents the top of Newstark's production, range which incorporates market unique and innovative solutions. The system fits an ISO standard direct integrated punch, easily available on the market, that can eventually be shaped to match with required geometries with power up to 30000 daN. This innovative system enables the increasing of the application possibilities and exponentially allows his life duration. Can be ftted horizontally or inclined (after comparison with Newstark's technical department).

CAMMA MAE

Order-No. parts: model-position





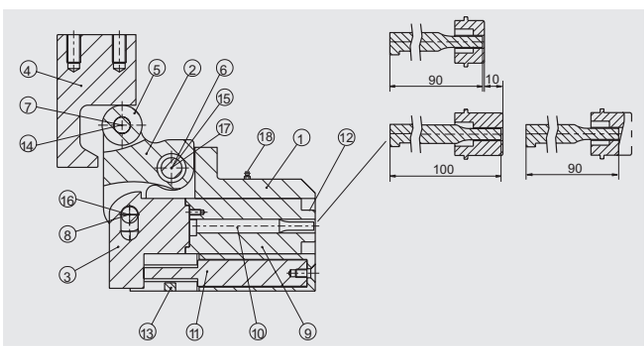


Note:
The system fits a miniaturized electronic device (P13) to control the correct repositioning of the equipment
We suggest to assembly by using a thrust mount key.
When slope application is present, we supply special part 002 “Lever”, which is not included in the standard supply.

Ordering example: parts: model = MAE 505-10, position = 002
MAE 505-10-002

Anvils-Table with mechanical extraction guaranteed.

Model	AA	BB	CC	GG	HH	II	JJ	KK
MAE-505-10	57	96	51	12	33	52,8	26	M10
MAE-420-10 Metal spring	57	96	51	12	33	52,8	26	M10
MAE-695-13	65	118	63	14	37	60,5	30	M12
MAE-470-13 Metal spring	65	118	63	14	37	60,5	30	M12
MAE-695-16	65	118	63	14	37	60,5	30	M12
MAE-470-16 Metal spring	65	118	63	14	37	60,5	30	M12
MAE-1160-20	78	128	66	14	49	91	37	M12
MAE-1160-25	78	128	66	14	49	91	37	M12
MAE-1390-32	73	136	71	16,5	40	92,5	37	M12
MAE-1880-40	88	148	76	20	48	109,5	45	M16
MAE-3300-65	127	177	69	25	77	130,5	45	M16



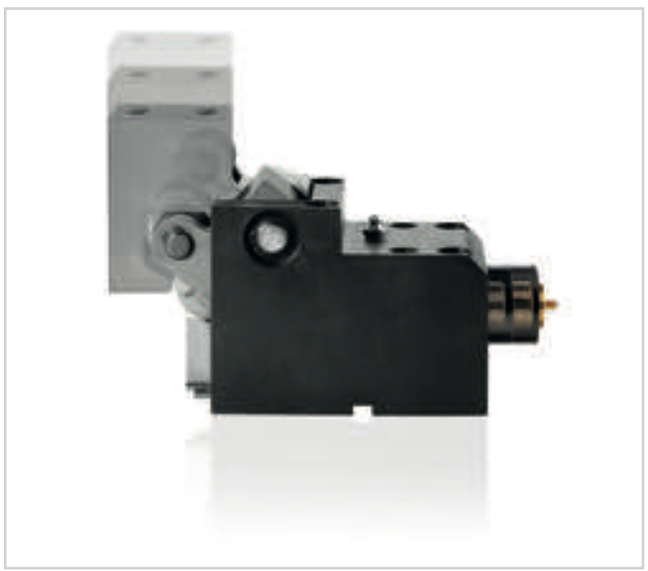
The stripper is removable and shaped in bronze, with a stroke of 8 mm.

position	quantity	description
001	1	cam body
002	1	lever
003	1	flange
004*	1	anvil
005	1	roller
006	1	pin
007	1	pin
008	1	pin
009	1	special cylinder
010*	1	punch
011	1	return cylinder
012	1	blank holder
013*	1	Micro sensor for security
014	2	seeger
015	2	seeger
016	2	seeger
017	2	bearings
018	1	nipples

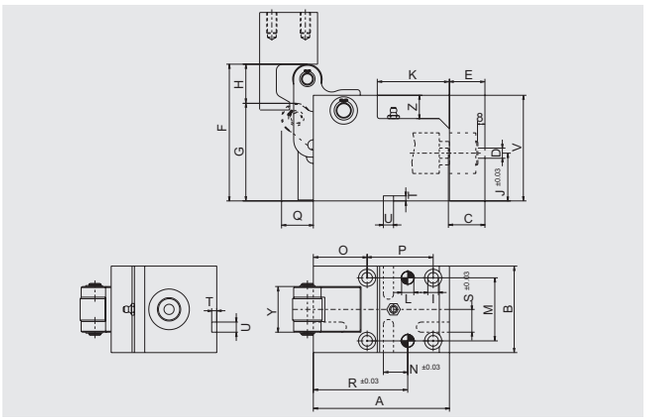
*available upon request

CAMMA MAE

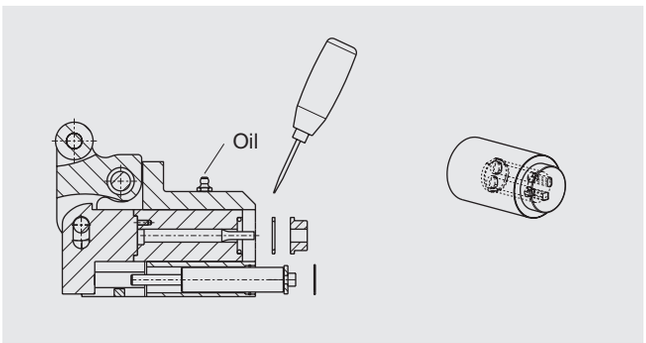
Version with nitrogen cylinder



Note:
It is possible to put several punches in the same unit.

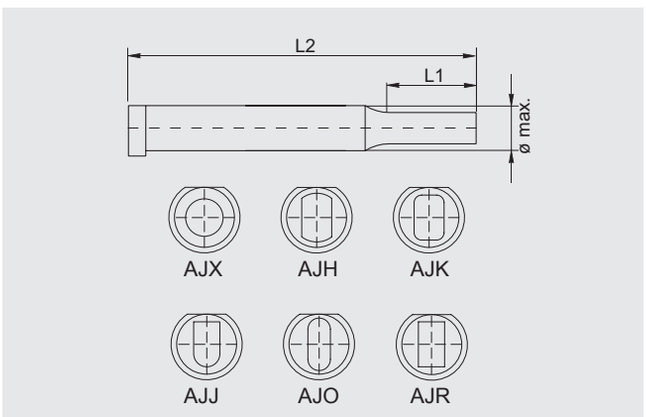


Examples for special applications



Attention:

In order to manually perform the test, extract the cylinder as indicated. Please consult our Instruction Manual.



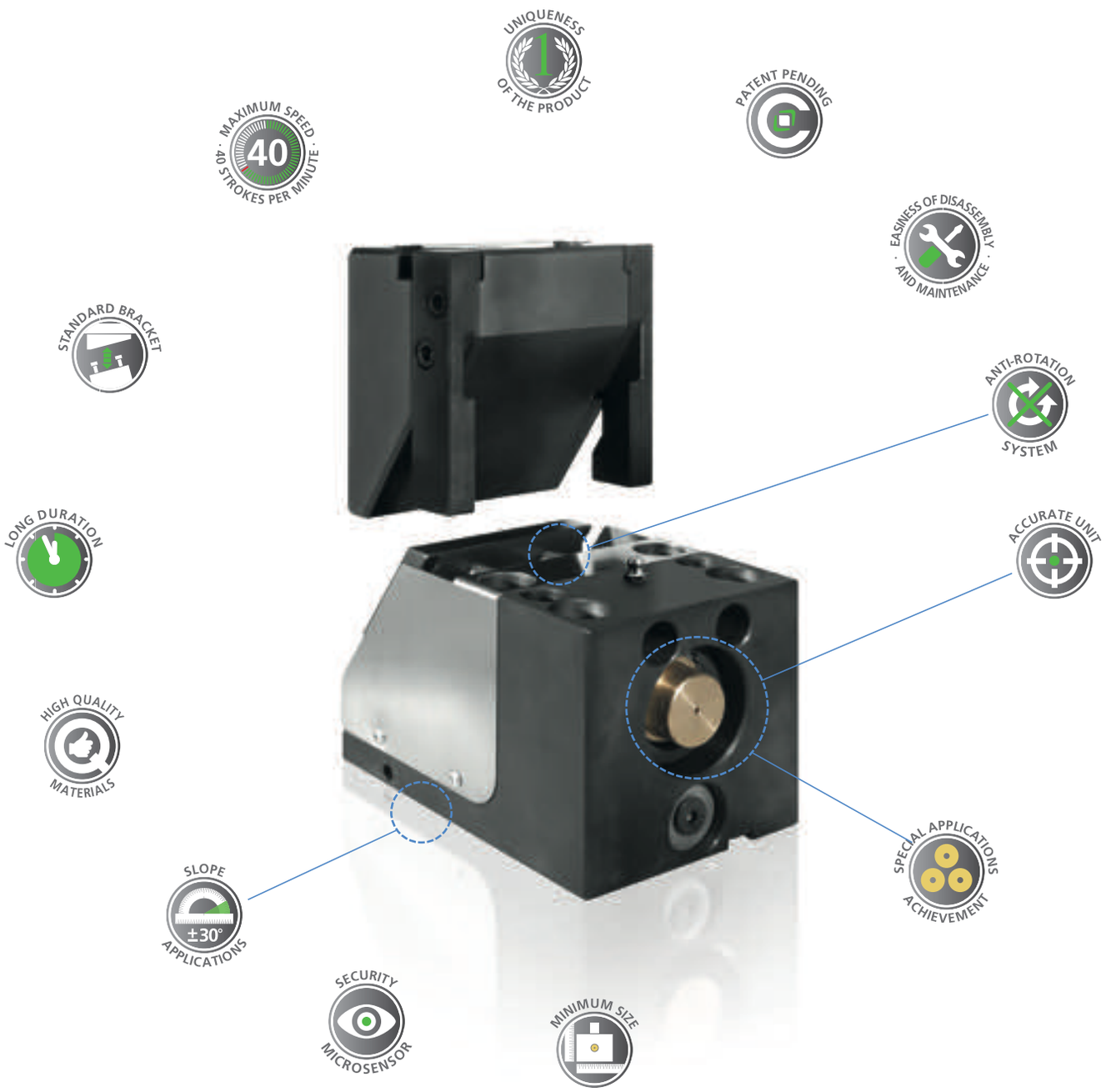
Standard punch length 90-100

Model	ø max.	L1	L2
MAE-505-10	10	25	90/100
MAE-695-13	13	25	90/100
MAE-695-16	16	25	90/100
MAE-1160-20	20	25	90/100
MAE-1160-25	25	25	90/100
MAE-1390-32	32	30	90/100
MAE-1880-40	40	30	90/100
MAE-3300-65	65	30	105/115 (special)

Technical data of the max extraction model (daN)

Model MAE-	A	B	C	D max.	E	F	G	H	I	L $^{+0,02}_{0}$	M	N	O	P	Q	R	S	T	U	V	Z	Y	K	J	max. cutting force (daN)
505-10	134	85	36	ø 10	35	134,5	96	38,5	ø 10,5	ø 12	62	24	53	65	31,3	93	22,5	5	10	104	23	45	71	47	4500
695-13	145	98	36	ø 13	35	152,5	115,7	36,7	ø 13	ø 16	74	26	64	65	35,8	104	28,5	6	12	118	27	54	66	52	6000
695-16	145	98	36	ø 16	35	152,5	115,7	36,7	ø 13	ø 16	74	26	64	65	35,8	104	28,5	6	12	118	27	54	66	52	6000
1160-20	145	117	47	ø 20	46	177,5	126,2	51,3	ø 13	ø 16	93	26	64	65	59,7	104	28,5	6	12	138	27	65	58	59,5	9000
1160-25	145	117	47	ø 25	46	177,5	126,2	51,3	ø 17	ø 16	93	26	64	65	59,7	104	28,5	6	12	138	27	65	58	59,5	9000
1390-32	145	127	47	ø 32	46	188,5	132,8	55,7	ø 17	ø 16	103	28	64	65	65,4	104	32,5	6	16	148	27	70	58	64,5	12000
1880-40	155	145	47	ø 40	46	218,5	164,2	53,8	17	ø 16	115	28	74	65	76,7	114	32,5	6	16	175	38	84	58	72,5	17000
3300-65	196	196	47	ø 65	46	283	238,4	44,6	17	ø 20	151,5	33	103	77	73,5	150	50,5	7	20	230	53	107	58	87	30000

STRENGTHS


UNIQUENESS
1
OF THE PRODUCT
PATENT PENDING
MAXIMUM SPEED
40
40 STROKES PER MINUTE
EASINESS OF DISASSEMBLY AND MAINTENANCE
STANDARD BRACKET
ANTI-ROTATION SYSTEM
LONG DURATION
ACCURATE UNIT
HIGH QUALITY MATERIALS
SLOPE
±30°
APPLICATIONS
SPECIAL APPLICATIONS ACHIEVEMENT
SECURITY MICROSENSOR
MINIMUM SIZE

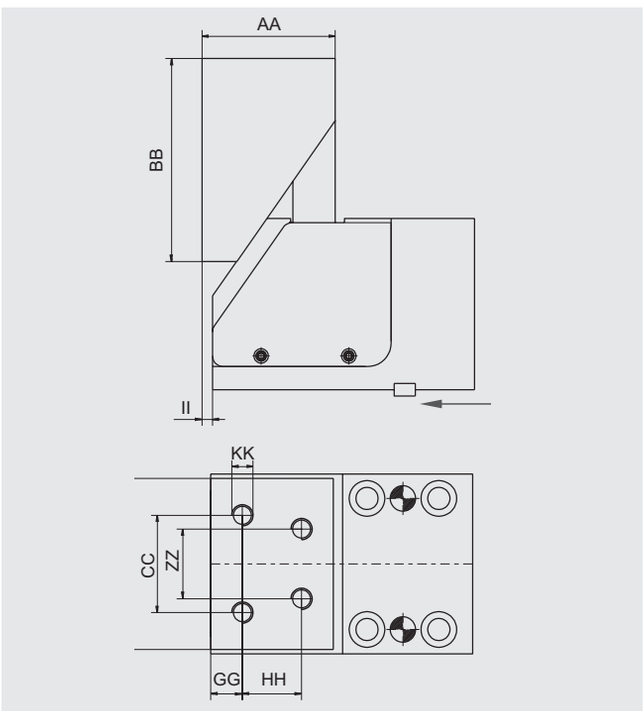
CAMMA MASE

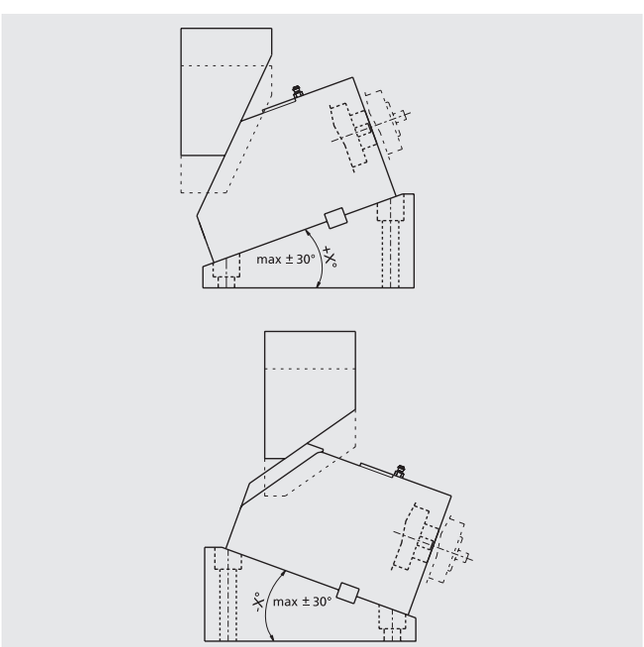
Mechanic shearing

This model represents the top of Newstark's production, range which incorporates market unique and innovative solutions. The system fits an ISO standard direct integrated punch, easily available on the market, that can eventually be shaped to match with required geometries with power up to 30000 daN. This innovative system enables the increasing of the application possibilities and exponentially allows his life duration. Can be ftted horizontally or inclined (after comparison with Newstark's technical department).

CAMMA MASE

Order-No. spare parts: model-position



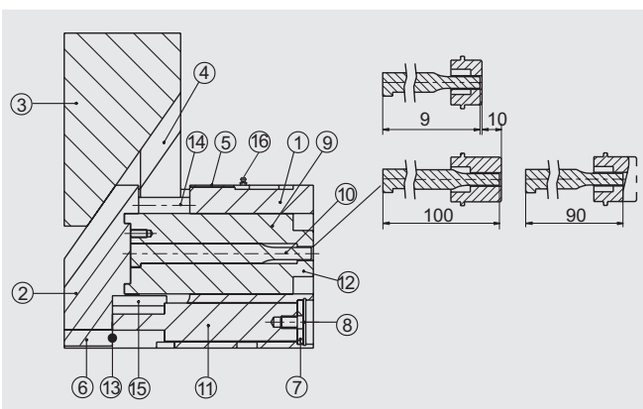


Note:
The system fits a miniaturized electronic device (P13) to control the correct repositioning of the equipment. We suggest you to assembly by using a thrust mount key. When slope application is present, we supply special part 002 “Slider”, 003 “Wedge” and 004 “Bracket attachments”, not included in the standard supply.

Ordering example spare parts: Model = MASE 505-10, position = 002
MASE 505-10-002

Anvils-Table with mechanical extraction guaranteed

Model	AA	BB	CC	GG	HH	II	JJ	KK	ZZ
MASE-505-10	73	96	52	23	35	3	81	M10	33
MASE-420-10 Metal spring	73	96	52	23	35	3	81	M10	33
MASE-695-13	81	106	54	25	41	3,8	94	M12	32
MASE-470-13 Metal spring	81	106	54	25	41	3,8	94	M12	32
MASE-695-16	81	106	54	25	41	3,8	94	M12	32
MASE-470-16 Metal spring	81	106	54	25	41	3,8	94	M12	32
MASE-1160-20	88	118	62	27,5	40,5	3,4	112	M12	32
MASE-1160-25	88	118	62	27,5	40,5	3,4	112	M12	32
MASE-1390-32	88	118	72	27,5	40,5	3	122	M12	42
MASE-1880-40	103	136	84	27	51,5	3	138	M16	54
MASE-3300-65	103	136	114	31,5	51,5	3	196	M16	84



The stripper is removable and shaped in bronze, with a stroke of 8 mm.

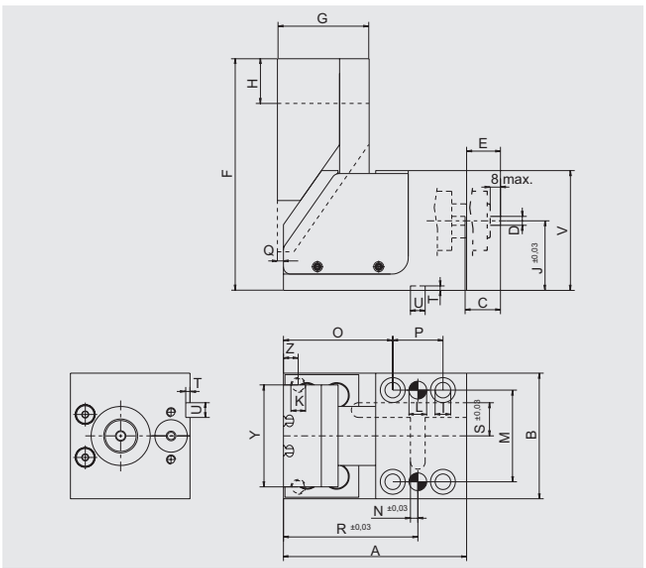
Position	Quantity	Description
001	1	Cam body
002	1	Slider
003	1	Wedge
004	2	Bracket attachments
005	1	Cover
006	1	Plate
007	1	Washer
008	1	Seeger
009	1	Special cylinder
010*	1	Punch ISO 8020
011	1	Return cylinder
012	1	Blank holder
013*	1	Micro sensor for security
014	2	Shoulder screw
015	2	Wear plate
016	1	Nipples

*available upon request

CAMMA MASE

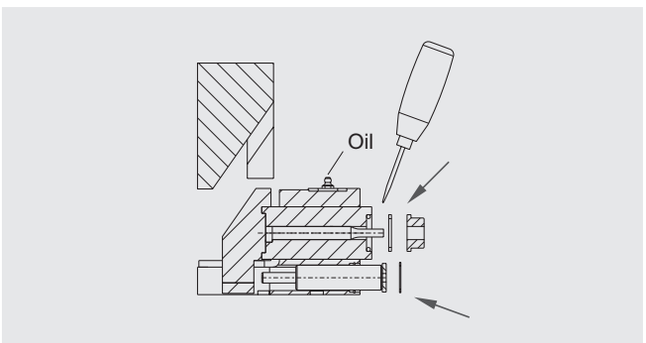
Version with nitrogen cylinder

Note:
It is possible to put several punches in the same unit.

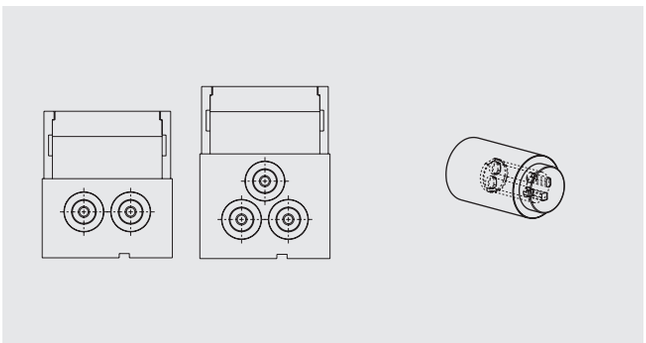


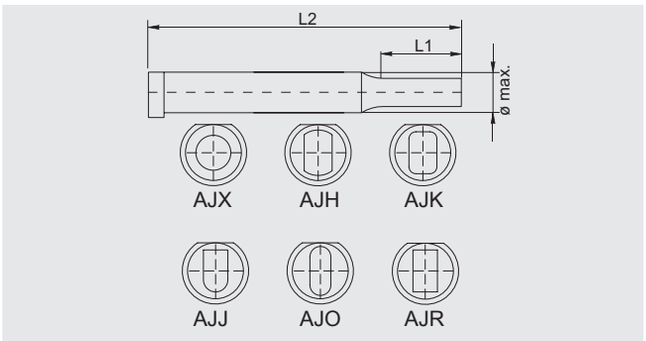
Attention:

In order to manually perform the test, extract the cylinder as indicated. Please consult our Instruction Manual.



Examples for special applications





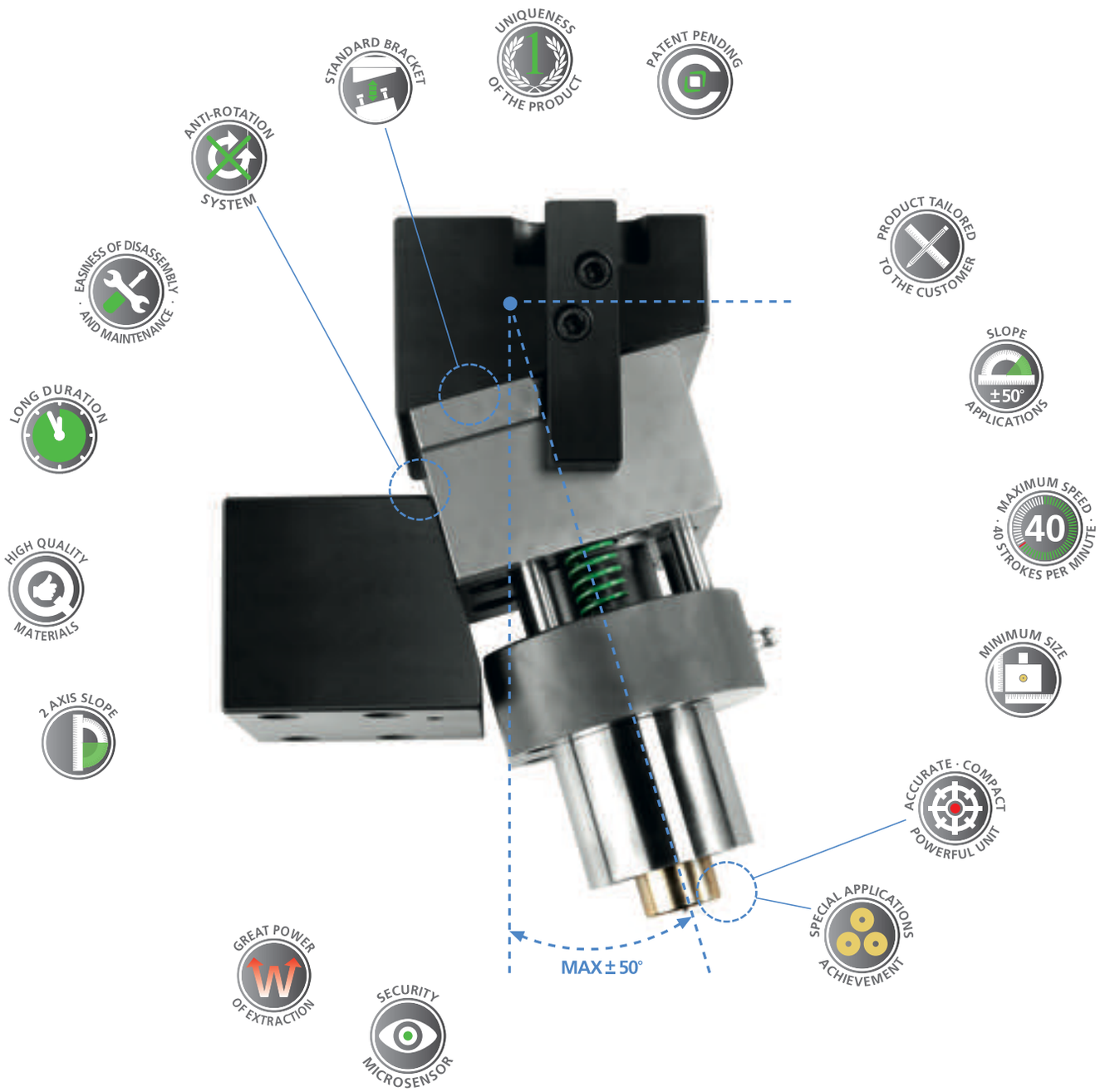
Standard punch length 90-100

Model	ø max.	L1	L2
MASE-505-10	10	25	90/100
MASE-695-13	13	25	90/100
MASE-695-16	16	25	90/100
MASE-1160-20	20	25	90/100
MASE-1160-25	25	25	90/100
MASE-1390-32	32	30	90/100
MASE-1880-40	40	30	90/100
MASE-3300-65	65	30	105/115 (special)

Technical data of the max extraction model (daN)

Model MASE-	A	B	C	D max.	E	F	G	H	I	L $^{+0,02}_{0}$	M	N	O	P	Q	R	S	T	U	V	Z	Y	K	J	max. cutting force (daN)
505-10	136	85	24	10	23	156,7	73	34,1	ø 10,5	ø 12	62	5	86	34	3	103	22,5	3	10	81	22	69	M10	47	4500
695-13	147	98	24	13	23	172,2	81	34,1	ø 13	ø 16	74	14	93	42	3,8	114	26	5	12	93	27	74	M12	54	6000
695-16	147	98	24	16	23	172,2	81	34,1	ø 13	ø 16	74	14	93	42	3,8	114	26	5	12	93	27	74	M12	54	6000
1160-20	154	117	24	20	23	186,2	88	34,1	ø 13	ø 16	93	18	98	44	3,4	120	35,5	5	12	108	27	93	M12	61,5	9000
1160-25	154	117	24	25	23	186,2	88	34,1	ø 13	ø 16	93	18	98	44	3,4	120	35,5	5	12	108	27	93	M12	61,5	9000
1390-32	154	127	24	32	23	190,8	88	34,1	ø 13	ø 16	103	18	98	44	3	120	41	5	12	120	27	103	M12	68,5	12000
1880-40	183	145	24	40	23	218,8	103	34,1	ø 17	ø 16	115	22	117	50	3	142	47,5	6	16	143	36	115	M16	78,5	17000
3300-65	198	205	24	65	23	248,8	103	34,1	17	ø 20	169	14	117	65	3	147	68,5	7	20	183	36	169	M16	98	30000

STRENGTHS


STANDARD BRACKET
UNIQUENESS OF THE PRODUCT
PATENT PENDING
ANTI-ROTATION SYSTEM
PRODUCT TAILORED TO THE CUSTOMER
EASINESS OF DISASSEMBLY AND MAINTENANCE
SLOPE ±50° APPLICATIONS
LONG DURATION
MAXIMUM SPEED 40 STROKES PER MINUTE
HIGH QUALITY MATERIALS
MINIMUM SIZE
2 AXIS SLOPE
ACCURATE · COMPACT POWERFUL UNIT
SPECIAL APPLICATIONS ACHIEVEMENT
GREAT POWER OF EXTRACTION
SECURITY MICROSENSOR
MAX ± 50°

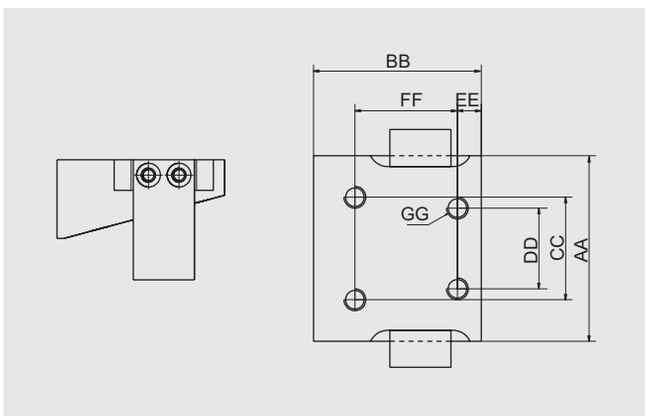
CAMMA SMEG

Mechanic shearing

This model represents the top of Newstark's production, range which incorporates market unique and innovative solutions. The system fits an ISO standard direct integrated punch, easily available on the market, that can eventually be shaped to match with required geometries with power up to 30000 daN. This innovative system enables the increasing of the application possibilities and exponentially allows his life duration.

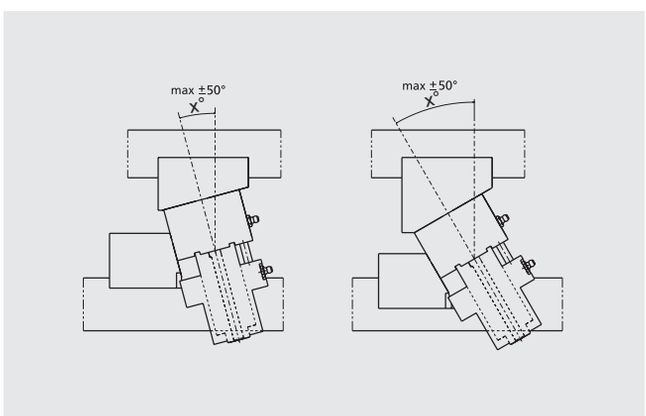
Note:
The system fits a miniaturized electronic device (P11) to control the correct repositioning of the equipment.
It's possible to use the anvil fxed with a little plate above the die. This helps the disassembly of equipment without removing the blank holder.

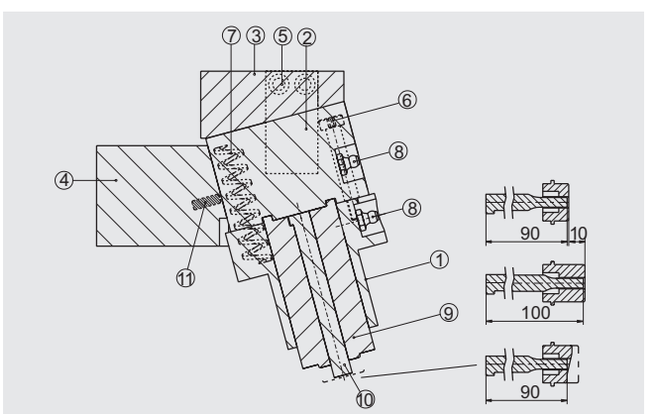
Ordering example: Model = SMEG 505-10, position = 002
SMEG 505-10-002



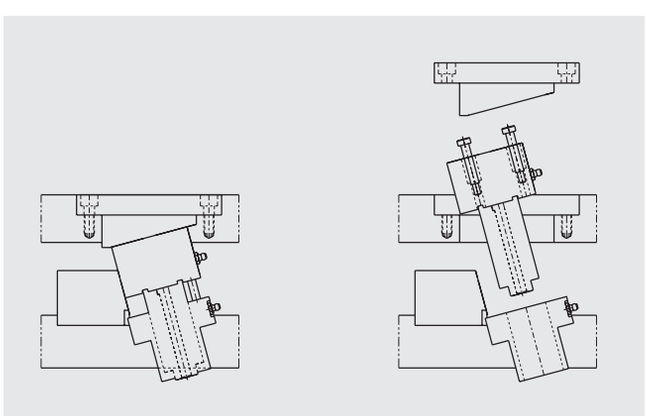
Anvils-Table with mechanical extraction guaranteed

Model	AA	BB	CC	DD	EE	FF	GG
SMEG 505-10	85	77	47	37	11	47	M10
SMEG-695-13	93	86	53	43	15	47	M10
SMEG-695-16	93	86	53	43	15	47	M10
SMEG 1160-20	116	107	72	57	25	57	M12
SMEG 1160-25	116	107	72	57	25	57	M12
SMEG 1390-32	126	107	82	67	20	67	M12
SMEG 1880-40	146	135	92	77	25	85	M16
SMEG 3300-65	186	175	120	100	37,5	100	M16





The stripper is removable and shaped in bronze, with a stroke of 8 mm.

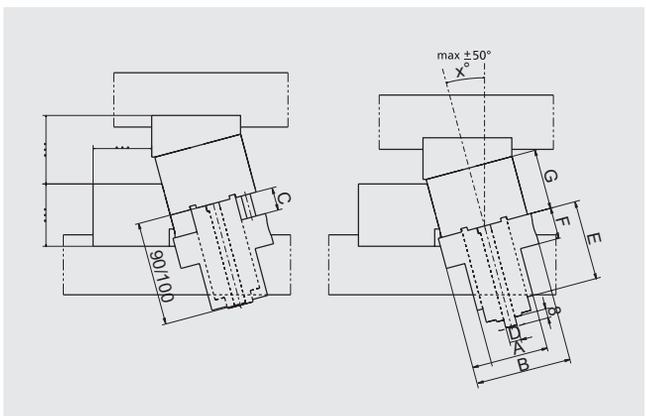


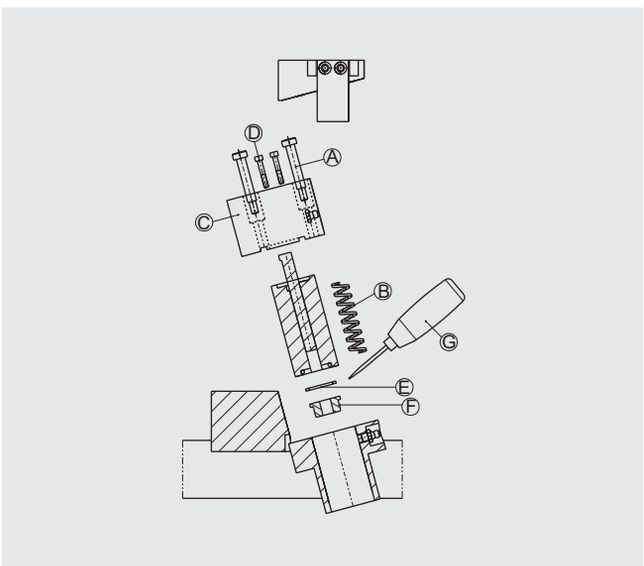
Position	Quantity	Description
001	1	Guide bushing
002	1	Punch holder
003	1	Anvil
004	1	Guide
005	1	Bracket attachments
006	1	Shoulder screw
007	1	Spring
008	1	Nipples
009	1	Special cylinder
010*	1	Punch
011*	1	Micro sensor for security

*available upon request

CAMMA SMEG

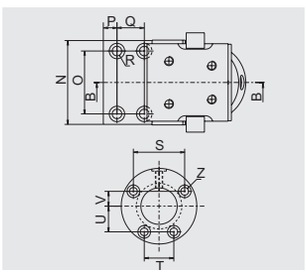
Version with nitrogen cylinder



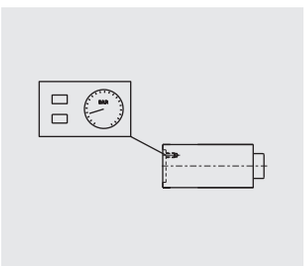


Attention:

In order to manually perform the test, extract the cylinder as indicated. Please consult our Instruction Manual.

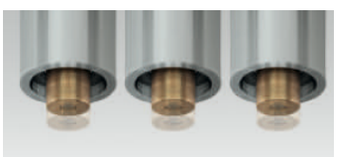


Drilling of the guide bushing.



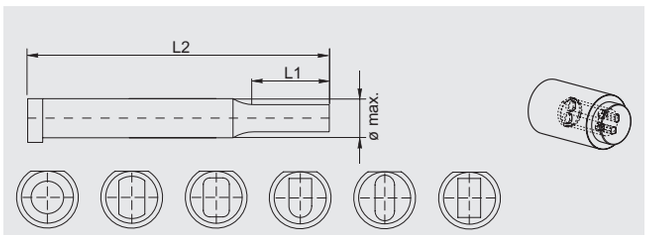
It is possible to reduce the strength of the extractor, by decreasing the charge of the unit.

Examples for special applications



Standard punch length 90-100

Model	ø max.	L1	L2
SMEG 505-10	10	25	90/100
SMEG-695-13	13	25	90/100
SMEG-695-16	16	25	90/100
SMEG 1160-20	20	25	90/100
SMEG 1160-25	25	25	90/100
SMEG 1390-32	32	30	90/100
SMEG 1880-40	40	30	90/100
SMEG 3300-65	65	30	105/115 (special)

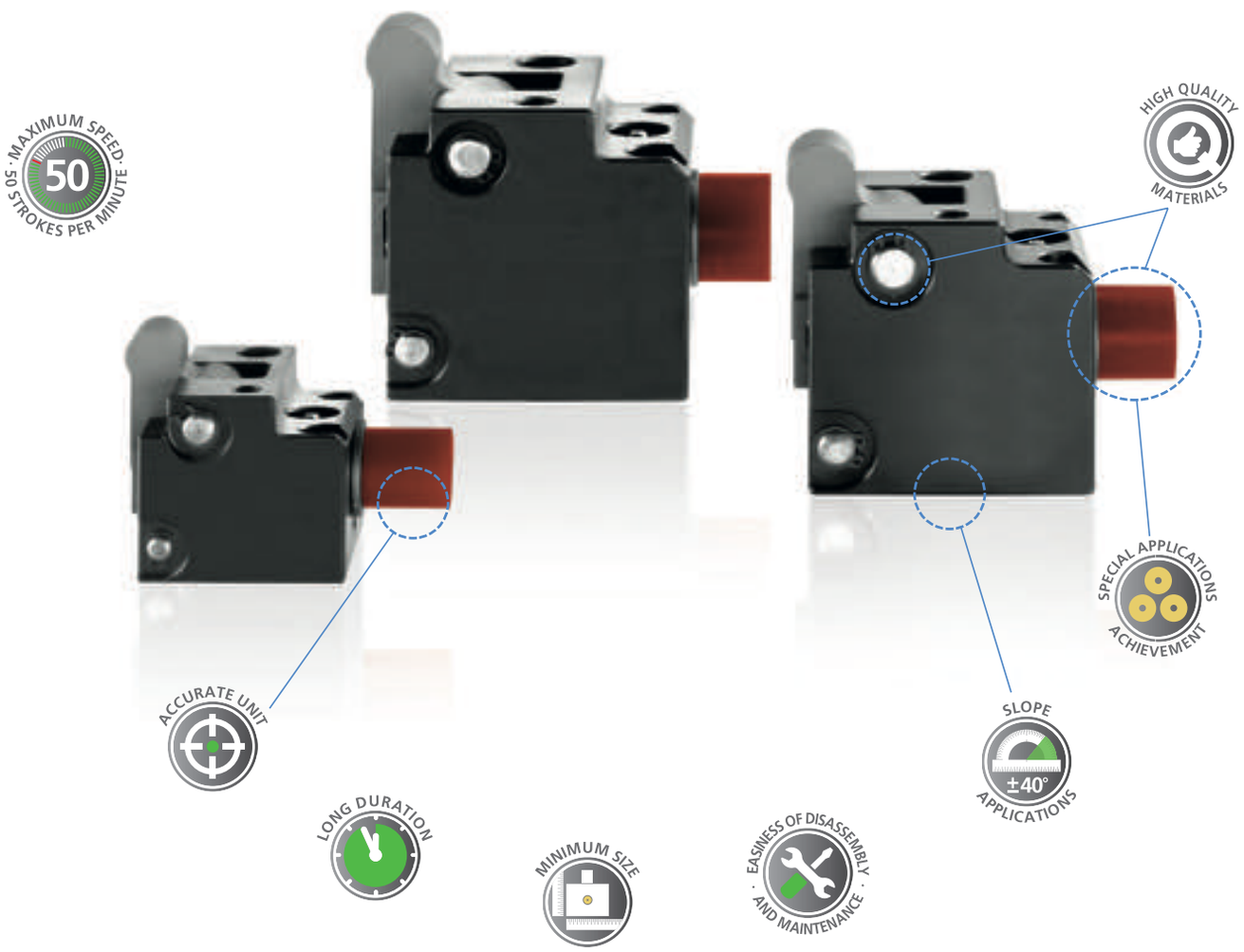


It is possible to put several punches in the same unit.

Model	A	B	C	D	E	F	G	N	O	P	Q	R	S	T	U	V	Z	max. cutting force (daN)
SMEG 505-10	ø 50 H7	ø 83	20	10	69	27	52	92	70	11	35	M10	56,3	32,5	28,1	16,2	M8	4500
SMEG-695-13	ø 55 H7	ø 90	20	13	69	27	52	92	68	12	34	M10	62,3	36	31,2	18	M8	6000
SMEG-695-16	ø 55 H7	ø 90	20	16	69	27	52	92	68	12	34	M10	62,3	36	31,2	18	M8	6000
SMEG 1160-20	ø 75 H7	ø 115	20	20	69	27	52	125	67	14	40	M12	81,4	47	40,7	23,5	M10	9000
SMEG 1160-25	ø 75 H7	ø 115	20	25	69	27	52	125	67	14	40	M12	81,4	47	40,7	23,5	M10	9000
SMEG 1390-32	ø 85 H7	ø 125	20	32	69	27	52	125	63	14	40	M12	88,3	51	44,2	23,5	M10	12000
SMEG 1880-40	ø 96 H7	ø 145	20	40	69	27	57	145	71	17	43	M16	103,9	60	52	30	M12	17000
SMEG 3300-65	ø 136 H7	ø 185	20	65	86	27	57	185	111	17	43	M16	138,5	80	69,2	40	M12	30000

X must be specified in the order.

STRENGTHS


MAXIMUM SPEED
50
50 STROKES PER MINUTE
HIGH QUALITY
MATERIALS
SPECIAL APPLICATIONS
ACHIEVEMENT
ACCURATE UNIT
SLOPE
±40°
APPLICATIONS
LONG DURATION
MINIMUM SIZE
EASINESS OF DISASSEMBLY
AND MAINTENANCE

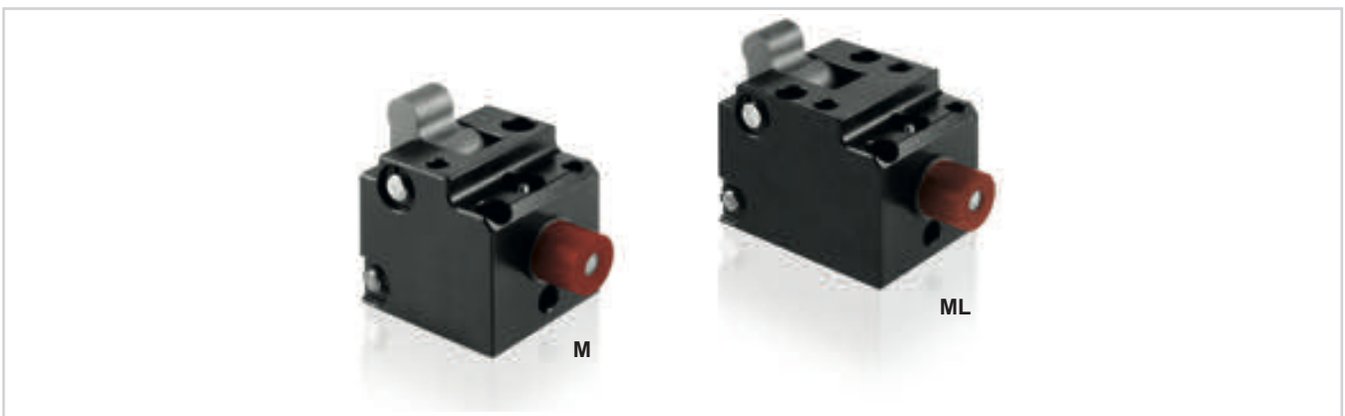
CAMMA M/ML

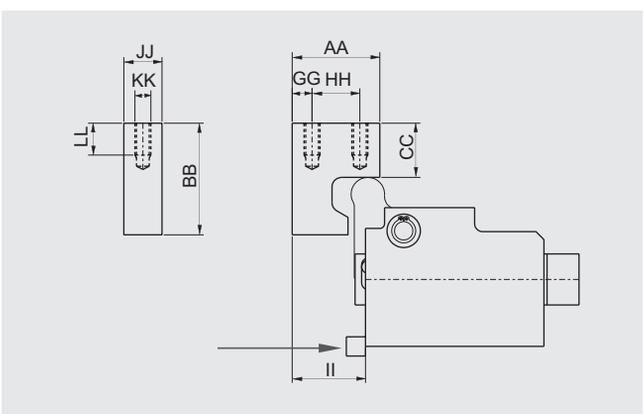
Mechanic shearing

Mechanical cam which contains a punch made from an ISO 8020 standard power supply up to 5000 daN with steel spring return. M normal stroke, ML long stroke identifable in the catalog with the letter “C”. The extraction from metal sheet is made by gummy-PU. Can be fitted horizontally or inclined (after comparison with Newstark’s technical department). Means of application: generally suitable for cutting and drilling work.

CAMMA M/ML

Order-No. spare parts: model-position



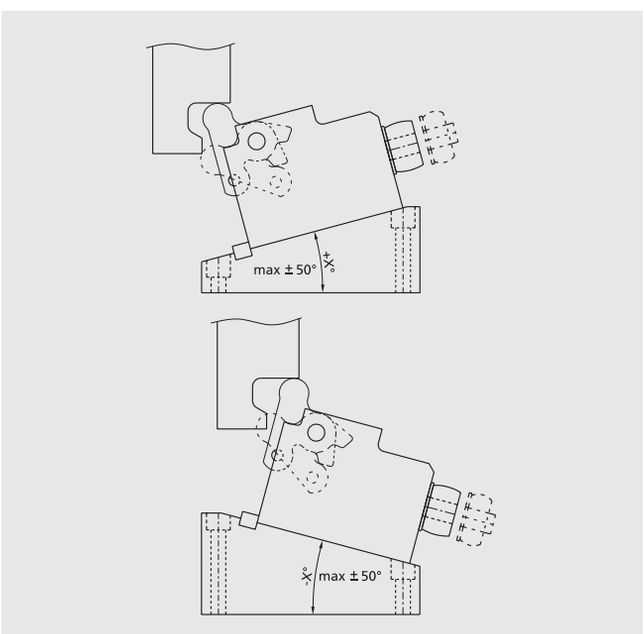


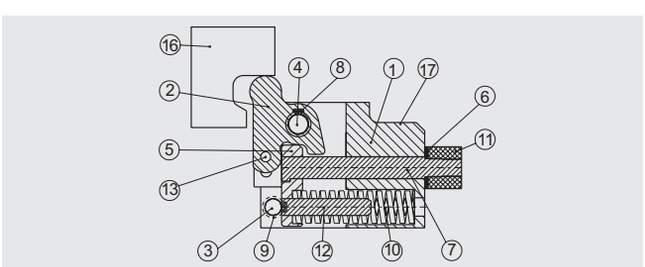
Note:
We suggest to assembly by using a thrust mount key. When slope application is present, we supply special part 002 “Lever”, which is not included in the standard supply.

Ordering example: Model = ML 170, position = 002
ML170-002

Anvils-Table with mechanical extraction guaranteed

Model		AA	BB	CC	GG	HH	II	JJ	KK	LL
170	M	30	45	21	6	18	25	15	M6	16
	ML	30	45	21	6	18	25	15	M6	16
210	M	50	60	29	10	30	41,5	22	M8	20
	ML	50	60	29	10	30	41,5	22	M8	20
320	M	55	70	34	12,5	30	46	24	M10	20
	ML	55	70	34	12,5	30	46	24	M10	20

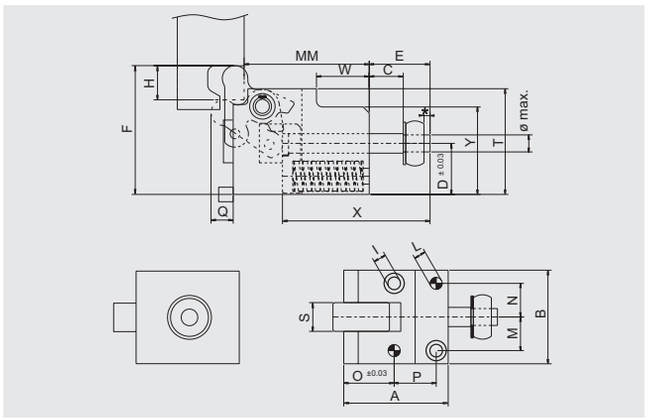


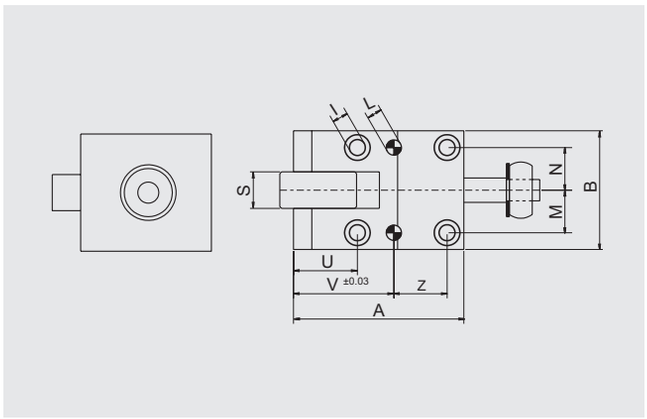


Position	Quantity	Description
001	1	Cam body
002	1	Lever
003	1	Pin
004	1	Pin
005	1	Gate punch
006	1	Washer
007	1	Punch
008	2	Seeger
009	2	Seeger
010	1	Spring
011	1	Rubber spring
012	1	Pin
013	1	Pin
016*	1	Anvil
017	1	Nipples

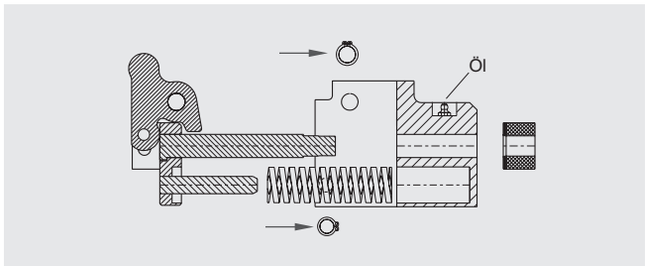
*available upon request

CAMMA M/ML





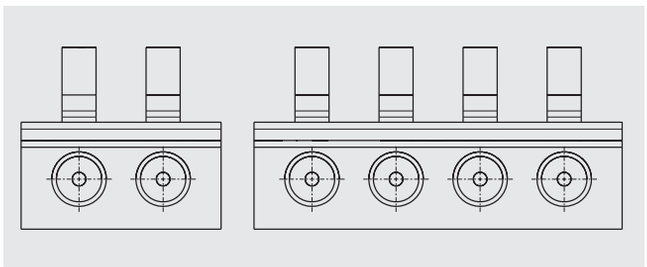
Mounting design



Attention:

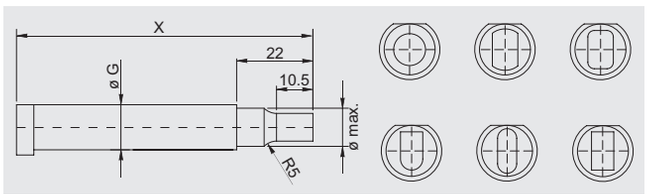
Please consult our Instruction Manual.

Examples for special applications



Punchl ISO 8020

Model	X	G	ø max.
M170	64,5	8	6
ML170	89,5	8	6
M210	85,5	13	11
ML210	107,5	13	11
M320	96,5	16	14
ML320	121,5	16	14



***max. 30% of the free length (adjustment 5%) Technical data of the max extraction model (daN)**

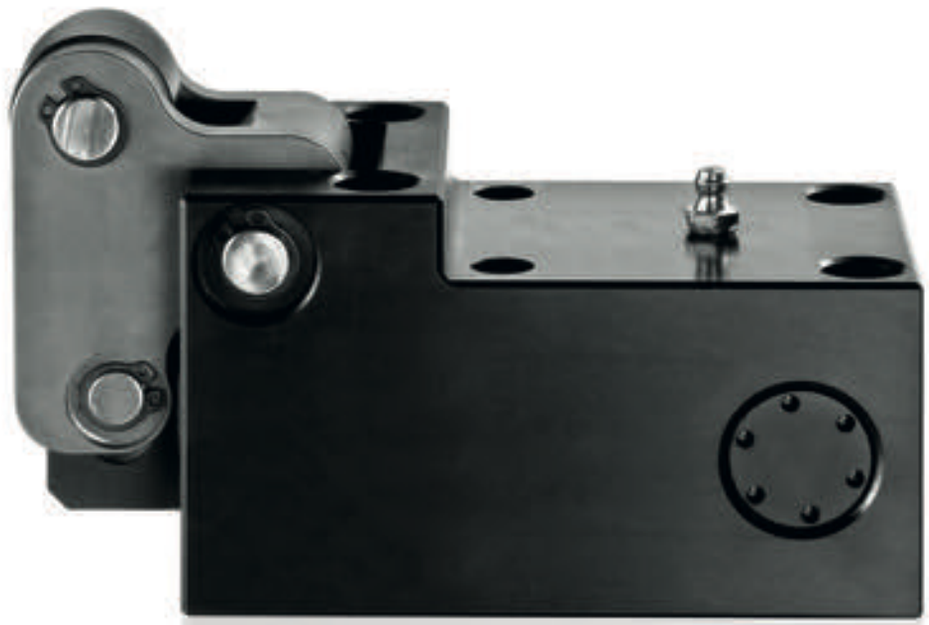
Model		A	B	C	D	E	F	H	I	L +0,02 0	M	N	O	P	Q	R	S	T	U	V	Z	Y	W	X	MM	ø max.	max. cutting force
170	M	51	51	9,5	22	31,5	59	9,5	ø 6,5	ø 6	18,5	18,5	26	18	11	5	15	47	–	–	–	39	18	64,5	47	6	1000
	ML	76	51	19	22	41	59	19	ø 6,5	ø 6	18,5	18,5	–	–	10,7	5	15	47	26	50	18	39	31	89,5	72	6	1000
210	M	76	68	16	36	38	91	16	ø 8,5	ø 8	25	25	38	30	14,5	10	22	75	–	–	–	63	24	85,5	67	11	3000
	ML	98	68	25	36	47	91	25	ø 8,5	ø 8	25	25	–	–	14,0	10	22	75	38	59	30	63	33	107,5	92	11	3000
320	M	87	78	19	42	41	106	19	ø 10,5	ø 10	28	28	42	35	18,5	13,5	24	87	–	–	–	72	27	96,5	79,5	14	5000
	ML	112	78	28	42	50	106	28	ø 10,5	ø 10	28	28	–	–	18,5	13,5	24	87	42	66	35	72	42	121,5	104,5	14	5000

STRENGTHS


MAXIMUM SPEED
50
50 STROKES PER MINUTE
HIGH QUALITY
MATERIALS
SLOPE
±50°
APPLICATIONS
LONG DURATION
ANTI-ROTATION
SYSTEM
EASINESS OF DISASSEMBLY
AND MAINTENANCE
SECURITY
MICROSENSOR
SPECIAL APPLICATIONS
ACHIEVEMENT

CAMMA MA

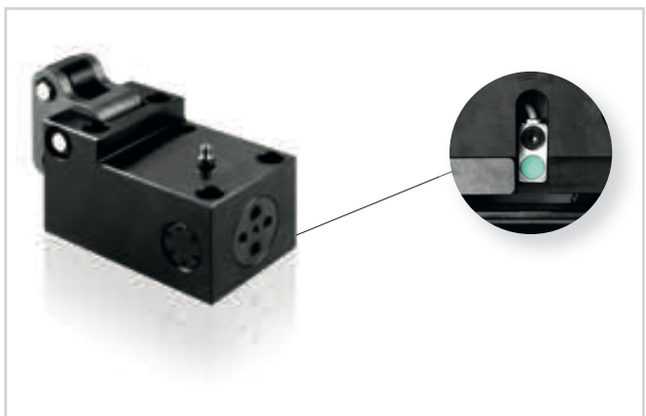
Mechanical shearing



Mechanical cam with power supply up to 10000 daN with return by nitrogen spring, on which are applied accessories or steel, to perform the required work. It has a solid and compact structure, in which there is an anti-rotation system. Can be fitted horizontally or inclined (after comparison with Newstark's technical department). Means of application: generally suitable for cutting, drilling and bending works.

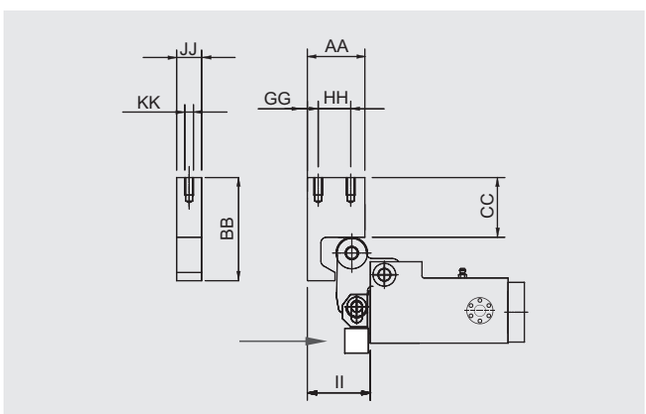
CAMMA MA

Order-No. spare parts: model-position



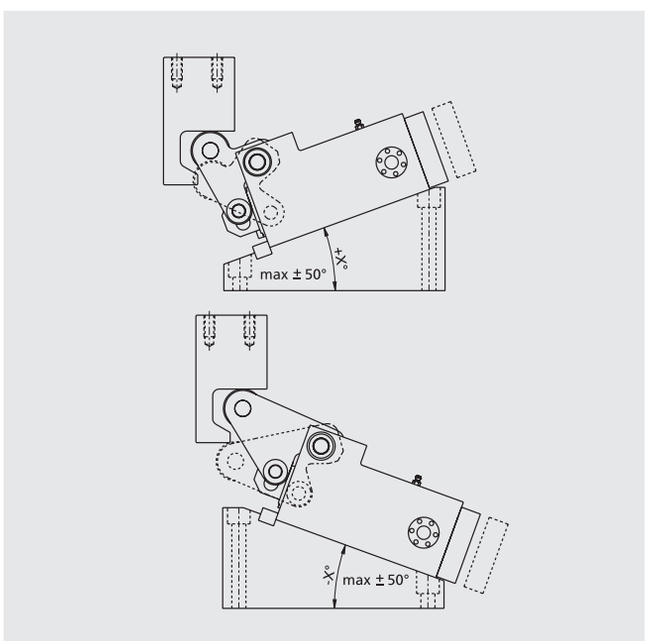
Note:
We suggest to assembly by using a thrust mount key. When slope application is present, we supply special part 004 “Lever”, which is not included in the standard supply.

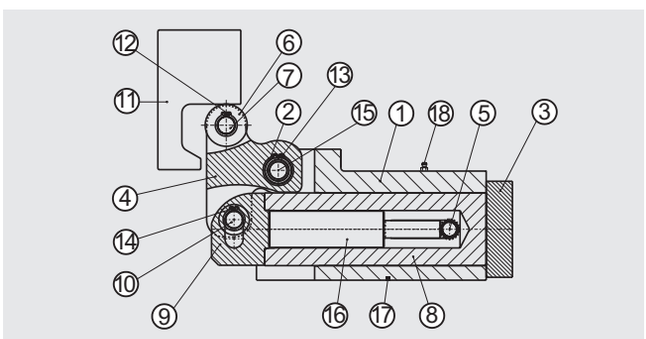
Ordering example: Model = MA 240, position = 004
MA240-004



Anvils-Table with mechanical extraction guaranteed

Model		AA	BB	CC	GG	HH	II	JJ	KK
140	MA	53	95	55	10	30	56,5	23	M8
150	MA	53	95	55	10	30	58	23	M8
240	MA	57	96	51	12	33	67,8	26	M10
600	MA	65	118	63	14	37	80,5	30	M12
850	MA	68	128	66	14	40	95,1	37	M12

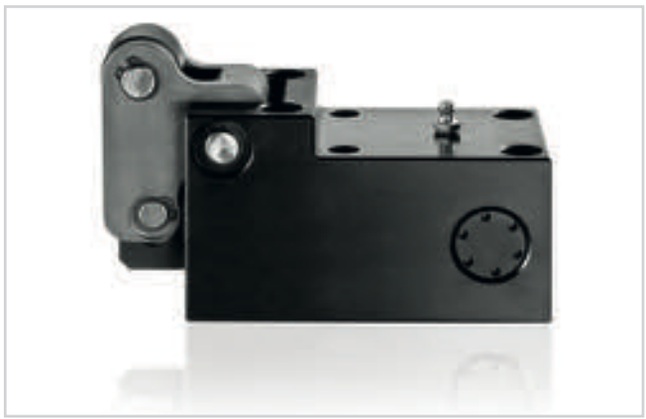


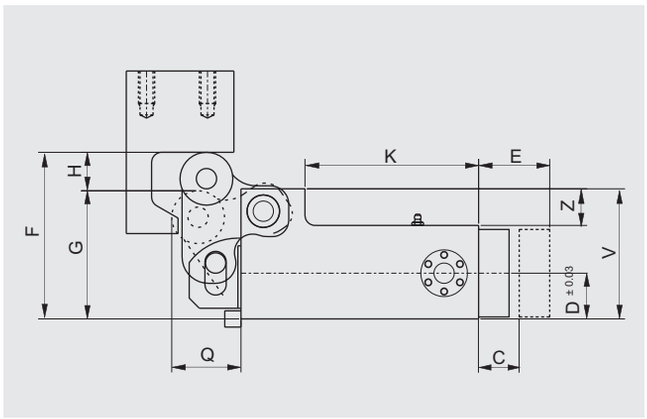


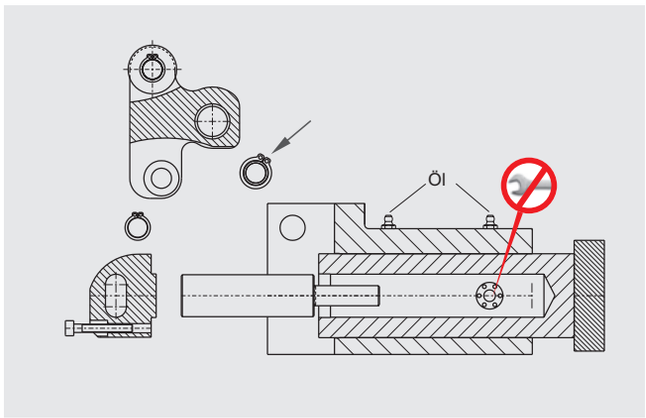
Position	Quanity	Description
001	1	Cam body
002	2	Bearings
003*	1	Punch holder
004	1	Lever
005	1 + 1	Guide pins
006	1	Roller
007	1	Pin
008	2	Central pin
009	2	Flange
010	1	Pushing pin
011*	1	Anvil
012	2	Seeger
013	2	Seeger
014	2	Seegerring
015	1	Pin of sup. reaction
016	1	Nitrogen cylinder
017*	1	Micro sensor for security
018	1	Nipples

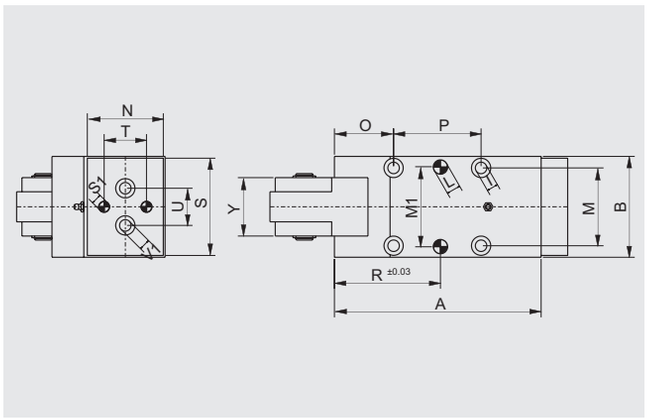
*available upon request

CAMMA MA









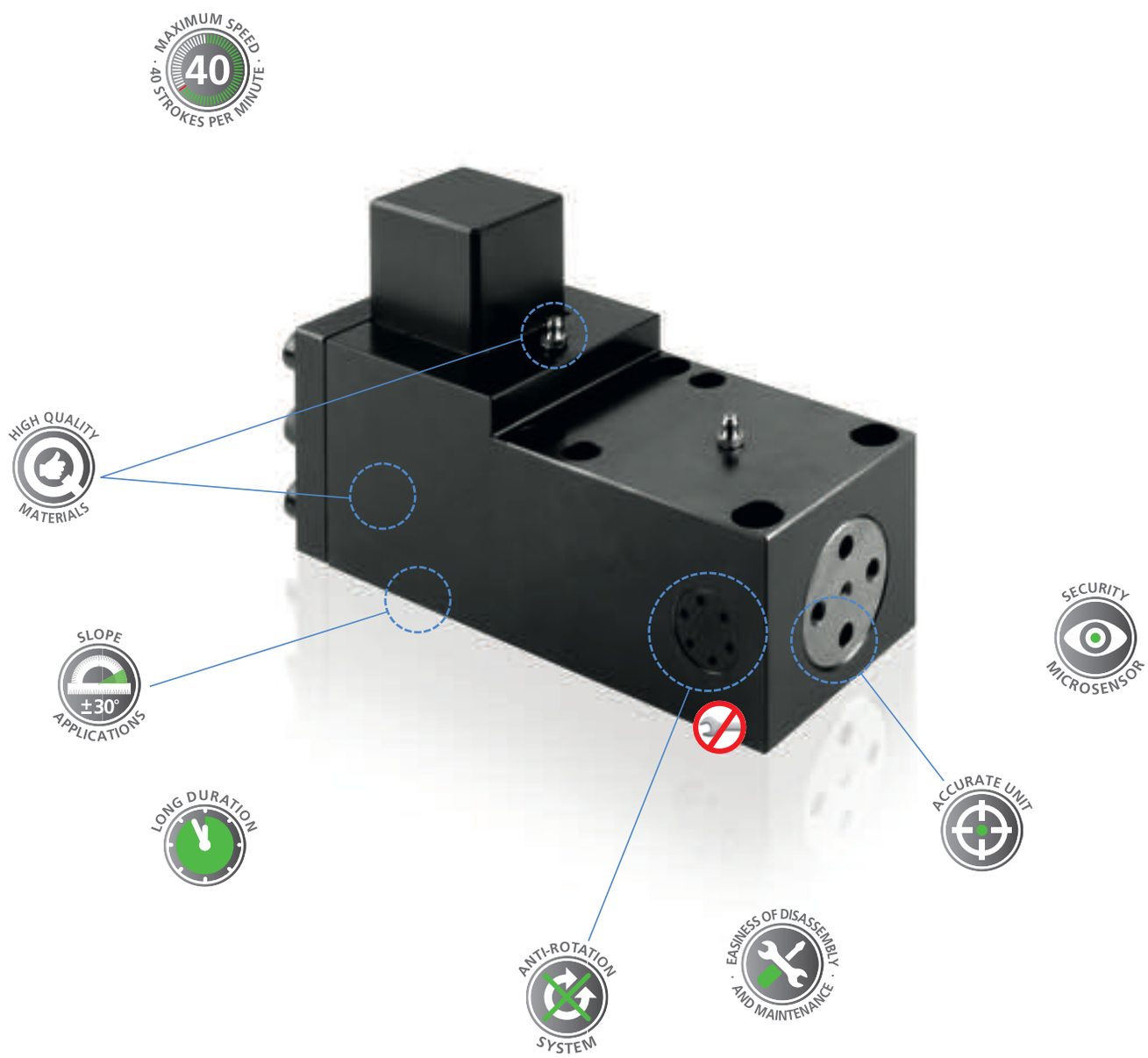
Attention:

In order to manually perform the test, extract the cylinder as indicated. Please consult our Instruction Manual.

Technial data of the max extraction model(daN)

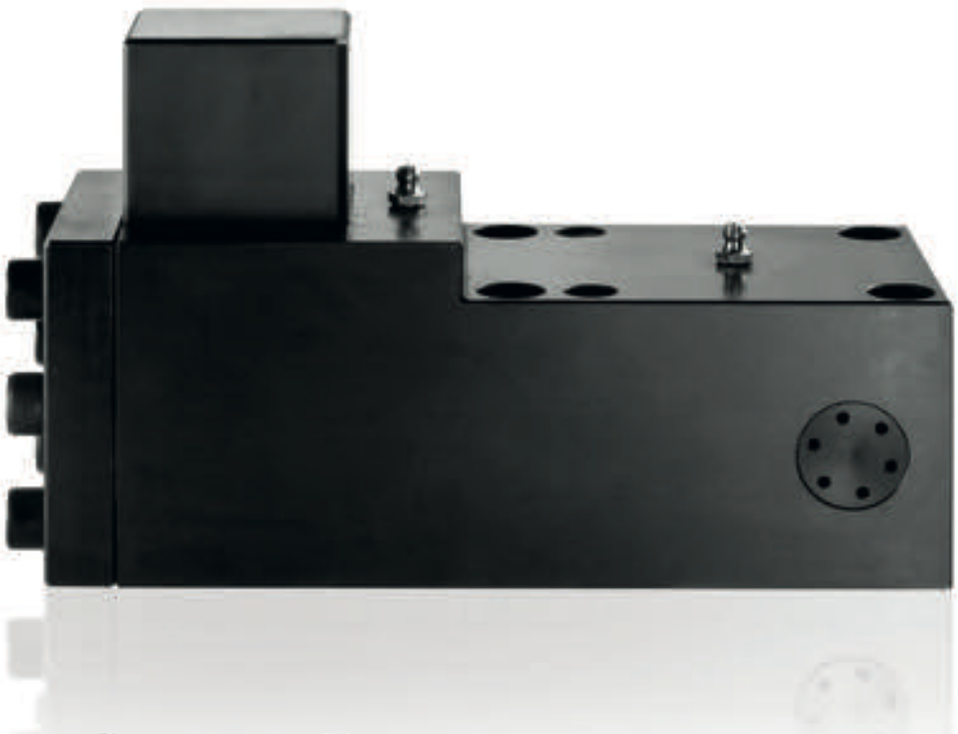
Model	A	B	C	D	E	F	G	H	I	L +0,02 0	M	M1	N	O	P	Q	R	S	T	U	V	Z	Y	S1 +0,02 0	V1	K	max. Cutting force
MA 140	117	57	19	22,5	34	82	63,1	18,9	ø 6,5	ø 8	44	45	43	33,5	49,5	34,1	60	55	24	21	64	18	33	ø 6	M6	85,5	2500
MA 150	127	75	22	28,5	37	97,5	77,1	20,4	ø 8,5	ø 10	53	53	55	33	84	37,5	55	70	22	22	75	15	20	ø 8	M8	82	3000
MA 240	158	88	34	35	48	121	89,6	31,4	ø 10,5	ø 12	67	67	66	48	98	46,5	68	80	32	32	90	15	24	ø 8	M8	100	5000
MA 600	168	108	36	42	54	144	107,82	36,13	ø 13	ø 16	80	80	80	56	97	55,8	81	88	38	38	107	20	28	ø 10	M10	100	7000
MA 850	202	124	45	48	67	169	119,52	49,08	ø 13	ø 16	96	96	88	67	120	68,03	96	100	47	47	125	25	33	ø 10	M12	122	10000

STRENGTHS


MAXIMUM SPEED
40
40 STROKES PER MINUTE
HIGH QUALITY
MATERIALS
SLOPE
±30°
APPLICATIONS
LONG DURATION
ANTI-ROTATION
SYSTEM
EASINESS OF DISASSEMBLY
AND MAINTENANCE
ACCURATE UNIT
SECURITY
MICROSENSOR

CAMMA MAS

Mechanic shearing



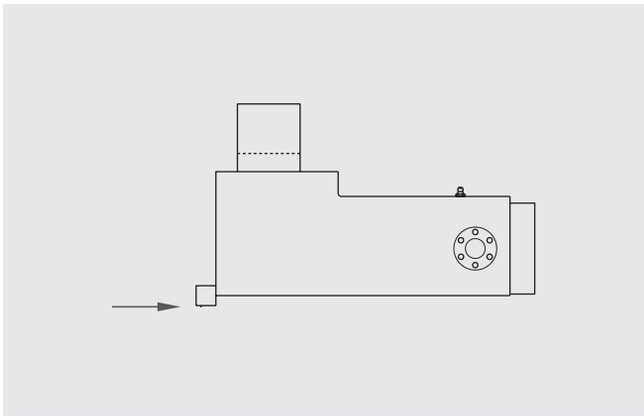
Mechanical cam, with power supply up to 19000 daN with return by nitrogen spring, on which are applied accessories or steel, to perform the required work. The motion is transferred through wedges inclined and in which there is an anti-rotation system. Can be fitted horizontally or inclined (after comparison with Newstark's technical department). Means of application: generally suitable for shearing, drilling and bending work.

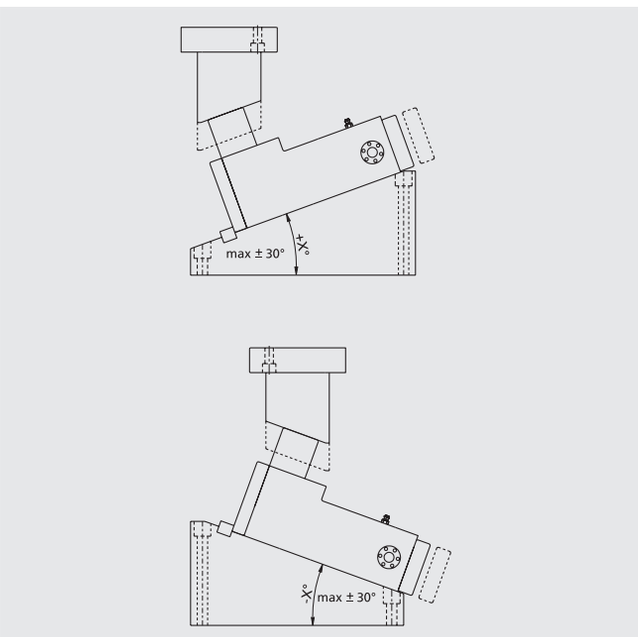
CAMMA MAS

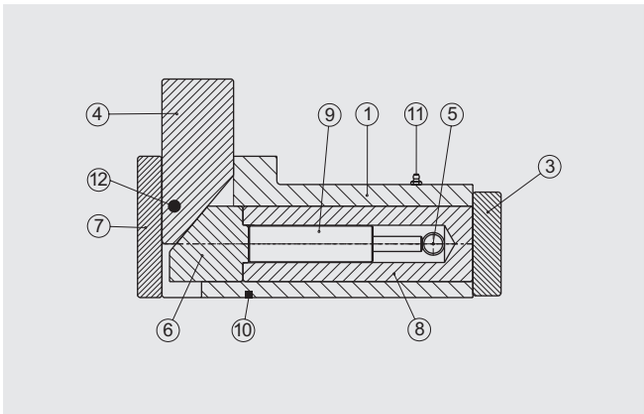
Order-No. spare parts: model-position

Note:
The system fits a miniaturized electronic device (P10) to control the correct repositioning of the equipment. We suggest to assembly by using a thrust mount key.

Ordering example: Model = MAS 240, position = 006
MAS 240-006



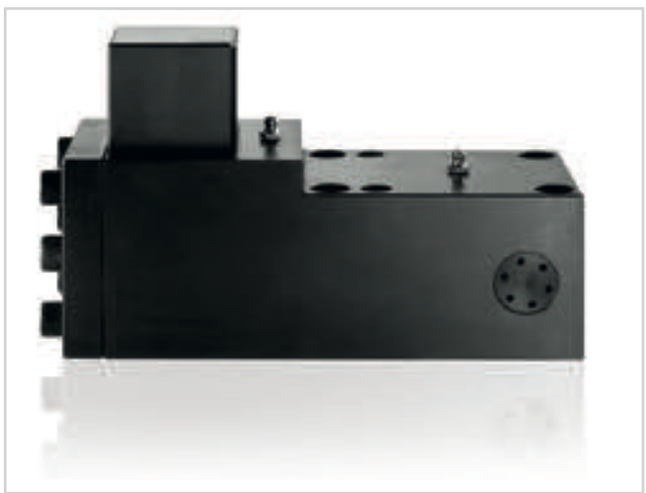


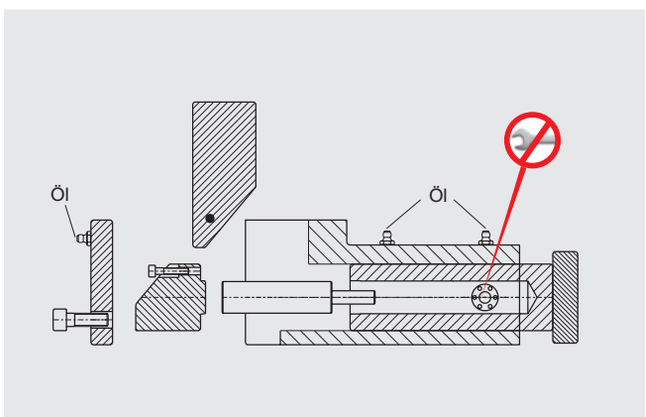


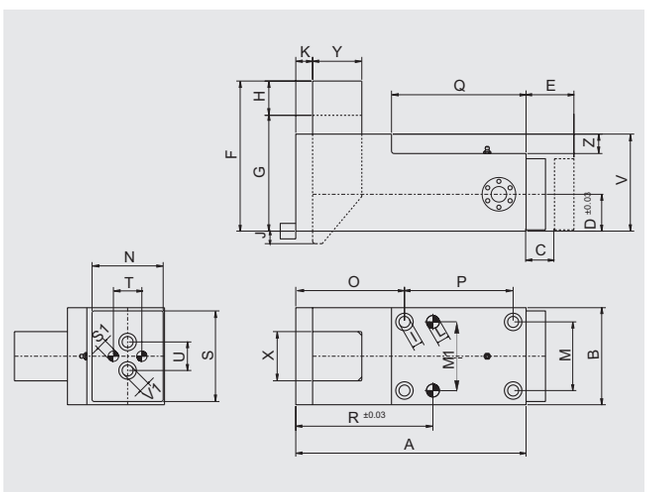
Position	Quality	Description
001	1	Cam body
003*	1	Punch holder
004	1	Wedge
005	1 + 1	Guide pins
006	1	Slider
007	1	Rear flange
008	1	Central pin
009	1	Nitrogen cylinder
010*	1	Micro sensor for security
011	2	Nipples
012	2	Pin

*available upon request

CAMMA MAS







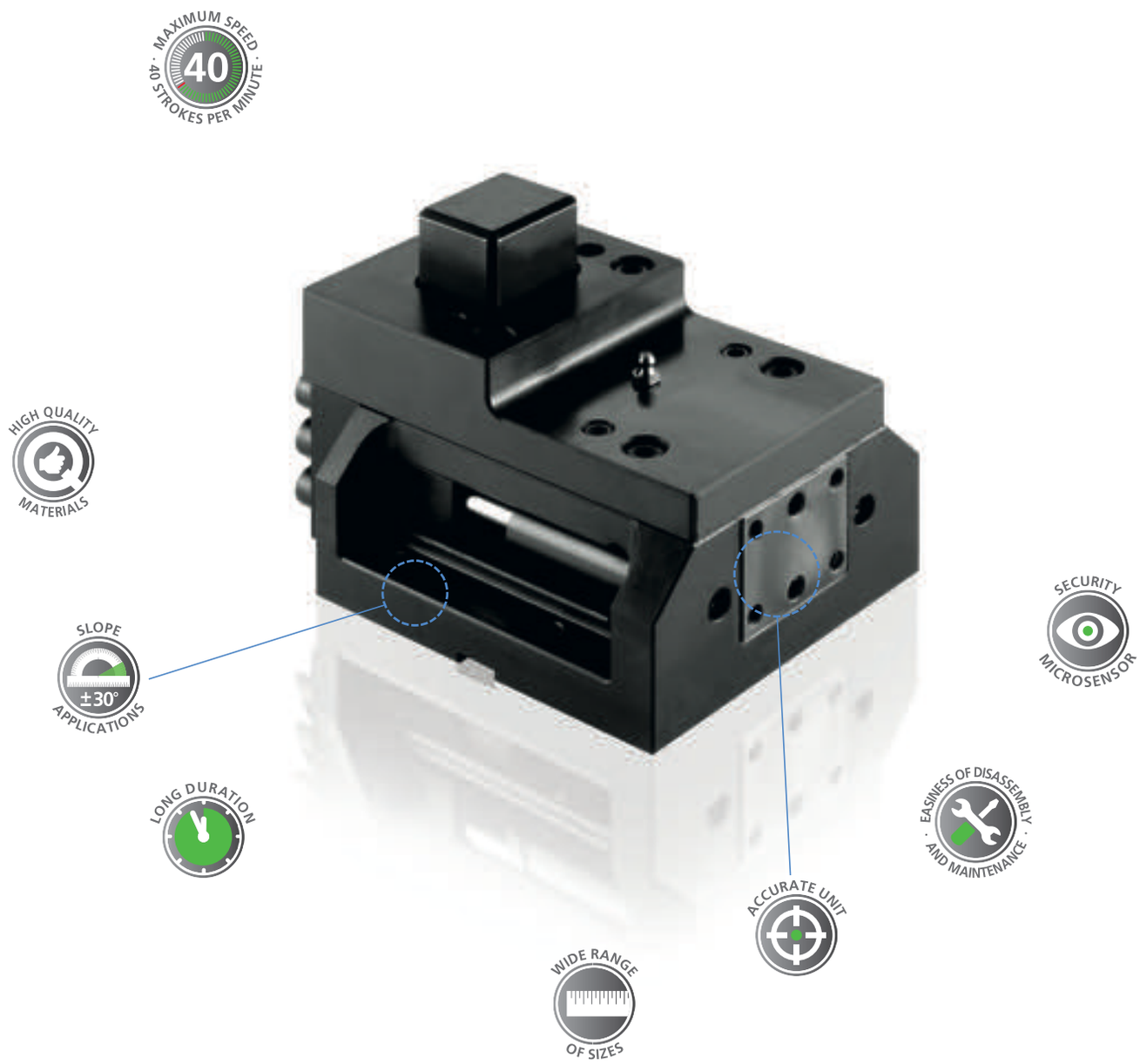
Attention:

In order to manually perform the test, extract the cylinder as indicated.
Please consult our Instruction Manual.

Technial data of the max extraction model (daN)

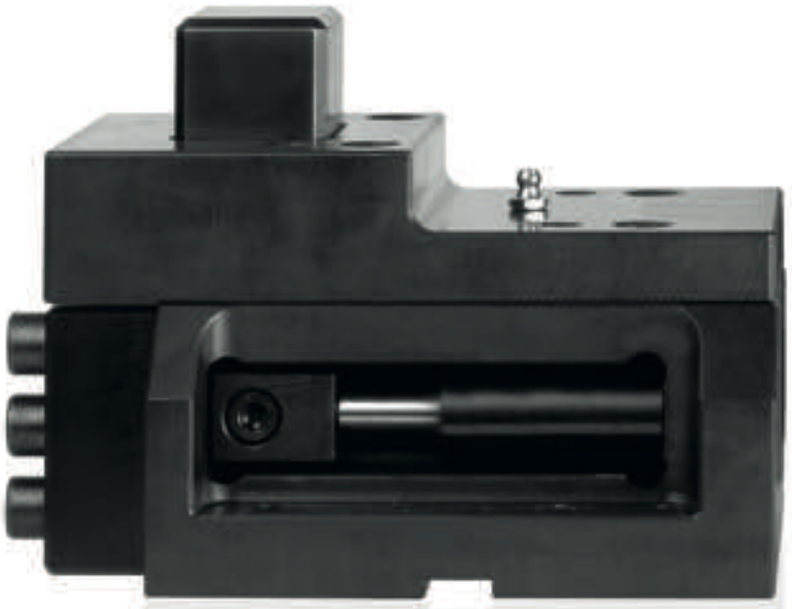
Model	A	B	C	D	E	F	G	H	I	L +0,02 0	M	M1	N	O	P	Q	R	S	T	U	V	Z	X	Y	K	J	S1 +0,02 0	V1	Max. Cutting force
140	154	57	19	22,5	34	99	76,5	22,5	ø 6,5	ø 8	44	45	43	70,5	49,5	95	97	55	24	21	64	18	33	33	13	–	ø 6	M6	3000
150	178	75	22	28,5	37	116	90	26,5	ø 8,5	ø 10	53	53	55	84	84	104	106	70	22	22	75	15	38	38	13	–	ø 8	M8	5000
150 S	178	75	32	28,5	47	122,5	84,4	38,1	ø 8,5	ø 10	53	53	55	84	84	104	106	70	22	22	83	23	38	46	13	9,7	ø 8	M8	5000
240	226	88	34	35	52	139	105	34	ø 10,5	ø 12	67	67	66	116	98	122	136	80	32	32	90	15	48	57	18	–	ø 8	M8	8000
240 S	226	88	46	35	64	146,9	100,9	46	ø 10,5	ø 12	67	67	66	116	98	122	136	80	32	32	98	23	48	65	18	9,1	ø 8	M8	8000
600	241	108	36	42	54	161	125	36	ø 13	ø 16	80	80	80	129	97	115	154	88	38	38	107	20	58	68	23	–	ø 10	M10	13000
600 S	241	108	48	42	66	171	123	48	ø 13	ø 16	80	80	80	129	97	115	154	88	38	38	118	31	58	78	23	9	ø 10	M10	13000
850	287	124	45	48	67	190	145	45	ø 13	ø 16	96	96	88	152	120	149	181	100	47	47	125	25	68	78	28	–	ø 12	M12	19000
850 S	287	124	60	48	82	204	144	60	ø 13	ø 16	96	96	88	152	120	149	181	100	47	47	138	38	68	86	28	11	ø 12	M12	19000

STRENGTHS


MAXIMUM SPEED
40
40 STROKES PER MINUTE
HIGH QUALITY
MATERIALS
SLOPE
±30°
APPLICATIONS
LONG DURATION
SECURITY
MICROSENSOR
EASINESS OF DISASSEMBLY
AND MAINTENANCE
ACCURATE UNIT
WIDE RANGE
OF SIZES

CAMMA MASC

Mechanic shearing



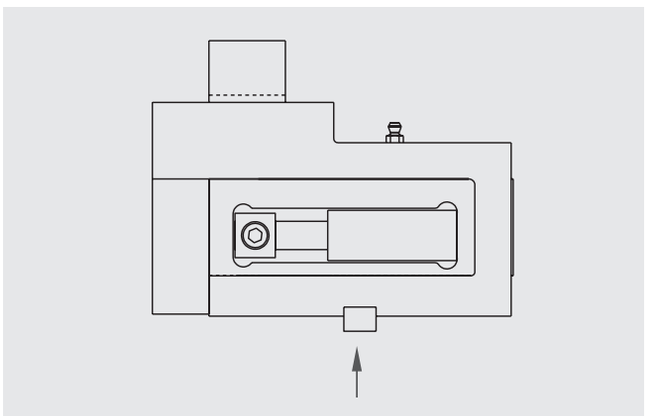
Mechanical cam with power supply up to 40000 daN with return by nitrogen spring, on which are applied accessories or steel, to perform required work. The motion is transferred through wedges inclined and in which there is an anti-rotation system. Can be ftited horizontally or inclined (after comparison with Newstark's technical department). Means of application: generally suitable for shearing, drilling and bending work.

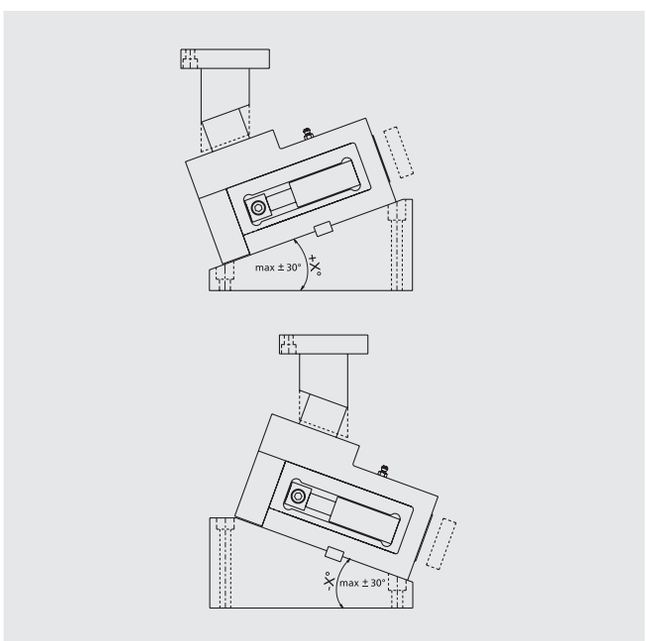
CAMMA MASC

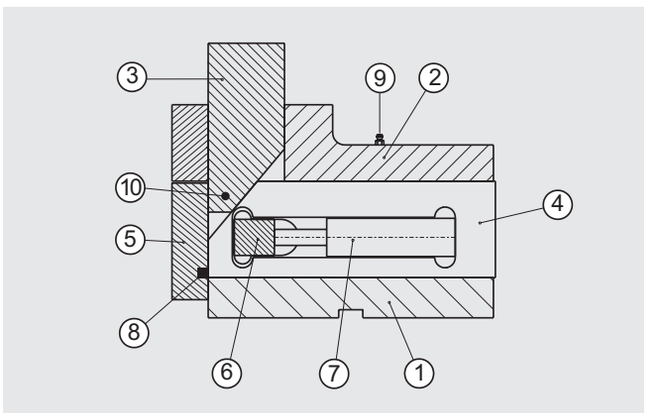
Order-No. spare parts: model-position

Note:
We suggest to assembly by using a thrust mount key. The system fits a miniaturized electronic device (P8) to control the correct repositioning of the equipment.

Ordering example: Model = MASC 400, position = 003
MASC 400-003



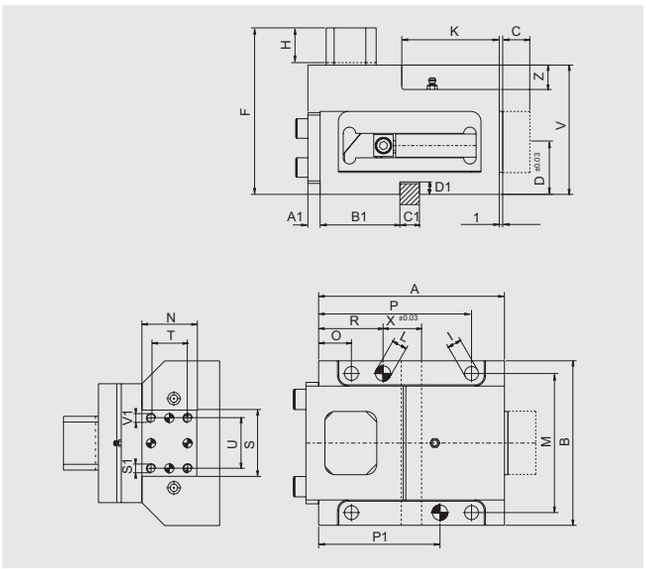


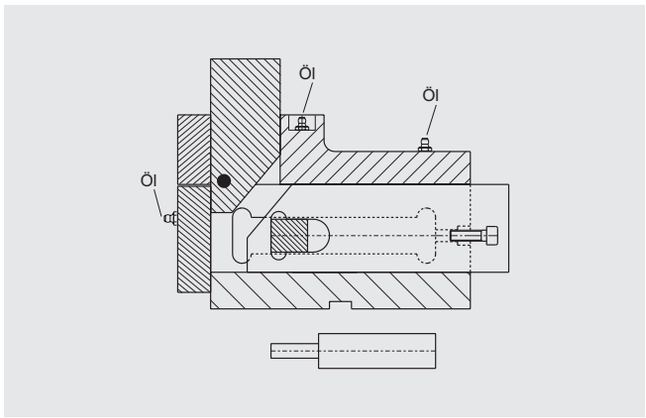


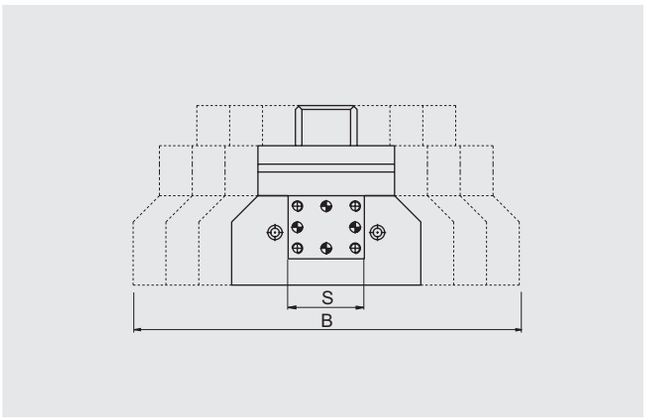
Position	Quantity	Description
001	1	Cam body
002	1	Cover
003	1	Wedge
004	1	Slider
005	1	Rear flange
006	2	Spring holder block
007	2	Nitrogen cylinder
008*	1	Micro sensor for security
009	2	Nipples
010	1	Pin

*available upon request

CAMMA MASC







Modular Width

Attention:

In order to manually perform the test, extract the cylinder as indicated. Please consult our Instruction Manual.

Technial data of the max extraction model (daN)

Model MASC	A	A1	B	B1	C	C1	D	D1	F	H	I	L +0,02 0	M	N	O	P	P1	R	S	T	U	Z	S1 +0,02 0	V	V1	K	X	max. Cutting force
400 S48	142	18	130	65	24	12	44	4	137	29	M10	ø 12	110	48	26	116	91	51	48	32	34	20	ø 8	106	M8	80	26	8000
400 S98	142	18	180	65	24	12	44	4	137	29	M10	ø 12	160	48	26	116	91	51	98	32	84	20	ø 8	106	M8	80	26	8000
400 S148	142	18	230	65	24	12	44	4	137	29	M10	ø 12	210	48	26	116	91	51	148	32	134	20	ø 8	106	M8	80	26	8000
400 S198	142	18	280	65	24	12	44	4	137	29	M10	ø 12	260	48	26	116	91	51	198	32	184	20	ø 8	106	M8	80	26	8000
900 S58	150	28	144	67	24	16	44	4,5	137	29	M10	ø 12	124	48	26	121	96	51	58	32	44	20	ø 8	106	M8	80	32	14000
900 S108	150	28	194	67	24	16	44	4,5	137	29	M10	ø 12	174	48	26	121	96	51	108	32	94	20	ø 8	106	M8	80	32	14000
900 S158	150	28	244	67	24	16	44	4,5	137	29	M10	ø 12	224	48	26	121	96	51	158	32	144	20	ø 8	106	M8	80	32	14000
900 S208	150	28	294	67	24	16	44	4,5	137	29	M10	ø 12	274	48	26	121	96	51	208	32	194	20	ø 8	106	M8	80	32	14000
1500 S88	217	38	196	113,5	36	20	60,5	5,5	195	43	M12	ø 16	172	75	65	182	157	90	88	54	69	20	ø 12	146	M12	111,5	43,5	20000
1500 S138	217	38	246	113,5	36	20	60,5	5,5	195	43	M12	ø 16	222	75	65	182	157	90	138	54	119	20	ø 12	146	M12	111,5	43,5	20000
3000 S118	247	48	266	124,5	36	28	81	7	244	51,5	M16	ø 16	236	94	75	202	172	105	118	68	94	20	ø 16	186	M12	126,5	47,5	40000
3000 S168	247	48	316	124,5	36	28	81	7	244	51,5	M16	ø 16	286	94	75	202	172	105	168	68	144	20	ø 16	186	M12	126,5	47,5	40000

STRENGTH


MAXIMUM SPEED
40
40 STROKES PER MINUTE
HIGH QUALITY
MATERIALS
SLOPE
±30°
APPLICATIONS
LONG DURATION
SECURITY
MICROSENSOR
EASINESS OF DISASSEMBLY
AND MAINTENANCE
ACCURATE UNIT
WIDE RANGE
OF SIZES

CAMMA MASC COMPACT

Mechanic shearing

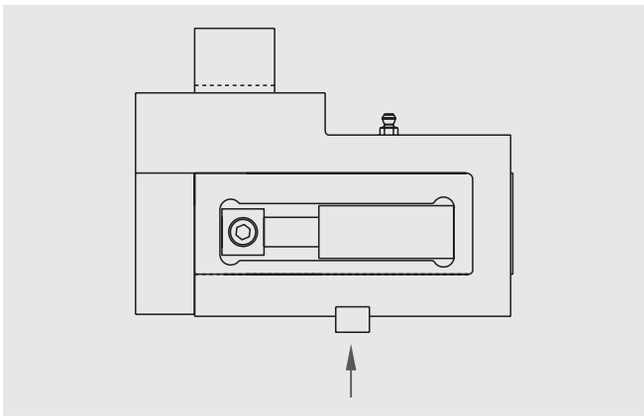
Mechanical cam with power supply up to 40000 daN with return by nitrogen spring, on which are applied accessories or steel, to perform the required work. The motion is transferred through wedges inclined and in which there is an anti-rotation system. Can be fitted horizontally or inclined (after comparison with Newstark's technical department). Means of application: generally suitable for shearing, drilling and bending work.

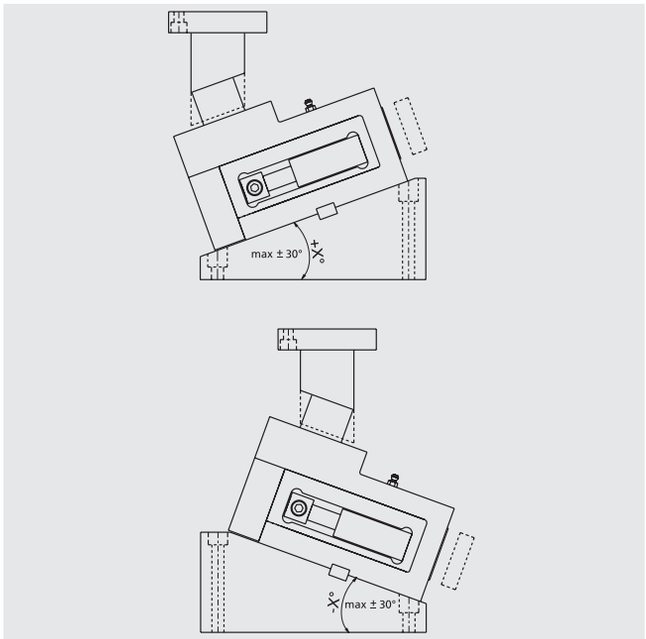
CAMMA MASC COMPACT

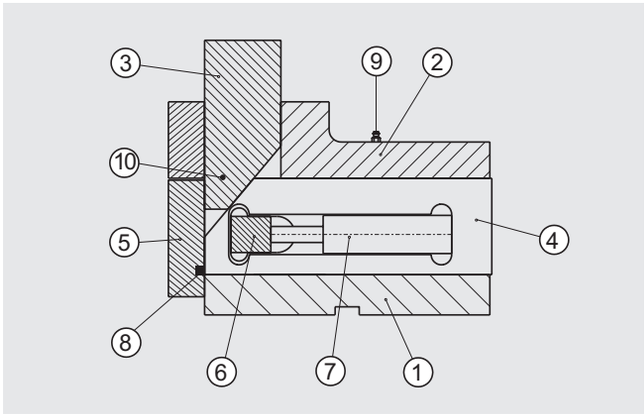
Order-No. spare parts: model-position

Note:
We suggest to assembly by using a thrust mount key. The system fits a miniaturized electronic device (P8) to control the correct repositioning of the equipment.

Ordering example: Model = MASC 400 COMAPCT, position = 003
MASC 400 COMPACT-003



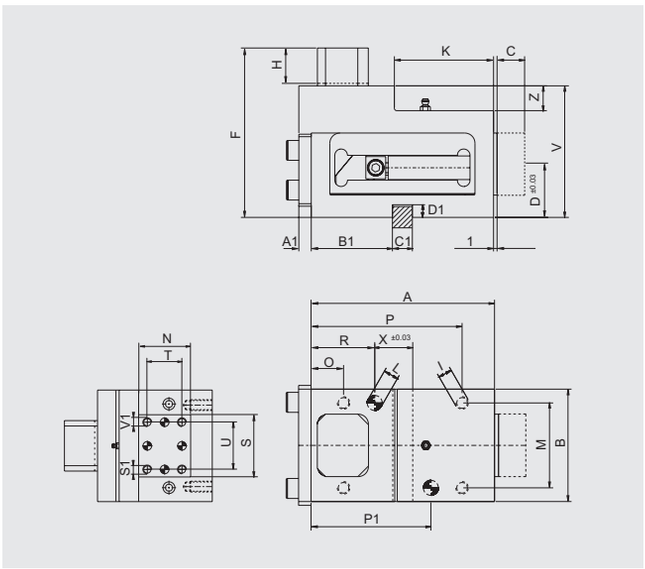


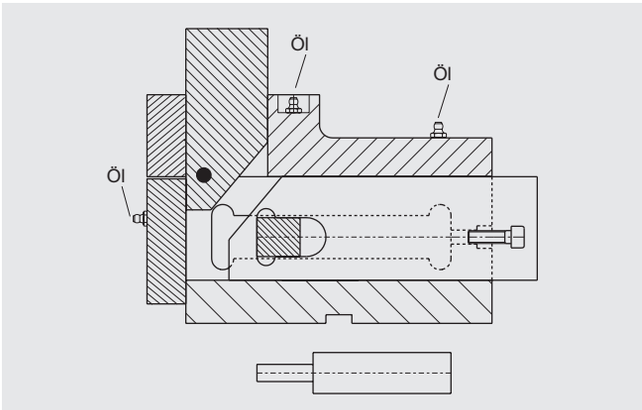


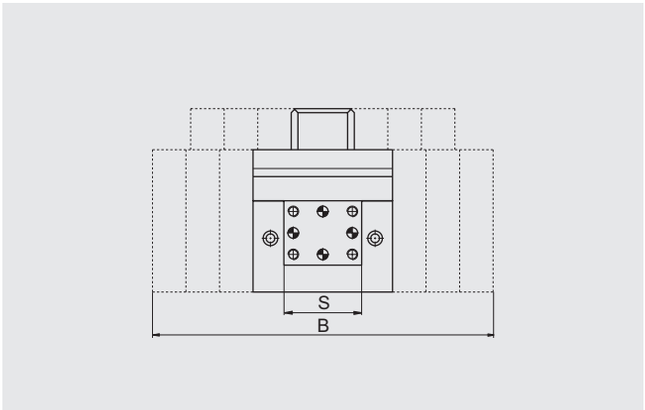
Position	Quantity	Description
001	1	Cam body
002	1	Cover
003	1	Wedge
004	1	Slider
005	1	Rear flange
006	2	Spring holder block
007	2	Nitrogen cylinder
008*	1	Micro sensor for security
009	2	Nipples
010	1	Pin

*available upon request

CAMMA MASC COMPACT







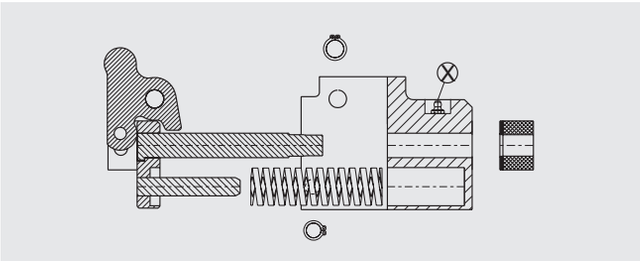
Modular width

Attention:

In order to manually perform the test, extract the cylinder as indicated. Please consult our Instruction Manual.

Technial data of the max extraction model (daN)

Model MASC COMPACT	A	A1	B	B1	C	C1	D	D1	F	H	I	L +0,02 0	M	N	O	P	P1	R	S	T	U	Z	S1 +0,02 0	V	V1	K	X	max. Cutting force
400 S48	142	18	90	65	4	12	44	4	137	29	M10	ø 12	68	48	26	116	91	51	48	32	34	20	ø 8	106	M8	80	26	8000
400 S98	142	18	140	65	24	12	44	4	137	29	M10	ø 12	118	48	26	116	91	51	98	32	84	20	ø 8	106	M8	80	26	8000
400 S148	142	18	190	65	24	12	44	4	137	29	M10	ø 12	168	48	26	116	91	51	148	32	134	20	ø 8	106	M8	80	26	8000
400 S198	142	18	240	65	24	12	44	4	137	29	M10	ø 12	218	48	26	116	91	51	198	32	184	20	ø 8	106	M8	80	26	8000
900 S58	150	28	104	67	24	16	44	4,5	137	29	M10	ø 12	76	48	26	121	96	51	58	32	44	20	ø 8	106	M8	88	32	14000
900 S108	150	28	154	67	24	16	44	4,5	137	29	M10	ø 12	126	48	26	121	96	51	108	32	94	20	ø 8	106	M8	88	32	14000
900 S158	150	28	204	67	24	16	44	4,5	137	29	M10	ø 12	176	48	26	121	96	51	158	32	144	20	ø 8	106	M8	88	32	14000
900 S208	150	28	254	67	24	16	44	4,5	137	29	M10	ø 12	226	48	26	121	96	51	208	32	194	20	ø 8	106	M8	88	32	14000
1500 S88	217	38	146	113,5	36	20	60,5	5,5	195	43	M12	ø 16	116	75	65	182	157	90	88	54	69	20	ø 12	146	M12	111,5	43,5	20000
1500 S138	217	38	196	113,5	36	20	60,5	5,5	195	43	M12	ø 16	166	75	65	182	157	90	138	54	119	20	ø 12	146	M12	111,5	43,5	20000
3000 S118	247	48	196	124,5	36	28	81	7	244	51,5	M16	ø 16	156	94	75	202	172	105	118	68	94	20	ø 16	186	M12	126,5	47,5	40000
3000 S168	247	48	246	124,5	36	28	81	7	244	51,5	M16	ø 16	206	94	75	202	172	105	168	68	144	20	ø 16	186	M12	126,5	47,5	40000



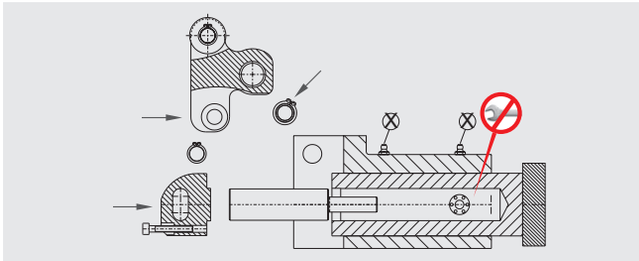
Product disassembly CAMMA M/ML:

1. Take off the punch holder and the punch by removing the seegers as shown.

2. Check the components.

3. Reassemble carefully using grease with disulfde molybdeno (MoS2). The use of this grease is recommended by Newstark.

4. Ensure the correct positioning of the individual components. During use lubricate with grease with disulfde molybdeno (MoS2).



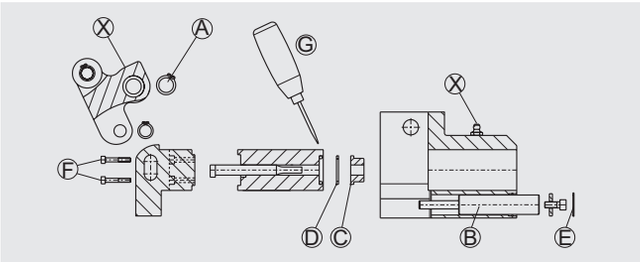
Product disassembly CAMMA MA:

1. Take off the gas cylinder by removing the seegers and the screws as shown.

2. Check the components.

3. Reassemble carefully using grease with disulfde molybdeno (MoS2). The use of this grease is recommended by Newstark.

4. Ensure the correct positioning of the individual components. During use lubricate with grease with disulfde molybdeno (MoS2).



Product disassembly CAMMA MAE:

1. Take off the cylinder “B” by removing the seeger “E” as shown.

2. Take off the special cylinder by removing the seeger “E” as shown.

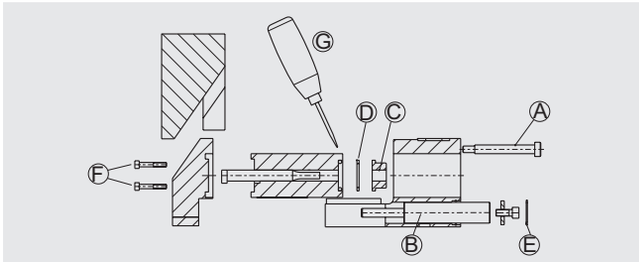
3. Take off the screws “F” to change the punch.

4. Take off the seeger “D” by removing stripper “C”. The tool “G” to remove “D” is available on request.

5. Check the components.

6. Reassemble carefully using grease with disulfde molybdeno (MoS2). The use of this grease is recommended by Newstark.

7. Ensure the correct positioning of the individual components. During use lubricate with grease with disulfde molybdeno (MoS2).



Product disassembly CAMMA MASE:

1. Take off the cylinder “B” by removing the seeger “E” as shown.

2. Take off the slider and the special cylinder by removing the screws “E” as shown.

3. Take off the screws “F” to change the punch.

4. Take off the seeger “D” by removing stripper “C”. The tool “G” to remove “D” is available on request.

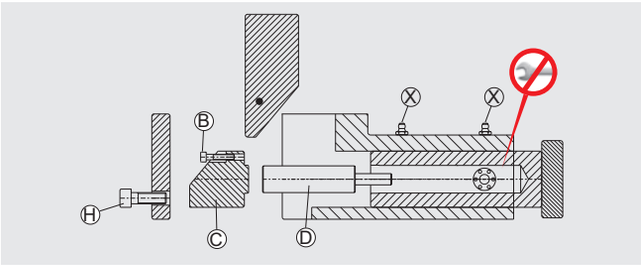
5. Check the components.

6. Reassemble carefully using grease with disulfde molybdeno (MoS2). The use of this grease is recommended by Newstark.

7. Ensure the correct positioning of the individual components. During use lubricate with grease with disulfde molybdeno (MoS2).

Attention:

Gas cylinder under pressure! Undertake reassemly or maintenance work only when the cam unit is in its basic position.



Product disassembly MAS:

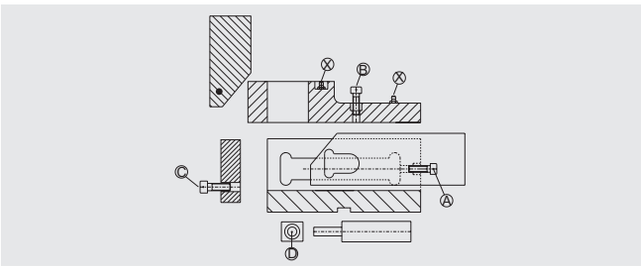
1. Take off the gas cylinder by removing the screws “A” as shown.

2. Take off the gas spring "D" after removing the screws ”B” and the slide “C”.

3. Check the components.

4. Reassemble carefully using grease with disulfde molybdeno (MoS2). The use of this grease is recommended by Newstark.

5. Ensure the correct positioning of the individual components. During use lubricate with grease with disulfde molybdeno (MoS2).



Product disassembly MASC/MASC COMPACT:

1. Take off the gas cylinder by removing the screws “A” as shown.

2. Take of the cover by removing the screws “B” as shown.

3. Take off the rear flange by removing the screws “C” as shown in order to remove the wedge.

4. Take off the springs holder block removing the screws “D” as shown in order to remove the slider.

5. Check the components.

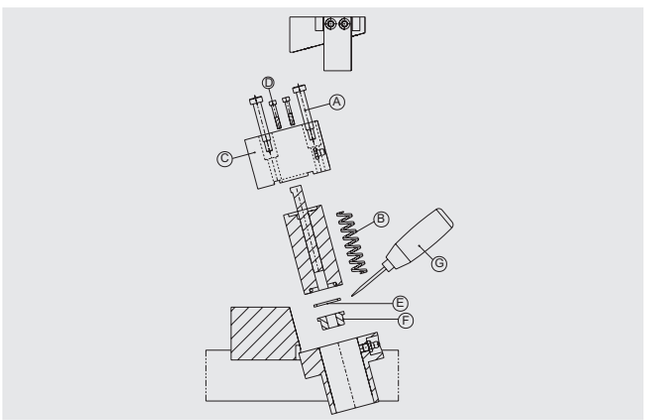
6. Reassemble carefully using grease with disulfde molybdeno (MoS2). The use of this grease is recommended by Newstark.

7. Ensure the correct positioning of the individual components. During use lubricate with grease with disulfde molybdeno (MoS2).

Attention:

Gas cylinder under pressure! Undertake reassemly or maintenance work only when the cam unit is in its basic position.

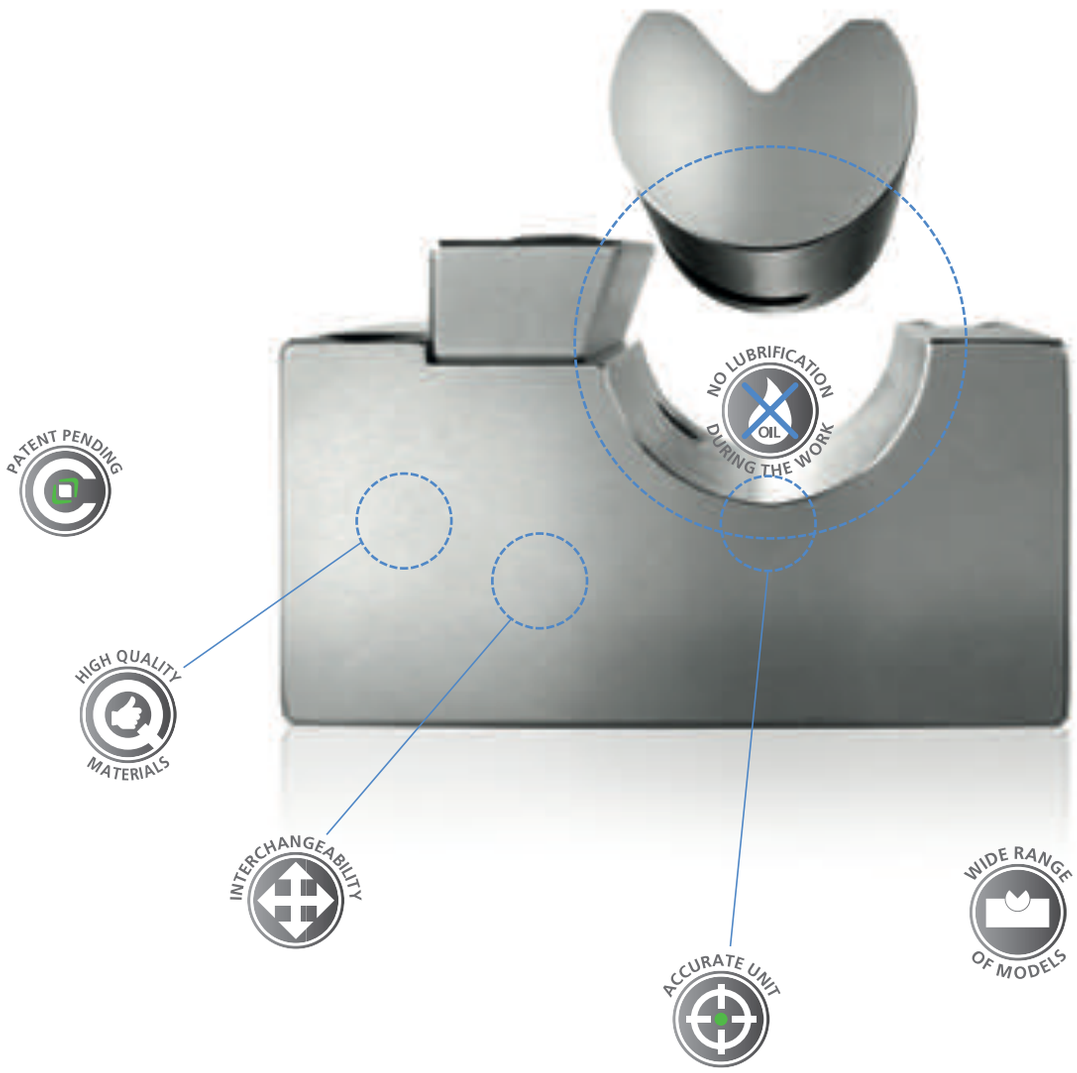
Avoid any mechanical modifcation. Use personal safety equipment such as: goggles and gloves. Do not switch off the electronic safety devices (if any). Use only original spare parts. All nitrogen cylinders have a stroke stated by the manufacturer. Therefore the nominal value (Cu) is fully applicable. However, it is recommended not to exceed the maximum stated on the race catalog in order to avoid the risk of any extra stroke caused by changes or errors in tools. This would result in irreparable damages to the cams and serious danger to personnel. When charging do not exceed the maximum recommended pressure for each model. When discharging using a DDS device, point the gas flow away from operator. Avoid any mechanical tooling or impact on the body and the rod. Ensure that the rod is 100% extracted when charging. For cylinders without a threaded hole on the rod, initially charge to 5 bar (75 psi) to extract the rod completely then charge to the required. Maintenance must only be conducted by qualifed personnel. Errors would cause serious injury or reduce the working life of the cylinders. Before carrying out any work on the system, fully release all pressure and ensure that the rod is fully retracted into the body.
Before disposing of a gas spring censure that all residual pressure is fully exhausted. If a cylinder has structural damage,fully exhaust allpressurebeforeanyformofhandling.



Product disassembly SMEG:

1. Take off the punch holder “C” and the springs “B” by removing the shoulder screws “A” as shown.
2. Take off the screws “D” to change the punch.
3. Take off the seeger “E” by removing stripper “F”. The tool “G” to remove “E” is available on request.
4. Check the components.
5. Reassemble carefully using grease with disulfde molybdeno (MoS2). The use of this grease is recommended by Newstark.
6. Ensure the correct positioning of the individual components. During use lubricate with grease with disulfde molybdeno (MoS2).

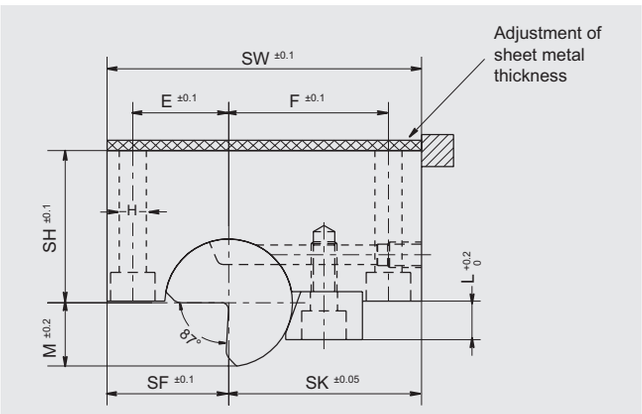
STRENGHTS

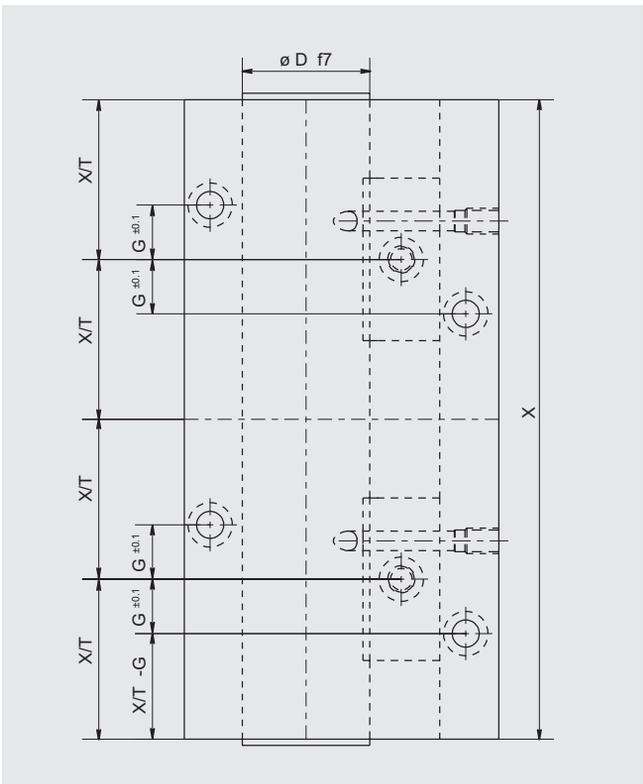

PATENT PENDING
NO LUBRIFICATION
OIL
DURING THE WORK
HIGH QUALITY
MATERIALS
INTERCHANGEABILITY
ACCURATE UNIT
WIDE RANGE
OF MODELS


newstark
INNOVATIVE METAL SOLUTIONS

Device that allows simultaneous calibration and bending of metal sheet or steel. It also allows the execution of many different types of folds, such as undersquare folds (with an angulation less than 90 °), open folds (greater than 90 °), large radius, maintaining requested tolerance angulation. Also performs “Z” open folds, doublefold etc. The system consists of a rotating previously shaped according to the required applications. The product is built with very strong materials ,wear and compression resistant, hardened and surface treated in order to considerably reduce friction. The product is patented.

ROLL-A





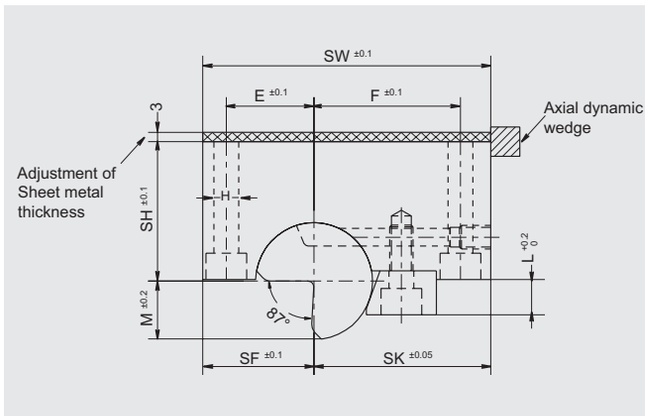
Model	X	X/T	Quantity brackets	X	X/T	Quantity brackets	X	X/T	Quantity brackets	X	X/T	Quantity brackets	G	E	F
ROLL-A15	150 77	X/4	2	225 152	X/6	3	300 227	X/8	4	375 302	X/10	5	14,5	13,5	29,5
ROLL-A25	200 102			300 202			400 302			500 402			17,5	20,5	37,5
ROLL-A40	260 132			390 262			250 392			650 522			22	30	48
ROLL-A50	300 152			450 302			650 452			– –			26	36	65
ROLL-A65	360 182			540 362			650 542			– –			32	44	80
ROLL-A75	400 202			650 402			– –			– –			35	55	90
ROLL-A100	480 241			650 482			– –			– –			45	64	104

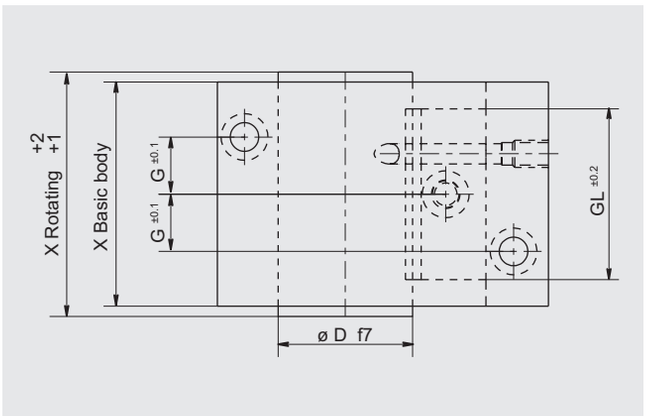
ROLL-A BENDING UNITS

Order-No.: Model-Length

Note: The bending unit also works without lubrification.

Ordering example: Model = ROLL-A40, Length = 200
ROLL-A40-200

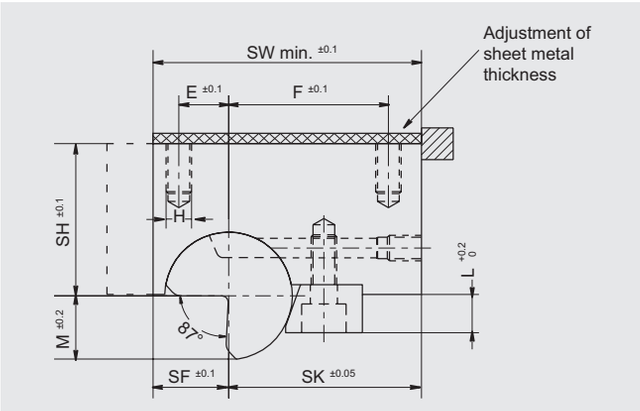


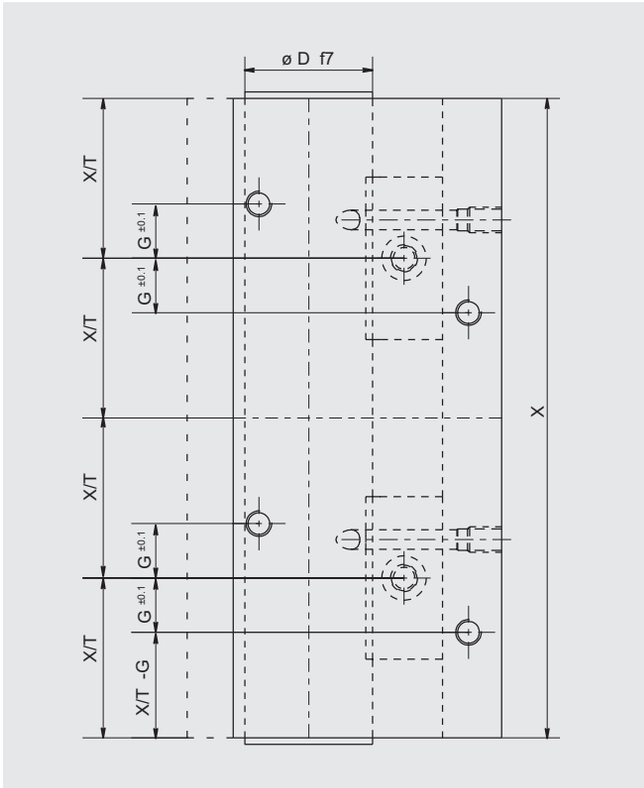


Dimensions and standard profile

Model	ROLL-A15	ROLL-A25	ROLL-A40	ROLL-A50	ROLL-A65	ROLL-A75	ROLL-A100
Metal sheet thickness	0,5 – 0,9	0,9 – 1,7	1,7 – 2,8	2,8 – 3,8	3,8 – 4,9	4,9 – 6,0	6,0 – 8,0
Min-max length (X)	30-375	40-500	40-720	50-720	50-720	50-720	60-720
ø rotating diameter (D)	15	25	40	50	65	75	100
Body width (SW)	54	73	98	123	148	175	196
Dist. rotating body/front part (SF)	19	28	40	47	56	70	78
Dist. rotating body/wedge (SK)	35	45	58	76	92	105	118
Dist. rotating body/body (SH)	22	35	48	60	73	86	96
Holder width (GL)	28,06	38,1	50,8	63,5	76,2	88,9	116
Holder higth (L)	4,6	7	12	14,5	19	22	30
Holder (M)	7,9	12,4	19,9	24,8	31,6	38	49,7
Diameter of the fixing (H)	M5	M8	M10	M10	M12	M12	M16
Position of the fixing (E)	13,5	20,5	30	36	44	55	64
Position of the fixing (F)	29,5	37,5	48	65	80	90	104
Position of the fixing (G)	14,5	17,5	22	26	32	35	45

ROLL-B





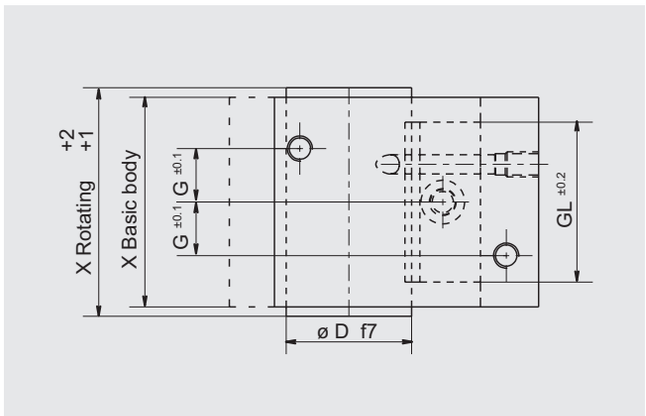
Model	X	X/T	Quantity brackets	X	X/T	Quantity brackets	X	X/T	Quantity brackets	X	X/T	Quantity brackets	G	E	F
ROLL-B15	150 77	X/4	2	225 152	X/6	3	300 227	X/8	4	375 302	X/10	5	14,5	4,5	29,5
ROLL-B25	200 102			300 202			400 302			500 402			17,5	7,5	37,5
ROLL-B40	260 132			390 262			250 392			650 522			22	15	48
ROLL-B50	300 152			450 302			650 452			– –			26	19	65
ROLL-B65	360 182			540 362			650 542			– –			32	25	80
ROLL-B75	400 202			650 402			– –			– –			35	32	90
ROLL-B100	480 241			650 482			– –			– –			45	46	104

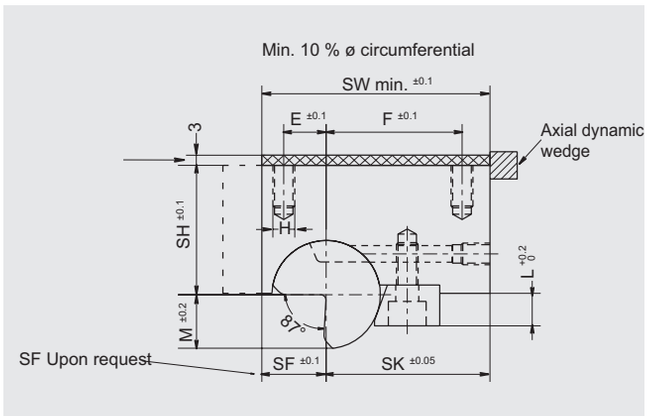
ROLL-B BENDING UNITS

Order-No.: Model-Length

Note: The bending unit also works without lubrification.

Ordering example: Model = ROLL-B40, Length = 200
ROLL-B40-200



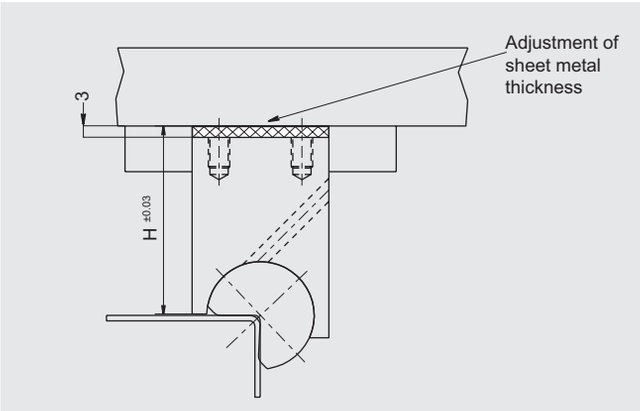


Dimensions and standard profile

Model	ROLL-B15	ROLL-B25	ROLL-B40	ROLL-B50	ROLL-B65	ROLL-B75	ROLL-B100
Metal sheet thickness	0,5 – 0,9	0,9 – 1,7	1,7 – 2,8	2,8 – 3,8	3,8 – 4,9	4,9 – 6,0	6,0 – 8,0
Min-max lengths (X)	25-375	30-500	35-720	45-720	50-720	50-720	60-720
ø Rotating diameter (D)	15	25	40	50	65	75	100
Body width (SW)	44	59	84	106	131	149	178
Dist. rotating body/front part (SF)	9	14	26	30	39	44	60
Dist. rotating body/wedge (SK)	35	45	58	76	92	105	118
Dist. rotating body/body (SH)	22	35	48	60	73	86	96
Holder width (GL)	28,06	38,1	50,8	63,5	76,2	88,9	116
Holder higth (L)	4,6	7	12	14,5	19	22	30
Holder (M)	7,9	12,4	19,9	24,8	31,6	38	49,7
Diameter of the fixing (H)	M5	M8	M10	M10	M12	M12	M16
Position of the fixing (E)	4,5	7,5	15	19	25	32	46
Position of the fixing (F)	29,5	37,5	48	65	80	90	104
Position of the fixing (G)	14,5	17,5	22	26	32	35	45

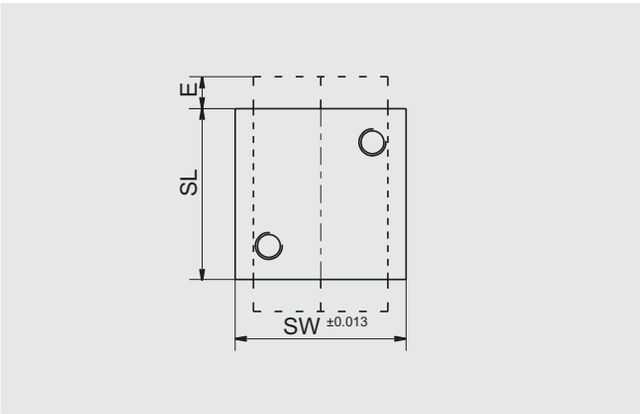
ROLL-C / ROLL-CL BENDING UNITS

Order-No.: Model-Length

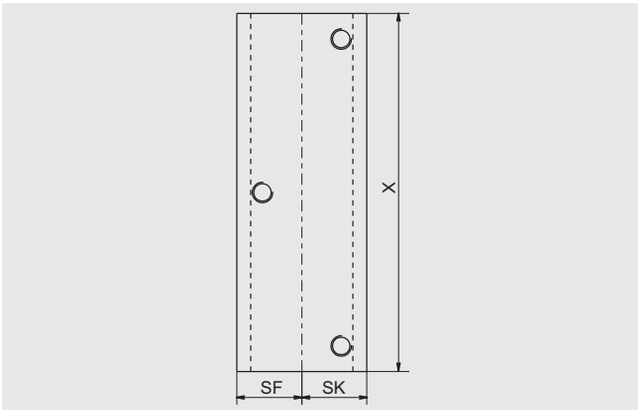


Note: The bending unit also works without lubrification.

Ordering example: Model = ROLL-CL-40, Length = 80
ROLL-CL-40-80



Standard version ROLL-C



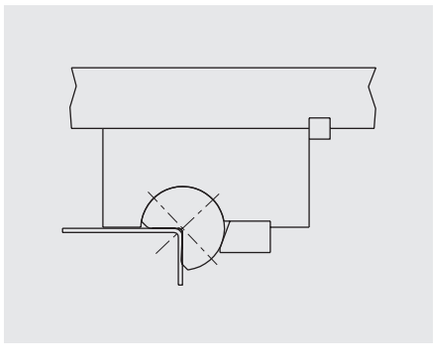
Special version ROLL-CL

Model	ROLL-CL15	ROLL-CL25	ROLL-CL40	ROLL-CL50
Metal sheet thickness	0,3 – 0,9	0,9 – 1,7	1,7 – 2,8	2,8 – 3,8
ø Rotating diameter (D)	15	25	40	50
Body width (SW)	25	38	50	76
Length (SL)	25	38	50	76
Heigth (H)	32	43,5	59	78
Extension rotating special (E)	6	6	9	12
Drilling of mounting	M6	M8	M8	M12

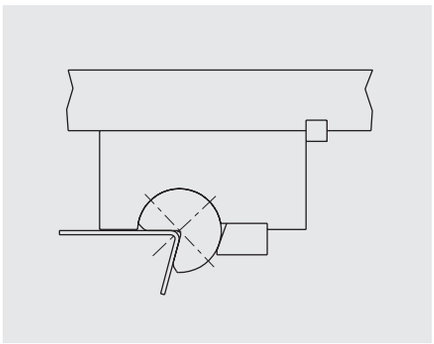
Modell	ROLL-CL25	ROLL-CL40	ROLL-CL50	ROLL-CL75
Metal sheet thickness	0,3 – 0,9	0,9 – 1,7	1,7 – 2,8	2,8 – 3,8
ø Rotating diameter (D)	25	40	50	75
Body width (SW)	25	50	76	98
Length (X)	38 – 76	50 – 101	69 – 139	101 – 139
Heigth (H)	32 – 76	59 – 76	78 – 95	78 – 101
Drilling of mounting	M6	M8	M8	M12

U-ROLL

Particular application examples

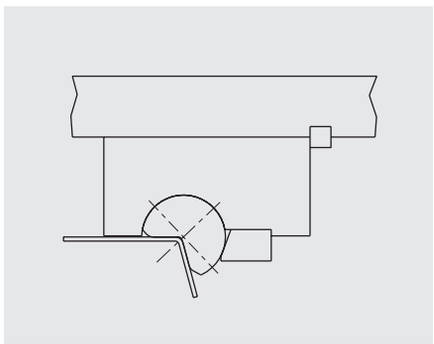


Normal bend

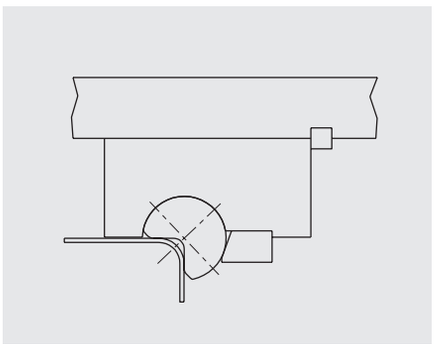


Angle bend

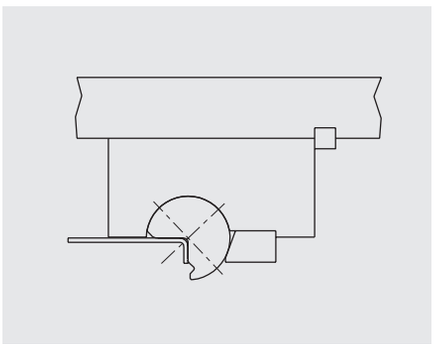
Note:
For particular use please contact Newstarks technical office.



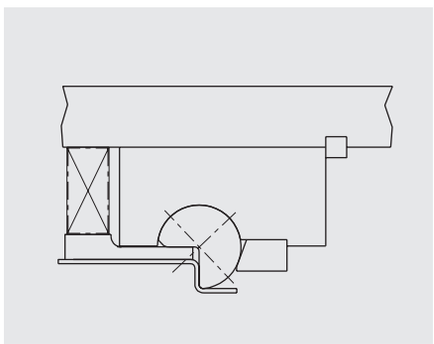
Opened bend



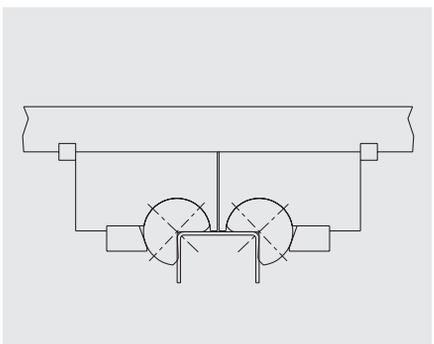
Bend with wide radius



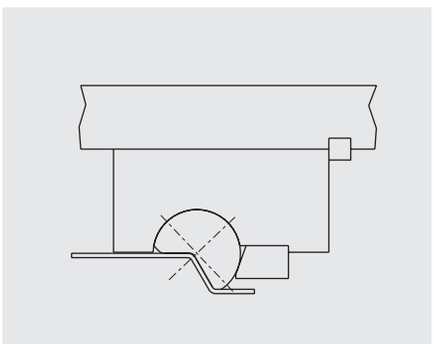
Bend with short edge



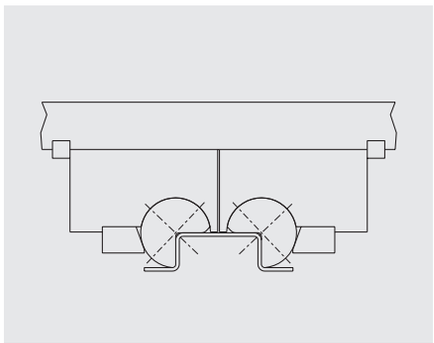
„Z“ Bend



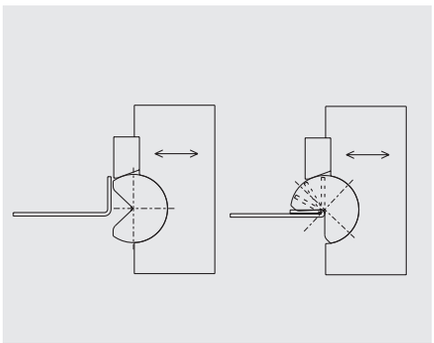
Double bend



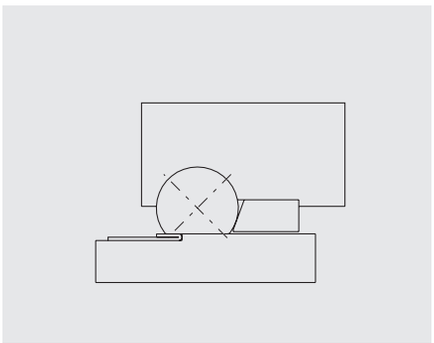
Opened „Z“ bend



Double opened „Z“ bend

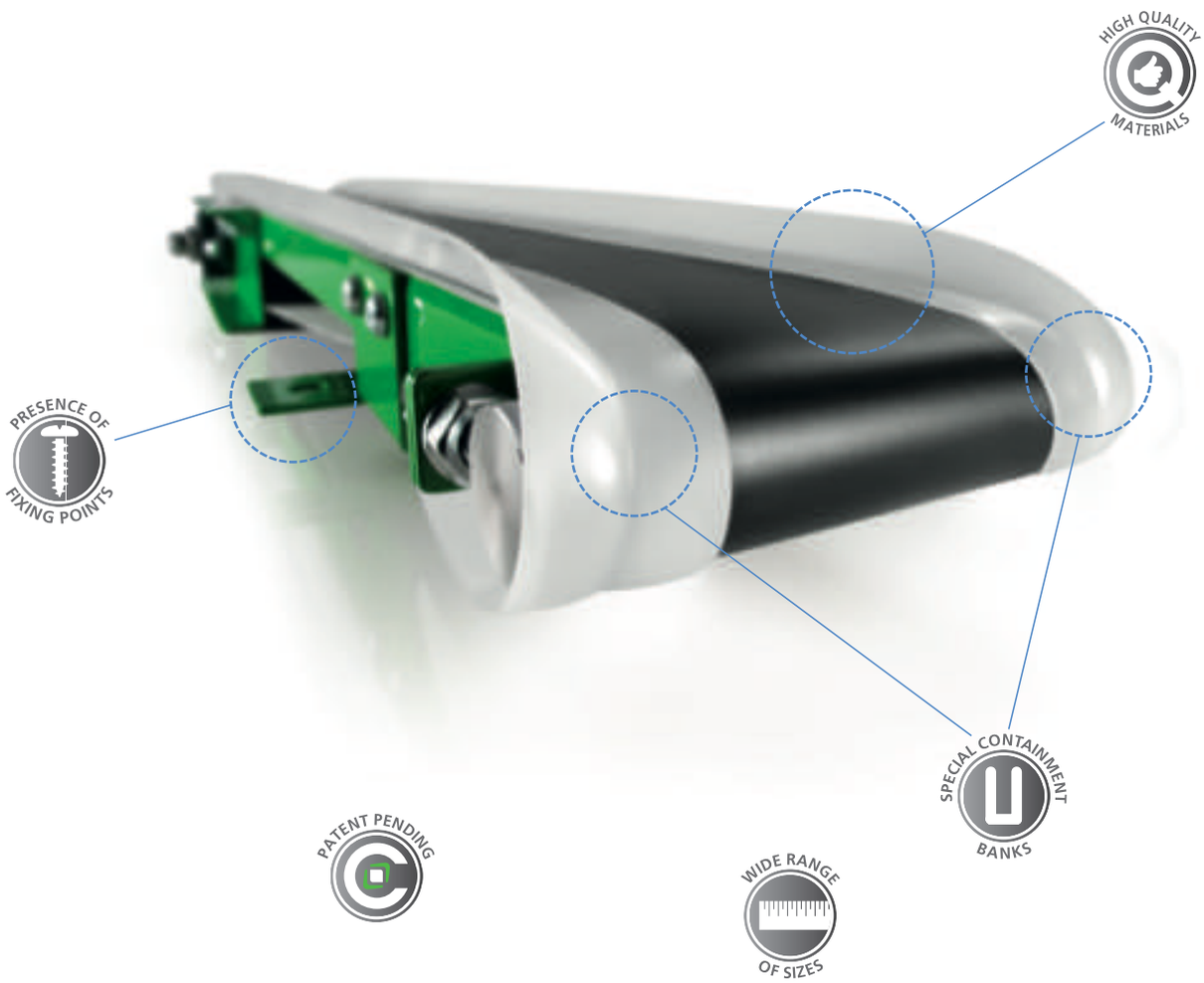


Crushed bend with cam



Crushed bend

STRENGTHS


HIGH QUALITY
MATERIALS
PRESENCE OF
FIXING POINTS
SPECIAL CONTAINMENT
BANKS
PATENT PENDING
WIDE RANGE
OF SIZES

newstark
INNOVATIVE METAL SOLUTIONS

PRODUCT DESIGNED AND MANUFACTURED IN ITALY

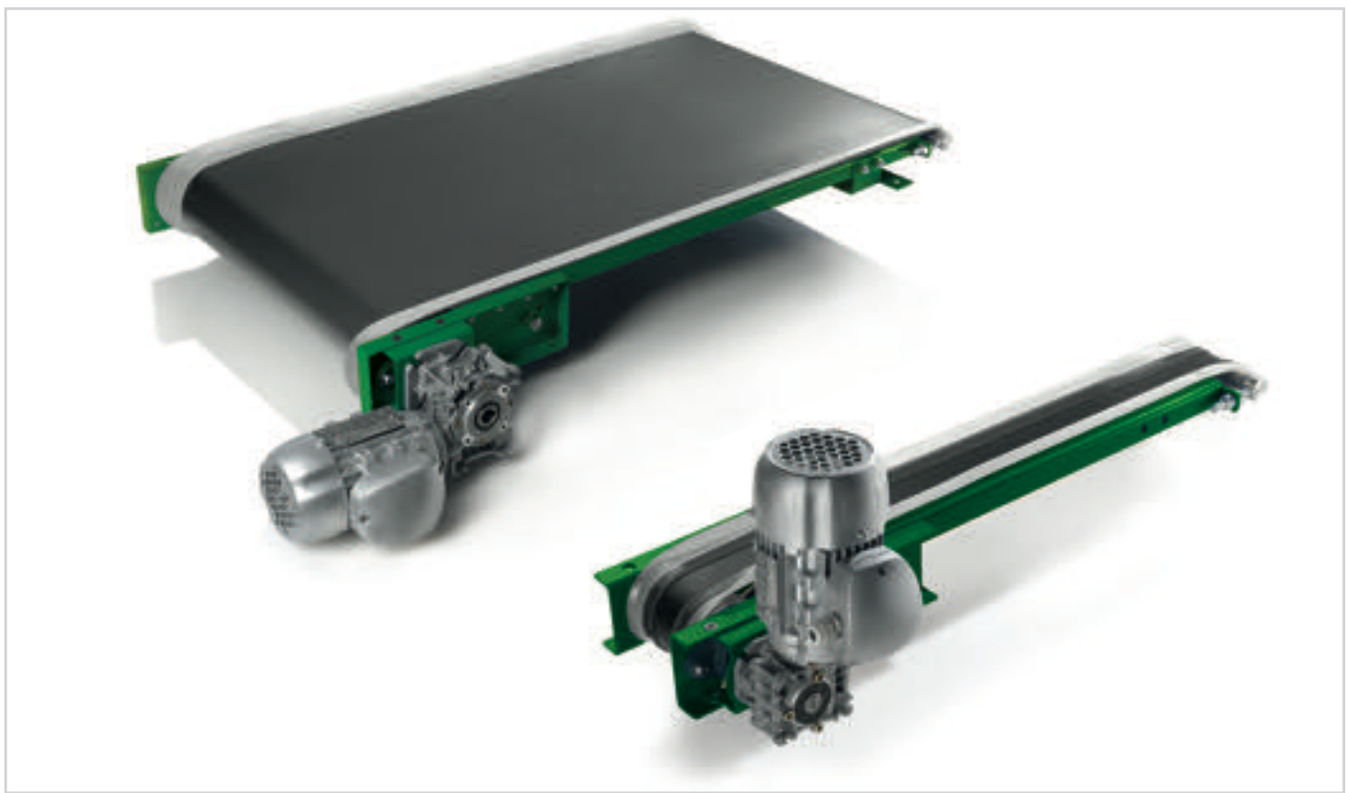
RIGHT USE AND MAINTENANCE · LONG TERM ·

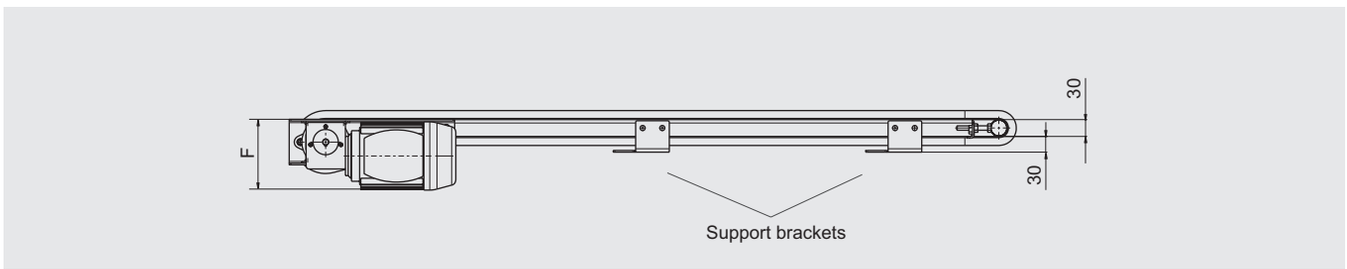
PRODUCT AVAILABLE IN 3 WEEKS

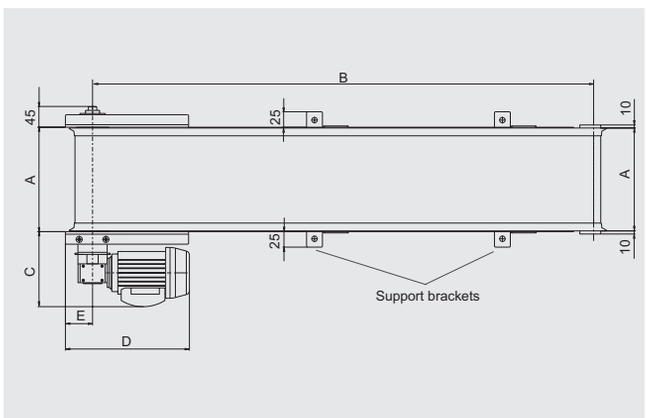
SPARE PARTS ON STOCK

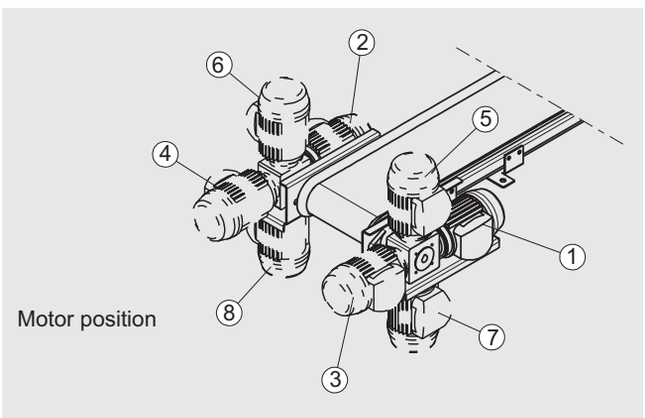
COMPETITIVE PRICE

Material convey system through a belt driven by electric force.







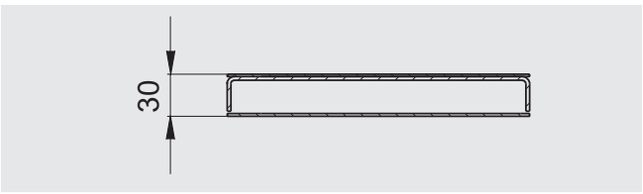


Motor	C	D	E	F
BOX 25	180	300	65	130
BOX 30	195	310	70	130
BOX 40	200	325	70	150

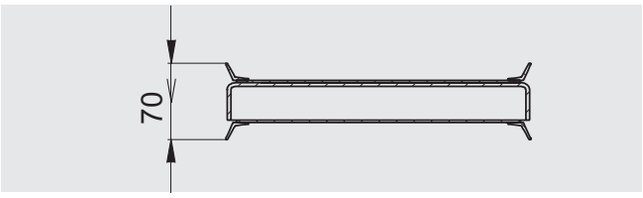
CONVEYORS BELTS

Order-No.: Model.width.length.motor position.fixed speed.adjustable speed.switch

Flat belt



Belt with angles



Material:
Polyurethane

Note:
Fixed speed:
BOX 25 = VF1 = 5,1 m/1' – VF2 = 11,7 m/1'
BOX 30 = VF1 = 4,4 m/1' – VF2 = 11,7 m/1'
BOX 40 = VF1 = 4,4 m/1' – VF2 = 8,8 m/1'

Ordering example: Model = NA, Model = P,
width = 200, length = 1500, motor position = 1,
fixed speed = VF, adjustable speed = VV,
switch = I
NA-P-200-1500-1-VF/VV/I

***Switch. Available upon request.**

Attention:
Models 30 / 50 / 70 only with flat belt

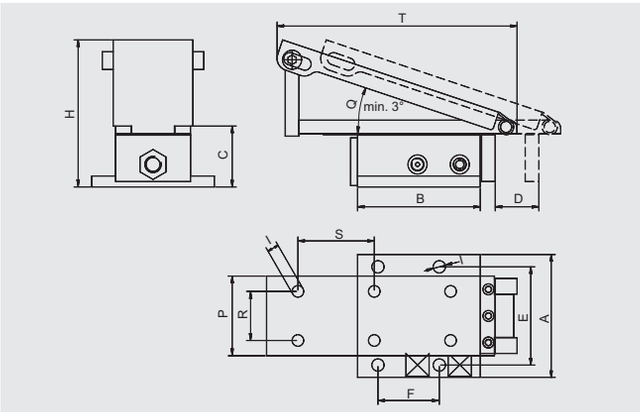
A	B										
	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
30 – 50	•	•	•	•	•	•	•	•	•	••	••
75 – 100	•	•	•	•	•	•	•	••	••	••	••
125 – 150	••	••	••	••	••	••	••	••	••	••	••
175 – 200	••	••	••	••	••	••	••	••	•••	•••	•••
225 – 250	••	••	••	••	••	••	•••	•••	•••	•••	•••
275 – 300	••	••	••	••	•••	•••	•••	•••	•••	•••	•••
350 – 400	••	••	•••	•••	•••	•••	•••	•••	•••	•••	•••
450 – 500	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••
550 – 600	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••

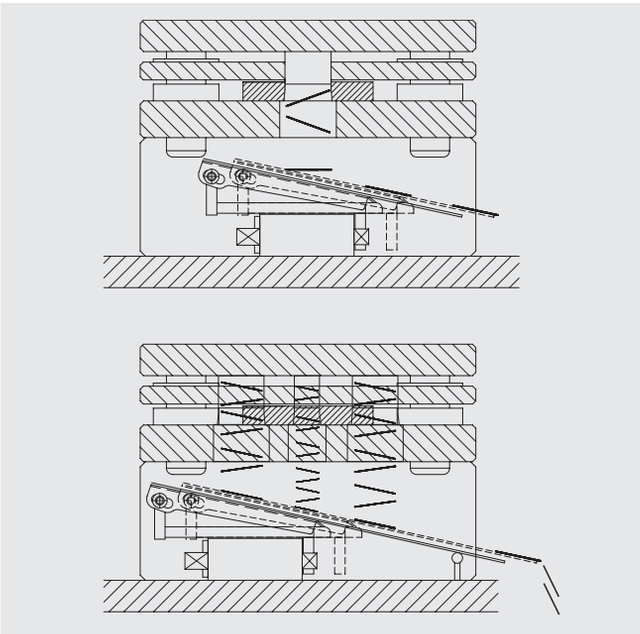
• = BOX 25
•• = BOX 30
••• = BOX 40

STRENGTHS


EASINESS OF APPLICATION AND REGULATION OF SLIDES ON CHASSIS
RANGE
Kg
WEIGHT
PLACE A PRESSURE REGULATOR AND LUBRIFICATOR

Application methods





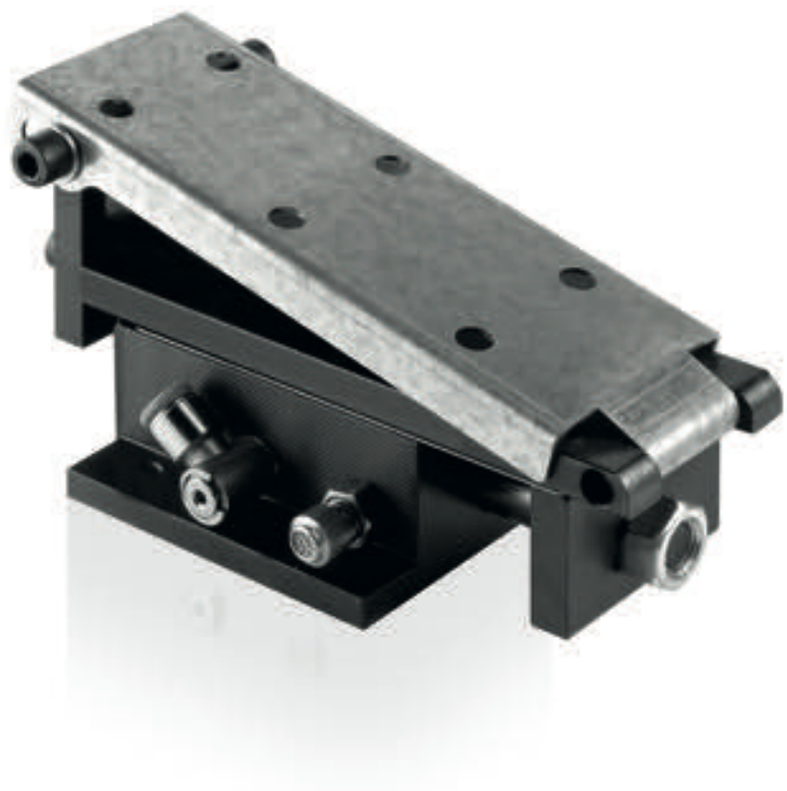
Place a pressure regulator and lubricator.

Note:
For the possible inclined applications please consult Newstarks technical department.

Model	Workpressure	A	B	C	D	E	F	H max.	I	P	Q max.	R	S	T	max. load
ALO-5	2/5 bar	90	90	29	20	72	45	83	ø 8,5	58	18°	36	56	180	5 kg
ALO-10	2/5 bar	90	90	52	35	72	45	105	ø 9	60	20°	36	56	175	10 kg
ALO-25	2/5 bar	100	106	63	36	82	55	125	ø 9	70	20°	44	62	190	25 kg
ALO-50	2/5 bar	120	120	72	46	102	96	140	ø 9	96	20°	56	70	220	50 kg

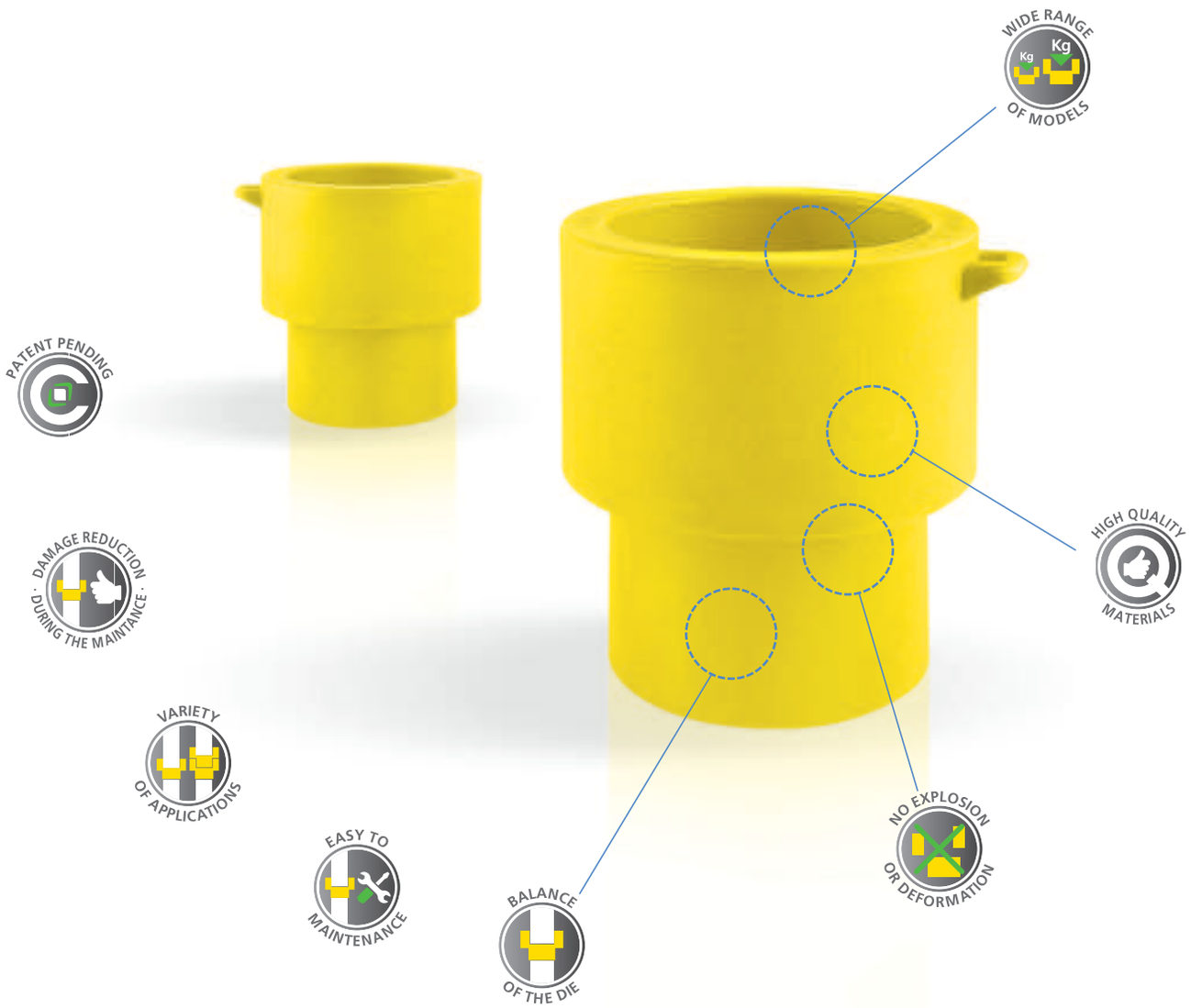
Maximum positioning inclination 20°

PNEUMATIC EJECTORS



Material conveyor mechanism through pneumatic vibrant system, with very small dimensions, applicable even in evacuation uneasy situations. Dependingon application requirements, by means of a slide, different sizes of plates can be applied, this slide is equipped with an adjustment sloping system.This system is activated through compressed air connection previously fltered through a pressure regulator from 2 to 5 bar. Work speed is adjustable through a brass valve directly inserted in the tool.

STRENGTHS


WIDE RANGE
Kg
OF MODELS
PATENT PENDING
DAMAGE REDUCTION
DURING THE MAINTANCE
HIGH QUALITY
MATERIALS
VARIETY
OF APPLICATIONS
EASY TO
MAINTENANCE
BALANCE
OF THE DIE
NO EXPLOSION
OR DEFORMATION

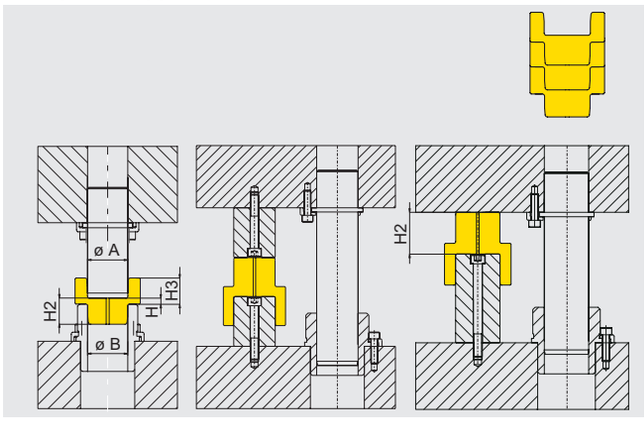
newstark
INNOVATIVE METAL SOLUTIONS

SUPPORT FOR DIES

Marerial:
Greenamid PA6 (GF30), yellow

Note:
Strengths: – Equality of the tools
– Damage reduction during maintenance
– Easy maintenance
– These products can be inserted one above the other

Examples of applications



Model	ø A mm	ø B mm	H	H2	H3	Carrying capacity per unit
SSD/15 SSD/16	15,2 16,2	14,8 15,8	12	32	32	2500 daN
SSD/18 SSD/19 SSD/20	18,2 19,2 20,2	17,8 18,8 19,8	12	32	32	2700 daN
SSD/24 SSD/25	24,2 25,2	23,8 24,8	12	34	34	3600 daN
SSD/30 SSD/32	30,2 32,2	29,8 31,8	12	36	36	4500 daN
SSD/38 SSD/40 SSD/42	38,2 40,2 42,2	37,8 39,8 41,8	12	42	42	6000 daN
SSD/48 SSD/50 SSD/52	48,2 50,2 52,2	47,8 49,8 51,8	12	48	48	7500 daN
SSD/60 SSD/63	60,2 63,2	61,8 62,8	12	52	52	9400 daN
SSD/80	80,2	79,8	12	54	54	12000 daN
SSD/100	100,2	99,8	12	56	56	15000 daN
SSD/125	125,2	124,8	12	56	56	18000 daN

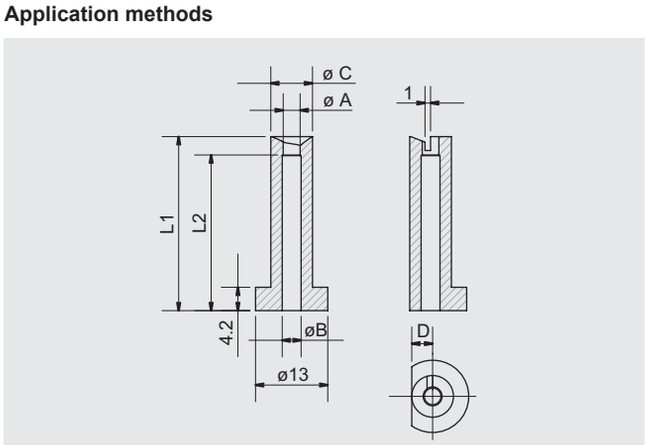
SUPPORT FOR DIES

Designed and built for the storage and transport of the die. This type of product is necessary to distance the party. In this way the springs and the cylinders are not over-loaded.

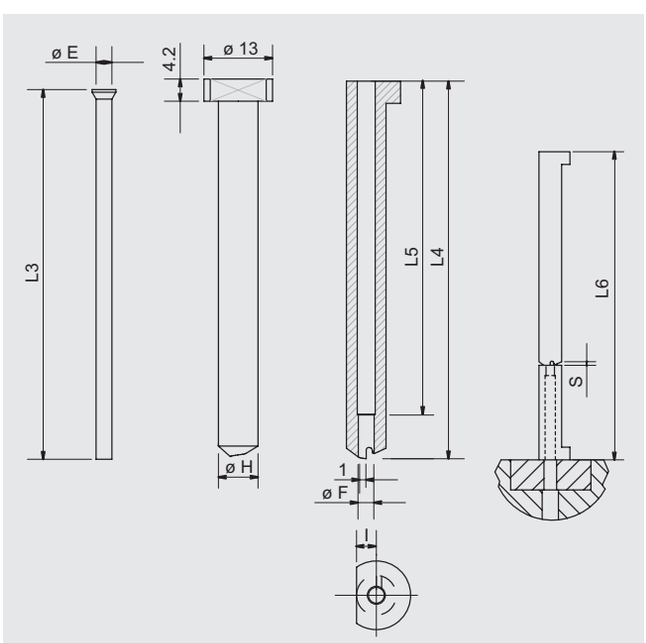
STRENGTHS

PRESTAM

Application methods



Matrix



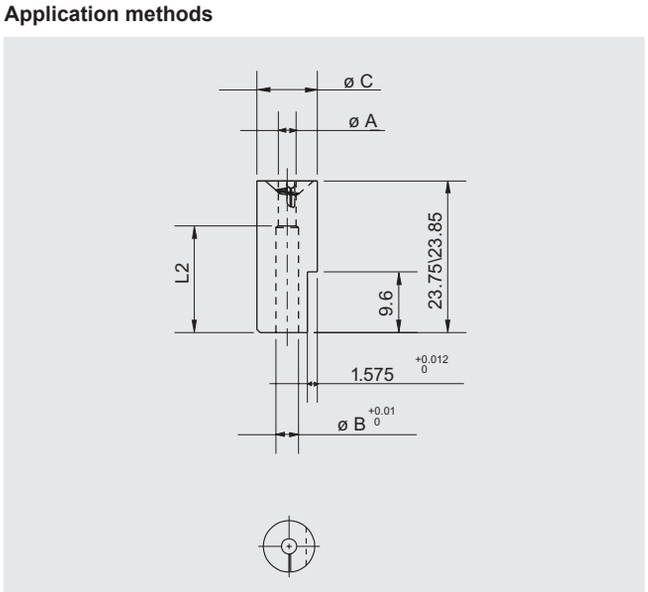
Punch

ø Screw	ø A H7	ø B	ø C h6	D K6	ø E h7	ø F h7	ø H h6	l k6	L1	L2	L3	L4	L5	S	L6	Code
														example		
B 3,5	2,75	3,2	7,5	3,75	2,7	2,7	7,5	3,75	31,3	28	74,5	71,5	60	0,5	101,72	PRESB3,5
B 3,9	3,05	3,4	7,5	3,75	3,0	3,0	7,5	3,75	31,3	28	74,5	71,5	60	0,63	101,85	PRESB3,9
B 4,2	3,15	3,5	8,5	4,25	3,1	3,1	8,0	4,0	31,3	28	74,5	71,5	60	0,75	101,97	PRESB4,2
B 4,8	3,85	4,2	9,0	4,50	3,8	3,8	8,0	4,0	31,3	28	74,5	71,5	60	0,88	102,10	PRESB4,8
B 5,5	4,35	4,8	9,0	4,50	4,3	4,3	8,0	4,0	31,3	28	74,5	71,5	60	1,00	102,22	PRESB5,5
B 6,3	4,85	5,3	10,5	5,25	4,8	4,8	10,0	5,0	31,3	28	74,5	71,5	60	1,20	102,42	PRESB6,3

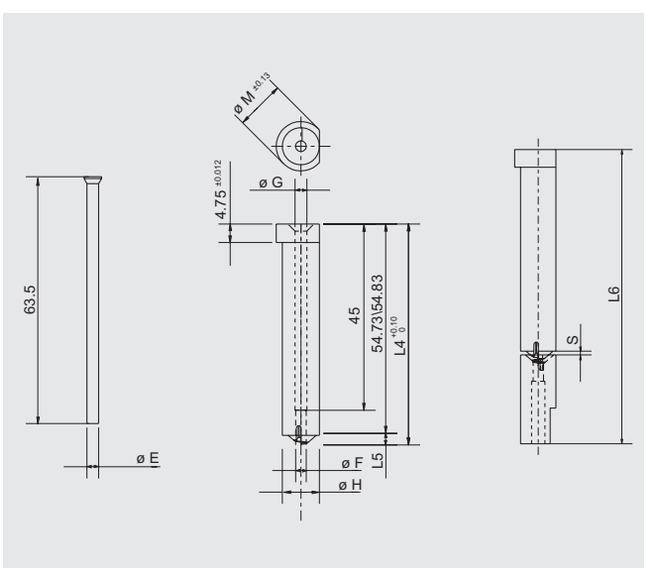
PRESTAM

Prestam are used for shear and shape the metal sheet in order to realize the ”twist” or “spiral” in the metal sheet itself, such that to tighten self-threading screws avoiding the use of standard collar made by “tip” end, which is unreliable. The special shape obtained by the Prestam allows to enhance the tightness of the thread of the threat.

Application methods



Matrix



Punch

ø Screws	ø A +0,03 / +0,02	ø B	ø C +0,025 / +0,12	ø E -0,01 / 0,02	ø F +0,02 / +0,01	ø G	ø H +0,0102 / +0,0054	ø M +-0-13	L2	L4	L5	S example	L6 example	Code
B 3,5	2,5	3,5	9,525	2,5	2,5	2,8	9,525	14,2	20	56,8	2	0,5	79,1	PRESB3,5
B 4,2	2,9	3,9	12,70	2,9	2,9	3,2	12,70	17,3	19	57,45	2,65	0,75	79,35	PRESB4,2
B 4,8	3,3	4,3	12,70	3,3	3,3	3,6	12,70	17,3	19	57,45	2,65	0,9	79,5	PRESB4,8
B 5,5	3,9	4,9	15,87	3,9	3,9	4,2	15,87	22	18,5	58,1	3,3	1	79,6	PRESB5,5
B 6,3	4,5	5,5	15,87	4,5	4,5	4,8	15,87	22	18,5	58,1	3,3	1,2	79,8	PRESB6,3
B 8	5,8	7,1	20,00	5,8	5,8	6,1	20,00	25	17,5	59	4,2	1,5	80,1	PRESB8

PRESTAUTO

Prestauto are used for shear and shape the metal sheet in order to realize the ”twist” or “spiral” in the metal sheet itself, such that to tighten self-threading screws avoiding the use of standard collar made by “tip” end, which is unreliable. The special shape obtained by the Prestauto allows to enhance the tightness of the thread of the threat.

We can realize special models, custom made.

SPECIAL MODELS

These units are used for shear and shape the metal sheet in order to realize the ”twist” or “spiral” in the metal sheet itself, such that to tighten self-threading screws avoiding the use of standard collar made by “tip” end, which is unreliable. The special shape obtained by the Prestauto allows to enhance the tightness of the thread of the threat.

STRENGTHS


DIRECT USE
UNDER THE PRESS
HIGH POWER
EXCELLENT RELATION BETWEEN
SIZE AND POWER

newstark
INNOVATIVE METAL SOLUTIONS

DEMAGNETIZER

Width	Length	Heigth
76	2/5 bar	120

All dimensions in mm

V 23w0	Hz 50	Absorption W 100

DEMAGNETIZER

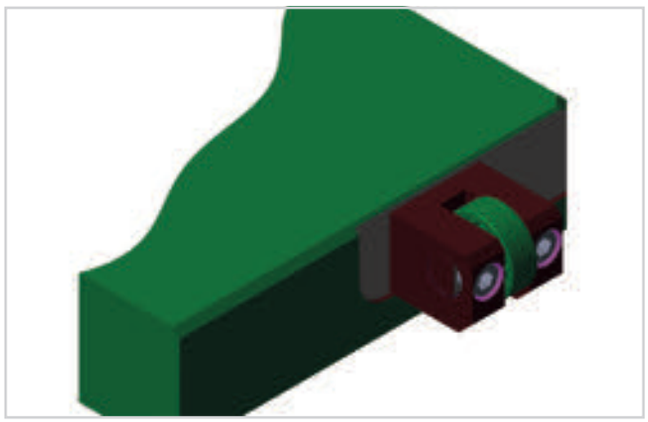
Small dimensions portable electrical device, with high performances, utilized for demagnetize metallic parts such as molds and punches that during grinding and normal work can demagnetize and attract metallic powders that, when present causes dents and haloes to the machined products.

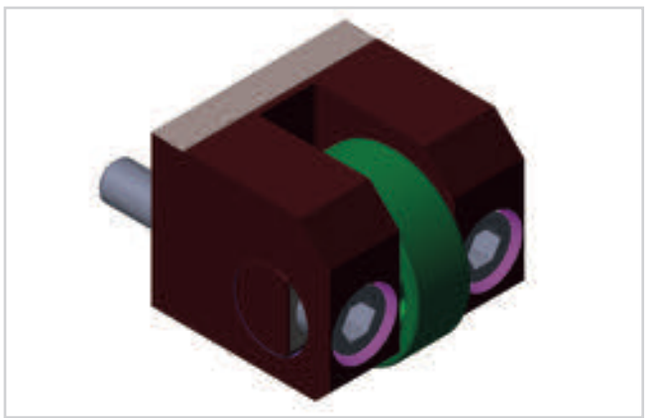
SLIDE UNITS

Overview

Slide units of any kind and all manufacturers upon request.

ROLLERS FOR TOOL POSITIONING





Load capacity:
Groove ball bearing:
Load rating:
– dynamic 19 kN
– static 4,6 kN

Socket cap screws:
Strength class 10.9
Max. load capacity: 7.500 kg
This is 15.000 kg with two screws

Function:
By tightening the socket cap screws, the roller is pulled towards his contact surface. The roller is supported by the milled ladge and lifts the item for about 2mm.