PNEUMAX®

Components for Pneumatic Automation

MANIPULATION

CATALOGUE 6

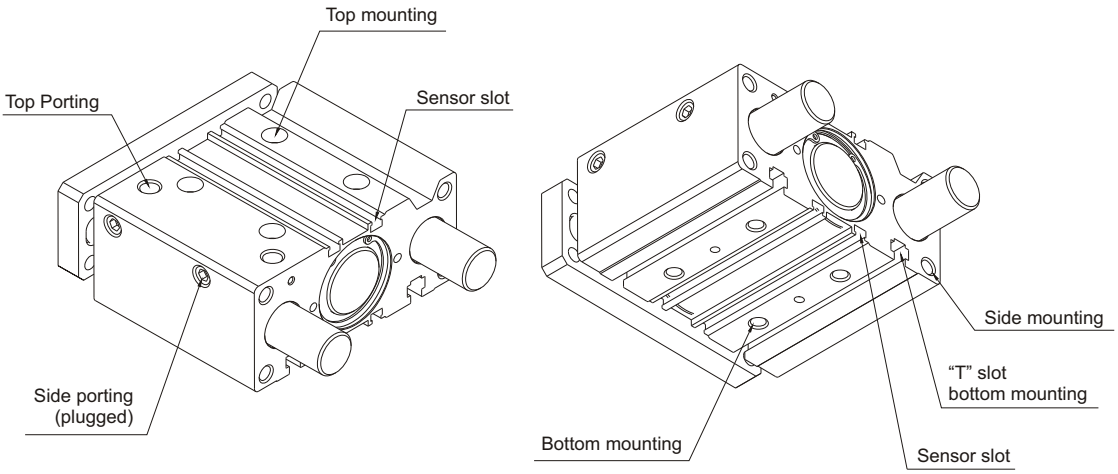
PNEUMAX S.p.A.
LURANO (BG) - ITALY

Certified
Quality System
SQS
ISO 9001 : 2000
ISO 14001 : 2004
Reg. No. 10677

PNEUMAX SpA
24050 LURANO (BG) - Italia
Via Cascina Barbellina, 10
Tel. 035/4192777
Fax 035/4192740
035/4192741
http://www.pneumaxspa.com

CAP. SOC. €. 2.700.000 I.V.
R.E.A. BERGAMO N. 160798
R.E.A. MILANO N. 931262
COD. FISC. E P.IVA N.02893330163
COD. MECC. MI 322178

GUIDED COMPACT CYLINDER
Series 6100

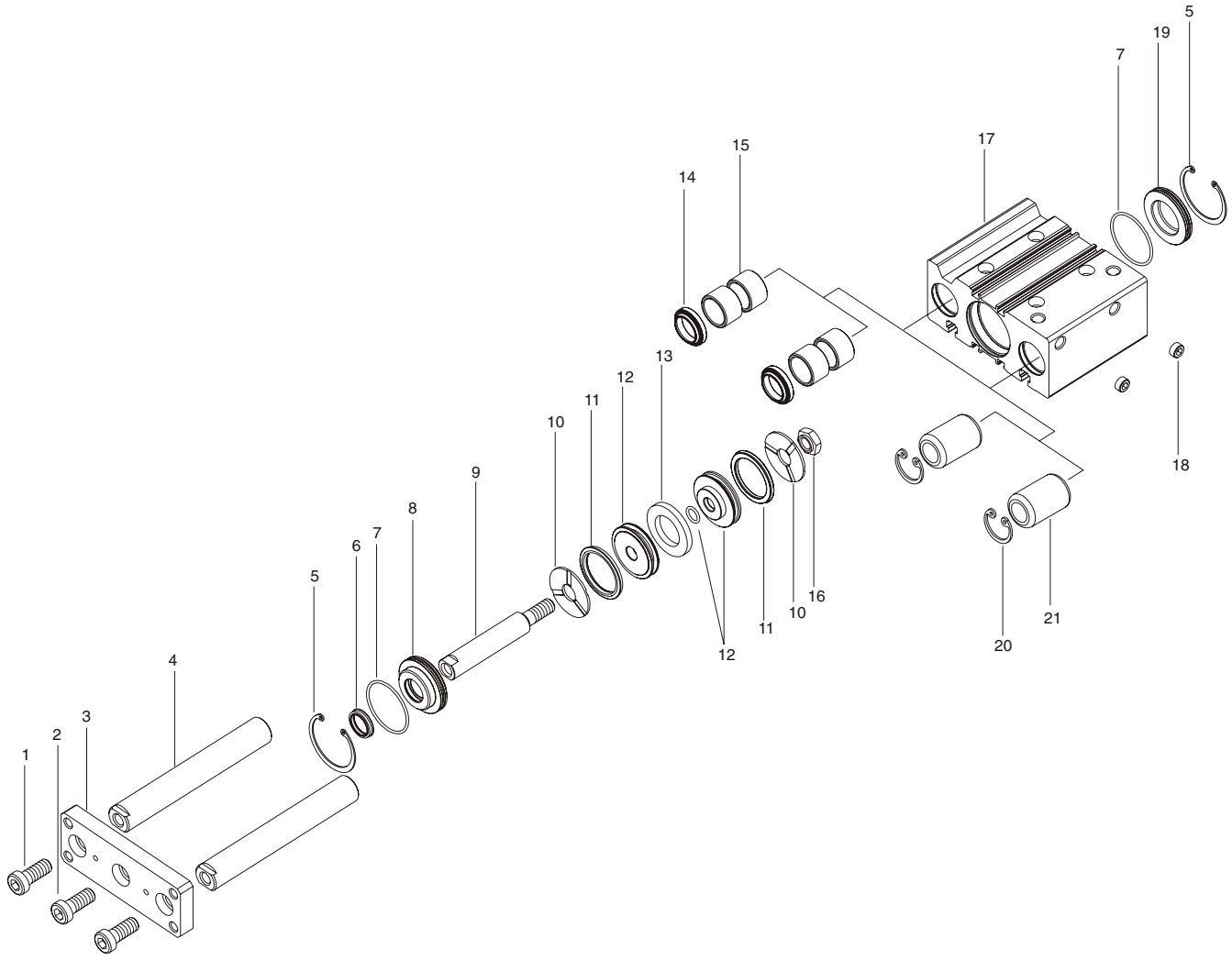


These guided compact cylinders, characterised by reduced overall dimensions, can be used for the compression, conveyance and manipulation of objects in many industrial sectors; similarly they can also be used in pushing, lifting and stopping applications.

These cylinders are available in sizes 32mm to 63 mm diameter, and comprise a single compact cylinder with integral guide rods, making it a true guide cylinder designed with installation flexibility and space saving at it's core.

The rod guide is available in two styles:
Self lubricating bronze bushes, useful for absorbing lateral loads and forces, especially as a stopper.
Bearing bushes, guaranteeing high precision and uniform movement with low friction characteristics, useful with misaligned loads.
Guided compact cylinders are ideal for use in applications requiring a combination of reduced dimensions and anti-rotation features. Mounting can be achieved on three sides through holes or "T" slots.

Adjustable mounting holes in the front plate ensure safe and accurate assembly. Pneumatic connections can be made to either lateral or top ports, (lateral ports plugged on standard units).
When sensors are required, there are special slot in the barrel extrusion where 1580 series miniaturized sensors are easily fitted.



Pos.	Item	Qty.	Pos.	Item	Qty.
1	Guide rod screw	2	13	Magnet	1
2	Piston rod screw	1	14	Wiper	2
3	Plate	1	15	Bronze bush	4*
4	Rod	2	16	Piston rod nut	1
5	Circlip	2	17	Body	1
6	Piston rod seal	1	18	Plug	2
7	Seal	2	19	End plate	1
8	Bushing	1	20	Circlip	2
9	Piston rod	1	21	Bearing bush	4**
10	Cushiuning washer	2	* N. 2 pieces for strokes under 50 mm (for bores ø20,25,32)		
11	Piston seal	2	** N. 2 pieces for strokes under 50 mm (for bores ø20,25,32)		
12	Half piston	2	N. 2 pieces for strokes under 50 mm (for bores ø40,50,63)		

Ordering code

6100.Ø.stroke.

- **B** = Control unit with Bronze bush
- **C** = Control unit with Bearing bush

- 20
- 25
- 32
- 40
- 50
- 63

Magnetic sensors: see page 1.10

Construction characteristics

Body	oxidated aluminium alloy
Guide rods	C43 chromed steel (control unit with Bronze bush) tempered and chromed steel (control unit with Bearing bush)
Piston	aluminium
Piston rod	AISI303 chromed stainless steel (for bores ø20, ø25) C43 chromed steel (for bores ø32, ø40, ø50, ø63)
Rods bushing	bronze or bearing bushing
End plate	oxidated aluminium
Piston seal	oil resistant NBR rubber
Piston rod seal	self lubricating polyurethane compound
Wipers	oil resistant NBR rubber
Plate	nickel plated steel

Technical characteristics

Function	double acting
Fluid	filtered and lubricated or non lubricated air
Working pressure	max. 10 bar
Working temperature	-5°C ÷ +70°C
Cushioning	elastic bumper on both ends

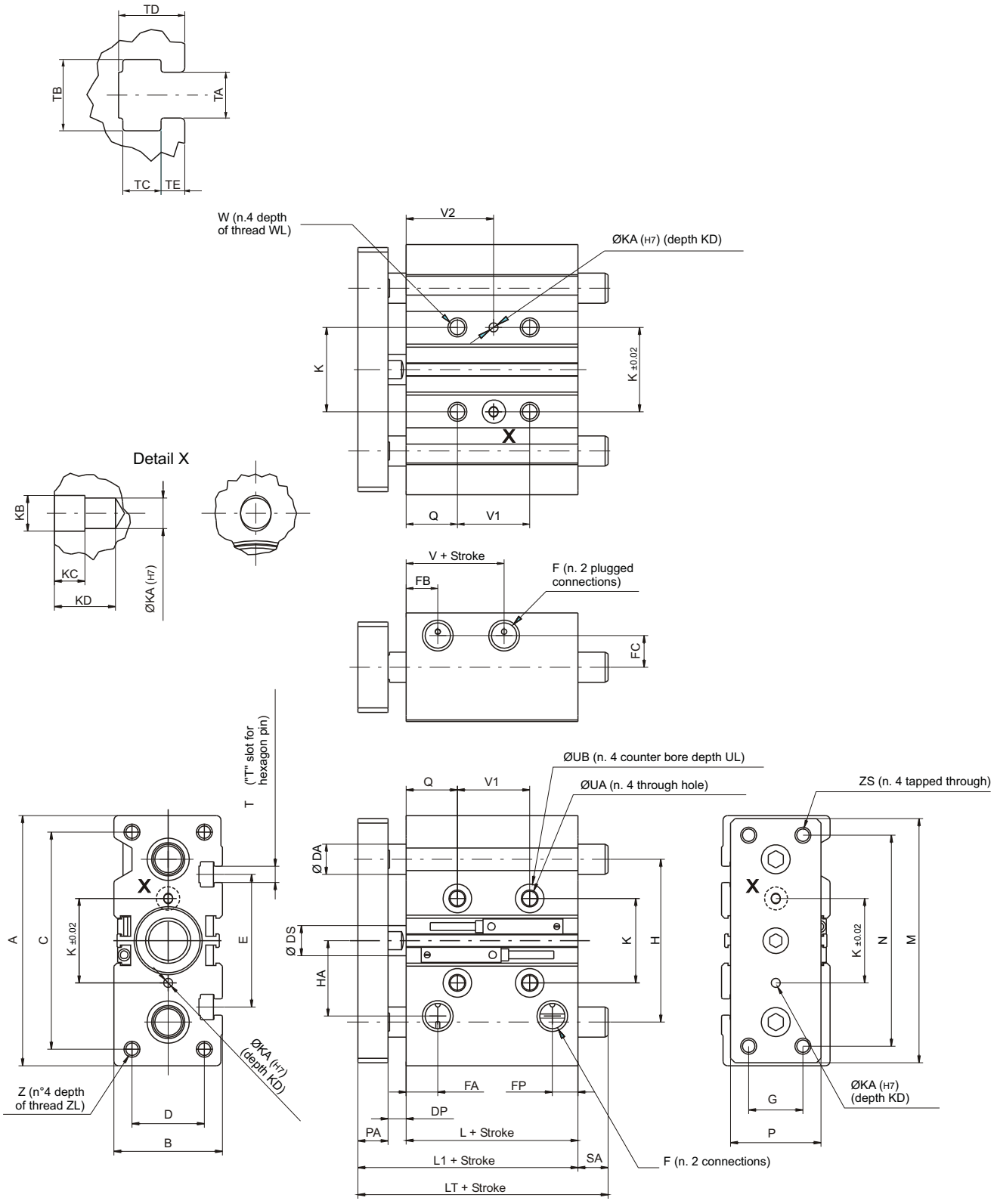
Standard stroke

Bore	20	25	30	40	50	75	100	125	150	175	200
Ø20	●		●	●	●	●	●	●	●	●	●
Ø25	●		●	●	●	●	●	●	●	●	●
Ø32		●			●	●	●	●	●	●	●
Ø40		●			●	●	●	●	●	●	●
Ø50		●			●	●	●	●	●	●	●
Ø63		●			●	●	●	●	●	●	●

Intermediate strokes are obtaining using spacers with defined length (5,10,15,20 mm).
Example:
It is possible obtaining a 6100.32.35B cylinder from a 6100.32.40B cylinder, inserting a spacer with length of 5 mm.

The strokes intermediate without using of spacers are considered special executions.

Dimension of "T" slot



Bore	A	B	C	D	DP	DS	E	F	FA	FB	FC	FP	G	H	HA	K	KA	KB	KC	KD	L	L1	M
20	83	36	72	24	6	10	44	G1/8	10,5	10,5	10,5	8,5	18	54	25	28	3	3,5	3	6	37	53	81
25	93	42	82	30	6	12	50	G1/8	11,5	11,5	13,5	9	26	64	28,5	34	4	4,5	3	6	37,5	53,5	91
32	112	48	98	34	10	16	63	G1/8	12,5	12,5	15	9	30	78	34	42	4	4,5	3	6	37,5	59,5	110
40	120	54	106	40	10	16	72	G1/8	14	14	18	10	30	86	38	50	4	4,5	3	6	44	66	118
50	148	64	130	46	13	20	92	G1/4	14	12	21,5	11	40	110	47	66	5	6	4	8	44	72	146
63	162	78	142	58	13	20	110	G1/4	16,5	16,5	28	13,5	50	124	55	80	5	6	4	8	49	77	158

Bore	N	PA	P	Q	T	TA	TB	TC	TD	TE	UA	UB	UL	V	W	WL	Z	ZL	ZS
20	70	10	30	17	M5	5,4	8,4	4,5	7,8	2,8	5,6	9,5	5,5	12,5	M6x1	12	M5x0,8	13	M5x0,8
25	78	10	38	17	M5	5,4	8,4	4,5	8,2	3	5,6	9,5	5,5	12,5	M6x1	12	M6x1	15	M6x1
32	96	12	44	21	M6	6,5	11	5,5	9,5	3,5	6,6	11	7,5	7	M8x1,25	16	M8x1,25	20	M8x1,25
40	104	12	44	22	M6	6,5	11	5,5	11	4	6,6	11	7,5	13	M8x1,25	16	M8x1,25	20	M8x1,25
50	130	15	60	24	M8	8,5	14	7,5	14	4,5	8,6	14	9	9	M10x1,5	20	M10x1,5	22	M10x1,5
63	130	15	70	24	M10	11	18	10	19	7	8,6	14	9	14	M10x1,5	20	M10x1,5	22	M10x1,5

	V1			V2		
Bore	stroke ≤ 30	30<stroke≤100	100<stroke≤200	stroke ≤ 30	30<stroke≤100	100<stroke≤200
20	24	44	120	29	39	77
25	24	44	120	29	39	77
	stroke ≤ 25	25<stroke≤100	100<stroke≤200	stroke ≤ 25	25<stroke≤100	100<stroke≤200
32	24	48	124	33	45	83
40	24	48	124	34	46	84
50	24	48	124	36	48	86
63	28	52	128	38	50	88

Control unit w ith bronze bushes

	LT		DA	SA	
Bore	stroke ≤ 50	50<stroke≤200		stroke ≤ 50	50<stroke≤200
20	53	84,5	12	0	31,5
25	53,5	85	16	0	31,5
32	97	102	20	37,5	42,5
40	97	102	20	31	36
50	106,5	118	25	34,5	46
63	106,5	118	25	29,5	41

Control unit w ith bearing bushes

	LT			DA	SA		
Bore	stroke ≤ 30	30<stroke≤100	100<stroke≤200		stroke ≤ 30	30<stroke≤100	100<stroke≤200
20	63	80	104	10	10	27	51
25	69,5	85,5	104,5	14	16	32	51
	stroke ≤ 50	50<stroke≤100	100<stroke≤200		stroke ≤ 50	50<stroke≤100	100<stroke≤200
32	81	98	118	16	21,5	38,5	58,5
40	81	98	118	16	15	32	52
50	93	114	134	20	21	42	62
63	93	114	134	20	16	37	57

Stroke tolerance: +1.5mm

Cylinder theoretic force

Bore	Piston area (mm^2)		Force (N)								
Ø20	Out	314	63	94	126	157	188	220	251	283	314
	In	236	47	71	94	118	142	165	189	212	236
Ø25	Out	491	98	147	196	246	295	344	393	442	491
	In	378	76	113	151	189	227	265	302	340	378
Ø32	Out	804	161	241	322	402	482	563	643	724	804
	In	603	121	181	241	302	362	422	482	543	603
Ø40	Out	1257	251	377	503	629	754	880	1006	1131	1257
	In	1056	211	317	422	528	634	739	845	950	1056
Ø50	Out	1963	393	589	785	982	1178	1374	1570	1767	1963
	In	1649	330	495	660	825	989	1154	1319	1484	1649
Ø63	Out	3117	623	935	1247	1559	1870	2182	2494	2805	3117
	In	2803	561	841	1121	1402	1682	1962	2242	2523	2803
			2	3	4	5	6	7	8	9	10
			Working pressure (bar)								

Weights

Control unit with bronze bushes

Bore	Weight (gr)										
20	670		750	830	910	1170	1370	1570	1760	1960	2160
25	950		1050	1160	1270	1650	1920	2190	2470	2740	3010
32		1690			2070	2470	2850	3240	3620	4000	4380
40		1950			2370	2830	3250	3680	4100	4530	4950
50		3360			4000	4730	5370	6010	6650	7290	7930
63		4180			4940	5780	6540	7290	8050	8800	9560
	Weight of moving parts (gr)										
20	330		350	380	400	520	580	640	700	760	820
25	520		560	600	640	840	950	1050	1150	1250	1350
32		1070			1230	1420	1580	1740	1910	2070	2230
40		1140			1300	1490	1650	1810	1980	2140	2300
50		2150			2400	2750	3000	3260	3510	3760	4020
63		2500			2750	3090	3350	3600	3860	4110	4360
	20	25	30	40	50	75	100	125	150	175	200
	Stroke										

Control unit with bearing bushes

Bore	Weight (gr)										
20	700		770	890	970	1140	1310	1520	1690	1870	2040
25	980		1070	1250	1340	1570	1810	2080	2310	2540	2770
32		1540			1850	2300	2620	2990	3310	3620	3940
40		1790			2150	2640	3000	3420	3780	4140	4500
50		3110			3660	4410	4960	5600	6150	6700	7250
63		3930			4590	5460	6120	6880	7540	8210	8870
	Weight of moving parts (gr)										
20	310		330	370	390	440	480	560	600	650	700
25	490		520	580	610	690	760	880	950	1020	1100
32		820			940	1110	1230	1410	1530	1650	1770
40		890			1010	1180	1300	1480	1600	1720	1830
50		1770			1950	2240	2430	2710	2890	3080	3270
63		2110			2300	2590	2770	3050	3240	3420	3610
	20	25	30	40	50	75	100	125	150	175	200
	Stroke										

How to calculate the Momentum

$$Ec = \frac{1}{2} \; m \; V^2 (J)$$

m = Total moving mass: weight of driven object added to weight of cylinder moving parts (kg).
V = max. speed: equal to average speed + 40% (m/sec)

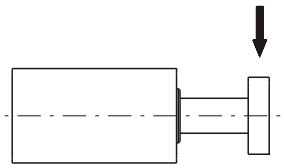
Maximum permissible Momentum (using this formula)

Bore	Ec (J)
ø20	0,1
ø25	0,2
ø32	0,3
ø40	0,5
ø50	0,9
ø63	1,55

Permissible lateral load (applied on overall plate)

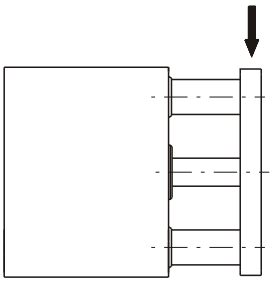
Control unit with bronze bush

Bore	Load (N)										
Ø20	49		43	38	35	87	75	66	59	54	49
Ø25	69		60	54	49	116	100	88	79	71	65
Ø32		203			164	182	159	142	127	116	106
Ø40		203			164	182	159	142	127	116	106
Ø50		296			245	273	241	216	195	179	164
Ø63		296			245	273	241	216	195	179	164
	20	25	30	40	50	75	100	125	150	175	200
	Stroke										



Control unit with bearing bush

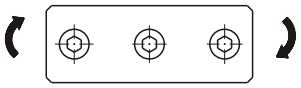
Bore	Load (N)										
Ø20	58		48	101	90	70	58	62	54	48	43
Ø25	69		68	132	118	93	77	80	70	62	55
Ø32		191			157	164	144	203	186	171	158
Ø40		190			157	163	144	203	185	171	158
Ø50		208			173	223	199	264	242	224	207
Ø63		206			171	221	196	262	240	221	205
	20	25	30	40	50	75	100	125	150	175	200
	Stroke										



Recommended torque moments

Control unit with bronze bush

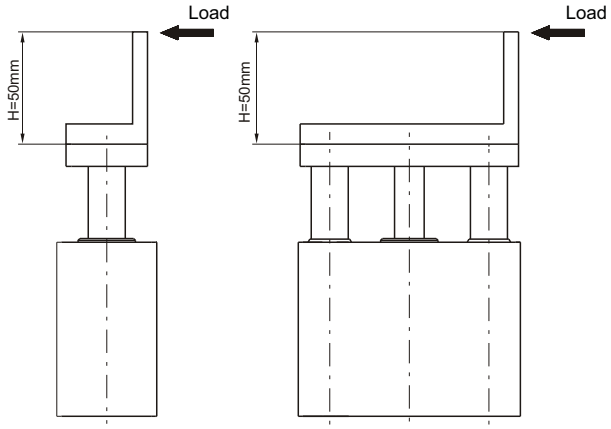
Bore	Load (N)										
Ø20	1,1		0,9	0,8	0,8	1,9	1,6	1,4	1,3	1,2	1,1
Ø25	1,8		1,6	1,4	1,3	3,0	2,6	2,3	2,0	1,8	1,7
Ø32		6,4			5,1	5,7	5,0	4,4	4,0	3,6	3,3
Ø40		7,0			5,7	6,3	5,5	4,9	4,4	4,0	3,7
Ø50		13,0			10,8	12,0	10,6	9,5	8,6	7,9	7,2
Ø63		14,7			12,1	13,5	11,9	10,7	9,7	8,9	8,2
	20	25	30	40	50	75	100	125	150	175	200
	Stroke										



Control unit with bearing bush

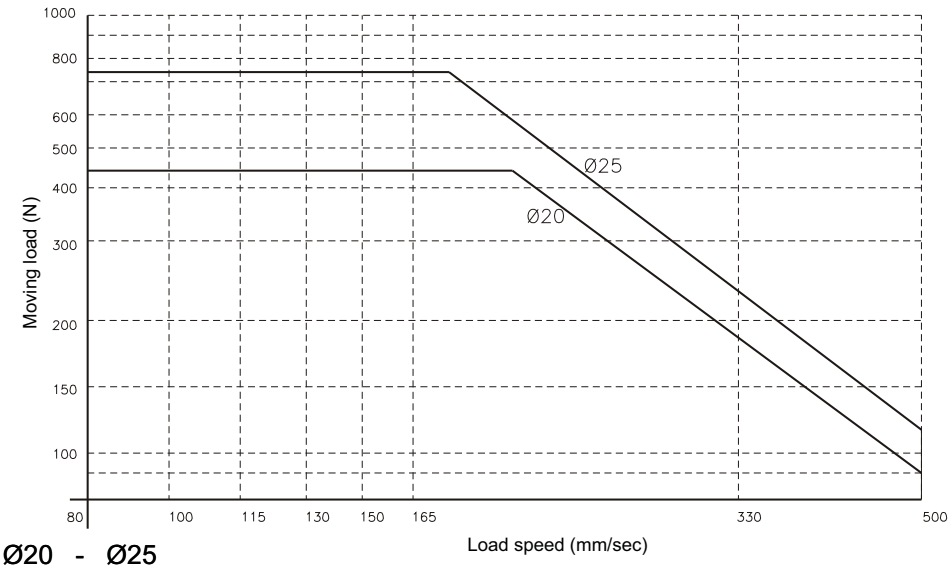
Bore	Load (N)										
Ø20	1,3		1,0	2,2	1,9	1,5	1,3	1,3	1,2	1,0	0,9
Ø25	2,1		1,8	3,4	3,0	2,4	2,0	2,1	1,8	1,6	1,4
Ø32		6,0			4,9	5,1	4,5	6,3	5,8	5,3	4,9
Ø40		6,6			5,4	5,6	5,0	7,0	6,4	5,9	5,4
Ø50		9,2			7,6	9,8	8,7	11,6	10,7	9,8	9,1
Ø63		10,2			8,5	11,0	9,7	13,0	11,9	11,0	10,2
	20	25	30	40	50	75	100	125	150	175	200
	Stroke										

Stopper device applications

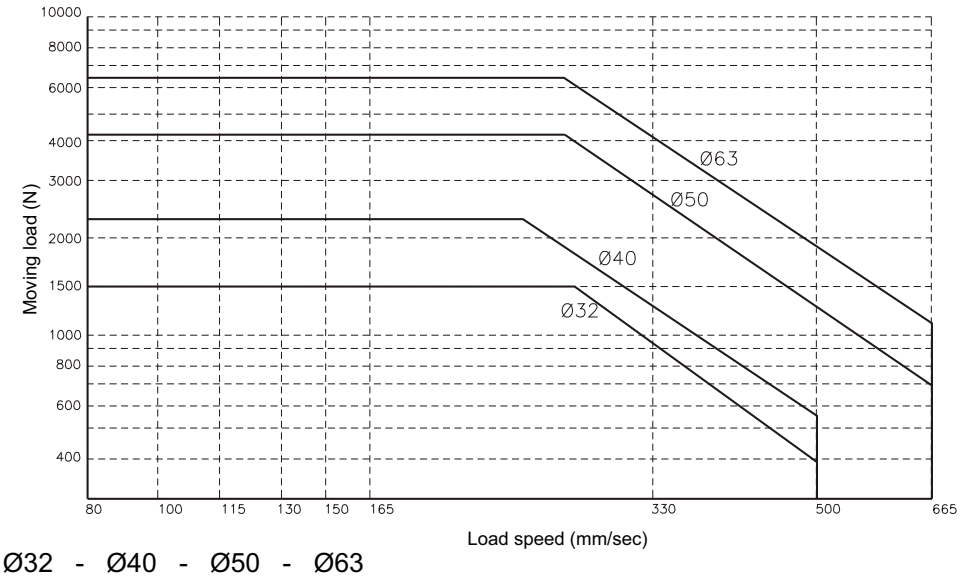


ATTENTION: if H>50 mm use larger bore

Control unit with bronze bushes

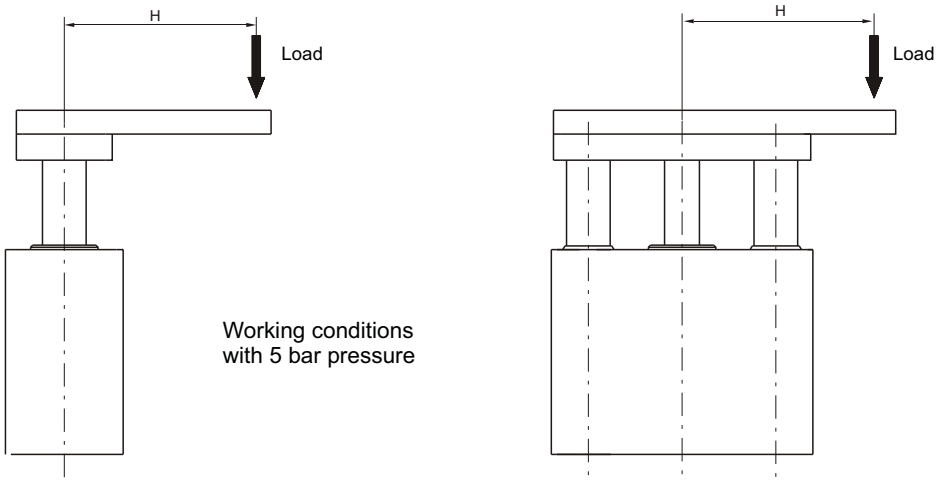


Ø20 - Ø25
ATTENTION: use with stroke ≤ 30 mm



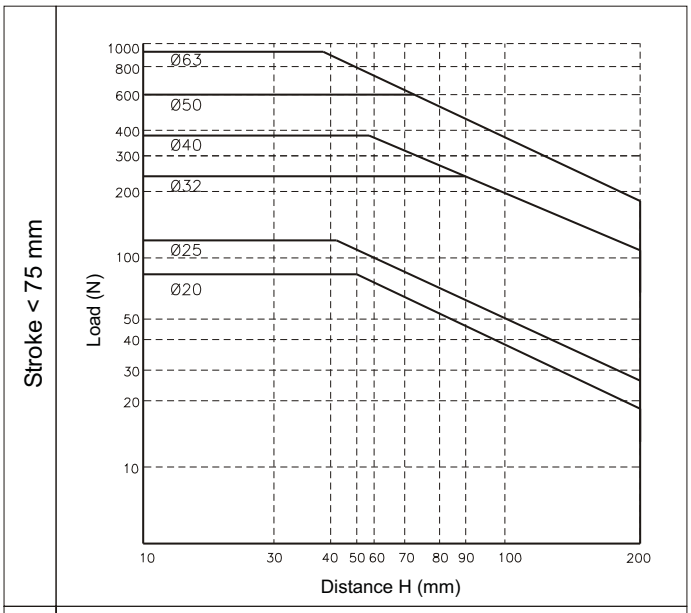
Ø32 - Ø40 - Ø50 - Ø63
ATTENTION: use with stroke ≤ 50 mm

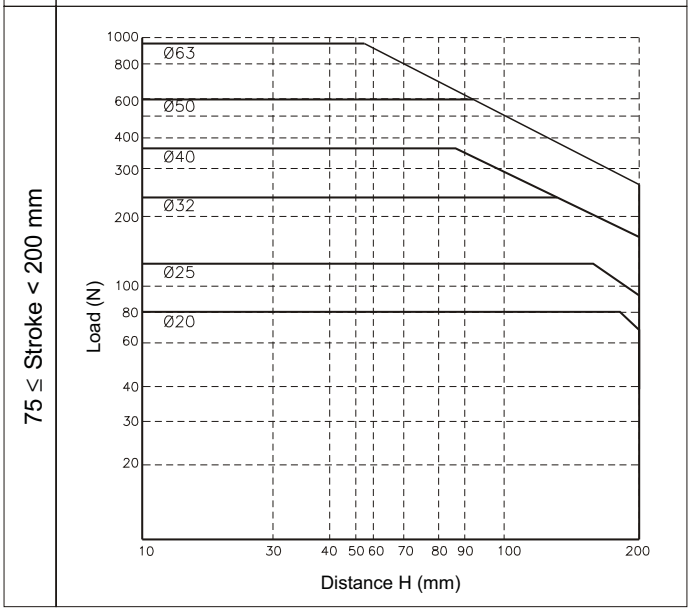
Handling applications



Working conditions
with 5 bar pressure

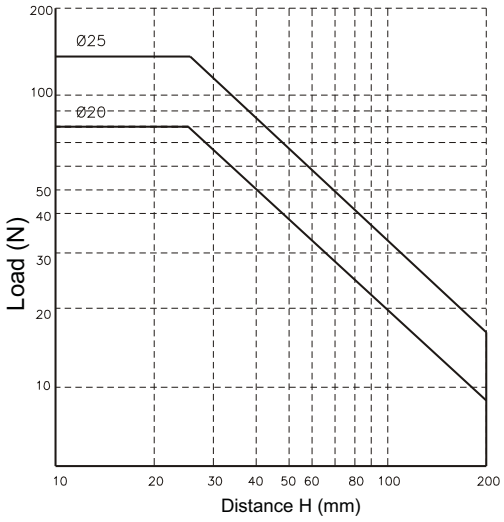
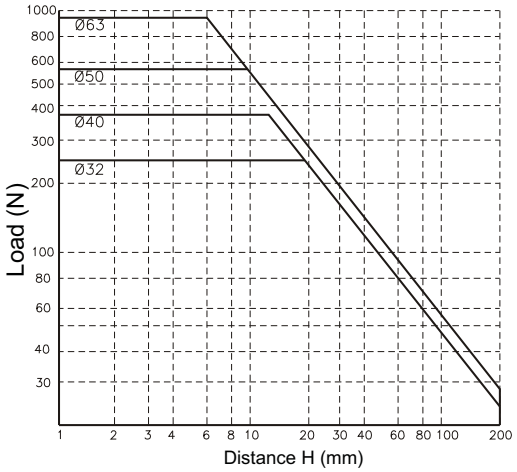
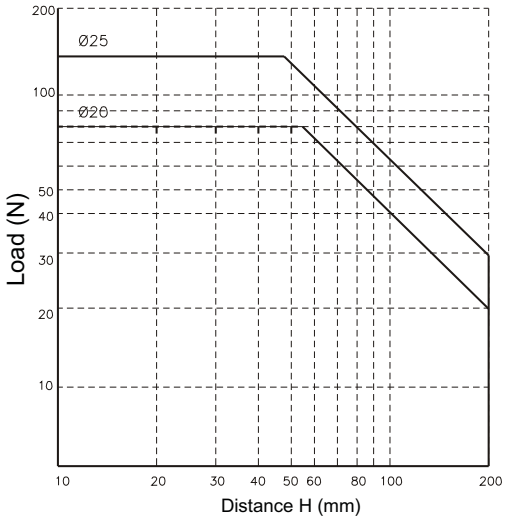
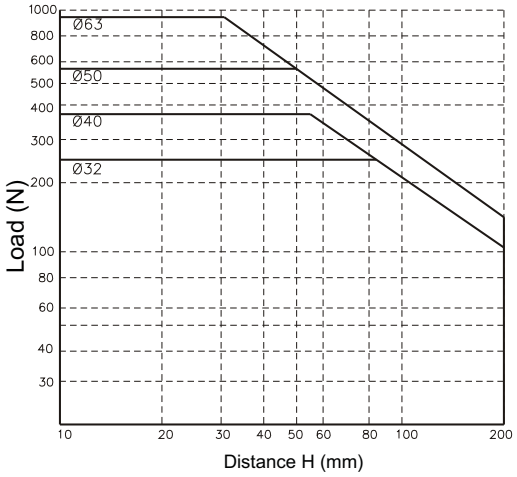
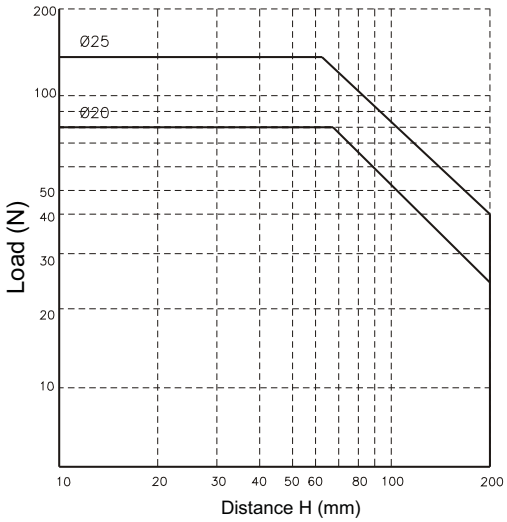
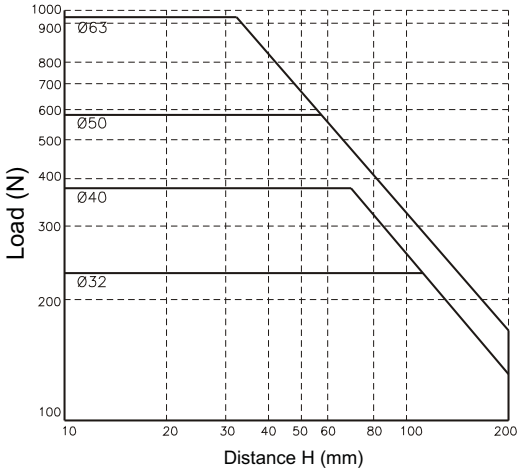
Control unit with bronze bushes





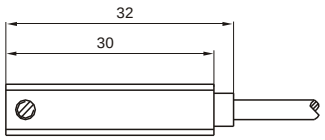
Handling applications

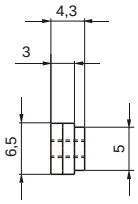
Control unit with bearing bushes

	Ø20 ÷ Ø25	Ø32 ÷ Ø63
Stroke < 40 mm		
40 ≤ Stroke < 125 mm		
125 ≤ Stroke < 200 mm		

Sensor c/w 2,5 m. cable

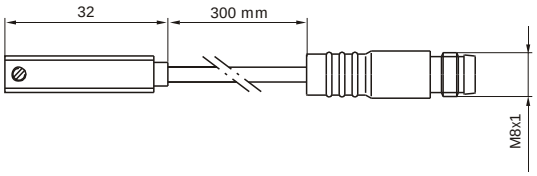
Weight gr. 27





Sensor c/w M8 connector (300 mm cable)

Weight gr. 15



Ordering codes	
1580.U	Reed bulb sensor with led and 2.5 m cable
1580.HAP	PNP sensor Hall effect with led and 2.5 m cable
MRS.U	Reed bulb sensor with led and connector
MHS.P	PNP sensor Hall effect with led and connector
MC1	M8 in line connector with 2.5 m cable (2 wires)
MC2	M8 in line connector with 5 m cable (2 wires)
MCH1	M8 in line connector with 2.5 m cable (3 wires)
MCH2	M8 in line connector with 5 m cable (3 wires)

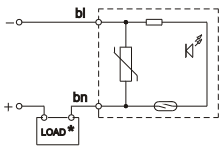
Technical characteristics

	1580.U	MRS.U	1580.HAP	MHS.P
Type of contact	N.A.			
Maximum current (pulses of 0.5 sec)	0,1A		0,2A	
Maximum permanent current	0,1A		0,2A	
Maximum permanent power	6VA		4W	
Voltage range A.C.	3 ÷ 30V		/	
Voltage range D.C.	3 ÷ 30V		12 ÷ 30V	
Working temperature	-20° C ÷ 70°C			
Maximum voltage drop	3V			
Cable section	2x0,14		3x0,14	
Degree of protection	IP 65			
Connecting time	0,5 ms		0,8 µs	
Disconnecting time	0,1 ms		0,3 µs	
Average life (operations)	10^7		10^9	
Repetition of intervention point	± 0,1			

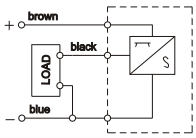
NOTE: Pay attention to the connected loads which should not exceed recommendations

***Reed bulb sensor: connection can be made either to negative or positive pole**

Diagrams and connection



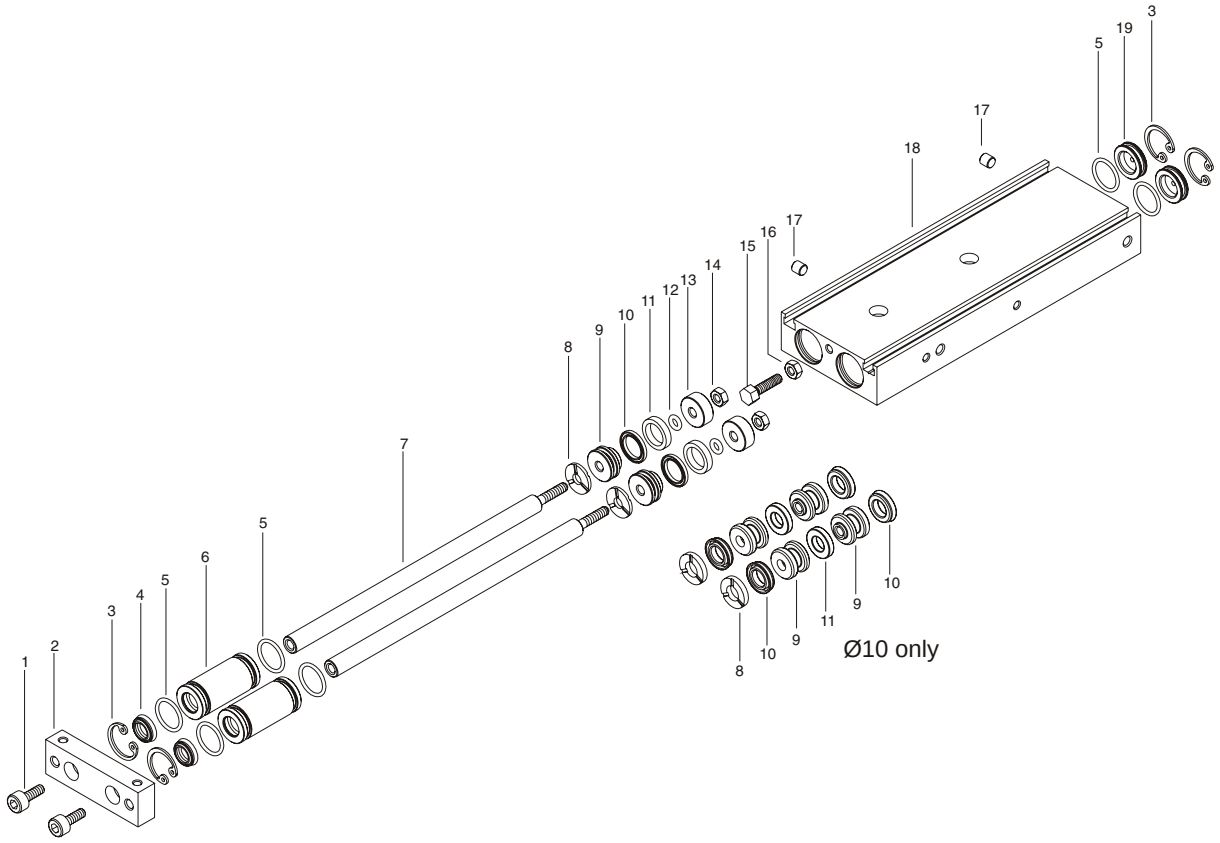
With Reed bulb



Hall effect

PNEUMATIC SLIDE UNITS

Series 6200B Drawing



Pos.	Item	Qty.	Pos.	Item	Qty.
1	Rods screw	2	11	Magnet	1
2	Plate	1	12	Seal	2
3	Circlip	4	13	Spacer	4*
4	Piston rod seal	2	14	Piston nut	1
5	Seal	4	15	Adjusting bolt	1
6	Bush	2	16	stop nut	2
7	Rod	2	17	Plug	1
8	Cushioning washer	2	18	Body	2
9	Piston	*	19	End plate	4**
10	Piston seal	*			
* n. 4 for bore Ø 10, n.2 for all other bores			** not in bore Ø 10, n.2 for all other bores		

Ordering code

6200.Ø.stroke.

- **10**
- **15**
- **20**
- **25**
- **32**

- **B** = Control unit with bronze bush
- **C** = Control unit with bearing bush

Magnetic sensors: see page.2.13

Construction characteristics

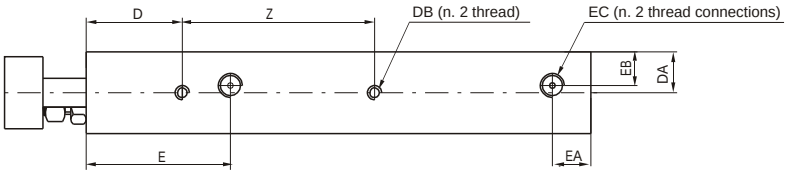
Body	oxidated aluminium alloy
Rods	C43 chromed steel (control unit with Bronze bush) tempered and chromed steel (control unit with Bearing bush)
Piston	aluminium
Rod bushing	brass
End plate	oxidated aluminium
Piston seal	oil resistant NBR rubber
Piston rod seal	self lubricating polyurethane compound
Plate	oxidated aluminium

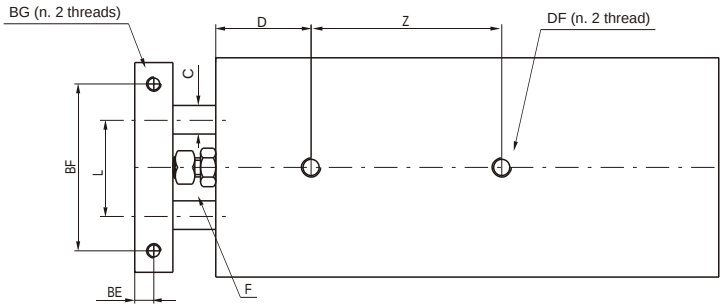
Technical characteristics

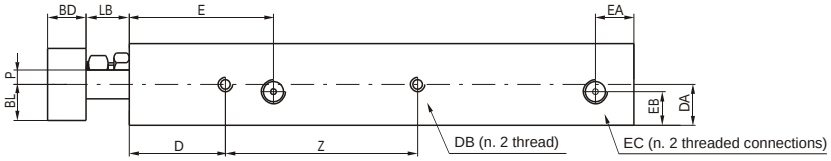
Function	double acting
Fluid	filtered and lubricated or non lubricated air
Max. pressure	7 bar
Working temperature	-5°C ÷ +70°C
Cushioning	elastic bumper

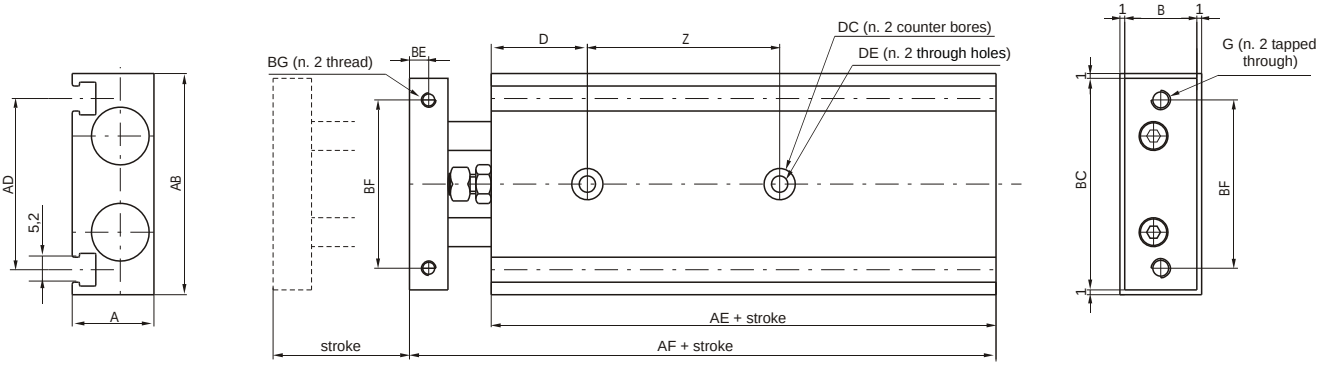
Standard strokes

Bore	Stroke (mm)														
	10	15	20	25	30	35	40	45	50	60	70	75	80	90	100
Ø10	●	●	●	●	●	●	●	●	●	●	●	●			
Ø15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ø32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●



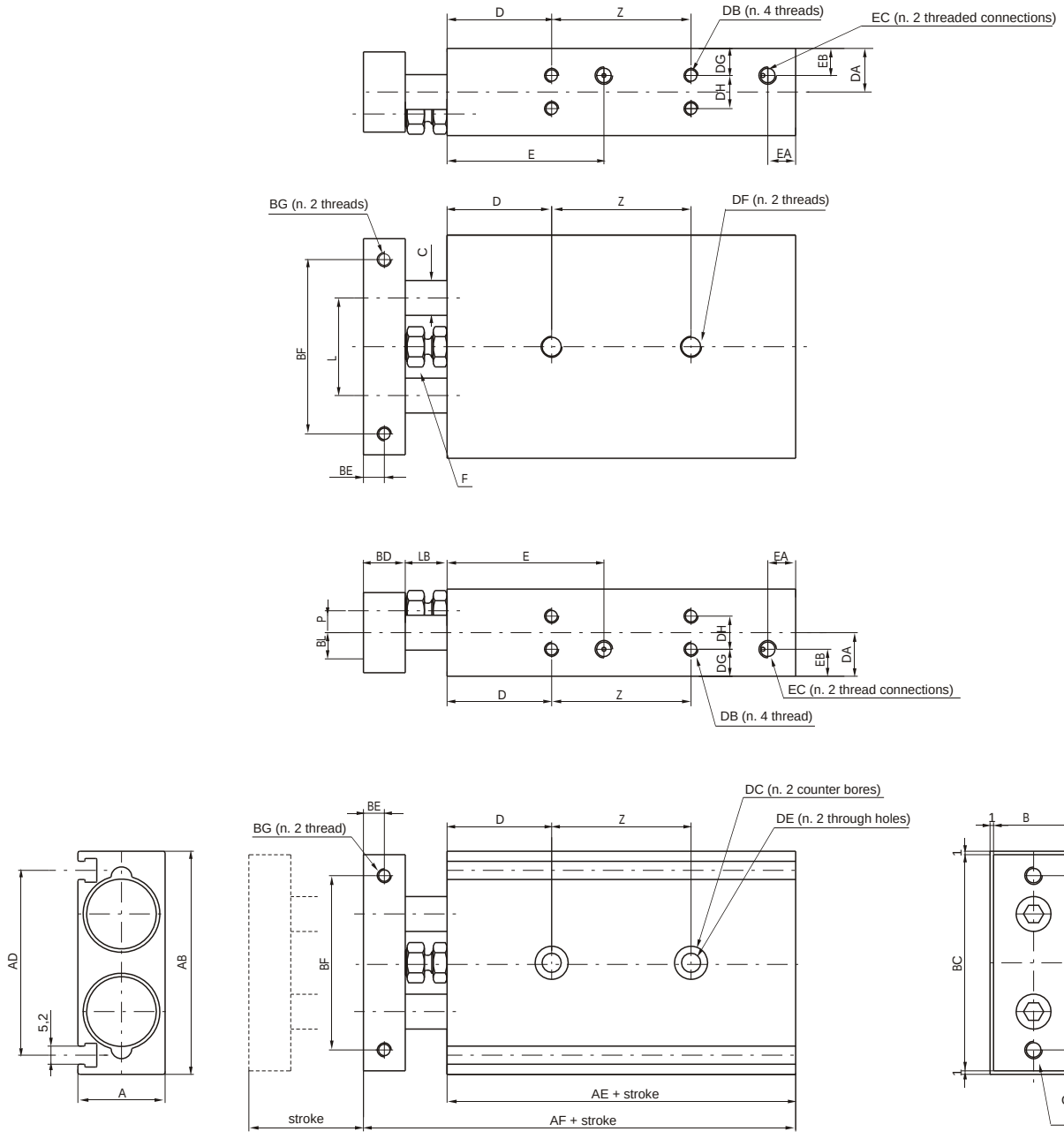






Bore	A	AB	AD	AE	AF	B	BC	BD	BE	BF	BG	BL	C	D	DA	DB	DC	DE
10	17	46	33,6	55	72	15	44	8	4	35	M3x0,5 (depth 5)	6	6	20	7	M3x0,5 (depth 4,5)	6,5 (depth 3,3)	3,4
15	20	58	48	60	79	18	56	10	5	45	M4x0,7 (depth 6)	9	8	30	10	M4x0,7 (depth 5)	8 (depth 4,4)	4,3

Bore	DF	E	EA	EB	EC	F	G	L	LB	P	Z				
10	M4x0,7 (depth 7)	30	8	7	M5x0,8 (depth 4,5)	M4x0,7	M4x0,7	20	9	4,7	30	40	50	-	-
15	M5x0,8 (depth 8)	38,5	8	10	M5x0,8 (depth 4,5)	M4x0,7	M5x0,8	25	9	5	25	35	45		55
											10-15 20-25	30-35 40-45 50	60-70 75	80	90- 100
											stroke				



Bore	A	AB	AD	AE	AF	B	BC	BD	BE	BF	BG	BL	C	D	DA	DB	DC	DE
20	25	64	53	70	94	23	62	12	6	50	M4x0,7 (depth 6)	11,5	10	30	12,5	M4x0,7 (depth 6)	9,5 (depth 5,3)	5,5
25	30	80	64	72	96	28	78	12	6	60	M5x0,8 (depth 7,5)	14	12	30	15	M5x0,8 (depth 7,5)	11 (depth 6,3)	6,9
32	38	98	76	82	112	36	96	16	8	75	M5x0,8 (depth 8)	18	16	30	19	M5x0,8 (depth 7,5)	11 (depth 6,3)	6,9

Bore	DF	DG	DH	E	EA	EB	EC	F	G	L	LB	P	Z				
20	M6x1 (depth 10)	7,75	9,5	45	8	7,8	M5x0,8 (depth 4,5)	M6x1	M5x0,8	28	12	6,3	30	40	60		
25	M8x1,25 (depth 12)	8,5	13	46	9	15	G1/8 (depth 6,5)	M6x1	M6x1	35	12	8,3	30	40	60		
32	M8x1,25 (depth 12)	9	20	56	10	19	G1/8 (depth 6,5)	M8x1,25	M6x1	44	14	12	40	50	70		
													10-15 20-25	30-35 40-45 50	60-70 75	80	90-100
													stroke				

Theoretical cylinder force

Bore	Force (N)								
Ø10	Out	16	23,5	31,5	47	63	78,5	94	110
	In	10	15	20	30	40	50	60	70
Ø15	Out	35,5	53	70,5	106	141	176,5	212	247
	In	25	38	50,5	75,5	101	126	151	176,5
Ø20	Out	63	94	126	189	251	314	377	440
	In	47	62,5	94	141	188	236	283	330
Ø25	Out	98	148	197	295	393	491	589	688
	In	75,5	114	151	227	303	378	454	529
Ø32	Out	161	241	322	483	643	804	965	1126
	In	121	181	241	362	483	603	724	844
		1	1,5	2	3	4	5	6	7
		Working pressure (bar)							

Weights

Control unit with bronze bush

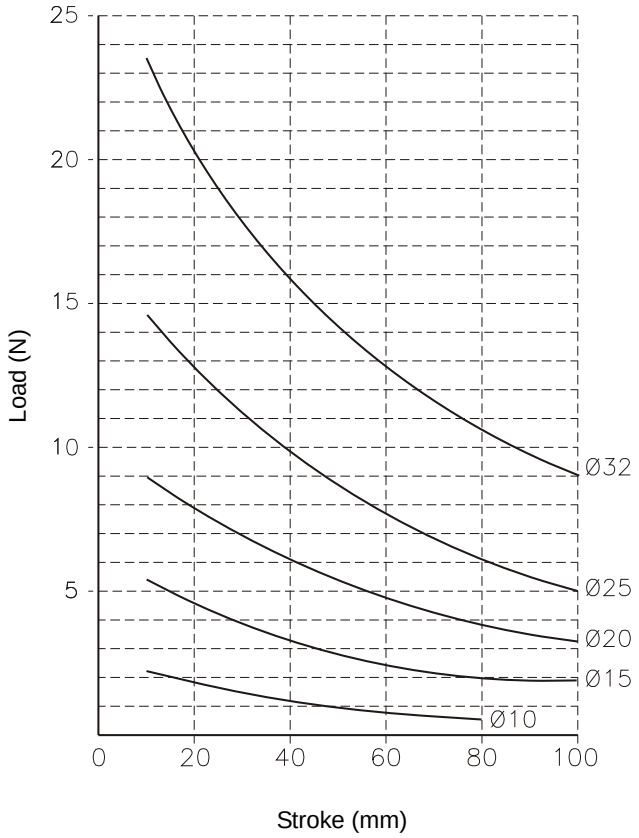
Bore	Weight (gr.)													
Ø10	150	160	170	180	190	200	210	220	230	250	270	280		
Ø15	250	265	280	290	300	315	330	345	360	390	420	435	450	480
Ø20	400	420	440	460	480	495	510	530	550	585	620	640	660	700
Ø25	610	635	660	690	720	745	770	800	830	890	950	970	995	1060
Ø32	1150	1190	1230	1275	1320	1360	1400	1450	1490	1580	1665	1710	1755	1840
	10	15	20	25	30	35	40	45	50	60	70	75	80	90
	Stroke													

Control unit with bearing bush

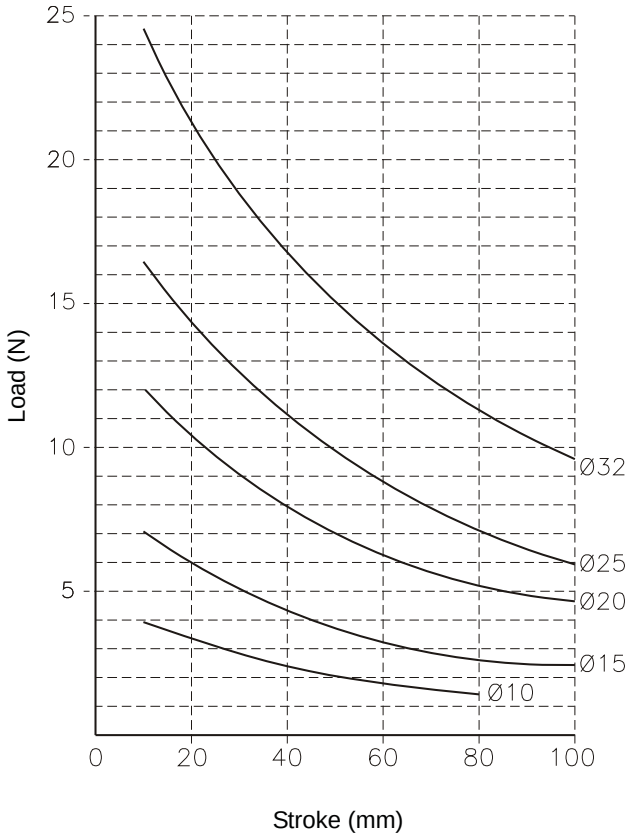
Bore	Weight (gr.)														
Ø10	160	165	170	180	190	200	210	220	230	250	270	280			
Ø15	270	285	300	310	320	335	350	365	380	410	440	455	470	500	530
Ø20	430	445	460	480	500	515	530	550	570	605	640	660	680	715	750
Ø25	620	645	670	700	730	755	780	810	840	895	955	980	1005	1065	1110
Ø32	1160	1205	1250	1295	1340	1380	1420	1465	1510	1595	1680	1720	1765	1855	1940
	10	15	20	25	30	35	40	45	50	60	70	75	80	90	100
	Stroke														

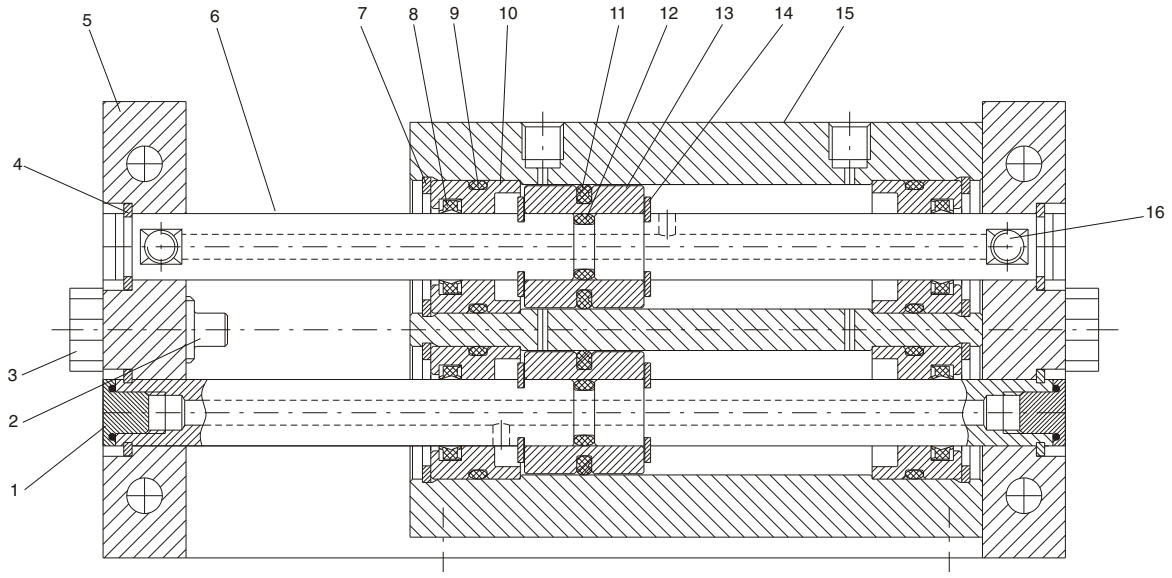
Permissible loads

Control unit with bronze bush



Control unit with bearing bush





Pos.	Item	Qty.	Pos.	Item	Qty.
1	plug	4	9	bush seal	4
2	stroke adjuster	2	10	bushing	4
3	lock nut	2	11	piston seal	2
4	circlip	4	12	seal	2
5	plate	2	13	piston	2
6	piston rod	2	14	piston cushion washer	4
7	bush cushion washer	4	15	body	1
8	piston rod seal	4	16	rod stop screw	4

Ordering code

6210.Ø.stroke. _

- Ø: **10**, **15**, **25**
- _: **C** = Fixed body; **P** = Fixed end plates

Magnetic sensors: see page 2.13

Construction characteristics

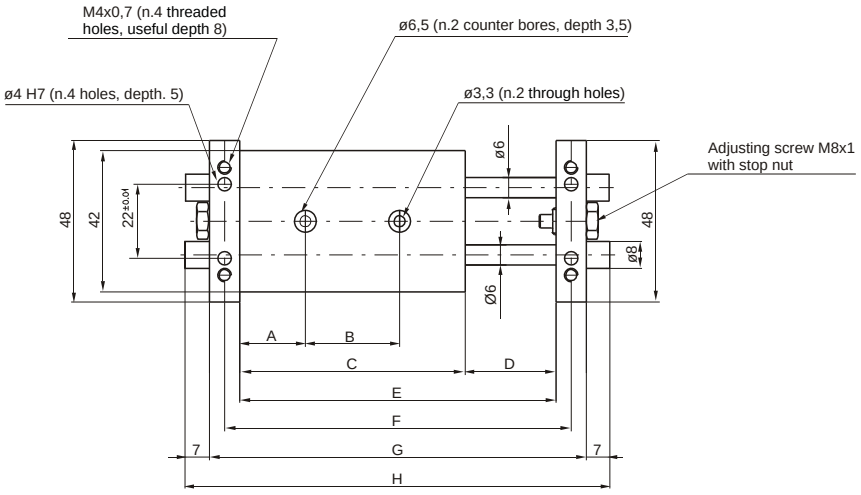
Body	oxidated aluminium alloy
Rods	chromed C43 steel
Piston	aluminium
Piston rod bushing	brass
Endplate	oxidated aluminium
Piston seal	oil resistant NBR rubber
Piston rod seal	self-lubricating polyurethane compound
Plate	oxidated aluminium

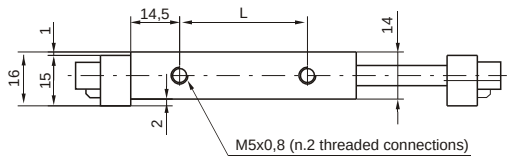
Technical characteristics

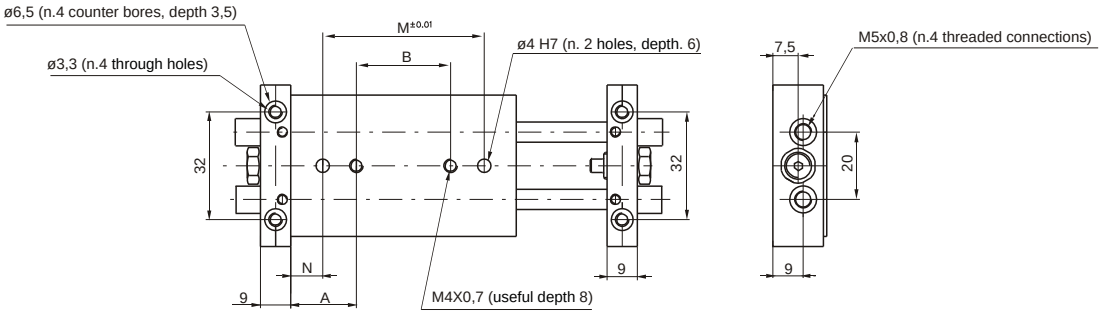
Function	double acting
Fluid	filtered and non lubricated air
Max pressure	10 bar
Operating temperature	-5°C ÷ +70°C
Cushioning	with decelerator (available on request)

Standard Stroke and weight

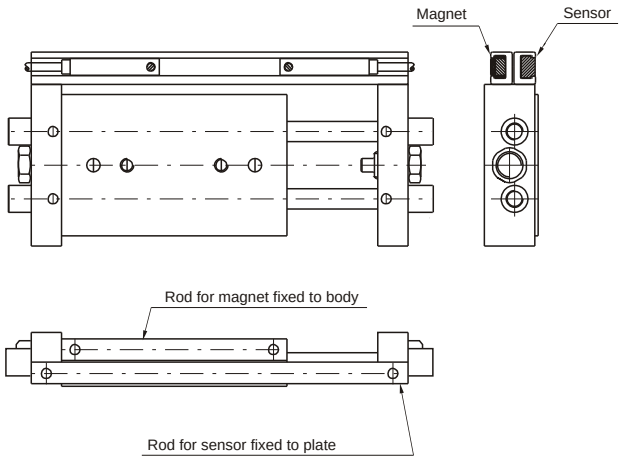
Bore	Stroke (mm)							
	25	50	75	100	125	150	175	200
Ø10	●	●	●	●				
Ø15	●	●	●	●	●	●	●	●
Ø25	●	●	●	●	●	●	●	●
Bore	**Weight (gr)**							
Ø10	160	230	280	310				
Ø15	240	350	450	550	670	750	900	1000
Ø25	950	1140	1350	1600	1800	2000	2300	2500



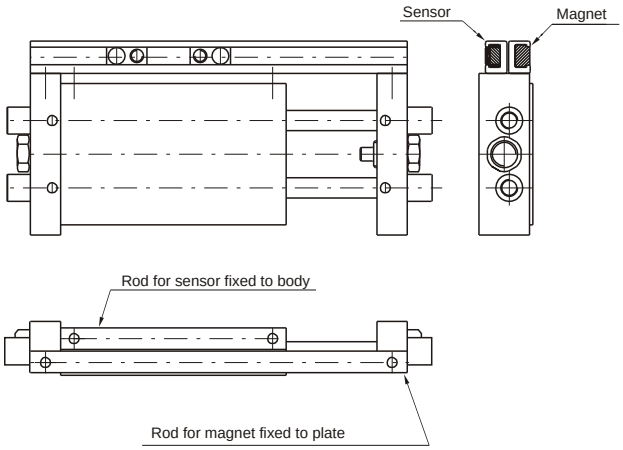




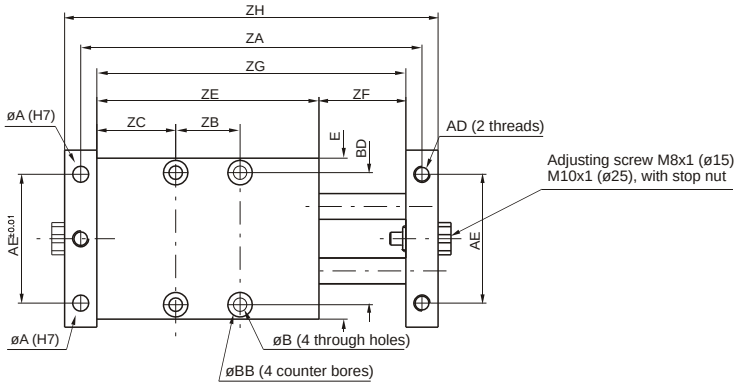
MOUNTING WITH FIXED PLACE

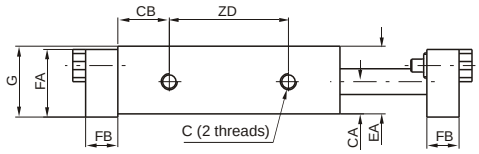


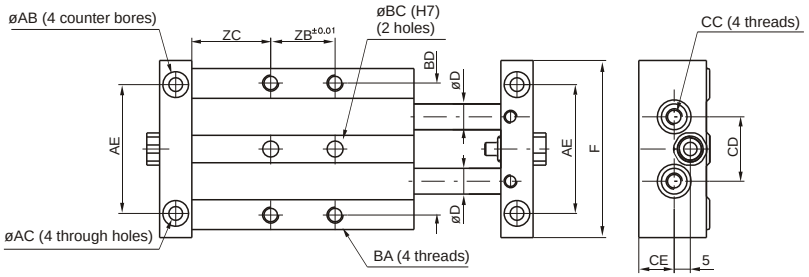
MOUNTING WITH A FIXED BODY



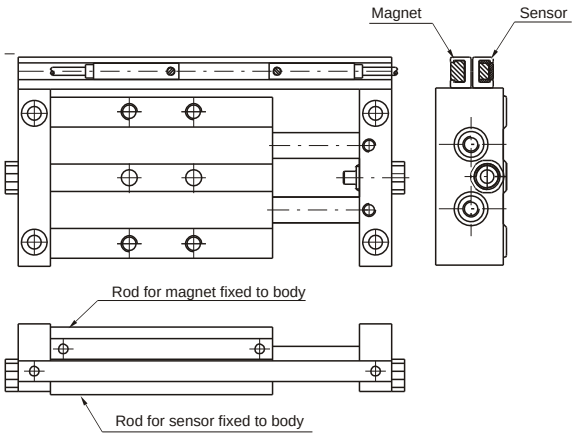
Stroke	A	B	C	D	E	F	G	H	L	M	N
25	20	28	67	27	94	103	112	126	38	48	9,5
50	30	32	92	52	144	153	162	176	63	52	20
75	35	47	117	77	194	203	212	226	88	67	25
100	35	72	142	102	244	253	262	276	113	92	25



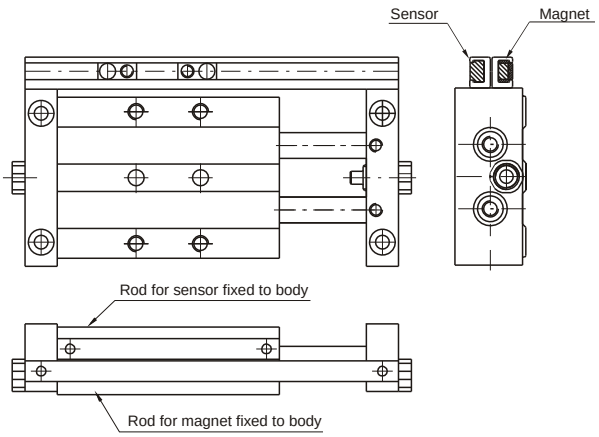




MOUNTING WITH FIXED PLACE



MOUNTING WITH FIXED BODY



Bore	ØA (H7)	ØAB	ØAC	ØAD	AE	ØB	BA	ØBB	ØBC (H7)	BD	C	CA	CB
15	5 (depth 6)	8 (depth 4)	4,3	M5x0,8 (useful depth 10)	40	4,3	M5x0,8 (useful depth 10)	7,6 (depth 4,4)	5 (depth 6)	41	M5x0,8	10	16
25	6 (depth 8)	9 (depth 5)	5,2	M6x1 (useful depth 12)	67	5,2	M6x1 (useful depth 12)	9,5 (depth 5,4)	6 (depth 8)	67	G1/8	16	18,5

Bore	CC	CD	CE	ØD	E	EA	F	FA	FB	G
15	M5x0,8	20	11	8	50	21	55	21	10	22
25	G1/8	35	18	14	79	32	84	32	16	34

	Bore Ø15								Bore Ø25							
Stroke	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH
25	106	20	24,5	37	69	27	96	116	125	25	28,5	45	82	27	109	141
50	156	45	24,5	62	94	52	146	166	175	45	31	70	107	52	159	191
75	206	65	27	87	119	77	196	216	225	65	33,5	95	132	77	209	241
100	256	90	27	112	144	102	246	266	275	90	33,5	120	157	102	259	291
125	306	90	39,5	137	169	127	296	316	325	90	46	145	182	127	309	341
150	356	90	52	162	194	152	346	366	375	90	58,5	170	207	152	359	391
175	406	90	64,5	187	219	177	396	416	425	90	71	190	232	177	409	441
200	456	90	77	212	244	202	446	466	475	90	83,5	220	257	202	459	491

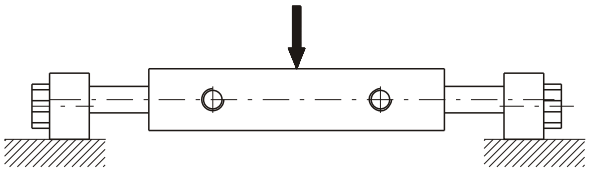
Theoretical force

Bore	Effective area (mm^2)	Force (N)							
10	101	20	30	40	51	61	71	81	91
15	207	41	62	83	104	124	145	166	186
25	597	119	179	239	299	358	418	478	537
		2	3	4	5	6	7	8	9
		Working pressure (bar)							

Deflection of piston rods

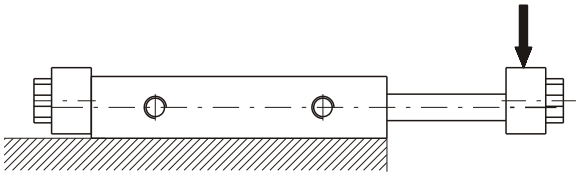
Applied load to body centre

Bore	Load (N)	Deflection (mm)	
10	10	0,07	/
15	30	0,08	0,28
25	60	0,02	0,08
		100	200
		Stroke	

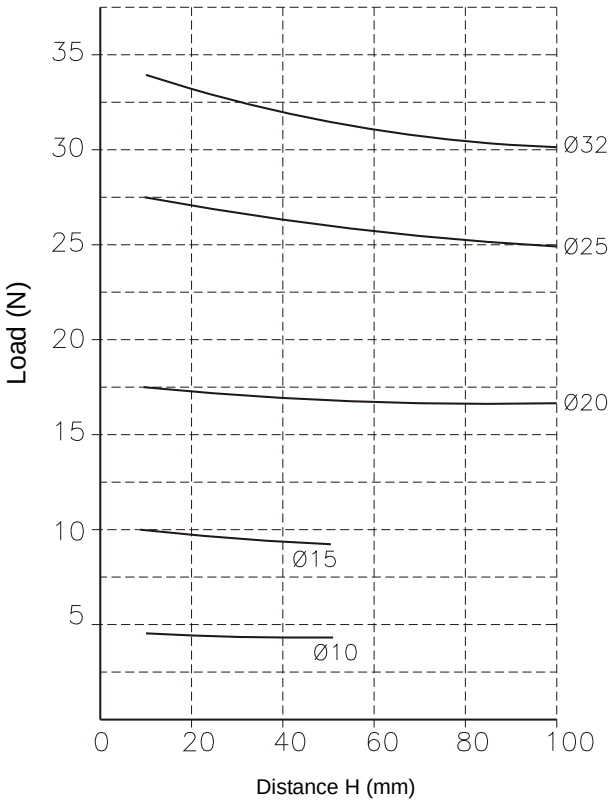


Applied load to plate centre

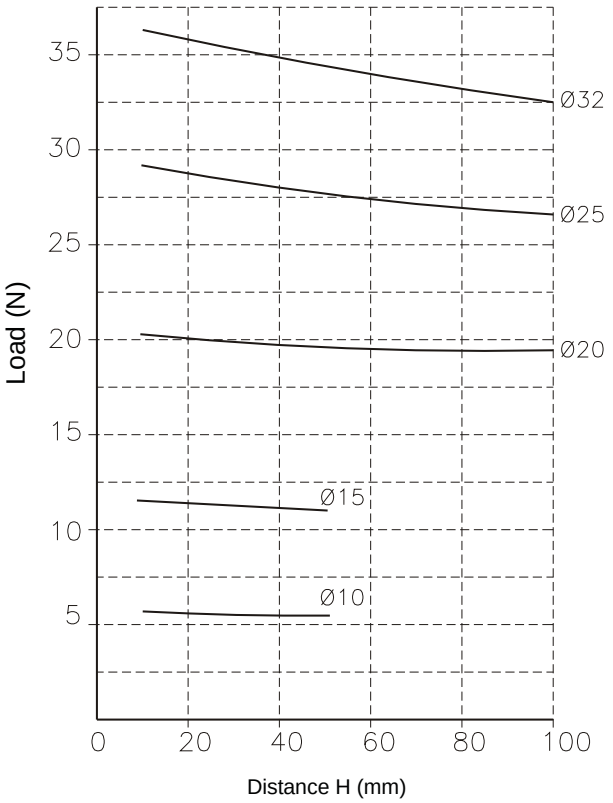
Bore	Load (N)	Deflection (mm)			
10	3	0,06	0,3	/	/
15	5	0,1	0,2	0,5	1
25	10	0,03	0,1	0,15	0,25
		50	100	150	200
		Stroke			

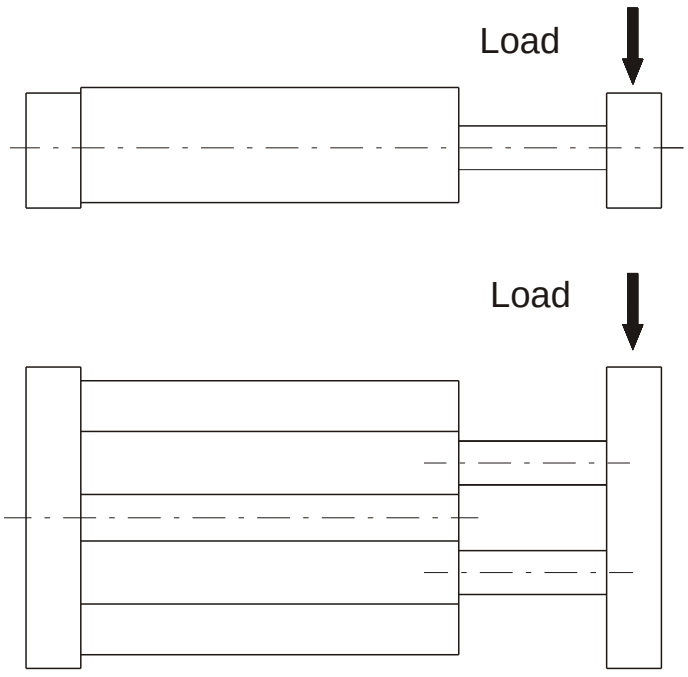


Control unit with bronze bushes



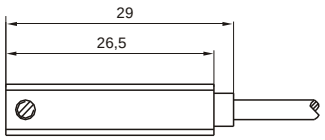
Control unit with bearing bushes

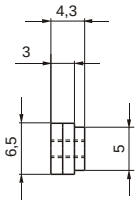




Sensor c/w 2,5 m. cable

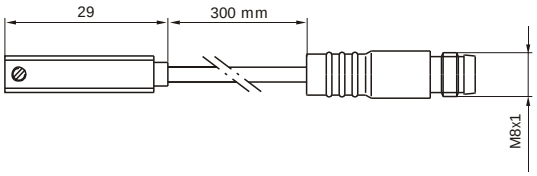
Weight gr. 27





Sensor c/w M8 connector (300 mm cable)

Weight gr. 15



Ordering codes	
1580.U	Reed bulb sensor with led and 2.5 m cable
1580.HAP	PNP sensor Hall effect with led and 2.5 m cable
MRS.U	Reed bulb sensor with led and connector
MHS.P	PNP sensor Hall effect with led and connector
MC1	M8 in line connector with 2.5 m cable (2 wires)
MC2	M8 in line connector with 5 m cable (2 wires)
MCH1	M8 in line connector with 2.5 m cable (3 wires)
MCH2	M8 in line connector with 5 m cable (3 wires)

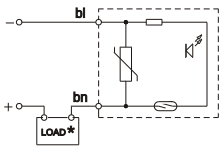
Technical characteristics

	1580.U	MRS.U	1580.HAP	MHS.P
Type of contact	N.A.			
Maximum current (pulses of 0.5 sec)	0,1A		0,2A	
Maximum permanent current	0,1A		0,2A	
Maximum permanent power	6VA		4W	
Voltage range A.C.	3 ÷ 30V		/	
Voltage range D.C.	3 ÷ 30V		12 ÷ 30V	
Working temperature	-20° C ÷ 70°C			
Maximum voltage drop	3V			
Cable section	2x0,14		3x0,14	
Degree of protection	IP 65			
Connecting time	0,5 ms		0,8 µs	
Disconnecting time	0,1 ms		0,3 µs	
Average life (operations)	10^7		10^9	
Repetition of intervention point	± 0,1			

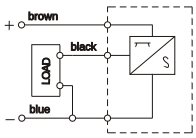
NOTE: Pay attention to the connected loads which should not exceed recommendations

***Reed bulb sensor: connection can be made either to negative or positive pole**

Diagrams and connection

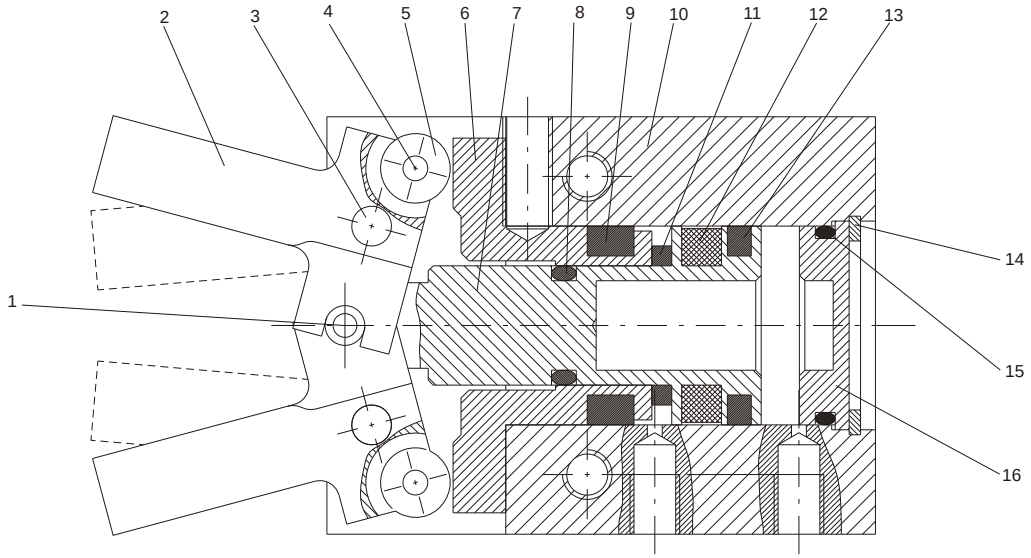


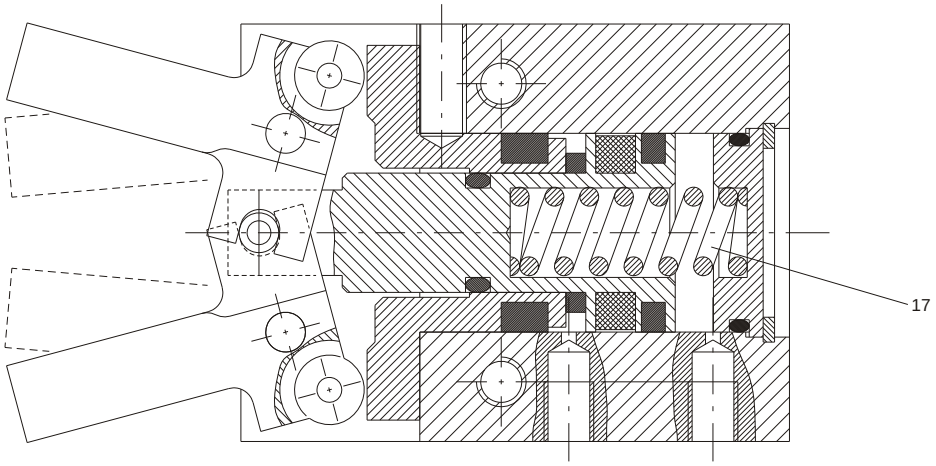
With Reed bulb



Hall effect

PNEUMATIC GRIPPERS





Pos.	Item	Qty.	Pos.	Item	Qty.
1	Central pin	1	10	Body	1
2	Fingers	2	11	Cushioning washer	1
3	Level shaft	2	12	Magnet	1
4	Side roller	2	13	Piston seal	1
5	Supplementary thrust roller	2	14	Circlip	1
6	Supplementary thrust piston	1	15	End cover seal	1
7	Piston	1	16	End cover	1
8	O-Ring seal	1	17	Spring (single acting version, N.O)	1
9	Supplementary piston seal	1			

Ordering code

6301.Ø.

- **10**
- **16**
- **20**
- **25**

- **D** = Double acting
- **S** = Single acting (N.O)

Magnetic sensors : see page 3.38

Construction characteristics

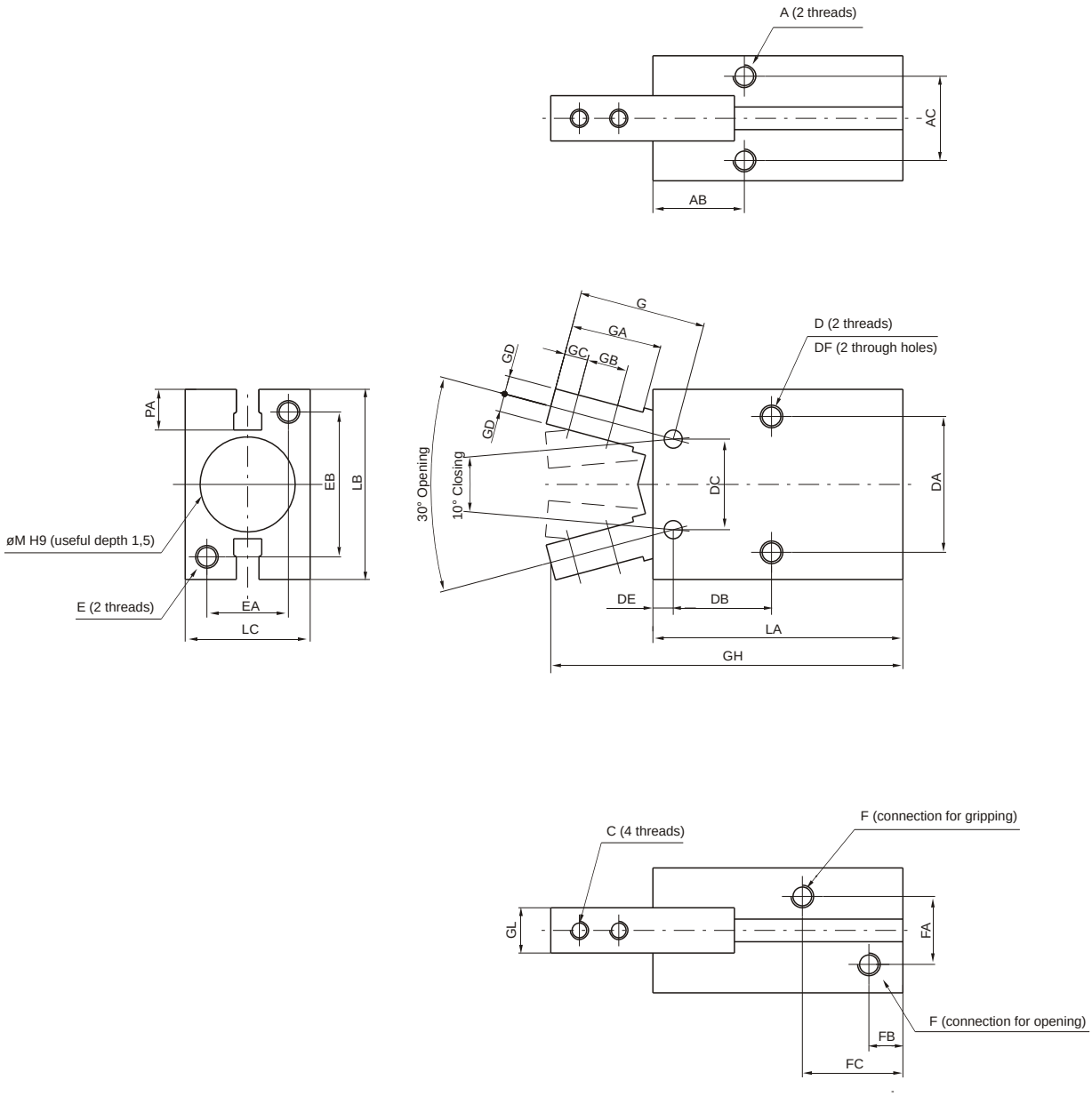
Body	oxidated aluminium
Piston	oxidated aluminium
Fingers	nitrate steel
End cover	oxidate aluminium
Seals	oil resistant NBR rubber

Technical characteristics

Fluid	filtered and lubricated or non lubricated air
Working pressure	1 ÷ 6 bar for double acting
	2,5 ÷ 6 bar for single acting
Operating temperature	-5°C ÷ +70°C

Holding force (Nm) at 5 bar

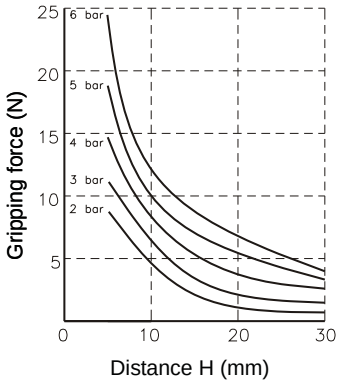
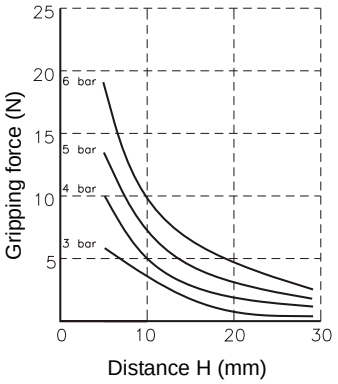
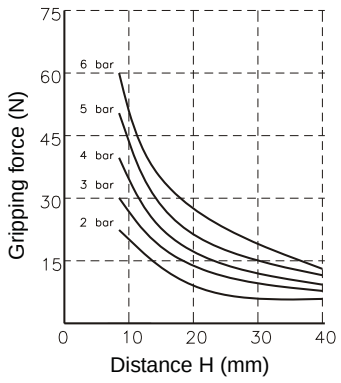
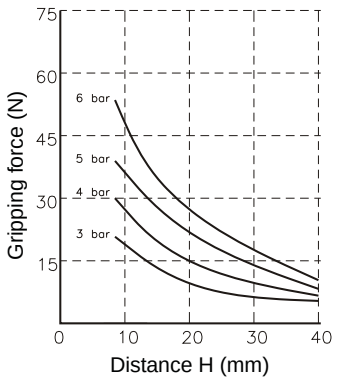
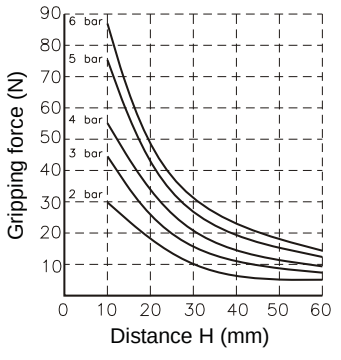
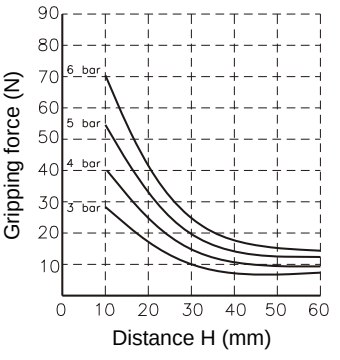
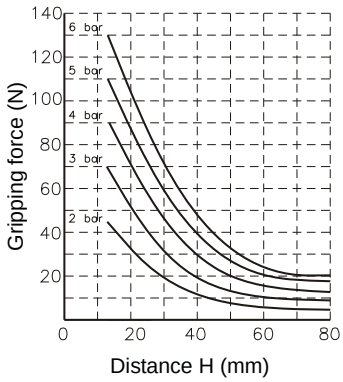
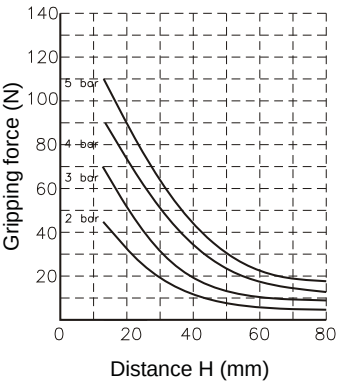
Bore	Double acting	Single acting	Opening total stroke
10	0,1	0,07	-10° ÷ 30°
16	0,4	0,30	
20	0,7	0,55	
25	1,35	1,08	

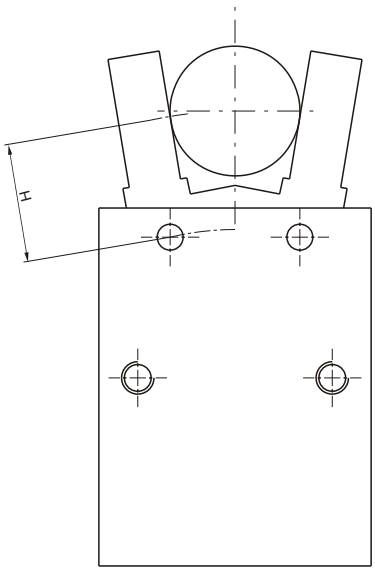


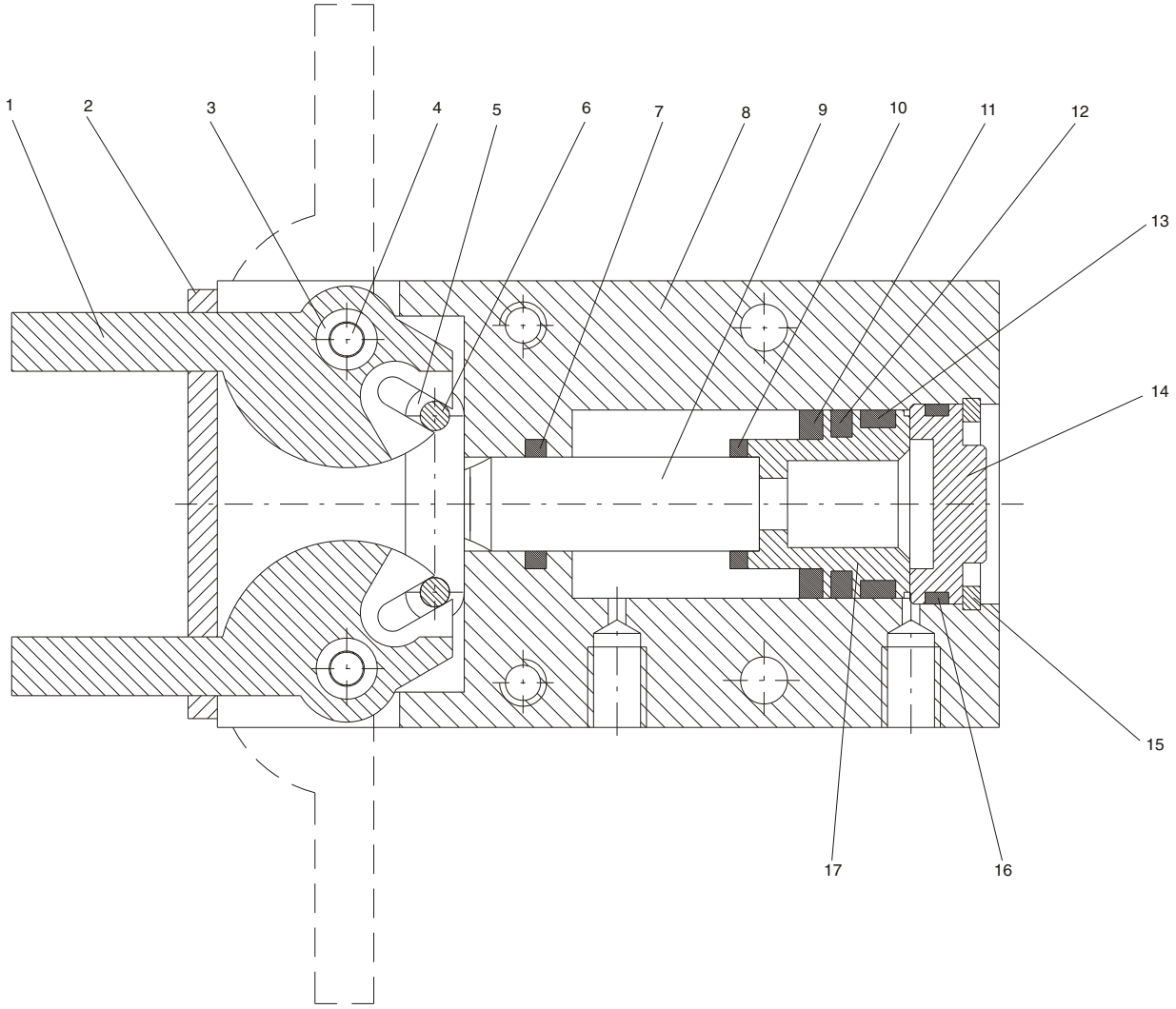
Bore	A	AB	AC	C	D	DA	DB	DC	DE	DF	E	EA	EB
10	M3x0,5 (useful depth 6)	11,6	11,4	M2,5x0,45	M3x0,5 (useful depth 5)	16	12,8	10	2,8	2,6	M3x0,5 (useful depth 6)	12	18
16	M4x0,7 (useful depth 6,5)	14,6	16	M3x0,5	M4x0,7 (useful depth 8)	24	16,2	16	3,9	3,4	M4x0,7 (useful depth 8)	15	22
20	M5x0,8 (useful depth 8)	20,2	18,6	M4x0,7	M5x0,8 (useful depth 10)	30	21,7	20	4,5	4,3	M5x0,8 (useful depth 10)	18	32
25	M6 (useful depth 10)	23,9	22	M5x0,8	M6 (useful depth 12)	36	25,8	25	4,6	5,1	M6 (useful depth 12)	22	40

Bore	F	FA	FB	FC	G	GA	GB	GC	GD	GH	GL	LA	LB	LC	M	PA	Weight (gr.)
10	M3x0,5	10,4	7,2	18,8	17,2	12	5,7	3	2	52,4	$6,4^{0/-0,1}$	38,6	23	16,4	11 H9	5,4	40
16	M5x0,8	13	7	18,3	22,6	16	7	4	3,5	62,5	$8^{0/-0,1}$	44,6	30,6	23,6	17 H9	5,8	90
20	M5x0,8	15	7,5	22,2	28	20	9	5,2	4	78,7	$10^{0/-0,1}$	55,2	42	27,6	21 H9	9	180
25	M5x0,8	20	7,7	23,5	37,5	27	12	8	5	92	$12^{0/-0,1}$	60,4	52	33,6	26 H9	11,5	315

NOTE:
Bore selection should be made considering a holding force 10 to 20 times the component weight.
In case of acceleration/deceleration a further margin of safety should be considered.

	Double acting	Single acting
Ø10		
Ø16		
Ø20		
Ø25		





Pos.	Item	Qty.	Pos.	Item	Qty.
1	Fingers	2	10	Cushioning	1
2	Closing plate	1	11	Magnet	1
3	Bearing	2	12	Piston seal	1
4	Pin	2	13	Sliding block	1
5	Thrust lever	1	14	End cover	1
6	Thrust pin	2	15	Circlip	1
7	Rod seal	1	16	End cover seal	1
8	Body	1	17	Piston	1
9	Rod	1			

Ordering code

6302.Ø.D

- **10**
- **16**
- **20**
- **25**

Magnetic sensors : see page 3.39

Construction characteristics

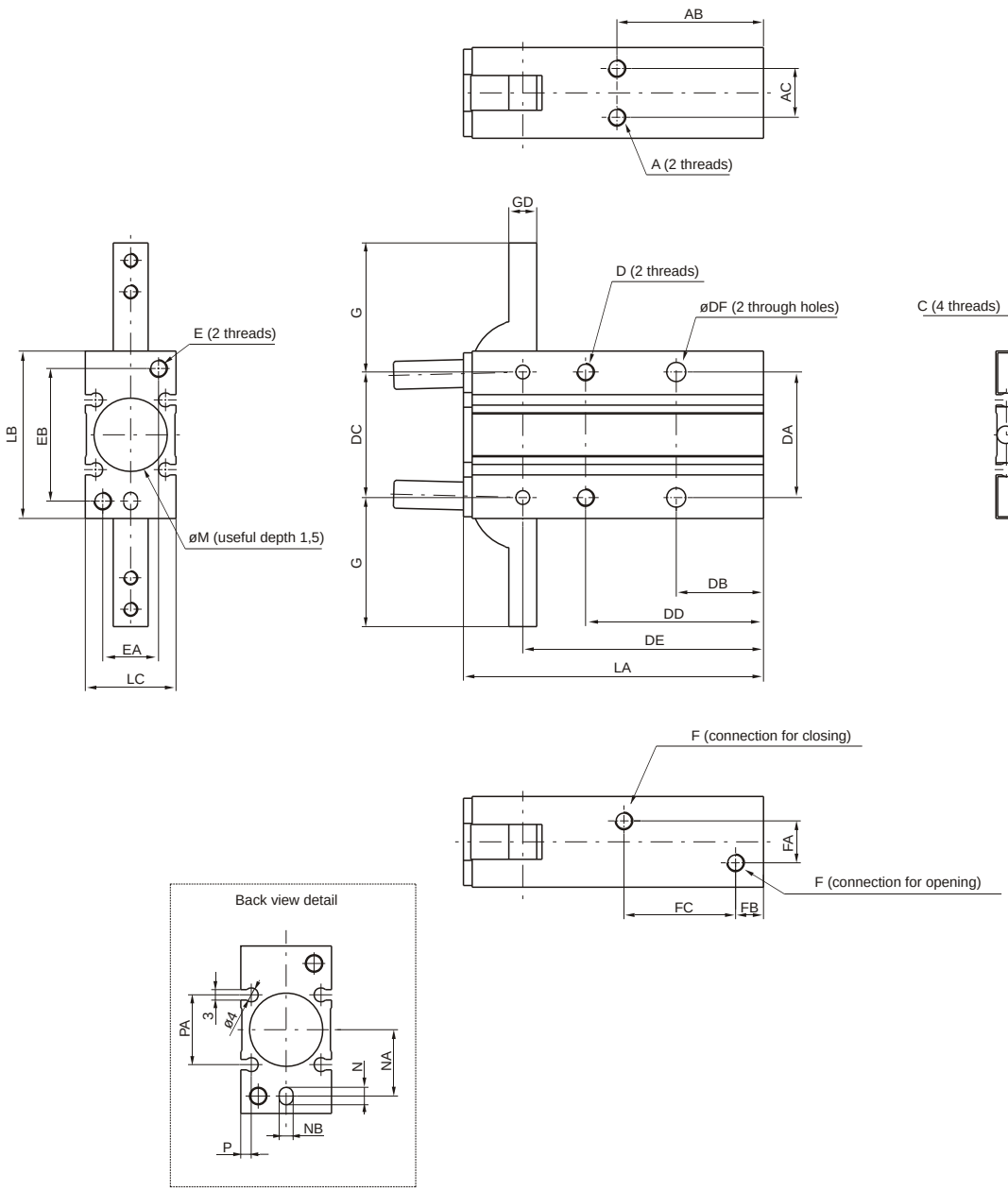
Body	aluminium
Piston	aluminium
Finghers	steel
End cover	aluminium

Technical characteristics

Fluid	filtered and non lubricated air
Function	double acting
Working pressure	1 ÷ 6 bar
Working temperature	-5°C ÷ +70°C

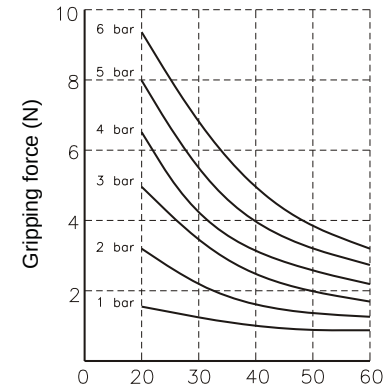
Holding force (Nm) at 5 bar

Bore	Holding force	Opening total Stroke
10	0,16	-3° ÷ 180°
16	0,54	
20	1,1	
25	2.28	



Bore	A	AB	AC	C	D	DA	DB	DC	DD	DE	DF	E	EA	EB
10	M3x0,5 (useful depth 4)	30	9	M3x0,5	M3x0,5 (useful depth 6)	24	18	22	35	47,5	3,4	M3x0,5 (useful depth 6)	9	24
16	M4x0,7 (useful depth 5)	33	12	M3x0,5	M4x0,7 (useful depth 8)	30	20	28	41	55,5	4,5	M4x0,7 (useful depth 8)	12	30
20	M5x0,8 (useful depth 8)	42	14	M4x0,7	M5x0,8 (useful depth 10)	36	25	36	51	69	5,5	M5x0,8 (useful depth 10)	16	38
25	M6x1 (useful depth 10)	50	16	M5x0,8	M6x1 (useful depth 12)	42	30	45	60	86	6,6	M6x1 (useful depth 12)	18	46

Bore	F	FA	FB	FC	G	GB	GC	GD	GL	LA	LB	LC	N	NA	ØM (H9)	ØNB (H)	P	PA	Weight (gr.)
10	M5x0,8	3	7	23	23,5	6	3	4	6	58	30	15	4	9	11	3 (useful depth 3)	2	13	70
16	M5x0,8	8	7	25	28,5	7	4	5	8	69	38	20	4	15	17	3 (useful depth 3)	2,5	18	150
20	M5x0,8	2	8	32	37	9	5	8	10	86	48	26	5	19	21	4 (useful depth 4)	3	20	320
25	M5x0,8	14	8	42	45	12	6	10	12	107	58	30	5	23	26	4 (useful depth 4)	3	24	550



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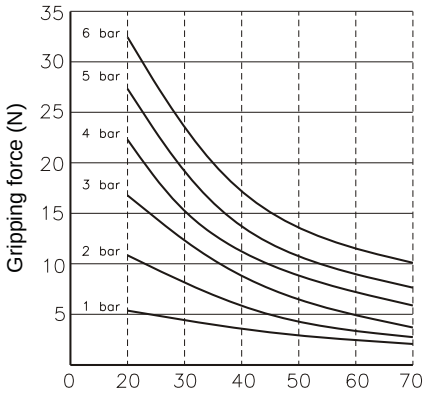

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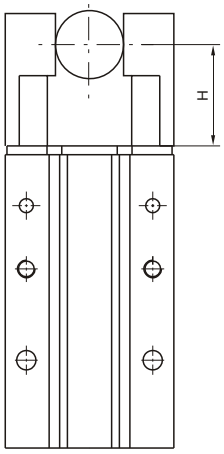

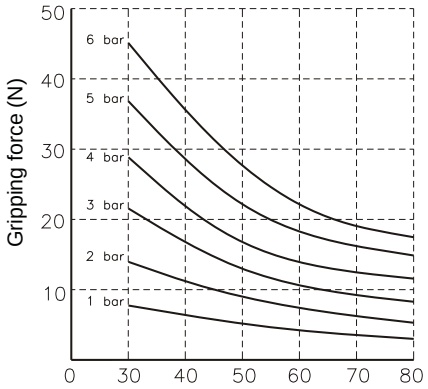

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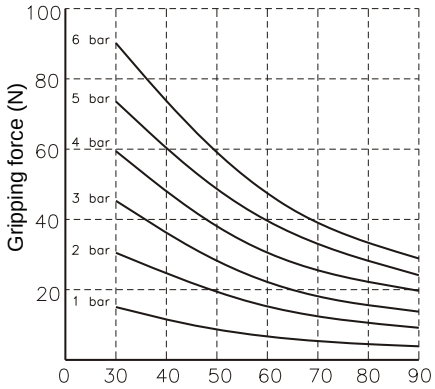

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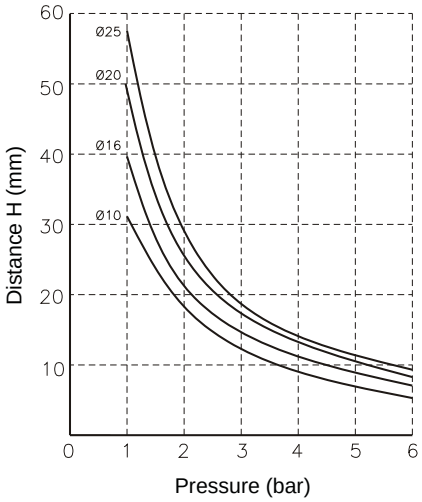
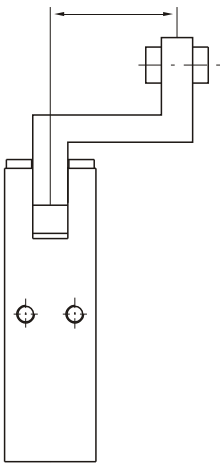
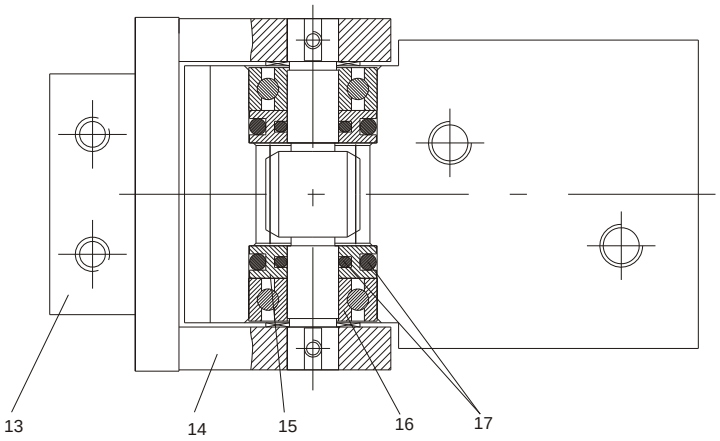
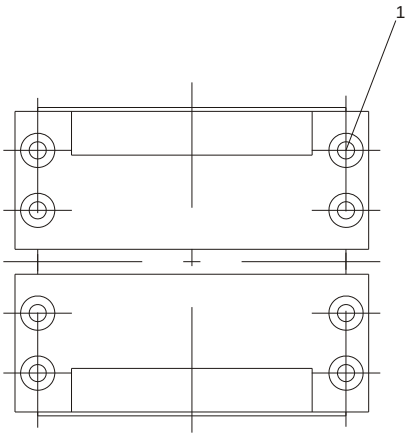
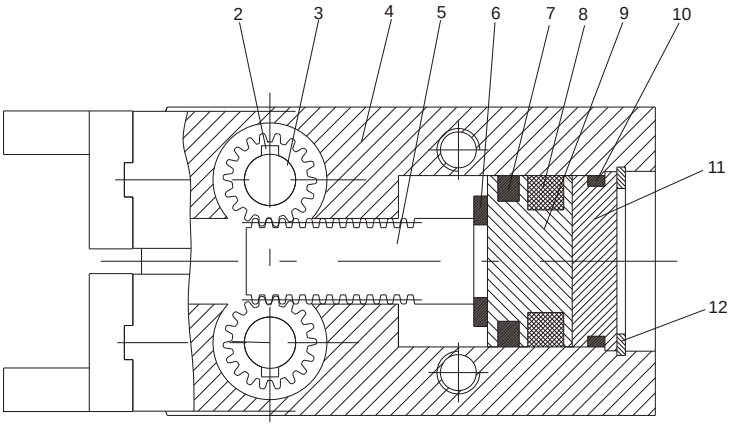










Pos.	Item	Qty.	Pos.	Item	Qty.
1	Finger fixing screw	8	10	End cover seal	1
2	ey	2	11	End cover	1
3	Pinion	2	12	Circlip	1
4	Body	1	13	Interchangeable tinger	2
5	Rack	1	14	Fix tinger	2
6	Cushioning washer	1	15	Seal bushing	2
7	Piston seal	1	16	Bearing	2
8	Magnet	1	17	Seal	4
9	Piston	1			

Ordering code

6303.Ø.D.

- **F** = Fingers, end fixing
- **L** = Fingers, side fixing

- **20**
- **25**
- **32**
- **0**
- **50**

Magnetic sensors : see page 3.38

Construction characteristics

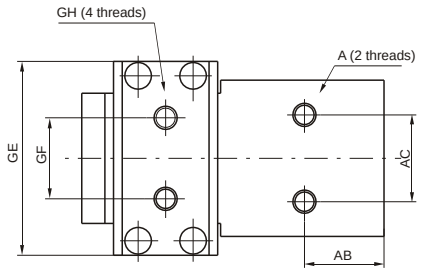
Body	aluminium
Piston	steel
Finghers	steel
End cover	aluminium

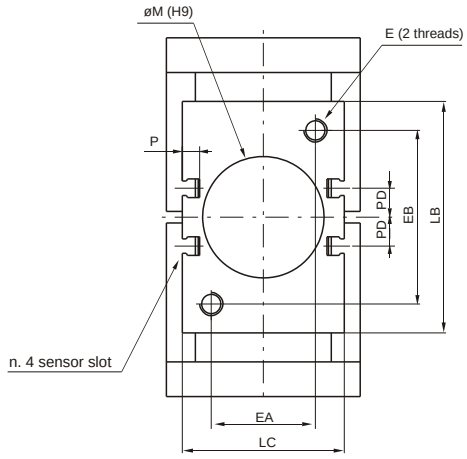
Technical characteristics

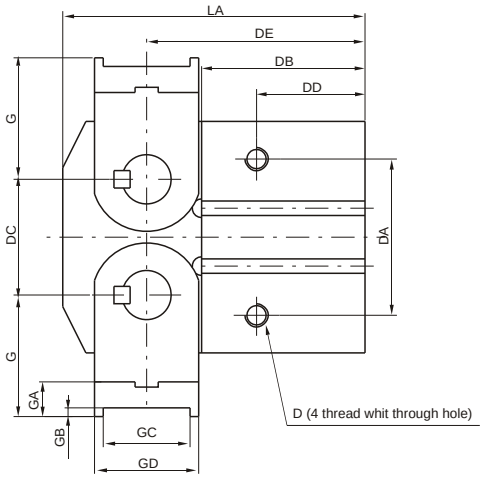
Fluid	filtered and non lubricated air
Function	double acting
Working pressure	1 ÷ 6 bar
Working temperature	-5°C ÷ +70°C

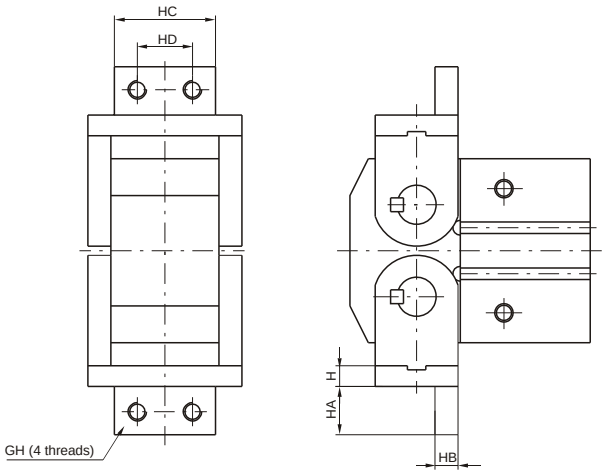
Holding force (Nm) at 5 bar

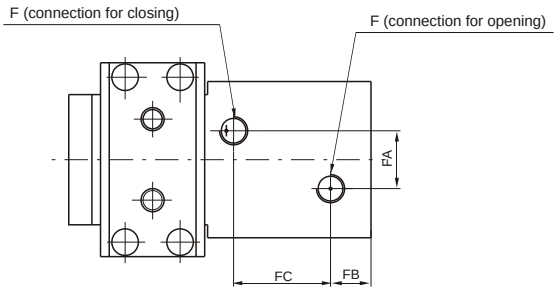
Bore	Holding force	Opening total Stroke
20	0,30	-5° ÷ 180°
25	0,7	-6° ÷ 180°
32	1,6	-5° ÷ 180°
40	3,7	-5° ÷ 180°
50	8,3	-4° ÷ 180°











Bore	A	AB	AC	D	DA	DB	DC	DD	DE	E	EA	EB	F	FA	FB	FC
20	M5 (useful depth 7)	17	20	M5 (useful depth 10)	27	35	18	23	45	M5 (useful depth 10)	26	26	M5	12	9	20
25	M6 (useful depth 10)	20	24	M6 (useful depth 12)	34	40	24	27	51	M6 (useful depth 12)	30	30	M5	16	10	23
32	M6 (useful depth 10)	21	24	M6 (useful depth 12)	42	47	30	29	61,5	M6 (useful depth 12)	30	45	G1/8	20	13	25
40	M8 (useful depth 15)	27,5	30	M8 (useful depth 16)	54	56,5	40	37,5	75,5	M8 (useful depth 15)	36	60	G1/8	20	14	33,5
50	M10 (useful depth 20)	36	40	M10 (useful depth 20)	70	69	56	48	96	M10 (useful depth 20)	40	80	G1/4	30	16	44

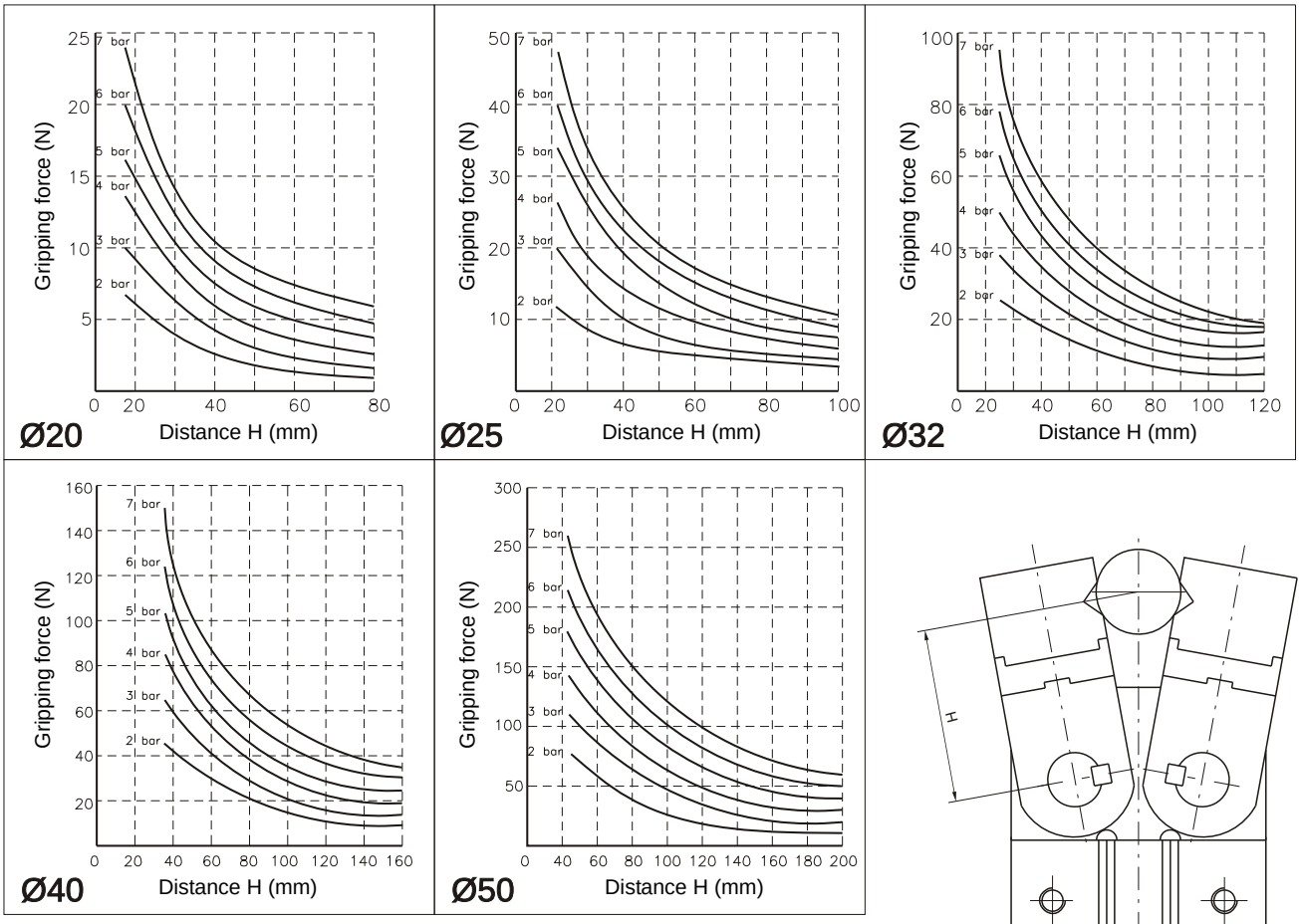
Bore	G	GA	GB	GC	GD	GE	GF	GH	H	HA	HB	HC	HD	LA	LB	LC	ØM (H)	P	PD	Weight (gr.)
20	23	7	2	12	16	41	18	M4	5	10	5	28	14	60	36	36	21 (useful depth 3)	6	4	300
25	27	8	2	17	21	45	20	M5	6	12	6	30	16	69	45	40	26 (useful depth 3)	5,5	4,5	500
32	32	9	2	23	27	51	20	M6	7	14	7	34	18	83,5	58	45	34 (useful depth 4)	5,5	11	900
40	42	12	3	30	36	67	28	M8	9	21	10	44	24	104,5	80	56	42 (useful depth 4)	6	10	2100
50	58	17	4	44	52	85	38	M10	13	24	13	58	30	136	112	66	52 (useful depth 5)	6	13	5000

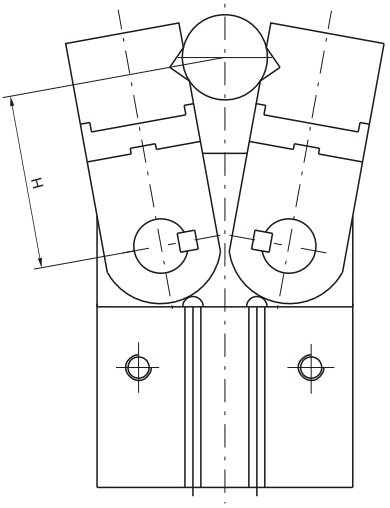
Gripping force

NOTE:

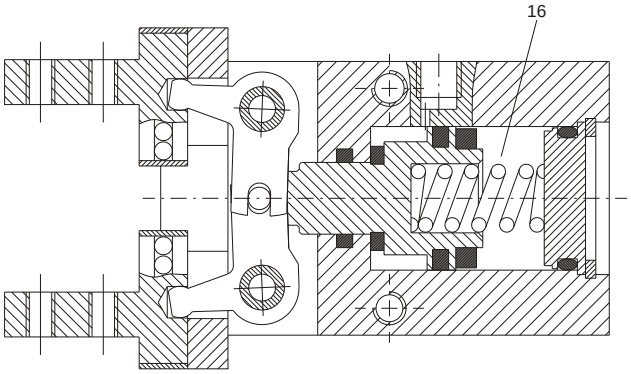
Bore selection should be made considering a holding force 10 to 20 times the component weight.

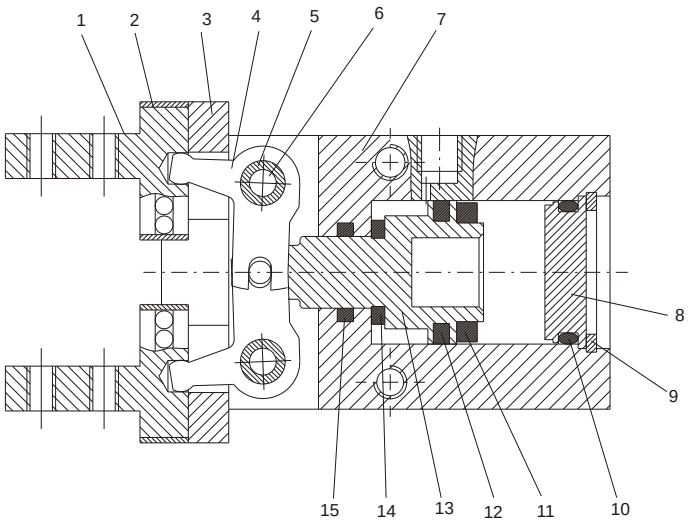
In case of acceleration/deceleration a further margin of safety should be considered.



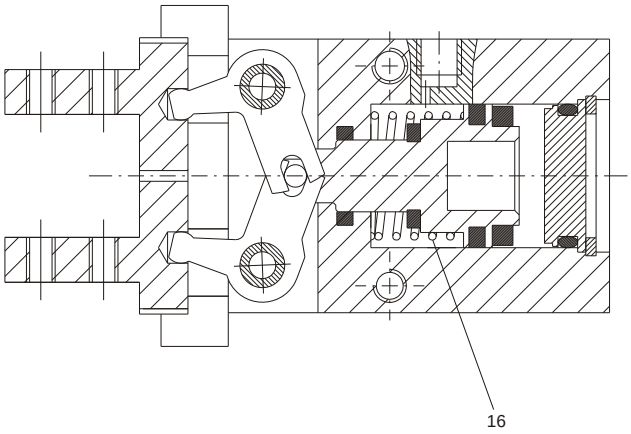


Single acting version
N.O.





Single acting version
N.C.



Pos.	Item	Qty.	Pos.	Item	Qty.
1	Finger	2	10	End cover seal	1
2	Closing plate	4	11	Magnet	1
3	Guide	1	12	Piston seal	1
4	Lever	1	13	Piston	1
5	Bushing	2	14	Cushioning washer	1
6	Pin	2	15	Rod seal	1
7	Body	1	16	Spring	1
8	End cover	1			
9	Circlip	1			

Ordering code

6310.Ø.

- **10**
- **16**
- **20**
- **25**

- **D** = Double acting
- **NC** = Single acting (N.C.)
- **NO** = Single acting (N.O.)

Magnetic sensors : see page 3.38 e 3.39

Construction characteristics

Body	aluminium
Piston	aluminium or stainless steel (depending on the bore)
Fingers	steel
End cover	aluminium
Seals	oil resistant NBR rubber

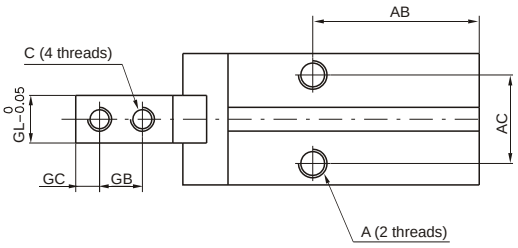
Construction characteristics

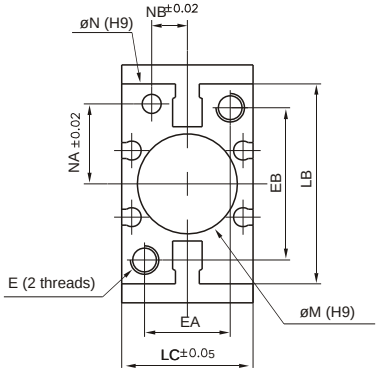
Fluid	filtered and non lubricated air
Working pressure	double acting : 2 ÷ 7 bar for ø10 - 1 ÷ 7 for other bores single acting : 3,5 ÷ 7 bar for ø10 - 2,5 ÷ 7 for other bores
Operating temperature	-5°C ÷ +70°C

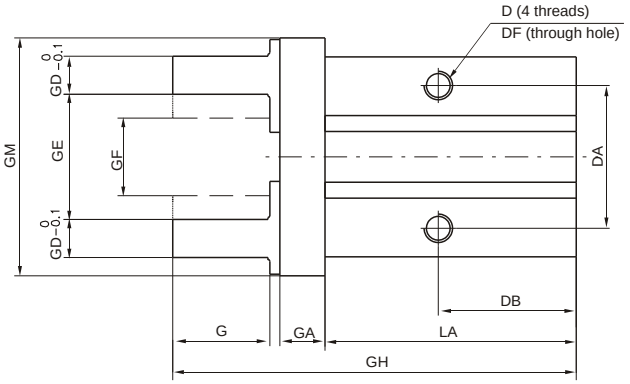
Holding force per finger

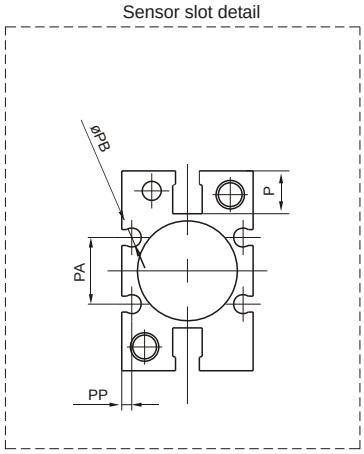
Bore	Force (N)			
	e	i	e	i
ø10	9,8	17	6,3	12
ø16	30	40	24	31
ø20	42	66	28	56
ø25	65	104	45	83
	double acting		N.O.	N.C.
			single acting	

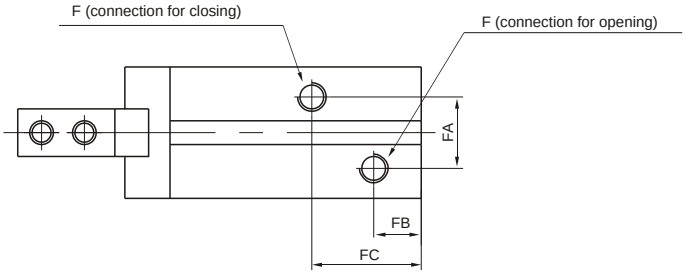
e = external holding force
i = internal holding force









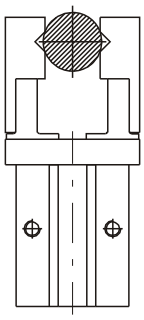


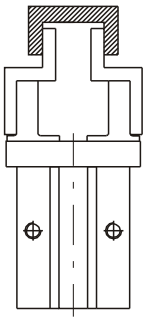
Bore	A	AB	AC	C	D	DA	DB	ØDF	E	EA	EB	F	FA
Ø10	M3x0,5 (useful depth 6)	27	11,4	M2,5x0,45	M3x0,5 (useful depth 5,5)	16	23	2,6	M3x0,5 (useful depth 6)	12	18	M3x0,5	11
Ø16	M4x0,7 (useful depth 4,5)	30	16	M3x0,5	M4x0,7 (useful depth 8)	24	24,5	3,4	M4x0,7 (useful depth 8)	15	22	M5x0,8	13
Ø20	M5x0,8 (useful depth 8)	35	18,6	M4x0,7	M5x0,8 (useful depth 10)	30	29	4,3	M5x0,8 (useful depth 10)	18	32	M5x0,8	15
Ø25	M6x1 (useful depth 10)	36,5	22	M5x0,8	M6x1 (useful depth 12)	36	30	5,1	M6x1 (useful depth 12)	22	40	M5x0,8	20

Bore	FB	FC	G	GB	GC	GA	GD	GE	GF	GH	GL	GM	LA	LB	LC	M (H)	N (H)	NA	NB	P
Ø10	9	19	12	5,7	3	6	4	15,2	11,2	57	5	29	37,8	23	16,4	11 (depth 2)	2 (depth 3)	7,6	5,2	5,4
Ø16	7,5	19	15	7	4	7,5	5	20,9	14,9	67,3	8	38	45,5	30,6	23,6	17 (depth 2)	3 (depth 3)	11	6,5	5,8
Ø20	10	23	20	9	5	9,5	8	26,3	16,3	84,8	10	50	52,8	42	27,6	21 (depth 3)	4 (depth 4)	16,8	7,5	9
Ø25	10,7	23,5	25	12	6	11	10	33,3	19,3	102,7	12	63	63,6	52	33,6	26 (depth 3,5)	4 (depth 4)	21,8	10	11,5

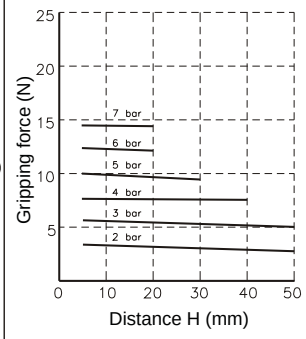
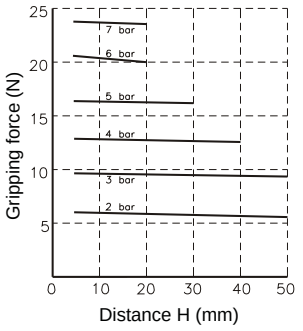
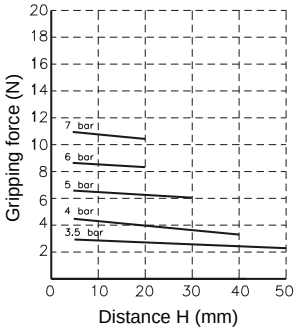
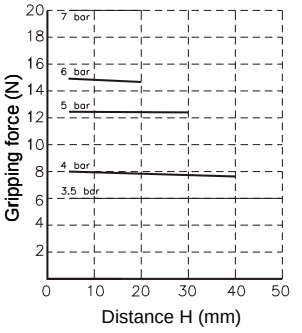
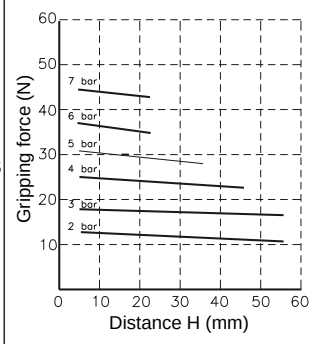
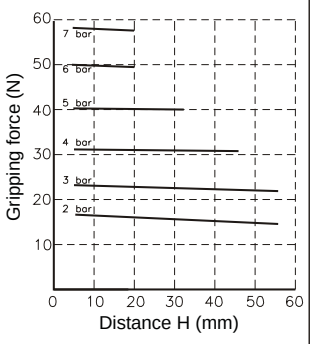
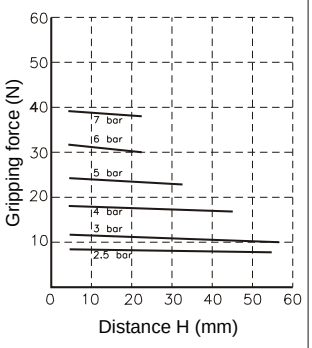
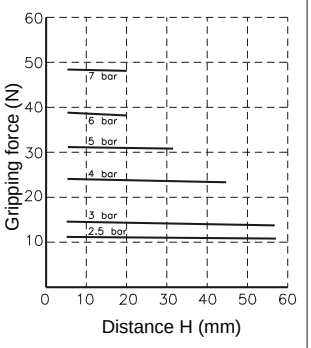
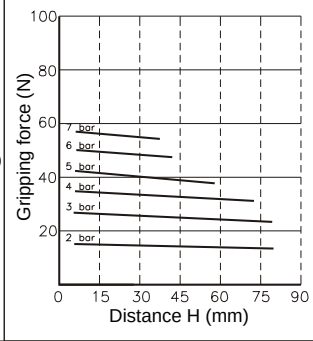
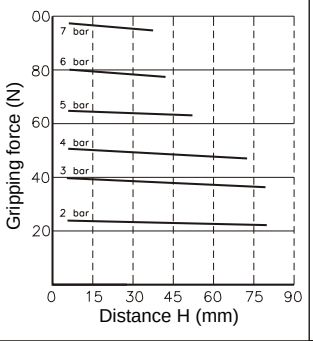
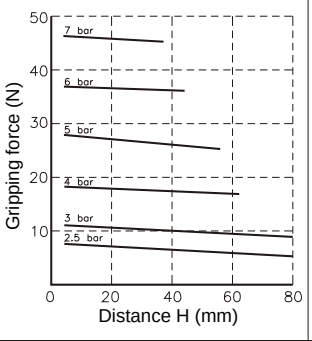
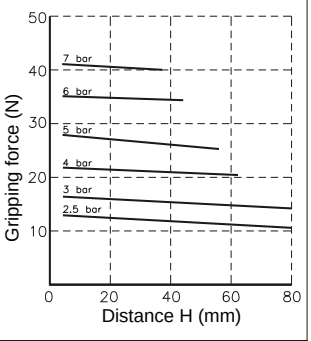
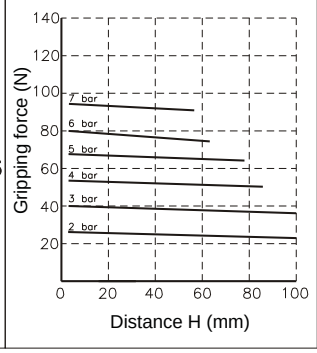
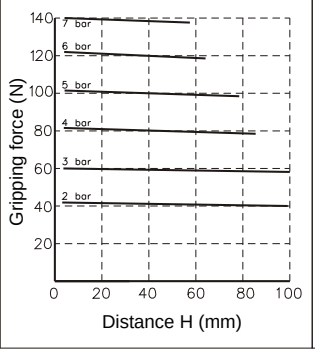
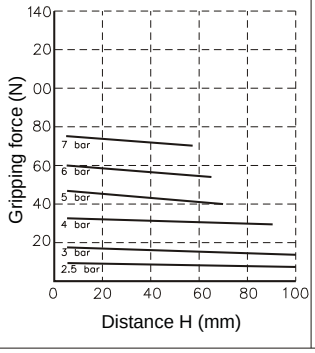
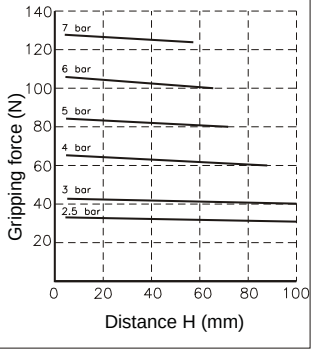
Bore	PA	ØPB	PP
Ø10	/	/	/
Ø16	11,6	4	2,1
Ø20	14	4	2,1
Ø25	19	4	3,5

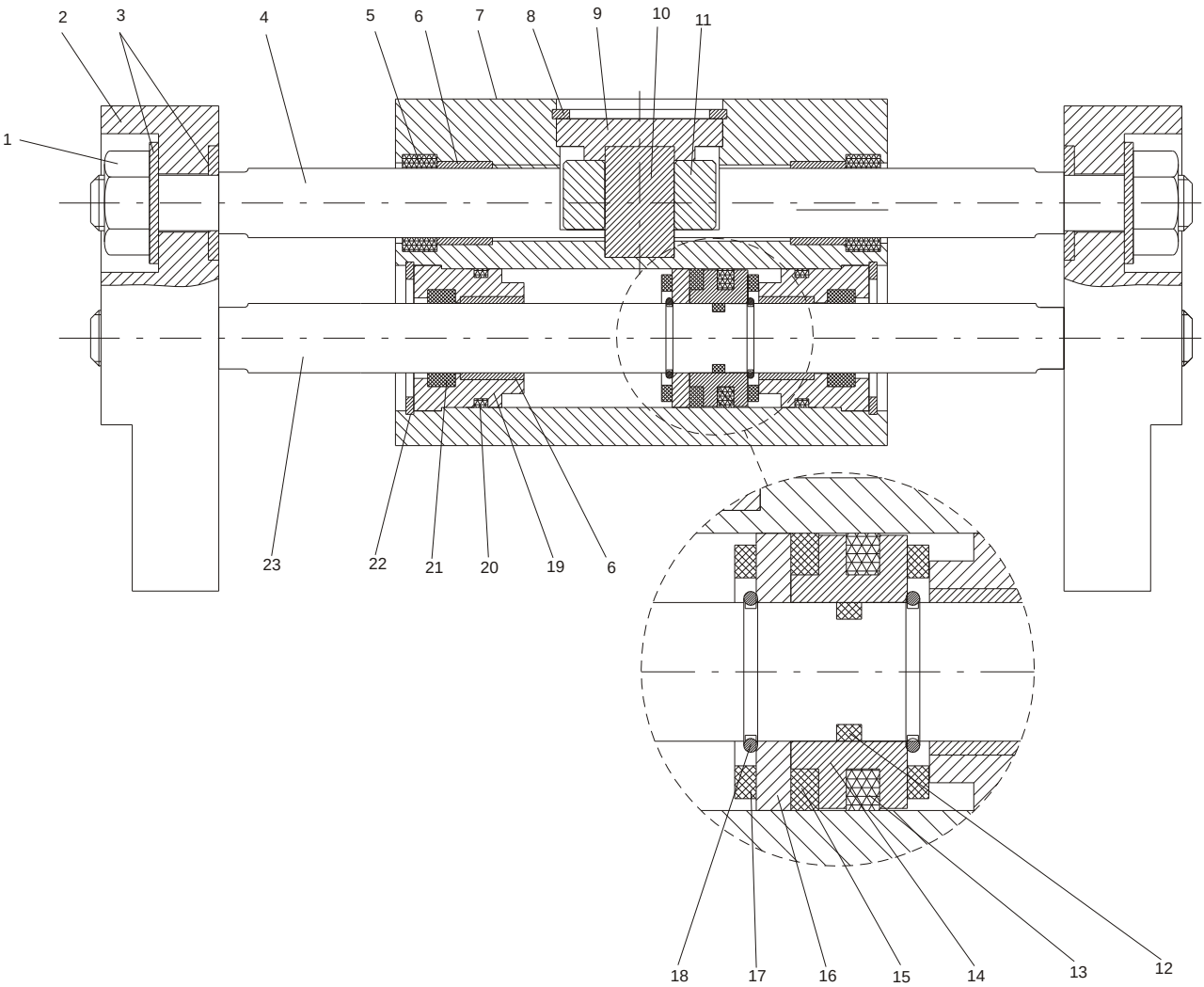
E TERNAL HOLD





INTERNAL HOLD

	Double acting		Single acting	
	External hold Force	Internal hold Force	External hold Force	Internal hold Force
Ø10				
Ø16				
Ø20				
Ø25				



Pos.	Item	Qty.	Pos.	Item	Qty.
1	Nut	4	13	Piston seal	2
2	Finger	2	14	Piston	2
3	Washer	8	15	Magnet	2
4	Rack	2	16	Piston closing washer	2
5	Rod seal	8	17	Cushioning washer	4
6	Rack guiding bush	4	18	Holding ring	4
7	Body	1	19	Bushing	4
8	Circlip	1	20	Bushing seal	4
9	End cover	1	21	Rod seal	4
10	Pinion axis	1	22	Circlip	4
11	Pinion	1	23	Piston rod	2
12	Seal	2			

Ordering Code

6311.Ø.D.

- **16**
- **20**
- **25**
- **32**
- **0**

Ordering code options	Stroke				
	30	40	50	70	100
1	60	80	100	120	160
2	80	100	120	160	200
	Ø16	Ø20	Ø25	Ø32	Ø40
	Bore				

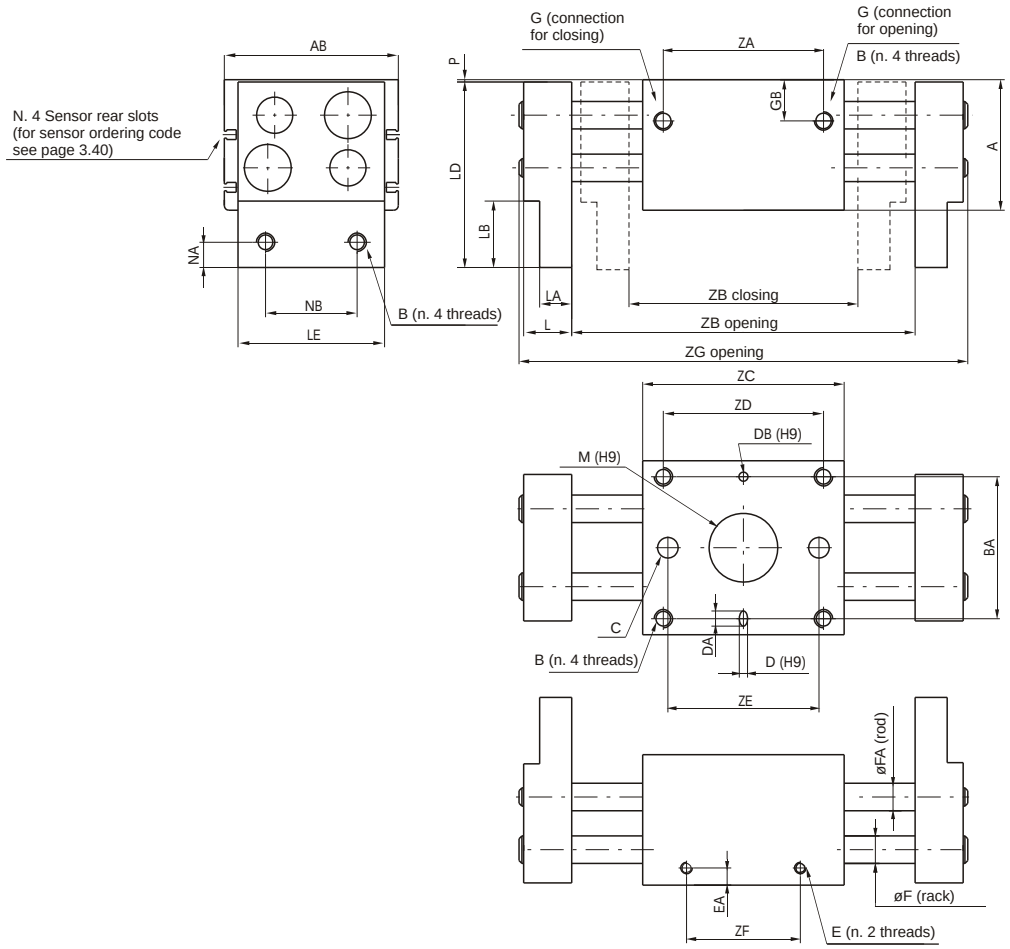
Magnet sensors: see page 3.40

Construction characteristics

Body	aluminium
Piston	brass
Fingers	aluminium
Rod	steel
Rack	steel
Pinion	steel

Technical characteristics

Fluid	filtered and non lubricated air
Function	double acting
Working pressure	1,6 bar
Working temperature	-5°C ÷ +70°C

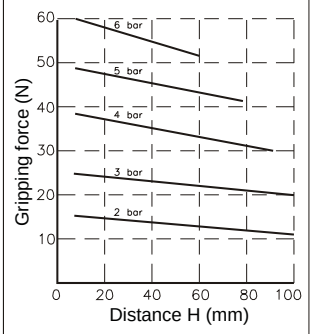
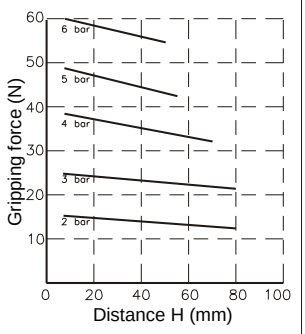
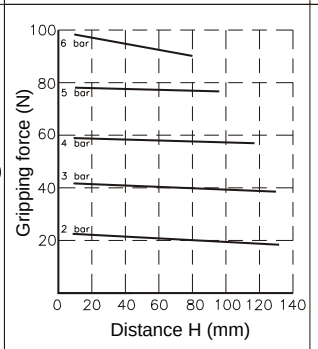
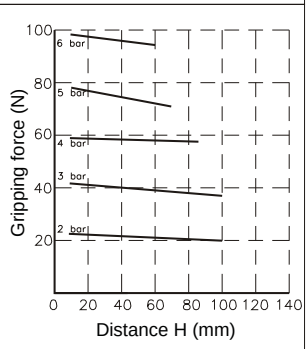
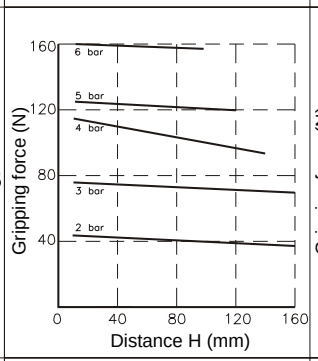
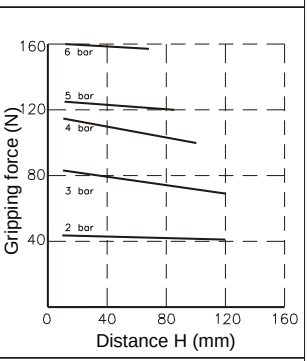
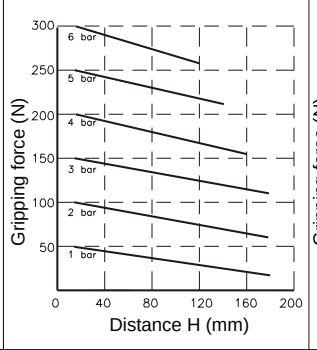
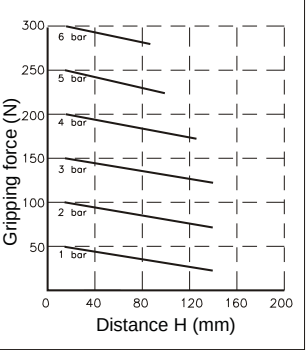
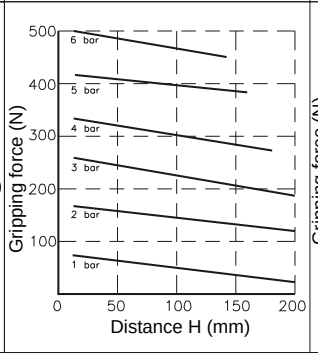
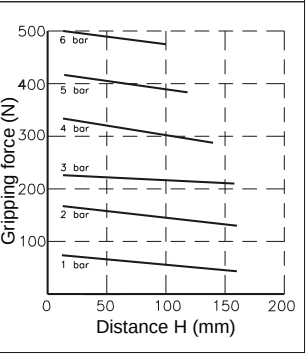


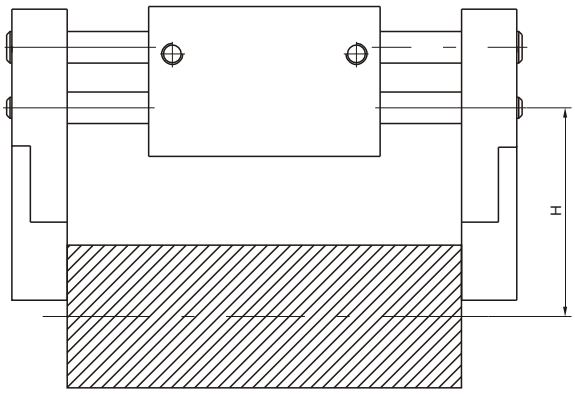
Bore	A	AB	B	BA	ØC	D (H)	DA	ØDB (H)	E	EA	ØF	FA	G	GB	L	LA
Ø16	39	55	M5x0,8 (useful depth 10)	42	5,5	3 (depth 3)	4	3 (depth 3)	M5x0,8 (useful depth 7)	10	8	8	M5x0,8	10	13	9
Ø20	46	65	M6x1 (useful depth 12)	52	6,6	4 (depth 4)	5	4 (depth 4)	M6x1 (useful depth 7)	11	10	10	M5x0,8	11	17	12,5
Ø25	52	76	M8x1.25 (useful depth 16)	62	9	4 (depth 4,5)	5	4 (depth 4,5)	M8x1.25 (useful depth 7)	12,5	12	12	M5x0,8	16	21	14
Ø32	68	82	M8x1.25 (useful depth 16)	64	/	6 (depth 8)	7	6 (depth 8)	M8x1.25 (useful depth 11)	22	14	16	G1/8	16	24	15
Ø40	79	98	M10x1.5 (useful depth 20)	76	/	6 (depth 8)	7	6 (depth 8)	M10x1.5 (useful depth 12)	28	16	20	G1/8	18	28	18

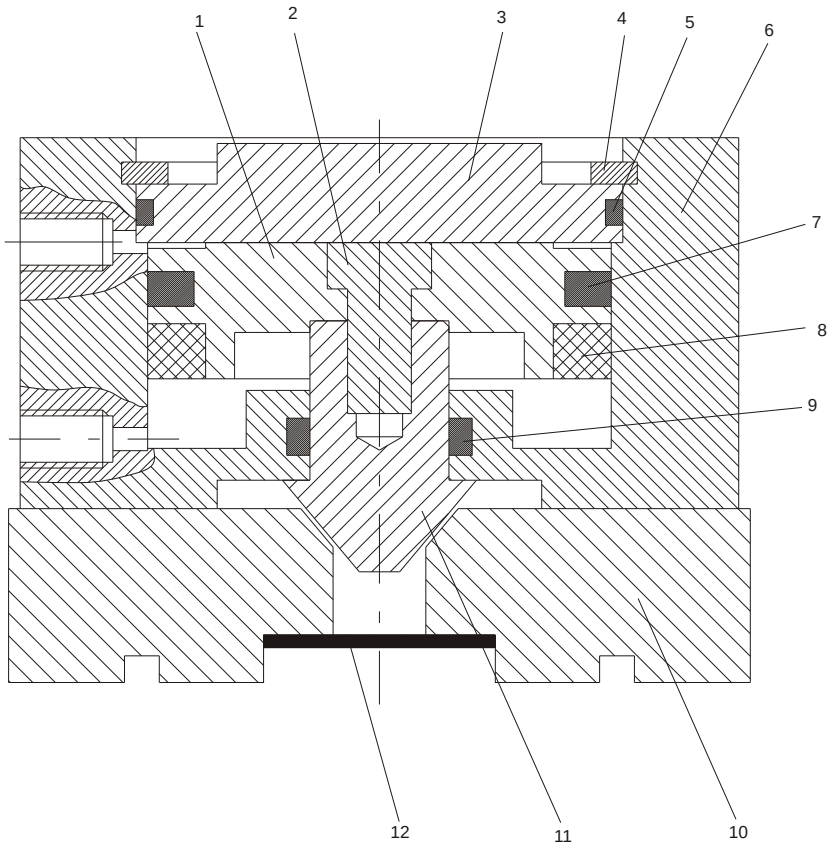
Bore	LB	LD	LE	ØM (H)	N	NA	NB	P
Ø16	19	57,5	43	23 (depth 1,5)	M5x0,8	8	25	0,5
Ø20	24	69	54	27 (depth 1,5)	M6x1	10	30	1
Ø25	29	80	64	32 (depth 1,5)	M8x1,25	12	40	1
Ø32	32	99	70	35 (depth 2,5)	M10x1,5	15	50	1
Ø40	38	176	86	40 (depth 2,5)	M12x1,75	18	60	1

Bore	Opening/Closing Stroke	ZA	ZB		ZC	ZD	ZE	ZF	ZG	Weight (gr.)
			closing	opening					opening	
Ø16	30	26	68	98	60	45	40	28	128	600
	60	50	110	170	90	75	70	58	200	800
	80	70	130	210	110	95	90	78	240	950
Ø20	40	32	82	122	71	58	54	38	160	1000
	80	68	142	222	113	100	96	80	260	1500
	100	88	162	262	133	120	116	100	300	1700
Ø25	50	38	100	150	88	70	66	48	196	1700
	100	86	182	282	142	124	120	102	328	2500
	120	104	200	320	160	142	138	120	366	2800
Ø32	70	56	150	220	110	86	/	60	272	2900
	120	104	198	318	158	134	/	108	370	3800
	160	148	242	402	202	178	/	152	454	4700
Ø40	100	72	188	288	148	116	/	80	348	5300
	160	130	246	406	206	174	/	138	466	6850
	200	170	286	486	246	214	/	178	546	7900

Holding force

	Opening / Closing Stroke	
	Basic Version	Versions 1 2
Ø16		
Ø20		
Ø25		
Ø32		
Ø40		





Pos.	Item	Qty.	Pos.	Item	Qty.
1	Piston	1	7	Piston seal	1
2	Piston nut	1	8	Magnet	1
3	End plate	1	9	Wedge seal	1
4	Circlip	1	10	Fingers	3
5	End plate seal	1	11	Wedge	1
6	Body	1	12	Cap	1

Ordering code

6312.Ø.D

- **16**
- **20**
- **25**
- **32**
- **0**
- **50**
- **63**
- **80**
- **100**
- **125**

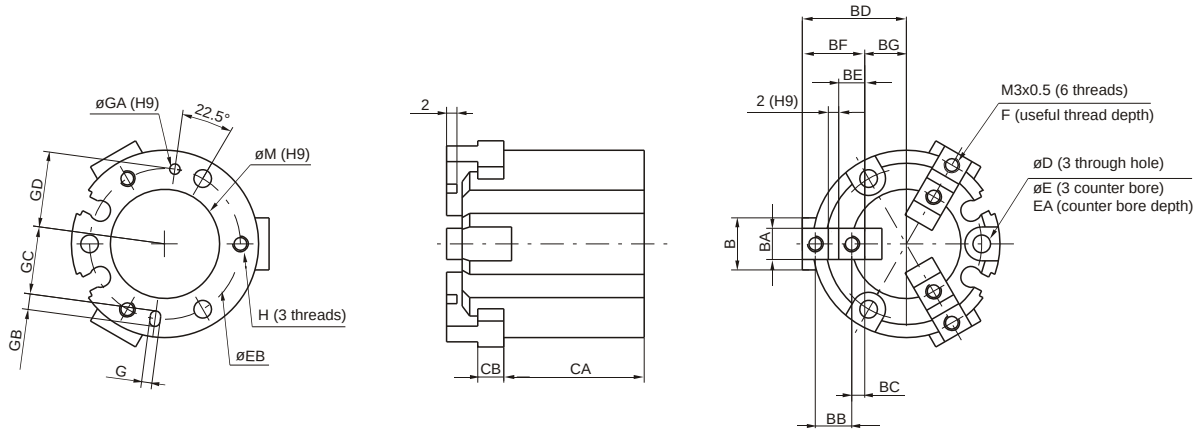
For sensors P/N see page 3.38 e 3.39

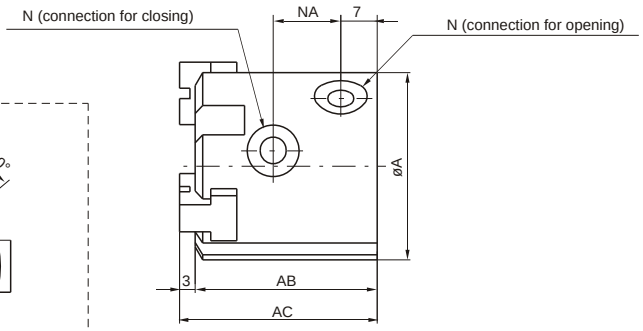
Construction characteristics

Body	aluminium
Piston	aluminium
Wedge	steel
Fingers	steel

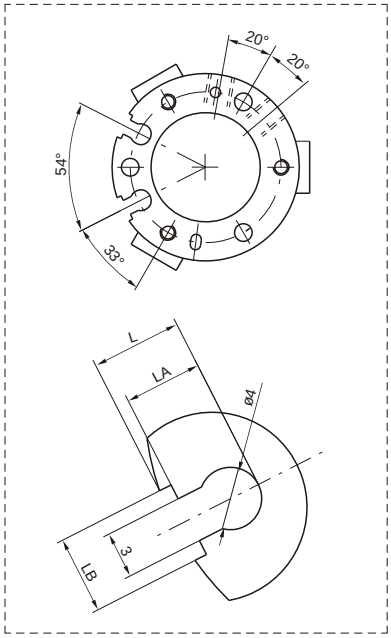
Technical characteristics

Fluid	filtered and non lubricated air
Function	double acting
Working pressure	2÷6 bar (ø16 - ø20 - ø25) - 1÷6 bar (ø32 ÷ ø125)
Working temperature	-5°C ÷ +70°C



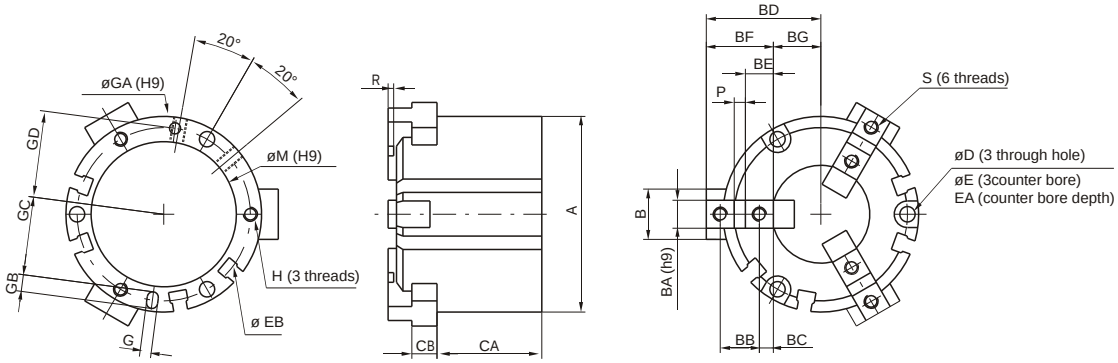


Rear slot detail

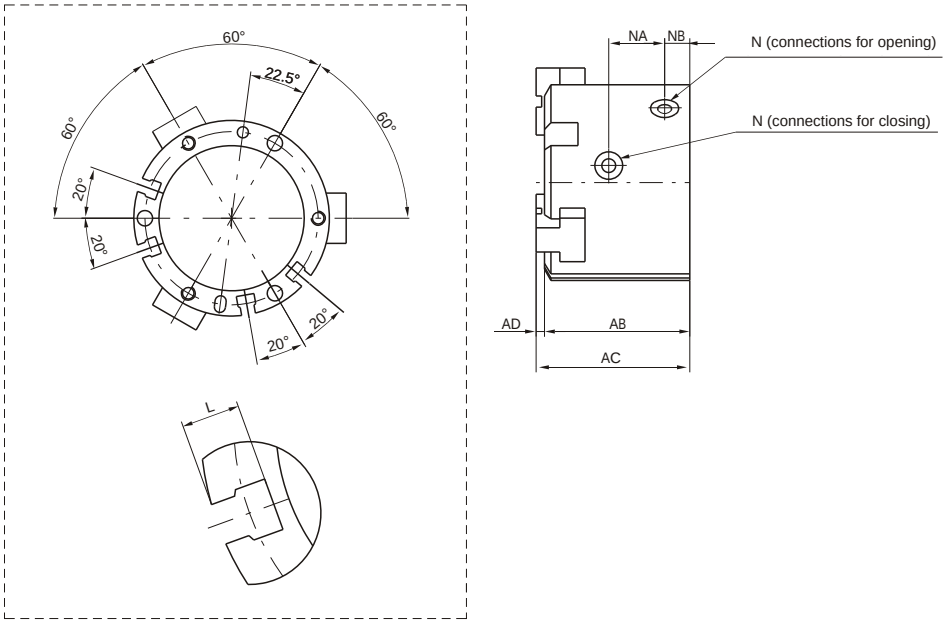


Bore	ØA	AB	AC	B	BA (h)	BB	BC	BD		BE	BF	BG		CA	CB	D	E	EA	EB	F	G (H)	ØGA (H)	GB
								open	close			open	close										
Ø16	30	32	35	8	5	6	2	17	15	4	10	7	5	25	4	3,4	6,5	8	25	5	2 (depth 2)	2 (depth 2)	3
Ø20	36	35	38	10	6	7	2,5	20	18	5	12	8	6	27	5	3,4	6,5	9,5	29	6	2 (depth 2)	2 (depth 2)	3
Ø25	42	37	40	12	6	8	3	24	21	6	14	10	7	28	5	4,5	8	10	34	6	3 (depth 3)	3 (depth 3)	5

Bore	GC	GD	H	L	LA	LB	ØM (H)	N	NA
Ø16	11	12,5	M3x0,5 (useful depth 4,5)	5	-	-	17 (depth 15)	M3x0,5	11
Ø20	13	14,5	M3x0,5 (useful depth 6)	6	5	5	21 (depth 15)	M5x0,8	13
Ø25	14,5	17	M4x0,7 (useful depth 6)	6,5	5	5	26 (depth 15)	M5x0,8	15

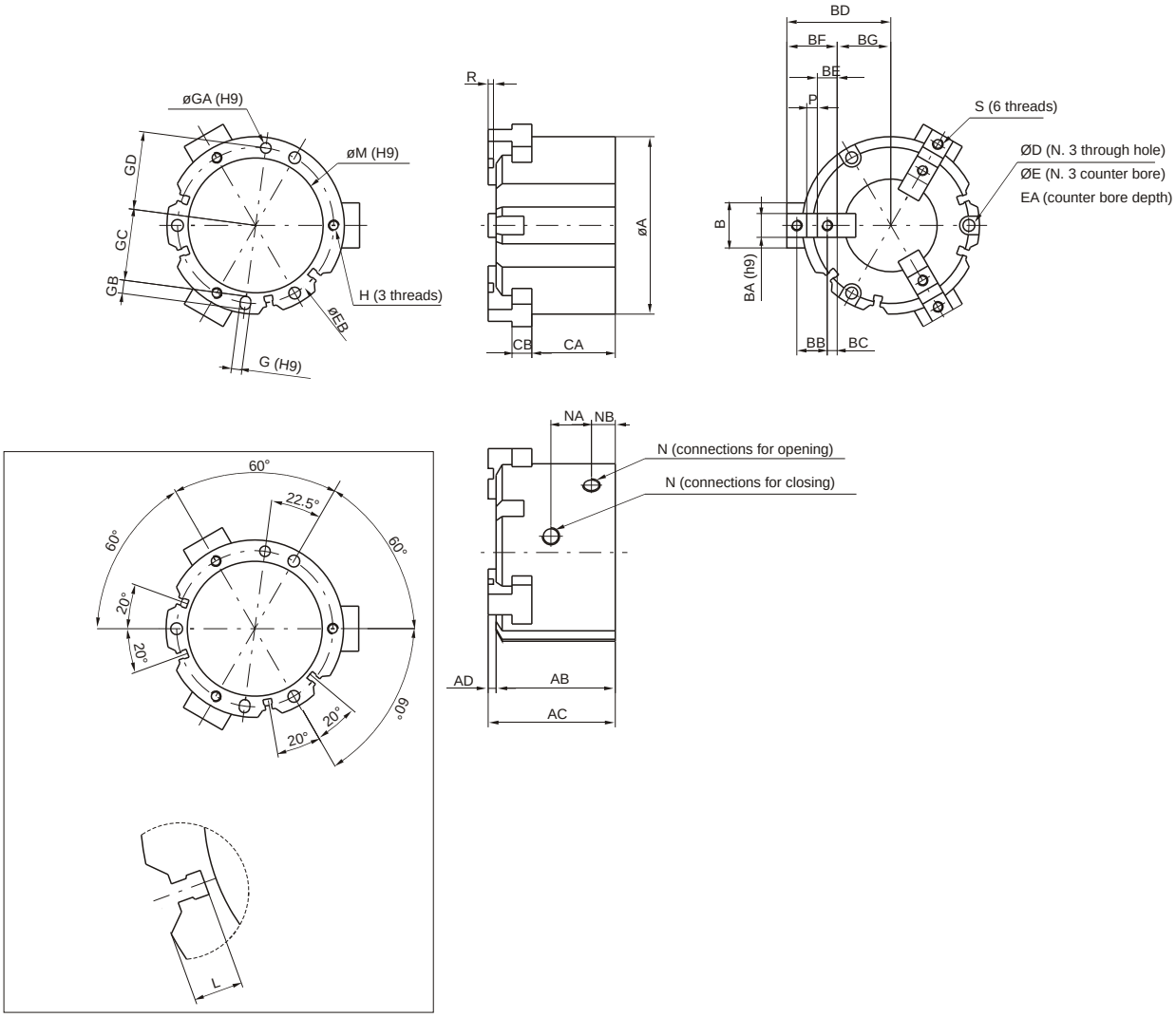


Sensor slots detail



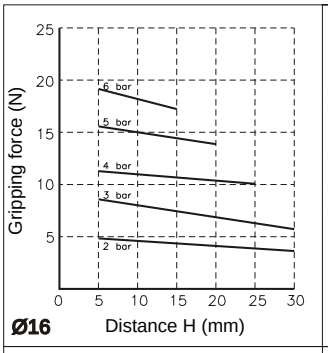
Bore	ØA	AB	AC	AD	B	BA (h)	BB	BC	BD		BE	BF	BG		CA	CB	D	E	EA	EB	H
									open	close			open	close							
Ø32	52	41	44	3	14	8	11	4,5	32	28	9	20	12	8	30,5	6	4,5	8	9	44	M4x0,7 (useful depth 6)
Ø40	62	44	47	3	16	8	12	4,5	35	31	9	21	14	10	32	7	5,5	9,5	9	53	M5x0,8 (useful depth 7,5)
Ø50	70	52	55	3	18	10	14	5	41	35	10	24	17	11	37,5	9	5,5	9,5	12	62	M5x0,8 (useful depth 10)
Ø63	86	62	66	4	24	12	17	5,5	51	43	11	28	23	15	44	11	6,6	11	14	76	M6x1 (useful depth 9)
Ø80	106	77	82	5	28	14	20	6	63,5	53,5	12	32	31,5	21,5	56	12	6,6	11	19	95	M6x1 (useful depth 12)

Bore	G (H)	ØGA (H)	GB	GC	GD	L	N	ØM (H)	NA	NB	P (h)	R	S
Ø32	3 (useful depth 3)	3 (useful depth 3)	5	19,5	22	6	M5x0,8	34 (useful depth 2)	16	8	2	2	M4x0,7 (useful depth 8)
Ø40	4 (useful depth 4)	4 (useful depth 4)	6	23,5	26,5	8	M5x0,8	42 (useful depth 2)	17	9	3	2	M4x0,7 (useful depth 8)
Ø50	4 (useful depth 4)	4 (useful depth 4)	6	28	31	7	M5x0,8	52 (useful depth 2)	20	9	4	2	M5x0,8 (useful depth 10)
Ø63	5 (useful depth 5)	5 (useful depth 5)	7	34,5	38	7,5	M5x0,8	65 (useful depth 2,5)	22	12	6	3	M5x0,8 (useful depth 10)
Ø80	6 (useful depth 6)	6 (useful depth 6)	8	43,5	47,5	9	G1/8	82 (useful depth 3)	27	13,5	8	4	M6x1 (useful depth 12)

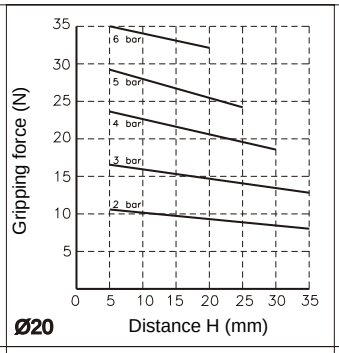


Bore	ØA	AB	AC	AD	B	BA (h)	BB	BC	BD		BE	BF	BG		CA	CB	ØD	ØE	EA	EB	G (H)
									open	close			open	close							
Ø100	134	90	96	6	34	18	23	7,5	78	66	15	38	40	28	63	15	9	14	21	118	8 (useful depth 6)
Ø125	166	114	122	8	40	22	31	10,5	98	82	21	52	46	30	84	18	11	17,5	34	148	10 (useful depth 8)

Bore	ØGA (H)	GB	GC	GD	H	L	ØM (H)	N	NA	NB	P (h)	R	S
Ø100	8 (useful depth 6)	10	54	59	M8x1,25 (useful depth 16)	13	102 (useful depth 4)	G1/4	30,6	18	8	4	M8x1,25 (useful depth 16)
Ø125	10 (useful depth 8)	12	68	74	M10x1,5 (useful depth 20)	15	130 (useful depth 6)	G3/8	38	23,5	10	6	M10x1,5 (useful depth 20)



Ø16



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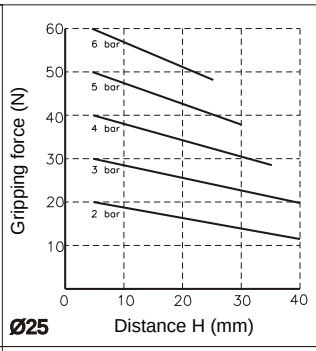

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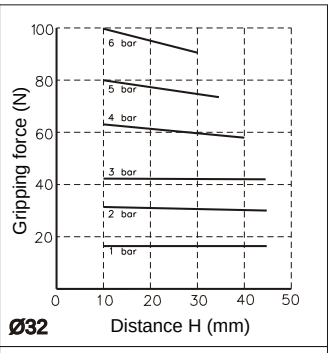

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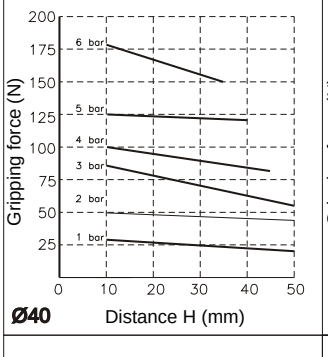

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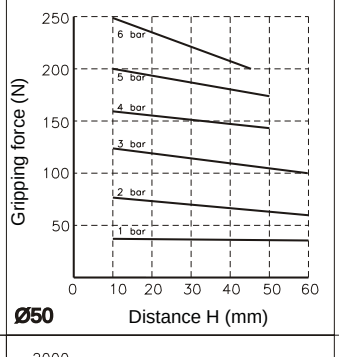

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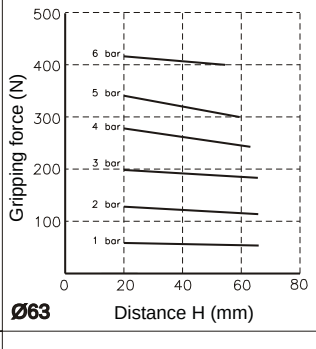
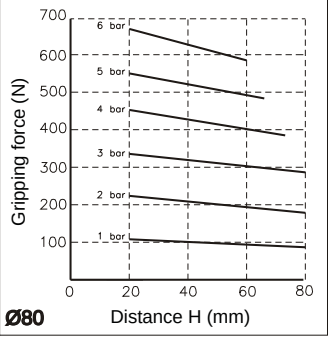


Ø63



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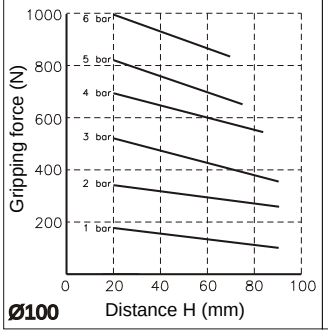
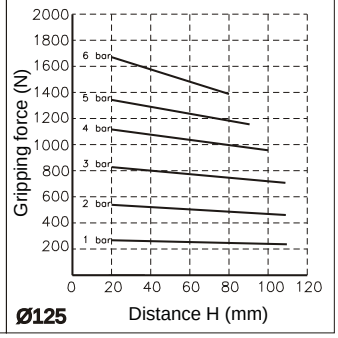
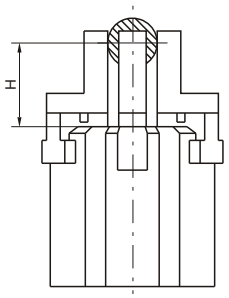
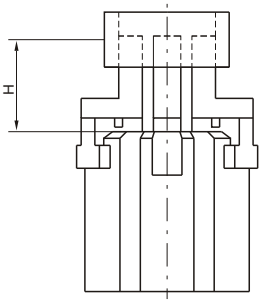


Ø100



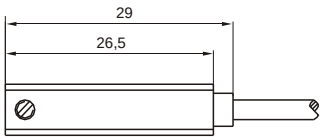
Ø125

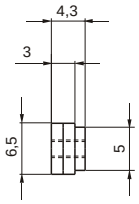




Sensor c/w 2,5 m. cable

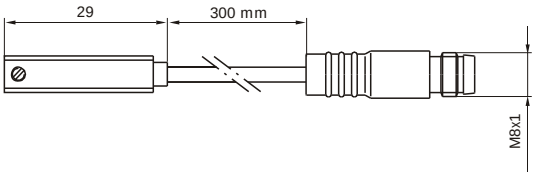
Weight gr. 27





Sensor c/w M8 connector (300 mm cable)

Weight gr. 15



Ordering codes	
1580.U	Reed bulb sensor with led and 2.5 m cable
1580.HAP	PNP sensor Hall effect with led and 2.5 m cable
MRS.U	Reed bulb sensor with led and connector
MHS.P	PNP sensor Hall effect with led and connector
MC1	M8 in line connector with 2.5 m cable (2 wires)
MC2	M8 in line connector with 5 m cable (2 wires)
MCH1	M8 in line connector with 2.5 m cable (3 wires)
MCH2	M8 in line connector with 5 m cable (3 wires)

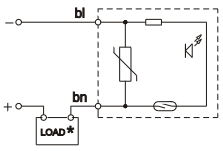
Technical characteristics

	1580.U	MRS.U	1580.HAP	MHS.P
Type of contact	N.O.			
Maximum current (pulses of 0.5 sec)	0,1A		0,2A	
Maximum permanent current	0,1A		0,2A	
Maximum permanent power	6VA		4W	
Voltage range A.C.	3 ÷ 30V		/	
Voltage range D.C.	3 ÷ 30V		12 ÷ 30V	
Working temperature	-20° C ÷ 70°C			
Maximum voltage drop	3V			
Cable section	2x0,14		3x0,14	
Degree of protection	IP 65			
Connecting time	0,5 ms		0,8 µs	
Disconnecting time	0,1 ms		0,3 µs	
Average life (operations)	10^7		10^9	
Repetition of intervention point	± 0,1			

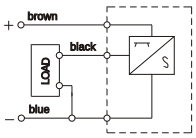
NOTE: Pay attention to the connected loads which should not exceed recommendations

***Reed bulb sensor: connection can be done either to negative or positive pole**

Diagrams and connection

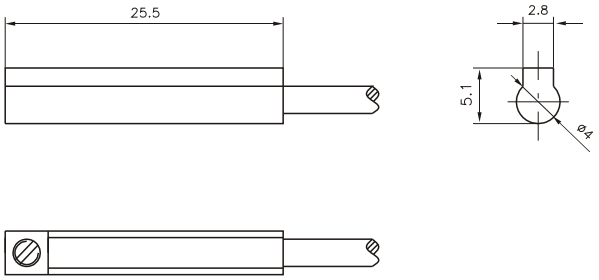


With Reed bulb



Hall effect

Sensor c/w 1 m. Cable

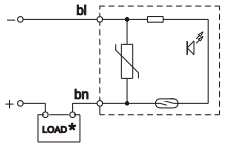


Ordering codes	
1581.U	Reed bulb sensor with led and 1 m cable
1581.HAP	PNP sensor Hall effect with led and 1 m cable
1581.HAN	NPN sensor Hall effect with led and 1 m cable

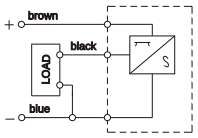
Technical characteristics

	1581.U	1581.HAP	1581.HAN
Type of contact	N.O.		
Maximum current	100mA	200mA	
Maximum permanent power	10W	6W	
Voltage range	5÷120VDC/AC	5 ÷ 30V DC	
Working temperature	-10° C ÷ 70°C		
Maximum voltage drop	/	0,5V	
Cable section	2, ø2,8	3,ø2,8	
Degree of protection	IP 67		

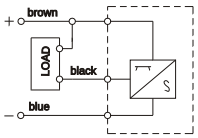
Diagrams and connection



With Reed bulb



PNP

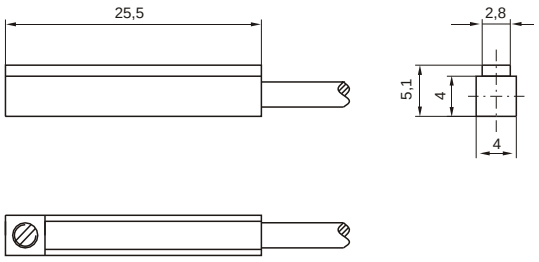


NPN

Hall effect

3

Sensor c/w 1 m. Cable

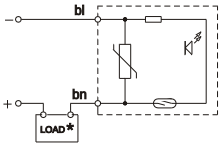


Ordering codes	
1582.U	Reed bulb sensor with led and 1 m cable
1582.HAP	PNP sensor Hall effect with led and 1 m cable
1582.HAN	NPN sensor Hall effect with led and 1 m cable

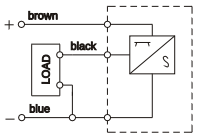
Technical characteristics

	1582.U	1582.HAP	1582.HAN
Type of contact	N.O.		
Maximum current	100mA	200mA	
Maximum permanent power	10W	6W	
Voltage range	5÷120VDC/AC	5÷30V DC	
Working temperature	-10° C ÷ 70°C		
Maximum voltage drop	/	0,5V	
Cable section	2, ø2,8	3,ø2,8	
Degree of protection	IP 67		

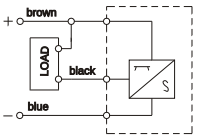
Diagrams and connection



With Reed bulb



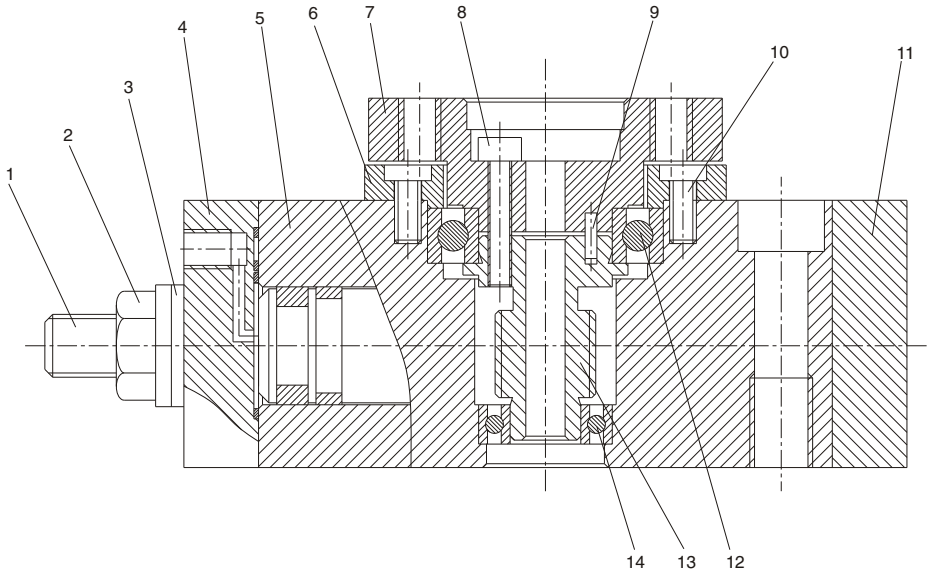
PNP

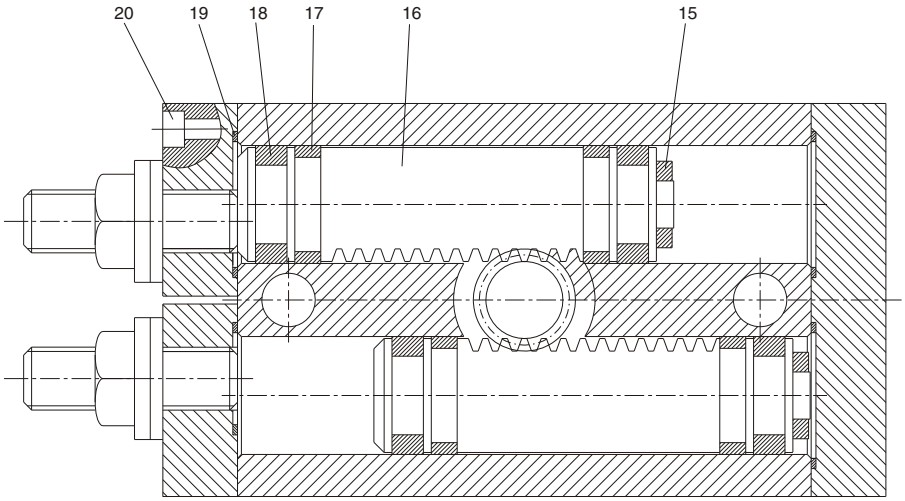


NPN

Hall effect

ROTAR ACTUATORS





Pos.	Item	Qty.	Pos.	Item	Qty.
1	Adjusting screw	2	11	End cover	1
2	Lock nut	2	12	Upper bearing	1
3	Washer	2	13	Pinion	1
4	Front head cover	2	14	Lower bearing	1
5	Body	1	15	Magnet	2
6	Closing flange	1	16	Rack	2
7	Turn table	1	17	Sliding shoe	4
8	Pinion-turn table fixing screw	6	18	Piston seal	4
9	Pin	1	19	Seal	4
10	Flange-Body fixing screw	6	20	Front head cover fixing screw	4

Ordering code

6 00. . .

- **10** (piston ø15)
- **30** (piston ø21)
- **50** (piston ø25)
- **100** (piston ø32)
- **200** (piston ø40)

- **A** = Standard
- **R** = Cushioning

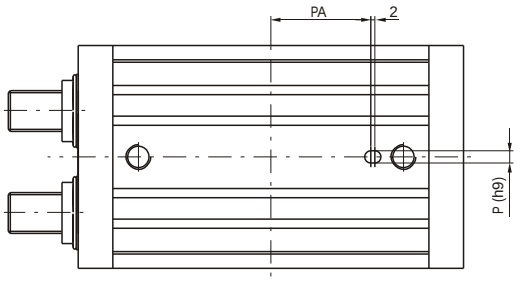
NOTE : Magnetic sensors see page 4.9

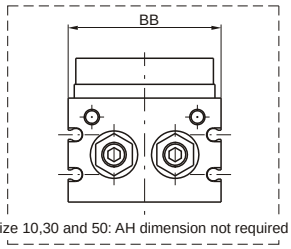
Construction characteristics

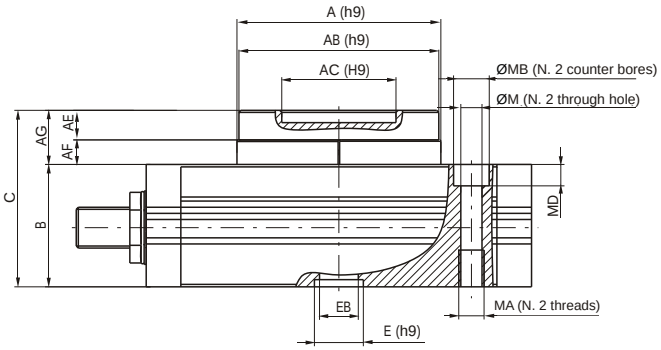
Body	aluminium alloy
Cover plate	steel
End plate	steel
Piston seal	NBR rubber
Pinion	steel
Rack	steel
Turn table	steel
Cushioning	elastic bumper (hydraulic damper available on request)

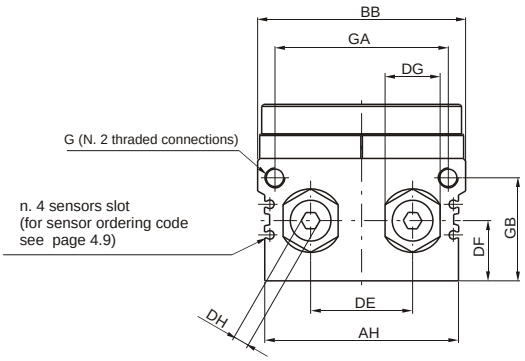
Technical characteristics

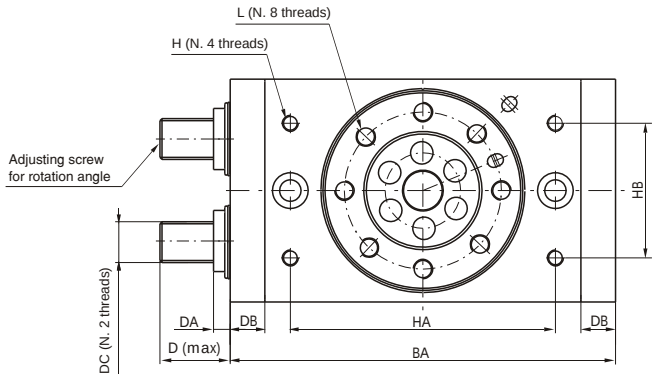
Fluid	filtered and non lubricated air
Max. pressure	10 bar (for type 100 and 200, 6 bar)
Working temperature	-5°C ÷ +70°C
Rotation angle range	0 ÷ 190°
Max. rotation	190°
Rotation speed	0,2 ÷ 1 sec/90°

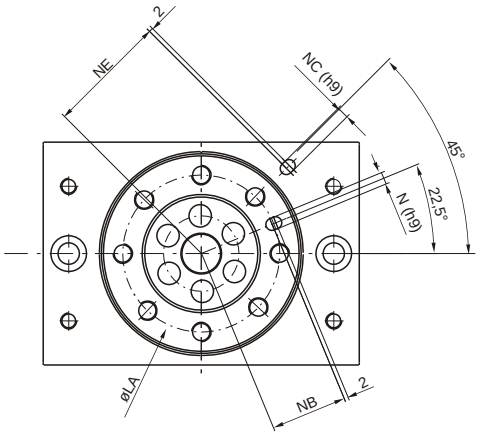












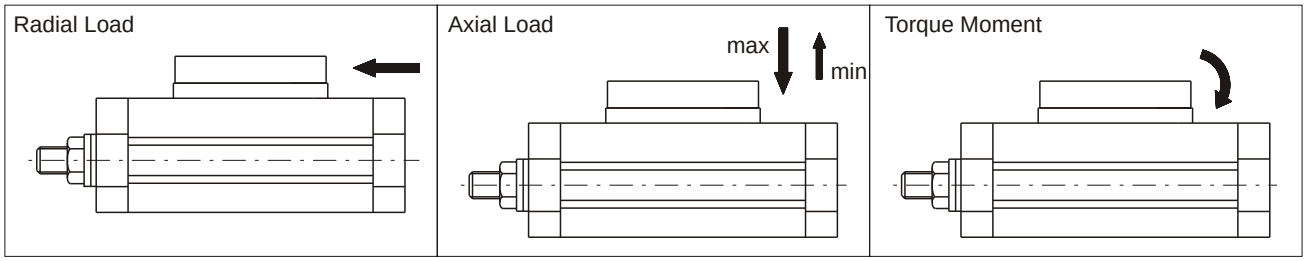
Size	ØA (h9)	ØAB (h9)	ØAC (H9)	AE	AF	AG	AH	AL	B	BA	BB	C	D	DA	DB	DC	DE	DF
10	46	45	20 (actual depth 4)	8	5	13			34	92	50	47	17,7	8,6	9,5	M8x1	20	15,5
30	67	65	32 (actual depth 4,5)	10	7	17	/	/	40	127	70	57	25	10,6	12	M10x1	29	18,5
50	77	75	35 (actual depth 5)	12	8	20			46	152	80	66	31,4	14	15,5	M14x1,5	38	22
100	100	98	56 (actual depth 6)	14,5	12,5	27	95	101	59	189	102	86	34,3	8	17	M20x1,5	50	29,5
200	118	116	64 (actual depth 9)	16,5	15,5	32	113	119	74	240	120	106	40,2	8	24	M27x1,5	60	36,5

Size	DG	DH	ØE (h)	ØEB	G	GA	GB	H	HA	HB	L
10	12	4	15 (actual depth 3)	5	M5x0,8	34,5	27,8	M5x0,8 (useful depth 8)	60	27	M5x0,8 (useful depth 8)
30	14	5	22 (actual depth 3)	9	G1/8	50	32	M6x1 (useful depth 8)	84	37	M6x1 (useful depth 10)
50	19	6	26 (actual depth 3)	10	G1/8	63	37,5	M8x1,25 (useful depth 8)	100	50	M8x1,25 (useful depth 12)
100	27		24 (actual depth 3,5)	19	G1/8	85	50,5	M12x1,75 (useful depth 10)	130	66	M10x1,5 (useful depth 14,5)
200	36		32 (actual depth 5,5)	24	G1/8	103	65,5	M12x1,75 (useful depth 13)	150	80	M12x1,75 (useful depth 16,5)

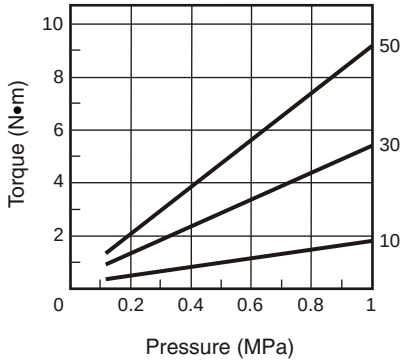
Size	LA	M	MA	MB	MD	N (h)	NB	NC (h)	NE	P (h)	PA	Weight (gr.)
10	32	6,8	M8x1,25 (useful depth 12)	11	6,5	3 (actual depth 3,5)	15					530
30	48	8,6	M10x1,5 (useful depth 15)	14	8,5	4 (actual depth 4,5)	23	/	/	/	/	1230
50	55	10,5	M12x1,75 (useful depth 18)	18	10,5	5 (actual depth 5,5)	26,5					2080
100	77	10,4	M12x1,75 (useful depth 18)	17,5	10,5	6 (actual depth 6,5)	37,5	6 (actual depth 4,5)	59	6 (actual depth 4,5)	49	4100
200	90	14,2	M16x2 (useful depth 25)	20	12,5	8 (actual depth 8,5)	44	8 (actual depth 4,5)	69	8 (actual depth 6,5)	54	7650

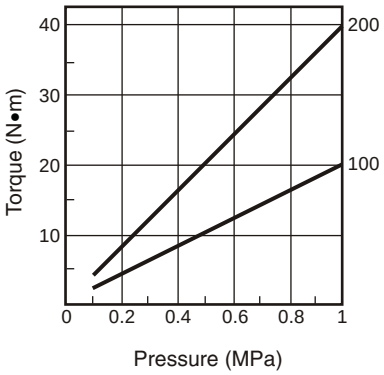
Permissible Loads

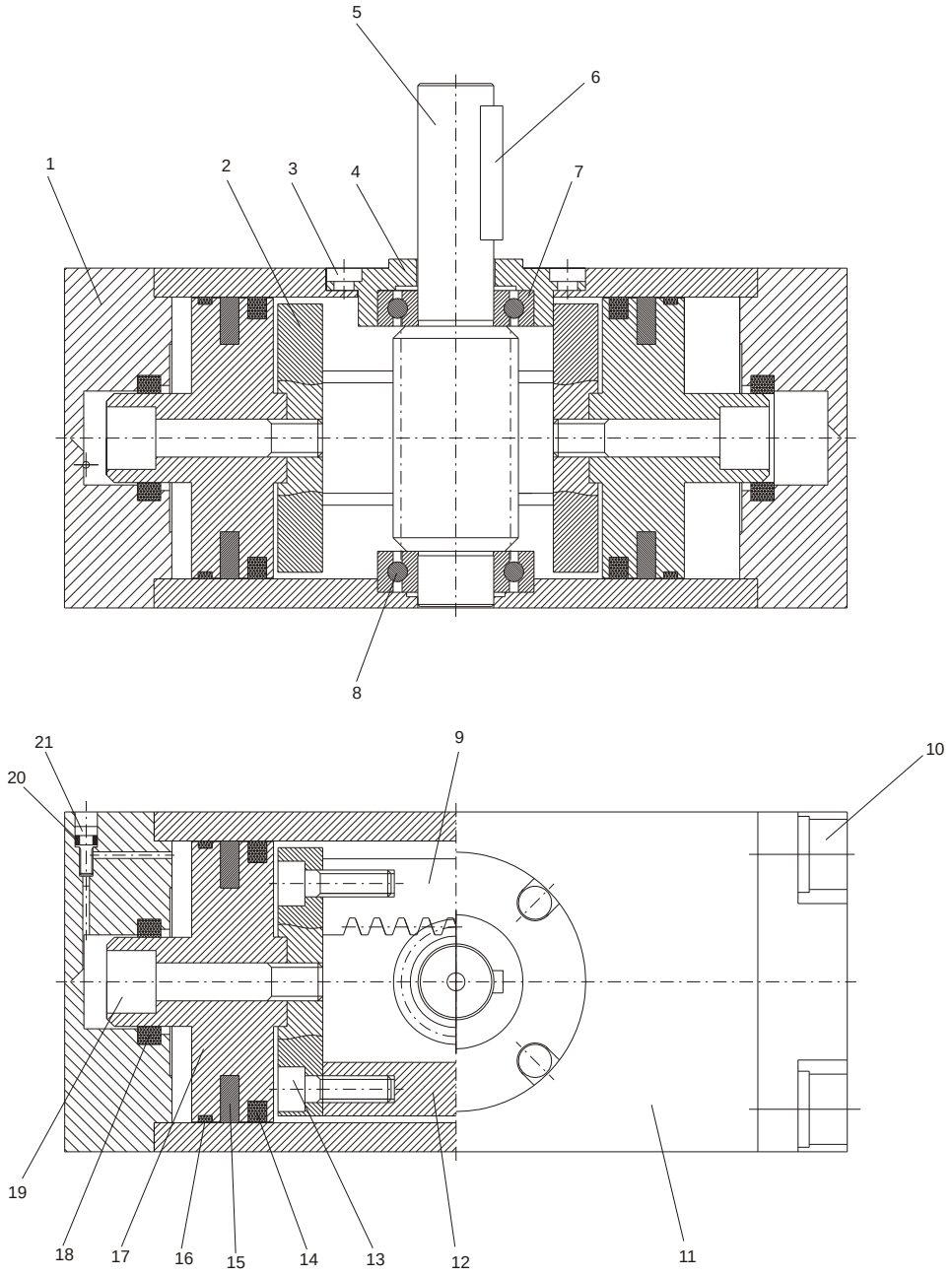
		Size				
		10	30	50	100	200
Radial Load (N)		80	200	320	400	550
Axial Load (N)	max	80	370	450	710	1000
	min	75	200	300	500	750
Tor ue Moment (Nm)		2,5	5,5	10	18	25



Tor ue Diagrams







Pos.	Item	Qty.	Pos.	Item	Qty.
1	End plate	2	12	Guiding rod	1
2	Rack support	2	13	Rack fixing screw	4
3	Upper bearing flange fixing screw	4	14	Piston seal	2
4	Upper bearing flange	1	15	Magnet	2
5	Pinion	1	16	Sliding shoe	2
6	ey	1	17	Piston	2
7	Upper bearing	1	18	Cushioning washer	2
8	Lower bearing	1	19	Piston fixing screw	2
9	Rack	1	20	Cushioning screw seal	2
10	End plate fixing screw	8	21	Cushioning adjusting screw	2
11	Body	1			

Ordering code

6 10.Ø.

- **50**
- **63**
- **80**
- **100**
- **0** = rotation 90°
- **180** = rotation 180°

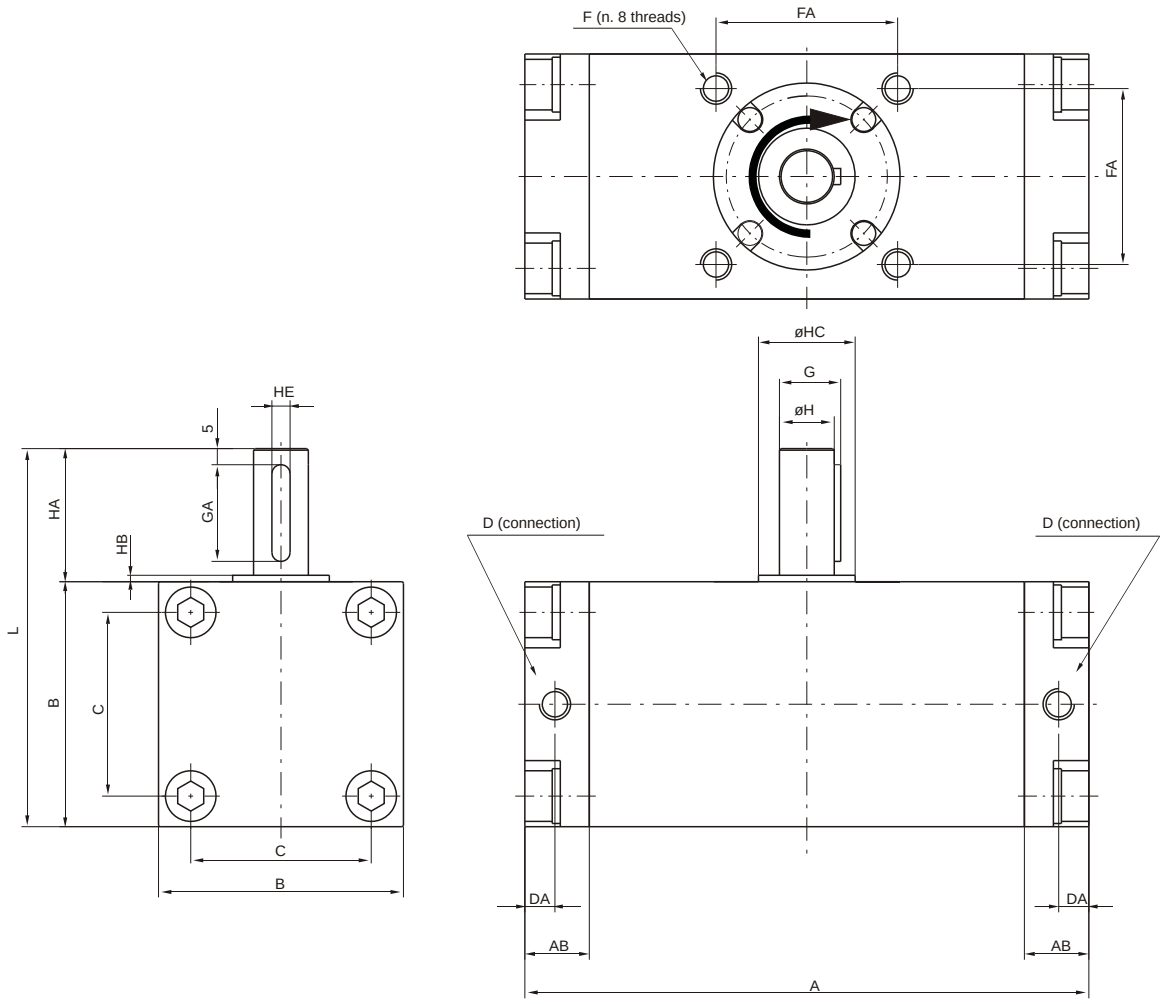
NOTE : Magnetic sensors see page 4.10

Construction characteristics

Body	aluminium alloy
Piston	aluminium
End plate	aluminium
Piston seal	NBR rubber
Pinion	steel
Rack	steel

Technical characteristics

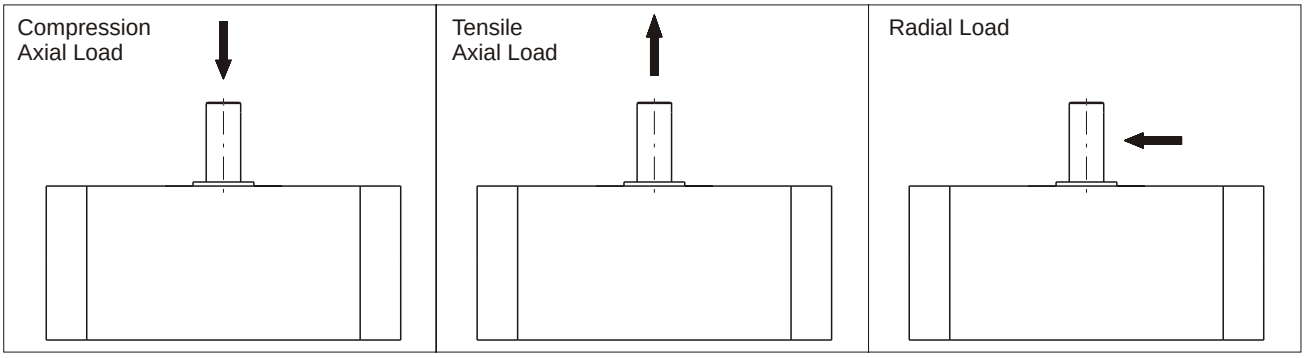
Fluid	filtered and non lubricated air
Max. pressure	10 bar
Working temperature	-5°C ÷ +70°C



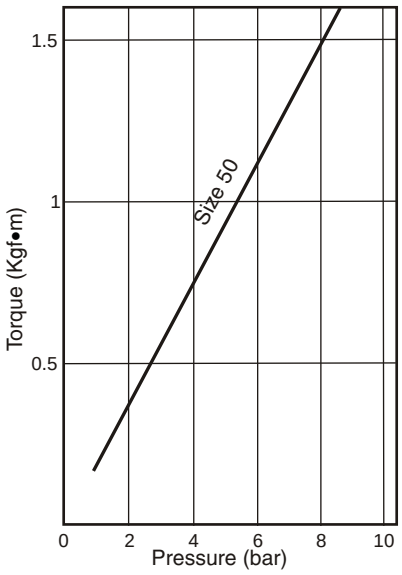
Size	A		AB	B	C	D	DA	F	FA	G	GA	H	HA	HB	HC	HE	L	Weight (g.)	
ø50	156	189	17	62	46	G1/8	8,5	M8x1,25 (useful depht 8)	48	17	25	15	36	2,5	25	$5\ ^{0}_{-0,030}$	98	1500	1700
ø63	175	214	20	76	57	G1/8	10	M10x1,5 (useful depht 12)	60	19,5	30	17	41	2,5	30	$6\ ^{0}_{-0,030}$	117	2500	3000
ø80	199	243	23,5	92	70	G1/4	12	M12x1,75 (useful depht 13)	72	22,5	40	20	50	3	35	$6\ ^{0}_{-0,030}$	142	4300	5000
ø100	259	325	25	112	85	G3/8	12,5	M12x1,75 (useful depht 14)	85	28	45	25	60	4	40	$8\ ^{0}_{-0,036}$	172	8500	9500
	90°	180°																90°	180°

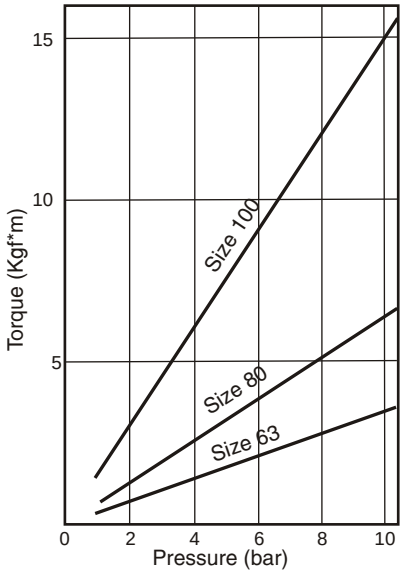
Allowable Loads

	Size			
	50	63	80	100
Radial Load (N)	200	300	400	600
Compression Axial Load (N)	500	600	900	1000
Tensile Axial Load (N)	200			



Tor ue Diagrams

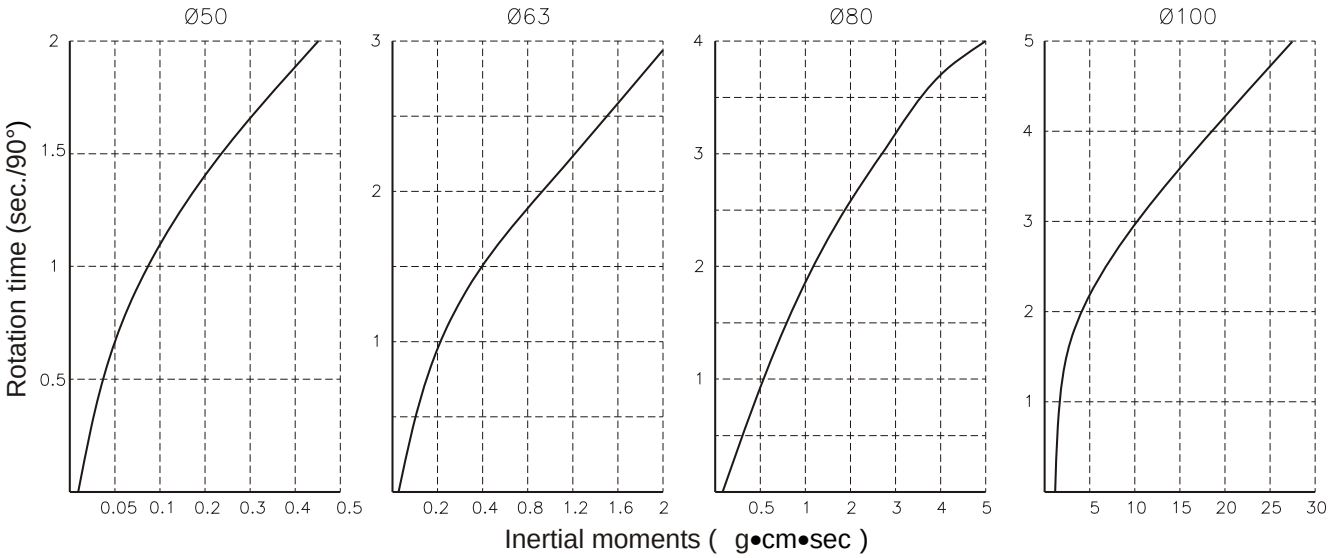




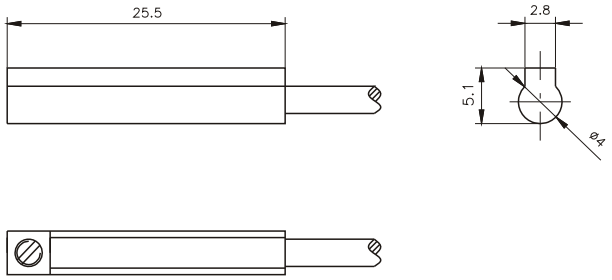
inetic energy (cushioning angle 35)

	Size			
	ø50	ø63	ø80	ø100
Max inetic energy (g cm)	10	15	20	30

Rotation time according to inertial moments



Sensor c/w 1 m. Cable

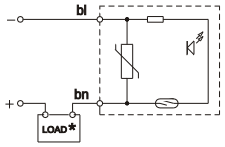


Ordering codes	
1581.U	Reed bulb sensor with led and 1 m cable
1581.HAP	PNP sensor Hall effect with led and 1 m cable
1581.HAN	NPN sensor Hall effect with led and 1 m cable

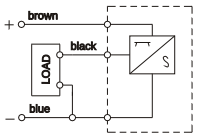
Technical characteristics

	1581.U	1581.HAP	1581.HAN
Type of contact	N.A.		
Maximum current	100mA	200mA	
Maximum permanent power	10W	6W	
Voltage range	5÷120VDC/AC	5 30V DC	
Working temperature	-10° C ÷ 70°C		
Maximum voltage drop	2,5 V	0,5V	
Cable section	2, ø2,8	3,ø2,8	
Degree of protection	IP 67		

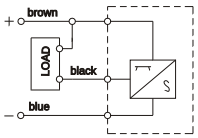
Diagrams and connection



With Reed bulb



PNP



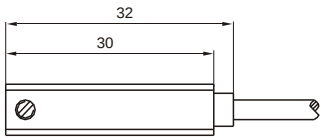
NPN

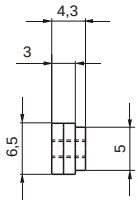
Hall effect

4

Sensor c/w 2,5 m. cable

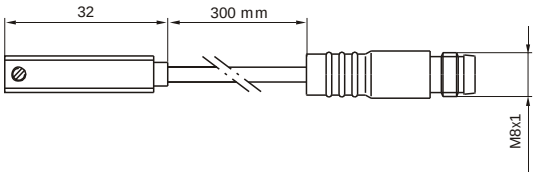
Weight gr. 27





Sensor c/w M8 connector (300 mm cable)

Weight gr. 15



Ordering codes	
1580.U	Reed bulb sensor with led and 2.5 m cable
1580.HAP	PNP sensor Hall effect with led and 2.5 m cable
MRS.U	Reed bulb sensor with led and connector
MHS.P	PNP sensor Hall effect with led and connector
MC1	M8 in line connector with 2.5 m cable (2 wires)
MC2	M8 in line connector with 5 m cable (2 wires)
MCH1	M8 in line connector with 2.5 m cable (3 wires)
MCH2	M8 in line connector with 5 m cable (3 wires)

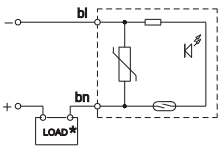
Technical characteristics

	1580.U	MRS.U	1580.HAP	MHS.P
Type of contact	N.A.			
Maximum current (pulses of 0.5 sec)	0,1A		0,2A	
Maximum permanent current	0,1A		0,2A	
Maximum permanent power	6VA		4W	
Voltage range A.C.	3 ÷ 30V		/	
Voltage range D.C.	3 ÷ 30V		12 ÷ 30V	
Working temperature	-20° C ÷ 70°C			
Maximum voltage drop	3V			
Cable section	2x0,14		3x0,14	
Degree of protection	IP 65			
Connecting time	0,5 ms		0,8 ms	
Disconnecting time	0,1 ms		0,3 ms	
Average working period	10^7		10^9	
Repetition of intervention point	± 0,1			

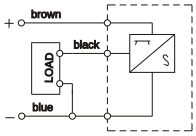
NOTE: Pay attention to the connected loads which should not exceed recommendations

***Reed bulb sensor: connection can be done either to negative or positive pole**

Diagrams and connection



With Reed bulb



Hall effect

Sales network

ITALY	*Head offices and Factory*	**PNEUMAX S.p.A.** Via Cascina Barbellina, 10 - 24050 LURANO (BG) - ITALY Tel. +39 (0) 35 4192777 - Fax +39 (0) 35 4192740/4192741 http://www.pneumaxspa.com - E-mail : pneumax@pneumaxspa.com
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INTERNATIONAL Branches:	*France*	**PNEUMAX S.a.r.l.** - Sélestat Tel. +33 (3) 88580450 - Fax. +33 (3) 88580451 http://www.pneumax-france.fr - E-mail : pneumax@pneumax-france.fr
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	Russia	**PNEUMAX Ltd.** - Moscow Tel. +7 095 1508329 - Fax. +7 095 7424082 http://www.pneumax.ru - E-mail : pneumax@asvt.ru
	Spain	**PNEUMAX S.A.** - Elgoibar Tel. +34 943 744174 - Fax. +34 943 744076 http://www.pneumax.es - E-mail : pneumax@pneumax.es **PNEUMAX CATALUNYA** - Molins De Rei Tel. +34 (93) 490 45 57 - Fax. +34 (93) 490 05 71 http://www.pneumax.es - E-mail : pneumaxcatalunya@pneumax.es
	Singapore (Indonesia - Vietnam)	**PNEUMAX SINGAPORE Pte Ltd.** - Singapore Tel. +65 3920581 - Fax. +65 3921273 http://www.pneumax.com.sg - E-mail : pneumax@pneumax.com.sg
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PNEUMAX S.p.A.
24050 LURANO (BG) - Italy
Via Cascina Barbellina, 10
Tel. 035/4192777
Fax 035/4192740
035/4192741
http://www.pneumaxspa.com
pneumax@pneumaxspa.com