

ACTUATORS

● CYLINDERS	PAG. 1-2
● GRIPPERS	PAG. 1-167
● ROTARY ACTUATORS	PAG. 1-187
● SLIDES	PAG. 1-205
● HYDRAULIC-PNEUMATIC	PAG. 1-229
● ELECTRIC CYLINDER	PAG. 1-247
● SENSORS, T-SLOT ACCESSORIES, TESTER	PAG. 1-285

CYLINDERS SUMMARY

● **GENERAL TECHNICAL DATA**

PAGE 1-4

CYLINDERS ACCORDING TO STANDARDS AND VARIANTS



● **ISO 6432 MINI-CYLINDERS – SERIES STD**

PAGE 1-10



● **ISO 6432 MINI-CYLINDERS – SERIES TP**

PAGE 1-13



● **ACCESSORIES FOR ISO 6432 MINI-CYLINDERS**

PAGE 1-15



● **ISO 15552 CYLINDERS**

PAGE 1-22



● **ISO 15552 CYLINDERS – SERIES STD**

PAGE 1-23



● **ISO 15552 CYLINDERS – TYPE A**

PAGE 1-25



● **ISO 15552 CYLINDERS – SERIES 3**

PAGE 1-27



● **ISO 15552 LOW FRICTIONS CYLINDERS**

PAGE 1-28



● **ISO 15552 ULTRA-LOW FRICTIONS CYLINDERS**

PAGE 1-29



● **ISO 15552 CYLINDERS WITH “COMBI” PISTON ROD GASKET**

PAGE 1-31

● **ISO 15552 CYLINDERS – DIMENSIONS**

PAGE 1-32



● **ISO 15552 TWO-FLAT CYLINDERS**

PAGE 1-35



● **ACCESSORIES AND SPARE PARTS FOR ISO 15552 CYLINDERS**

PAGE 1-37



● **TWIN-ROD CYLINDER – SERIES TWNC**

PAGE 1-49



● **ISO 15552 CYLINDERS Ø 160-200**

PAGE 1-54



● **ISO 21287 CYLYNDER – SERIES LINER**

PAGE 1-60



● **COMPACT CYLINDERS – SERIES CMPC**

PAGE 1-72



● **COMPACT CYLINDERS – SERIES CMPC TWO-FLAT**

PAGE 1-84



● **COMPACT STOPPER CYLINDER**

PAGE 1-87



● **ACCESSORIES AND SPARE PARTS FOR ISO CMPC, TWO-FLAT AND STOPPER CYLINDERS**

PAGE 1-91

OTHER CYLINDER



● **ROUND CYLINDER – SERIES RNDC**

PAGE 1-98



● **SHORT-STROKE CYLINDERS – SERIES SSCY**

PAGE 1-103



● **CARTRIDGE MICRO-CYLINDER – SERIES CRTC**

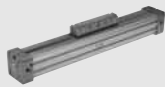
PAGE 1-110



● **COMPACT GUIDED CYLINDERS – SERIES CMPG**

PAGE 1-112

RODLESS CYLINDERS



● **RODLESS CYLINDER – SERIES STD**

PAGE 1-118



● **RODLESS CYLINDER WITH GUIDE “V”**

PAGE 1-123



● **RODLESS CYLINDER WITH BALL RECIRCULATING GUIDE**

PAGE 1-127



● **RODLESS CYLINDER – SERIES DOUBLE**

PAGE 1-132



● **ACCESSORIES AND SPARE PARTS FOR RODLESS STD, GUIDE “V”, WITH BALL CIRCULATION GUIDE AND DOUBLE CYLINDERS**

PAGE 1-133



● **RODLESS CYLINDER – SERIES PU**

PAGE 1-139



● **RODLESS CYLINDER WITH MAGNETIC SLIDING – SERIES MAGNETIC SLIDE**

PAGE 1-149

STAINLESS STEEL CYLINDERS



● **STAINLESS STEEL ISO 6432 MINI-CYLINDER**

PAGE 1-153



● **STAINLESS STEEL ROUND CYLINDERS RNDC**

PAGE 1-157



● **STAINLESS STEEL ISO 1552 CYLINDERS**

PAGE 1-161

GENERAL TECHNICAL DATA

Compressed air

The cylinders have been designed for use with unlubricated air, in which case no maintenance is required. If lubricated air is used, lubrication must be continuous because the additional lubrication removes the lubricant applied at the factory. With reference to ISO/DIN 8573-1, the compressed air to use is class 3-4-3, i.e.:

- Solid particle classe 3: 10.000 particles/m³ with d < = 1 micron and 500 particles/m³ with d < = 5 micron
- Humidity classe 4: Pressure dewpoint < = +3 °C
- Oil classe 3: Concentration total oil < = 1 mg/m³

Gasket material

Please refer to page 6-7 of the technical documentation for compatibility data. Some families of Metal Work cylinders are available with gaskets made of different materials.

Polyurethane: the best in terms of long-life, resistance to wear and reduced friction.

Chemically compatible with:

- Pure aliphatic hydrocarbons (butane, propane, gasoline)
- Any impurities (moisture, alcohol, acid or alkaline compounds) can chemically attack polyurethane
- Mineral oil and grease (some additives can chemically attack the material)
- Silicone oil and grease
- Water up to +50°C
- Resistance to ozone and ageing

Not compatible with:

- Ketones, esters, ethers
- Alcohols, glycols
- Hot water, steam, alkali, amines, acids.
- Good elasticity down to -35°C (for low temperature PU version only).

NBR: These gaskets have a shorter life than polyurethane gaskets.

However, they are recommended for use in environments causing the formation of water condensate, such as tropical climates, where polyurethane gaskets may tend to deteriorate quickly due to hydrolysis.

Chemically compatible with:

- Methane, butane, propane, oily acids
- Aliphatic hydrocarbons
- Lubrication oils
- Gasoline

Not compatible with:

- Ozone and exposure to sunlight
- Good elasticity down to -35°C (for low temperature NBR version only)

FKM/FPM: Can withstand temperatures as high as 150°C.

This makes them ideal for use on rodless cylinders, high-speed applications, involving high temperatures at the sliding lips.

Chemically compatible with:

- Mineral oil and grease, slight swelling with oil grade ASTM no. 1 and 3
- Silicon oil and grease
- Animal and vegetable oil and fat
- Aliphatic hydrocarbons (gasoline, butane, propane, natural gas)
- Aromatic hydrocarbons (benzol, toluene)
- Chlorinated hydrocarbons (tetrachloroethylene)
- Fuels
- Ozone, atmospheric agents, ageing

Not compatible with:

- Polar solvents (acetone, methylethylcheton, diethyl ether, dioxane)
- Glycol-based brake fluids
- Ammonia gas, amines, alkali
- Superheated water vapour
- Low molecular organic acids (formic and acetic acid)

No-stick-slip cylinders

Standard cylinders are designed to ensure trouble-free operation under any conditions, particularly at high speed. Operation tends to be irregular and jerky at very low speeds in the presence of side loads. In this case, no-stick-slip cylinders are recommended as they allow smooth operation. These versions feature specific tribological properties and preferably polyurethane gaskets.

Radial oscillation of the piston rod

These cylinders have been designed to apply forces in the direction of the axis and not to withstand side loads. If you intend to use the cylinder piston rod with side loads, the play between the piston rod and guide bushing must be taken into account. Indicatively, each 100-mm stroke corresponds to 1-mm radial oscillation measured at the end of the piston rod.

Cylinder operating life

The life of cylinders depends on numerous factors including axial and radial loads, speed, frequency of use, temperature, shocks, air loss (limits).

Below are a few factors that must be taken purely as a reference.

They are not binding or guaranteed due to the variability of different factors. Without radial load:

ISO 15552 cylinders and round cylinders with polyurethane gaskets: 15.000 km.

ISO 15552 cylinders and round cylinders with NBR gaskets: 8.000 km.

ISO 6432 cylinders, SSC cylinders and compact cylinders with polyurethane gaskets: 30 million cycles.

ISO 6432 cylinders and SSC cylinders with NRB gaskets: 15 million cycles.

Rodless cylinders: 5.000 km.

Stroke tolerances

The actual cylinder stroke has a tolerance with respect to the nominal stroke, in compliance with any applicable laws, within the following ranges:

• ISO 15552 cylinders	32 - 50	-0	+2	mm
	63 - 200	-0	+2.5	mm
• ISO 6432	8 - 25	-1	+1	mm
• Round cylinders	32 - 50	-0.5	+1.5	mm
• SSC cylinders	12 - 50	-1	+1	mm
	63 - 100	-1	+1.5	mm
• Compact cylinders	12 - 100	-0.5	+1.5	mm
• Compact cylinders ISO 21 287	20 - 100	-0.5	+1.5	mm
• Rodless cylinders	16 - 40	-1	+2	mm

Air loss

All the cylinders have air losses, mainly around the gaskets.

ISO 10099 establishes the maximum loss allowed in a new cylinder (see table below):

Cylinder diameter	8-10-12	16-20-25	32-40-50	63-80-100	125-160-200
Loss (Nl/hour)	0.6	0.8	1.2	2	3

Metal Work's own standards are more rigorous than ISO standards, but air loss still occurs.

Strokes exceeding the maximum value specified in the catalogue

Metal Work can supply cylinders with strokes greater than those specified in the catalogue, considering the production technological limits. The Metal Work Sales Department can provide you with full details. However, it is up to the end user to use these special cylinders properly, by guiding the piston rod, avoiding peak loads, etc.

Magnetic sensors

The magnetic field generated by permanent magnets housed in the piston assembly changes in shape and intensity depending on the presence of magnetic metal masses in the vicinity of the cylinder. These masses may prevent the sensors from switching correctly, in which case non-magnetic materials should be used. In particular, the tie rods of short-stroke and compact cylinders should preferably be made of stainless steel.

CALCULATING PEAK LOAD ON THE PISTON ROD

During operation, the piston rod of the cylinder behaves like a rod subjected to peak load (bending + compression).

In the case of long strokes, it is necessary to make sure the diameter of the piston rod is correct for the load applied and the type of cylinder and piston rod mounting. The following formulae can be used to do this.

A. Calculating the maximum force with a given stroke and piston rod diameter:

$$F \leq \frac{20.350 \cdot \varnothing^4}{C^2 \cdot K^2}$$

B. Calculating the minimum acceptable piston rod diameter with a given stroke and force:

$$S \geq \sqrt[4]{\frac{F \cdot C^2 \cdot K^2}{20.350}}$$

Where:

- F Force applied [N]
- ∅ Diameter of the piston rod [mm]
- C Stroke [mm]
- K Free length coefficient depending on the mounting – see diagrams

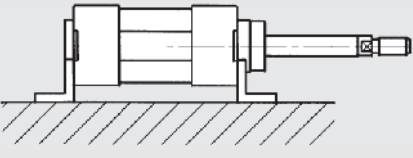
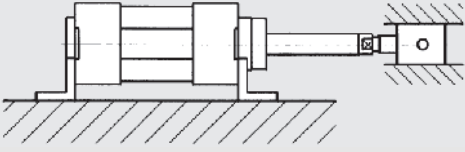
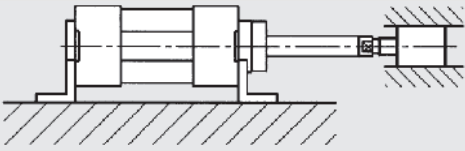
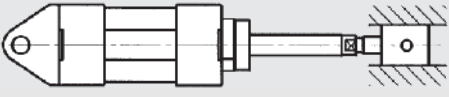
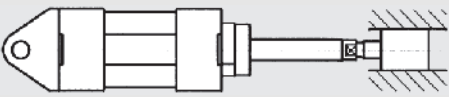
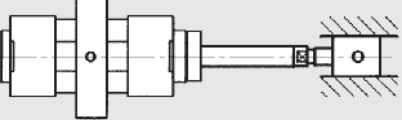
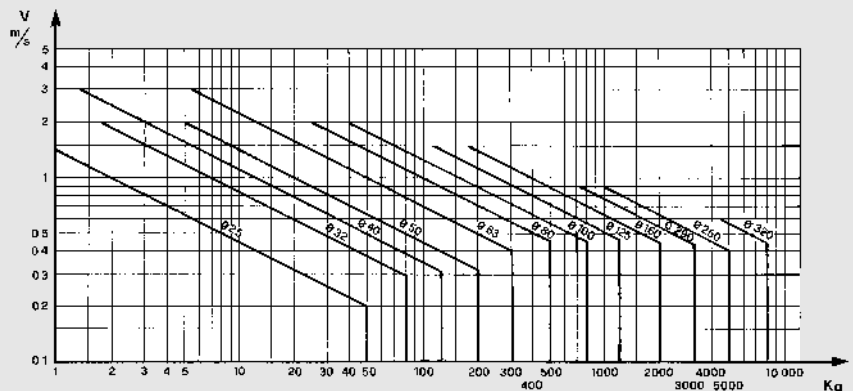
CONSTRAINT	K
	2
	0.7
	0.5
	2
	1
	1.5

CHART OF SPEED / MAXIMUM ABSORBABLE LOAD

For the cylinder to reach the end-of-stroke position without suffering damaging impact due to intensity and repetition, it is necessary to annul the kinetic energy of the moving mass and the relative work generated. The maximum absorbable load depends on the transference speed and the absorption capacity of the standard pneumatic cushion in the various cylinders. The chart gives the speed and absorbable mass in various diameters at a pressure of 6 bar, under the best regulation conditions and in a horizontal direction.



CONSUMPTION OF AIR IN THE CYLINDERS

Cylinder bore D mm	Piston rod diameter d mm	Motion	Useful area cm ²	Air consumption during thrust and traction in Nl/cm of stroke, depending on the working pressure P in bar at 20°C									
				1 bar	2 bar	3 bar	4 bar	5 bar	6 bar	7 bar	8 bar	9 bar	10 bar
12	4	thrust	1.13	0.0023	0.0034	0.0045	0.0057	0.0068	0.0079	0.0090	0.0102	0.0113	0.0124
		traction	1.00	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0110
16	6	thrust	2.01	0.0040	0.0060	0.0080	0.0100	0.0121	0.0141	0.0161	0.0181	0.0202	0.0221
		traction	1.73	0.0035	0.0052	0.0069	0.0086	0.0104	0.0121	0.0138	0.0156	0.0173	0.0190
20	8	thrust	3.14	0.0063	0.0094	0.0126	0.0157	0.0188	0.0220	0.0251	0.0283	0.0314	0.0346
		traction	2.64	0.0053	0.0079	0.0106	0.0132	0.0158	0.0185	0.0211	0.0238	0.0264	0.0290
25	12	thrust	4.91	0.0098	0.0147	0.0196	0.0245	0.0295	0.0344	0.0393	0.0442	0.0491	0.0540
		traction	3.78	0.0076	0.0113	0.0151	0.0189	0.0227	0.0264	0.0302	0.0340	0.0378	0.0415
32	12	thrust	8.04	0.016	0.024	0.032	0.040	0.048	0.056	0.064	0.072	0.080	0.088
		traction	6.91	0.014	0.021	0.028	0.035	0.042	0.049	0.058	0.063	0.070	0.076
40	16	thrust	12.56	0.025	0.038	0.050	0.063	0.076	0.088	0.100	0.113	0.126	0.138
		traction	10.55	0.021	0.032	0.042	0.053	0.063	0.074	0.088	0.095	0.106	0.116
50	20	thrust	19.63	0.039	0.059	0.079	0.098	0.118	0.137	0.157	0.177	0.196	0.216
		traction	16.49	0.033	0.050	0.066	0.082	0.099	0.115	0.132	0.149	0.165	0.181
63	20	thrust	31.16	0.062	0.093	0.125	0.156	0.187	0.218	0.249	0.280	0.312	0.343
		traction	28.02	0.056	0.084	0.112	0.140	0.168	0.196	0.224	0.252	0.280	0.308
80	25	thrust	50.24	0.100	0.150	0.200	0.250	0.301	0.351	0.402	0.452	0.502	0.552
		traction	45.36	0.091	0.138	0.181	0.227	0.272	0.318	0.363	0.408	0.454	0.500
100	32	thrust	78.54	0.157	0.238	0.314	0.382	0.471	0.549	0.628	0.706	0.785	0.862
		traction	70.50	0.141	0.211	0.282	0.352	0.423	0.493	0.564	0.635	0.705	0.775
125	32	thrust	122.66	0.245	0.368	0.490	0.613	0.736	0.859	0.981	1.104	1.226	1.349
		traction	114.67	0.229	0.344	0.459	0.573	0.688	0.803	0.917	1.032	1.147	1.262
160	40	thrust	201.06	0.402	0.603	0.804	1.005	1.206	1.407	1.608	1.809	2.010	2.211
		traction	188.49	0.377	0.565	0.754	0.942	1.130	1.319	1.508	1.696	1.884	2.073
200	40	thrust	314.15	0.628	0.942	1.257	1.571	1.885	2.199	2.513	2.827	3.145	3.456
		traction	301.59	0.603	0.905	1.206	1.508	1.810	2.111	2.413	2.714	3.016	3.318

FORCE OF SPRINGS IN SINGLE-ACTING CYLINDERS (THEORETICAL)

ISO 15552 SINGLE-ACTING CYLINDERS			
Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
32	63	250	35
40	88	250	51
50	102	250	64
63	102	250	64

SSC SINGLE-ACTING CYLINDERS			
Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
12	6	25	1.5
16	7	25	3
20	12	25	4
25	14	25	5
32	33	50	6
40	45	50	15
50	70	50	20
63	81	50	25

ISO 6432 SINGLE-ACTING CYLINDERS			
Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
8	3	50	1
10	5	50	1
12	7	50	3
16	20	50	5
20	22	50	12
25	28	50	17

ROUND SINGLE-ACTING CYLINDERS			
Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
32	86	250	34
40	95	250	50
50	108	250	62

$$P = P_1 + \frac{(P_2 - P_1)}{C_{max}} \cdot C_x$$

- P₁ = Force with spring extended
- P₂ = Force with spring compressed
- C_x = Required stroke
- C_{max} = Max stroke

SINGLE-ACTING CARTRIDGE CYLINDERS			
Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
6	3.7	5	-
10	7.8	5	-
16	7.2	5	-
6	3.9	10	-
10	9.6	10	-
16	13.3	10	-
6	3.9	15	-
10	9.1	15	-
16	13.3	15	-

FORCES GENERATED DURING THRUST AND TRACTION (THEORETICAL)

Cylinder bore D mm	Piston rod diameter d mm	Motion	Useful area cm ²	Thrust and traction force in daN depending on the operating pressure in bar									
				1 bar	2 bar	3 bar	4 bar	5 bar	6 bar	7 bar	8 bar	9 bar	10 bar
8	4	thrust	0.50	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
		traction	0.38	0.4	0.8	1.1	1.5	1.9	2.3	2.6	3.0	3.4	3.8
10	4	thrust	0.79	0.8	1.6	2.4	3.1	3.9	4.7	5.5	6.3	7.1	7.9
		traction	0.66	0.7	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	6.6
12	6	thrust	1.13	1.1	2.3	3.4	4.5	5.7	6.8	7.9	9.0	10.2	11.3
		traction	0.85	0.8	1.7	2.5	3.4	4.2	5.1	5.9	6.8	7.6	8.5
16	6	thrust	2.01	2.0	4.0	6.0	8.0	10.1	12.1	14.1	16.1	18.1	20.1
		traction	1.73	1.7	3.5	5.2	6.9	8.6	10.4	12.1	13.8	15.6	17.3
16	8	thrust	2.01	2.0	4.0	6.0	8.0	10.1	12.1	14.1	16.1	18.1	20.1
		traction	1.51	1.5	3.0	4.5	6.0	7.5	9.0	10.6	12.1	13.6	15.1
20	8	thrust	3.14	3.1	6.3	9.4	12.6	15.7	18.8	22.0	25.1	28.3	31.4
		traction	2.64	2.6	5.3	7.9	10.6	13.2	15.8	18.5	21.1	23.8	26.4
20	10	thrust	3.14	3.1	6.3	9.4	12.6	15.7	18.8	22.0	25.1	28.3	31.4
		traction	2.36	2.4	4.7	7.1	9.4	11.8	14.1	16.5	18.8	21.2	23.6
25	8	thrust	4.91	4.9	9.8	14.7	19.6	24.5	29.5	34.4	39.3	44.2	49.1
		traction	4.41	4.4	8.8	13.2	17.6	22.0	26.4	30.8	35.2	39.7	44.1
25	10	thrust	4.91	4.9	9.8	14.7	19.6	24.5	29.5	34.4	39.3	44.2	49.1
		traction	4.12	4.1	8.2	12.4	16.5	20.6	24.7	28.9	33.0	37.1	41.2
32	12	thrust	8.04	8.0	16.1	24.1	32.2	40.2	48.3	56.3	64.3	72.4	80.4
		traction	6.91	6.9	13.8	20.7	27.6	34.6	41.5	48.4	55.3	62.2	69.1
40	12	thrust	12.57	12.6	25.1	37.7	50.3	62.8	75.4	88.0	100.5	113.1	125.7
		traction	11.44	11.4	22.9	34.3	45.7	57.2	68.6	80.0	91.5	102.9	114.4
40	16	thrust	12.57	12.6	25.1	37.7	50.3	62.8	75.4	88.0	100.5	113.1	125.7
		traction	10.56	10.6	21.1	31.7	42.2	52.8	63.3	73.9	84.4	95.0	105.6
50	16	thrust	19.63	19.6	39.3	58.9	78.5	98.2	117.8	137.4	157.1	176.7	196.3
		traction	17.62	17.6	35.2	52.9	70.5	88.1	105.7	123.4	141.0	158.6	176.2
50	20	thrust	19.63	19.6	39.3	58.9	78.5	98.2	117.8	137.4	157.1	176.7	196.3
		traction	16.49	16.5	33.0	49.5	66.0	82.5	99.0	115.5	131.9	148.4	164.9
63	16	thrust	31.17	31.2	62.3	93.5	124.7	155.9	187.0	218.2	249.4	280.6	311.7
		traction	29.16	29.2	58.3	87.5	116.6	145.8	175.0	204.1	233.3	262.5	291.6
63	20	thrust	31.17	31.2	62.3	93.5	124.7	155.9	187.0	218.2	249.4	280.6	311.7
		traction	28.03	28.0	56.1	84.1	112.1	140.2	168.2	196.2	224.2	252.3	280.3
80	20	thrust	50.27	50.3	100.5	150.8	201.1	251.3	301.6	351.9	402.1	452.4	502.7
		traction	47.12	47.1	94.2	141.4	188.5	235.6	282.7	329.9	377.0	424.1	471.2
80	25	thrust	50.27	50.3	100.5	150.8	201.1	251.3	301.6	351.9	402.1	452.4	502.7
		traction	45.36	45.4	90.7	136.1	181.4	226.8	272.1	317.5	362.9	408.2	453.6
100	25	thrust	78.54	78.5	157.1	235.6	314.2	392.7	471.2	549.8	628.3	706.9	785.4
		traction	73.63	73.6	147.3	220.9	294.5	368.2	441.8	515.4	589.0	662.7	736.3
125	32	thrust	122.72	122.7	245.4	368.2	490.9	613.6	736.3	859.0	981.7	1104.5	1227.2
		traction	114.68	114.7	229.4	344.0	458.7	573.4	688.1	802.7	917.4	1032.1	1146.8
160	40	thrust	201.06	201.1	402.1	603.2	804.2	1005.3	1206.4	1407.4	1608.5	1809.6	2010.6
		traction	188.50	188.5	377.0	565.5	754.0	942.5	1131.0	1319.5	1508.0	1696.5	1885.0
200	40	thrust	314.16	314.2	628.3	942.5	1256.6	1570.8	1885.0	2199.1	2513.3	2827.4	3141.6
		traction	301.59	301.6	603.2	904.8	1206.4	1508.0	1809.6	2111.1	2412.7	2714.3	3015.9

WEIGHT OF CYLINDERS

Micro-cylinder series ISO 6432				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
8	40	0.234	55	0.334
10	41	0.257	59	0.371
12	77	0.419	111	0.635
16	93	0.491	133	0.708
20	181	0.732	233	1.121
25	241	1.100	334	1.722

Micro-cylinder ISO 6432 series TP				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
16	66	0.377	101	0.604
20	94	0.628	131	1.03
25	144	0.908	207	1.536

Short-stroke cylinder series SSCY								
Ø	Single-rod		Through-rod		Non-rotating		Oscillating	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
12	45	1.24	52	1.47	64	1.35	-	-
16	63	1.65	72	2.05	88	1.6	-	-
20	91	2.14	104	2.75	126	2.37	-	-
25	144	3.04	167	3.65	189	3.25	-	-
32	185	4.14	200	4.72	260	4.56	272	4.14
40	275	5.05	295	5.94	373	5.49	386	5.05
50	412	7.09	437	8.9	592	7.89	620	7.09
63	587	9.32	621	10.91	854	10.57	889	9.32
80	393	14.41	1485	16.9	1740	25.87	-	-
100	673	21.94	2841	25.9	2692	30.77	-	-

Compact cylinder series CMPC								
Ø	Single-rod		Through-rod		Non-rotating		Through-rod non-rotating	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
12	96	1.59	104	1.82	105	1.90	114	2.12
16	105	1.51	124	1.90	109	1.81	129	2.20
20	171	2.35	204	2.95	181	2.78	214	3.39
25	201	2.73	233	3.32	220	3.15	252	3.76
32	246	3.17	282	4.05	306	3.96	343	4.84
40	370	4.41	408	5.29	457	5.20	495	6.08
50	552	6.42	605	7.98	709	7.64	768	9.21
63	779	7.34	656	8.90	977	8.56	1054	10.13
80	1468	12.57	1624	15.02	1851	14.33	2027	16.78
100	2988	16.11	3100	19.93	3710	17.87	3850	21.70

Cylinder series ISO 15552, ISO 15552 TWO-FLAT				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	433	2.2	494	3.09
40	660	3.15	783	4.73
50	1087	4.57	1348	7.04
63	1443	5.03	1718	7.44
80	2815	7.49	3260	10.16
100	3897	8.79	4425	12.33
125	6988	13.42	8040	18
160	12979	22.92	13800	30
200	17000	28	18000	39

Cylinder series ISO 15552 type A, ISO 15552 type A TWO-FLAT				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	460	3.09	576	3.98
40	716	4.08	916	5.66
50	1155	5.86	1513	8.33
63	1524	5.92	1945	8.33
80	2886	9.07	3520	11.74
100	3965	9.48	4779	13.02
125	7093	14.11	8642	18.69

Cylinder ISO 15552 series 3				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	434	2.30	495	3.19
40	660	3.22	783	4.80
50	1079	4.50	1340	6.97
63	1427	4.78	1702	7.24
80	2774	6.73	3219	10.58
100	3836	7.726	4364	11.58
125	6529	11.63	7581	17.94

Cylinder ISO 15552 Ultra-low frictions		
Ø	Single-rod	
	Weight [g] Stroke = 0	Weight [g] each mm
32	504	1.64
40	774	2.09
50	1245	3.02
63	1697	3.36

Round cylinder series RNDC				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	404	1.44	455	2.04
40	660	1.58	808	3.14
50	1235	3.59	1507	6.03

Compact cylinder series CMPC TWO-FLAT				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	261	3.17	297	4.05
40	394	4.41	432	5.29
50	595	6.42	648	7.98
63	845	7.34	129	8.90
80	1524	12.57	1680	15.02

ISO 21287 cylinder series LINER				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
20	98	2.49	110	3.10
25	119	2.63	133	3.24
32	182	3.62	197	4.50
40	228	4.09	243	4.98
50	330	5.67	355	7.25
63	461	6.52	487	8.10
80	991	10.11	1066	12.58
100	1869	13.78	2029	17.63

Twin-rod cylinder series TWNC				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	725	2.57	790	3.79
40	945	2.81	1065	4.03
50	1499	3.96	1737	5.72
63	2360	5.72	2628	8.85
80	4300	9.59	4730	15.52
100	6270	10.89	6775	16.8

Rodless cylinder								
Ø	Standard		Series Double		with Guide		with Guide "V"	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
16	244	0.86	561	1.72	460	1.79	-	-
25	746	1.79	1607	3.58	1.421	2.99	953	1.98
32	1707	3.84	3737	7.68	3.025	5.04	2.150	3.21
40	2911	5.55	-	-	4.434	6.75	3.210	4.67
63 (Std)	7280	9.22	-	-	10.860	10.65	9.230	9.27
63 (Heavy)	-	-	-	-	13.275	14.02	-	-

Rodless cylinder series PU		
Ø	Weight [g] Stroke = 0	Weight [g] each mm
25	1009	2.54
32	1535	3.72
40	2702	4.78
50	4875	7.50

Rodless cylinder series MAGNETIC SLIDE		
Ø	Weight [g] Stroke = 0	Weight [g] each mm
16	490	0.262
20	795	0.325
25	1250	0.487

Guide unit				
Ø	Type GDS		Type GDH and GDM	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
12	150	0.78	374	0.78
16	150	0.78	374	0.78
20	420	1.22	759	1.22
25	420	1.22	759	1.22
32	772	1.76	1200	1.76
40	1000	1.76	2000	3.13
50	1900	3.13	3300	4.9
63	2300	3.13	4750	4.9
80	3800	4.9	8500	7.26
100	7000	4.9	12000	7.26

Compact guided cylinder				
Ø	Non-cushioned (approximate)		Cushioned (approximate)	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
16	295	4.77	414	4.77
20	486	6.38	543	6.38
25	550	10.01	735	10.01
32	942	16.51	1.354	16.51
40	1028	18.04	1.479	18.04
50	1355	23.76	1.949	23.76
63	1900	32.56	2.714	32.56
80	3910	55.77	-	-
100	5710	73.48	-	-

Compact Stopper cylinder		
Ø x Stroke	Trunnion version	Roller version
	Weight [g]	Weight [g]
20x15	210	220
32x20	420	460
50x30	1.190	1.300
80x30	-	4.500
80x40	-	4.750

ISO 6432 MINI-CYLINDERS SERIES STD

Mini-cylinders to ISO 6432 with a chamfered stainless steel barrel. The cylinder head dimensions have been reduced for some sizes so that they can be used where there are space restrictions. Can be used with different types of sensors.

Available in various versions with a wide range of accessories:

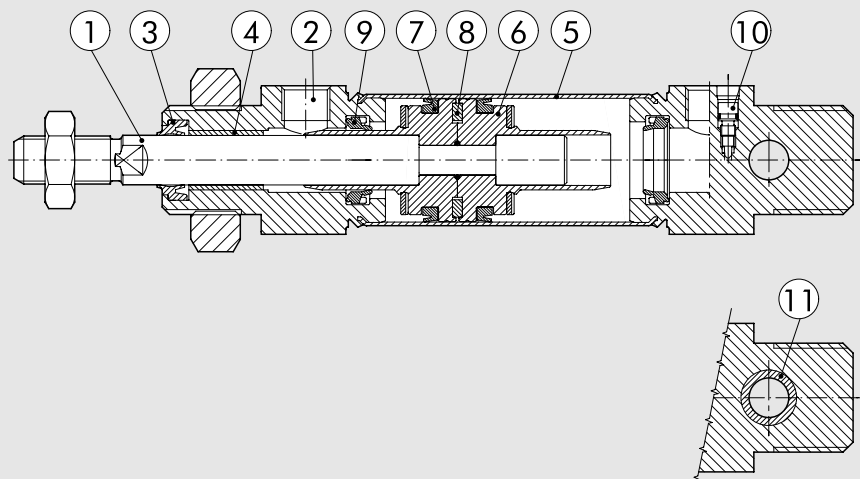
- with or without magnet
- single and double acting – single or through rod
- with pneumatic cushioning (Ø16-20-25)
- gaskets made of NBR, POLYURETHANE, and FKM/FPM (for high temperatures), and low-temperature gaskets
- special executions on request
- fixing accessories, guide units and mechanical rod locking



TECHNICAL DATA		Polyurethane	NBR	FKM/FPM			Low temperature
Max operating pressure	bar			10			
	MPa			1			
Temperature range	°C	-10 to +80	-10 to +80	-10 to +150 (non-magnetic cylinders)			-35 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous					
Bores	mm	8; 10; 12; 16; 20; 25					
Design		Chamfered barrel					
Standard strokes +	mm	Single-acting: for bores Ø 8 to 25 strokes from 1 to 50 Double-acting: for bores Ø 8 to 10 strokes from 1 to 100 for bores Ø 12 to 16 strokes from 1 to 200 for bores Ø 20 to 25 strokes from 1 to 500 Double-acting, cushioned: for bores Ø 16 strokes from 1 to 300 for bores Ø 20 to 25 strokes from 1 to 500					
Versions		Double-acting, Double-acting cushioned, Single-acting retracted piston rod, Through-rod, Through-rod cushioned, Version with piston rod block, no-stick slip					
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request.					
Inrush pressure		Ø 8	Ø 10	Ø 12	Ø 16	Ø 20	Ø 25
single piston rod	bar	0.8	0.8	0.8	0.6	0.6	0.6
through-rod	bar	1	1	1	0.8	0.8	0.8
Forces generated at 6 bar thrust/retraction		See page 1-7					
Weights		See page 1-8					
Notes		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air. + Maximum recommended strokes. Higher values can create operating problems					

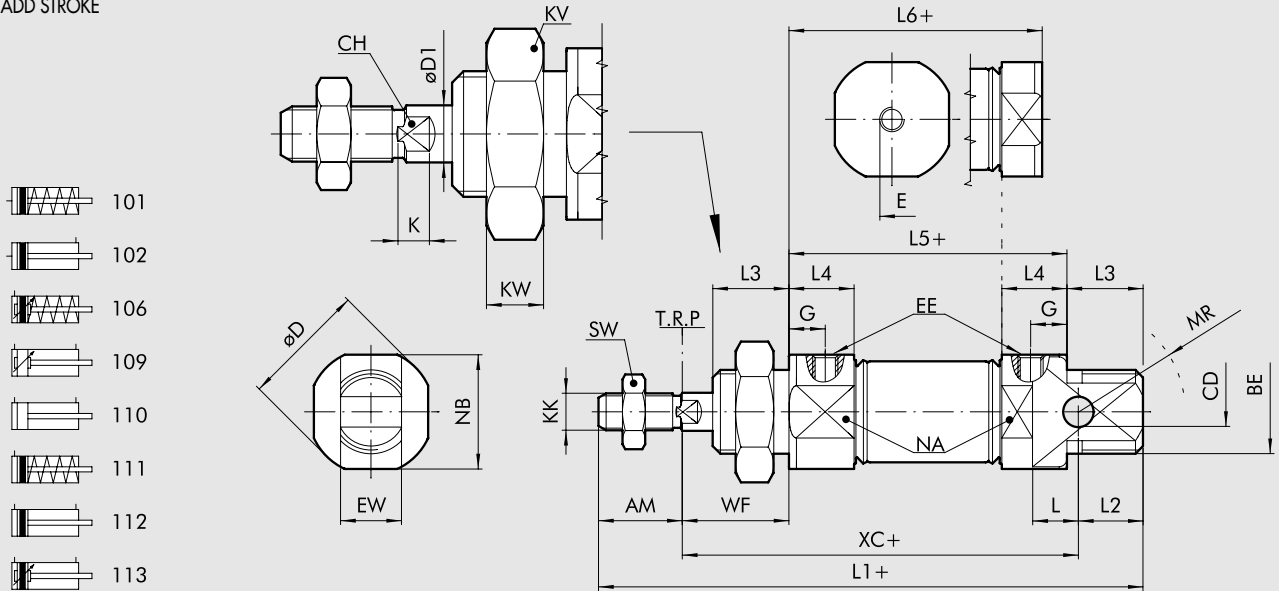
COMPONENTS

- 1 PISTON ROD: C45 steel or stainless steel, thick chromed
- 2 HEAD: anodised aluminium alloy
- 3 PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
- 4 GUIDE BUSHING: steel strip with bronze and PTFE insert
- 5 BARREL: AISI 304 steel
- 6 HALF-PISTON: acetal resin
- 7 PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
- 8 MAGNET: plasteodymium
- 9 CUSHIONING GASKET: NBR or FKM/FPM
- 10 NEEDLE: OT 58 with needle out movement safety system even when fully open
- 11 BUSHING (optional): self-lubricating bronze



DIMENSIONS OF STANDARD VERSIONS

+ = ADD STROKE

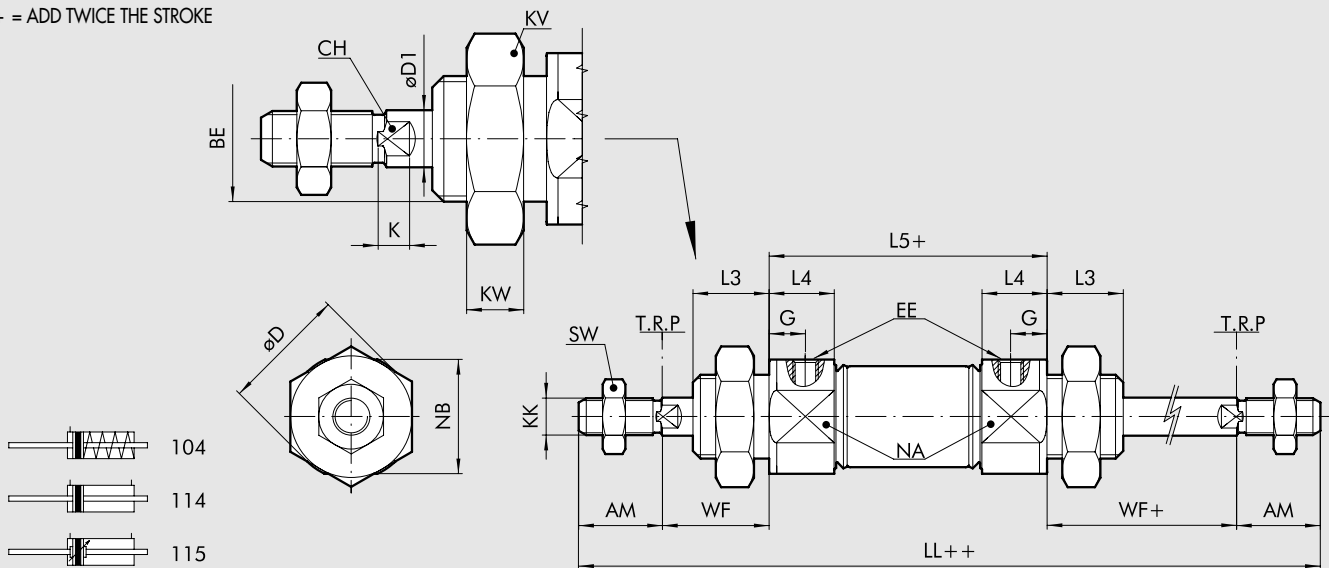


Ø	AM ^{+0.0;-2.0}	BE	øCD ^{H9}	øD	øD1	E	G	EE	EW ^{d13}	L	L1	L2	L3	L4	L5	L6	KK	XC ^{±1}	WF ^{±1,2}	KW	KV	MR	NA	NB	SW	CH	K
8	12	M12x1.25	4	16.7	4	M5	6	M5	8	6.5	86	10	12	10	46	46	M4	64	16	7	19	12	15	15	7	3	3
10	12	M12x1.25	4	16.7	4	M5	6	M5	8	6.5	86	10	12	10	46	46	M4	64	16	7	19	12	15	15	7	3	3
12	16	M16x1.5	6	19	6	M5	6	M5	12	9	104	13	17	10	49	47	M6	75	22	8	24	16	17	17	10	5	3.5
16	16	M16x1.5	6	19.7	6	1/8	6	M5	12	9	111	13	17	10	56	53	M6	82	22	8	24	16	18	18	10	5	3.5
20	20	M22x1.5	8	27.9	8	1/8	8	G 1/8	16	12	129	14	17	15.5	68	61	M8	95	24	7	32	18	24	24	13	7	4.6
25	22	M22x1.5	8	33	10	1/8	9	G 1/8	16	12	143	17	20	17.1	73	66.5	M10x1.25	104	28	7	32	21	30	30	17	8	5

DIMENSIONS OF STANDARD VERSIONS WITH THROUGH-ROD

+ = ADD STROKE

++ = ADD TWICE THE STROKE



Ø	AM ^{+0.0;-2.0}	BE	øD	øD1	G	EE	LL	L3	L4	L5	KK	WF ^{±1,2}	KW	KV	NA	NB	SW	CH	K
8	12	M12x1.25	16.7	4	6	M5	102	12	10	46	M4	16	7	19	15	15	7	3	3
10	12	M12x1.25	16.7	4	6	M5	102	12	10	46	M4	16	7	19	15	15	7	3	3
12	16	M16x1.5	19	6	6	M5	125	17	10	49	M6	22	8	24	17	17	10	5	3.5
16	16	M16x1.5	19.7	6	6	M5	132	17	10	56	M6	22	8	24	18	18	10	5	3.5
20	20	M22x1.5	27.9	8	8	G 1/8	156	17	15.5	68	M8	24	7	32	24	24	13	7	4.6
25	22	M22x1.5	33	10	9	G 1/8	173	20	17.1	73	M10x1.25	28	7	32	30	30	17	8	5

KEY TO CODES

CYL	1 1 2 TYPE	0	16 BORE	0020 STROKE	C MATERIAL	P GASKETS				
	101 SE axial coupling	0 Standard	▼ 08	For the maximum suppliable strokes, look at the technical data	A C45 chrome rod, aluminium piston rod	P Polyurethane				
	102 DEM axial coupling	U Bronze rear head bushing	▼ 10		For the maximum suppliable strokes, look at the technical data	C C45 chrome rod, technopolymer piston rod	N NBR			
	104 SE through-rod	V Without head nut	▼ 12			For the maximum suppliable strokes, look at the technical data	Z Stainless steel piston rod and nut	● V FKM/FPM		
■	106 SE cushioned	S Non-magnetic	16				For the maximum suppliable strokes, look at the technical data	X Stainless steel piston rod and nut	● B Low temperature	
■	109 DEA	▲ G No stick slip	20					For the maximum suppliable strokes, look at the technical data		
	110 DE		25						For the maximum suppliable strokes, look at the technical data	
	111 SE			For the maximum suppliable strokes, look at the technical data						
	112 DEM				For the maximum suppliable strokes, look at the technical data					
■	113 DEMA					For the maximum suppliable strokes, look at the technical data				
* ▼	114 DEM through-rod						For the maximum suppliable strokes, look at the technical data			
* ▼ ■	115 DEMA through-rod							For the maximum suppliable strokes, look at the technical data		
◆	116 DEM for mechanical lock								For the maximum suppliable strokes, look at the technical data	
■	117 DEMA for mechanical lock			For the maximum suppliable strokes, look at the technical data						

DE: Double-acting (non-cushioned, not magnetic)
 DEM: Magnetic double-acting (non-cushioned)
 DEMA: Magnetic double-acting (cushioned)
 DEA: Cushioned double-acting (non-magnetic)
 SE: Single-acting (magnetic)

- Only available for non-magnetic versions (S) and with aluminium piston (A or Z)
- ▲ For speeds lower than 0.2m/s, to prevent surging. Use no-lubricated air only
- ▼ Stainless steel piston rod
- Available from Ø 16
- ◆ Available from Ø 12
- * For Ø16 to 25 aluminium piston, stainless steel piston rod

NOTES

ISO 6432 MINI-CYLINDERS SERIES TP

Minicylinders manufactured according to the ISO 6432 regulation having high resistance technopolymer heads and anodized aluminium liner.

Available in various versions with a wide range of accessories:

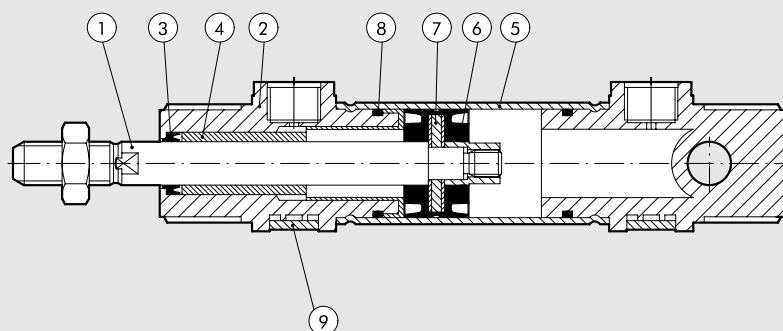
- with or without magnet
- single and double acting-single or through rod
- gaskets made of POLYURETHANE
- fixing accessories and guide units.



TECHNICAL DATA		POLYURETHANE					
Max operating pressure	bar	10					
	MPa	1					
Temperature range	°C	-10 to +60					
Fluid		Unlubricated air. Lubrication, if used, must be continuous					
Bores	mm	16; 20; 25					
Design		Aluminium liner chamfered on the heads					
Standard strokes +	mm	Ø 16: from 1 to 200					
	mm	Ø 20 to 25: from 1 to 500					
Versions		Double-acting, Double Through-rod (for both there are magnetic and non magnetic versions)					
Forces generated at 6 bar thrust/retraction		See page 1-7					
Weights		See page 1-8					
Inrush pressure	bar	Ø 8	Ø 10	Ø 12	Ø 16	Ø 20	Ø 25
		0.8	0.8	0.8	0.6	0.6	0.6
through-rod	bar	1	1	1	0.8	0.8	0.8
Notes		The standard version is lacking of the head nut					
		Use of fittings with a taper thread is NOT recommended.					
		+ Maximum recommended strokes. Higher values can create operating problems.					

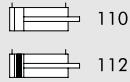
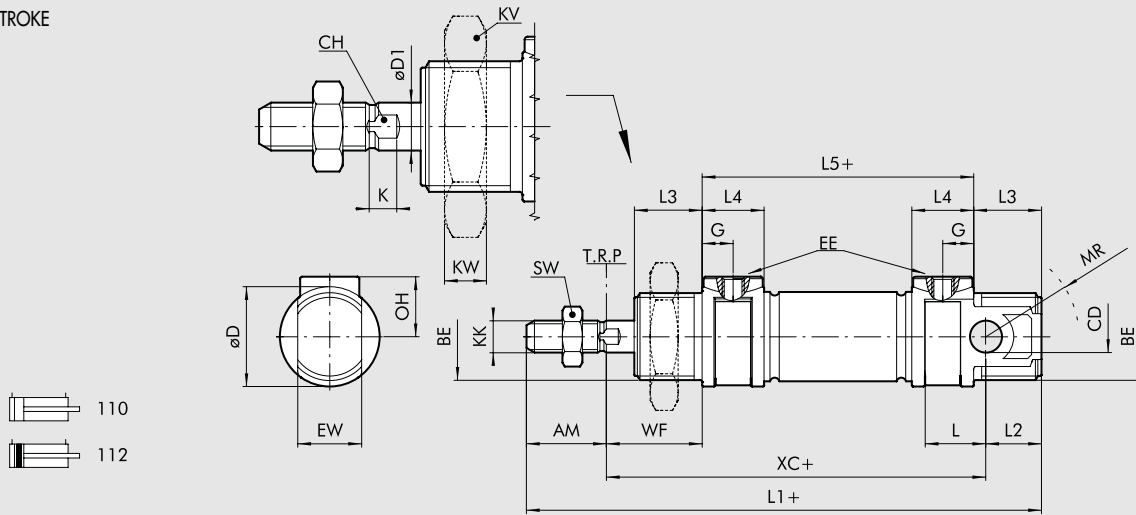
COMPONENTS

- ① PISTON ROD: C45 steel or stainless steel, thick chromed
- ② HEADS: high resistance technopolymer
- ③ PISTON ROD GASKET: polyurethane
- ④ GUIDE OPERATOR: technopolymer
- ⑤ BARREL: drawn anodized aluminium alloy
- ⑥ PISTON GASKET: polyurethane
- ⑦ MAGNET: neodymium
- ⑧ STATIC O-RINGS: NBR
- ⑨ COVER PLATE: technopolymer



DIMENSIONS OF STANDARD VERSIONS

+ = ADD STROKE



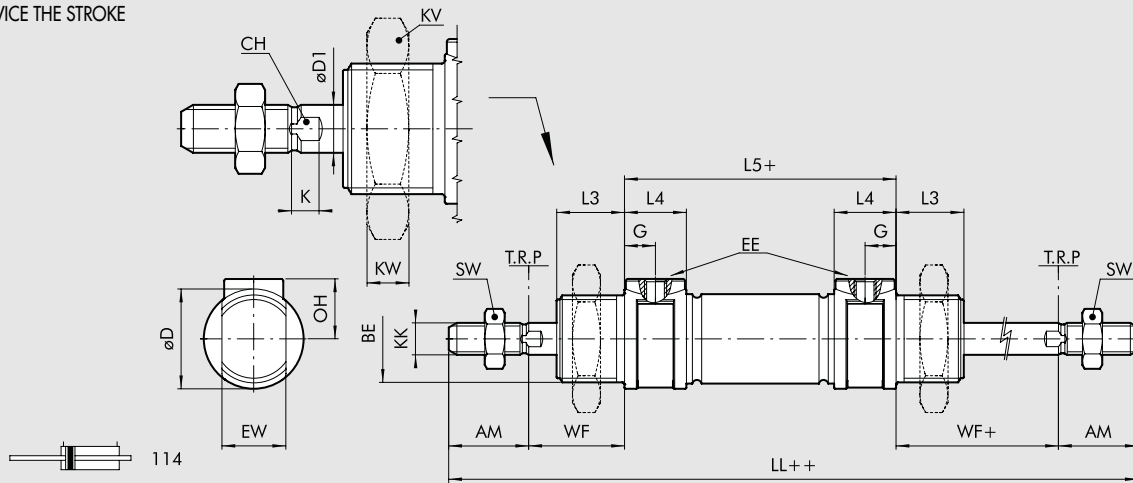
MAX LOCKING TORQUE [Nm]

Ø	AM	BE	CD (H9)	øD	øD1	G	EE	EW (d13)	OH	L	L1	L2	L3	L4	L5	KK	XC(±1)	WF	KW	KV	MR	SW	CH	K	Ø	BE (front/rear)	EE
16	16	M16x1.5	6	21	6	4.7	M5	12	12	11	111	13	17	9.5	56	M6	82	22	8	24	16	10	5	3.5	16	12/8	1.2
20	20	M22x1.5	8	25	8	7.7	1/8"	16	16	15	129	14	17	15.5	68	M8	95	24	7	32	18	13	7	4.6	20	22/15	3
25	22	M22x1.5	8	30	10	7.7	1/8"	16	17	15	143	17	20	15.5	73	M10x1.25	104	28	7	32	21	17	8	5.5	25	22/15	3

DIMENSIONS OF STANDARD VERSIONS WITH THROUGH-ROD

+ = ADD STROKE

++ = ADD TWICE THE STROKE



MAX LOCKING TORQUE [Nm]

Ø	AM	BE	øD	øD1	G	EE	OH	LL	L3	L4	L5	KK	WF	KW	KV	SW	CH	K	Ø	BE	EE
16	16	M16x1.5	21	6	4.7	M5	12	132	17	9.5	56	M6	22	8	24	10	5	3.5	16	12	1.2
20	20	M22x1.5	25	8	7.7	1/8"	16	156	17	15.5	68	M8	24	7	32	13	7	4.6	20	22	3
25	22	M22x1.5	30	10	7.7	1/8"	17	173	20	15.5	73	M10x1.25	28	7	32	17	8	5.5	25	22	3

KEY TO CODES

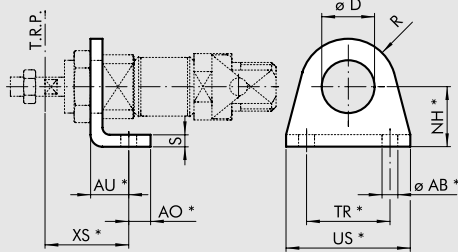
CYL	110	3	16	0	020	C	P
	TYPE		BORE		STROKE	MATERIAL	GASKETS
110	DE non-magnetic minicylinder	● 3 TP heads (standard)	■ 16	0 Standard	For the maximum suppliable strokes, look at the technical data	C C45 chrome rod X Stainless rod	P Polyurethane
112	DEM minicylinder	● 4 TP heads (standard) + head nut	■ 20 ■ 25	S Non-magnetic			
114	DEM through-rod minicylinder						

DE: Double-acting (non-cushioned, not magnetic).
 DEM: Double action magnetic (unless otherwise specified) not cushioned.

As standard the cylinders are already no stick-slip version.
 ● This version don't provide the nut on the head.
 ■ Ø 16 will be only in version with stainless rod (X).

ACCESSORIES FOR ISO 6432 MINI-CYLINDERS: FIXINGS

FOOT MODEL A

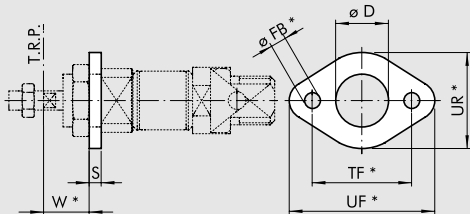


Code	Ø	Ø D	XS ±1.4	AU	AO	NH ±0.3	TR J ^{s14}	US	Ø AB H ¹³	R	S	Weight [g]
W0950080001	8	12	24	11	5	16	25	35	4.5	10	3	22
W0950080001	10	12	24	11	5	16	25	35	4.5	10	3	22
W0950120001	12	16	32	14	6	20	32	42	5.5	13	4	42
W0950120001	16	16	32	14	6	20	32	42	5.5	13	4	42
W0950200001	20	22	36	17	8	25	40	54	6.5	20	5	90
W0950200001	25	22	40	17	8	25	40	54	6.5	20	5	90

*ISO 6432 values

Note: Individually packed

FLANGE MODEL C

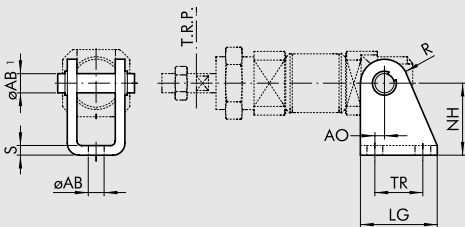


Code	Ø	Ø D	W ±1.4	Ø FB H ¹³	TF J ^{s14}	UF	UR	S	Weight [g]
W0950080002	8	12	13	4.5	30	40	22	3	10
W0950080002	10	12	13	4.5	30	40	22	3	10
W0950120002	12	16	18	5.5	40	52	30	4	26
W0950120002	16	16	18	5.5	40	52	30	4	26
W0950200002	20	22	19	6.5	50	66	40	5	52
W0950200002	25	22	23	6.5	50	66	40	5	52

*ISO 6432 values

Note: Individually packed

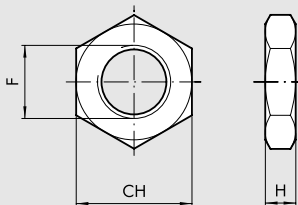
COUNTER-HINGE MODEL BC



Code	Ø	AO	LG	TR J ^{s13}	NH ±0.2	MO	Ø AB1	Ø AB H ¹³	R	S	Weight [g]
W0950080005	8	2.5	22	12.5	24	18	4	4.5	6	2.5	24
W0950080005	10	2.5	22	12.5	24	18	4	4.5	6	2.5	24
W0950120005	12	2	25	15	27	25	6	5.5	7	3	40
W0950120005	16	2	25	15	27	25	6	5.5	7	3	40
W0950200005	20	4	32	20	30	30	8	6.5	10	4	78
W0950200005	25	4	32	20	30	30	8	6.5	10	4	78

Note: Supplied complete with 1 pin and 2 snap rings

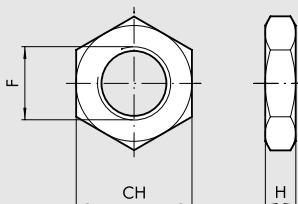
NUT FOR HEADS MODEL D



Code	Ø	F	CH	H	Weight [g]
0950080010	8	M12x1.25	19	7	12
0950080010	10	M12x1.25	19	7	12
0950120010	12	M16x1.5	24	8	20
0950120010	16	M16x1.5	24	8	20
0950200010	20	M22x1.5	32	7	44
0950200010	25	M22x1.5	32	7	44

Note: Individually packed

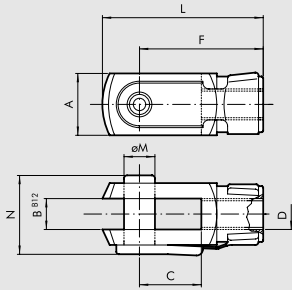
NUT FOR PISTON RODS MODEL DA



Code	Ø	F	CH	H	Weight [g]
0950080011	8	M4	7	3	0.6
0950080011	10	M4	7	3	0.6
0950120011	12	M6	10	4	1
0950120011	16	M6	10	4	1
0950200011	20	M8	13	5	3
0950322010	25	M10x1.25	17	6	7

Note: Individually packed

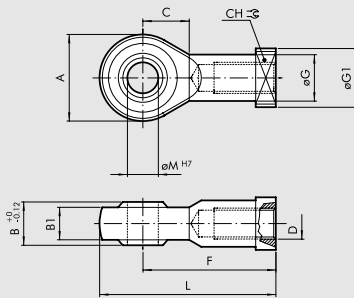
FORK MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0950080020	8	4	8	4	8	21	16	M4	11	8
W0950080020	10	4	8	4	8	21	16	M4	11	8
W0950120020	12	6	12	6	12	31	24	M6	16	20
W0950120020	16	6	12	6	12	31	24	M6	16	20
W0950200020	20	8	16	8	16	42	32	M8	22	48
W0950322020	25	10	20	10	20	52	40	M10x1.25	26	92

Note: Individually packed

ROD EYE MODEL GA-M

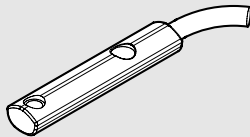


Code	Ø	øM	C	B	B1	A	L	F	D	øG	øG1	CH	Weight [g]
W0950080025	8	5	10	8	6	18	36	27	M4	9	11	9	22
W0950080025	10	5	10	8	6	18	36	27	M4	9	11	9	22
W0950120025	12	6	11	9	6.75	20	40	30	M6	10	13	11	28
W0950120025	16	6	11	9	6.75	20	40	30	M6	10	13	11	28
W0950200025	20	8	13	12	9	24	48	36	M8	12.5	16	14	50
W0950322025	25	10	15	14	10.5	28	57	43	M10x1.25	15	19	17	78

Note: Individually packed

ACCESSORIES FOR ISO 6432 MINI-CYLINDERS: MAGNETIC SENSORS

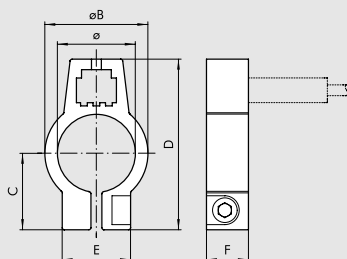
(E) RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
For technical data see page 1-288 Note: Individually packed

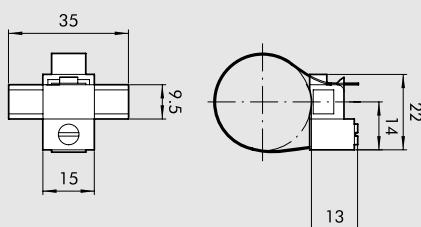
(F) SENSOR CIRCLIP MOD. DSW



Code	Bore	Model	Ø	øB	C	D	E	F
W0950000608	8	Circlip DSW - 08	9.3	12.3	11	24	12.3	9
W0950000610	10	Circlip DSW - 10	11.3	14.3	12	26	12.3	9
W0950000612	12	Circlip DSW - 12	13.3	16.3	13	28	12.3	9
W0950000616	16	Circlip DSW - 16	17.3	20.3	15.5	32	12.3	9
W0950000620	20	Circlip DSW - 20	21.3	24.3	17.5	36	14	9
W0950000625	25	Circlip DSW - 25	26.3	29.3	20	41.5	14	9

Note: Individually packed

(G) UNIVERSAL SENSOR CIRCLIP

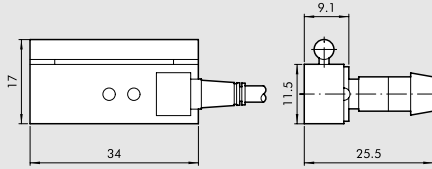


Code	Bore	Model
W0950001103	8 to 25	Sensor circlip

Note: Individually packed

MATERIAL
Circlip: stainless steel
Sensor holder: plastic

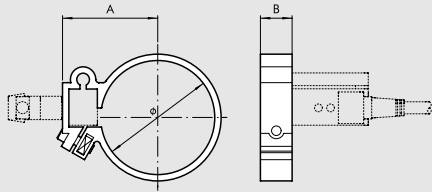
A SENSORS MOD. DSM



Code	Bore	Model
W0950000201	8 to 25	REED sensor DSM2 - C525 HS
W0950000222	8 to 25	HALL PNP sensor DSM3 - N225
W0950000232	8 to 25	HALL NPN sensor DSM3 - M225

For technical data see page 1-286
Note: Individually packed

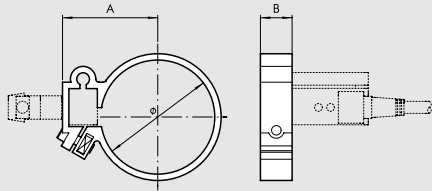
B SENSOR CIRCLIP MOD. DXF FOR STAINLESS STEEL BARREL



Code	Bore	Model	Ø	A	B
W0950000508	8	Circlip DXF - 09	9.3	15	10
W0950000510	10	Circlip DXF - 11	11.3	16.5	10
W0950000512	12	Circlip DXF - 13	13.3	17.5	10
W0950000516	16	Circlip DXF - 17	17.3	18.5	10
W0950000520	20	Circlip DXF - 21	21.3	21	10
W0950000525	25	Circlip DXF - 26	26.3	23.5	10

Note: Individually packed

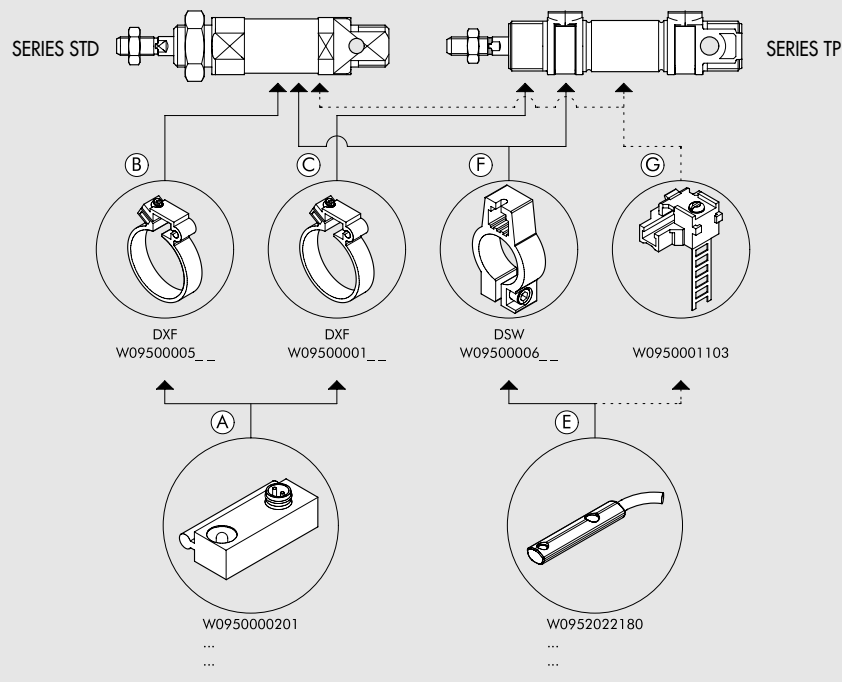
C SENSOR CIRCLIP MOD. DXF FOR ALUMINIUM BARREL



Code	Bore	Model	Ø	A	B
W0950000108	8	Circlip DXF 12- 8	12	17	10
W0950000110	10	Circlip DXF 14-10	14	18	10
W0950000112	12	Circlip DXF 16-12	16	19	10
W0950000116	16	Circlip DXF 20-16	20	21	10
W0950000120	20	Circlip DXF 24-20	24	23	10
W0950000125	25	Circlip DXF 29-25	29	28	10

Note: Individually packed. For the Ø16 in addition to the circlip 2 reduction rings, for the Ø20 and Ø25 1 reduction ring.

USE SENSORS



ACCESSORIES FOR ISO 6432 MINI-CYLINDERS: MECHANICAL PISTON ROD LOCK

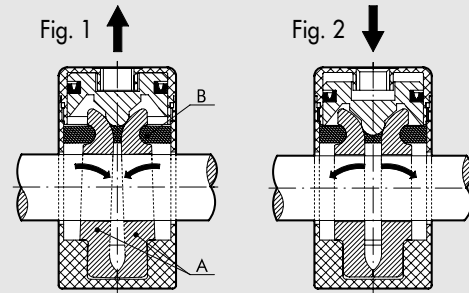
TECHNICAL DATA

Operating pressure	bar	3 to 6
	MPa	0.3 to 0.6
Temperature range	°C	-10 to +80
Installation		In any position
Mechanics		Double shoe with mechanical locking Mechanical stick-slip
Operation		NC bidirectional
Fluid		Lubricated or unlubricated compressed air
Locking force		Ø 12-16: 180 N / Ø 20: 250 N Ø 25: 400 N
Pilot port		M5
MATERIALS		
body		Aluminium
shoe		Brass
spring		NBR
piston		Synthetic, with added teflon®
gasket		NBR



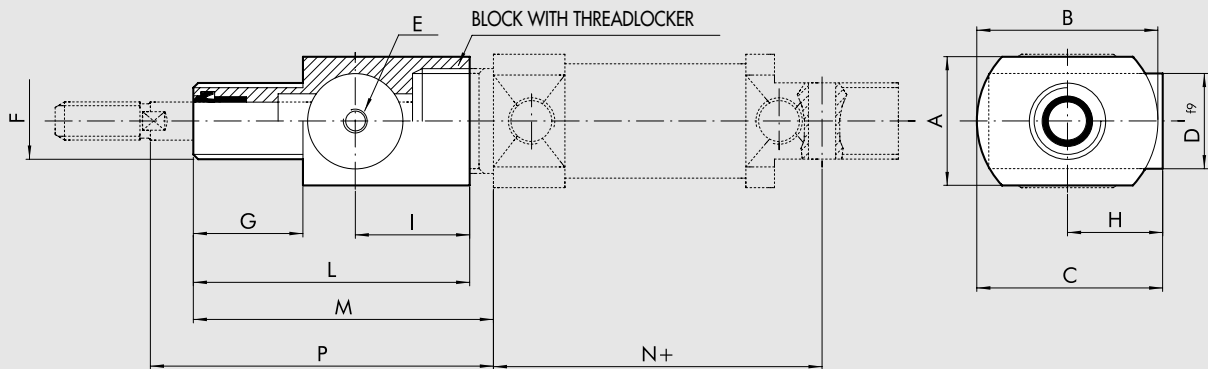
OPERATING PRINCIPLE

The mechanical piston rod lock is a normally-closed mechanism. In the absence of pneumatic piloting, the two shoes (A) lock the cylinder rod in both directions (Fig. 1). With pneumatic piloting, the piston rod guide forces the shoes to come right up to each other and overcome the counter spring (B) force and the piston rod can slide (Fig. 2). **It is important to remember that the mechanical piston rod lock is a static type, which means that it is necessary to stop the cylinder piston rod pneumatically before locking the part mechanically.**



DIMENSIONS

+ = ADD STROKE



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	P(±1.2)	Weight [g]
W5010001099	12	25	25	31.5	20	M5	M16x1.5	12	19	23	47	52	53	57	100
W5010001099	16	25	25	31.5	20	M5	M16x1.5	12	19	23	47	52	60	57	100
W5010001100	20	27	38	40	20	M5	M22x1.5	23	21	24	58	65	71	72	100
W5010001101	25	27	38	40	20	M5	M22x1.5	23	21	24	58	68	76	76	100

ACCESSORIES FOR ISO 6432 MINI-CYLINDERS: GUIDE UNIT

Guide units series DS-DH-DM ensure optimal alignment and anti-rotation effect of the pneumatic cylinder connected to it. The guide units can be used separately or combined in order to get complete handling units: in which case the guide units can be coupled using the type A and C anchorage (foot and flange).

The guide unit can be coupled to ISO 6432 cylinders (Ø 12 - Ø 25).

The following versions are available:

U PROFILE*: for limited loads and speeds (GDS)

H PROFILE*: for high loads (GDH)

H PROFILE**: for high speeds (GDM)

For weights, see technical data page 1-8



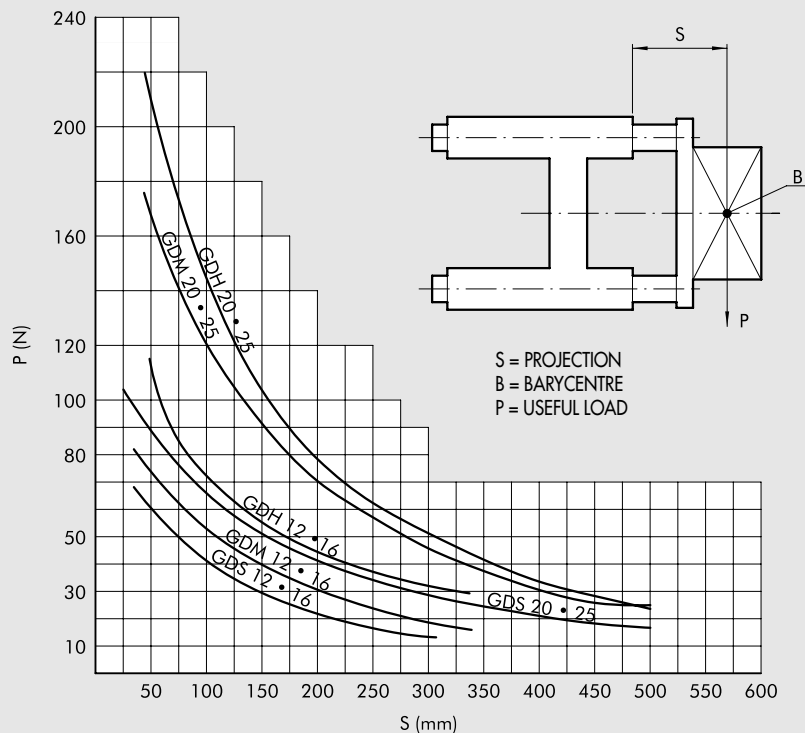
* With bronze guide bushing

** With ball guide bushing

GUIDE ELEMENTS

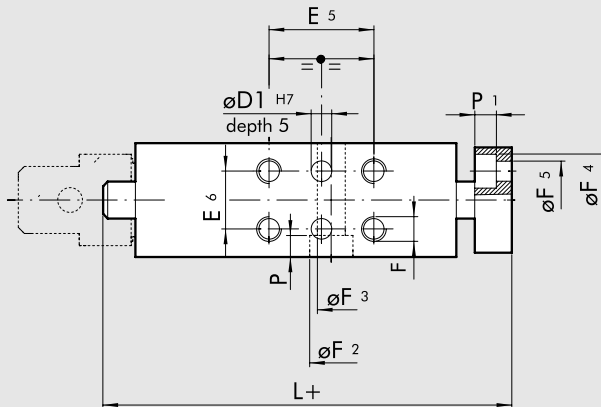
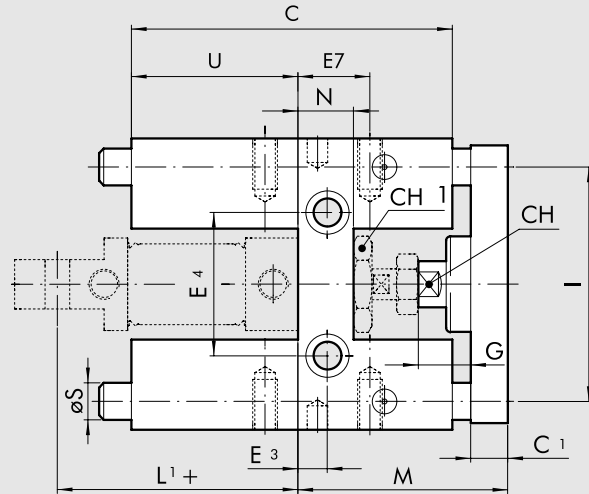
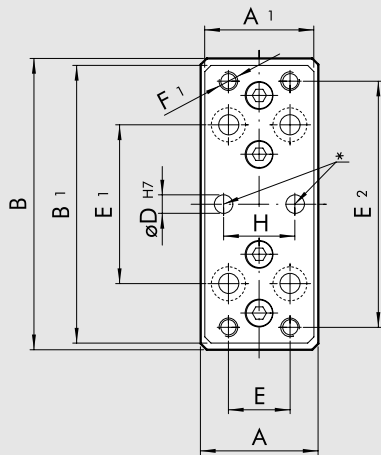
SERIES GDS-GDH	Body:	aluminium alloy
	Guide bushing:	self-lubricating sintered bronze and wiper rings
	Piston rod:	chromed rolled steel
SERIES GDM	Body:	aluminium alloy
	Guide bushing:	linear guide ball bearings and wiper rings
	Piston rod:	tempered and chromed steel

GUIDE UNIT LOAD DIAGRAM



DIMENSIONS OF TYPE GDH-GDM

+ = ADD THE STROKE
 * = CENTERING PINHOLES



Ø	A	A ₁	B	B ₁	C	C ₁	Ch	Ch ₁	D	D ₁	E	E ₁	E ₂	E ₃	E ₄	E ₅	E ₆	E ₇	F	F ₁	F ₂	F ₃	F ₄	F ₅	G	H	I	L	L ₁	M	N	P	S	U
12	30	27	65	63	75	10	8	19	4	-	15	32	54	6.5	24	32.5	22	11	M4	M4	8.5	5.1	7.5	4.5	15	15	46	130	53	54	15	5.5	10	37
16	30	27	65	63	75	10	8	19	4	-	15	32	54	6.5	24	32.5	22	11	M4	M4	8.5	5.1	7.5	4.5	15	15	46	130	60	54	15	5.5	10	37
20	34	32	79	76	108	12	13	27	6	5	20	40	68	8.5	38	32.5	23	15	M6	M5	10.5	6.5	9	5.5	22	20	58	160	71	65	15	7	12	58
25	34	32	79	76	108	12	13	27	6	5	20	40	68	8.5	38	32.5	23	15	M6	M5	10.5	6.5	9	5.5	22	20	58	160	76	65	15	7	12	58

GDH (BRONZE GUIDE BUSHING)

Code	Bore	Type
W0700122...	12	UNIT MW DH 012
W0700162...	16	UNIT MW DH 016
W0700202...	20	UNIT MW DH 020
W0700252...	25	UNIT MW DH 025

...Enter the stroke in 3 digits (e.g. 50 = 050).

GDM (BALL GUIDE BUSHING)

Code	Bore	Type
W0700123...	12	UNIT MW DM 012
W0700163...	16	UNIT MW DM 016
W0700203...	20	UNIT MW DM 020
W0700253...	25	UNIT MW DM 025

...Enter the stroke in 3 digits (e.g. 50 = 050).

STROKE

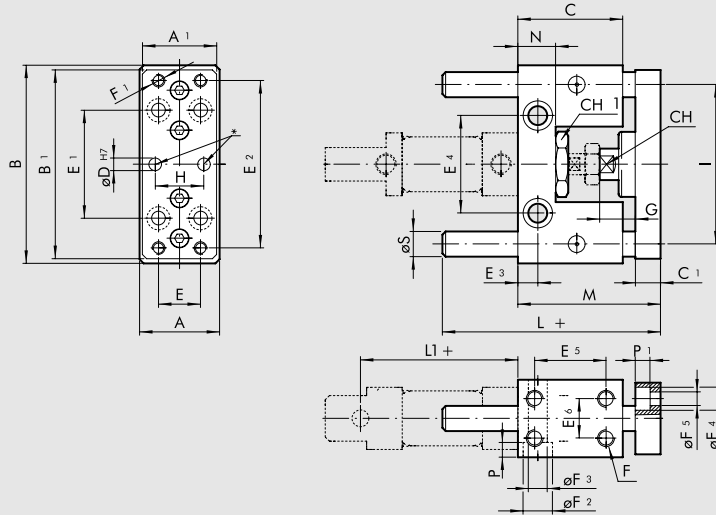
Cylinder stroke [mm]		Guide stroke [mm]
from	to	
0	75	50
75	125	100
125	175	150
175	225	200
225	275	250
275	345	320
345	425	400
425	525	500

Note:

Thanks to the dimensional features, it is possible to extend the use of GDH/GDM guides to cylinders with strokes up to 25 mm above the nominal guide stroke. The table here shows the stroke/cylinder range that can be used depending on the nominal stroke of the guide.

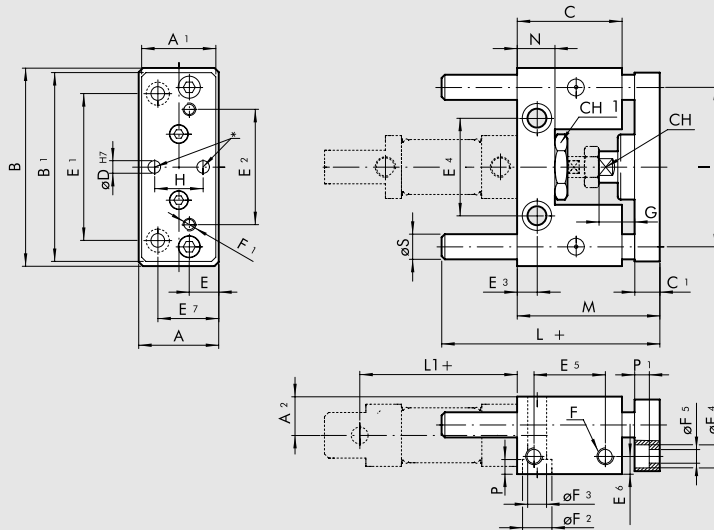
DIMENSIONS OF TYPE GDS

+ = ADD THE STROKE
* = CENTERING PINHOLES



Ø	A	A ₁	B	B ₁	C	C ₁	Ch	Ch ₁	D	E	E ₁	E ₂	E ₃	E ₄	E ₅	E ₆	F	F ₁	F ₂	F ₃	F ₄	F ₅	G	H	I	L	L ₁	M	N	P	P ₁	S
12	30	27	65	63	38	10	8	19	4	15	32	54	6.5	24	25	22	M4	M4	8.5	5.1	7.5	4.5	15	15	46	70	53	54	13	5.5	4.5	10
16	30	27	65	63	38	10	8	19	4	15	32	54	6.5	24	25	22	M4	M4	8.5	5.1	7.5	4.5	15	15	46	70	60	54	13	5.5	4.5	10

+ = ADD THE STROKE
* = CENTERING PINHOLES



Ø	A	A ₁	A ₂	B	B ₁	C	C ₁	Ch	Ch ₁	D	E	E ₁	E ₂	E ₃	E ₄	E ₅	E ₆	E ₇	F	F ₁	F ₂	F ₃	F ₄	F ₅	G	H	I	L	L ₁	M	N	P	P ₁	S
20	40	38	24	100	90	48	12	13	27	6	15	70	55	8.5	46.5	32	10	30	M8	M6	14	9	11	6.5	22	20	76	77	71	65	17	9	6.5	12
25	40	38	65	100	90	48	12	13	27	6	15	70	55	8.5	46.5	32	10	30	M8	M6	14	9	11	6.5	22	20	76	77	76	71	17	9	6.5	12

GDS (BRONZE GUIDE BUSHING)

Code	Bore	Type
W0700121...	12	UNIT MW DS 012
W0700161...	16	UNIT MW DS 016
W0700201...	20	UNIT MW DS 020
W0700251...	25	UNIT MW DS 025

...Enter the stroke in 3 digits (e.g. 50 = 050).

STROKE

Cylinder stroke [mm]		Guide stroke [mm]
from	to	
0	50	50
51	100	100
101	150	150
151	200	200
201	250	250

Note:

Thanks to the dimensional features, it is possible to use the range of strokes - cylinders, as shown in the table here, without the guide piston rods projecting beyond the cylinder fixing value (L1 +).

ISO 15552 CYLINDERS (EX ISO 6431)

Cylinders made to ISO 15552 available in various versions and with a wide range of accessories:

- Configuration with or without magnet
- Single-or double acting – single-or through-rod
- Wide choice of NBR, POLYURETHANE and FKM/FPM gaskets (for high temperatures, for low temperature)
- Special versions on request
- Fixing accessories, guide units and mechanical piston rod lock.

They are available in three series, which differ according to the shape of the barrel and, consequently, the type of sensors and accessories that can be mounted.

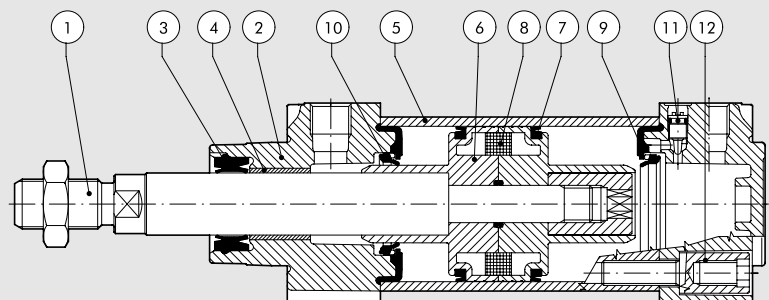
These cylinders are called series STD, type A, series 3.



TECHNICAL DATA		Polyurethane	NBR	FKM/FPM	Low Temperature
Max operating pressure	bar			10	
	MPa			1	
	psi			145	
Temperature range	°C	-10 to +80	-10 to +80	-10 to +150 (non-magnetic cyl.)	-35 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous			
Bore	mm	32; 40; 50; 63; 80; 100; 125			
Design		Heads with Tap Tite screws			
Standard stroke †	mm	Single-acting: for bores 32 to 63 strokes from 1 to 250 Double-acting: for bores 32 to 80 strokes from 1 to 2800 for bores 100 to 125 strokes from 1 to 2600			
Versions		Double-acting cushioned, Single-acting extended or retracted rod cushioned, Through-rod cushioned, Long cushioning, High-temperature, Piston rod lock, Oil seal, Through-rod oil seal, Low friction, Non-stick-slip.			
Sensor magnet		All versions come complete with magnet. Supplied without magnet on request.			
Inrush pressure		Ø 32; 40: 0.4 bar Ø 50; 63 strokes < 1500 mm: 0.3 bar; strokes > 1500 mm: 0.4 bar Ø 80; 100; 125 strokes < 1500 mm: 0.2 bar; strokes > 1500 mm: 0.4 bar			
Notes		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air. † Maximum recommended strokes. Higher values can create operating problems			
Forces generated at 6 bar thrust/retraction		See page 1-7			
Weights		See page 1-8			

COMPONENTS

- ① PISTON ROD: C45 steel or stainless steel, thick chromed
- ② HEAD: die cast aluminium
- ③ PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
- ④ GUIDE BUSHING: steel strip with bronze and PTFE insert
- ⑤ BARREL: drawn anodised calibrated aluminium
- ⑥ HALF-PISTON: self-lubricating technopolymer with built-in cushioning olives (aluminium with PTFE pad for diameters 80-100-125)
- ⑦ PISTON GASKET: polyurethane, NBR or FKM/FPM
- ⑧ MAGNET: plastoferrite
- ⑨ BUFFER + Static O-rings: NBR or FKM/FPM
- ⑩ CUSHIONING GASKET: polyurethane, NBR or FKM/FPM
- ⑪ CUSHIONING NEEDLE: OT 58 with needle out movement safety system even when fully open
- ⑫ SCREWS: Tap Tite for assembly



ISO 15552 CYLINDERS – SERIES STD (EX ISO 6431)



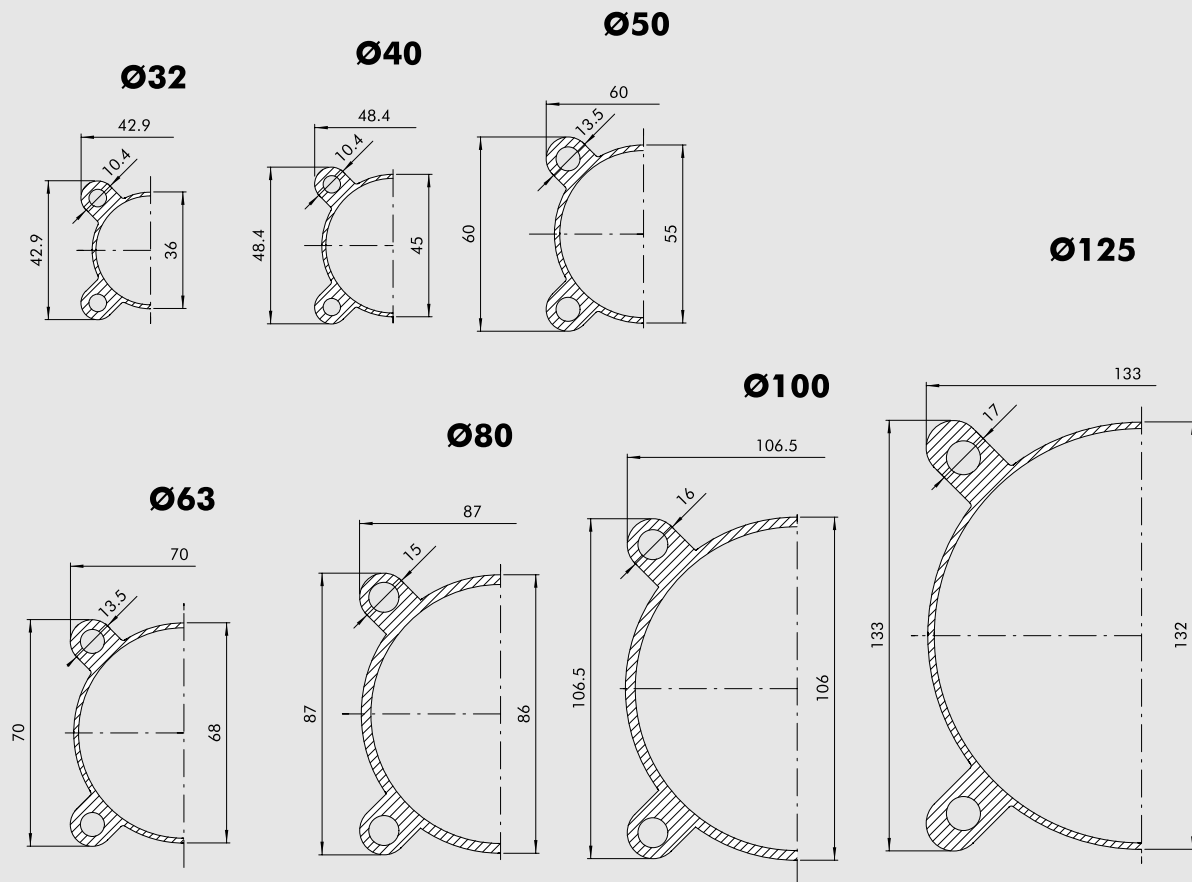
ISO 15552 cylinders, featuring a smooth barrel with no longitudinal slots. This means it is easier to clean the cylinder and there are fewer points where dirt can collect. Specific brackets are required for mounting magnetic sensors.



ACTUATORS

ISO 15552 CYLINDERS – SERIES STD

BARREL CROSS SECTION



KEY TO CODES CYLINDER ISO 15552 STD

CYL	1 2 1	0	3 2	0 0 5 0	C	P	▼ E
	TYPE		BORE	STROKE	MATERIAL	GASKETS	
	120 Double-acting, cushioned, non-magnetic	0 Diameter S Non-magnetic	32 40 50	For the maximum applicable strokes, look at the technical data	A C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over	N NBR gaskets P Polyurethane gaskets V FKM/FPM gaskets	E Single-acting extended rod
	121 Double-acting, cushioned	▲ G No stick slip	63 80			● B Low temperature	
	122 Through-rod		■ 100		C C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes		
	124 Double-acting, non-cushioned		■ 125		Z Stainless steel piston rod and nut aluminium piston		
	125 Opposed				X Stainless steel piston rod and nut technopolymer piston		
+	126 Single-acting						
	127 Tandem						
	134 Rod lock version						
*	136 Version with piston rod lock						
* ♦	137 Piston rod lock + guide unit						

- In the code of cylinder with letter in fourth position Ø 100 becomes A1; Ø 125 becomes A2
- Only available for versions with aluminium piston (A or Z)
- + Available until Ø 63 and only the versions with piston in aluminum (A or Z)
- 126... Single-acting retracted rod
- 126...E Single-acting extended rod
- ▼ Letter to be added only to the single acting extended rod version
- ▲ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only
- ◆ Available up to Ø 100
- * Not available for gaskets V or B

KEY TO CODES CYLINDER ISO 15552 STD LOW-FRICTION

CYL	1 2 3	A	3 2	0 0 5 0	C	P
		TYPE	BORE	STROKE	MATERIAL	GASKETS
		A Low friction, type A	32	Ø 32 to 80	A C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over	N NBR gaskets P Polyurethane gaskets V FKM/FPM gaskets
		B Low friction, type B	40	stroke 1 to 2800 mm		
		C Low friction, type C	50	Ø 100 to 125		
		D Low friction, type D	63	stroke 1 to 2600 mm	C C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes	
		E Low friction, type E	80		Z Stainless steel piston rod and nut aluminium piston	
		F Low friction, type F	A1 = Ø 100 A2 = Ø 125		X Stainless steel piston rod and nut technopolymer piston	

KEY TO CODES CYLINDER ISO 15552 STD LONG-CUSHIONING

CYL	1 3 1	A	3 2	0 0 5 0	A	P
		TYPE	BORE	STROKE	MATERIAL	GASKETS
		A 200 mm front/rear cushioning cone – 200 mm ext.	32	1 to 2600 mm	A C45 chromed rod, aluminium piston rod for all sizes	N NBR gaskets P Polyurethane gaskets V FKM/FPM gaskets
		B 150 mm front/rear cushioning cone – 150 mm ext.	40		Z Stainless steel piston rod and nut aluminium piston	
		C 100 mm front/rear cushioning cone – 100 mm ext.	50			
		D 150 mm front/rear cushioning cone – 200 mm ext.	63			
		E 100 mm front/rear cushioning cone – 200 mm ext.				
		F 50 mm front/rear cushioning cone – 100 mm ext.				
		G 100 mm front/rear cushioning cone – 150 mm ext.				
		H 200 mm front cushioning cone – 200 mm ext.				
		I 150 mm front cushioning cone – 150 mm ext.				
		L 100 mm front cushioning cone – 100 mm ext.				
		M 150 mm front cushioning cone – 200 mm ext.				
		N 100 mm front cushioning cone – 150 mm ext.				
		O 50 mm front cushioning cone – 100 mm ext.				
		Q 200 mm rear cushioning cone – 200 mm ext.				
		R 150 mm rear cushioning cone – 150 mm ext.				
		S 100 mm rear cushioning cone – 100 mm ext.				
		T 150 mm rear cushioning cone – 200 mm ext.				
		U 100 mm rear cushioning cone – 200 mm ext.				
		V 50 mm rear cushioning cone – 100 mm ext.				

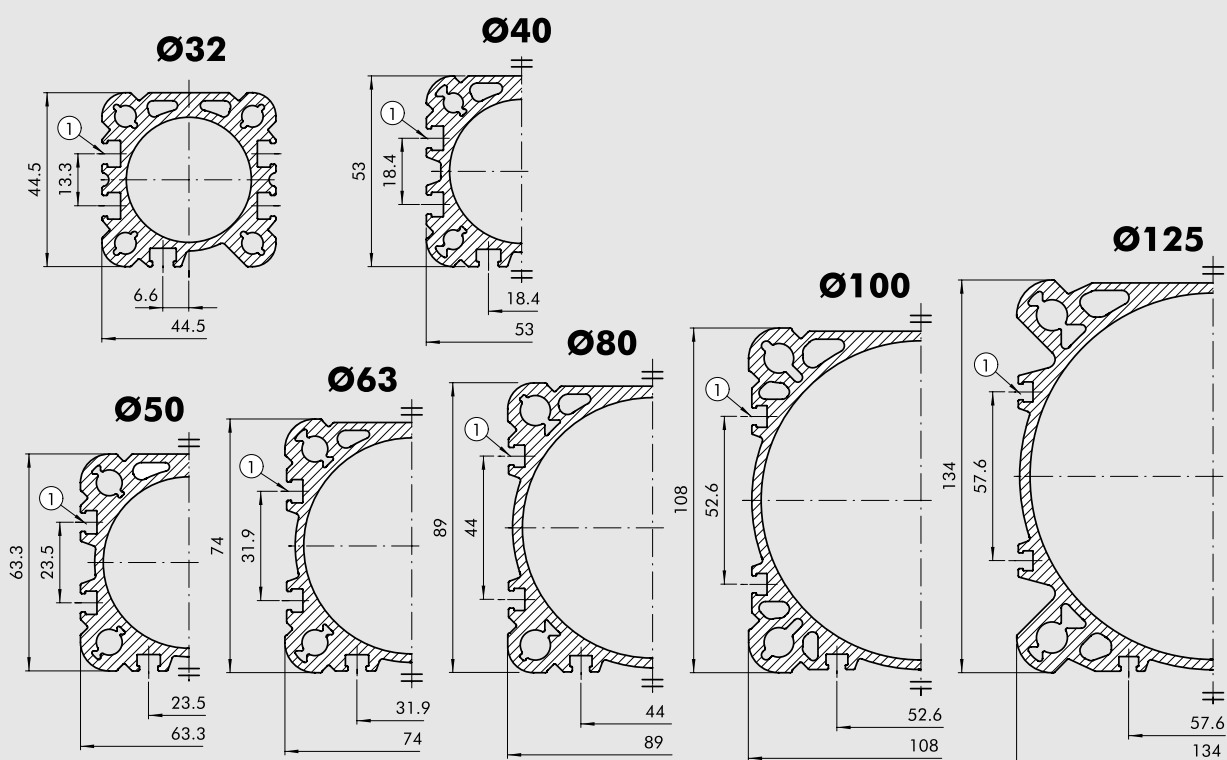
ISO 15552 CYLINDERS – TYPE A (EX ISO 6431)

ISO 15552 cylinders, featuring a barrel with longitudinal slots on three sides for inserting and securing retractable sensors. The same slots can also be used for valves and other mechanical parts.



BARREL CROSS SECTION

① SLOTS FOR RETRACTABLE SENSOR



KEY TO CODES CYLINDER ISO 15552 TYPE "A"

CYL	1 2 1 TYPE	A	3 2 BORE	0 0 5 0 STROKE	C MATERIAL	P GASKETS	▼ E
	121 Double-acting, cushioned	A Standard	32	For the maximum applicable strokes, look at the technical data	A C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over	N NBR gaskets P Polyurethane gaskets V FKM/FPM gaskets ● B Low temperature	E Single-acting extended rod
	122 Through-rod	▲ B No stick slip	40				
	124 Double-acting, non-cushioned	C Non-magnetic	50				
	125 Opposed		63				
	+ 126 Single-acting		80				
	127 Tandem		A1 = Ø 100 A2 = Ø 125				
	134 Rod lock version						
	* 136 Version with piston rod lock			Z Stainless steel piston rod and nut aluminium piston			
	* ♦ 137 Piston rod lock + guide unit			X Stainless steel piston rod and nut technopolymer piston			

- Only available for versions with aluminium piston (A or Z)
- + Available until Ø 63 and only the versions with piston in aluminum (A or Z)
- 126... Single-acting retracted rod
- 126...E Single-acting extended rod
- ▼ Letter to be added only to the single acting extended rod version
- ▲ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only
- ◆ Available up to Ø 100
- * Not available for gaskets V or B

KEY TO CODES CYLINDER ISO 15552 LOW-FRICTION TYPE "A"

CYL	1 2 9	A TYPE	3 2 BORE	0 0 5 0 STROKE	C MATERIAL	P GASKETS
		A Low friction, type A	32	Ø 32 to 80 stroke 1 to 2800 mm Ø 100 to 125 stroke 1 to 2600 mm	A C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over	N NBR gaskets P Polyurethane gaskets V FKM/FPM gaskets
		B Low friction, type B	40			
		C Low friction, type C	50			
		D Low friction, type D	63			
		E Low friction, type E	80			
		F Low friction, type F	A1 = Ø 100 A2 = Ø 125			
				C C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes		
				Z Stainless steel piston rod and nut aluminium piston		
				X Stainless steel piston rod and nut technopolymer piston		

KEY TO CODES CYLINDER ISO 15552 LONG-CUSHIONING TYPE "A"

CYL	1 3 0	A TYPE	3 2 BORE	0 0 5 0 STROKE	A MATERIAL	P GASKETS
		A 200 mm front/rear cushioning cone – 200 mm ext.	32	1 to 2600 mm	A C45 chromed rod, aluminium piston rod for all sizes	N NBR gaskets P Polyurethane gaskets V FKM/FPM gaskets
		B 150 mm front/rear cushioning cone – 150 mm ext.	40			
		C 100 mm front/rear cushioning cone – 100 mm ext.	50			
		D 150 mm front/rear cushioning cone – 200 mm ext.	63			
		E 100 mm front/rear cushioning cone – 200 mm ext.				
		F 50 mm front/rear cushioning cone – 100 mm ext.				
		G 100 mm front/rear cushioning cone – 150 mm ext.				
		H 200 mm front cushioning cone – 200 mm ext.				
		I 150 mm front cushioning cone – 150 mm ext.				
		L 100 mm front cushioning cone – 100 mm ext.				
		M 150 mm front cushioning cone – 200 mm ext.				
		N 100 mm front cushioning cone – 150 mm ext.				
		O 50 mm front cushioning cone – 100 mm ext.				
		Q 200 mm rear cushioning cone – 200 mm ext.				
		R 150 mm rear cushioning cone – 150 mm ext.				
		S 100 mm rear cushioning cone – 100 mm ext.				
		T 150 mm rear cushioning cone – 200 mm ext.				
		U 100 mm rear cushioning cone – 200 mm ext.				
		V 50 mm rear cushioning cone – 100 mm ext.				

ISO 15552 CYLINDERS – SERIES 3 (EX ISO 6431)



ISO 15552 cylinders, featuring specially-shaped barrels designed to reduce weight to a minimum. Two T-slots on the same side as the threaded fittings can take retractable sensors. The other three sides of the barrel are smooth, with no slots, and hence easy to clean.

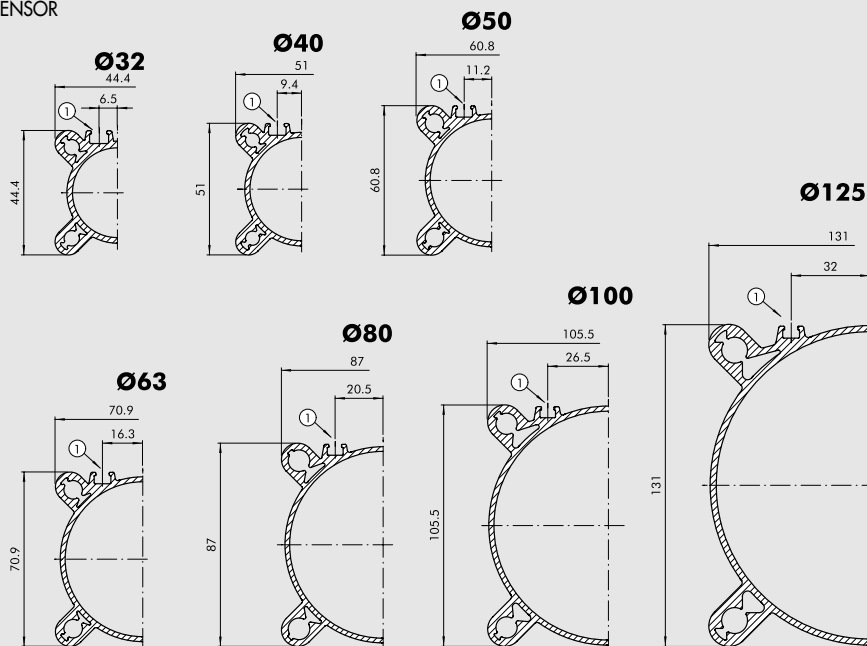


ACTUATORS

ISO 15552 CYLINDERS – SERIES 3

BARREL CROSS SECTION

① SLOTS FOR RETRACTABLE SENSOR



KEY TO CODES

CYL	1 2 1 TYPE	3	3 2 BORE	0 0 5 0 STROKE	C MATERIAL	P GASKETS	▼ E
	121 Double-acting, cushioned	3 Series 3	32	For the maximum applicable strokes, look at the technical data	A C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with ≥ 80 mm and over	N NBR gaskets P Polyurethane gaskets V FKM/FPM gaskets ● B Low temperature	E Single-acting extended rod
	122 Through-rod	◆ 4 Series 3	40				
	124 Double-acting, non-cushioned		50				
	125 Opposed	5 Series 3	63		C C45 chromed rod, technopolymer piston: standard for cylinders of ≥ 80 mm with < 1000 mm strokes		
+	126 Single-acting	Non-magnetic	80				
	127 Tandem		A1 = $\varnothing 100$ A2 = $\varnothing 125$		Z Stainless steel piston rod and nut aluminium piston		
■	134 Rod lock version				X Stainless steel piston rod and nut technopolymer piston		
■	136 Version with piston rod lock						
■ *	137 Piston rod lock + guide unit						

● Only available for versions with aluminium piston (A or Z)

+ Available until $\varnothing 63$ and only the versions with piston in aluminium (A or Z)
126... Single-acting retracted rod
126...E Single-acting extended rod

▼ Letter to be added only to the single acting extended rod version

◆ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only
* Available until $\varnothing 100$
■ Not available for gasket V or B

ISO 15552 LOW-FRICTION CYLINDERS (EX ISO 6431) CODE 123 FOR SERIES STD CODE 129 FOR TYPE A

The low-friction cylinder is typically used as a dandy or tensioning cylinder since it is a single-acting cylinder without a return spring. The configurations are shown below:

- 1) The best type is A as it involves less friction.
- 2) Type B should be used when the cylinder is working under normal conditions outside the pneumatic cushioning area. Cushioning is only for emergency use. It acts as a shock absorber in the case of malfunction.
- 3) Type C differs from type A due to the presence of a piston rod gasket that prevents dirt getting in when operating in dirty environments.
- 4) Type D differs from type B due to the presence of a piston rod gasket that prevents dirt getting in when operating in dirty environments.
- 5) Type E should be used when the pressurized chamber is the front one.
- 6) For type F, see point 2.

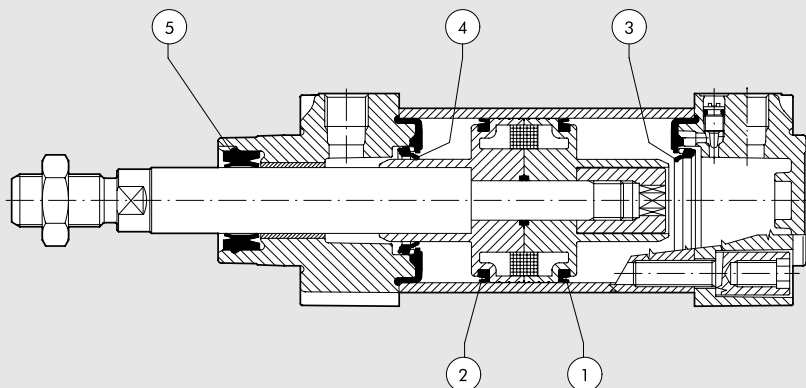


NB. THE CYLINDER IS ALWAYS SINGLE-ACTING WITHOUT A RETURN SPRING.

	TYPE	GASKETS
Rear chamber pressure	A	1
Rear chamber pressure and cushioning in case of impact	B	1+3
Rear chamber pressure and piston rod gasket	C	1+5
Rear chamber pressure, cushioning in case of impact and piston rod gasket	D	1+3+5
Front chamber pressure	E	2+5
Front chamber pressure and cushioning in case of impact	F	2+5+4

COMPONENTS

- ① Rear chamber piston gasket made of polyurethane (Ø 32 to 125)
- ② Front chamber piston gasket made of polyurethane (Ø 32 to 125)
- ③ Rear chamber cushioning gasket made of polyurethane
- ④ Front chamber cushioning gasket made of polyurethane
- ⑤ Piston rod gasket made of polyurethane



ISO 15552 ULTRA-LOW FRICTIONS CYLINDERS (EX ISO 6431)



A typical ultra-low friction cylinder is generally used as an oscillating or tensioning cylinder. It is single acting, in the sense that compressed air is normally fed into one of the two chambers only. An external force acts on the other side. Metal Work's ultra-low friction cylinder is designed as a double-acting one, which means the compressed air can be fed into the rear or either the front chamber. They are built to comply with ISO 15552 and are available with or without a magnet. Supplied with a series 3 barrel.

A through-rod version is not available.

These cylinders are always non-cushioned.

The gaskets are made of NBR.

A full range of accessories is available.



TECHNICAL DATA		NBR
Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	-10 to +80
Fluid		Unlubricated air
Bore	mm	32; 40; 50; 63
Standard stroke	mm	1 to 1200
Design		Heads with Tap Tite screws
Versions		Double-acting magnetic, Double-acting non-magnetic (always "no stick slip" cylinder)
Sensor magnet		All the versions with or without magnet
Inrush pressure	bar	Ø 32 = 0.08 Ø 40 = 0.06 Ø 50 = 0.05 Ø 63 = 0.04
Forces generated at 6 bar thrust/retraction		See page 1-7
Weights		See page 1-8
Notes		There may be leakage between the two chambers in the presence of low pressures (up to 1 bar)

COMPONENTS

- ① PISTON ROD: C45 steel or stainless steel, thick chromed
- ② HEAD: die cast aluminium
- ③ PISTON ROD GASKET: NBR
- ④ GUIDE BUSHING: steel strip with bronze insert
- ⑤ BARREL: drawn anodised calibrated aluminium
- ⑥ PISTON GASKET: NBR
- ⑦ HALF-PISTON: aluminium alloy
- ⑧ MAGNET: plastoferrite
- ⑨ GUIDE RING: special technopolymer
- ⑩ BUFFER + Static O-rings: NBR
- ⑪ CUSHIONING NEEDLE: OT 58 with needle out movement safety system even when fully open
- ⑫ SCREWS: Tap Tite for assembly

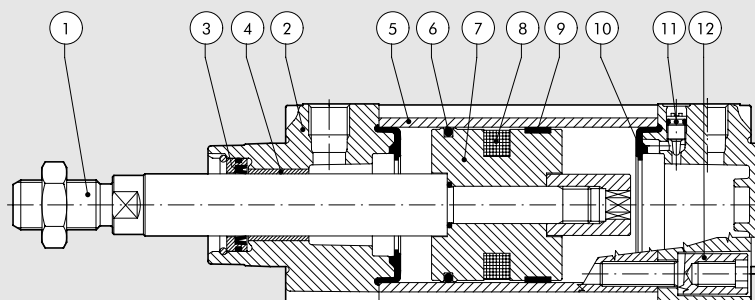
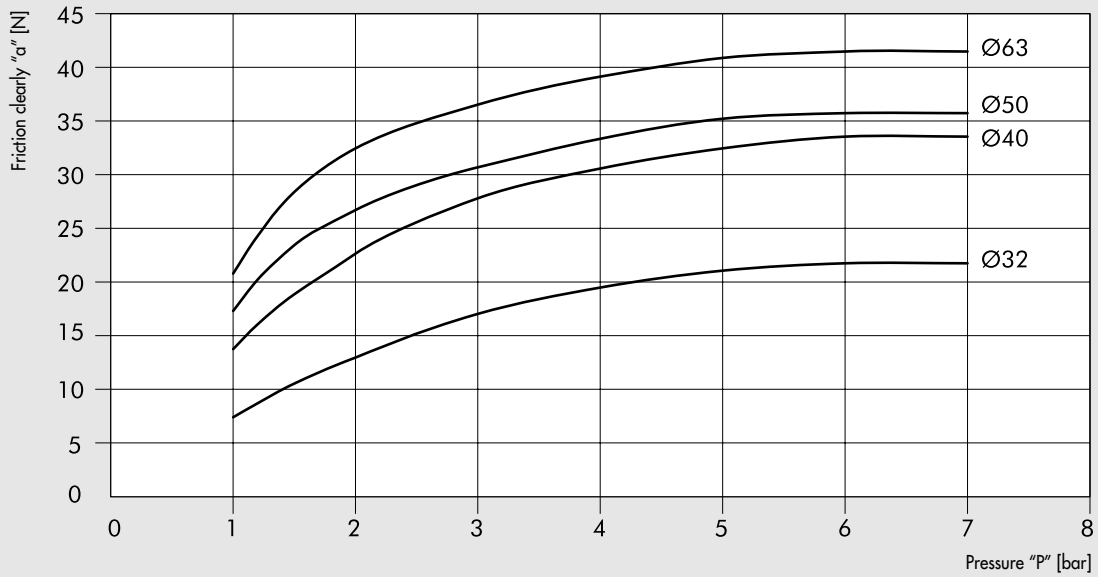


DIAGRAM OF THE CLEAN FRICTIONS



The clean friction values "a" in N have been obtained by inserting in the back chamber the pressure "P" in bars, and simultaneously by detecting the necessary force "F" in N to make the rod re-enter, applying the following formula:

$$a = F - [(P \times S) \times 9.81]$$

where "S" is the thrust section in cm²

KEY TO CODES

CYL	1 2 3 TYPE	3	3 2 BORE	0 1 0 0 STROKE	A MATERIAL	N GASKETS
123	Ultra-low friction	3 Double-acting magnetic 5 Double-acting not magnetic	32 40 50 63	From 1 to 1200 mm	A C45 chromed rod, aluminium piston rod Z Stainless steel piston rod and nut aluminium piston	N NBR gaskets

ALL the cylinders are no stick slip.
 ALL the cylinders are non-cushioned.
 Ultra-low friction cylinders are not available in the through-rod version.

ISO 15552 CYLINDERS WITH "COMBI" PISTON ROD GASKET (EX ISO 6431)

In some applications the piston rod is exposed to pollutants and dirt, which tend to adhere to the surface.

Ordinary gaskets are made of relatively soft elastomers as their main job is to provide a pneumatic seal. In critical applications they are unable to scrape dirt off the surface of the piston rod.

COMBI piston rod gaskets are designed to solve these problems.

They are made up of two separate parts:

- a **sealing element**, inside the cylinder, made of a special NBR elastomer with a Shore A hardness of 80 to provide a pneumatic seal.
- a **scraper ring**, outside the cylinder, made of highly wear-resistant plastic.



FEATURES AND ADVANTAGES

COMBI gaskets have three functions - sealing, scraping and securing. The outer projection of the scraper ring secures the cylinder head in its seat, so steel retaining rings are not required. This eliminates the risk of corrosion due to the presence of metal.

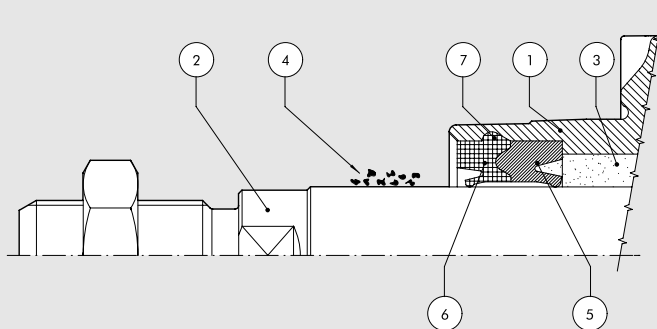
Friction is reduced. The materials used in the scraper ring and sealing element make the gasket extremely long lasting.

Cylinders with COMBI gaskets can be used with unlubricated dry air. The cylinder head seat is the same as for other Metal Work cylinder gaskets, so the cylinder head is standard.

OPERATING PRINCIPLE

The gasket is housed in the cylinder head ①. Inside the cylinder there is compressed air ③. Dirt ④ deposits on the piston rod ②.

The sealing element ⑤ provides the pneumatic seal. The scraper ring ⑥ cleans the piston rod. The projection ⑦ on the scraper ring secures the gasket in the cylinder head seat.



TECHNICAL DATA

Bores: 32; 40; 50; 63; 80; 100; 125.

The same as for ISO 15552 cylinders with NBR gaskets.

Maximum recommended speed: 1 m/s.

KEY TO CODES

The codes for ISO 15552 cylinders apply, the last letter C identifying the type of gasket.

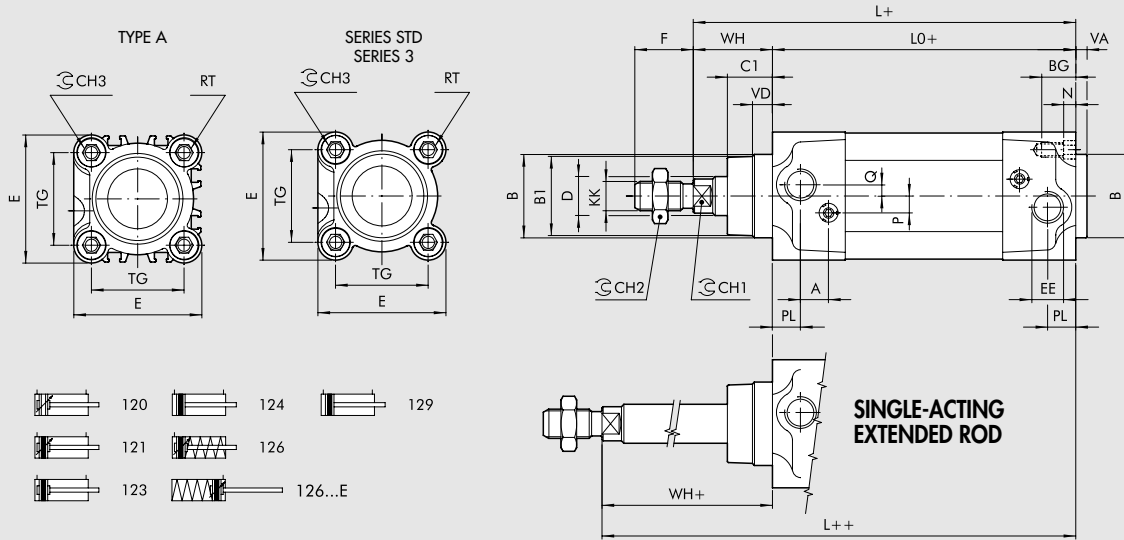
Example:

1210320100CC: ISO 15552 cylinder, dual-acting, cushioned, magnetic, diameter 32, stroke 100 mm, piston rod made of C45 chrome, COMBI piston rod gasket, other gaskets NBR.

ISO 15552 CYLINDERS DIMENSIONS

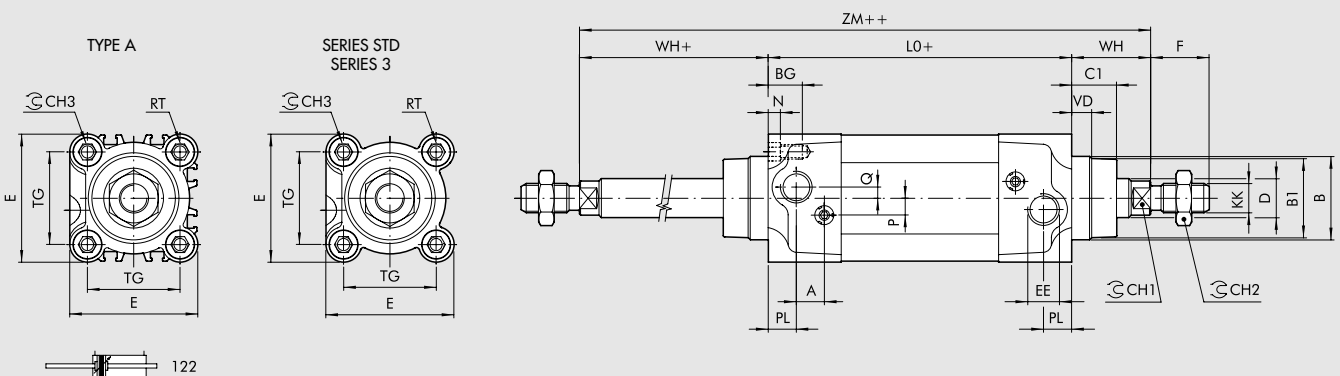
DIMENSIONS

STANDARD VERSION



+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

THROUGH-ROD VERSION



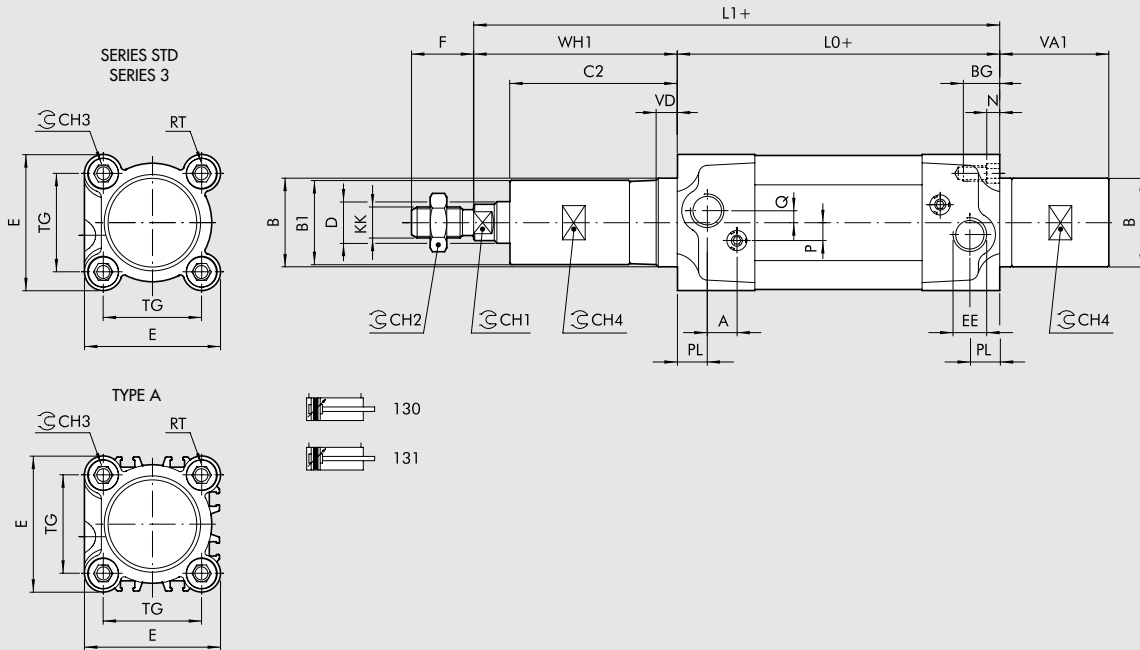
Ø	PL	VD	A	B	B ₁	WH	C ₁	CH ₁	CH ₂	CH ₃	KK	D	TG	VA	F	EE	RT	E	L	L ₀	ZM	BG	N	P	Q
32	10	6.5	10	30	28	26	16	10	17	6	M10x1.25	12	32.5	4	22	G1/8	M6	46	120	94	146	14.5	4.5	6	4
40	12	8	10	35	33	30	20	13	19	6	M12x1.25	16	38	4	24	G1/4	M6	54	135	105	165	14.5	4.5	6	4
50	14	13	10	40	38	37	25	17	24	8	M16x1.5	20	46.5	4	32	G1/4	M8	64.5	143	106	180	17.5	5.5	6	6
63	16	14	10	45	40	37	25	17	24	8	M16x1.5	20	56.5	4	32	G3/8	M8	75.5	158	121	195	17.5	5.5	6	6
80	18	12	12	45	43	46	33	22	30	10	M20x1.5	25	72	4	40	G3/8	M10	94	174	128	220	21.5	5.5	10	7
100	20	14	12	55	49	51	38	22	30	10	M20x1.5	25	89	4	40	G1/2	M10	111	189	138	240	21.5	5.5	10	7
125	25	20	10	60	54	65	45	27	41	12	M27x2	32	110	6	54	G1/2	M12	135	225	160	290	25.5	6.5	12	8

VERSION 126 ... (SINGLE-ACTING RETRACTED ROD)
VERSION 126...E (SINGLE-ACTING EXTENDED ROD)

Stroke			L ₀								L							
	126...	126...E	Ø 32	Ø 32	Ø 40	Ø 40	Ø 50	Ø 50	Ø 63	Ø 63	Ø 32	Ø 32	Ø 40	Ø 40	Ø 50	Ø 50	Ø 63	Ø 63
0 ÷ 25	ISO	ISO	94	94	105	105	106	106	121	121	120	120	135	135	143	143	158	158
26 ÷ 50	ISO	NON ISO	94	115	105	129.5	106	130.5	121	145.5	120	141	135	159.5	143	167.5	158	182.5
51 ÷ 75	NON ISO	NON ISO	115	136	129.5	154	130.5	155	145.5	170	141	162	159.5	184	167.5	192	182.5	207
76 ÷ 100	NON ISO	NON ISO	136	157	154	178.5	155	179.5	170	194.5	162	183	184	208.5	192	216.5	207	231.5
101 ÷ 125	NON ISO	NON ISO	157	178	178.5	203	179.5	204	194.5	219	183	204	208.5	233	216.5	241	231.5	256
126 ÷ 150	NON ISO	NON ISO	178	199	203	227.5	204	228.5	219	243.5	204	225	233	257.5	241	265.5	256	280.5
151 ÷ 175	NON ISO	NON ISO	199	220	227.5	252	228.5	253	243.5	268	225	246	257.5	282	265.5	290	280.5	305
176 ÷ 200	NON ISO	NON ISO	220	241	252	276.5	253	277.5	268	292.5	246	267	282	306.5	290	314.5	305	329.5
201 ÷ 225	NON ISO	NON ISO	241	262	276.5	301	277.5	302	292.5	317	267	288	306.5	331	314.5	339	329.5	354
226 ÷ 250	NON ISO	NON ISO	262	283	301	325.5	302	326.5	317	341.5	288	309	331	355.5	339	363.5	354	378.5

DIMENSIONS CUSHIONING VERSION

+ = ADD THE STROKE



Ø	PL	VD	A	B	B ₁	CH ₁	CH ₂	CH ₃	CH ₄	KK	D	TG	F	EE	RT	E	L ₀	BG	N	P	Q
32	10	6.5	10	30	29	10	17	6	27	M10x1.25	12	32.5	22	G1/8	M6	46	94	14.5	4.5	6	4
40	12	8	10	35	34	13	19	6	30	M12x1.25	16	38	24	G1/4	M6	54	105	14.5	4.5	6	4
50	14	13	10	40	38	17	24	8	35	M16x1.5	20	46.5	32	G1/4	M8	64.5	106	17.5	5.5	6	6
63	16	14	10	45	38	17	24	8	35	M16x1.5	20	56.5	32	G3/8	M8	75.5	121	17.5	5.5	6	6

100 mm CUSHIONING

Ø	WH ₁	C ₂	VA ₁	L ₁
32	106	96	79	200
40	107	97	76.5	212
50	113.5	101.5	76.5	219.5
63	113.5	101.5	76.5	234.5

150 mm CUSHIONING

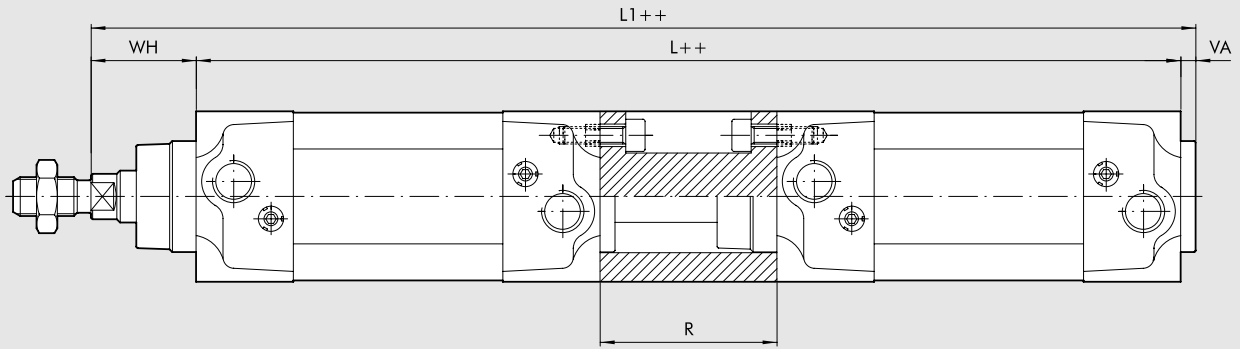
Ø	WH ₁	C ₂	VA ₁	L ₁
32	156	146	129	250
40	157	147	121.5	262
50	162.5	150.5	119.5	268.5
63	162.5	150.5	123.5	283.5

200 mm CUSHIONING

Ø	WH ₁	C ₂	VA ₁	L ₁
32	206	196	179	300
40	207	197	176.5	312
50	213.5	201.5	176.5	319.5
63	213.5	201.5	176.5	334.5

DIMENSIONS OF TANDEM VERSION

++ = ADD TWICE THE STROKE



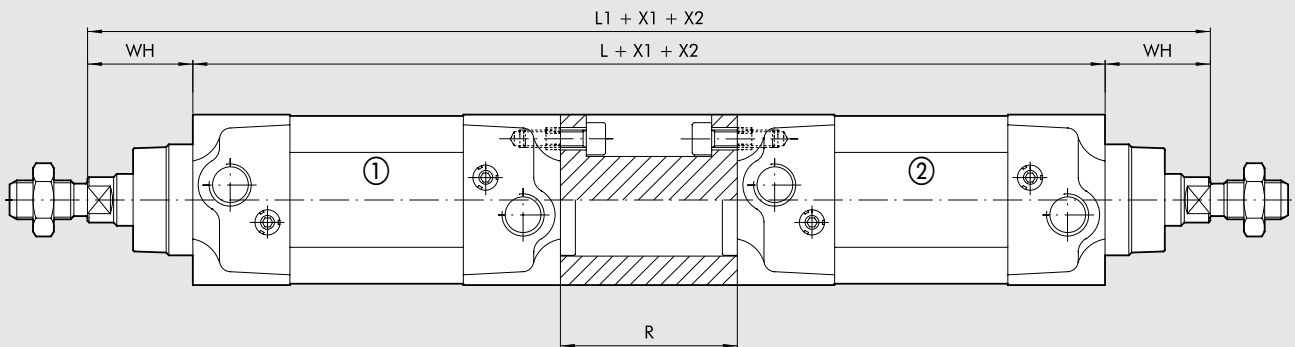
Ø	WH	VA	R	L	L ₁
32	26	4	55	243	273
40	30	4	55	265	299
50	37	4	68	280	321
63	37	4	68	310	351
80	46	4	92	348	398
100	51	4	92	368	423
125	65	6	120	440	511

Refer to standard cylinders for other values.

DIMENSIONS OF OPPOSED VERSION

X1 = STROKE CYLINDER 1

X2 = STROKE CYLINDER 2



Ø	WH	R	L	L ₁
32	26	55	243	295
40	30	55	265	325
50	37	68	280	354
63	37	68	310	384
80	46	92	348	440
100	51	92	368	470
125	65	120	440	570

Refer to standard cylinders for other values.

ISO 15552 TWO-FLAT CYLINDERS (EX ISO 6431)

This version of cylinder is used to keep the parts fixed to the piston rod at an angle and to apply torques within the specified limits.

The piston rod of the Two Flat has two opposing longitudinal surfaces; it is made of stainless steel.

The front cylinder head includes a sintered bronze bush that matches the profile of the piston rod and prevents it from rotating on its own axis.

A special polyurethane gasket ensures pneumatic seal and prevents the accumulation of dirt. This technical solution is more reliable and gives a better pneumatic seal than with square or hexagonal piston rods.

Supplied in series STD, with a smooth barrel, and type A, with a barrel with slots for retractable sensors.

They are available in several versions and with a wide range of accessories:

- with or without magnet
- double acting, single piston rod
- double acting, through rod; one piston rod is Two Flat, the other cylindrical
- fixing accessories.



TECHNICAL DATA		POLYURETHANE			
Max operating pressure	bar	10			
	MPa	1			
	psi	145			
Temperature range	°C	-10 to +80			
	Fluid	Unlubricated air. Lubrication, if used, must be continuous			
Bore	mm	32; 40; 50; 63			
Design		Heads with Tap Tite screws			
Maximun stroke	mm	Ø 32 = 300	Ø 40 = 400	Ø 50 = 500	Ø 63 = 500
Versions		Double-acting cushioned, Through-rod cushioned, no-stick slip			
Sensor magnet		All versions come complete with magnet. Supplied without magnet on request.			
Inrush pressure	bar	Ø 32 = 0.4	Ø 40 = 0.4	Ø 50 = 0.3	Ø 63 = 0.3
Max torque on piston rod	Nm	Ø 32 = 0.2	Ø 40 = 0.4	Ø 50 = 1	Ø 63 = 1
Maximum rotation on the rod	degrees	Ø 32 = 0.70°	Ø 40 = 0.75°	Ø 50 = 0.65°	Ø 63 = 0.65°
Forces generated at 6 bar thrust/retraction		See page 1-7			
Weights		See page 1-8			
Notes		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.			

KEY TO CODES FOR ISO 15552 TWO-FLAT STD CYLINDERS

CYL	1 2 1 TYPE	0 DIAMETER	3 2 BORE	0 0 5 0 STROKE	F MATERIAL	P GASKETS
120	Double-acting, cushioned, non-magnetic	Ø Diameter S Non-magnetic ▲ G No stick slip	32 40 50 63	+ Ø 32 stroke 1 to 300 mm + Ø 40 stroke 1 to 400 mm + Ø 50 to 63 stroke 1 to 500 mm	F "Two Flat" piston rod AISI 303 stainless steel nut	P Polyurethane gaskets
121	Double-acting, cushioned					
122	Through-rod					

- + Maximum recommended strokes. Higher values can create operating problems
- ▲ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only

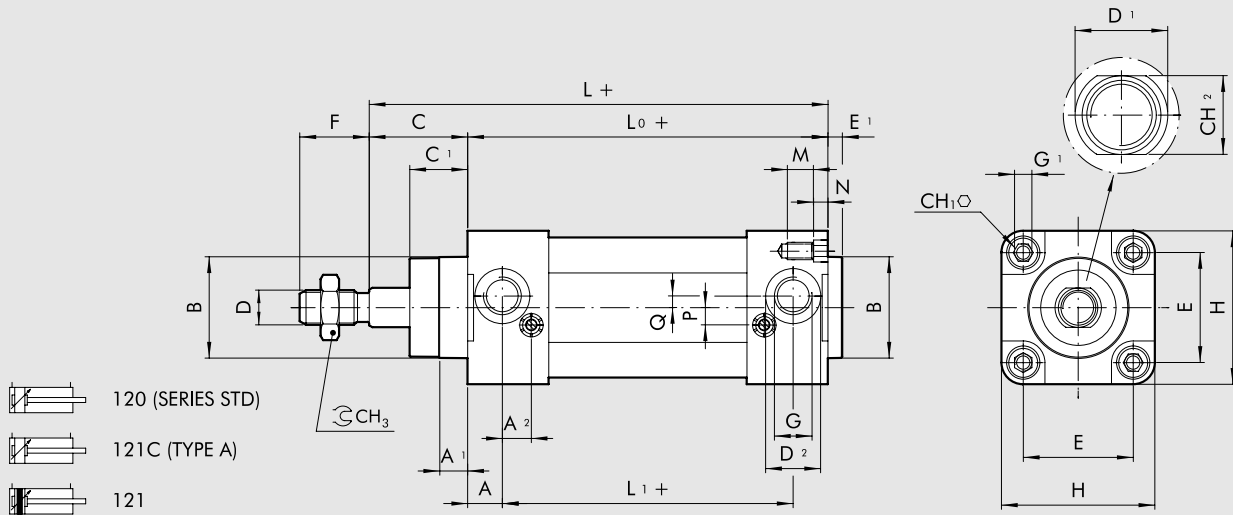
KEY TO CODES FOR ISO 15552 TWO-FLAT TYPE A CYLINDERS

CYL	1 2 1 TYPE	A DIAMETER	3 2 BORE	0 0 5 0 STROKE	F MATERIAL	P GASKETS
121	Double-acting, cushioned	A Standard ▲ B No stick slip C Non-magnetic	32 40 50 63	+ Ø 32 stroke 1 to 300 mm + Ø 40 stroke 1 to 400 mm + Ø 50 to 63 stroke 1 to 500 mm	F "Two Flat" piston rod AISI 303 stainless steel nut	P Polyurethane gaskets
122	Through-rod					

- + Maximum recommended strokes. Higher values can create operating problems
- ▲ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only

DIMENSIONS OF STANDARD VERSIONS

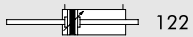
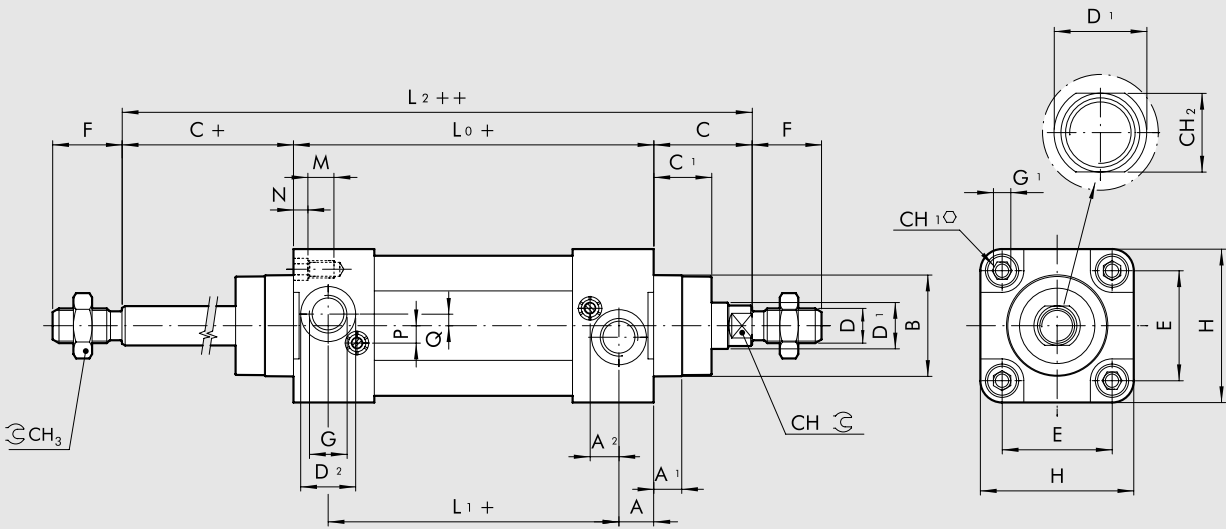
+ = ADD THE STROKE



DIMENSIONS OF THROUGH-ROD VERSION

+ = ADD THE STROKE

++ = ADD TWICE THE STROKE



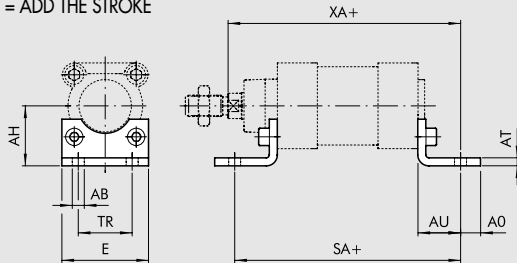
Ø	A	A ₁	A ₂	B	C	C ₁	CH	CH ₁	CH ₂	CH ₃	D	D ₁	D ₂	E	E ₁	F	G	G ₁	H	L	L ₀	L ₁	L ₂	M	N	P	Q
32	10	7	10	30	26	16	10	6	10	17	M10x1.25	12	15	32.5	5	22	G1/8	M6	47	120	94	74	146	9	4.5	6	4
40	12	9	10	35	30	20	13	6	13	19	M12x1.25	16	19	38	5	24	G1/4	M6	53	135	105	81	165	9	4.5	6	4
50	14	14	10	40	37	25	17	8	17	24	M16x1.5	20	19	46.5	5	32	G1/4	M8	65	143	106	78	180	12	5.5	6	6
63	16	14	10	45	37	25	17	8	17	24	M16x1.5	20	23	56.5	5	32	G3/8	M8	75	158	121	89	195	12	5.5	6	6

ACCESSORIES FOR ISO 15552 STD, TYPE A, SERIES 3, TWO FLAT: FIXINGS



FOOT - MODEL A

+ = ADD THE STROKE

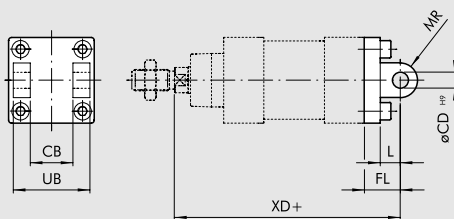


Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	XA	SA	Weight [g]
W0950322001	32	7	32	11	4	24	32	45	144	142	76
W0950402001	40	9	36	15	4	28	36	52	163	161	100
W0950502001	50	9	45	15	4	32	45	65	175	170	162
W0950632001	63	9	50	15	6	32	50	75	190	185	266
W0950802001	80	12	63	20	6	41	63	95	215	210	456
W0951002001	100	14	71	25	6	41	75	115	230	220	572
W0951252001	125	16	90	15	7	45	90	140	270	250	1130

Note: individually packed with 2 screws

FEMALE HINGE - MODEL B

+ = ADD THE STROKE

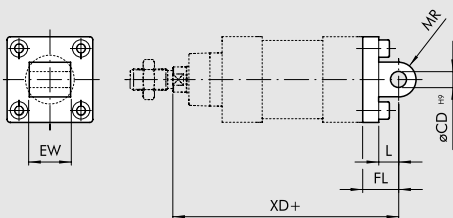


Code	Ø	UB	CB	FL	øCD	XD	MR	L	Weight [g]
W0950322003	32	45	26	22	10	142	10	12	116
W0950402003	40	52	28	25	12	160	12	15	160
W0950502003	50	60	32	27	12	170	12	15	252
W0950632003	63	70	40	32	16	190	16	20	394
W0950802003	80	90	50	36	16	210	16	20	670
W0951002003	100	110	60	41	20	230	20	25	1085
W0951252003	125	130	70	50	25	275	25	30	2000

Note: Supplied with 4 screws, 4 washers, 2 snap-rings, 1 pin

MALE HINGE - MODEL BA

+ = ADD THE STROKE

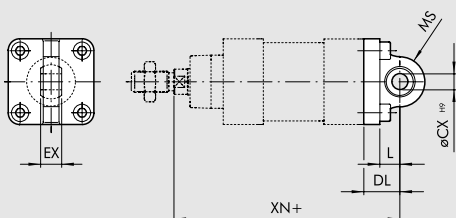


Code	Ø	EW	FL	MR	øCD	L	XD	Weight [g]
W0950322004	32	26	22	11	10	12	142	94
W0950402004	40	28	25	13	12	15	160	124
W0950502004	50	32	27	13	12	15	170	220
W0950632004	63	40	32	17	16	20	190	316
W0950802004	80	50	36	17	16	20	210	578
W0951002004	100	60	41	21	20	25	230	850
W0951252004	125	70	50	26	25	30	275	1590

Note: Supplied with 4 screws, 4 washers

ARTICULATED MALE HINGE - MODEL BAS

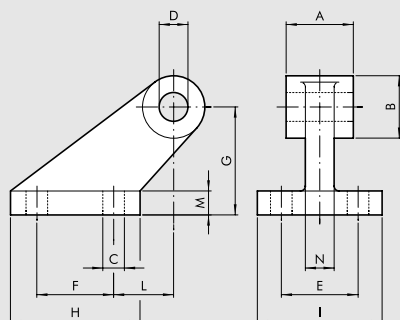
+ = ADD THE STROKE



Code	Ø	DL	MS	L	XN	øCX	EX	Weight [g]
W0950322006	32	22	16	12	142	10	14	106
W0950402006	40	25	19	15	160	12	16	142
W0950502006	50	27	19	15	170	12	16	236
W0950632006	63	32	24	20	190	16	21	336
W0950802006	80	36	24	20	210	16	21	572
W0951002006	100	41	30	25	230	20	25	840
W0951252006	125	50	36	30	275	25	31	1520

Note: Supplied with 4 screws, 4 washers

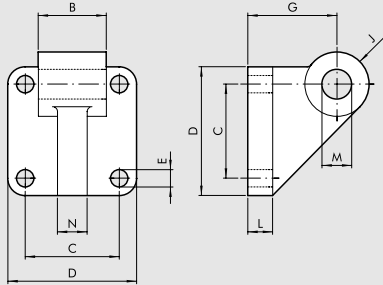
CETOP HINGE FOR MODEL B - MODEL GI



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96
W0950402008	40	28	26	9	12	32	32	45	54	52	25	10	12	216
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440
W0950802008	80	50	33	11	16	40	50	63	75	63	32	12	15	464
W0951002008	100	60	44	14	20	50	70	90	103	80	40	16	22	985
W0951252008	125	70	44	14	25	50	70	90	103	80	40	16	22	1000

Note: Supplied with 4 screws, 4 washers

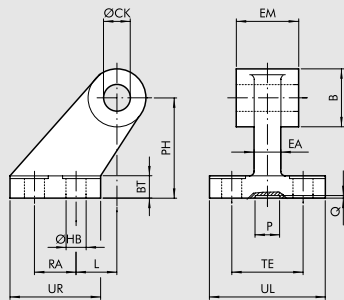
ISO HINGE FOR MODEL B - MODEL GS



Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]
W0950322108	32	25.5	32.5	45	7	32	11	10	10	10	106
W0950402108	40	27.5	38	52	7	36	13	10	12	12	138
W0950502108	50	31.5	46.5	65	9	45	13	12	12	12	252
W0950632108	63	39.5	56.5	75	9	50	17	12	16	15	350
W0950802108	80	49.5	72	95	11	63	17	16	16	15	655
W0951002108	100	59.5	89	115	11	73	21	16	20	22	980

Note: Supplied with 4 screws, 4 washers

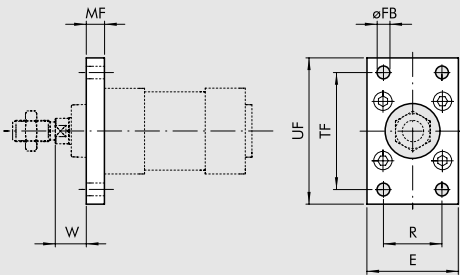
ISO 15552 HINGE FOR MODEL B - MODEL AB7



Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]
W0950322017	32	26	20	6.6	10	38	18	32	31	51	3	8	10	21	3	60
W0950402017	40	28	22	6.6	12	41	22	36	35	54	2	10	15*	21	3	85
W0950502017	50	32	26	9	12	50	30	45	45	65	3	12	16	21	3	162
W0950632017	63	40	30	9	16	52	35	50	50	67	2	14*	16	21	3	191
W0950802017	80	50	30	11	16	66	40	63	60	86	7	14	20	21	3	332
W0951002017	100	60	38	11	20	76	50	71	70	96	5	17*	20	11	3	522
W0951252017	125	70	45	14	25	94	60	90	90	124	10	20	30	21	3	960

* Dimensions not to ISO 15552

FRONT FLANGE - MODEL C

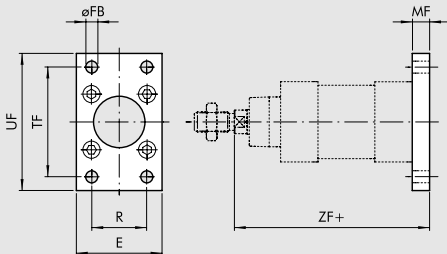


Code	Ø	TF	UF	E	MF	R	øFB	W	Weight [g]
W0950322002	32	64	80	50	10	32	7	16	246
W0950402002	40	72	90	55	10	36	9	20	290
W0950502002	50	90	110	65	12	45	9	25	522
W0950632002	63	100	120	75	12	50	9	25	670
W0950802002	80	126	153	95	16	63	12	30	1420
W0951002002	100	150	178	115	16	75	14	35	2040
W0951252002	125	180	220	140	20	90	16	45	4300

Note: Supplied with 4 screws

REAR FLANGE - MODEL C

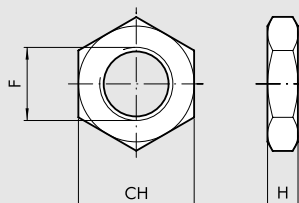
+ = ADD THE STROKE



Code	Ø	TF	UF	E	MF	R	øFB	ZF	Weight [g]
W0950322002	32	64	80	50	10	32	7	130	246
W0950402002	40	72	90	55	10	36	9	145	290
W0950502002	50	90	110	65	12	45	9	155	522
W0950632002	63	100	120	75	12	50	9	170	670
W0950802002	80	126	153	95	16	63	12	190	1420
W0951002002	100	150	178	115	16	75	14	205	2040
W0951252002	125	180	220	140	20	90	16	245	4300

Note: Supplied with 4 screws.

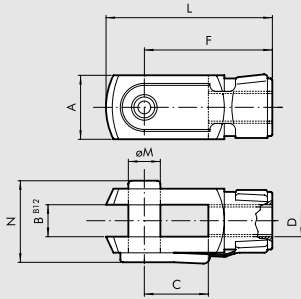
ROD NUT - MODEL S



Code	Ø	F	H	CH	Weight [g]
0950322010	32	M10x1.25	6	17	6
0950402010	40	M12x1.25	7	19	12
0950502010	50/63	M16x1.5	8	24	20
0950802010	80/100	M20x1.5	9	30	32
0951252010	125	M27x2	12	41	74

Note: Individually packed

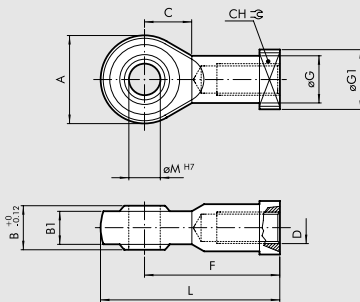
FORK MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0950322020	32	10	20	10	20	52	40	M10x1.25	26	92
W0950402020	40	12	24	12	24	62	48	M12x1.25	32	148
W0950502020	50	16	32	16	32	83	64	M16x1.5	40	340
W0950502020	63	16	32	16	32	83	64	M16x1.5	40	340
W0950802020	80	20	40	20	40	105	80	M20x1.5	48	690
W0950802020	100	20	40	20	40	105	80	M20x1.5	48	690
W0951252020	125	30	54	30	55	148	110	M27x2	65	1835

Note: Individually packed

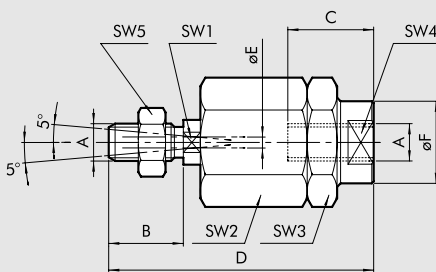
ROD EYE - MODEL GA-M



Code	Ø	øM	C	BI	B	A	L	F	D	øG	CH	øG1	Weight [g]
W0950322025	32	10	15	10.5	14	28	57	43	M10x1.25	15	17	19	78
W0950402025	40	12	17	12	16	32	66	50	M12x1.25	17.5	19	19	116
W0950502025	50	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950502025	63	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950802025	80	20	26	18	25	50	102	77	M20x1.5	27.5	30	27	404
W0950802025	100	20	26	18	25	50	102	77	M20x1.5	27.5	30	27	404
W0951252025	125	30	36	25	37	70	145	110	M27x2	40	41	50	1190

Note: Individually packed

SELF ALIGNING ROD COUPLER - MODEL GA-K



Code	Ø	A	B	C	D	øF	øE	SW ₁	SW ₂	SW ₃	SW ₄	SW ₅	Weight [g]
W0950322030	32	M10x1.25	20	20	71	22	4	12	30	30	19	17	216
W0950402030	40	M12x1.25	24	20	75	22	4	12	30	30	19	19	220
W0950502030	50	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950502030	63	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950802030	80	M20x1.5	40	40	119	32	4	20	41	41	30	30	680
W0950802030	100	M20x1.5	40	40	119	32	4	20	41	41	30	30	680

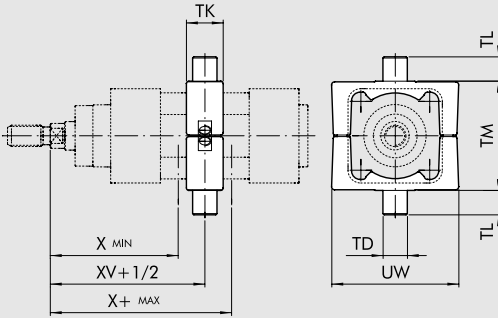
Note: Individually packed

NOTES

ACCESSORIES FOR ISO 15552 CYLINDERS: INTERMEDIATE HINGE

INTERMEDIATE HINGE - MODEL EN, FOR STD AND STD TWO-FLAT SERIES

+ = ADD THE STROKE
+ 1/2 = ADD HALF THE STROKE

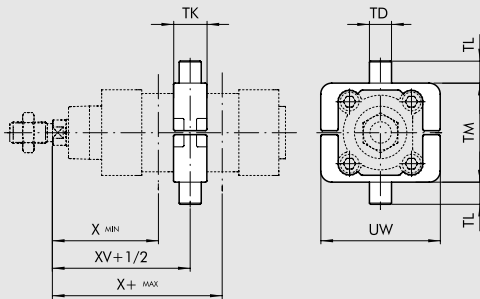


Code	Ø	X _(min)	XV	X _(max)	TM	TL	TD _{e.9}	TK	UW	Weight [g]
0950322007	32	63	73	83	50	12	12	22	65	282
0950402007	40	72	82.5	93	63	16	16	28	75	582
0950502007	50	83	90	97	75	16	16	32	95	880
0950632007	63	86.5	97.5	108.5	90	20	20	35	105	1230
0950802007	80	104	110	116	110	20	20	40	130	2030
0951002007	100	113.5	120	126.5	132	25	25	45	145	2600
0951252007	125	135	145	155	160	25	25	50	175	3900

Note: Supplied complete with 4 grub screws, 2 pins

INTERMEDIATE HINGE - MODEL EN, FOR TYPE A AND TYPE A TWO-FLAT SERIES

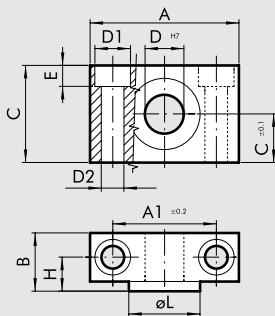
+ = ADD THE STROKE
+ 1/2 = ADD HALF THE STROKE



Code	Ø	X _(min)	XV	X _(max)	TM	TL	TD _{e.9}	TK	UW	Weight [g]
0950322107	32	63	73	83	50	12	12	22	65	170
0950402107	40	72	82.5	93	63	16	16	28	75	360
0950502107	50	83	90	97	75	16	16	28	95	580
0950632107	63	86.5	97.5	108.5	90	20	20	36	105	950
0950802107	80	104	110	116	110	20	20	36	130	1480
0951002107	100	113.5	120	126.5	132	25	25	45	145	2140
0951252107	125	135	145	155	160	25	25	50	175	2950

Note: Supplied with 8 grub screws, 2 pins

COUNTER-HINGE FOR MODEL EN - MODEL EL



Code	Ø	A	A ₁	B	C	C ₁	D ₁	D ₂	D	E	H	øL	Weight [g]
W0950322009	32	46	32	18	30	15	11	7	12	6.5	10.5	22	162
W0950402009	40	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950402009	50	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950632009	63	65	42	23	40	20	18	11	20	10.5	13	35	414
W0950632009	80	65	42	23	40	20	18	11	20	10.5	13	35	414
W0951002009	100	75	50	28.5	50	25	20	13	25	12.5	16	40	715
W0951002009	125	75	50	28.5	50	25	20	13	25	12.5	16	40	715

Note: 2-pieces pack with 4 screws

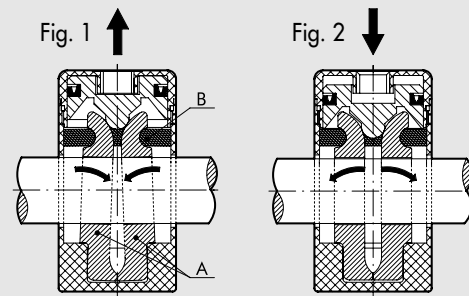
ACCESSORIES FOR ISO 15552 CYLINDERS: MECHANICAL ROD BLOCK

TECHNICAL DATA	
Pilot pressure	bar 4 to 8
	MPa 0.4 to 0.8
Temperature range	°C -10 to +80
	°F 14 to 176
Operation	NC - bidirectional
Mechanics	Double shoe with mechanical lock Mechanical stick-slip
Locking force	Ø 32 40 50 63 80 100 125
	N 650 1100 1600 2500 4000 6300 8700
MATERIAL	
body	Aluminium
shoe	Brass
spring	NBR
piston	Synthetic material with added Teflon®
gasket	NBR
Pilot port	M5 or 1/8"



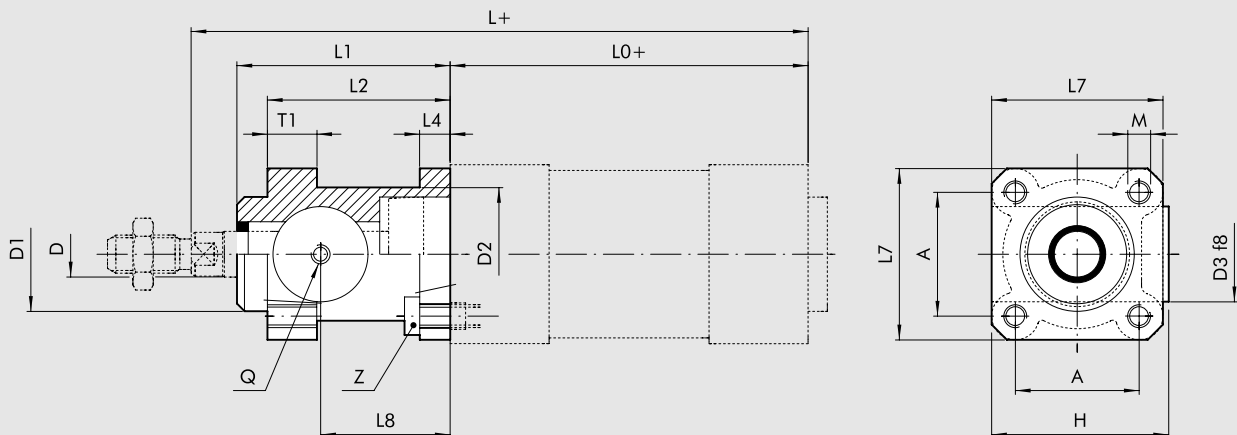
OPERATING PRINCIPLE

The mechanical piston rod lock is a normally-closed mechanism. In the absence of pneumatic piloting, the two shoes (A) lock the cylinder rod in both directions (Fig. 1). With pneumatic piloting, the piston rod guide forces the shoes to come right up to each other and overcome the counter spring (B) force and the piston rod can slide (Fig. 2). It is important to remember that the mechanical piston rod lock is a static type, which means that it is necessary to stop the cylinder piston rod pneumatically before locking the part mechanically.



DIMENSIONS

+ = ADD THE STROKE



Code	Ø	L ₁	L ₂	L ₄	L ₇	L ₈	D	D ₁	D ₂	D ₃	H	A	T ₁	M	Z	Q	L ₀	L	Weight [g]
W5010001102	32	58	48	8	45	34	12	30	35	25	46.5	32.5	13	M6	M6x20	M5	94	162	150
W5010001103	40	65	55	8	50	38	16	35	40	28	53	38	13	M6	M6x20	G1/8	105	180	200
W5010001104	50	82	70	15	60	48	20	40	50	35	64	46.5	16	M8	M8x30	G1/8	106	200	500
W5010001109	63	82	70	15	70	49.5	20	45	60	38	75	56.5	16	M8	M8x30	G1/8	121	215	700
W5010001106	80	110	90	18	90	61	25	45	80	48	95	72	20	M10	M10x35	G1/8	128	251	1700
W5010001107	100	115	100	18	105	68	25	55	100	58	110.5	89	20	M10	M10x35	G1/8	138	266	2700
W5010001108	125	167	122	22	140	86.5	32	60	130	65	150	110	30	M12	M12x40	G1/8	160	347	5600

ACCESSORIES FOR ISO 15552 CYLINDERS: GUIDE UNITS

Guide units series DS-DH-DM ensure optimal alignment and anti-rotation effect of the pneumatic cylinder connected to it. The guide units can be used separately or combined in order to get complete handling units, in which case the guide units can be coupled using the type A and C anchorage (pin and flange).

The guide units can be coupled to ISO 15552 cylinders (Ø 32 to 100).

The following versions are available:

U PROFILE*: for limited loads and speeds (GDS)

H PROFILE*: for high loads (GDH)

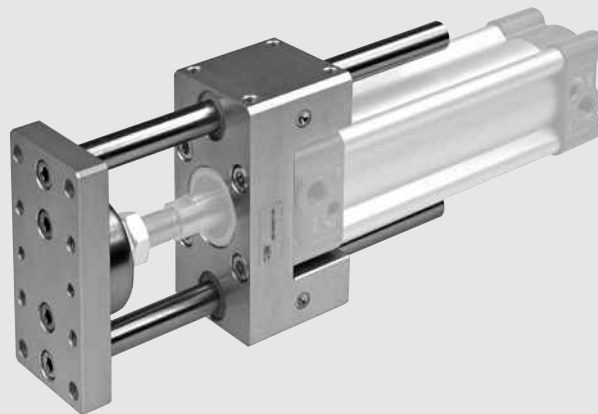
H PROFILE**: for high speeds (GDM)

STANDARD STROKES: 50 - 100 - 150 - 200 - 250 - 320 - 400 - 500

* Bronze guide bushings

** Ball guide bushings

(For weights, see technical data page 1-9)

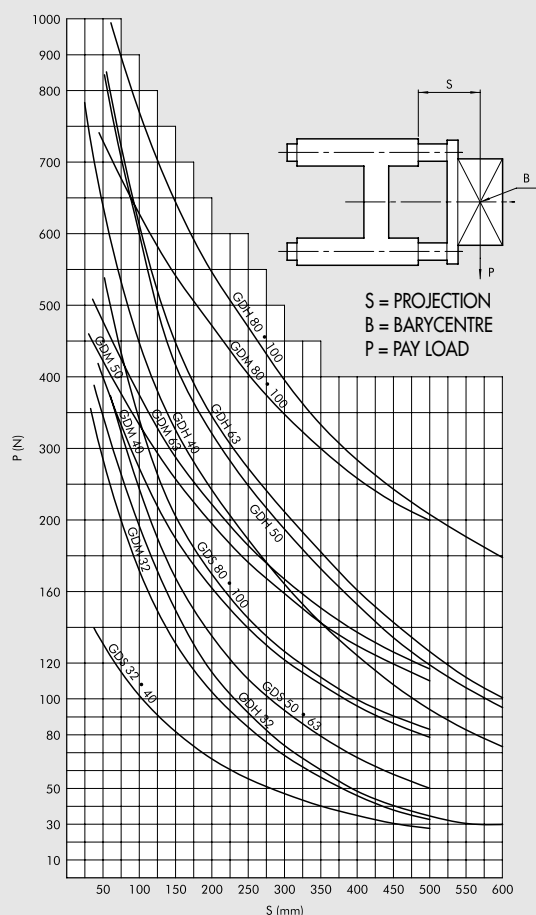


COMPONENTS

SERIES GDS-GDH	Body:	aluminium alloy
	Guide bushing:	self-lubricating sintered bronze and wiper rings
	Piston rod:	chromed rolled steel

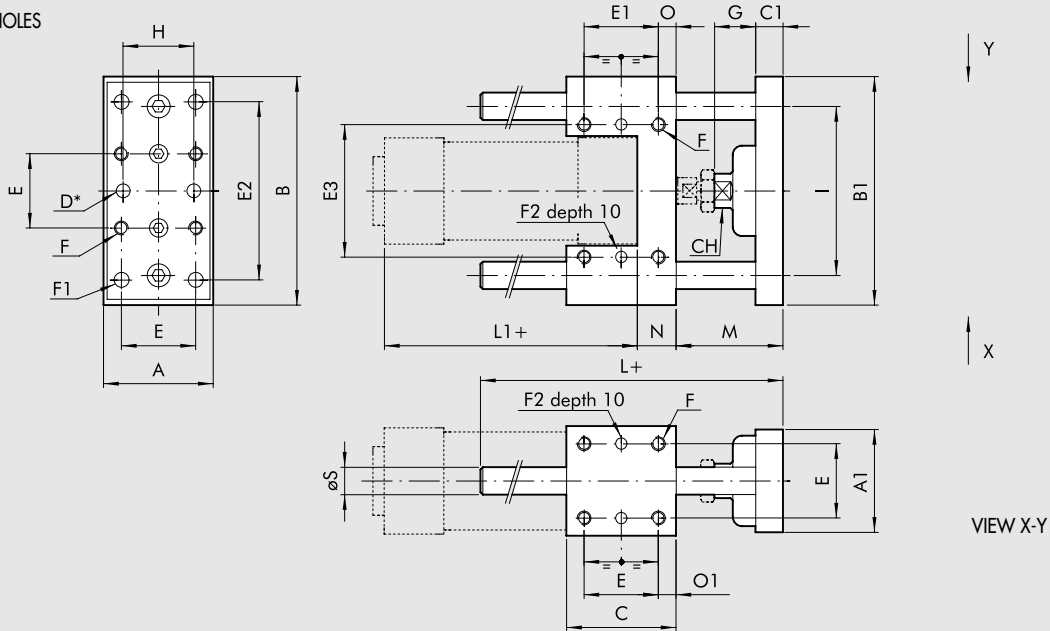
SERIES GDM	Body:	aluminium alloy
	Guide bushing:	ball linear bearings and scraper ring
	Piston rod:	tempered stainless steel

GRAPH OF GUIDE UNIT LOADS



DIMENSIONS TYPE GDS

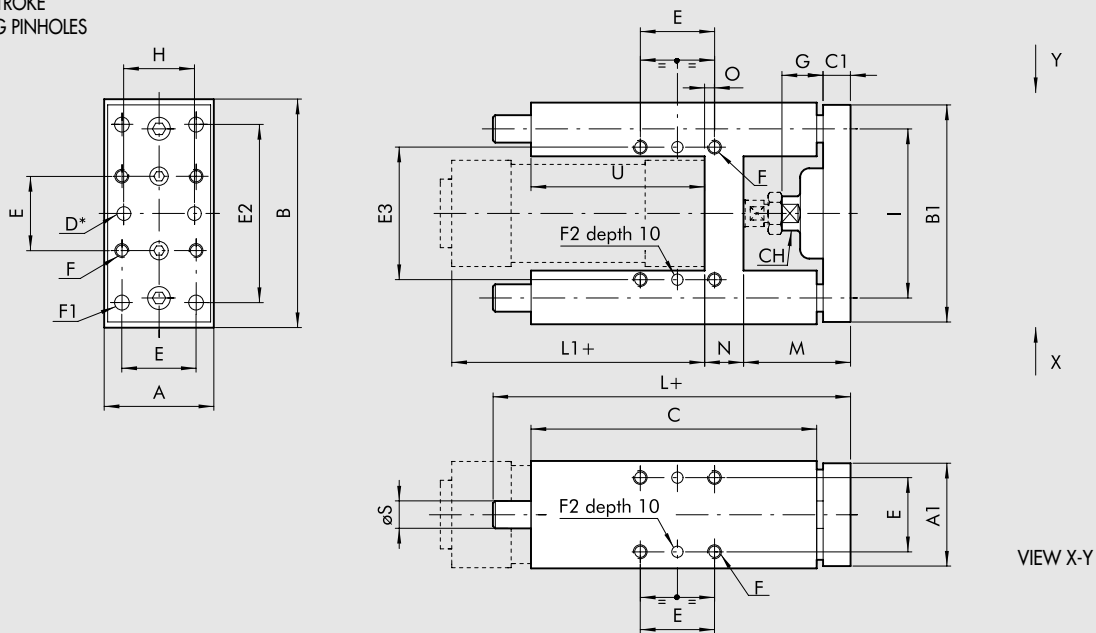
+ = ADD THE STROKE
* = CENTERING PINHOLES



Ø	A	A ₁	B	B ₁	C	C ₁	D ^{H7}	E	E ₁	E ₂	E ₃	F	F ₁	F ₂ ^{H7}	G	H	I	L	L ₁	M	N	O	O ₁	ØS	CH
32	48	45	100	95	48	12	6	32.5	32.5	78	58	M6	6.5	6	18	31	74	108	94	46	17	7.8	7.8	12	15
40	56	53	106	101	58	15	6	38	38	84	64	M6	6.5	6	21	36	80	120	105	52	21	10	10	12	15
50	66	63	125	120	59	15	6	46.5	46.5	100	80	M8	8.5	6	24	45	96	130	106	65	25	6.3	6.3	16	22
63	76	73	132	127	76	15	6	56.5	56.5	105	95	M8	8.5	6	24	45	104	145	121	65	25	9.8	9.8	16	22
80	98	95	165	160	90	16	6	72	50	130	130	M10	11	6	31	56	130	170	128	71	34	20	9	20	27
100	118	115	185	180	110	16	6	89	70	150	150	M10	11	6	31	56	152	190	138	71	39	20	10.5	20	27

DIMENSIONS TYPE GDH-GDM

+ = ADD THE STROKE
* = CENTERING PINHOLES



Ø	A	A ₁	B	B ₁	C	C ₁	CH	D ^{H7}	E	E ₂	E ₃	F	F ₁	F ₂ ^{H7}	G	H	I	L	L ₁	M	N	O	ØS	U
32	49	45	97	90	125	12	13	6	32.5	78	61	M6	6.5	6	18	31	74	177	94	47	17	4.3	12	76
40	58	54	115	110	139	15	15	6	38	84	69	M6	6.5	6	21	36	87	192	105	53	21	11	16	81
50	69	63	137	130	148	15	22	6	46.5	100	85	M8	8.5	6	24	45	104	205	106	63	26	18.5	20	78
63	85	79	152	145	182	15	22	6	56.5	105	100	M8	8.5	6	24	45	119	237	121	62	26	15.3	20	111
80	105	99	189	180	215	20	27	6	72	130	130	M10	11	6	31	56	148	280	128	76	34	21	25	128
100	129	120	213	200	220	20	27	6	89	150	150	M10	11	6	31	56	172	280	138	76	39	24.5	25	128

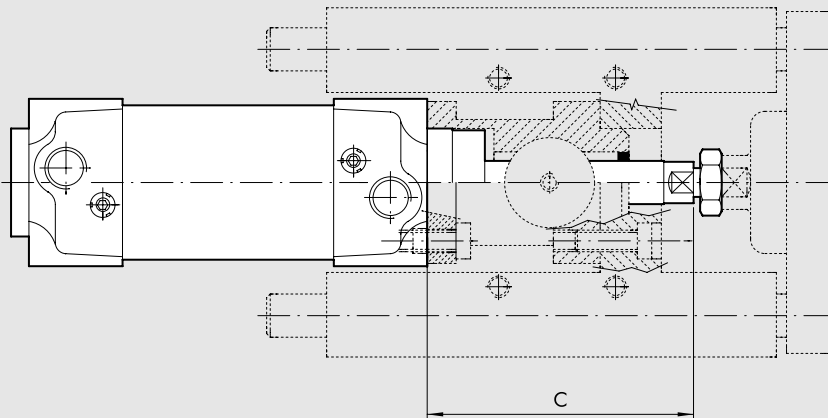
ORDER CODE GUIDE UNIT

Version	Code	Bore	Type
Sliding on bronze bushings (GDS)	W0700321...	32	UNIT MW DS 032...
	W0700401...	40	UNIT MW DS 040...
	W0700501...	50	UNIT MW DS 050...
	W0700631...	63	UNIT MW DS 063...
	W0700801...	80	UNIT MW DS 080...
	W0701001...	100	UNIT MW DS 100...
Sliding on bronze bushings (GDH)	W0700322...	32	UNIT MW DH 032...
	W0700402...	40	UNIT MW DH 040...
	W0700502...	50	UNIT MW DH 050...
	W0700632...	63	UNIT MW DH 063...
	W0700802...	80	UNIT MW DH 080...
	W0701002...	100	UNIT MW DH 100...
Sliding on ball bearing (GDM)	W0700323...	32	UNIT MW DM 032...
	W0700403...	40	UNIT MW DM 040...
	W0700503...	50	UNIT MW DM 050...
	W0700633...	63	UNIT MW DM 063...
	W0700803...	80	UNIT MW DM 080...
	W0701003...	100	UNIT MW DM 100...

Note: To complete the type and code, add the 3-digit stroke (e.g. 50=050)

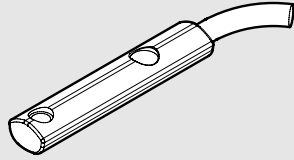
DIMENSIONS PISTON ROD LOCK + GUIDE UNIT COD. 137

Ø	C
32	74
40	85
50	107
63	107
80	136
100	143



ACCESSORIES FOR ISO 15552 CYLINDERS: MAGNETIC SENSORS

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

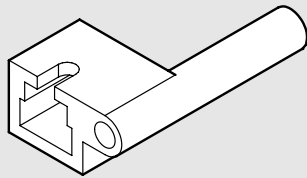
* For use when standard sensors do not detect the magnet, e.g. near metal masses.

Can be used on all ISO 15552 cylinders.

Use the adaptor to secure to STD cylinders.

For technical data see pag. 1-288

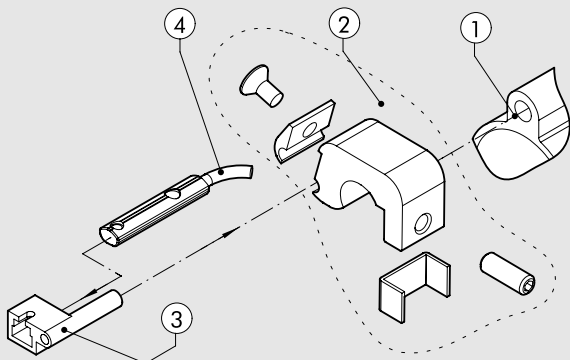
ADAPTOR FOR RETRACTABLE SENSOR



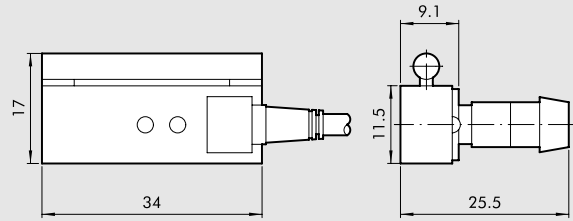
Code	Description
W0950001001	Adaptor DSS005 for DST/ST brackets

ASSEMBLY DIAGRAM

- ① ISO 15552 cylinder with Serie STD or Serie 3 barrel
- ② Sensor bracket mod. DST (Ø 32 to 125)
- ③ Adaptor
- ④ Retractable sensor with insertion from above



SENSOR MOD. DSM

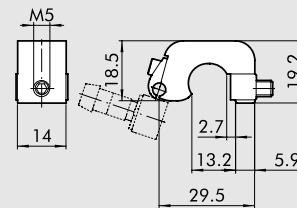


Code	Description
W0950000201	REED sensor DSM2-C525 HS
W0950000222	E.HALL PNP sensor DSM3-N225
W0950000232	E. HALL NPN sensor DSM3-M225

Can be used on ISO 15552 cylinders in the STD series and series 3.
For technical data see pag. 1-286

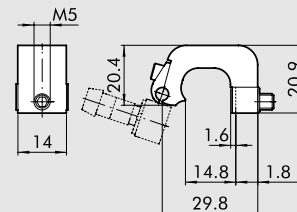
SENSOR SUPPORT BRACKETS FOR SENSORS DSM

Ø 32 to 40



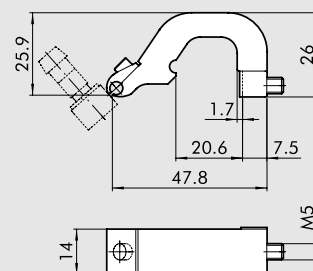
Code	Description
W0950000711	Bracket D.32 DST 80

Ø 50 to 63



Code	Description
W0950000712	Bracket D.50 DST 81

Ø 80 to 125



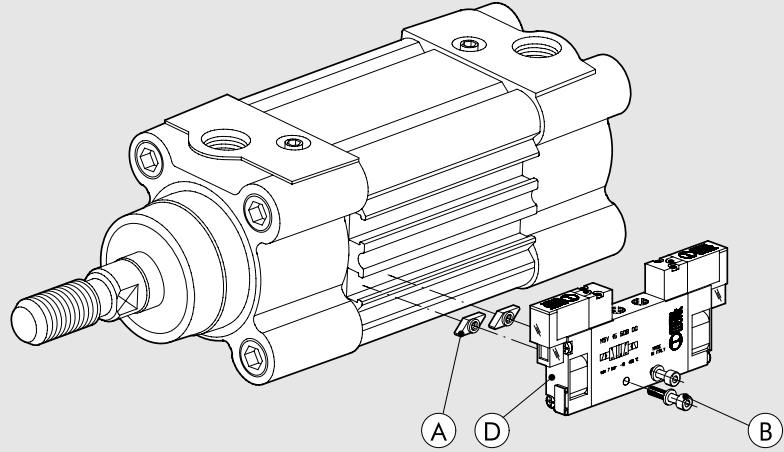
Code	Description
W0950000713	Bracket D.80-100-125 DST 82

VALVE ASSEMBLY ON CYLINDER FOR TYPE A AND SERIES 3 CYLINDERS

With this type of cylinder, the valves (D) can be mounted directly using the retracting sensor slot, without requiring the use of intermediate brackets.

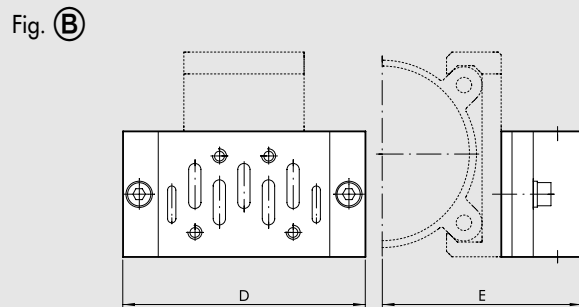
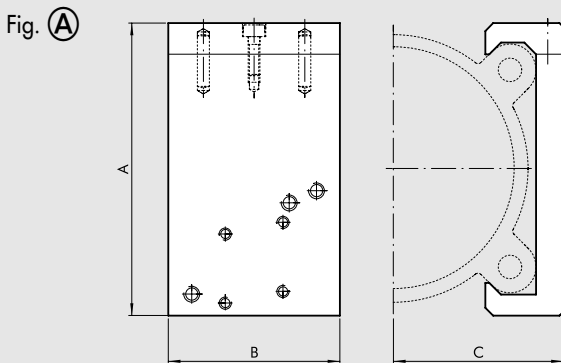
This can be done using the special plates (A), which come with both the M3 and M4 threads, and screws (B) of the size, type and quantity shown in the table below.

For ISO 1 and ISO 2 valves, the kit on which the valve is to be mounted (codes shown in the tables) will be fitted to the cylinder using the special plates (A) and the screws (B) listed in the table.



Type of valve to mount (D)	M3 fixing plate (A) code 0950003002	M4 fixing plate (A) code 0950003001	Screw (B) for connection to cylinder (one per plate)	Washer (B) (one per screw)	Valve assembly kit
MINIMACH	n° 2	-	M3x16 UNI 5931 (DIN 912)	A3.2 UNI 1751 (DIN 127A)	-
MACH 11	n° 2	-	M3x16 UNI 5931 (DIN 912)	A3.2 UNI 1751 (DIN 127A)	-
SERIE 70 1/8	-	n° 2	M4x25 UNI 5931 (DIN 912)	-	-
SERIE 70 1/4	-	n° 2	M4x30 UNI 5931 (DIN 912)	A4.3 UNI 1751 (DIN 127A)	-
SERIE 70 1/2	-	n° 2	M4x45 UNI 5931 (DIN 912)	A4.3 UNI 1751 (DIN 127A)	-
ISO 1	-	n° 2	M4x8 UNI 7688 (DIN 965A)	-	0950002001
ISO 2	-	n° 2	M4x8 UNI 7688 (DIN 965A)	-	0950002002

FIXING BRACKET SERIES KCV FOR TYPE A AND SERIES 3 CYLINDERS



VALVE FIXING BRACKET - CYLINDER (Fig. A)

Code	Ø	A	B	C	D	ISO 1		ISO 2		Applicable valves	Weight [g]
						E	D	E			
0950322090	32	54	40	29.5	110	64.5	124	70.5	MACH 16 Series 70 1/8-1/4 ISO 1 - ISO 2	80	
0950402090	40	59.5	40	32.2	110	67.2	124	73.2	MACH 16 Series 70 1/8-1/4 ISO 1 - ISO 2	86	
0950502090	50	71.5	40	37	110	72	124	78	MACH 16 Series 70 1/8-1/4 ISO 1 - ISO 2	93	
0950632090	63	81.5	40	42	110	77	124	83	MACH 16 Series 70 1/8-1/4 ISO 1 - ISO 2	101	
0950802090	80	99	60	53.5	110	88.5	124	94.5	Series 70 1/8-1/4-1/2 ISO 1 - ISO 2	222	
0951002090	100	119.5	60	63.5	110	98.5	124	104.5	Series 70 1/8-1/4-1/2 ISO 1 - ISO 2	258	
0951252090	125	148	60	76.5	110	111.5	124	117.9	Series 70 1/8-1/4-1/2 ISO 1 - ISO 2	298	

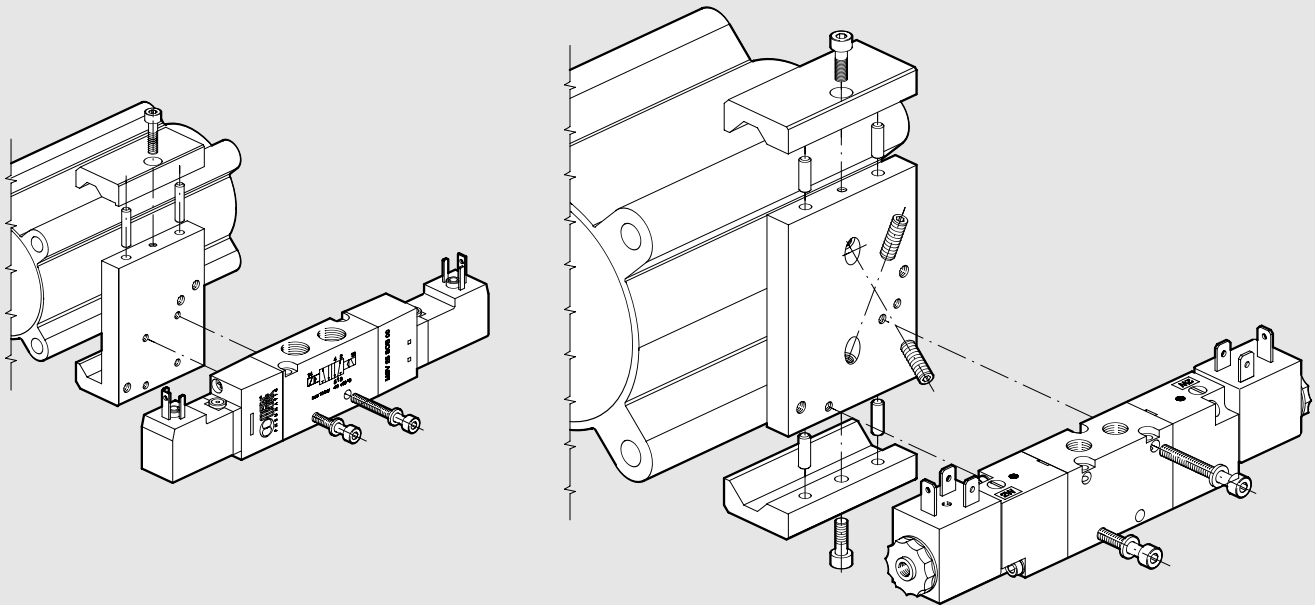
KIT FOR FIXING VALVES TO BRACKETS, FOR SERIES KCV BRACKETS

Code	Valve kit	Composition	Weight [g]
0950002003	MACH 16	2 hex. screws M3x25 with washer	4
0950002004	Series 70 1/8-1/4	2 hex. screws M4x50 with washer	8
0950002006	Series 70 1/2	2 hex. screws M5x50 with washer	20
0950002001	ISO 1	Adaptor + ISO 1 BASE SIDE + screws + washers (Fig.B)	230
0950002002	ISO 2	Adaptor + ISO 2 BASE SIDE + screws + washers (Fig.B)	350

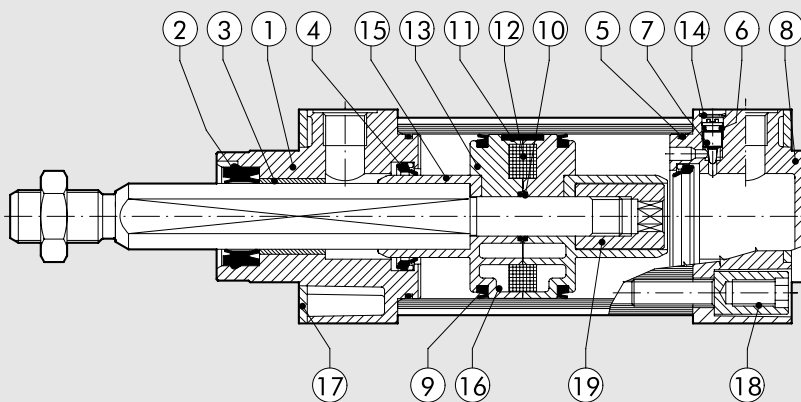
VALVE ASSEMBLY ON CYLINDER

FOR Ø 32-40-50-63

FOR Ø 80-100-125



CYLINDERS ISO 15552 STD AND TYPE "A" TWO-FLAT: SPARE PARTS

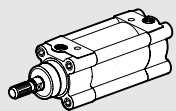


Code	Bore	Type	Parts
009 ... 0101F	Ø 32 to 63	Set of polyurethane gaskets	4-5-6-9-10
009 ... 0110F	Ø 32 to 63	Complete polyurethane front head kit	1-2-3-4-5-6-7-14-17-18
009 ... 0111	Ø 32 to 63	Complete polyurethane rear head kit	4-5-6-7-8-14-17-18
009 ... 0604	Ø 32 to 63	Complete polyurethane piston kit	9-10-16-17
009 ... 0704F	Ø 32 to 63	Complete polyurethane head front+rear+piston kit	1-2-3-4-5-6-7-8-9-10-14-16-17-18
009 ... 0800	Ø 32 to 63	Magnet	12

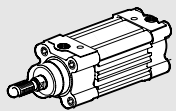
CYLINDERS ISO 1552 STD, TYPE "A" AND SERIES 3: SPARE PARTS

NEW RELEASE

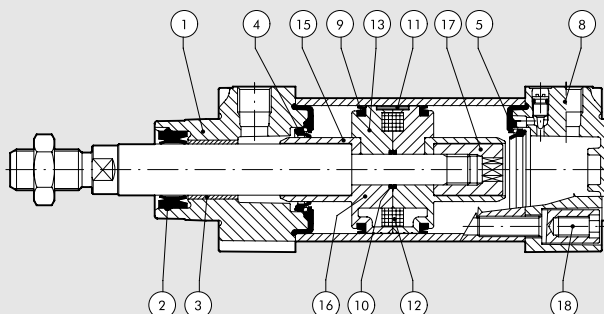
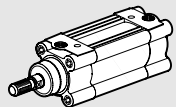
STD



TYPE A



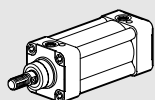
SERIES 3



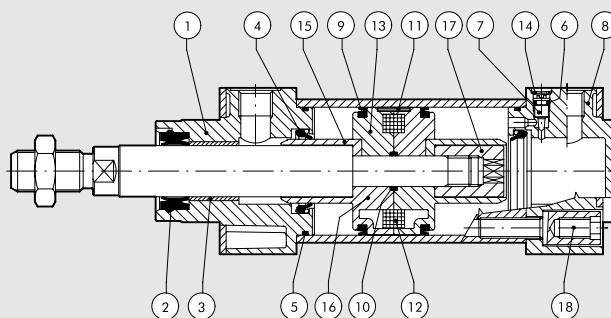
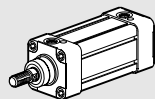
Code	Bore	Type	Parts
009 ... 0101	Ø 32 to 125	Complete set of polyurethane gaskets	2-4-5-9-10
009 ... 0103	Ø 32 to 125	Complete set of high temperature gaskets	2-4-5-9-10
009 ... 0502	Ø 32 to 125	Complete set of NBR gaskets	2-4-5-9-10
009 ... 0110N	Ø 32 to 125	Complete polyurethane front head kit	1-2-3-4-5-17-18
009 ... 0304N	Ø 32 to 125	Complete NBR front head kit	1-2-3-4-5-17-18
009 ... 0111N	Ø 32 to 125	Complete polyurethane rear head kit	4-5-8-17-18
009 ... 0305N	Ø 32 to 125	Complete NBR rear head kit	4-5-8-17-18
009 ... 0604	Ø 32 to 63	Complete polyurethane piston kit	9-10-16-17
009 ... 0604	Ø 80 to 125	Complete polyurethane piston kit	9-10-11-13-15-18
009 ... 0602	Ø 32 to 63	Complete NBR piston kit	9-10-16-17
009 ... 0602	Ø 80 to 125	Complete NBR piston kit	9-10-11-13-15-18
009 ... 0704N	Ø 32 to 63	Complete polyurethane head front+rear+piston kit	1-2-3-4-5-8-9-10-16-17-18
009 ... 0704N	Ø 80 to 125	Complete polyurethane head front+rear+piston kit	1-2-3-4-5-8-9-10-11-13-15-17-18
009 ... 0702N	Ø 32 to 63	Complete NBR head front+rear+piston kit	1-2-3-4-5-8-9-10-16-17-18
009 ... 0702N	Ø 80 to 125	Complete NBR head front+rear+piston kit	1-2-3-4-5-8-9-10-11-13-15-17-18
009 ... 0800	Ø 32 to 125	Magnet	12

OLD RELEASE

STD



TYPE A



Code	Bore	Type	Parts
009 ... 0101	Ø 32 to 125	Complete set of polyurethane gaskets	2-4-5-9-10
009 ... 0103	Ø 32 to 125	Complete set of high temperature gaskets	2-4-5-9-10
009 ... 0502	Ø 32 to 125	Complete set of NBR gaskets	2-4-5-9-10
009 ... 0110	Ø 32 to 125	Complete polyurethane front head kit	1-2-3-4-5-6-7-14-17-18
009 ... 0304	Ø 32 to 125	Complete NBR front head kit	1-2-3-4-5-6-7-14-17-18
009 ... 0111	Ø 32 to 125	Complete polyurethane rear head kit	4-5-6-7-8-14-17-18
009 ... 0305	Ø 32 to 125	Complete NBR rear head kit	4-5-6-7-8-14-17-18
009 ... 0604	Ø 32 to 63	Complete polyurethane piston kit	9-10-16-17
009 ... 0604	Ø 80 to 125	Complete polyurethane piston kit	9-10-11-13-15-18
009 ... 0602	Ø 32 to 63	Complete NBR piston kit	9-10-16-17
009 ... 0602	Ø 80 to 125	Complete NBR piston kit	9-10-11-13-15-18
009 ... 0704	Ø 32 to 63	Complete polyurethane head front+rear+piston kit	1-2-3-4-5-6-7-8-9-10-14-16-17-18
009 ... 0704	Ø 80 to 125	Complete polyurethane head front+rear+piston kit	1-2-3-4-5-6-7-8-9-10-11-13-14-15-17-18
009 ... 0702	Ø 32 to 63	Complete NBR head front+rear+piston kit	1-2-3-4-5-6-7-8-9-10-14-16-17-18
009 ... 0702	Ø 80 to 125	Complete NBR head front+rear+piston kit	1-2-3-4-5-6-7-8-9-10-11-13-14-15-17-18
009 ... 0800	Ø 32 to 125	Magnet	12

TWIN-ROD CYLINDER SERIES TWNC

Anti-rotation cylinders with axial dimensions to ISO 15552.

Serie STD barrel.

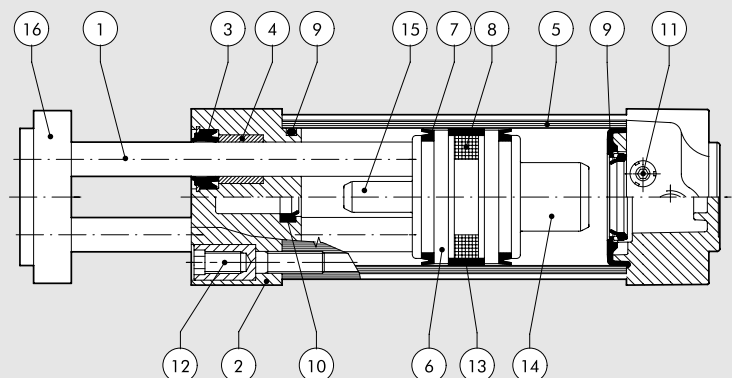
- standard configuration with magnet
- double-acting – passing twinner rods and single passing rod
- polyurethane gasket



TECHNICAL DATA		
Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	-10 to +80
Fluid		Filtered, unlubricated air. Lubrication, if used, must be continuous.
Bores	mm	32; 40; 50; 63; 80; 100
Strokes ⁺	mm	from 25 to 500
Design		Extruded profile
Esecution		Magnetic standard cushioned
Forces generated at 6 bar thrust/retraction		Ø 32: 434/350
		Ø 40: 678/597
		Ø 50: 1060/940
		Ø 63: 1683/1471
		Ø 80: 2714/2295
	Ø 100: 4241/3812	
Weight		See page 1-9
Notes		⁺ Maximum recommended strokes. Higher values can create operating problems

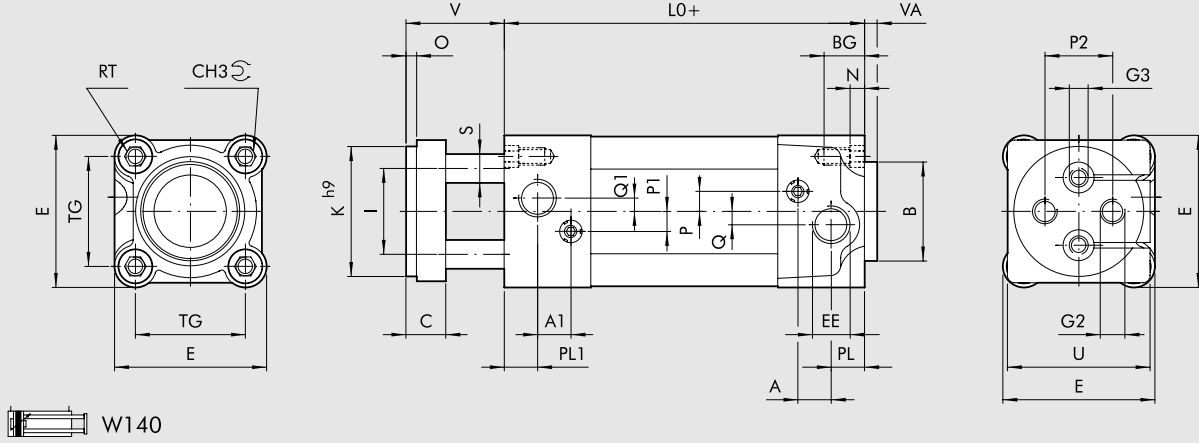
COMPONENTS

- PISTON ROD: thick chromed steel
- HEAD: aluminium alloy
- PISTON ROD GASKET: polyurethane
- GUIDE BUSHING: sintered bronze
- BARREL: drawn anodised aluminium alloy
- PISTON: aluminium alloy
- PISTON GASKET: polyurethane
- MAGNET: plastoferrite
- BUFFER+STATIC O-rings: NBR
- CUSHIONING GASKET: front NBR, rear polyurethane
- NEEDLE: OT 58 brass
- SCREWS: Tap Tite for fixing and assembly
- GUIDE RING: special technopolymer
- REAR CUSHIONING CONE: OT58 brass
- FRONT CUSHIONING CONE: aluminium
- FLANGE: zinc-plated steel



TWIN RODS CYLINDER

+ = ADD THE STROKE

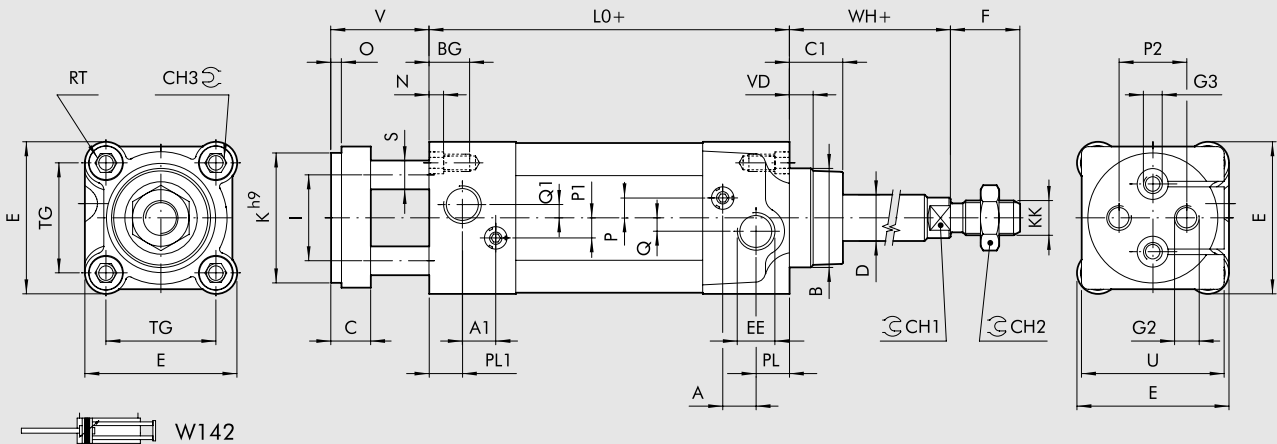


W140

Ø	PL	PL1	A	A1	B	CH3	TG	VA	EE	RT	E	L0	BG	N	P	P1	P2	Q	Q1	C	I	K ^{h9}	S	O	V	U	G2	G3
32	10	13	10	10.5	30	6	32.5	4	G1/8	M6	46	100	14.5	4.5	6	8	19	4	-	15	18	32	10	4	40	45	M6	-
40	12	12	10	10	35	6	38	4	G1/4	M6	54	100	14.5	4.5	6	6	22	4	4	15	22	40	10	4	40	49	M8	-
50	14	14	10	10	40	8	46.5	4	G1/4	M8	64.5	106	17.5	5.5	6	6	30	6	6	18	30	50	12	5	43	54	M8	M8
63	16	16	10	10	45	8	56.5	4	G3/8	M8	75.5	116	17.5	5.5	6	6	38	6	6	22	38	63	16	5	47	69	M10	M10
80	18	18	12	12	45	10	72	4	G3/8	M10	94	131	21.5	5.5	10	10	50	7	7	25	48	80	22	5	50	89	M12	M12
100	20	20	12	12	55	10	89	4	G1/2	M10	111	138	21.5	5.5	10	10	70	7	7	25	60	100	22	5	50	109	M12	M12

SINGLE THROUGH-ROD CYLINDER

+ = ADD THE STROKE



W142

Ø	PL	PL1	A	A1	B	CH1	CH2	CH3	TG	EE	RT	E	L0	BG	N	P	P1	P2	Q	Q1	C	C1	D	F	I	K ^{h9}	KK	S	O	V	VD	U	G2	G3	WH
32	10	13	10	10.5	30	10	17	6	32.5	G1/8	M6	46	100	14.5	4.5	6	8	19	4	-	15	16	12	22	18	32	M10x1.25	10	4	40	6.5	45	M6	-	26
40	12	12	10	10	35	13	19	6	38	G1/4	M6	54	100	14.5	4.5	6	6	22	4	4	15	20	16	24	22	40	M12x1.25	10	4	40	8	49	M8	-	30
50	14	14	10	10	40	17	24	8	46.5	G1/4	M8	64.5	106	17.5	5.5	6	6	30	6	6	18	25	20	32	30	50	M16x1.5	12	5	43	13	54	M8	M8	37
63	16	16	10	10	45	17	24	8	56.5	G3/8	M8	75.5	116	17.5	5.5	6	6	38	6	6	22	25	20	32	38	63	M16x1.5	16	5	47	14	69	M10	M10	37
80	18	18	12	12	45	22	30	10	72	G3/8	M10	94	131	21.5	5.5	10	10	50	7	7	25	33	25	40	48	80	M20x1.5	22	5	50	12	89	M12	M12	46
100	20	20	12	12	55	22	30	10	89	G1/2	M10	111	138	21.5	5.5	10	10	70	7	7	25	38	25	40	60	100	M20x1.5	22	5	50	14	109	M12	M12	51

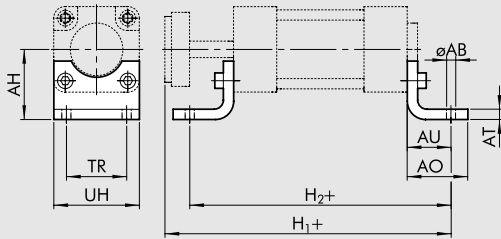
KEY TO CODES

CYL	W 1 4 0 TYPE	0 3 2 BORES	0 0 2 5 STROKE	+ Maximum recommended strokes. Higher values can create operating problems.
W140	Double-acting cylinder, magnetic, cushioned	032	+ 0025 to 0500 mm	
W142	Double-acting cylinder, magnetic, cushioned single through-rod	040 050 063 080 100		

ACCESSORIES FOR TWIN-ROD CYLINDER: FIXINGS

FOOT - MODEL A/S

+ = ADD THE STROKE



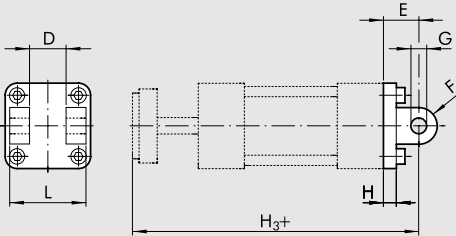
Code	∅	AB	AH	AO	AT	AU	TR	UH	H ₁	H ₂	Weight [g]
W0950323001	32	7	32	35	4	24	32	45	164	148	76
W0950403001	40	9	36	43	4	28	36	52	168	156	98
W0950503001	50	9	45	47	4	32	45	65	181	170	156
W0950633001	63	9	50	47	6	32	50	75	195	180	246
W0950803001	80	12	63	61	6	41	63	95	222	213	406
W0951003001	100	14	71	66	6	41	75	115	229	220	540

Note: Individually packed with 2 screws

For fixing the leg to the supporting surface, it is advisable to use a DIN 7984 sunk-headed screw

FEMALE HINGE - MODEL B

+ = ADD THE STROKE

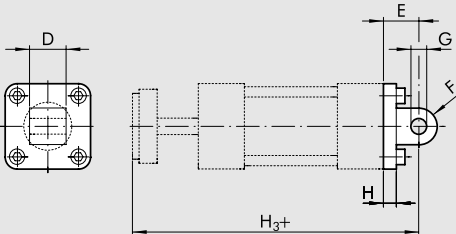


Code	∅	D	E	F	G	H	H ₃	L	Weight [g]
W0950322003	32	26	22	11	10	10	162	45	116
W0950402003	40	28	25	13	12	10	165	52	160
W0950502003	50	32	27	13	12	12	176	60	252
W0950632003	63	40	32	17	16	12	195	70	394
W0950802003	80	50	36	17	16	16	217	90	670
W0951002003	100	60	41	21	23	16	229	110	1085

Note: Supplied with 4 screws, 4 washers, 2 snap-rings and 1 pin

MALE HINGE - MODEL BA

+ = ADD THE STROKE

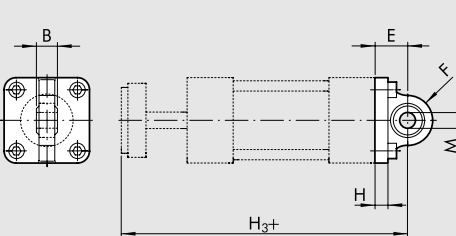


Code	∅	D	E	F	G	H	H ₃	Weight [g]
W0950322004	32	26	22	11	10	10	162	94
W0950402004	40	28	25	13	12	10	165	124
W0950502004	50	32	27	13	12	12	176	220
W0950632004	63	40	32	17	16	12	195	316
W0950802004	80	50	36	17	16	16	217	578
W0951002004	100	60	41	21	20	16	229	850

Note: Supplied with 4 screws, 4 washers

ARTICULATED MALE HINGE - MODEL BAS

+ = ADD THE STROKE

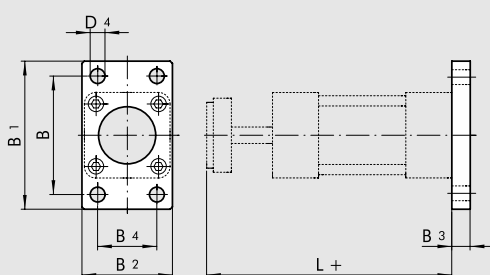


Code	∅	B	E	F	H	H ₃	M	Weight [g]
W0950322006	32	14	22	16	10	162	10	106
W0950402006	40	16	25	19	10	165	12	142
W0950502006	50	16	27	19	12	176	12	236
W0950632006	63	21	32	24	12	195	16	336
W0950802006	80	21	36	24	16	217	16	572
W0951002006	100	25	41	30	16	229	20	840

Note: Supplied with 4 screws, 4 washers.

REAR FLANGE - MODEL C

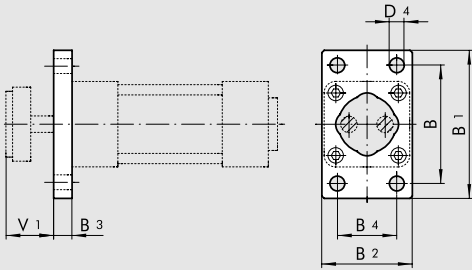
+ = ADD THE STROKE



Code	∅	B	B ₁	B ₂	B ₃	B ₄	D ₄	L	Weight [g]
W0950322002	32	64	80	50	10	32	7	140	246
W0950402002	40	72	90	55	10	36	9	140	290
W0950502002	50	90	110	65	12	45	9	149	522
W0950632002	63	100	120	75	12	50	9	163	670
W0950802002	80	126	153	95	16	63	12	181	1420
W0951002002	100	150	178	115	16	75	14	188	2040

Note: Supplied with 4 screws.

FRONT FLANGE - MODEL C/S

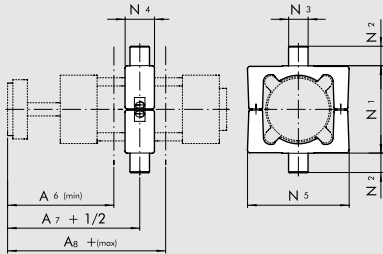


Code	Ø	B	B ₁	B ₂	B ₃	B ₄	D ₄	V ₁	Weight [g]
W0950323002	32	64	80	50	10	32	7	30	228
W0950403002	40	72	90	55	10	36	9	30	288
W0950503002	50	90	110	65	12	45	9	31	486
W0950633002	63	100	120	75	12	50	9	35	569
W0950803002	80	126	153	95	16	63	12	34	1145
W0951003002	100	150	178	115	16	75	14	34	1760

Note: Supplied with 4 screws

INTERMEDIATE HINGE - MODEL EN

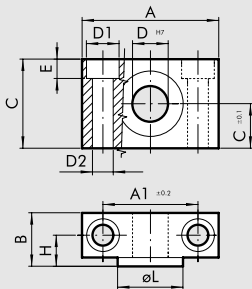
+ = ADD THE STROKE +1/2 = ADD HALF THE STROKE



Code	Ø	N ₁	N ₂	N ₃	N ₄	N ₅	A ₆	A ₇	A ₈	Weight [g]
0950322007	32	50	12	12	22	65	79	91	103	282
0950402007	40	63	16	16	28	75	82	90	98	582
0950502007	50	75	16	16	32	95	91.5	97.5	103.5	880
0950632007	63	90	20	20	35	105	95.5	104.5	113.5	1230
0950802007	80	110	20	20	40	130	108	115.5	123	2030
0951002007	100	132	25	25	45	145	110.5	119	127.5	2600

Note: Supplied with 4 screws, 2 pin

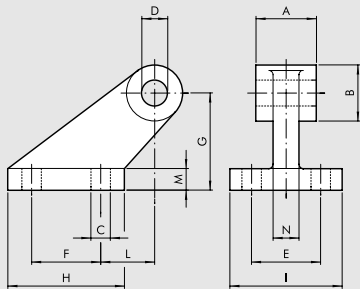
COUNTER-HINGE FOR MODEL EN - MODEL EL



Code	Ø	A	A ₁	B	C	C ₁	D ₁	D ₂	D	E	H	ØL	Weight [g]
W0950322009	32	46	32	18	30	15	11	7	12	6.5	10.5	22	162
W0950402009	40	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950402009	50	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950632009	63	65	42	23	40	20	18	11	20	10.5	13	35	414
W0950632009	80	65	42	23	40	20	18	11	20	10.5	13	35	414
W0951002009	100	75	50	28.5	50	25	20	13	25	12.5	16	40	715

Note: 2-pieces pack with 4 screws

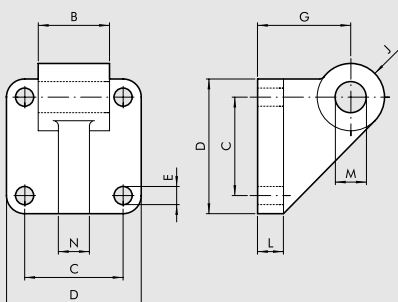
COUNTER-HINGE CETOP FOR MODEL B - MODEL GL



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950322108	32	26	19	7	10	25	20	32	37	41	18	8	10	96
W0950402108	40	28	26	9	12	32	32	45	54	52	25	10	12	216
W0950502108	50	32	26	9	12	32	32	45	54	52	25	10	12	212
W0950632108	63	40	33	11	16	40	50	63	75	63	32	12	15	440
W0950802108	80	50	33	11	16	40	50	63	75	63	32	12	15	464
W0951002108	100	60	44	14	20	50	70	90	103	80	40	16	22	985

Note: Supplied with 4 screws, 4 washers

COUNTER-HINGE ISO FOR MODEL B - MODEL GS

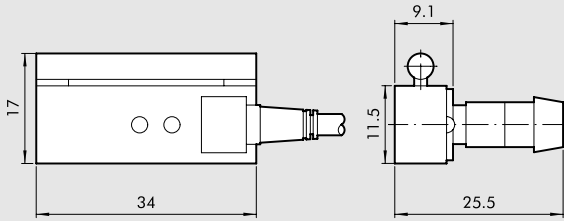


Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]
W09503221108	32	25.5	32.5	45	7	32	11	10	10	10	106
W09504021108	40	27.5	38	52	7	36	13	10	12	12	138
W09505021108	50	31.5	46.5	65	9	45	13	12	12	12	252
W09506321108	63	39.5	56.5	75	9	50	17	12	16	15	350
W09508021108	80	49.5	72	95	11	63	17	16	16	15	655
W09510021108	100	59.5	89	115	11	73	21	20	20	22	980

Note: Supplied with 4 screws, 4 washers

ACCESSORIES FOR TWIN-ROD CYLINDER: MAGNETIC SENSORS

SENSOR SERIES DSM

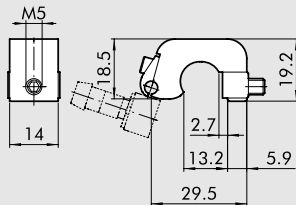


Code	Description
W0950000201	REED sensor DSM2-C525 HS
W0950000222	E.HALL PNP sensor DSM3-N225
W0950000232	E.HALL NPN sensor DSM3-M225

For technical data see page 1-286

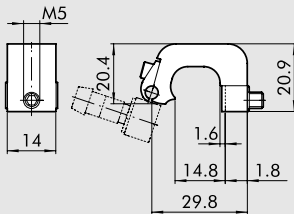
SENSOR BRACKET

Ø 32 to 40



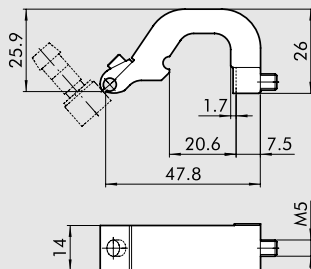
Code	Description
W0950000711	Bracket D.32-40 DST 80

Ø 50 to 63



Code	Description
W0950000712	Bracket D.50-63 DST 81

Ø 80 to 100



Code	Description
W0950000713	Bracket D.80-125 DST 82

NOTES

ISO 15552 CYLINDERS Ø 160-200 (ex ISO 6431)

Cylinders made to ISO 15552 available in various versions and with a wide range of accessories:

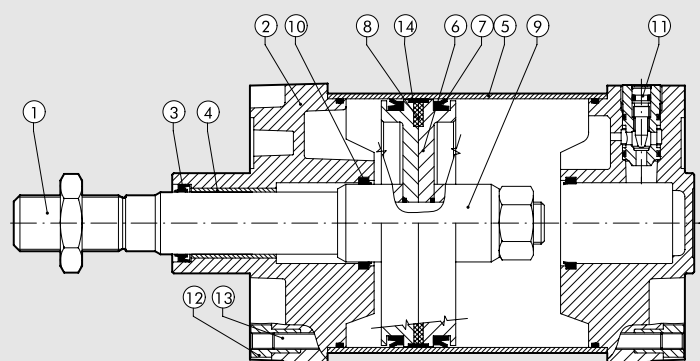
- configuration with or without magnet
- double-acting – single- or through-rod
- NBR gaskets or FKM/FPM (high temperature)
- available with mounted intermediate hinge
- special configurations on request



TECHNICAL DATA		NBR	FKM/FPM
Max operating pressure	bar	10	
	MPa	1	
Temperature range	°C	-10 to +80	-10 to +150
Design		Round barrel with tie rods	
Standard strokes	mm	25-50-75-80-100-125-150-200-250-300-350-400-500-600-700-800-900-1000	
Weight		See page 1-8	
Forces generated at 6 bar (tensile stress)		See page 1-7	

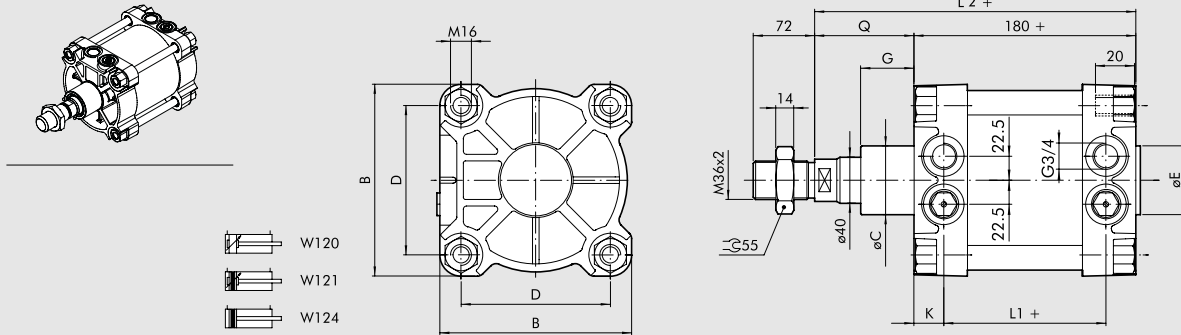
COMPONENTS

- ① PISTON ROD: C45 steel or stainless steel, thick chromed
- ② HEAD: die cast aluminium
- ③ PISTON ROD GASKET: NBR or FKM/FPM
- ④ GUIDE BUSHING: sintered bronze
- ⑤ BARREL: drawn anodised aluminium alloy
- ⑥ PISTON: aluminium
- ⑦ PISTON GASKET: NBR or FKM/FPM
- ⑧ MAGNET: plastoferrite
- ⑨ CUSHIONING CAP: aluminium
- ⑩ CUSHIONING GASKET+ Static O-rings: NBR or FKM/FPM
- ⑪ CUSHIONING NEEDLE: OT 58 with needle out movement safety system even when fully open
- ⑫ SCREWS: galvanised steel
- ⑬ TIE RODS: galvanised steel
- ⑭ GUIDE BELT: technopolimer



DIMENSIONS OF STANDARD VERSION

+ = ADD THE STROKE

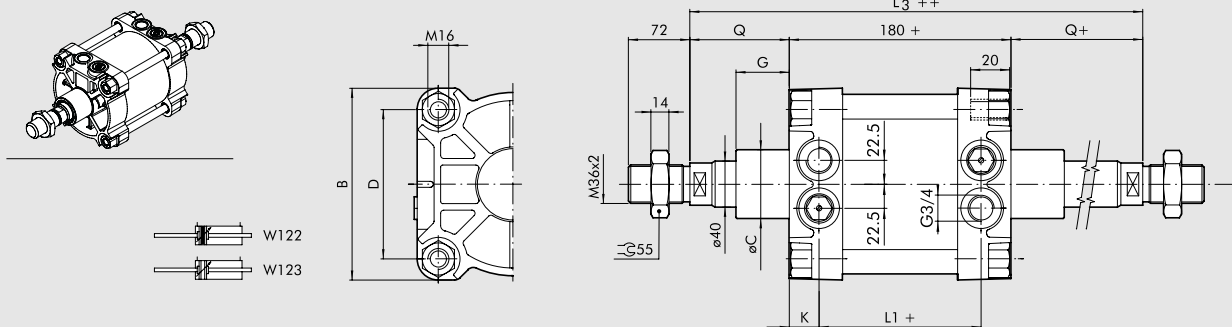


Ø	B	øC	øE	D	G	L ₁	L ₂	Q	K
160	180	65	65	140	50	124	260	80	28
200	220	75	75	175	60	122	275	95	29

DIMENSIONS OF THROUGH-ROD VERSION

+ = ADD THE STROKE

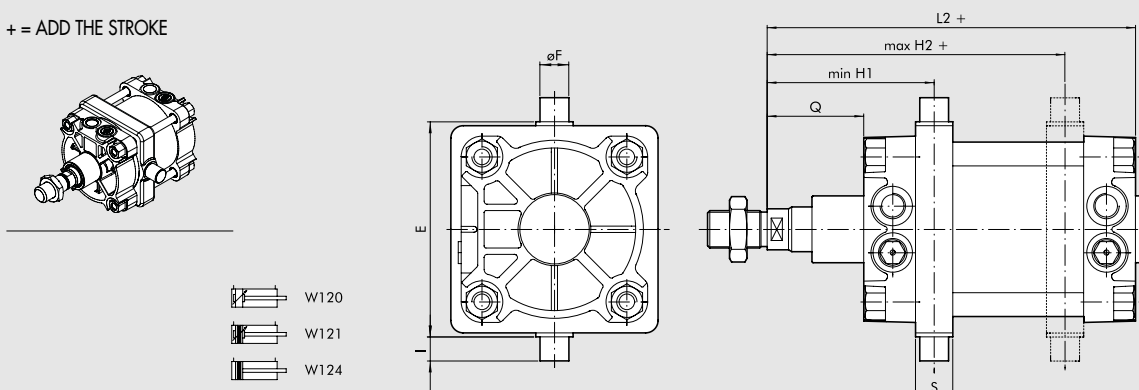
++ = ADD TWICE THE STROKE



Ø	B	øC	øE	D	G	L ₁	L ₂	L ₃	Q	K
160	180	65	65	140	50	124	260	338	80	28
200	220	75	75	175	60	122	275	370	95	29

DIMENSIONS OF VERSION WITH INTERMEDIATE HINGE

+ = ADD THE STROKE



Ø	E	øF	H1	H2	I	L2	Q	S
160	200	32	150	190	32	260	80	40
200	250	32	165	205	32	275	95	40

For the missing values, refer to standard cylinders. In your order, please specify the desired value for H1

KEY TO CODES FOR ROUND BARREL

CYL	W 1 2 1 TYPE	1 6 0 DIAMETER-EXECUTION	0 0 5 0 STROKE	0 2 0 0 EXECUTION
	W120 Double-acting, cushioned, non magnetic W121 Double-acting, cushioned, W122 Double-acting, cushioned, through-rod W123 Double-acting, cushioned, through-rod, non magnetic W124 Double-acting, non-cushioned	160 160 200 200 XA3 160 stainless steel piston rod XA4 200 stainless steel piston rod VA3 160 FKM/FPM gasket, stainless steel piston rod VA4 200 FKM/FPM gasket, stainless steel piston rod KA3 160 FKM/FPM gasket, C45 piston rod KA4 200 FKM/FPM gasket, C45 piston rod AA3 160 + intermediate hinge AA4 200 + intermediate hinge ● GA3 160 no stick-slip ● GA4 200 no stick-slip	+ 0025 to 2800 mm	Specify H1 value ONLY for version with intermediate hinge

- + Maximum recommended strokes. Higher values can create operating problems
- For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only

VERSION WITH SHAPED BARREL

An alternative to the round barrel version is a version with a shaped barrel.
 The technical data, components and dimensions are the same as for the round barrel version.

Note: Type with intermediate hinge not available.



KEY TO CODES FOR SHAPED BARREL

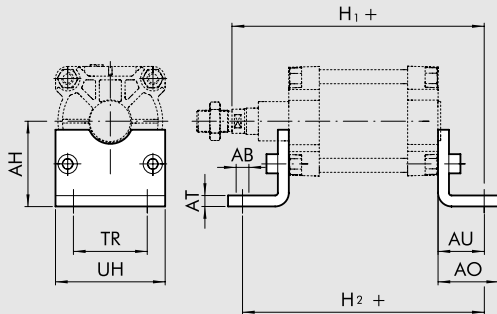
CYL	1 2 1 TYPE	1 6 0 DIAMETER-EXECUTION	0 0 5 0 STROKE	A MATERIAL	N GASKETS
	120 Double-acting, cushioned, non-magnetic 121 Double-acting, cushioned, 122 Double-acting, cushioned, through-rod 124 Double-acting, non-cushioned	160 160 200 200 SA3 160 non magnetic SA4 200 non magnetic ● GA3 160 no stick-slip ● GA4 200 no stick-slip	+ 0025 to 2800 mm	A C45 chromed, piston rod Z Stainless steel chromed, piston rod	N NBR gaskets V FKM/FPM gaskets

- + Maximum recommended strokes. Higher values can create operating problems
- For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only

ACCESSORIES FOR ISO 15552 CYLINDERS Ø 160-200: FIXINGS

FOOT - MODEL A

+ = ADD THE STROKE

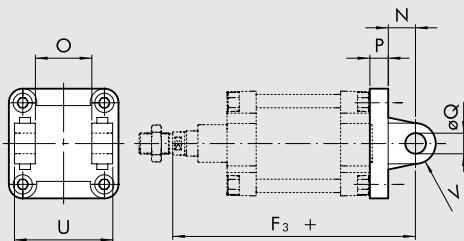


Code	Ø	AB	AH	AO	AT	AU	H ₁	H ₂	TR	UH	Weight [g]
W0951602001	160	18	115	80	10	60	319	300	115	180	2400
W0952002001	200	22	135	100	10	70	345	320	135	220	4000

Note: Individually packed with 2 screws

FEMALE HINGE - MODEL B

+ = ADD THE STROKE

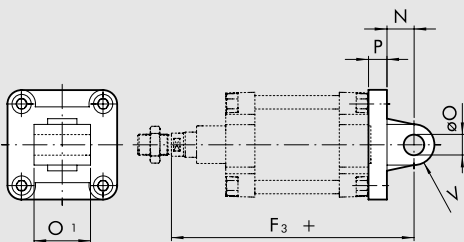


Code	Ø	U	O	øQ	P	N	F ₃	V	Weight [g]
W0951602003	160	170	90	30	20	35	314	25	3300
W0952002003	200	170	90	30	25	35	335	25	4300

Note: Supplied complete with 4 screws, 4 washers, 2 snap rings

MALE HINGE - MODEL BA

+ = ADD THE STROKE

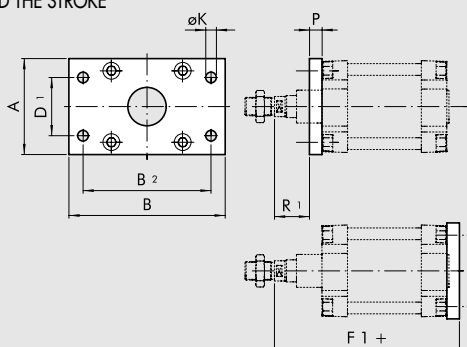


Code	Ø	O ₁	øO	P	N	F ₃	V	Weight [g]
W0951602004	160	90	30	20	35	314	25	2150
W0952002004	200	90	30	25	35	335	25	3550

Note: Supplied complete with 4 screws, 4 washers

FLANGE - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE

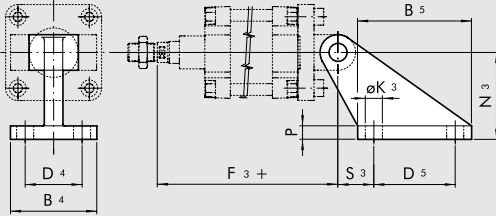


Code	Ø	A	B	B ₂	D ₁	øK	R ₁	P	F ₁	Weight [g]
W0951602002	160	180	270	230	115	18	59	20	279	6900
W0952002002	200	225	312	270	135	22	70	25	300	12800

Note: Individually packed with 4 screws

CETOP COUNTER-HINGE - MODEL GL

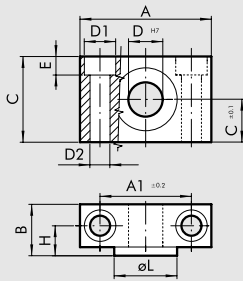
±= ADD THE STROKE



Code	Ø	B ₄	B ₅	D ₄	D ₅	N ₂	N ₃	S ₃	øK ₃	P	F ₃	Weight [g]
W0951602008	160	110	154	63	110	55	140	50	18	20	314	2300
W0951602008	200	110	154	63	110	60	140	50	18	20	335	2300

Note: Supplied complete with 4 screws, 4 washers

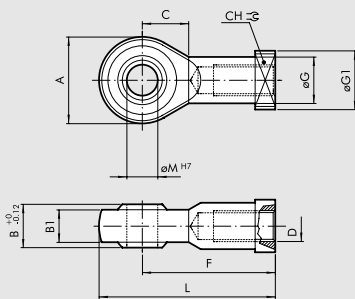
COUNTER-HINGE MODEL EL



Code	Ø	A	A ₁	B	C	C ₁	D ₁	D ₂	D	E	H	øL	Weight [g]
W0951602009	160	92	60	40	60	30	25	17	32	16.5	22.5	48	2740
W0951602009	200	92	60	40	60	30	25	17	32	16.5	22.5	48	2740

Note: 2-pieces pack with 4 screws

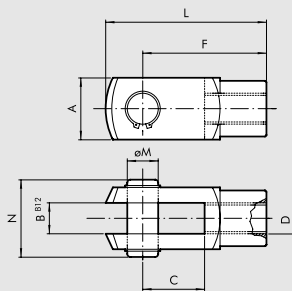
ROD EYE - MODEL GA-M



Code	Ø	øM	C	B ₁	B	A	L	F	D	øG	CH	øG ₁	Weight [g]
W0952002025	160	35	41	28	43	80	165	125	M36x2	46	50	58	1645
W0952002025	200	35	41	28	43	80	165	125	M36x2	46	50	58	1645

Note: Individually packed

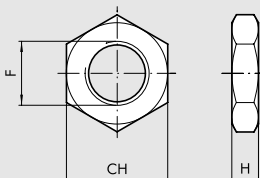
FORK - MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0951602020	160	35	72	35	70	188	144	M36x2	84	3850
W0951602020	200	35	72	35	70	188	144	M36x2	84	3850

Note: Individually packed

ROD NUT - MODEL S

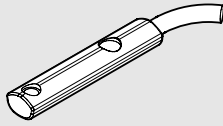


Code	Ø	F	H	CH	Weight [g]
W0951602010	160	M36x2	14	55	170
W0951602010	200	M36x2	14	55	170

Note: Individually packed

ACCESSORIES FOR ISO 15552 CYLINDERS Ø 160-200: MAGNETIC SENSORS

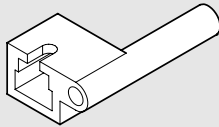
RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
NB: For technical data see page 1-288

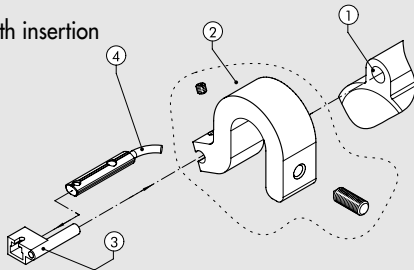
ADAPTOR FOR RETRACTABLE SENSOR



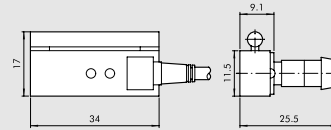
Code	Description
W0950001001	Adaptor DSS005 for DST/ST brackets

ASSEMBLY DIAGRAM

- ① ISO 15552 cylinder with traditional barrel
- ② Sensor bracket mod. ST (Ø 160 and 200)
- ③ Adaptor
- ④ Retractable sensor with insertion from above



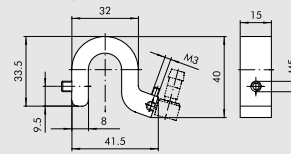
SENSOR SERIES DSM



Code	Description
W0950000201	REED sensor DSM2-C525
W0950000222	E.HALL PNP sensor DSM3-N225
W0950000232	E.HALL NPN sensor DSM3-M225

NB: For technical data see page 1-286

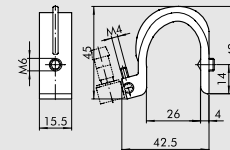
SENSOR SUPPORT BRACKET FOR STANDARD VERSION (WITH ROUND BARREL)



Code	Description
0951602093	Bracket 160-200

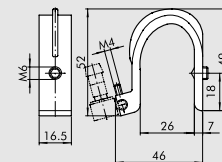
SENSOR SUPPORT BRACKET FOR OLD VERSION BARREL (SHAPED)

Ø 160



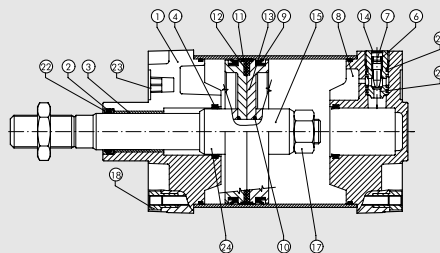
Code	Description
W0950000715	Bracket ST 160

Ø 200



Code	Description
W0950000716	Bracket ST 200

CYLINDERS ISO 15552 Ø 160-200: SPARE PARTS



Code	Bores	Type	Parts
W095__2101	160÷200	Complete set of gaskets	2-4-5-6-9-10-20-22
W095__2102	160÷200	Complete set of high temperature gaskets	2-4-5-6-9-10-20-22
W095__0104	160÷200	Complete front head kit	1-2-3-4-5-6-7-14-18-20-21-22-23
W095__0105	160÷200	Complete rear head kit	4-5-6-7-8-14-18-20-21-23
W095__2115	160÷200	Complete magnetic piston kit	9-10-11-12-13-15-17-24
W095__2118	160÷200	Complete non-magnetic piston kit	9-10-11-13-15-17-24
W095__2120	160÷200	Complete head A + P + non-magnetic piston	1-2-3-4-5-6-7-8-9-10-11-13-14-15-17-18-20-21-22-23-24
W095__2119	160÷200	Complete head A + P + magnetic piston	1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-17-18-20-21-22-23-24
W095__2300	160÷200	Magnet	12

ISO 21287 CYLINDER SERIES LINER

Compact cylinder to ISO 21287, LINER series, available in different versions to meet all possible requirements:

- With or without magnet
- Double acting, single or through piston rod
- Double acting, perforated through piston rod
- Single acting, extended, retracted or through piston rod
- Single acting, perforated through rod
- Double acting anti-rotating version and double acting through piston rod
- Polyurethane or FKM/FPM gaskets (for high temperatures) also available
- Dimensions and centre distances to ISO 21287.

The heads have been eliminated for ease of installation, improved sturdiness and precision. The metal lining is designed to withstand heavy-duty work, tensile stress and impact. Technopolymer parts can withstand dynamic and pneumatic thrust. The lining virtually acts as a "bearing" to which most of user accessories are attached.

The wide range of anchors provide numerous fixing points.

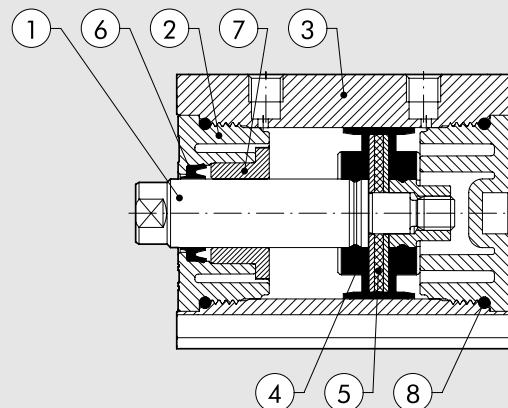
Retractable magnetic limit switches can be mounted to identify the position in the cylinder grooves.



TECHNICAL DATA		POLYURETHANE					FKM/FPM		
Max operating pressure	bar						10		
	MPa						1		
	psi						145		
Temperature range	°C	-10 to +60 (Ø 20 to 63)					-10 to +150 (non-magnetic cylinders)		
		-10 to +80 (Ø 80 to 100)							
Fluid		Unlubricated air. Lubrication, if used, must be continuous.							
Bores	mm	20; 25; 32; 40; 50; 63; 80; 100 with ISO 21287 fixing centre distances							
Design		With profile							
Versions		Double-acting, Double-acting through-rod, Single-acting extended or retracted rod, Single-acting through-rod, Double-acting through-rod perforated, Double-acting non-rotating, Double-acting through-rod non-rotating, No stick slip							
		All versions are available with male or female piston rod.							
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request.							
Inrush pressure		Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
	for single piston rod	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4
	for through-rod	0.8	0.8	0.6	0.4	0.4	0.4	0.4	0.4
Forces generated at 6 bar thrust/retraction		see page 1-7							
Weights		see page 1-9							
Notes		For correct operation, it is advisable to use 50 µm filtered air							
		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.							

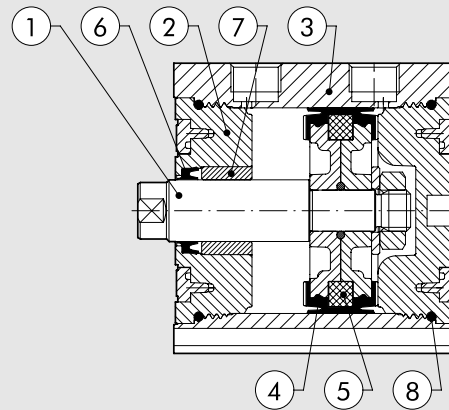
COMPONENTS Ø 20-25

- ① PISTON ROD: stainless steel, thick chromed
- ② END CAP: high-performance technopolymer
- ③ BARREL: drawn anodised and calibrated aluminium alloy
- ④ PISTON GASKET: polyurethane or FKM/FPM (for high temperature)
- ⑤ MAGNET: plastoneodimio
- ⑥ PISTON ROD GASKET: polyurethane or FKM/FPM (for high temperature)
- ⑦ GUIDE BUSHING: sintered bronze
- ⑧ STATIC O-RINGS: NBR or FKM/FPM (for high temperature)



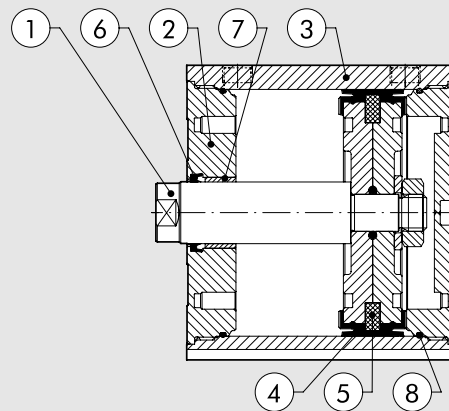
COMPONENTS Ø 32-63

- ① PISTON ROD: C45 steel or stainless steel, thick chromed
- ② END CAP: high-performance technopolymer
- ③ BARREL: drawn anodised and calibrated aluminium alloy
- ④ PISTON GASKET: polyurethane or FKM/FPM (for high temperature)
- ⑤ MAGNET: Ø 32 plastoneodimio - Ø 40 to 63 plastoferrite
- ⑥ PISTON ROD GASKET: polyurethane or FKM/FPM (for high temperature)
- ⑦ GUIDE BUSHING: sintered bronze
- ⑧ STATIC O-RINGS: NBR or FKM/FPM (for high temperature)

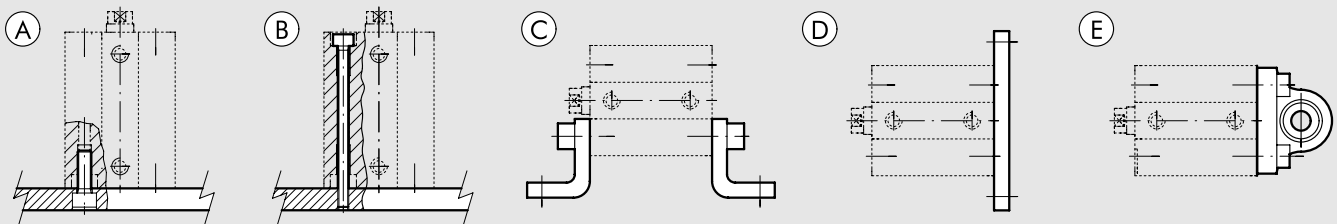


COMPONENTS Ø 80-100

- ① PISTON ROD: C45 steel or stainless steel, thick chromed
- ② END CAP: anodized aluminium alloy
- ③ BARREL: drawn anodised and calibrated aluminium alloy
- ④ PISTON GASKET: polyurethane or FKM/FPM (for high temperature)
- ⑤ MAGNET: plastoferrite
- ⑥ PISTON ROD GASKET: polyurethane or FKM/FPM (for high temperature)
- ⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert
- ⑧ STATIC O-RINGS: NBR or FKM/FPM (for high temperature)



FIXING OPTIONS



- Ⓐ Fixing to structural work with a through screw, using the thread in the heads
- Ⓑ Direct fixing from above using long through screws or tie rods. Non-magnetic stainless steel must be used (e.g. AISI 304)
- Ⓒ Fixing with feet; the ordering code covers the supply of one foot and two screws for fixing to the cylinder
- Ⓓ Fixing with a flange mounted on the front or rear head; the ordering code covers the supply of a flange and four screws for fixing to the cylinder
- Ⓔ Fixing with articulated hinge to compensate for slight system misalignment and turn freely
The ordering code covers the supply of a hinge and four screws for fixing to the cylinder.

FORCE OF SPRINGS IN SINGLE-ACTING CYLINDERS (THEORETICAL)

Bore	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
Min. load (N)	8.40	13.90	19.00	24.80	36.30	50.20	77.60	131.80
Max. load (N)	20.90	33.20	35.90	53.70	62.20	82.30	118.90	183.30

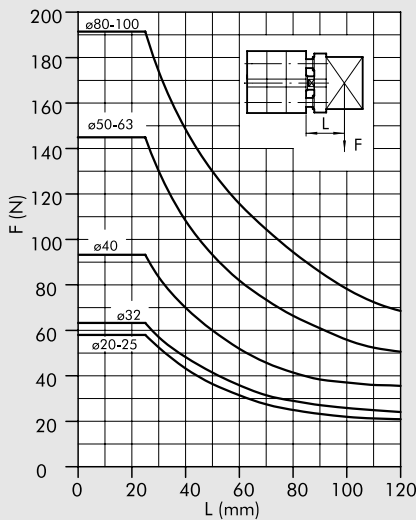
STROKES FOR COMPACT CYLINDERS ISO 21287

Standard stroke for single-acting cylinders	Standard stroke for other types	Max. recommended strokes for other types	Max. recommended strokes for non-rotating cylinders	Max recommended strokes for through-rod perforated
Ø 20 to 100 → 25 mm	Ø 20 to 25 → 5 to 60 mm Ø 32 to 100 → 5 to 80 mm	Ø 20 to 25 → 300 mm Ø 32 to 63 → 400 mm Ø 80 to 100 → 500 mm	Ø 20 to 63 → 120 mm Ø 80 to 100 → 150 mm	Ø 20 to 40 → 5 to 80 mm Ø 50 to 63 → 5 to 100 mm Ø 80 to 100 → 5 to 160 mm

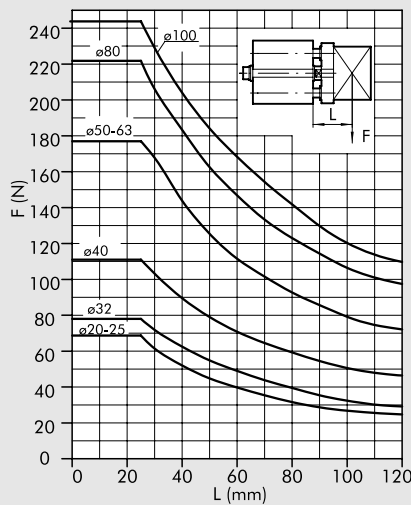
Maximum recommended strokes. Higher values can create operating problems

MAXIMUM LOADS FOR NON-ROTATING VERSION

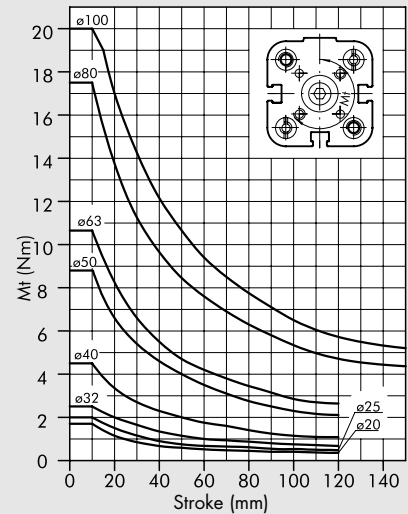
TRANSVERSAL FORCE FOR NON-ROTATING



TRANSVERSAL FORCE FOR NON-ROTATING THROUGH-ROD

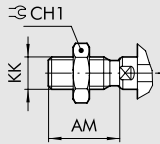


TORQUE DEPENDING ON STROKE



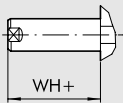
DIMENSIONS OF DOUBLE-ACTING Ø 20 to 50 AND SINGLE-ACTING Ø 20 to 50

SE-DE MALE PISTON ROD

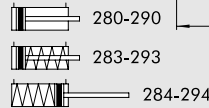
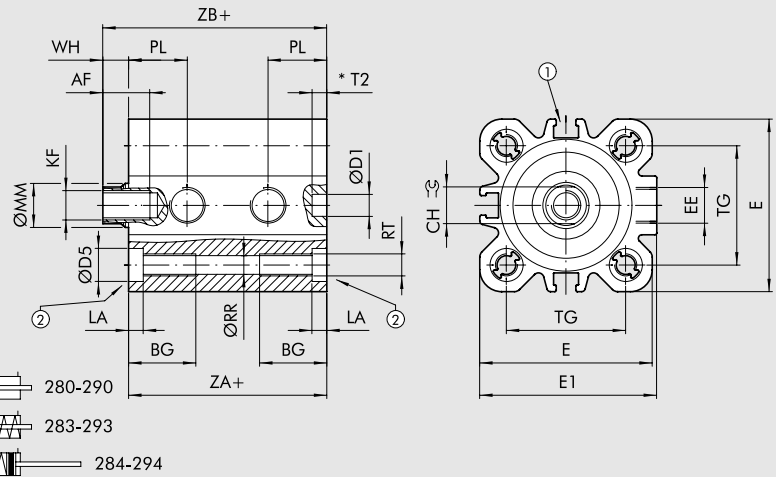
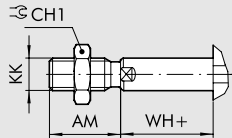


- + = ADD THE STROKE
- * = SECTION WITH TOLERANCE
- 1 = SENSOR SLOT
- 2 = SEAT FOR DIN 7984 SCREWS

SE EXTENDED PISTON ROD



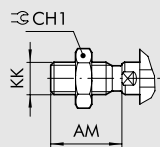
SE MALE EXTENDED PISTON ROD



Ø	AF	AM	BG	CH	CH1	ØD1 ^{H9}	ØD5	E	E1	EE	KF	KK	LA	ØMM	PL	ØRR	RT	T2	TG ^{+0.2}	WH	ZA ^{+0.3}	ZB
20	14	16	17.5	8	13	6	7.5	35.5	36.5	M5	M6	M8	4.2	10	12	4.2	M5	3	22	6	37	43
25	14	16	17.5	8	13	6	7.5	39.5	40	M5	M6	M8	4.2	10	13	4.2	M5	3.5	26	6	39	45
32	16.5	19	21.5	10	17	6	9	47	48.2	G1/8	M8	M10x1.25	4	12	16	5.1	M6	4	32.5	7	44	51
40	16.5	19	21.5	10	17	6	9	55.5	56.5	G1/8	M8	M10x1.25	4	12	16	5.1	M6	4	38	7	45	52
50	17	22	21	13	19	6	10.5	66.5	67.8	G1/8	M10	M12x1.25	4.5	16	15.5	6.8	M8	3	46.5	8	45	53

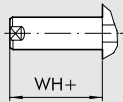
DIMENSIONS OF DOUBLE-ACTING Ø 63 to 100 AND SINGLE-ACTING Ø 63 to 100

SE-DE MALE PISTON ROD

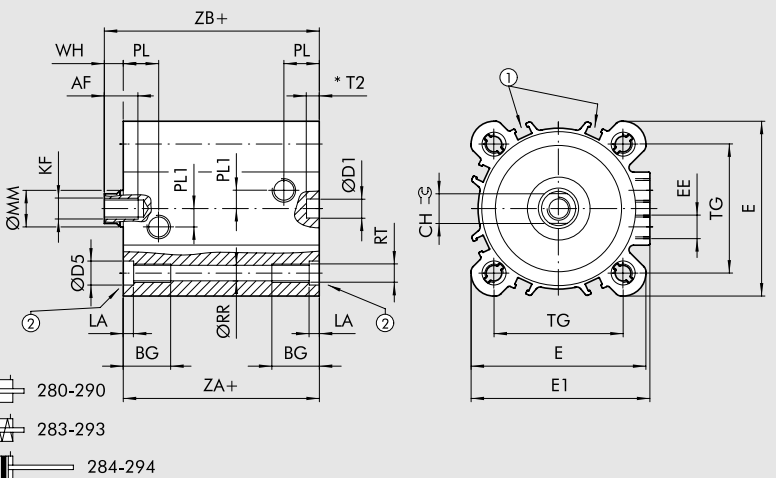
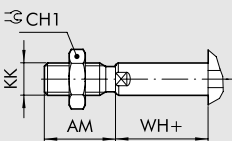


- + = ADD THE STROKE
- * = SECTION WITH TOLERANCE
- 1 = SENSOR SLOT
- 2 = SEAT FOR DIN 7984 SCREWS

SE EXTENDED PISTON ROD



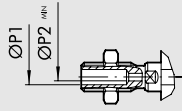
SE MALE EXTENDED PISTON ROD



Ø	AF	AM	BG	CH	CH1	ØD1 ^{H9}	ØD5	E	E1	EE	KF	KK	LA	ØMM	PL1	PL	ØRR	RT	T2	TG ^{+0.2}	WH	ZA ^{+0.4}	ZB
63	17	22	21	13	19	8	10.5	76.5	78.3	G1/8	M10	M12x1.25	4.5	16	8	15.5	6.8	M8	3.5	56.5	8	49	57
80	22	28	22.5	17	24	8	14	95.5	95.5	G1/8	M12	M16x1.5	5	20	14	16.5	8.5	M10	4	72	10	54	64
100	24	28	25.5	22	30	8	14	114	114	G1/8	M12	M16x1.5	5	25	19	19.2	8.5	M10	4	89	10	67	77

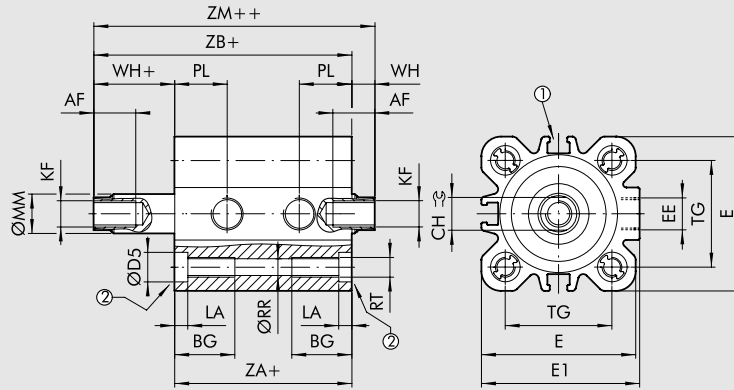
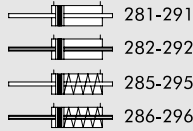
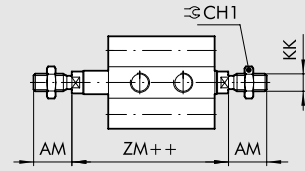
DIMENSIONS OF THROUGH-ROD Ø 20 to 50

SE-DE MALE PERFORATED THROUGH-ROD



- + = ADD THE STROKE
- ++ = ADD TWICE THE STROKE
- 1 = SENSOR SLOT
- 2 = SEAT FOR DIN 7984 SCREWS

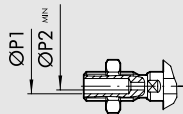
SE-DE MALE PISTON ROD



Ø	AF	AM	BG	CH	CH1	ØD5	E	E1	EE	KF	KK	LA	ØMM	ØP1	ØP2	PL	ØRR	RT	TG ^{+0.2}	WH	ZA ^{+0.3}	ZB	ZM
20	14	16	17.5	8	13	7.5	35.5	36.5	M5	M6	M8	4.2	10	3	1.5	12	4.2	M5	22	6	37	43	49
25	14	16	17.5	8	13	7.5	39.5	40	M5	M6	M8	4.2	10	3	1.5	13	4.2	M5	26	6	39	45	51
32	16.5	19	21.5	10	17	9	47	48.2	G1/8	M8	M10x1.25	4	12	4	2.5	16	5.1	M6	32.5	7	44	51	58
40	16.5	19	21.5	10	17	9	55.5	56.5	G1/8	M8	M10x1.25	4	12	4	2.5	16	5.1	M6	38	7	45	52	59
50	17	22	21	13	19	10.5	66.5	67.8	G1/8	M10	M12x1.25	4.5	16	6	4	15.5	6.8	M8	46.5	8	45	53	61

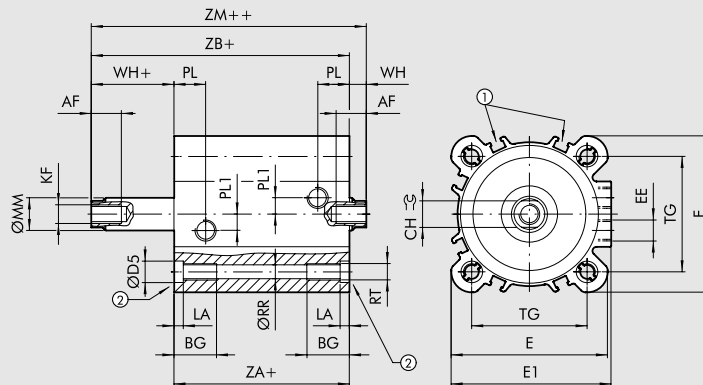
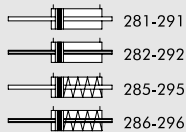
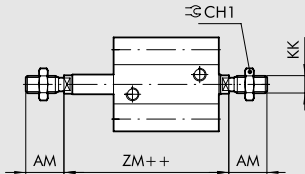
DIMENSIONS OF THROUGH-ROD Ø 63 to 100

SE-DE MALE PERFORATED THROUGH-ROD



- + = ADD THE STROKE
- ++ = ADD TWICE THE STROKE
- 1 = SENSOR SLOT
- 2 = SEAT FOR DIN 7984 SCREWS

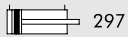
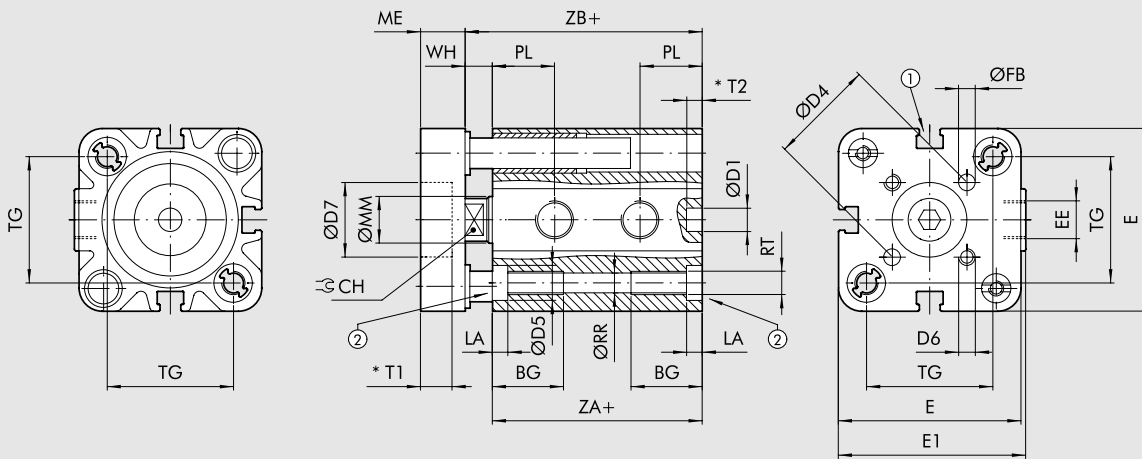
SE-DE MALE PISTON ROD



Ø	AF	AM	BG	CH	CH1	ØD5	E	E1	EE	KF	KK	LA	ØMM	ØP1	ØP2	PL1	PL	ØRR	RT	TG ^{+0.2}	WH	ZA ^{+0.4}	ZB	ZM
63	17	22	21	13	19	10.5	76.5	78.3	G1/8	M10	M12x1.25	4.5	16	6	4	8	15.5	6.8	M8	56.5	8	49	57	65
80	22	28	22.5	17	24	14	95.5	95.5	G1/8	M12	M16x1.5	5	20	G1/8	5	14	16.5	8.5	M10	72	10	54	64	74
100	24	28	25.5	22	30	14	114	114	G1/8	M12	M16x1.5	5	25	G1/8	6	19	19.2	8.5	M10	89	10	67	77	87

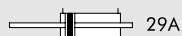
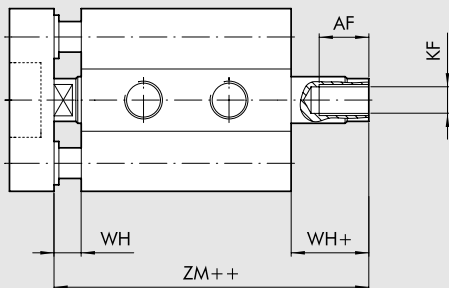
DIMENSIONS OF NON-ROTATING Ø 20 to 50

- + = ADD THE STROKE
- * = SECTION WITH TOLERANCE
- 1 = SENSOR SLOT
- 2 = SEAT FOR DIN 7984 SCREWS



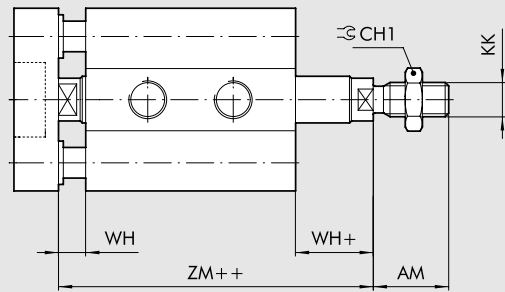
NON-ROTATING FEMALE THROUGH-ROD

- + = ADD THE STROKE
- ++ = ADD TWICE THE STROKE



NON-ROTATING MALE THROUGH-ROD

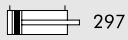
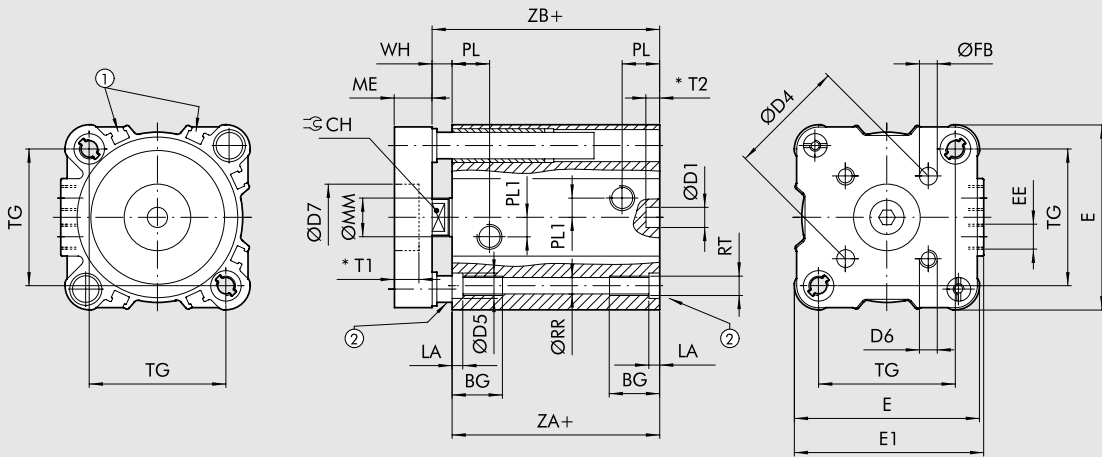
- + = ADD THE STROKE
- ++ = ADD TWICE THE STROKE



Ø	AF	AM	BG	CH	CH1	ØD1 ¹⁹	ØD4	ØD5	D6	ØD7 ¹⁹	E	E1	EE	ØFB	KF	KK	LA	ME	ØMM	PL	ØRR	RT	T1	T2	TG ^{+0.2}	WH	ZA ^{+0.3}	ZB	ZM
20	14	16	17.5	8	13	6	17	7.5	M4	-	35.5	36.5	M5	4	M6	M8	4.2	8	10	12	4.2	M5	-	3	22	6	37	43	49
25	14	16	17.5	8	13	6	22	7.5	M5	14	39.5	40	M5	5	M6	M8	4.2	8	10	13	4.2	M5	3.5	3.5	26	6	39	45	51
32	16.5	19	21.5	10	17	6	28	9	M5	17	47	48.2	G1/8	5	M8	M10x1.25	4	10	12	16	5.1	M6	3.5	4	32.5	7	44	51	58
40	16.5	19	21.5	10	17	6	33	9	M5	17	55.5	56.5	G1/8	5	M8	M10x1.25	4	10	12	16	5.1	M6	3.5	4	38	7	45	52	59
50	17	22	21	13	19	6	42	10.5	M6	22	66.5	67.8	G1/8	6	M10	M12x1.25	4.5	12	16	15.5	6.8	M8	5	3	46.5	8	45	53	61

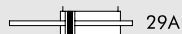
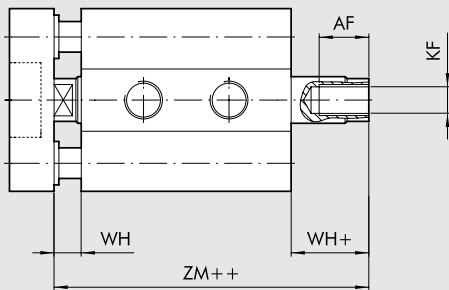
DIMENSIONS OF NON-ROTATING Ø 63 to 100

- + = ADD THE STROKE
- * = SECTION WITH TOLERANCE
- 1 = SENSOR SLOT
- 2 = SEAT FOR DIN 7984 SCREWS



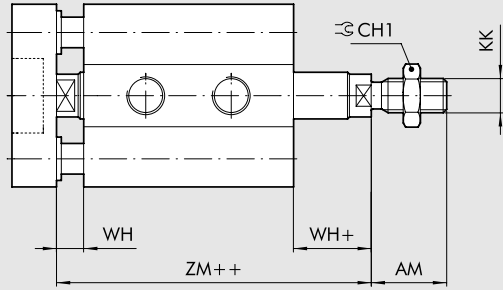
NON-ROTATING FEMALE THROUGH-ROD

- + = ADD THE STROKE
- ++ = ADD TWICE THE STROKE



NON-ROTATING MALE THROUGH-ROD

- + = ADD THE STROKE
- ++ = ADD TWICE THE STROKE



Ø	AF	AM	BG	CH	CH1	ØD1 ^{H9}	ØD4	ØD5	D6	ØD7 ^{H9}	E	E1	EE	ØFB	KF	KK	LA	ME	ØMM	PL1	PL	ØRR	RT	T1	T2	TG ^{+0.2}	WH	ZA ^{+0.4} ₀	ZB	ZM
63	17	22	21	13	19	8	50	10.5	M6	22	76.5	78.3	G1/8	6	M10	M12x1.25	4.5	12	16	8	15.5	6.8	M8	5	3.5	56.5	8	49	57	65
80	22	28	22.5	17	24	8	65	14	M8	24	95.5	95.5	G1/8	8	M12	M16x1.5	5	14	20	14	16.5	8.5	M10	7.5	4	72	10	54	64	74
100	24	28	25.5	22	30	8	80	14	M10	24	114	114	G1/8	10	M12	M16x1.5	5	14	25	19	19.2	8.5	M10	7.5	4	89	10	67	77	87

KEY TO CODE

CYL	2 8 TYPE	0	0	20 BORE	0	0 5 0 STROKE **	X MATERIAL	P GASKETS
	28 Compact cylinder ISO 21287 male piston rod	0 Double-acting through-rod	0 Magnetic	20	0 Standard		* C C45 piston rod chromium-plated	P Polyurethane gaskets
		1 Double-acting through-rod	□ S Non-magnetic	25			▷ X Stainless steel piston rod and nut	▶ V FKM/FPM gaskets
		2 Double-acting through-rod perforated	▲ G No stick slip	32			◁ A C45 chromed rod, aluminium piston	
	29 Compact cylinder ISO 21287 female piston rod	● 3 Single-acting retracting piston rod		40			○ Z Stainless steel piston rod and nut aluminium piston	
		● 4 Single-acting extended piston rod		50				
		● 5 Single-acting through-rod		63				
		● 6 Single-acting through piston rod perforated		80				
		▼ 7 Double-acting non-rotating		100				
		A Double-acting through-rod non-rotating						

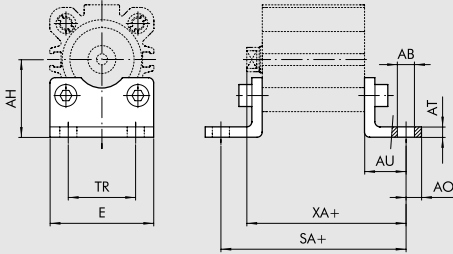
- ** For the maximum suppliabe stroke, see page 1-62
- Can also be used as double-acting with spring return
- ▼ For versions 29 only (female piston rod)
- ▲ For Ø 20 to 25 the standard version (0 or S)
- For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**
- ◆ In the code of cylinder with letter in fourth position Ø 100 becomes A1
- ▶ Only for standard double acting and standard through rod double acting version
- Compulsory for Ø 20 and Ø 25 version Z
- * Only for Ø 32 to 63 P version (Polyurethane gaskets)
- ▷ Only for Ø 20 to 63 P version (Polyurethane gaskets)
- ◁ Only for Ø 32 to 100 V version (FKM/FPM gaskets) and for Ø 80 and 100 P version (Polyurethane gaskets)
- Only for Ø 20 to 100 V version (FKM/FPM gaskets) and for Ø 80 and 100 P version (Polyurethane gaskets)

NOTES

ACCESSORIES FOR ISO 21287 CYLINDERS: FIXING

FOOT - MODEL A

+ = ADD THE STROKE



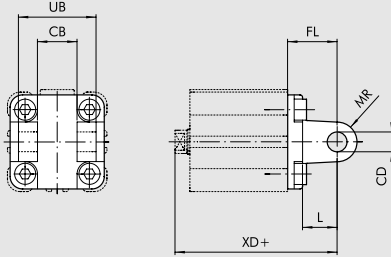
Code	Ø	ØAB	AH	AO	AT	AU	E	SA	TR	XA	Weight [g]
W0950206001	20	6.6	27	6	4	16	36	69	22	59	46
W0950256001	25	6.6	30*	6	4	16	40	71	26	61	52
W0950322001	32	7	32*	11*	4	24*	45	92*	32	75*	76
W0950402001	40	9	36*	15*	4	28*	52	101*	36	80*	100
W0950502001	50	9	45	15*	5	32*	65	109*	45	85*	162
W0950632001	63	9	50	15*	5	32*	75	113*	50	89*	266
W0950802001	80	12	63	20*	6	41*	95	136*	63	105*	456
W0951002001	100	14	71*	25*	6	41*	115	149*	75	118*	572

Note: Individually packed with 2 screws

* **IMPORTANT:** Values not to ISO 21287. Cylinder pins to ISO 15552 are used.

FEMALE HINGE-MODEL B

+ = ADD THE STROKE

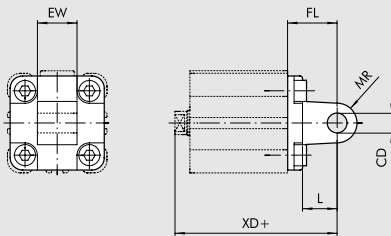


Code	Ø	CB ^{H14}	ØCD ^{H9}	FL	L	MR	UB ^{H14}	XD	Weight [g]
W0950322003	32	26	10	22	12	10	45	73	112
W0950402003	40	28	12	25	15	12	52	77	159
W0950502003	50	32	12	27	15	12	60	80	250
W0950632003	63	40	16	32	20	16	70	89	390
W0950802003	80	50	16	36	20	16	90	100	668
W0951002003	100	60	20	41	25	20	110	118	1047

Note: Supplied with 4 screws, 4 washers, 2 snap-rings and 1 pin

MALE HINGE-MODEL BA

+ = ADD THE STROKE

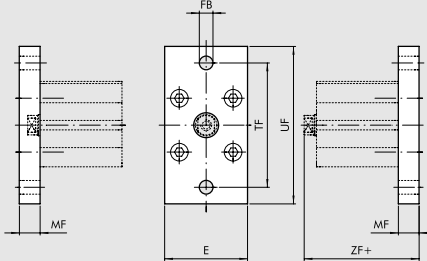


Code	Ø	ØCD ^{H9}	EW	FL	L	MR	XD	Weight [g]
W0950206004	20	8	16	20	14	8	63	44
W0950256004	25	8	16	20	14	8	65	48
W0950322004	32	10	26	22	12	11	73	94
W0950402004	40	12	28	25	15	13	77	124
W0950502004	50	12	32	27	15	13	80	220
W0950632004	63	16	40	32	20	17	89	316
W0950802004	80	16	50	36	20	17	100	578
W0951002004	100	20	60	41	25	21	118	850

Note: Supplied with 4 screws, 4 washers

FLANGE Ø 20 to 25 - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE



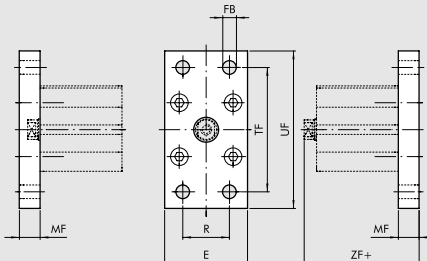
Code	Ø	E	ØFB	MF	TF	UF	ZF	Weight [g]
W0950206002	20	36	6.6	10*	55	70	53*	184
W0950256002	25	40	6.6	10*	60	76	55*	226

Note: Supplied with 4 screws

* **IMPORTANT:** Non ISO 21287 norm fixing distance

FLANGE Ø 32 to 100 - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE

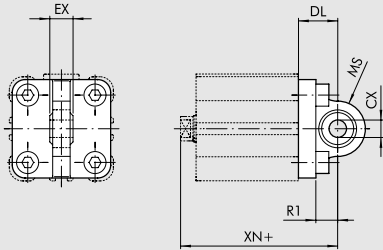


Code	Ø	E	ØFB	MF	R	TF	UF	ZF	Weight [g]
W0950322002	32	50	7	10	32	64	80	61	246
W0950402002	40	55	9	10	36	72	90	62	290
W0950502002	50	65	9	12	45	90	110	65	522
W0950632002	63	75	9	12	50	100	120	69	670
W0950802002	80	95	12	16	63	126	153	80	1420
W0951002002	100	115	14	16	75	150	178	93	2040

Note: Supplied with 4 screws

ARTICULATED MALE HINGE - MODEL BAS

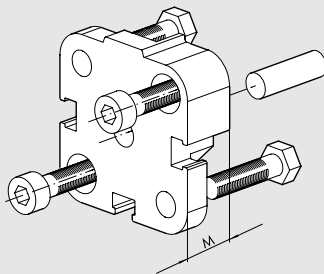
+ = ADD THE STROKE



Code	Ø	ØCX	DL	EX	MS	R1	XN	Weight [g]
W0950322006	32	10	22	14	16	12	73	106
W0950402006	40	12	25	16	18	15	77	142
W0950502006	50	12	27	16	21	19	80	236
W0950632006	63	16	32	21	23	20	89	336
W0950802006	80	16	36	21	28	24	100	572
W0951002006	100	20	41	25	30	25	118	840

Note: Supplied with 4 screws, 4 washers

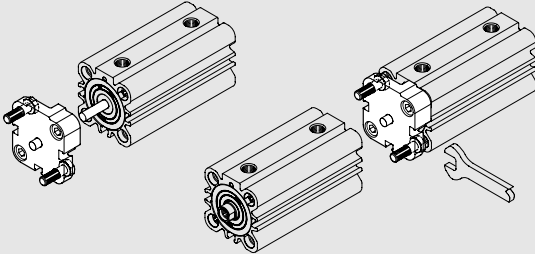
FLANGE FOR OPPOSITE CYLINDERS



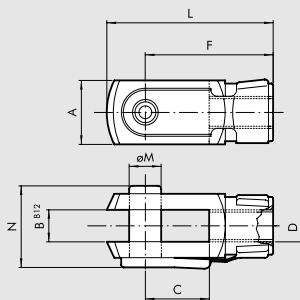
Code	Ø	M	Weight [g]
0950203060	20	12.5	45
0950253060	25	13	57
0950323060	32	14.5	88
0950403061	40	14.5	106
0950503061	50	14.5	158
0950633061	63	14.5	258
0950803061	80	16.5	452
0951003061	100	19.5	801

Note: Supplied complete with 1 pin, 4 screws

ASSEMBLING OPPOSING CYLINDERS



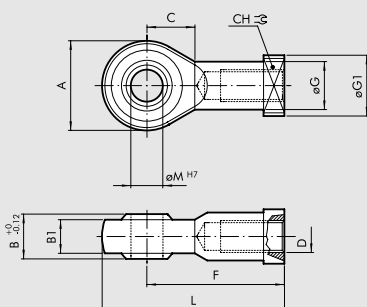
FORK - MODEL GK-M



Code	Ø	A	B	C	D	F	L	øM	N	Weight [g]
W0950200020	20	16	8	16	M8	32	42	8	22	48
W0950200025	25	16	8	16	M8	32	42	8	22	48
W0950322020	32	20	10	20	M10x1.25	40	52	10	26	92
W0950322025	40	20	10	20	M10x1.25	40	52	10	26	92
W0950402020	50	24	12	24	M12x1.25	48	62	12	32	148
W0950402025	63	24	12	24	M12x1.25	48	62	12	32	148
W0950502020	80	32	16	32	M16x1.5	64	83	16	40	340
W0950502025	100	32	16	32	M16x1.5	64	83	16	40	340

Note: Individually packed

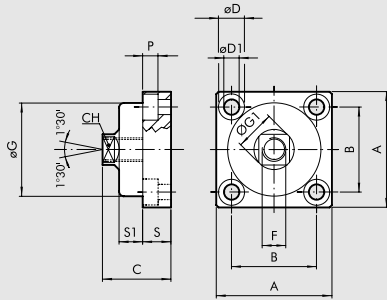
ROD EYE - MODEL GA-M



Code	Ø	A	B	B1	C	CH	D	F	øG	øG1	L	øM	Weight [g]
W0950200025	20	24	12	9	13	14	M8	36	12.5	16	48	8	50
W0950200025	25	24	12	9	13	14	M8	36	12.5	16	48	8	50
W0950322025	32	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950322025	40	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950402025	50	32	16	12	17	19	M12x1.25	50	17.5	22	66	12	116
W0950402025	63	32	16	12	17	19	M12x1.25	50	17.5	22	66	12	116
W0950502025	80	42	21	15	23	22	M16x1.5	64	22	27	85	16	226
W0950502025	100	42	21	15	23	22	M16x1.5	64	22	27	85	16	226

Note: Individually packed

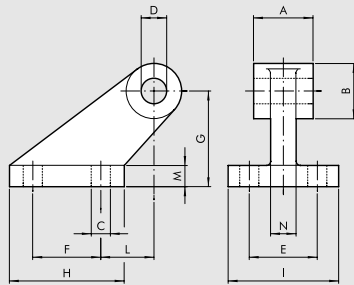
COMPENSATION JOINT - MODEL GA



Code	Ø	A	B	C	CH	øD	øD1	F	øG	ØG1	P	S	S1	Weight [g]
W0950326021	32	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950326021	40	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950406021	50	59	42	36	15	14	8.5	M12x1.25	44	19	8.5	15	13.5	286
W0950406021	63	59	42	36	15	14	8.5	M12x1.25	44	19	8.5	15	13.5	286
W0950506021	80	79	58	44	22	17	10.5	M16x1.5	59	26	10.5	20	15	628
W0950506021	100	79	58	44	22	17	10.5	M16x1.5	59	26	10.5	20	15	628

Note: Individually packed

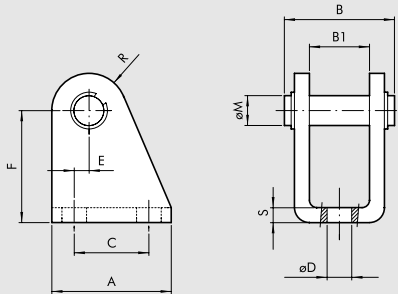
COUNTER-HINGE CETOP Ø 32 to 100



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96
W0950402008	40	28	26	9	12	32	32	45	54	52	25	10	12	216
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440
W0950802008	80	50	33	11	16	40	50	63	75	63	32	12	15	464
W0951002008	100	60	44	14	20	50	70	90	103	80	40	16	22	985

Note: Supplied complete with 4 screws, 4 washers

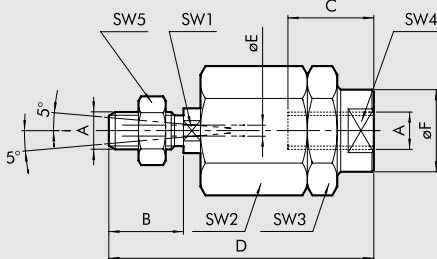
COUNTER-HINGE Ø 16 to 25 - MODEL BC



Code	Ø	A	B	B1	C	øD	E	F	øM	R	S	Weight [g]
W0950200005	20	32	30	16	20	6.5	4	30	8	10	4	78
W0950200005	25	32	30	16	20	6.5	4	30	8	10	4	78

Note: Supplied complete with 1 pin and and 2 snap rings

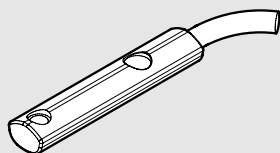
SELF ALIGNING ROD COUPLER - MODEL GA-K



Code	Ø	A	B	C	D	øE	øF	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950200030	20	M8	20	20	57	4	12.5	7	17	17	11	13	56
W0950200030	25	M8	20	20	57	4	12.5	7	17	17	11	13	56
W0950322030	32	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950322030	40	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950402030	50	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950402030	63	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950502030	80	M16x1.5	32	32	103	4	32	20	41	41	30	24	620
W0950502030	100	M16x1.5	32	32	103	4	32	20	41	41	30	24	620

Note: Individually packed

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE

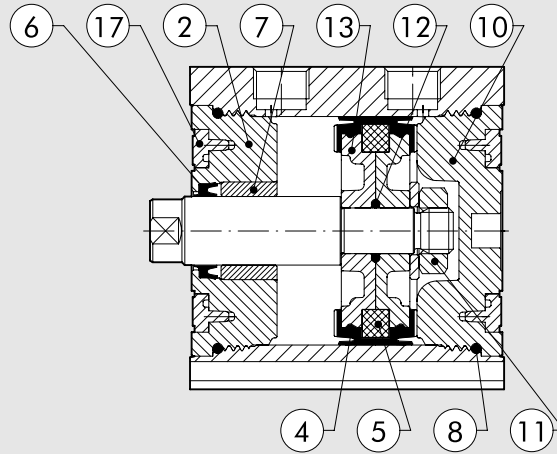


Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
NB: For technical data see page 1-288

SPARE PARTS FOR ISO 21287 CYLINDER

COMPACT CYLINDERS ISO 21287 (POLYURETHANE)



Code	Bores	Type	Parts
009 ..L001	Ø 20, 25	Complete set of gaskets polyurethane	4 6 8
009 ..L001	Ø 32 to 63	Complete set of gaskets polyurethane	4 6 8 12 17
009 ..L001	Ø 80, 100	Complete set of gaskets polyurethane	4 6 8 12
009 ..L008	Ø 20, 25	Complete set of high temperature gaskets	4 6 8
009 ..L008	Ø 32 to 63	Complete set of high temperature gaskets	4 6 8 12 17
009 ..L008	Ø 80, 100	Complete set of high temperature gaskets	4 6 8 12
009 ..L101	Ø 20, 25, 80, 100	Front head kit	2 6 7 8
009 ..L101	Ø 32 to 63	Front head kit	2 6 7 8 17
009 ..L201	Ø 20, 25, 80, 100	Rear head kit	8 10
009 ..L201	Ø 32 to 63	Rear head kit	8 10 17
009 ..7401	Ø 20, 25	Piston kit polyurethane	4 5 11
009 ..L401	Ø 32 to 63	Piston kit polyurethane	4 5 11 12 13 17
009 ..7401	Ø 80 to 100	Piston kit polyurethane	4 5 11 12 13
009 ..7501	Ø 20, 25, 80, 100	Magnet	5
009 ..L501	Ø 32 to 63	Magnet	5 17
009 ..L901	Ø 20, 25	Front + rear cylinder head + piston kit polyurethane	2 4 5 6 7 8 10 11
009 ..L901	Ø 32 to 63	Front + rear cylinder head + piston kit polyurethane	2 4 5 6 7 8 10 11 12 13 17
009 ..L901	Ø 80, 100	Front + rear cylinder head + piston kit polyurethane	2 4 5 6 7 8 10 11 12 13

NOTES

COMPACT CYLINDERS SERIES CMPC

Compact cylinder series CMPC available in numerous versions to meet a full range of requirements:

- With or without magnet
- Single-acting extended rod, retracted or through-rod
- Dual-acting non-rotating and dual-acting through-rod versions
- Tandem with two, three or four stages
- Multi-position with two and three stages
- Fixing centre distances to ISO 15552 from Ø 32 to Ø 100 and from Ø 20 to Ø 100 complying with French standard NFE 49-004-1 and 2 (UNITOP). Ø 12 and Ø 16 have centre distances compatible with trade cylinders.

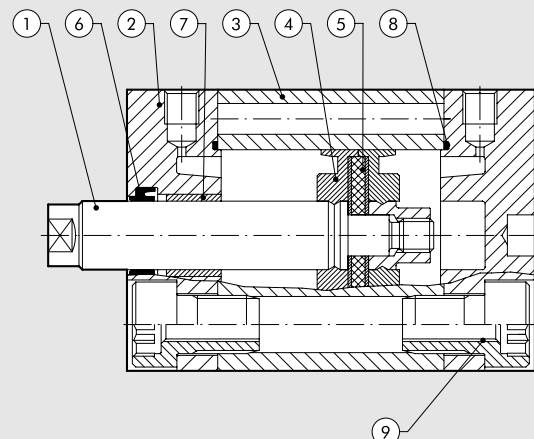
The special profile and outer heads locked onto the barrel by screws ensure optimal guiding of the cylinder and multiple fixing options with a wide range of mountings. To determine the position in the relevant cylinder slots, it is possible to mount retracting magnetic limit switches. Available also in a version having FKM/FPM gaskets (for high temperature) from Ø 20 to Ø 100.



TECHNICAL DATA		POLYURETHANE					FKM/FPM				
Max operating pressure	bar						10				
	MPa						1				
	psi						145				
Temperature range	°C	-10 to +80					-10 to +150 (non-magnetic cylinders)				
Fluid		Unlubricated air. Lubrication, if used, must be continuous									
Bores	mm	Ø 12; 16; interchangeable with similar products									
	mm	Ø 32; 40; 50; 63; 80; 100 with ISO 15552 fixing centre distances									
	mm	Ø 20; 25; 32; 40; 50; 63; 80; 100 with NFE 49-004-1 and 2 fixing centre distances									
Design		With profile, heads with screws									
Versions		Double-acting, Single-acting extended or retracted rod, Through-rod, Through-rod perforated, Single-acting through-rod, Through-rod non-rotating, no-stick slip									
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request.									
Inrush pressure	bar	Ø 12	Ø 16	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
		single piston rod	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.4
through-rod	bar	1	0.8	0.8	0.8	0.6	0.4	0.4	0.4	0.4	0.4
Forces generated at 6 bar thrust/retraction		See page 1-7									
Weights		See page 1-8									
Notes		For correct operation, it is advisable to use 50 µm filtered air									
		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.									

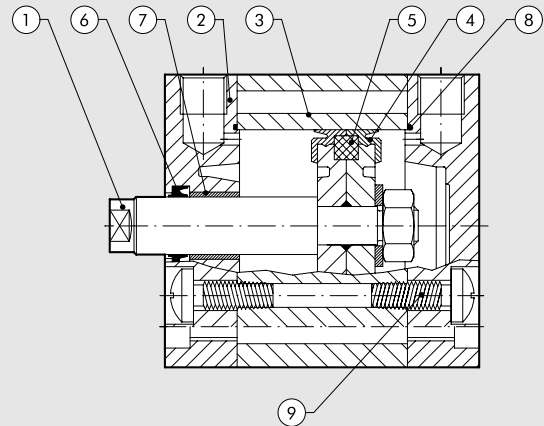
COMPONENTS Ø 12 to 25

- ① PISTON ROD: stainless steel, thick chromed
- ② HEAD: extruded anodised aluminium alloy
- ③ BARREL: drawn anodised and calibrated aluminium alloy
- ④ PISTON GASKET: polyurethane or FKM/FPM
- ⑤ MAGNET: neodymium-plastic
- ⑥ PISTON ROD GASKET: polyurethane or FKM/FPM
- ⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert
- ⑧ STATIC O-RINGS: NBR or FKM/FPM
- ⑨ SECURING SCREWS: zinc-plated steel

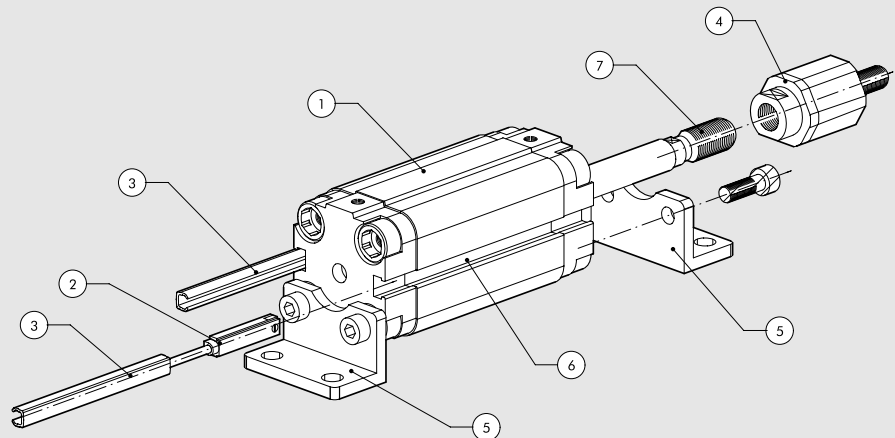
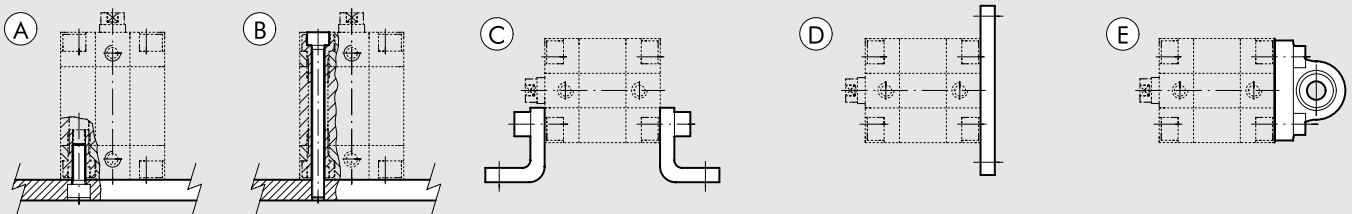


COMPONENTS Ø 32 to 100

- ① PISTON ROD: C45 steel or stainless steel, thick chromed
- ② HEAD: extruded anodised aluminium alloy
- ③ BARREL: drawn anodised and calibrated aluminium alloy
- ④ PISTON GASKET: polyurethane or FKM/FPM
- ⑤ MAGNET: Ø 12 to 32 neodymium-plastic
Ø 40 to 100 plastoferrite
- ⑥ PISTON ROD GASKET: polyurethane or FKM/FPM
- ⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert
- ⑧ STATIC O-rings: NBR or FKM/FPM
- ⑨ SECURING SCREWS: zinc-plated steel


TECHNICAL DATA

- ① Compact cylinder available with two separate fixing centre distances
 - Ø 32 to 100 to ISO 15552
 - Ø 20 to 100 to NFE 49-004-1 and 2
- ② Pre-wired retracting sensor with or without connector
- ③ Plastic strip to keep out dirt and/or protect the sensor wire cod. W0950000160
- ④ Ball-and-socket joint code W095... 2030
- ⑤ Example of cylinder mounting with feet code W095... 6001. All mountings come complete with cylinder assembly screws
- ⑥ Sensor slot
- ⑦ Piston rod with male or female thread as required


COMPACT CYLINDER FIXING OPTIONS


- Ⓐ Fixing to structural work with a through screw, using the thread in the heads
- Ⓑ Direct fixing from above using long through screws or tie rods. Non-magnetic stainless steel must be used (e.g. AISI 304)
- Ⓒ Fixing with feet; the ordering code covers the supply of one foot and two screws for fixing to the cylinder
- Ⓓ Fixing with a flange mounted on the front or rear head; the ordering code covers the supply of a flange and four screws for fixing to the cylinder
- Ⓔ Fixing with articulated hinge to compensate for slight system misalignment and turn freely
The ordering code covers the supply of a hinge and four screws for fixing to the cylinder

FORCE OF SPRINGS IN SINGLE-ACTING CYLINDERS (THEORETICAL)

Bore	Ø 12	Ø 16	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
Min. load (N)	4.40	4.90	8.40	13.90	19.00	24.80	36.30	50.20	77.60	131.80
Max. load (N)	9.80	14.20	20.90	33.20	35.90	53.70	62.20	82.30	118.90	183.30

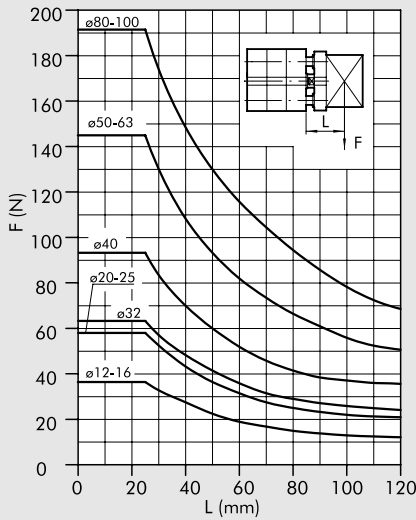
STROKES FOR COMPACT CYLINDERS

Standard stroke for single-acting cylinders	Standard stroke for other types	Max. recommended strokes for other types	Max. recommended strokes for non-rotating cylinders	Max recommended strokes for through-rod perforated
Ø 12 → 10 mm	Ø 12 to 16 → from 5 to 40 mm	Ø 12 to 25 → 200 mm	Ø 12 to 63 → 120 mm	Ø 20 to 40 → from 5 to 80 mm
Ø 16 to 100 → 25 mm	Ø 20 to 25 → from 5 to 50 mm	Ø 32 to 40 → 300 mm	Ø 80 to 100 → 150 mm	Ø 50 to 63 → from 5 to 100 mm
	Ø 32 to 100 → from 5 to 80 mm	Ø 50 to 63 → 400 mm		Ø 80 to 100 → from 5 to 160 mm
		Ø 80 to 100 → 500 mm		

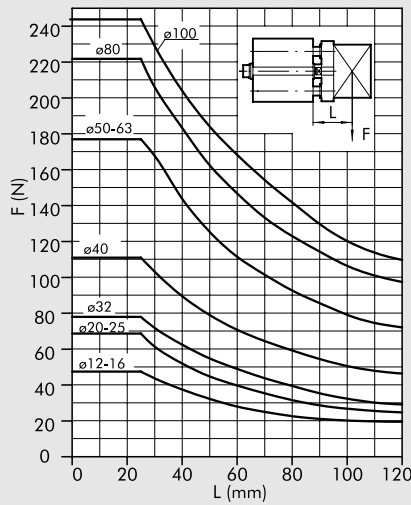
Maximum recommended strokes. Higher values can create operating problems

MAXIMUM LOADS FOR NON-ROTATING VERSION

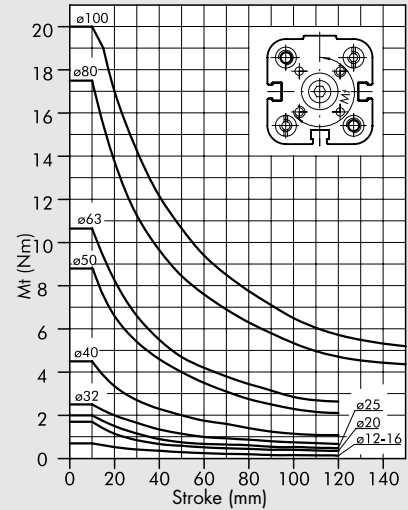
TRANSVERSAL FORCE FOR NON-ROTATING



TRANSVERSAL FORCE FOR NON-ROTATING THROUGH-ROD

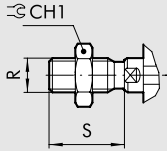


TORQUE DEPENDING ON STROKE



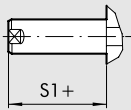
DIMENSIONS OF DOUBLE-ACTING Ø 12 to 25 AND SINGLE-ACTING Ø 12 to 25

SE-DE MALE PISTON ROD

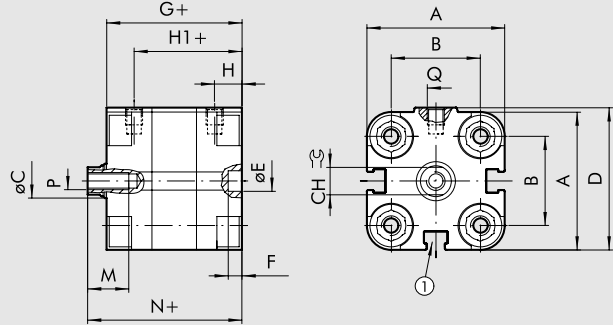
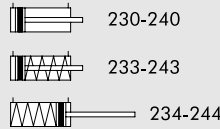
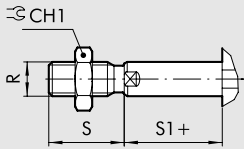


+ = ADD THE STROKE
1 = SENSOR SLOT

SE EXTENDED PISTON ROD



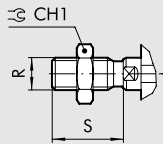
SE MALE EXTENDED PISTON ROD



Ø	A	B	ØC	CH	CH1	D	ØE ^{HP}	F	G	H	H1	L	M	N	O	ØO1	P	Q	R	S	S1	NORM
12	29	18	6	5	10	30	6	4	38	8	30	18.5	8	42.5	M4	3.2	M3	M5	M6	16	4.5	-
16	29	18	8	7	13	30	6	4	38	8	30	18.5	10	42.5	M4	3.2	M4	M5	M8	20	4.5	-
20	36.5	22	10	8	17	37.5	6	4	38	8	30	18.5	12	42.5	M5	4.2	M5	M5	M10x1.25	22	4.5	UNITOP
25	40.5	26	10	8	17	41.5	6	4	39.5	8	31.5	19	12	45	M5	4.2	M5	M5	M10x1.25	22	5.5	UNITOP

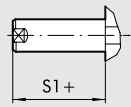
DIMENSIONS OF DOUBLE-ACTING Ø 32 to 100 AND SINGLE-ACTING Ø 32 to 100

SE-DE MALE PISTON ROD

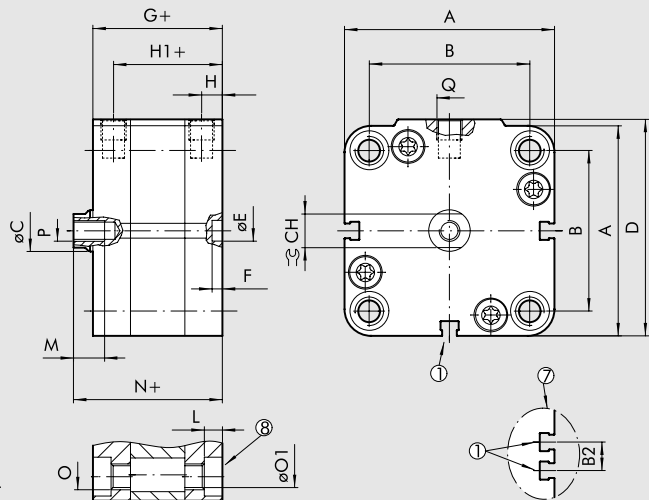
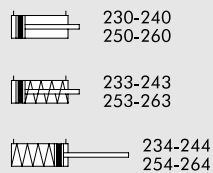
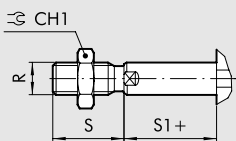


+ = ADD THE STROKE
1 = SENSOR SLOT
7 = ONLY FOR Ø 63 to Ø 100
8 = SEAT FOR DIN 7984 SCREWS

SE EXTENDED PISTON ROD



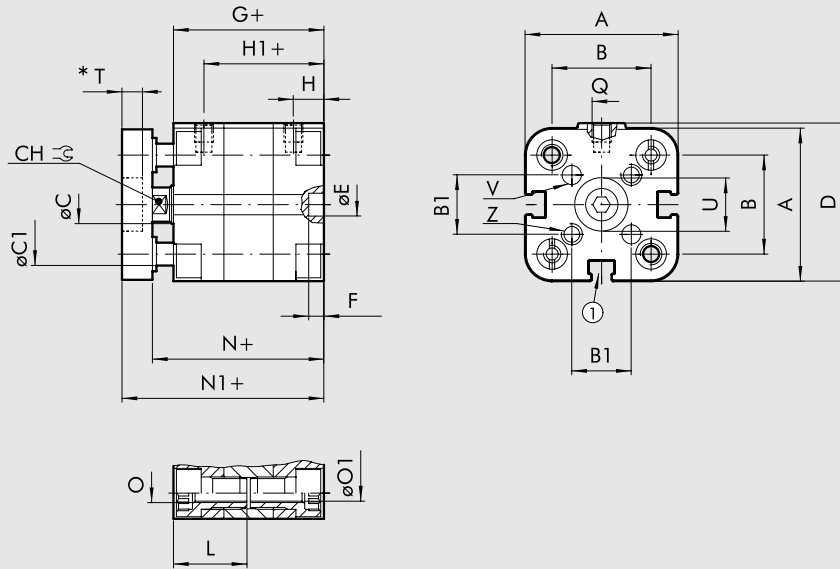
SE MALE EXTENDED PISTON ROD



Ø	A	B		ØC	CH	CH1	D	ØE ^{HP}	F	G	H	H1	L	M	N	O		ØO1		P	Q	R	S	S1	
		ISO	UNITOP													ISO	UNITOP								
32	47	32.5 ^{+0.1} _{-0.4}	32 ^{+0.4} _{-0.1}	-	12	10	17	48.5	6	4	44.5	7.5	37	4	14	50.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	6
40	56	38	42	-	12	10	17	57.5	6	4	45.5	7.5	38	4.5	14	52	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	6.5
50	67	46.5	50	-	16	13	19	69	6	4	45.5	7.5	38	4.5	16	53	M8	M8	6.2	6.2	M8	G1/8	M12x1.25	24	7.5
63	80	56.5	62	13	16	13	19	82	8	4	50	7.5	42.5	5.5	16	57.5	M8	M10	6.2	8.5	M8	G1/8	M12x1.25	24	7.5
80	102	72	82	17	20	17	24	105	8	4	56	8.5	47.5	5.5	20	64	M10	M10	8.5	8.5	M10	G1/8	M16x1.5	32	8
100	123	89	103	21	25	22	30	126	8	4	66.5	10.5	56	5.5	24	76.5	M10	M10	8.5	8.5	M12	G1/4	M20x1.5	40	10

DIMENSIONS OF NON-ROTATING Ø 12 to 25

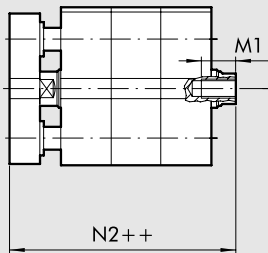
- + = ADD THE STROKE
- ++ = ADD TWICE THE STROKE
- * = SECTION WITH TOLERANCE
- 1 = SENSOR SLOT



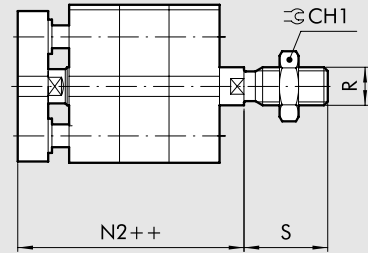
247

NON-ROTATING FEMALE THROUGH-ROD

NON-ROTATING MALE THROUGH-ROD



24A

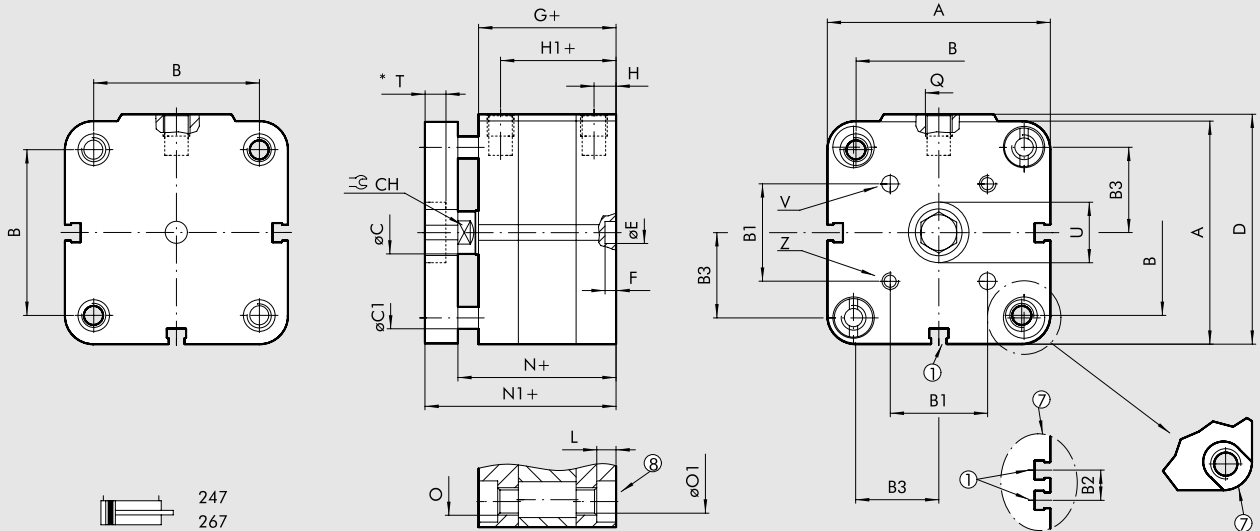


23A

Ø	A	B	B1	øC	øC1	CH	CH1	D	øE ^{H9}	F	G	H	H1	L	M1 x strokes		N	N1	N2	O	øO1	P	Q	R	S	T	øU ^{H9}	øV ^{H8}	Z	NORM
															< 5	≥ 5														
12	29	18	9.9	6	5	5	10	30	6	4	38	8	30	18.5	5	8	42.5	48.5	53	M4	3.2	M3	M5	M6	16	2	6	3	M3	-
16	29	18	9.9	8	5	7	13	30	6	4	38	8	30	18.5	5	10	42.5	48.5	53	M4	3.2	M4	M5	M8	20	2	8	3	M3	-
20	36.5	22	12	10	6	8	17	37.5	6	4	38	8	30	18.5	7	12	42.5	50.5	55	M5	4.2	M5	M5	M10x1.25	22	3.5	10	4	M4	UNITOP
25	40.5	26	15.6	10	6	8	17	41.5	6	4	39.5	8	31.5	19	7	12	45	53	58.5	M5	4.2	M5	M5	M10x1.25	22	4	14	5	M5	UNITOP

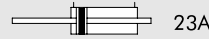
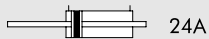
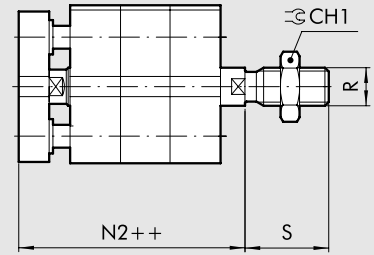
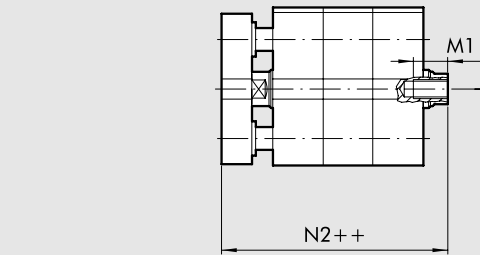
DIMENSIONS OF NON-ROTATING Ø 32 to 100

- + = ADD THE STROKE
- ++ = ADD TWICE THE STROKE
- * = SECTION WITH TOLERANCE
- 1 = SENSOR SLOT
- 7 = ONLY FOR Ø 63 TO Ø 100
- 8 = SLOT FOR DIN 7984 SCREWS



NON-ROTATING FEMALE THROUGH-ROD

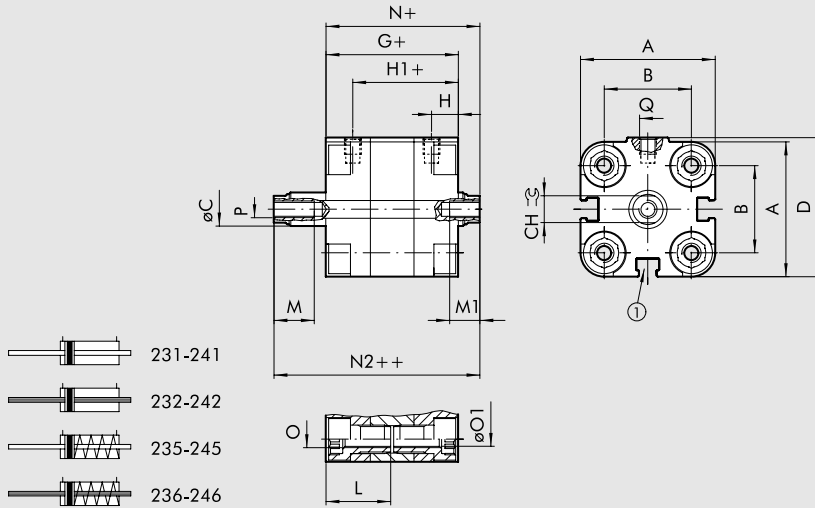
NON-ROTATING MALE THROUGH-ROD



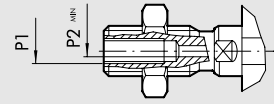
Ø	B																
	A	ISO	UNITOP	B1	B2	B3	ØC	ØC1	CH	CH1	D	ØE ^{H9}	F	G	H	H1	L
32	47	32.5 ^{+0.1} _{-0.1}	32 ^{+0.4} _{-0.1}	19.8	-	16.1	12	8	10	17	48.5	6	4	44.5	7.5	37	4
40	56	38	42	23.3	-	20	12	8	10	17	57.5	6	4	45.5	7.5	38	4.5
50	67	46.5	50	29.7	-	24	16	10	13	19	69	6	4	45.5	7.5	38	4.5
63	80	56.5	62	35.4	13	30	16	10	13	19	82	8	4	50	7.5	42.5	5.5
80	102	72	82	46	17	38.5	20	12	17	24	105	8	4	56	8.5	47.5	5.5
100	123	89	103	56.6	21	48	25	12	22	30	126	8	4	66.5	10.5	56	5.5
Ø	M1 x strokes		O				ØO1				Q	R	S	T	ØU ^{H9}	ØV ^{H8}	Z
	< 5	≥ 5	N	N1	N2	ISO	UNITOP	ISO	UNITOP	P							
32	14	9	50.5	60.5	66.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	4.5	17	5	M5
40	14	9	52	62	68.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	4.5	17	5	M5
50	16	11	53	65	72.5	M8	M8	6.2	6.2	M8	G1/8	M12x1.25	24	6	22	6	M6
63	16	11	57.5	69.5	77	M8	M10	6.2	8.5	M8	G1/8	M12x1.25	24	6	22	6	M6
80	20	15	64	78	86	M10	M10	8.5	8.5	M10	G1/8	M16x1.5	32	8	28	8	M8
100	24	19	76.5	90.5	100.5	M10	M10	8.5	8.5	M12	G1/4	M20x1.5	40	9	30	10	M10

DIMENSIONS OF THROUGH-ROD Ø 12 to 25

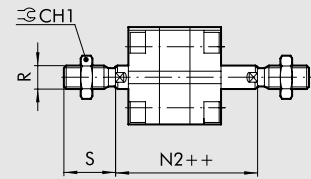
+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE
 1 = SENSOR SLOT



SE-DE MALE PERFORATED THROUGH-ROD



SE-DE MALE THROUGH-ROD

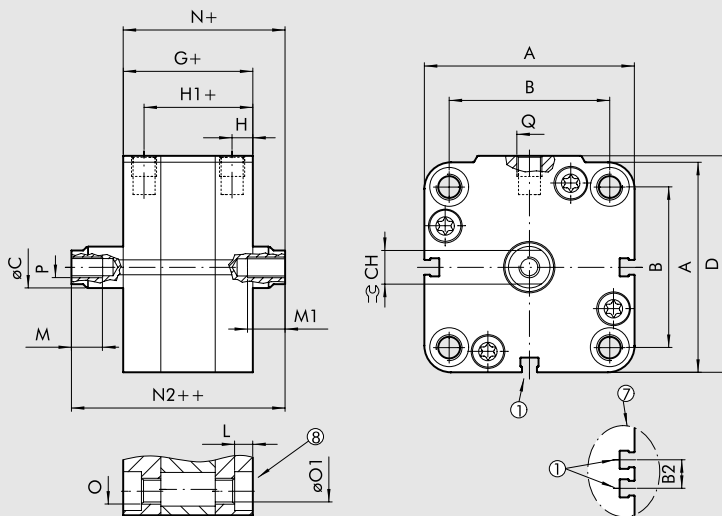


Ø	A	B	ØC	CH	CH1	D	G	H	H1	L	M	M1 x strokes			N2	O	ØO1	P	P2	Q	R	S	NORM
												< 5	≥ 5	N									
12	29	18	6	5	10	30	38	8	30	18.5	8	5	8	42.5	47	M4	3.2	M3	-	M5	M6	16	-
16	29	18	8	7	13	30	38	8	30	18.5	10	5	10	42.5	47	M4	3.2	M4	-	M5	M8	20	-
20	36.5	22	10	8	17	37.5	38	8	30	18.5	12	7	12	42.5	47	M5	4.2	M5	1.5	M5	M10x1.25	22	UNITOP
25	40.5	26	10	8	17	41.5	39.5	8	31.5	19	12	7	12	45	50.5	M5	4.2	M5	1.5	M5	M10x1.25	22	UNITOP

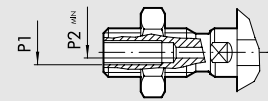
DIMENSIONS OF THROUGH-ROD Ø 32 to 100

+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

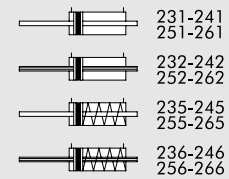
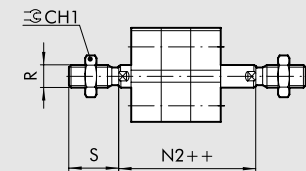
1 = SENSOR SLOT
 7 = ONLY FOR Ø 63 TO Ø 100
 8 = SLOT FOR DIN 7984 SCREWS



SE-DE MALE PERFORATED THROUGH-ROD



SE-DE MALE THROUGH-ROD



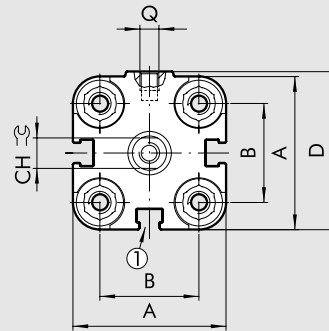
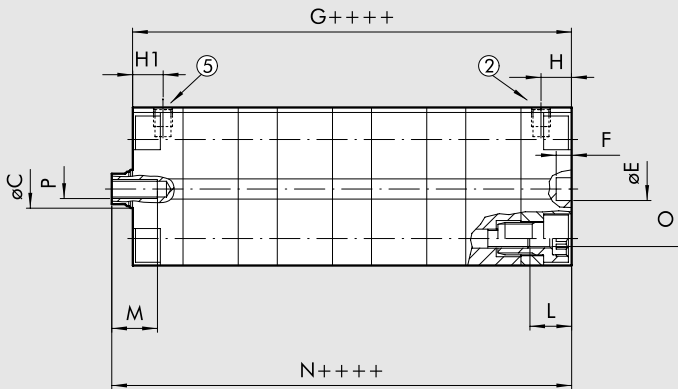
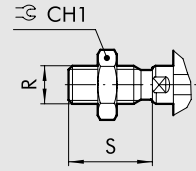
Ø	A	B		ØC	CH	CH1	D	G	H	H1	L	M	M1 x strokes			N2	O	ØO1		P	P1	P2	Q	R	S		
		ISO	UNITOP										< 5	≥ 5	N			ISO	UNITOP								
32	47	32.5 ^{+0.1} _{-0.4}	32 ^{+0.4} _{-0.1}	-	12	10	17	48.5	44.5	7.5	37	4	14	14	9	50.5	56.5	M6	M6	5.2	5.2	M6	-	2.5	G1/8	M10x1.25	22
40	56	38	42	-	12	10	17	57.5	45.5	7.5	38	4.5	14	14	9	52	58.5	M6	M6	5.2	5.2	M6	-	2.5	G1/8	M10x1.25	22
50	67	46.5	50	-	16	13	19	69	45.5	7.5	38	4.5	16	16	11	53	60.5	M8	M8	6.2	6.2	M8	-	4	G1/8	M12x1.25	24
63	80	56.5	62	13	16	13	19	82	50	7.5	42	5.5	16	16	11	57.5	65	M8	M10	6.2	8.5	M8	-	4	G1/8	M12x1.25	24
80	102	72	82	17	20	17	24	105	56	8.5	47.5	5.5	20	20	15	64	72	M10	M10	8.5	8.5	M10	1/8	5	G1/8	M16x1.5	32
100	123	89	103	21	25	22	30	126	66.5	10.5	56	5.5	24	24	19	76.5	86.5	M10	M10	8.5	8.5	M12	1/4	6	G1/4	M20x1.5	40

DIMENSIONS OF TANDEM Ø 20 to 25 - 4-STAGES

++ = ADD TWICE THE STROKE
 +++ = ADD THREE TIMES THE STROKE
 ++++ = ADD FOUR TIMES THE STROKE

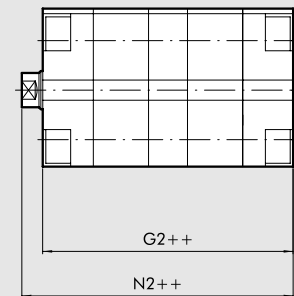
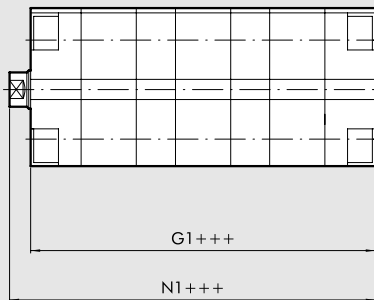
1 = SENSOR SLOT
 2 = CYLINDERS OUT
 5 = CYLINDERS IN

MALE PISTON ROD



TANDEM 3 STAGES

TANDEM 2 STAGES



Ø	A	B	ØC	CH	CH1	D	ØE ^{HP}	F	G	G1	G2	H	H1	L	M	N	N1	N2	O	P	Q	R	S	NORM
20	36.5	22	10	8	17	37.5	6	4	114.5	89	63.5	8	8	10	12	119	93.5	68	M5	M5	M5	M10x1.25	22	UNITOP
25	40.5	26	10	8	17	41.5	6	4	118	92	66	8	8	10	12	123.5	97.5	71.5	M5	M5	M5	M10x1.25	22	UNITOP

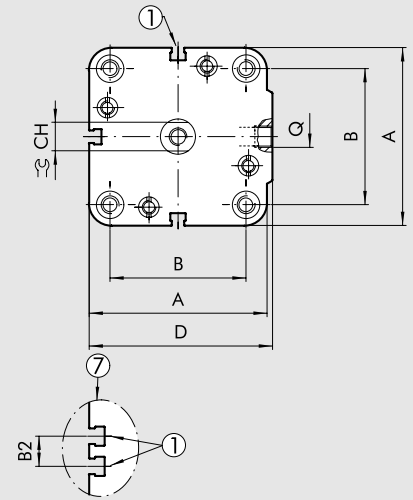
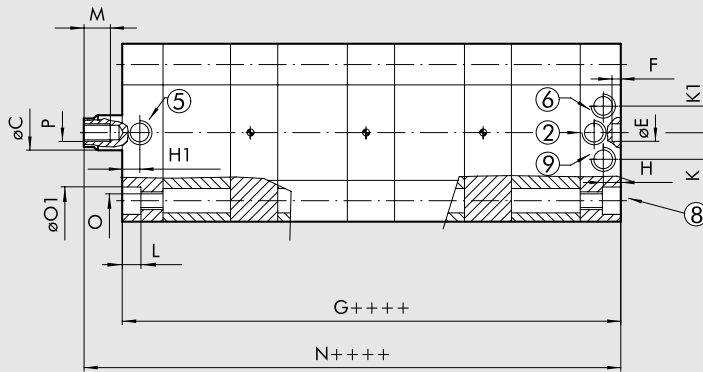
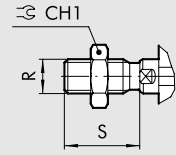
DIMENSIONS OF TANDEM Ø 32 to 100 - 4-STAGES

++ = ADD TWICE THE STROKE
 +++ = ADD THREE TIMES THE STROKE
 ++++ = ADD FOUR TIMES THE STROKE

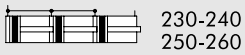
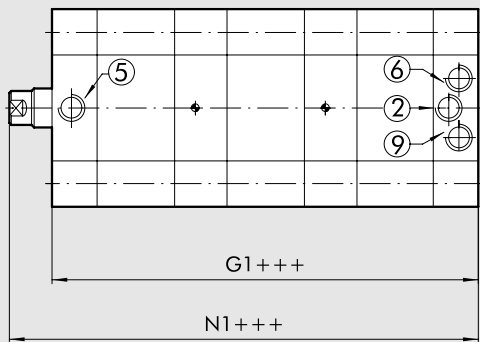
2 = CYLINDERS OUT FOR Ø 32 to 63
 5 = CYLINDERS IN FOR Ø 32 to 63
 6 = CYLINDERS IN FOR Ø 80; 100
 9 = CYLINDERS OUT FOR Ø 80; 100

1 = SENSOR SLOT
 7 = ONLY FOR Ø 63 to 100
 8 = SLOT FOR DIN 7984 SCREWS

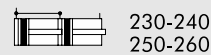
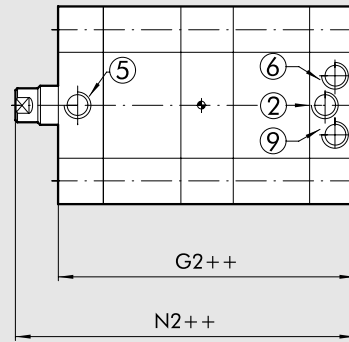
MALE PISTON ROD



TANDEM 3-STAGES



TANDEM 2-STAGES



Ø	A	B			ØC	CH	CH1	D	ØE ^{HP}	F	G	G1	G2	H	H1	K	K1
		ISO	UNITOP	B2													
32	47	32.5 ^{+0.1} _{-0.1}	32 ^{+0.4} _{-0.1}	-	12	10	17	48.5	6	4	154	117.5	81	7.5	7.5	-	-
40	56	38	42	-	12	10	17	57.5	6	4	162.5	123.5	84.5	7.5	7.5	-	-
50	67	46.5	50	-	16	13	19	69	6	4	163.5	124	85	7.5	7.5	-	-
63	80	56.5	62	13	16	13	19	82	8	4	182	138	94	7.5	7.5	-	-
80	102	72	82	17	20	17	24	105	8	4	204.5	155	105.5	8.5	-	10.5	10.5
100	123	89	103	21	25	22	30	126	8	4	243	184	125.5	10.5	-	14.5	14.5

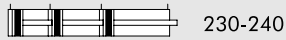
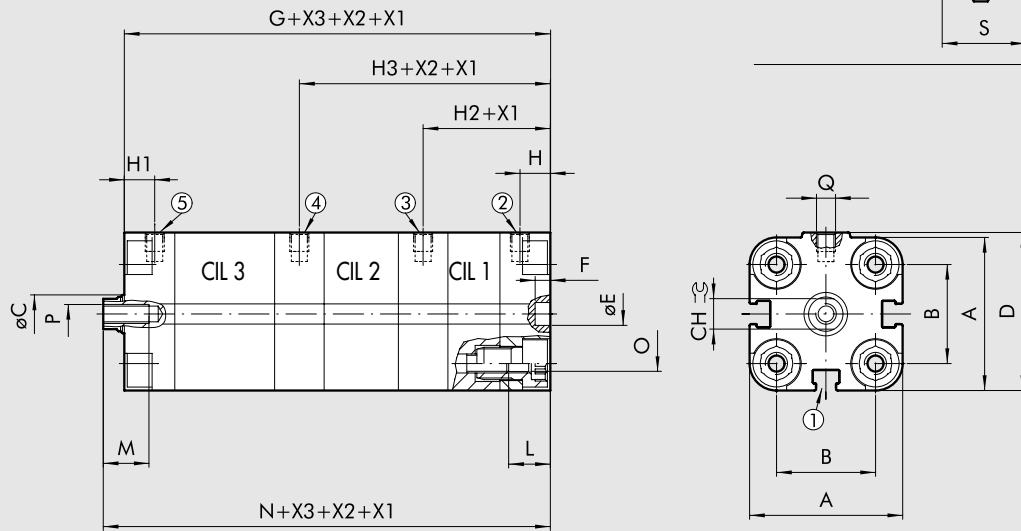
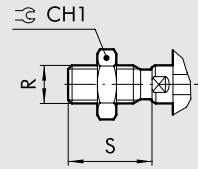
Ø	L	M	N	N1	N2	O		P	Q	R	S
						ISO	UNITOP				
32	4	14	160	123.5	87	M6	M6	M6	G1/8	M10x1.25	22
40	4.5	14	169	130	91	M6	M6	M6	G1/8	M10x1.25	22
50	4.5	16	171	131.5	92.5	M8	M8	M8	G1/8	M12x1.25	24
63	5.5	16	189.5	145.5	101.5	M8	M10	M8	G1/8	M12x1.25	24
80	5.5	20	212.5	163	113.5	M10	M10	M10	G1/8	M16x1.5	32
100	5.5	24	253	194	135.5	M10	M10	M12	G1/4	M20x1.5	40

DIMENSIONS OF MULTI-POSITION Ø 12 to 25 - 3-STAGES

- 1 = SENSOR SLOT
- 2 = CYLINDER 1 OUT
- 3 = CYLINDER 2 OUT
- 4 = CYLINDER 3 OUT
- 5 = CYLINDERS 1-2-3 IN

- X1 = CYLINDER 1 STROKE
- X2 = CYLINDER 2 STROKE
- X3 = CYLINDER 3 STROKE

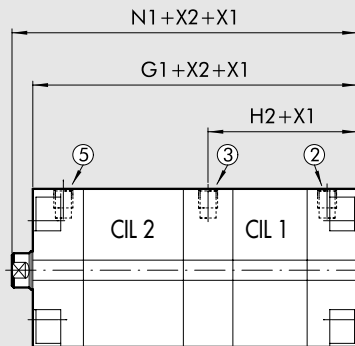
MALE PISTON ROD



MULTI-POSITION 2-STAGES

- 2 = CYLINDER 1 OUT
- 3 = CYLINDER 2 OUT
- 5 = CYLINDERS 1-2 IN

- X1 = CYLINDER 1 STROKE
- X2 = CYLINDER 2 STROKE



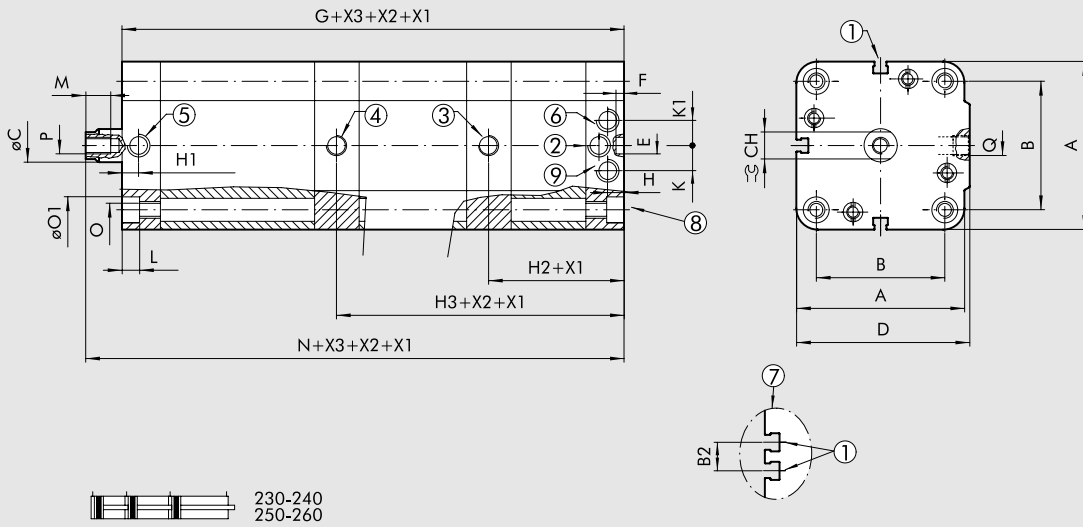
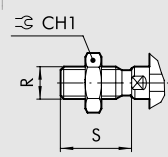
Ø	A	B	ØC	CH	CH1	D	ØE ^{H9}	F	G	G1	H	H1	H2	H3	L	M	N	N1	O	P	Q	R	S	NORM	
12	29	18	6	5	10	30	6	4	89	63.5	8	8	33.5	59	10	8	93.5	68	M4	M3	M5	M6	16	-	
16	29	18	8	7	13	30	6	4	89	63.5	8	8	33.5	59	10	10	93.5	68	M4	M4	M5	M8	20	-	
20	36.5	22	10	8	17	37.5	6	4	89	63.5	8	8	33.5	59	10	12	93.5	68	M5	M5	M5	M5	M10x1.25	22	UNITOP
25	40.5	26	10	8	17	41.5	6	4	92	66	8	8	34	60	10	12	97.5	71.5	M5	M5	M5	M5	M10x1.25	22	UNITOP

DIMENSIONS OF MULTI-POSITION Ø 32 to 100 - 3-STAGES

- 1 = SENSOR SLOT
- 2 = CYLINDER 1 OUT FOR Ø 32 to 63
- 3 = CYLINDER 2 OUT FOR Ø 32 to 100
- 4 = CYLINDER 3 OUT FOR Ø 32 to 100
- 5 = CYLINDER 1-2-3 IN FOR Ø 32 to 63
- 6 = CYLINDER 1-2-3 IN FOR Ø 80 to 100
- 7 = ONLY FOR Ø 63 to 100
- 8 = SLOT FOR DIN 7984 SCREWS
- 9 = CYLINDER 1 OUT FOR Ø 80 to 100

- X1 = CYLINDER 1 STROKE
- X2 = CYLINDER 2 STROKE
- X3 = CYLINDER 3 STROKE

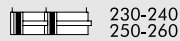
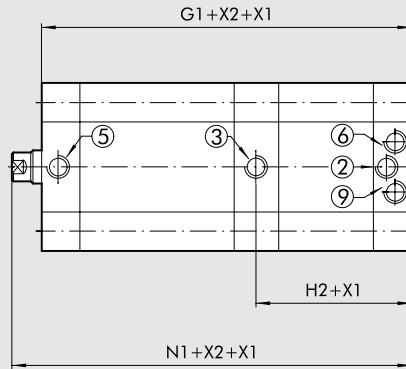
MALE PISTON ROD



MULTI-POSITION 2-STAGES

- 2 = CYLINDER 1 OUT FOR Ø 32 to 63
- 3 = CYLINDER 2 OUT FOR Ø 32 to 100
- 5 = CYLINDER 1-2 IN FOR Ø 32 to 63
- 6 = CYLINDER 1-2 IN FOR Ø 80 to 100
- 9 = CYLINDER 1 OUT FOR Ø 80 to 100

- X1 = CYLINDER 1 STROKE
- X2 = CYLINDER 2 STROKE

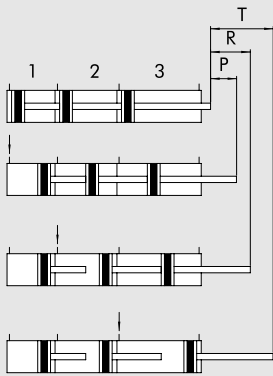


Ø	B				ØC	CH	CH1	D	ØE ^{HP}	F	G	G1	H	H1	H2	H3
	A	ISO	UNITOP	B2												
32	47	32.5 ^{+0.1} _{-0.4}	32 ^{+0.4} _{-0.1}	-	12	10	17	48.5	6	4	117.5	81	7.5	7.5	44	80.5
40	56	38	42	-	12	10	17	57.5	6	4	123.5	84.5	7.5	7.5	46.5	85.5
50	67	46.5	50	-	16	13	19	69	6	4	124	85	7.5	7.5	47	86
63	80	56.5	62	13	16	13	19	82	8	4	138	94	7.5	7.5	51.5	95.5
80	102	72	82	17	20	17	24	105	8	4	155	105.5	8.5	-	58	107.5
100	123	89	103	21	25	22	30	126	8	4	184	125.5	10.5	-	69.3	128

Ø	K	K1	L	M	N	N1	O		P	Q	R	S
							ISO	UNITOP				
32	-	-	4	14	123.5	87	M6	M6	M6	G1/8	M10x1.25	22
40	-	-	4.5	14	130	91	M6	M6	M6	G1/8	M10x1.25	22
50	-	-	4.5	16	131.5	92.5	M8	M8	M8	G1/8	M12x1.25	24
63	-	-	5.5	16	145.5	101.5	M8	M10	M8	G1/8	M12x1.25	24
80	10.5	10.5	5.5	20	163	113.5	M10	M10	M10	G1/8	M16x1.5	32
100	14.5	14.5	5.5	24	194	135.5	M10	M10	M12	G1/4	M20x1.5	40

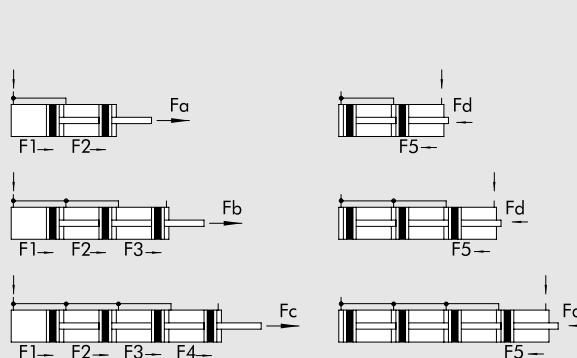
FUNCTIONAL DIAGRAMS

MULTI-POSITION



1 = STAGE 1
2 = STAGE 2
3 = STAGE 3

TANDEM



LEGENDA

P = Stage 1 stroke
R = Stage 2 stroke
T = Stage 3 stroke

$F_a = F_1 + F_2$ [N]
 $F_b = F_1 + F_2 + F_3$ [N]
 $F_c = F_1 + F_2 + F_3 + F_4$ [N]
 $F_d = F_5$ [N]

KEY TO CODE

CYL	23 TYPE	1	0	25 BORE	0	050 STROKE **	X MATERIAL	P GASKETS
	23 Compact cylinder centre distances to UNITOP male piston rod	0 Double-acting 1 Double-acting through-rod + 2 Double-acting through-rod perforated	0 Magnetic □ S Non-magnetic ▲ G No stick slip	12 16 20 25 32 40 50 63 80 ◆ 100	0 Standard + A 2-stage tandem + B 3-stage tandem + C 4-stage tandem		* C C45 piston rod chromium-plated ▷ X Stainless steel piston rod and nut	P Polyurethane gaskets ▶ + V FKM/FPM gaskets
	24 Compact cylinder centre distances to UNITOP female piston rod	● 3 Single-acting retracting piston rod ● 4 Single-acting extended piston rod ● 5 Single-acting through-rod			MULTI-POSITION ●● P Stage 1 ●● R Stage 2 ●● T Stage 3		◁ A C45 chromed rod, aluminium piston ○ Z Stainless steel piston rod and nut aluminium piston	
	■ 25 Compact cylinder centre distances to ISO male piston rod	● + 6 Single-acting through-rod piston rod perforated ▼ 7 Double-acting non-rotating						
	■ 26 Compact cylinder centre distances to ISO female piston rod	A Double-acting through-rod non-rotating						

** For the maximum suppliance stroke, see page 1-74

- ◆ In the code of cylinder with letter in fourth position Ø 100 becomes A1
- Codes only for cylinders Ø 32 to 100
- Can also be used as double-acting with spring return
- + Available from Ø 20
- ▼ For versions 24 and 26 only (female piston rod)
- ▲ For Ø 12 to 25 the standard version (0 or S) it's already no stick slip
- For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**
- ▶ Only for standard double acting and standard through rod double acting version
- Compulsory for Ø 20 and Ø 25 version Z
- * Only for Ø 32 to 63 P version (Polyurethane gaskets)
- ▷ Only for Ø 12 to 63 P version (Polyurethane gaskets)
- ◁ Only for Ø 32 to 100 V version (FKM/FPM gaskets) and for Ø 80 and 100 P version (Polyurethane gaskets)
- Only for Ø 20 to 100 V version (FKM/FPM gaskets) and for Ø 80 and 100 P version (Polyurethane gaskets)

- The ordering codes for a Multi-position cylinder is a combination of several codes, each describing a stage.

Coding example for a UNITOP multiposition cylinder
2 stages Ø 20 strokes 40 + 10 (total stroke 50 mm) male rod:
1° STADIO (P) : 230020P040XP +
2° STADIO (R) : 230020R050XP

Coding example for a UNITOP multiposition cylinder
3 stages Ø 20 strokes 15 + 30 + 40 (total stroke 85 mm) male rod:
1° STADIO (P) : 230025P015XP +
2° STADIO (R) : 230025R045XP +
3° STADIO (T) : 230025T085XP

COMPACT CYLINDERS SERIES CMPC TWO-FLAT

This version is used to keep at an angle the objects fixed onto the piston rod and to apply torques within the specified limits. The piston rod in two-flat cylinders has two opposing longitudinal surfaces and is made entirely of stainless steel. The front head of the cylinder includes a sintered bronze bush that engages the piston rod and prevents it from rotating. A special polyurethane gasket guarantees air-tightness and dirt removal. This technical solution is more airtight and reliable than square or hexagonal piston rods.

These compact cylinders come in the following versions:

- with or without a magnet
- dual-acting, single piston rod
- dual-acting, through piston rod – one piston rod is two-flat, and the other is cylindrical
- fixing centre distances compatible with ,ISO 15552 (former ISO 6431), or with French standard NFE 49-004-1 and 2 (UNITOP).

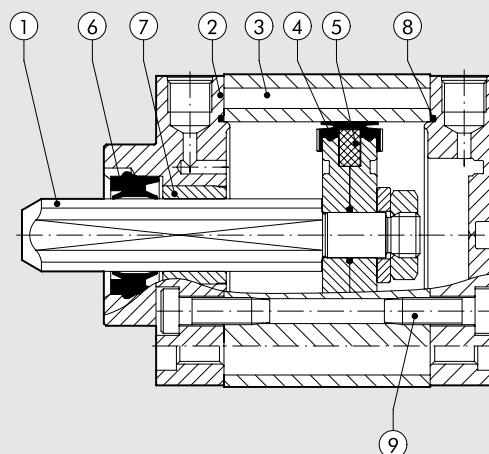
The special profile and the fact that the external heads are screwed onto the liner give an excellent guide. Numerous fixing options are available thanks to wide range of anchor points. Retractable magnetic limit switches can be mounted in slots in the cylinder to measure the position.



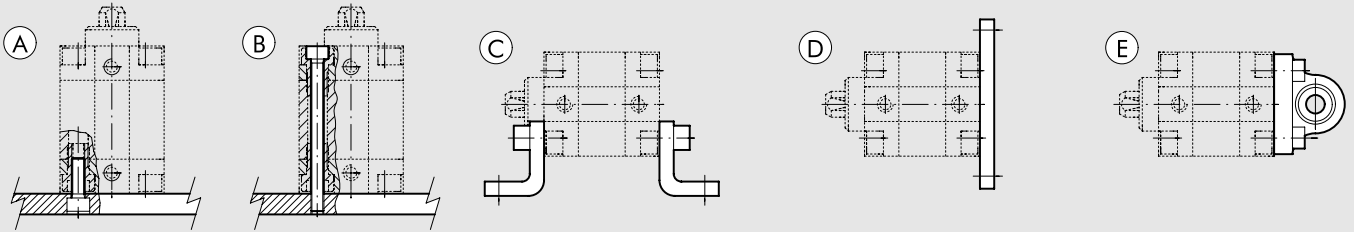
TECHNICAL DATA		POLYURETHANE
Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	-10 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous
Bores	mm	32; 40; 50; 63; 80 with ISO 15552 fixing centre distances
	mm	32; 40; 50; 63; 80 with NFE 49-004-1 and 2 fixing centre distances
Design		With profile, heads with screws
Maximum strokes †	mm	Ø 32-40 = 300; Ø 50-63 = 400; Ø 80 = 500
Versions		Double-acting, Double-acting Through-rod
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request
Inrush pressure	bar	Ø 32 = 0.8; from Ø 40 to 80 = 0.6
Max torque on piston rod	Nm	Ø 32 and 40 = 0.2; Ø 50 and 63 = 0.4; Ø 80 = 1
Maximum rotation on the rod	degrees	Ø 32 and 40 = 0.70°; Ø 50 and 63 = 0.75°; Ø 80 = 0.65°
Weights		See page 1-9
Notes		† Maximum recommended strokes. Higher values can create operating problems
		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.

COMPONENTS Ø 12 to 25

- 1 PISTON ROD: C45 steel or stainless steel, two-flat
- 2 HEAD: extruded anodised aluminium alloy
- 3 BARREL: drawn anodised and calibrated aluminium alloy
- 4 PISTON GASKET: polyurethane
- 5 MAGNET: Ø 32 neodymium - Ø 40 to 100 plastoferrite
- 6 PISTON ROD GASKET TWO-FLAT: polyurethane
- 7 GUIDE BUSHING: steel strip with bronze
- 8 STATIC O-rings: NBR
- 9 SECURING SCREWS: zinc-plated steel



FIXING OPTIONS



- Ⓐ Fixing to structural work with a through screw, using the thread in the heads
- Ⓑ Direct fixing from above using long through screws or tie rods. Non-magnetic stainless steel must be used (e.g. AISI 304)
- Ⓒ Fixing with feet; the ordering code covers the supply of one foot and two screws for fixing to the cylinder.
- Ⓓ Fixing with a flange mounted on the front or rear head; the ordering code covers the supply of a flange and four screws for fixing to the cylinder
- Ⓔ Fixing with articulated hinge to compensate for slight system misalignment and turn freely
The ordering code covers the supply of a hinge and four screws for fixing to the cylinder

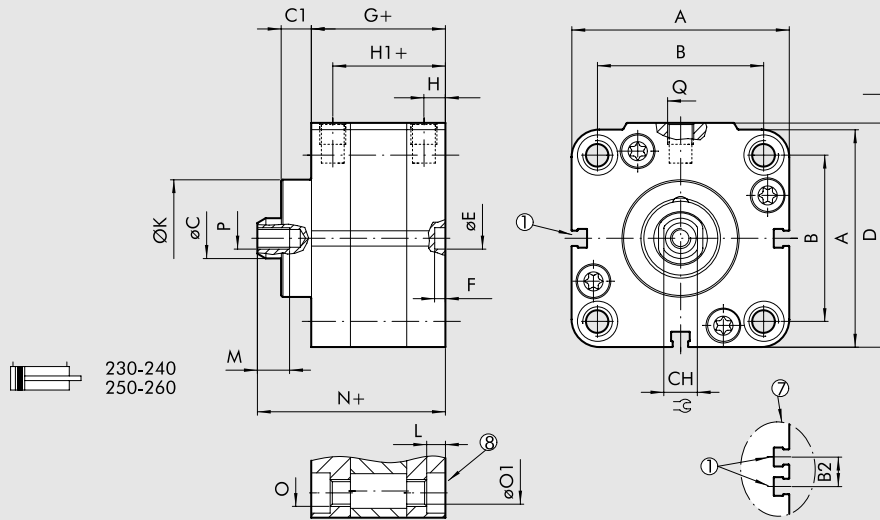
KEY TO CODE

CYL	2 3 TYPE	1	0	3 2 BORE	0	0 5 0 STROKE *	F MATERIAL	P GASKETS
	23 Compact cylinder centre distances to UNITOP male piston rod	0 Double-acting 1 Double-acting through-rod	0 Magnetic S Non-magnetic ▲ G No stick slip	32 40 50 63 80	0 Standard		F "TWO-FLAT" piston rod AISI 303 stainless steel	P Polyurethane gaskets
	24 Compact cylinder centre distances to UNITOP female piston rod							
	25 Compact cylinder centre distances to ISO male piston rod							
	26 Compact cylinder centre distances to ISO female piston rod							

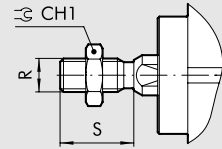
* For the maximum suppliable strokes, look at the technical data
▲ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only

DIMENSIONS OF DOUBLE-ACTING

+ = ADD THE STROKE
 1 = SENSOR SLOT
 7 = ONLY FOR Ø 63 to 100
 8 = SEAT FOR DIN 7984 SCREWS



DE MALE PISTON ROD

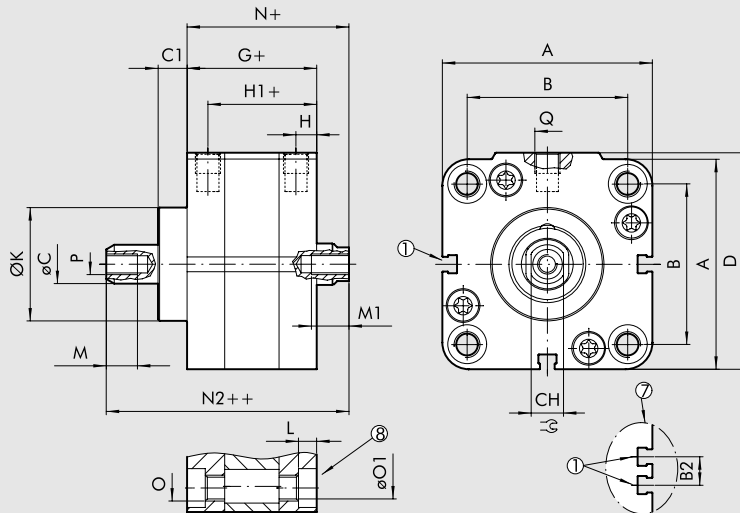


Ø	A	B											O			ØO1		P	Q	R	S					
		ISO	UNITOP	B2	ØC	C1	CH	CH1	D	ØE ^{M7}	F	G	H	H1	ØK	L	M					N	ISO	UNITOP	ISO	UNITOP
32	47	32.5 ^{+0.1} _{-0.4}	32 ^{+0.4} _{-0.1}	-	12	9	10	17	48.5	6	4	44.5	7.5	37	30	4	14	59.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22
40	56	38	42	-	12	9	10	17	57.5	6	4	45.5	7.5	38	35	4.5	14	61	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22
50	67	46.5	50	-	16	11.5	13	19	69	6	4	45.5	7.5	38	40	4.5	16	64.5	M8	M8	6.2	6.2	M8	G1/8	M12x1.25	24
63	80	56.5	62	13	16	11.5	13	19	82	8	4	50	7.5	42.5	45	5.5	16	69	M8	M10	6.2	8.5	M8	G1/8	M12x1.25	24
80	102	72	82	17	20	13	17	24	105	8	4	56	8.5	47.5	45	5.5	20	77	M10	M10	8.5	8.5	M10	G1/8	M16x1.5	32

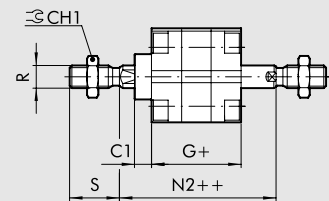
DIMENSIONS OF THROUGH-ROD

+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

1 = SENSOR SLOT
 7 = ONLY FOR Ø 63 TO Ø 80
 8 = SLOT FOR DIN 7984 SCREWS



DE MALE PISTON ROD



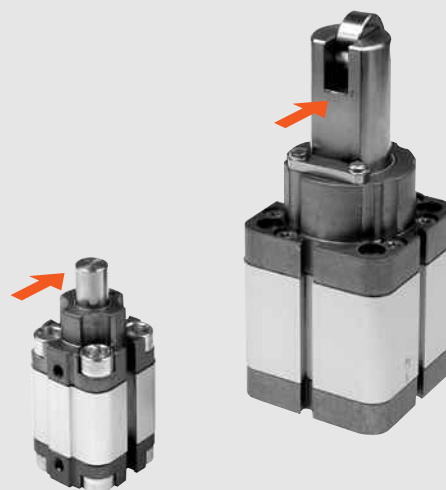
Ø	A	B											M1 x strokes		O			ØO1		P	Q	R	S				
		ISO	UNITOP	B2	ØC	C1	CH	CH1	D	G	H	H1	ØK	L	M	N	N2	ISO	UNITOP					ISO	UNITOP		
32	47	32.5 ^{+0.1} _{-0.4}	32 ^{+0.4} _{-0.1}	-	12	9	10	17	48.5	44.5	7.5	37	30	4	14	14	9	50.5	65.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22
40	56	38	42	-	12	9	10	17	57.5	45.5	7.5	38	35	4.5	14	14	9	52	67.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22
50	67	46.5	50	-	16	11.5	13	19	69	45.5	7.5	38	40	4.5	16	16	11	53	72	M8	M8	6.2	6.2	M8	G1/8	M12x1.25	24
63	80	56.5	62	13	16	11.5	13	19	82	50	7.5	42	45	5.5	16	16	11	57.5	76.5	M8	M10	6.2	8.5	M8	G1/8	M12x1.25	24
80	102	72	82	17	20	13	17	24	105	56	8.5	47.5	45	5.5	20	20	15	64	85	M10	M10	8.5	8.5	M10	G1/8	M16x1.5	32


COMPACT STOPPER CYLINDER

Compact stopper cylinders designed for stopping moving parts or chucks.

- With or without magnet execution
- Single-acting, oversize extended piston rod
- Can be also used as double-acting with spring return
- Fixing centre distances to ISO 15552 for $\varnothing 32$, $\varnothing 50$, $\varnothing 80$ and French standard NFE 49-004-1 and 2 (UNITOP).

In the relevant cylinder slots, it is possible to mount retracting magnetic sensor.

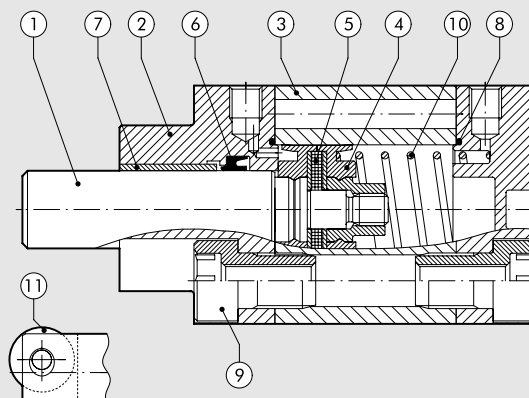


 Chuck impact direction

TECHNICAL DATA	
Max operating pressure	bar 10 MPa 1 psi 145
Temperature range	$^{\circ}\text{C}$ -10 to +80
Fluid	Unlubricated air. Lubrication, if used, must be continuous
Stroke bore	mm $\varnothing 20 \times 15$; $\varnothing 32 \times 20$; $\varnothing 50 \times 30$; $\varnothing 80 \times 30$; $\varnothing 80 \times 40$ a with NFE 49-004-1 and 2 fixing centre distances (UNITOP) mm $\varnothing 32 \times 20$; $\varnothing 50 \times 30$; $\varnothing 80 \times 30$; $\varnothing 80 \times 40$ with ISO 15552 fixing centre distances
Design	With profile, heads with screws
Versions	Single-acting extended rod, Can be also used as double-acting with spring return
Magnet for sensors	All versions come complete with magnet. Supplied without magnet on request
Inrush pressure	bar $\varnothing 20$: 1.2; $\varnothing 32$ -50: 1; $\varnothing 80$: 0.5
Weights	See page 1-9
Notes	For correct operation, it is advisable to use 50 μm filtered air

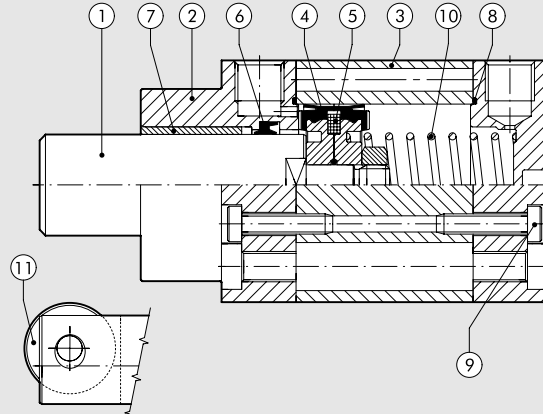
COMPONENTS $\varnothing 20$

- ① PISTON ROD: Stainless steel, thick chromed
- ② HEAD: extruded anodised aluminium alloy
- ③ BARREL: drawn anodised and calibrated aluminium alloy
- ④ PISTON GASKET: polyurethane
- ⑤ MAGNET: neodymium-plastic
- ⑥ PISTON ROD GASKET: polyurethane
- ⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert
- ⑧ STATIC O-RINGS: NBR
- ⑨ SECURING SCREWS: zinc-plated steel
- ⑩ RETURN SPRING: spring stainless steel
- ⑪ WHEEL: zinc-plated steel



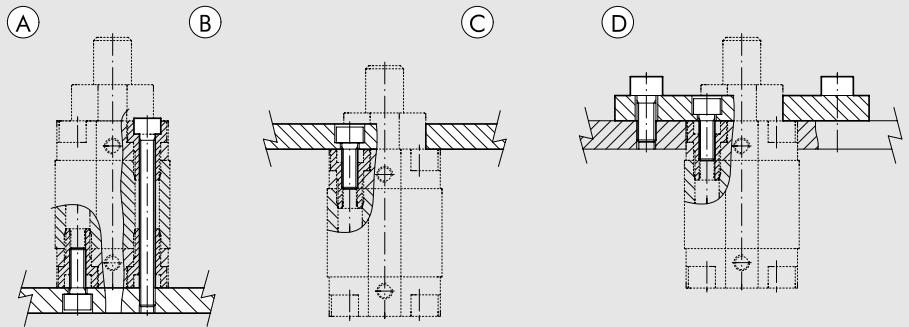
COMPONENTS Ø 32, Ø 50, Ø 80

- ① PISTON ROD: Stainless steel, thick chromed
- ② HEAD: extruded anodised aluminium alloy
- ③ BARREL: drawn anodised and calibrated aluminium alloy
- ④ PISTON GASKET: polyurethane
- ⑤ MAGNET: Ø 32 neodymium-plastic - Ø 50 to 80 plastoferrite
- ⑥ PISTON ROD GASKET: polyurethane
- ⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert.
- ⑧ STATIC O-rings: NBR
- ⑨ SECURING SCREWS: zinc-plated steel
- ⑩ RETURN SPRING: spring stainless steel
- ⑪ WHEEL: zinc-plated steel



COMPACT STOPPER CYLINDER FIXING OPTIONS

- Ⓐ Fixing with screws, using the thread in the rear heads
- Ⓑ Direct fixing from above using long through screws or tie rods. Non-magnetic stainless steel must be used (e.g. AISI 304)
- Ⓒ Fixing with screws, using the thread in the front heads.
- Ⓓ Fixing using flange fixed onto the cylinder.

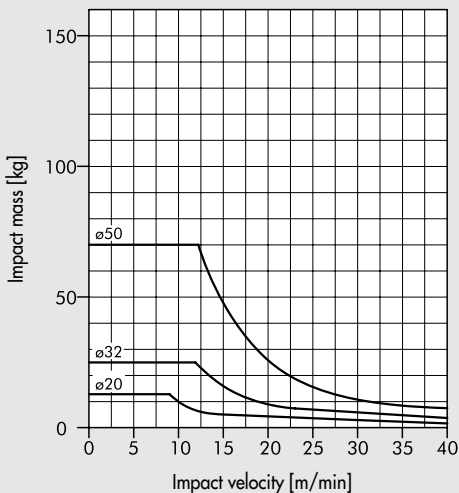


FORCE OF SPRINGS IN COMPACT STOPPER CYLINDERS (THEORETICAL)

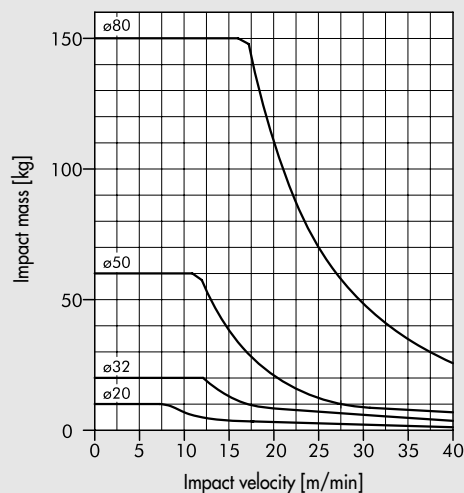
Stroke bore	Ø 20 x 15	Ø 32 x 20	Ø 50 x 30	Ø 80 x 30	Ø 80 x 40
Min. load (N)	13.7	22.4	50.2	97.9	71.0
Max. load (N)	21.2	36.0	115.9	178.5	178.5

LOAD GRAPH

TRUNNION VERSION



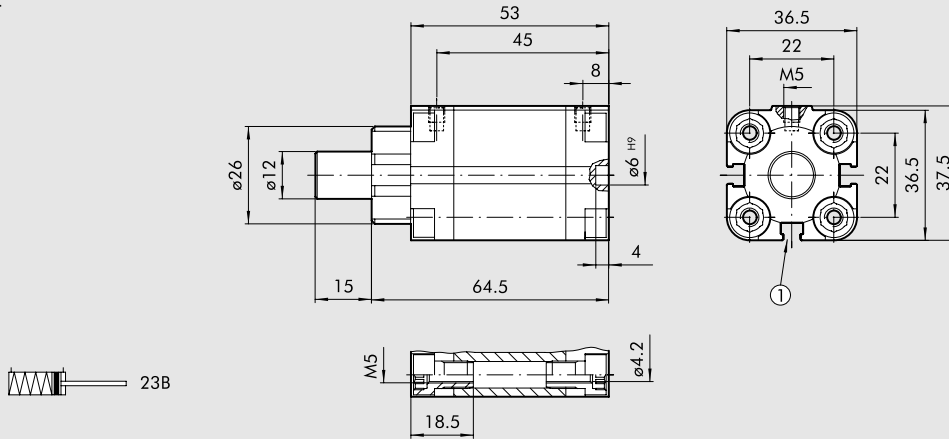
ROLLER VERSION



With stopper cylinders it is important to keep to the values shown in the graph to prevent early breakage of the mechanical parts. The values shown are only valid with about 1 mm plastic deformation (stopper on chuck).

Ø 20 STROKE 15 mm TRUNNION VERSION

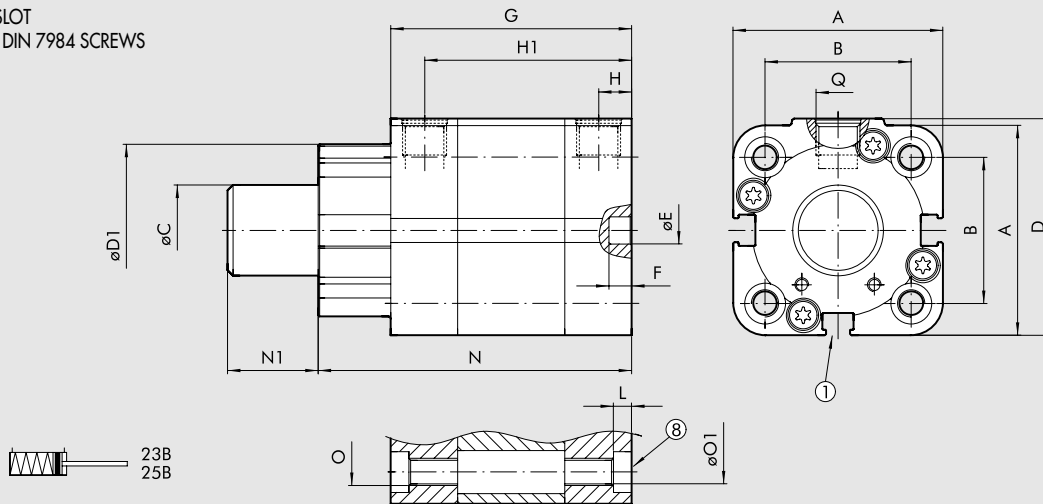
1 = SENSOR SLOT



Code	Description
23B0200015XP	Compact stopper cylinder, trunnion Ø 20, stroke 15
23B5200015XP	Compact stopper cylinder, trunnion Ø 20, stroke 15 (non-magnetic version)

Ø 32 STROKE 20 mm; Ø 50 STROKE 30 mm TRUNNION VERSION

1 = SENSOR SLOT
8 = SEAT FOR DIN 7984 SCREWS

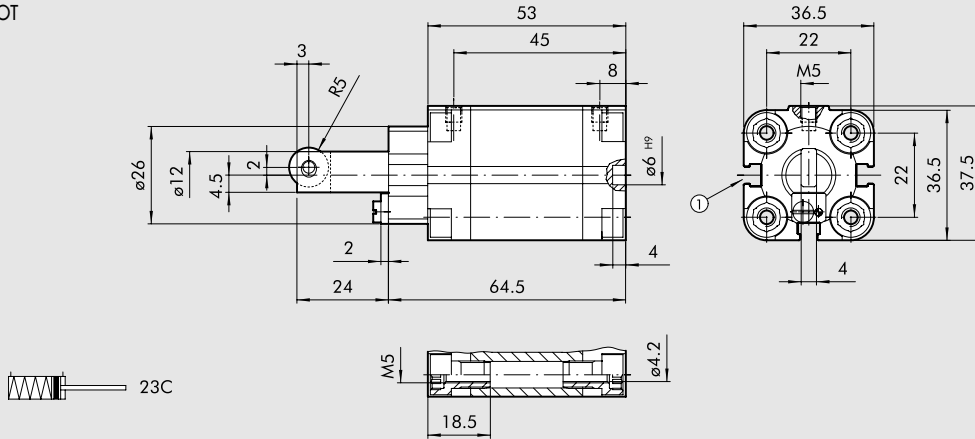


Ø	A	B		ØC	D	D1	ØE ^{H9}	F	G	H	H1	L	N	N1	O		ØO1		Q
		ISO	UNITOP												ISO	UNITOP			
32x20	47	32.5 ^{+0.1} _{-0.4}	32 ^{+0.4} _{-0.1}	20	48.5	38	6	4	64.5	7.5	57	4	80.5	20	M6	M6	5.2	5.2	G1/8
50x30	67	46.5	50	32	69	53	6	4	75.5	7.5	68	4.5	99.5	30	M8	M8	6.2	6.2	G1/8

Code	Description
23B0320020XP	Compact stopper cylinder, trunnion Ø 32, stroke 20 UNITOP
25B0320020XP	Compact stopper cylinder, trunnion Ø 32, stroke 20 ISO 15552
23B5320020XP	Compact stopper cylinder, trunnion Ø 32, stroke 20 UNITOP (non-magnetic version)
25B5320020XP	Compact stopper cylinder, trunnion Ø 32, stroke 20 ISO 15552 (non-magnetic version)
23B0500030XP	Compact stopper cylinder, trunnion Ø 50, stroke 30 UNITOP
25B0500030XP	Compact stopper cylinder, trunnion Ø 50, stroke 30 ISO 15552
23B5500030XP	Compact stopper cylinder, trunnion Ø 50, stroke 30 UNITOP (non-magnetic version)
25B5500030XP	Compact stopper cylinder, trunnion Ø 50, stroke 30 ISO 15552 (non-magnetic version)

Ø 20 STROKE 15 mm ROLLER VERSION

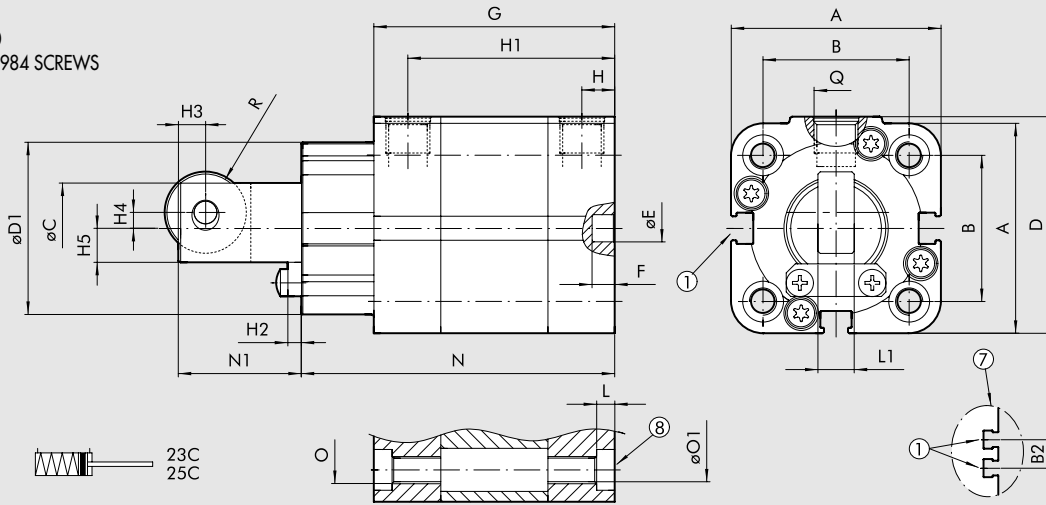
1 = SENSOR SLOT



Code	Description
23C0200015XP	Compact stopper cylinder, roller Ø 20, stroke 15
23CS200015XP	Compact stopper cylinder, roller Ø 20, stroke 15 (non-magnetic version)

Ø 32 STROKE 20 mm; Ø 50 STROKE 30 mm; Ø 80 STROKE 30 AND 40 mm ROLLER VERSION

1 = SENSOR SLOT
 7 = ONLY FOR Ø 80
 8 = SEAT FOR DIN 7984 SCREWS



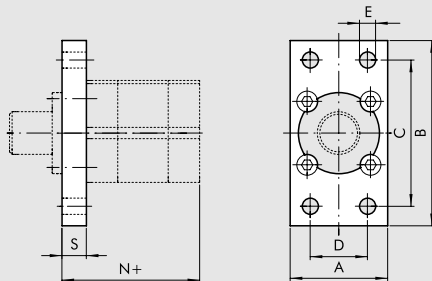
Ø	A	ISO	B		ØC	D	D1	ØE ^{H9}	G	F	H	H1	H2	H3	H4	H5	O		ØO1		L	L1	N	N1	Q	R
			UNITOP	B2													ISO	UNITOP								
32x20	47	32.5 ^{+0.1} _{-0.4}	32 ^{+0.1} _{-0.1}	-	20	48.5	38	6	64.5	4	7.5	57	3	6	3.5	7.5	M6	M6	5.2	5.2	4	8	80.5	38	G1/8	9
50x30	67	46.5	50	-	32	69	53	6	75.5	4	7.5	68	4	6	7	12	M8	M8	6.2	6.2	4.5	10	99.5	50.5	G1/8	12.5
80x30	102	72	82	17	50	105	76	8	126	4	8.5	117.5	8	10	11	18	M10	M10	8.5	8.5	5.5	18	141	63	G1/8	18
80x40	102	72	82	17	50	105	76	8	136	4	8.5	127.5	8	10	11	18	M10	M10	8.5	8.5	5.5	18	151	73	G1/8	18

Code	Description
23C0320020XP	Compact stopper cylinder, roller Ø 32, stroke 20 UNITOP
25C0320020XP	Compact stopper cylinder, roller Ø 32, stroke 20 ISO 15552
23CS320020XP	Compact stopper cylinder, roller Ø 32, stroke 20 UNITOP (non-magnetic version)
25CS320020XP	Compact stopper cylinder, roller Ø 32, stroke 20 ISO 15552 (non-magnetic version)
23C0500030XP	Compact stopper cylinder, roller Ø 50, stroke 30 UNITOP
25C0500030XP	Compact stopper cylinder, roller Ø 50, stroke 30 ISO 15552
23CS500030XP	Compact stopper cylinder, roller Ø 50, stroke 30 UNITOP (non-magnetic version)
25CS500030XP	Compact stopper cylinder, roller Ø 50, stroke 30 ISO 15552 (non-magnetic version)
23C0800030XP	Compact stopper cylinder, roller Ø 80, stroke 30 UNITOP
25C0800030XP	Compact stopper cylinder, roller Ø 80, stroke 30 ISO 15552
23CS800030XP	Compact stopper cylinder, roller Ø 80, stroke 30 UNITOP (non-magnetic version)
25CS800030XP	Compact stopper cylinder, roller Ø 80, stroke 30 ISO 15552 (non-magnetic version)
23C0800040XP	Compact stopper cylinder, roller Ø 80, stroke 40 UNITOP
25C0800040XP	Compact stopper cylinder, roller Ø 80, stroke 40 ISO 15552
23CS800040XP	Compact stopper cylinder, roller Ø 80, stroke 40 UNITOP (non-magnetic version)
25CS800040XP	Compact stopper cylinder, roller Ø 80, stroke 40 ISO 15552 (non-magnetic version)

ACCESSORIES FOR STOPPER CYLINDER

FLANGE Ø 32, Ø 50, Ø 80

+ = ADD THE STROKE



UNITOP

Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950326302	32	50	80	64	32	7	54.5	10	210
W0950506302	50	68	110	90	45	9	57.5	12	502
W0950806302	80	107	160	135	63	12	111	15	1575

ISO

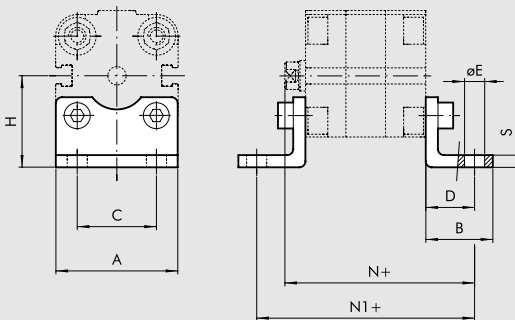
Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950326302	32	50	80	64	32	7	54.5	10	210
W0950506312	50	65	110	90	45	9	57.5	12	447
W0950806312	80	95	153	126	63	12	112	16	1190

Note: Supplied with 4 screws.

ACCESSORIES FOR COMPACT AND COMPACT TWO-FLAT CYLINDERS

FOOT - MODEL A

+ = ADD THE STROKE



CMPC UNITOP, TWO-FLAT UNITOP

Code	Ø	A	B	C	D	ØE	H	N	N1	S	Weight [g]
W0950126001 ▲	12	30	17.5	18	13	5.5	22	55.5	64	3	26
W0950126001 ▲	16	30	17.5	18	13	5.5	22	55.5	64	3	26
W0950206001	20	36	22	22	16	6.6	27	58.5	70	4	46
W0950256001	25	40	22	26	16	6.6	30	58.5	71.5	4	52
W0950322001	32	45	35	32	24	7	31.9	74.5	92.5	4	76
W0950406001	40	60	28	42	20	9	42.5	72	85.5	5	88
W0950406001F *	40	60	28	42	20	9	42.5	72	85.5	5	88
W0950506001	50	68	32	50	24	9	47	77	93.5	6	176
W0950506001F *	50	68	32	50	24	9	47	77	93.5	6	176
W0950636001	63	84	39	62	27	11	59.5	84.5	104	6	276
W0950636001F *	63	84	39	62	27	11	59.5	84.5	104	6	276
W0950806001	80	102	42	82	30	11	65.5	94	116	8	392
W0951006001	100	123	45	103	33	13.5	78	109.5	132.5	8	558

* Only for Two-Flat version

CMPC ISO, TWO-FLAT ISO

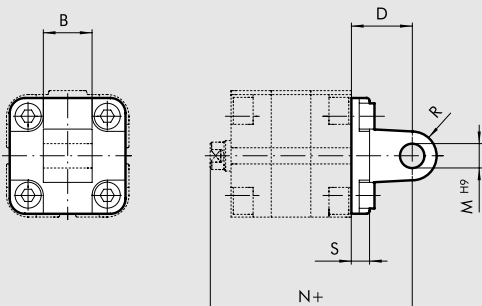
Code	Ø	A	B	C	D	ØE	H	N	N1	S	Weight [g]
W0950322001	32	45	35	32	24	7	31.9	74.5	92.5	4	76
W0950402001	40	52	43	36	28	9	36	80	101.5	4	100
W0950502001	50	65	47	45	32	9	45	85	109.5	4	162
W0950632001	63	75	47	50	32	9	50	89.5	114	6	266
W0950802001	80	95	61	63	41	12	63	105	138	6	456
W0951002001	100	115	65	75	41	14	71	117.5	148.5	6	572

Note: Individually packed with 2 screws.

▲ Non UNITOP norm fixing distance

MALE HINGE-MODEL BA

+ = ADD THE STROKE



CMPC UNITOP, TWO-FLAT UNITOP

Code	Ø	B	D	M	N	R	S	Weight [g]
W0950126004 ▲	12	12	16	6	58.5	6	6	24
W0950126004 ▲	16	12	16	6	58.5	6	6	24
W0950206004	20	16	20	8	62.5	8	6	44
W0950256004	25	16	20	8	62.5	8	6	48

CMPC ISO, TWO-FLAT ISO

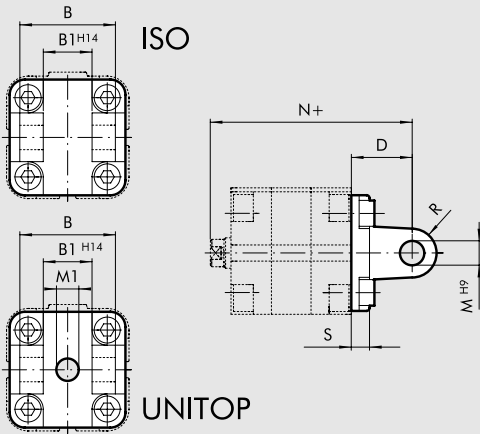
Code	Ø	B	D	M	N	R	S	Weight [g]
W0950322004	32	26	22	10	72.5	11	10	94
W0950402004	40	28	25	12	77	13	10	124
W0950502004	50	32	27	12	80	13	12	220
W0950632004	63	40	32	16	89.5	17	12	316
W0950802004	80	50	36	16	100	17	16	578
W0951002004	100	60	41	20	117.5	21	16	850

Note: Supplied with 4 screws, 4 washers

▲ Non UNITOP norm fixing distance

FEMALE HINGE-MODEL B

+ = ADD THE STROKE



CMPC UNITOP, TWO-FLAT UNITOP

Code	Ø	B	B1	D	M	M1	N	R	S	Weight [g]
W0950322003	32	45	26	22	10	14	72.5	11	10	116
W0950406003	40	52	28	25	12	14	77	12.5	9	184
W0950506003	50	60	32	27	12	18	80	12.5	11	266
W0950636003	63	70	40	32	16	-	89.5	15	11	470
W0950806003	80	90	50	36	16	23	100	15	13	670
W0951006003	100	110	60	41	20	28	117.5	20	15	1110

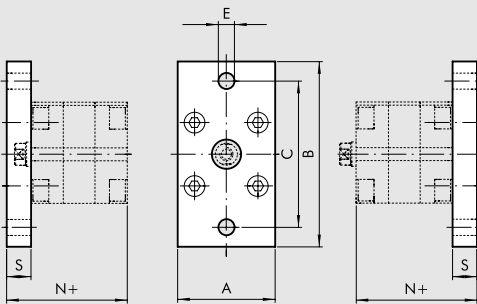
CMPC ISO, TWO-FLAT ISO

Code	Ø	B	B1	D	M	N	R	S	Weight [g]
W0950322003	32	45	26	22	10	72.5	11	10	116
W0950402003	40	52	28	25	12	77	13	10	160
W0950502003	50	60	32	27	12	80	13	12	252
W0950632003	63	70	40	32	16	89.5	17	12	394
W0950802003	80	90	50	36	16	100	17	16	670
W0951002003	100	110	60	41	23	117.5	21	16	1085

Note: Supplied with 4 screws, 4 washers, 2 snap-rings and 1 pin.

FLANGE Ø 12 to 25 - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE



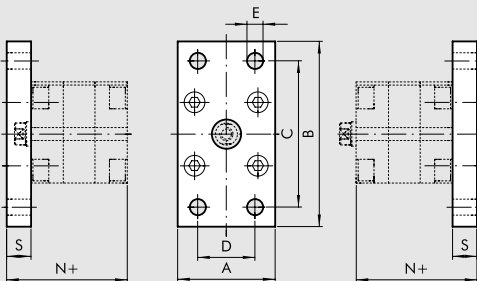
CMPC

Code	Ø	A	B	C	E	N	S	Weight [g]
W0950126002 ▲	12	29	55	43	5.5	48	10	112
W0950126002 ▲	16	29	55	43	5.5	48	10	112
W0950206002	20	36	70	55	6.6	48	10	184
W0950256002	25	40	76	60	6.6	49.5	10	226

Note: Supplied with 4 screws
▲ Non UNITOP norm fixing distance

FLANGE Ø 32 to 100 - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE



CMPC UNITOP

Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950322002	32	50	80	64	32	7	54.5	10	246
W0950406002	40	60	102	82	36	9	55.5	10	454
W0950506002	50	68	110	90	45	9	57.5	12	655
W0950636002	63	87	130	110	50	9	65	15	1255
W0950806002	80	107	160	135	63	12	71	15	1900
W0951006002	100	128	190	163	75	14	81.5	15	2700

TWO FLAT UNITOP

Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950322002	32	50	80	64	32	7	54.5	10	246
W0950406002F	40	60	102	82	36	9	55.5	10	454
W0950506002F	50	68	110	90	45	9	57.5	12	655
W0950636002F	63	87	130	110	50	9	65	15	1255
W0950806002F	80	107	160	135	63	12	71	15	1900

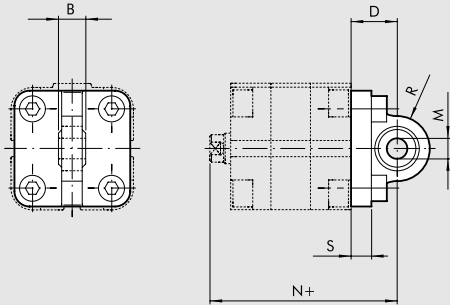
CMPC ISO, TWO FLAT ISO

Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950322002	32	50	80	64	32	7	54.5	10	246
W0950402002	40	55	90	72	36	9	55.5	10	290
W0950502002	50	65	110	90	45	9	57.5	12	522
W0950632002	63	75	120	100	50	9	62	12	670
W0950802002	80	95	153	126	63	12	72	16	1420
W0951002002	100	115	178	150	75	14	82.5	16	2040

Note: Supplied with 4 screws

ARTICULATED MALE HINGE - MODEL BAS

+ = ADD THE STROKE

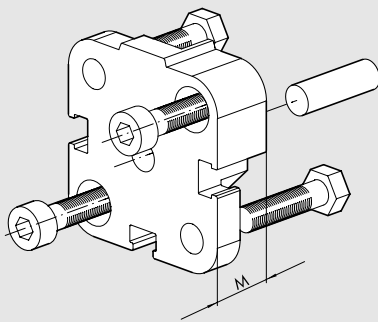


CMPC ISO, TWO FLAT ISO

Code	Ø	B	D	M	N	R	S	Weight [g]
W0950322006	32	14	22	10	72.5	16	10	106
W0950402006	40	16	25	12	77	19	10	142
W0950502006	50	16	27	12	80	19	12	236
W0950632006	63	21	32	16	89.5	24	12	336
W0950802006	80	21	36	16	100	24	16	572
W0951002006	100	25	41	20	117.5	30	16	840

Note: Supplied with 4 screws, 4 washers

FLANGE FOR OPPOSITE CYLINDERS

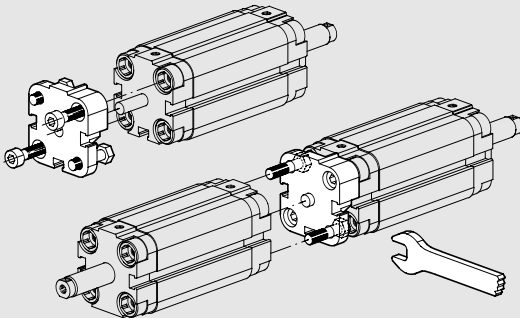


CMPC UNITOP Code	CMPC ISO Codice	Ø	M	Weight [g]	
				UNITOP	ISO
0950123060 ▲	-	12	12.5	29	-
0950123060 ▲	-	16	12.5	29	-
0950203060	-	20	12.5	45	-
0950253060	-	25	13	57	-
0950323060	0950323060	32	14.5	88	88
0950403060	0950403061	40	14.5	106	106
0950503060	0950503061	50	14.5	172	158
0950633060	0950633061	63	14.5	274	258
0950803060	0950803061	80	16.5	470	452
0951003060	0951003061	100	19.5	826	801

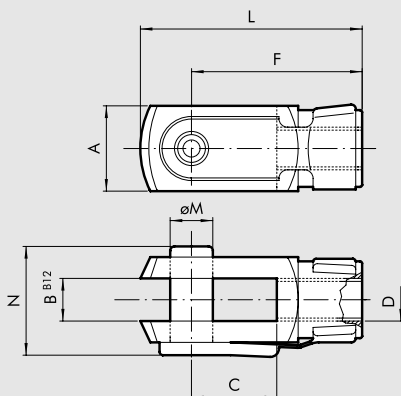
Note: Supplied complete with 1 pin, 4 screws

▲ Non UNITOP norm fixing distance

ASSEMBLING OPPOSING CYLINDERS



FORK - MODEL GK-M

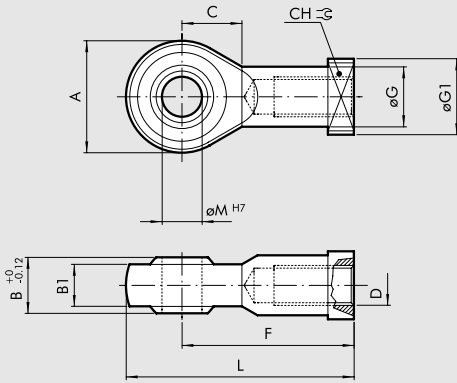


CMPC UNITOP AND ISO, TWO FLAT UNITOP AND ISO

Code	Ø	A	B	C	D	F	L	ØM	N	Weight [g]
W0950120020	12	12	6	12	M6	24	31	6	16	20
W0950200020	16	16	8	16	M8	32	42	8	22	48
W0950322020	20	20	10	20	M10x1.25	40	52	10	26	92
W0950322020	25	20	10	20	M10x1.25	40	52	10	26	92
W0950322020	32	20	10	20	M10x1.25	40	52	10	26	92
W0950322020	40	20	10	20	M10x1.25	40	52	10	26	92
W0950402020	50	24	12	24	M12x1.25	48	62	12	32	148
W0950402020	63	24	12	24	M12x1.25	48	62	12	32	148
W0950502020	80	32	16	32	M16x1.5	64	83	16	40	340
W0950802020	100	40	20	40	M20x1.5	80	105	20	48	690

Note: Individually packed

ROD EYE - MODEL GA-M

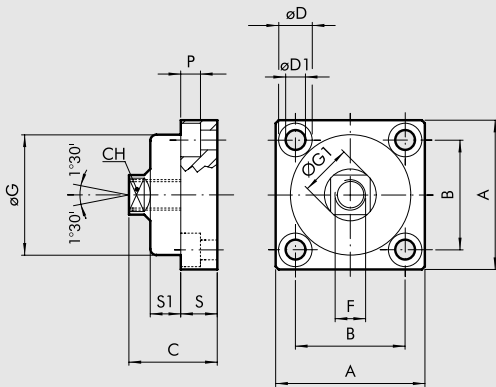


CMPC UNITOP AND ISO, TWO FLAT UNITOP AND ISO

Code	Ø	A	B	B1	C	CH	D	F	ØG	ØG1	L	ØM	Weight [g]
W0950120025	12	20	9	6.75	11	11	M6	30	10	13	40	6	28
W0950200025	16	24	12	9	13	14	M8	36	12.5	16	48	8	50
W0950322025	20	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950322025	25	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950322025	32	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950322025	40	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950402025	50	32	16	12	17	19	M12x1.25	50	17.5	22	66	12	116
W0950402025	63	32	16	12	17	19	M12x1.25	50	17.5	22	66	12	116
W0950502025	80	42	21	15	23	22	M16x1.5	64	22	27	85	16	226
W0950802025	100	50	25	18	27	30	M20x1.5	77	27.5	34	102	20	404

Note: Individually packed.

COMPENSATION JOINT - MODEL GA

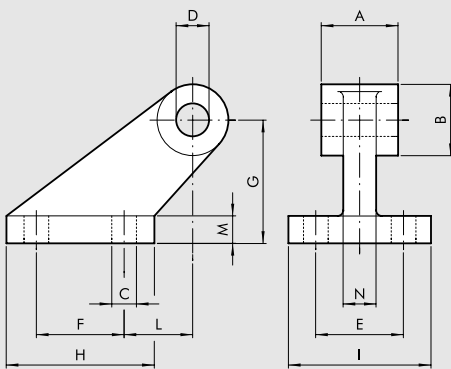


CMPC UNITOP, ISO, TWO FLAT

Code	Ø	A	B	C	CH	ØD	ØD1	F	ØG	ØG1	P	S	S1	Weight [g]
W0950326021	20	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950326021	25	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950326021	32	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950326021	40	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950406021	50	59	42	36	15	14	8.5	M12x1.25	44	19	8.5	15	13.5	286
W0950406021	63	59	42	36	15	14	8.5	M12x1.25	44	19	8.5	15	13.5	286
W0950506021	80	79	58	44	22	17	10.5	M16x1.5	59	26	10.5	20	15	628
W0950806021	100	89	65	51	27	19	12.5	M20x1.5	69	31	12.5	20	20	1200

Note: Individually packed.

COUNTER-HINGE CETOP Ø 32 to 100

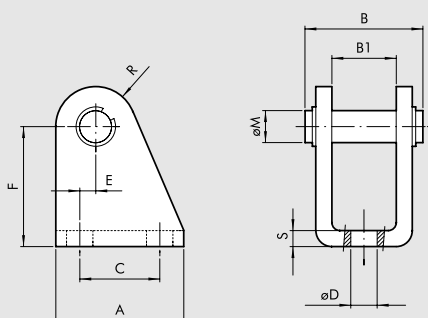


CMPC UNITOP AND ISO, TWO FLAT UNITOP AND ISO

Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96
W0950402008	40	28	26	9	12	32	32	45	54	52	25	10	12	216
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440
W0950802008	80	50	33	11	16	40	50	63	75	63	32	12	15	464
W0951002008	100	60	44	14	20	50	70	90	103	80	40	16	22	985

Note: Supplied complete with 4 screws, 4 washers

COUNTER-HINGE Ø 12 to 25 - MODEL BC

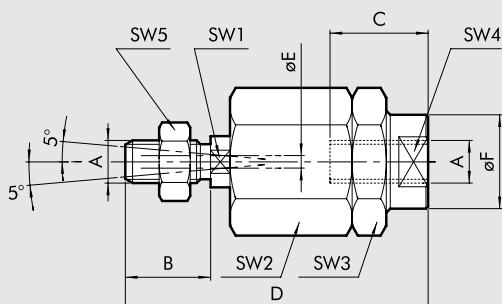


CMPC UNITOP

Code	Ø	A	B	B1	C	ØD	E	F	ØM	R	S	Weight [g]
W0950120005	12	25	25	12	15	5.5	2	27	6	7	3	40
W0950120005	16	25	25	12	15	5.5	2	27	6	7	3	40
W0950200005	20	32	30	16	20	6.5	4	30	8	10	4	78
W0950200005	25	32	30	16	20	6.5	4	30	8	10	4	78

Note: Supplied complete with 1 pin and 2 snap rings

SELF ALIGNING ROD COUPLER - MODEL GA-K

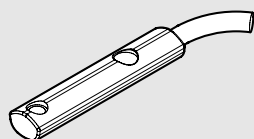


CMPC UNITOP, ISO, TWO FLAT UNITOP E ISO

Code	Ø	A	B	C	D	ØE	ØF	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950120030	12	M6	10	10	35	2	8.5	5	13	13	7	10	24
W0950200030	16	M8	20	20	57	4	12.5	7	17	17	11	13	56
W0950322030	20	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950322030	25	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950322030	32	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950322030	40	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950402030	50	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950402030	63	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950502030	80	M16x1.5	32	32	103	4	32	20	41	41	30	24	620
W0950802030	100	M20x1.5	40	40	119	4	32	20	41	41	30	30	680

Note: Individually packed.

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

NB: For technical data see page 1-288

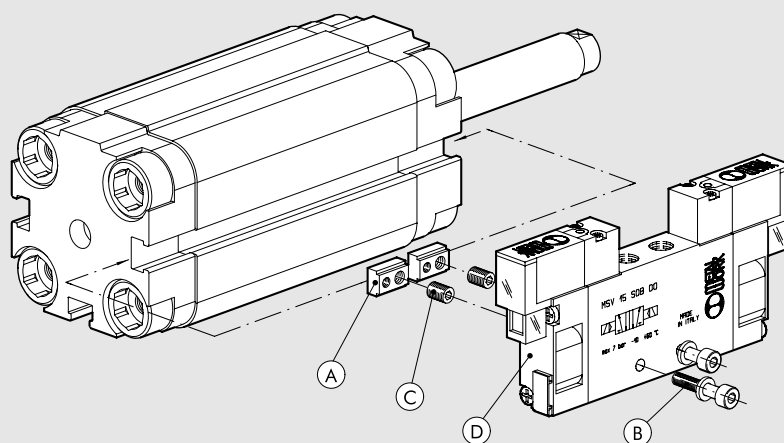
VALVE ASSEMBLY ON CYLINDER

With this type of cylinder, the valves (D) can be mounted directly using the retracting sensor slot, without requiring the use of intermediate brackets. This can be done using the special plates (A) which come with both M3 and M4 threads, and screws (B) of the size, type and quantity shown in the table below.

The plates are supplied complete with 2 stud pins, one M3 and one M4 (C).

After the valve centre distance and the position of the valve have been determined, the plates can be secured to the cylinder.

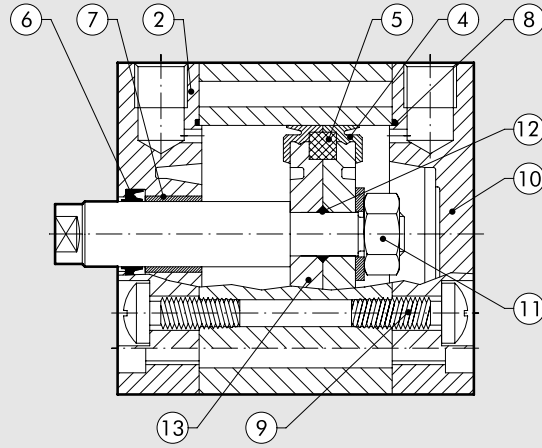
A "position memory" will be created to facilitate subsequent maintenance on the valve.



Type of valve to mount (D)	Fixing plate (A) CODE 0950003000	Position memory: grub screw (C) to be used	Screw (B) for connection to the cylinder (one per plate)	Washer (B) (one per screw)
MINIMACH	n° 2	M4	M3x16 UNI 5931 (DIN 912)	A3.2 UNI 1751 (DIN 127A)
MACH 11	n° 2	M4	M3x16 UNI 5931 (DIN 912)	A3.2 UNI 1751 (DIN 127A)
SERIE 70 1/8	n° 2	M3	M4x25 UNI 5931 (DIN 912)	—
SERIE 70 1/4	n° 2	M3	M4x30 UNI 5931 (DIN 912)	A4.3 UNI 1751 (DIN 127A)

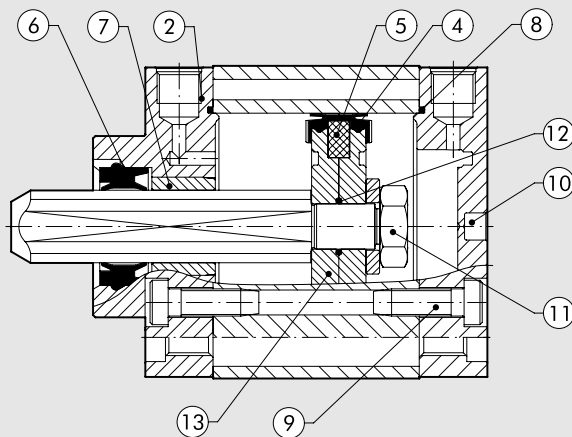
SPARE PARTS

COMPACT CYLINDERS, SERIES CMPC



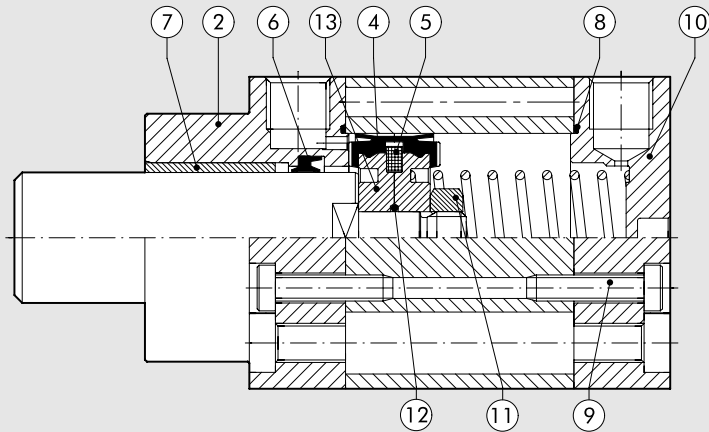
Code	Bores	Type	Parts
009 ... 7001	Ø 12 to 100	Complete set of gaskets polyurethane	4 6 8
009 ... 7008	Ø 12 to 100	Complete set of high temperature gaskets	4 6 8
009 ... 7101	Ø 12 to 100	Front cylinder head kit for UNITOP polyurethane	2 7 6 8 9
0090327101	Ø 32	Front cylinder head kit for ISO Ø 32 polyurethane	2 7 6 8 9
009 ... 8101	Ø 40 to 100	Front cylinder head kit for ISO polyurethane	2 7 6 8 9
009 ... 7201	Ø 12 to 100	Rear cylinder head kit for UNITOP polyurethane	8 9 10
0090327201	Ø 32	Rear cylinder head kit for ISO Ø 32 polyurethane	8 9 10
009 ... 8201	Ø 40 to 100	Rear cylinder head kit for ISO polyurethane	8 9 10
009 ... 7401	Ø 12 to 100	Piston kit polyurethane	4 5 11 12 13
009 ... 7501	Ø 12 to 100	Magnet	5
009 ... 7901	Ø 12 to 100	Front + rear cylinder head + piston kit for UNITOP polyurethane	2 4 5 6 7 8 9 10 11 12 13
0090327901	Ø 32	Front + rear cylinder head + piston kit for ISO Ø 32 polyurethane	2 4 5 6 7 8 9 10 11 12 13
009 ... 8901	Ø 40 to 100	Front + rear cylinder head + piston kit for ISO polyurethane	2 4 5 6 7 8 9 10 11 12 13

COMPACT CYLINDERS, SERIES CMPC TWO-FLAT



Code	Bores	Type	Parts
009 ... 7001F	Ø 32 to 80	Set of gaskets	4 8 12
009 ... 7101F	Ø 40 to 80	Front cylinder head kit for UNITOP	2 7 6 8 9
0090327101F	Ø 32	Front cylinder head kit for ISO Ø 32	2 7 6 8 9
009 ... 8101F	Ø 40 to 80	Front cylinder head kit for ISO	2 7 6 8 9
009 ... 7201	Ø 40 to 80	Rear cylinder head kit for UNITOP	8 9 10
0090327201	Ø 32	Rear cylinder head kit for ISO Ø 32	8 9 10
009 ... 8201	Ø 40 to 80	Rear cylinder head kit for ISO	8 9 10
009 ... 7401	Ø 32 to 80	Piston kit	4 5 11 12 9 13
009 ... 7501	Ø 32 to 80	Magnet	5
009 ... 7901F	Ø 40 to 80	Front + rear cylinder head + piston kit for UNITOP	2 4 5 6 7 8 9 10 11 12 13
0090327901F	Ø 32	Front + rear cylinder head + piston kit for ISO Ø 32	2 4 5 6 7 8 9 10 11 12 13
009 ... 8901F	Ø 40 to 80	Front + rear cylinder head + piston kit for ISO	2 4 5 6 7 8 9 10 11 12 13

COMPACT CYLINDERS, STOPPER



Code	Bores	Type	Parts
009 ... 7060	Ø 20; 32; 50; 80	Complete set of gaskets	4 6 8
009 ... 7160	Ø 20; 32; 50; 80	Front cylinder head kit for UNITOP	2 7 6 8 9
0090327160	Ø 32	Front cylinder head kit for ISO Ø 32	2 7 6 8 9
009 ... 8160	Ø 50; 80	Front cylinder head kit for ISO	2 7 6 8 9
009 ... 7201	Ø 20; 32	Rear cylinder head kit for UNITOP Ø 20 - Ø 32	8 9 10
009 ... 7260	Ø 50; 80	Rear cylinder head kit for UNITOP	8 9 10
0090327201	Ø 32	Rear cylinder head kit for ISO Ø 32	8 9 10
009 ... 8260	Ø 50; 80	Rear cylinder head kit for ISO	8 9 10
0090207401	Ø 20	Piston kit Ø 20	4 5 11
009 ... 7460	Ø 32; 50; 80	Piston kit	4 5 11 12 13
009 ... 7501	Ø 20; 32; 50; 80	Magnet	5
009 ... 7960	Ø 20; 32; 50; 80	Front + rear cylinder head + piston kit for UNITOP	2 4 5 6 7 8 9 10 11 12 13
0090327960	Ø 32	Front + rear cylinder head + piston kit for ISO Ø 32	2 4 5 6 7 8 9 10 11 12 13
009 ... 8960	Ø 50; 80	Front + rear cylinder head + piston kit for ISO	2 4 5 6 7 8 9 10 11 12 13

NOTES

ROUND CYLINDER SERIES RNDC

Clean profile cylinders available in different versions:

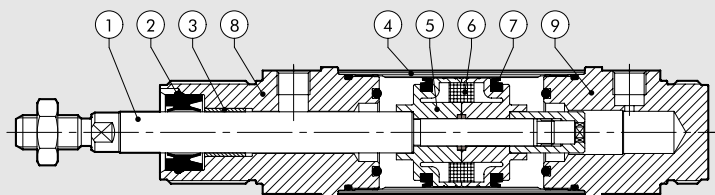
- configuration with or without magnet
- single- and double-acting - single or through-rod
- pneumatic cushioning on request
- range of gaskets available in NBR, POLYURETHANE and FKM/FPM (for high temperatures)



TECHNICAL DATA		POLYURETHANE	NBR	FKM/FPM	LOW TEMPERATURE
Max operating pressure	bar	10	10	10	10
	MPa	1	1	1	1
	psi	145	145	145	145
Temperature range	°C	-10 to +80	-10 to +80	-10 to +150 (non-magnetic cylinders)	-35 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous			
Bores	mm	32; 40; 50			
Design		Screwed heads			
Versions		Double-acting, Double-acting through-rod, Double-acting cushioned, Double-acting through-rod cushioned, Single-acting, Single-acting through-rod, no-stick slip			
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request			
Standard strokes †	mm	Single-acting: for bores Ø 32 to 50 strokes from 1 to 250			
		Double-acting: for bores Ø 32 to 50 strokes from 1 to 500			
		† Maximum recommended strokes. Higher values can create operating problems			
Inrush pressure	bar	Ø 32 and 40: 0.4 - Ø 50: 0.3			
Forces generated at 6 bar thrust/retraction		See page 1-7			
Weights		See page 1-9			
Notes		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.			

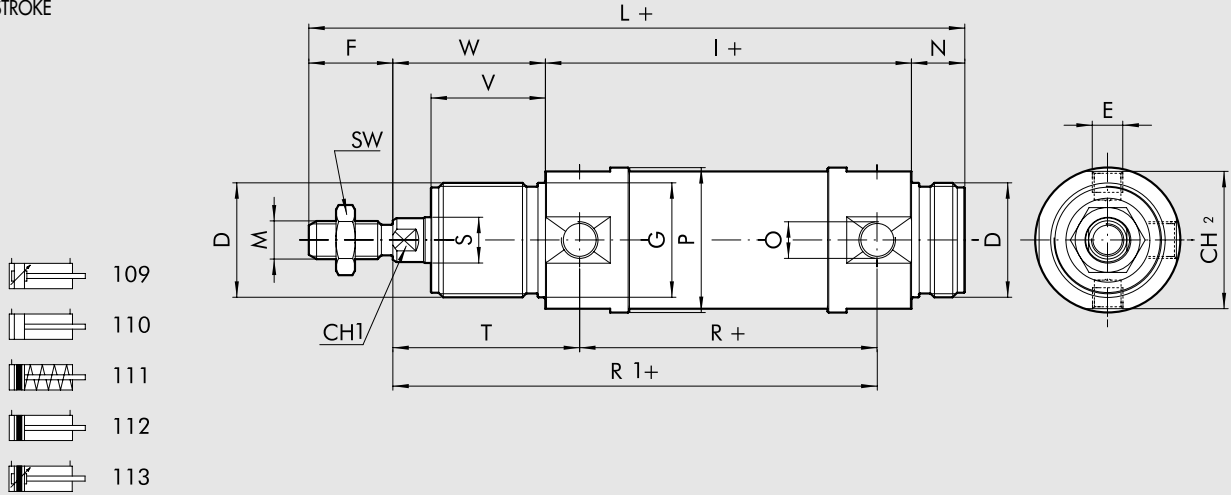
COMPONENTS






- ① PISTON ROD: C45 steel or stainless steel, thick chromed
- ② PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
- ③ GUIDE BUSHING: steel strip with bronze and PTFE insert
- ④ BARREL: drawn anodised aluminium alloy
- ⑤ HALF-PISTON: self-lubricating technopolymer with integrated cushioning olives
- ⑥ MAGNET: plastroferrite
- ⑦ PISTON GASKET: polyurethane, NBR or FKM/FPM
- ⑧ HEAD: anodised aluminium alloy
- ⑨ HEAD: anodised aluminium alloy



DIMENSIONS OF STANDARD VERSIONS

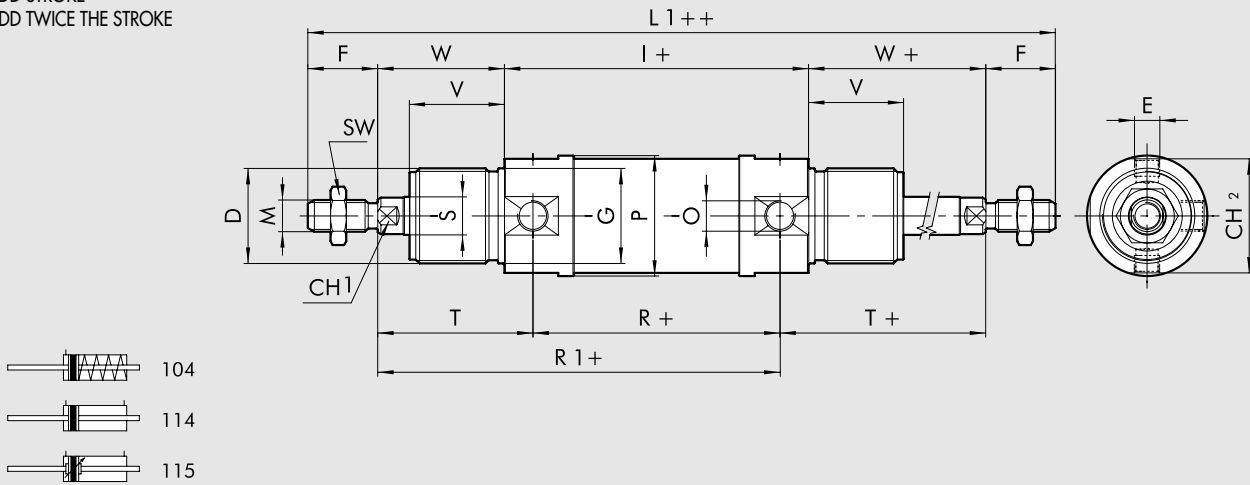
+ = ADD STROKE






-  109
-  110
-  111
-  112
-  113

DIMENSIONS OF THROUGH-ROD VERSIONS

+ = ADD STROKE
++ = ADD TWICE THE STROKE



-  104
-  114
-  115

DIMENSIONS OF STANDARD DOUBLE-ACTING AND THROUGH-ROD

Ø D	E	F	Ø G	CH1	I	L	M	N	O	Ø P	R	Ø S	SW	T	CH2	V	W	L1	
32	M30x1.5	M8x1	22	30	10	96	172	M10x1.25	14	G1/8	38	78	12	17	49	36	30	40	220
40	M38x1.5	M10x1	24	38	13	113	198	M12x1.25	16	G1/4	46	89	16	19	57	43	35	45	251
50	M45x1.5	M12x1.5	32	45	17	120	220	M16x1.5	18	G1/4	57	96	20	24	62	54	38	50	284

DIMENSIONS OF STANDARD SINGLE-ACTING AND THROUGH-ROD

Lower limit	Stroke	Upper limit	I			L			R1			L1		
			Ø 32	Ø 40	Ø 50	Ø 32	Ø 40	Ø 50	Ø 32	Ø 40	Ø 50	Ø 32	Ø 40	Ø 50
0	< C ≤	50	96	113	120	172	198	220	127	146	158	220	251	284
50	< C ≤	100	125	145.5	155.5	201	230.5	255.5	156	178.5	193.5	249	283.5	319.5
100	< C ≤	150	154	178	191	230	263	291	185	211	229	278	316	355
150	< C ≤	200	183	210.5	226.5	259	295.5	326.5	214	243.5	264.5	307	348.5	390.5
200	< C ≤	250	212	243	262	288	328	362	243	276	300	336	381	426

For all the other values, see previous table, except for T and R which are both replaced by R1

KEY TO CODES

CYL	1 1 2 TYPE	0	3 2 BORE	0 0 2 5 STROKE	C MATERIAL	P GASKETS
	<ul style="list-style-type: none"> ■ 104 SE through-rod 109 DEA 110 DE ■ 111 SE 112 DEM 113 DEMA 114 DEM through-rod 115 DEMA through-rod 	<ul style="list-style-type: none"> 0 Standard ▲ G No stick slip S Non-magnetic 	<ul style="list-style-type: none"> 32 40 50 	<ul style="list-style-type: none"> For the maximum suppliable strokes, look at the technical data 	<ul style="list-style-type: none"> A C45 chrome rod, aluminium piston rod C C45 chrome rod, technopolymer piston rod Z Stainless steel piston rod and nut aluminium piston X Stainless steel piston rod and nut technopolymer piston 	<ul style="list-style-type: none"> P polyurethane N NBR ● V FKM/FPM ● B low temperature

DE: Double-acting (non-cushioned, not magnetic)
 DEM: Magnetic double-acting (non-cushioned)
 DEMA: Magnetic double-acting (cushioned)
 DEA: Cushioned double-acting (non-magnetic)
 SE: Single-acting (magnetic)

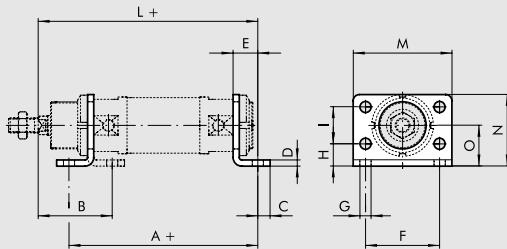
- Only available for non-magnetic versions (S) and with aluminium piston (A or Z)
- ▲ For speeds lower than 0.2m/s, to prevent surging.
Use no-lubricated air only
- Only available for versions with aluminium piston (A or Z)

NOTES

ACCESSORIES FOR ROUND CYLINDER: FIXINGS

FOOT MODEL AC

+ = ADD STROKE

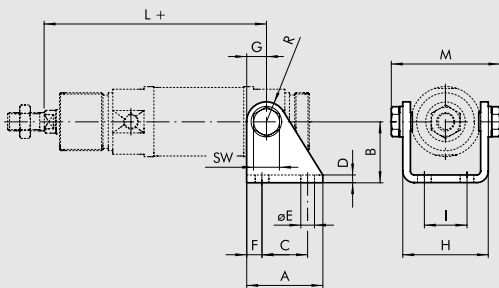


Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	O	Weight [g]
W0950320002	32	124	50	7	4	14	52	7	14	28	150	66	49	28	104
W0950400002	40	153	60	10	5	20	60	9	18	30	178	80	58	33	190
W0950500002	50	160	64	10	6	20	70	9	20	40	190	90	70	40	296

Note: Individually packed

COUNTER-HINGE MODEL BC

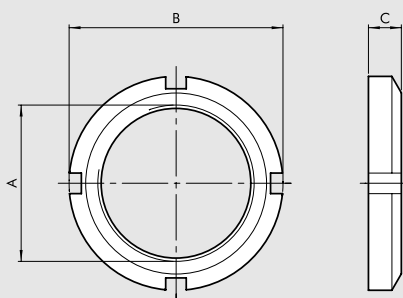
+ = ADD STROKE



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	R	SW	Weight [g]
W0950320005	32	40	35	24	4	7	8	12	46.1	20	127	60	12	13	152
W0950400005	40	50	40	30	5	9	10	13	56.1	28	146	72.5	13	17	262
W0950500005	50	54	45	34	6	9	10	14	69.1	36	158	89	14	19	401

Note: Supplied with 2 screws

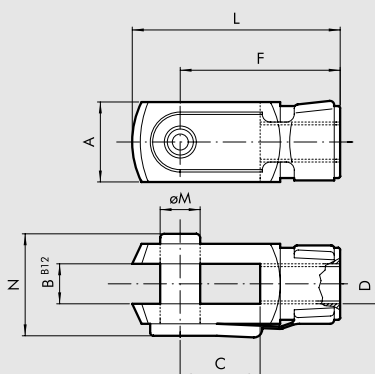
HEAD LOCK RING MODEL G



Code	Ø	A	B	C	Weight [g]
W0950320010	32	M30x1.5	45	7	46
W0950400010	40	M38x1.5	50	8	56
W0950500010	50	M45x1.5	58	9	124

Note: Individually packed

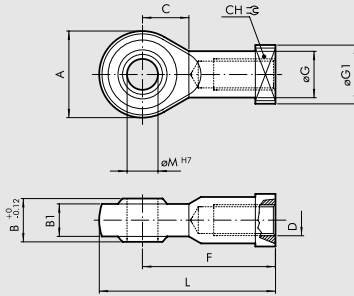
FORK MODEL GK-M



Code	Ø	Ø M	C	B	A	L	F	D	N	Weight [g]
W0950322020	32	10	20	10	20	52	40	M10x1.25	26	92
W0950402020	40	12	24	12	24	62	48	M12x1.25	32	148
W0950502020	50	16	32	16	32	83	64	M16x1.5	40	340

Note: Individually packed

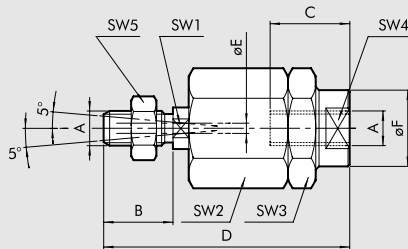
SPHERICAL JOINT MODEL GA-M



Code	Ø	øM	C	B1	B	A	L	F	D	øG	CH	Weight [g]
W0950322025	32	10	15	10,5	14	28	57	43	M10x1.25	15	17	78
W0950402025	40	12	17	12	16	32	66	50	M12x1.25	17.5	19	116
W0950502025	50	16	22	15	21	42	85	64	M16x1.5	22	22	226

Note: Individually packed

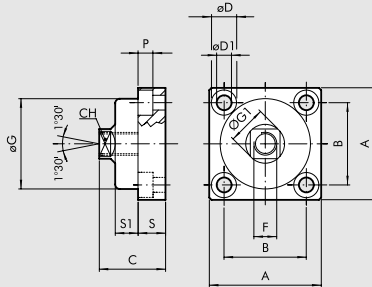
ARTICULATED JOINT MODEL GA-K



Code	Ø	A	B	C	D	øE	øF	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950322030	32	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950402030	40	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950502030	50	M16x1.5	32	32	103	4	32	20	41	41	30	24	620

Note: Individually packed

FLEXIBLE COLLAR - MODEL GA

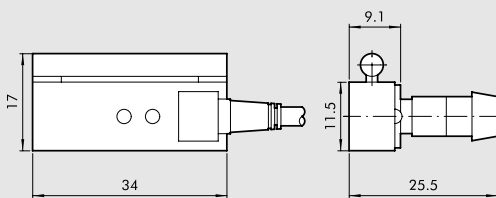


Code	Ø	A	B	C	CH	øD	øD1	F	øG	øG1	P	S	S1	Weight [g]
W0950326021	32	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950406021	40	59	42	36	15	14	8.5	M12x1.25	44	19	8.5	15	13.5	286
W0950506021	50	79	58	44	22	17	10.5	M16x1.5	59	26	10.5	20	15	628

Note: Individually packed

ACCESSORIES FOR ROUND CYLINDER: MAGNETIC SENSORS

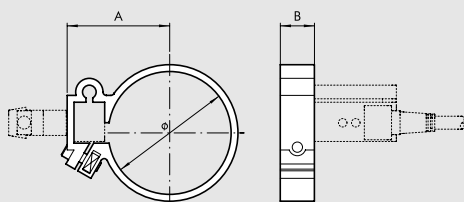
SENSOR



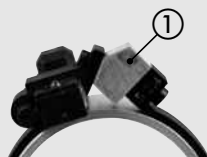
Code	Description
W0950000201	REED sensor DSM2 - C525 HS
W0950000222	E. HALL PNP sensor DSM3-N225
W0950000232	E. HALL NPN sensor DSM3-M225

N.B.: For technical data see page 1-286

SENSOR CIRCLIP



Code	Bore	Model	Ø	A	B
W0950000132	32	Circlip DXF 36 - 32	36	29.5	10
W0950000140	40	Circlip DXF 45 - 40	45	34.5	10
W0950000150	50	Circlip DXF 52 - 50	55	38.5	10



FOR MOUNTING ON THE CYLINDER Ø 50 INSERT THE ALUMINIUM SPACER ① YOU FIND IN THE PACKAGE

SHORT-STROKE CYLINDERS SERIES SSCY

Compact cylinders suitable for installation in limited spaces:

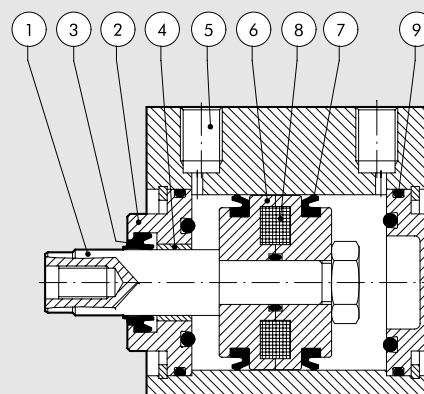
- configuration with or without magnet
- single or double-acting - single or through-rod
- anti-rotation version and with built-in fixings
- possible choice of NBR, POLYURETHANE or FKM/FPM gaskets
- special design on request.



TECHNICAL DATA		Polyurethane	NBR	FKM/FPM	Low Temperature						
Max operating pressure	bar	10	10	10	10						
	MPa	1	1	1	1						
Temperature range	°C	-10 to +80	-10 to +80	-10 to +150 (non-magnetic cylinders)	-35 to +80						
Fluid		Unlubricated air. Lubrication, if used, must be continuous									
Bores	mm	12 ; 16 ; 20 ; 25 ; 32 ; 40 ; 50 ; 63 ; 80 ; 100									
Design		With profile									
Standard strokes †	mm	Double acting: Ø 12 to Ø 25, stroke 5 to 50 mm Ø 32 to Ø 40, stroke 5 to 70 mm Ø 50 to Ø 63, stroke 5 to 110 mm Ø 80 to Ø 100, stroke 5 to 150 mm Single-acting: Ø 12 to Ø 25, stroke 5 to 25 mm Ø 32 to Ø 63, stroke 5 to 50 mm Anti-rotation: Ø 12 to Ø 63, stroke 5 to 120 mm Ø 80 to Ø 100, stroke 5 to 150 mm Perforated through-rod: Ø 20 to Ø 40, stroke 5 to 100 mm Ø 50 to Ø 63, stroke 5 to 130 mm Ø 80 to Ø 100, stroke 5 to 165 mm									
Versions		† Maximum recommended strokes. Higher values can create operating problems Double-acting, Double-acting through-rod, Single-acting retracted piston rod, Single acting extended piston rod, Single-acting through-rod, Perforated through-rod, Anti-rotation, Oscillating male, Oscillating female, no-stick slip*									
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request									
Inrush pressure		Ø 12	Ø 16	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
single piston rod	bar	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4
through-rod	bar	1	0.8	0.8	0.8	0.6	0.4	0.4	0.4	0.4	0.4
Forces generated at 6 bar thrust/retraction		See page 1-7									
Weight		See page 1-8									
Notes		* Using for speeds lower than 0.2 m/s, to prevent surging. For no-stick-slip versions use no-lubricated air only									

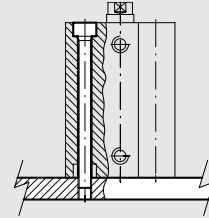
COMPONENTS

- PISTON ROD: C45 steel or stainless steel, thick chromed
- HEAD:
 - Ø 12 to 25 nichel-plated brass
 - Ø 32 to 100 anodised aluminium
- PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
- GUIDE BUSHING: steel strip with bronze and PTFE insert
- BARREL: drawn anodised aluminium alloy
- HALF-PISTON:
 - Ø 12 to 63 acetal resin
 - Ø 80 to 100 in aluminium with PTFE guide pad
- PISTON GASKET: polyurethane, NBR or FKM/FPM
- MAGNET: Ø 12 to 25 neodymium - Ø 32 to 100 plastoferrite
- Static O-rings: NBR or FKM/FPM



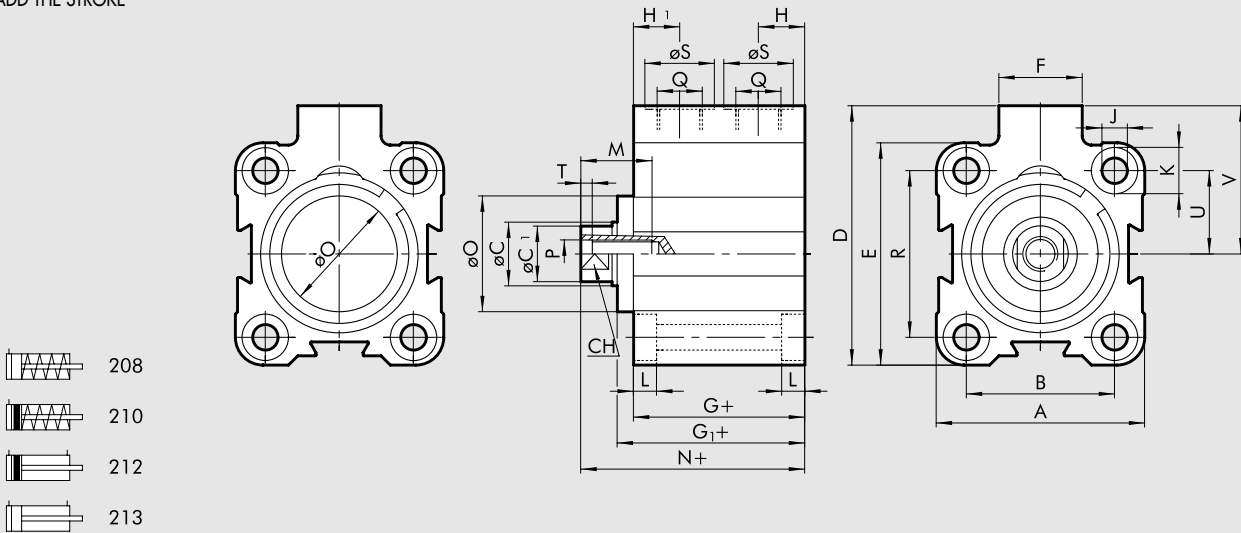
FIXING METHOD

Fix directly from above using long through-screws or tie rods.
Non-magnetic stainless steel must be used (e.g. AISI 304).



DIMENSIONS STANDARD VERSIONS

+ = ADD THE STROKE



- 208
- 210
- 212
- 213

DIMENSIONS OF DOUBLE ACTING

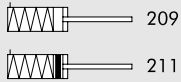
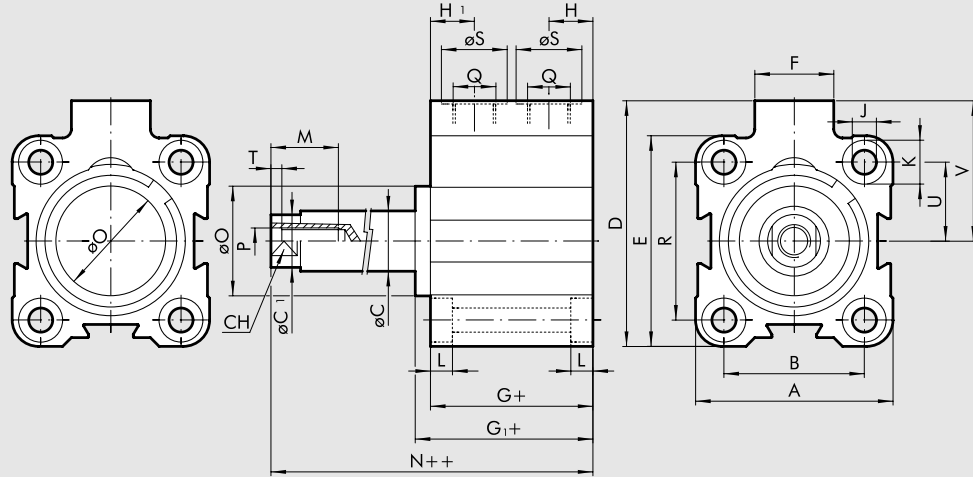
Ø	A	B	øC	øC ₁	D	E	F	G	G ₁	H	H ₁	J	K	L	M	N	øO	P	Q	R	øS	CH	T	U	V
12	23.5	13	6	5.5	28	26	11	32.5	-	6.5	10.5	3.7	6	3.7	7	38	-	M3	M5	-	8	5	2	9.5	16.5
16	28	20	8	7.5	33	28	11	33	-	6.7	10.5	3.7	6	3.7	10	37.5	-	M5	M5	20	8	7	2	10	19
20	32	22	10	9	37	32	11	32	-	6.5	10.5	4.6	7.5	4.6	10	36.5	-	M5	M5	22	8	8	2	11	21
25	37	26	10	9	47.5	39	18	33	36.5	8.5	8.5	4.6	7.5	4.6	10	42.5	20	M5	G1/8	28	15	8	2	14	28
32	45	32	12	11	56	48	18	37	40.8	10	10	5.5	10	5.7	15	48.3	25	M6	G1/8	36	15	10	2.5	18	32
40	54.5	40	12	11	62.7	54.5	18	39.5	44.7	10	10	5.5	10	5.7	15	53.2	30	M6	G1/8	40	15	10	2.5	20	35.5
50	66	50	16	15	73	66	18	39.5	46.2	11	11	6.6	11	6.8	18	53.2	35	M8	G1/8	50	15	13	3.5	25	40
63	80	62	16	15	88	80	23	42	48.7	12	12	9	15	9	18	57.7	35	M8	G1/8	62	15	13	3.5	31	48
80	100	82	20	19	110	100	26	57	67.2	14	14	9	15	9	18	75.2	44	M10	G1/4	82	19	17	4	41	60
100	124	103	25	24	134	124	26	64	74.7	15	15	11	18	11	20	84.3	56	M12	G1/4	103	19	22	5	51.5	72

DIMENSIONS OF SINGLE-ACTING, RETRACTED PISTON ROD

Ø	stroke	A	B	øC	øC ₁	D	E	F	G	G ₁	H	H ₁	J	K	L	M	N	øO	P	Q	R	øS	CH	T	U	V
12	5 to 25	23.5	13	6	5.5	28	26	11	32.5	-	6.5	10.5	3.7	6	3.7	7	38	-	M3	M5	-	8	5	2	9.5	16.5
16	5 to 25	28	20	8	7.5	33	28	11	33	-	6.7	10.5	3.7	6	3.7	10	37.5	-	M5	M5	20	8	7	2	10	19
20	5 to 25	32	22	10	9	37	32	11	32	-	6.5	10.5	4.6	7.5	4.6	10	36.5	-	M5	M5	22	8	8	2	11	21
25	5 to 25	37	26	10	9	47.5	39	18	33	36.5	8.5	8.5	4.6	7.5	4.6	10	42.5	20	M5	G1/8	28	15	8	2	14	28
32	5 to 25	45	32	12	11	56	48	18	37	40.8	10	10	5.5	10	5.7	15	48.3	25	M6	G1/8	36	15	10	2.5	18	32
	> 25 to 50								45	48.8							56.3									
40	5 to 25	54.5	40	12	11	62.7	54.5	18	39.5	44.7	10	10	5.5	10	5.7	15	53.2	30	M6	G1/8	40	15	10	2.5	20	35.5
	> 25 to 50								47.5	52.7							61.2									
50	5 to 25	66	50	16	15	73	66	18	39.5	46.2	11	11	6.6	11	6.8	18	53.2	35	M8	G1/8	50	15	13	3.5	25	40
	> 25 to 50								47.5	54.2							61.2									
63	5 to 25	80	62	16	15	88	80	23	42	48.7	12	12	9	15	9	18	57.7	35	M8	G1/8	62	15	13	3.5	31	48
	> 25 to 50								50	56.7							65.7									

DIMENSIONS OF SINGLE-ACTING EXTENDED PISTON ROD

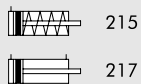
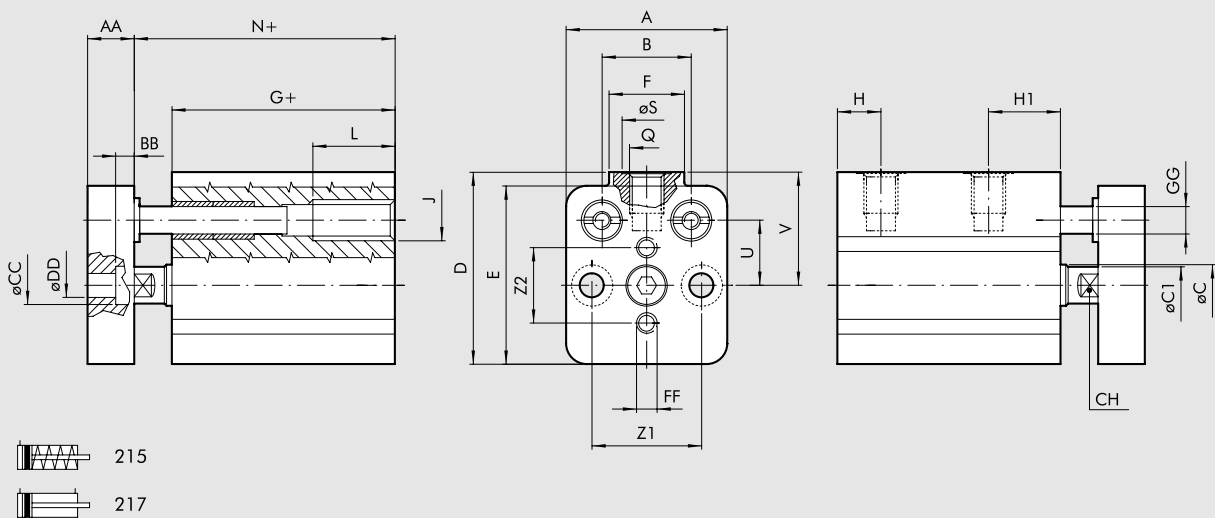
+ = ADD THE STROKE
++ = ADD TWICE THE STROKE



Ø	stroke	A	B	øC	øC ₁	D	E	F	G	G ₁	H	H ₁	J	K	L	M	N	øO	P	Q	R	øS	CH	T	U	V
12	5 to 25	23.5	13	6	5.5	28	26	11	32.5	-	6.5	10.5	3.7	6	3.7	7	38	-	M3	M5	-	8	5	2	9.5	16.5
16	5 to 25	28	20	8	7.5	33	28	11	33	-	6.7	10.5	3.7	6	3.7	10	37.5	-	M5	M5	20	8	7	2	10	19
20	5 to 25	32	22	10	9	37	32	11	32	-	6.5	10.5	4.6	7.5	4.6	10	36.5	-	M5	M5	22	8	8	2	11	21
25	5 to 25	37	26	10	9	47.5	39	18	33	36.5	8.5	8.5	4.6	7.5	4.6	10	42.5	20	M5	G1/8	28	15	8	2	14	28
32	5 to 25	45	32	12	11	56	48	18	37	40.8	10	10	5.5	10	5.7	15	48.3	25	M6	G1/8	36	15	10	2.5	18	32
	> 25 to 50								45	48.8							56.3									
40	5 to 25	54.5	40	12	11	62.7	54.5	18	39.5	44.7	10	10	5.5	10	5.7	15	53.2	30	M6	G1/8	40	15	10	2.5	20	35.5
	> 25 to 50								47.5	52.7							61.2									
50	5 to 25	66	50	16	15	73	66	18	39.5	46.2	11	11	6.6	11	6.8	18	53.2	35	M8	G1/8	50	15	13	3.5	25	40
	> 25 to 50								47.5	54.2							61.2									
63	5 to 25	80	62	16	15	88	80	23	42	48.7	12	12	9	15	9	18	57.7	35	M8	G1/8	62	15	13	3.5	31	48
	> 25 to 50								50	56.7							65.7									

DIMENSIONS OF Ø 12 ANTI-ROTATION

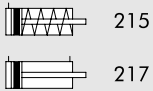
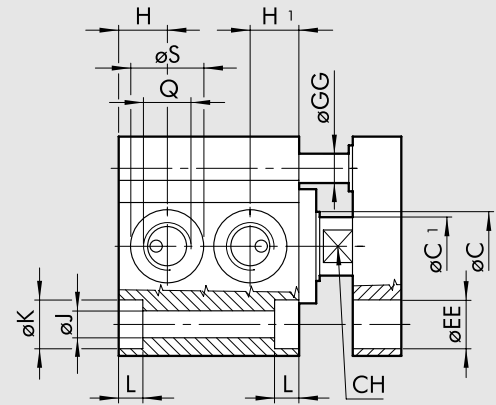
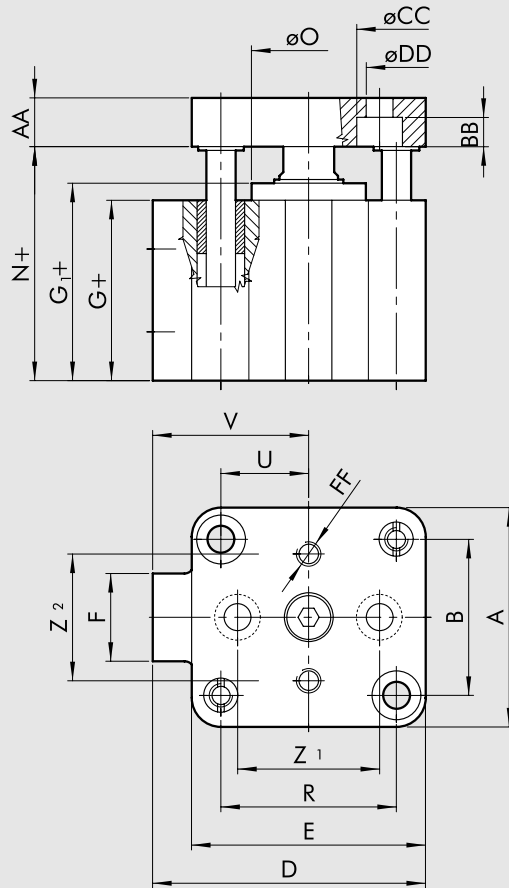
+ = ADD THE STROKE



Ø	A	B	øC	øC ₁	D	E	F	G	H	H ₁	J	L	N	Z ₁	Z ₂	Q	øS	CH	U	V	AA	BB	øCC	øDD	FF	øGG
12	23.5	13	6	5.5	28	26	11	32.5	6.5	10.5	M6	12	38	16	11	M5	8	5	9.5	16.5	8	3.5	6	3.5	M3	4

DIMENSIONS OF Ø 16 TO Ø 100 ANTI-ROTATION

+ = ADD THE STROKE

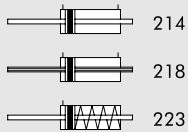
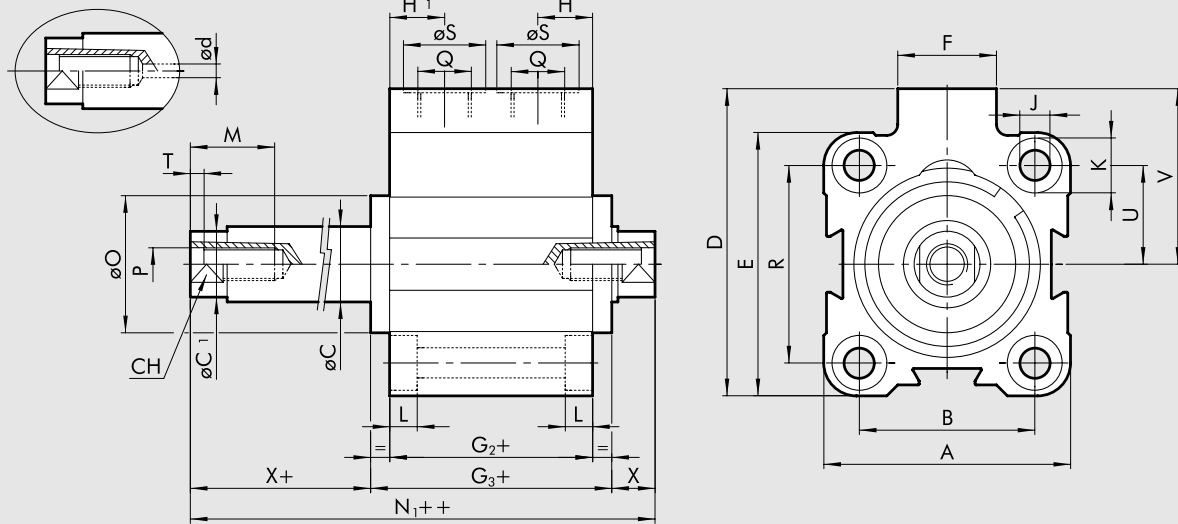


Ø	A	B	øC	øC1	D	E	F	G	G1	H	H1	J	K	L	N	Z1	Z2	Q	R	øS	CH	U	V	AA	BB	øCC	øDD	øEE	FF	øGG	øO
16	28	20	8	7.5	33	28	11	33	-	6.7	10.5	3.7	6	3.7	37.5	20	15	M5	20	8	7	10	19	8	3.5	6	3.5	6	M3	4	-
20	32	22	10	9	37	32	11	32	-	6.5	10.5	4.6	7.5	4.6	36.5	22	18	M5	22	8	8	11	21	8	5	7.5	4.5	7.5	M4	6	-
25	37	26	10	9	47.5	39	18	33	36.5	8.5	8.5	4.6	7.5	4.6	42.5	22	22	G1/8	28	15	8	14	28	8	5	7.5	4.5	8	M4	6	20
32	45	32	12	11	56	48	18	37	40.8	10	10	5.5	10	5.7	48.3	26	26	G1/8	36	15	10	18	32	10	6	10	5.5	10	M5	8	25
40	54.5	40	12	11	62.7	54.5	18	39.5	44.7	10	10	5.5	10	5.7	53.2	34	34	G1/8	40	15	10	20	35.5	10	6	10	5.5	10	M5	8	30
50	66	50	16	15	73	66	18	39.5	46.2	11	11	6.6	11	6.8	53.2	43	43	G1/8	50	15	13	25	40	12	7	11	6.5	11	M6	10	35
63	80	62	16	15	88	80	23	42	48.7	12	12	9	15	9	57.7	55	55	G1/8	62	15	13	31	48	12	9	14	9	15	M6	10	35
80	100	82	20	19	110	100	26	57	67.2	14	14	9	15	9	75.2	70	70	G1/4	82	19	17	41	60	14	9	14	9	15	M8	12	44
100	124	103	25	24	134	124	26	64	74.7	15	15	11	18	11	84.3	94	94	G1/4	103	19	22	51.5	72	17	9	14	9	18	M8	12	56

DIMENSIONS OF THROUGH-ROD

+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

PERFORATED THROUGH-ROD



DIMENSION OF DOUBLE ACTING THROUGH-ROD AND PERFORATED THROUGH-ROD

Ø	A	B	øC	øC ₁	D	ød**	E	F	G ₂	G ₃	H	H ₁	J	K	L	M	N ₁	øO	P	Q	R	øS	CH	T	U	V	X*
12	23.5	13	6	5.5	28	-	26	11	36.7	-	10.5	10.5	3.7	6	3.7	7	47.7	-	M3	M5	-	8	5	2	9.5	16.5	5.5
16	28	20	8	7.5	33	-	28	11	36.8	-	10.5	10.5	3.7	6	3.7	10	45.8	-	M5	M5	20	8	7	2	10	19	4.5
20	32	22	10	9	37	1.5	32	11	36	-	10.5	10.5	4.6	7.5	4.6	10	45.0	-	M5	M5	22	8	8	2	11	21	4.5
25	37	26	10	9	47.5	1.5	39	18	35.7	42.7	8.5	8.5	4.6	7.5	4.6	10	54.7	20	M5	G1/8	28	15	8	2	14	28	6
32	45	32	12	11	56	2.5	48	18	37	44.5	10	10	5.5	10	5.7	15	59.5	25	M6	G1/8	36	15	10	2.5	18	32	7.5
40	54.5	40	12	11	62.7	2.5	54.5	18	39.5	49.9	10	10	5.5	10	5.7	15	66.9	30	M6	G1/8	40	15	10	2.5	20	35.5	8.5
50	66	50	16	15	73	2.5	66	18	39.5	52.9	11	11	6.6	11	6.8	18	66.9	35	M8	G1/8	50	15	13	3.5	25	40	7
63	80	62	16	15	88	4	80	23	42	55.4	12	12	9	15	9	18	73.4	35	M8	G1/8	62	15	13	3.5	31	48	9
80	100	82	20	19	110	5	100	26	57	77.4	14	14	9	15	9	18	93.4	44	M10	G1/4	82	19	17	4	41	60	8
100	124	103	25	24	134	6	124	26	64	85.4	15	15	11	18	11	20	104.6	56	M12	G1/4	103	19	22	5	51.5	72	9.6

* for Ø 12, 16, 20: (N₁++) = (G₂+) + (X) + (X+)
 ** column for perforated through-rod only

DIMENSION OF SINGLE-ACTING THROUGH-ROD

Ø	stroke	A	B	øC	øC ₁	D	E	F	G ₂	G ₃	H	H ₁	J	K	L	M	N ₁	øO	P	Q	R	øS	CH	T	U	V	X*
12	5 to 25	23.5	13	6	5.5	28	26	11	36.7	-	10.5	10.5	3.7	6	3.7	7	47.7	-	M3	M5	-	8	5	2	9.5	16.5	5.5
16	5 to 25	28	20	8	7.5	33	28	11	36.8	-	10.5	10.5	3.7	6	3.7	10	45.8	-	M5	M5	20	8	7	2	10	19	4.5
20	5 to 25	32	22	10	9	37	32	11	36	-	10.5	10.5	4.6	7.5	4.6	10	45.0	-	M5	M5	22	8	8	2	11	21	4.5
25	5 to 25	37	26	10	9	47.5	39	18	35.7	42.7	8.5	8.5	4.6	7.5	4.6	10	54.7	20	M5	G1/8	28	15	8	2	14	28	6
32	5 to 25	45	32	12	11	56	48	18	37	44.5	10	10	5.5	10	5.7	15	59.5	25	M6	G1/8	36	15	10	2.5	18	32	7.5
	> 25 to 50								45	52.5							67.5										7.5
40	5 to 25	54.5	40	12	11	62.7	54.5	18	39.5	49.9	10	10	5.5	10	5.7	15	66.9	30	M6	G1/8	40	15	10	2.5	20	35.5	8.5
	> 25 to 50								47.5	57.9							74.9										8.5
50	5 to 25	66	50	16	15	73	66	18	39.5	52.9	11	11	6.6	11	6.8	18	66.9	35	M8	G1/8	50	15	13	3.5	25	40	7
	> 25 to 50								47.5	60.9							74.9										7
63	5 to 25	80	62	16	15	88	80	23	42	55.4	12	12	9	15	9	18	73.4	35	M8	G1/8	62	15	13	3.5	31	48	9
	> 25 to 50								50	63.4							81.4										9

* for Ø 12, 16, 20: (N₁++) = (G₂+) + (X) + (X+)

KEY TO CODES

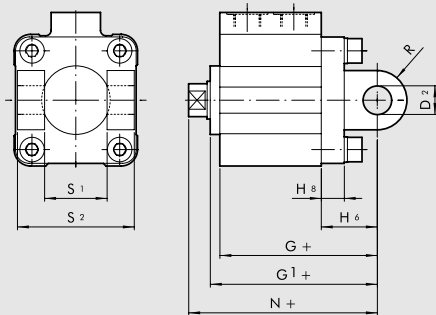
CYL	2 1 2 TIPOLOGIA	0	4 0 BORE	0 0 1 0 STROKE	C MATERIAL	P GASKETS											
■	208 Single-acting retracted rod, non-magnetic	0 Standard	12	For the maximum suppliable strokes, look at the technical data	A C45 chrome rod, aluminium piston rod Ø 12 to 63 mm	P Polyurethane gaskets											
■	209 Single-acting extended rod, non-magnetic	S Non-magnetic	16		For the maximum suppliable strokes, look at the technical data	C C45 chrome rod, technopolymer piston rod (standard Ø 80 to 100 mm)	N NBR gaskets										
■	210 Single-acting, retracted rod	▲ G No stick slip	20			For the maximum suppliable strokes, look at the technical data	Z Stainless steel piston rod and nut	● V FKM/FPM gaskets									
■	211 Single acting, extended rod		25				For the maximum suppliable strokes, look at the technical data	X Stainless steel piston rod and nut	● B Low temperature								
■	212 Double acting, magnetic		32					For the maximum suppliable strokes, look at the technical data									
■	213 Double acting, non-magnetic		40						For the maximum suppliable strokes, look at the technical data								
■	214 Double acting, through-rod		50							For the maximum suppliable strokes, look at the technical data							
■	215 Single-acting, retracted, anti-rotation		63								For the maximum suppliable strokes, look at the technical data						
■	217 Double acting, anti-rotation		80									For the maximum suppliable strokes, look at the technical data					
▼	218 Double acting, perforated through-rod		◆ 100										For the maximum suppliable strokes, look at the technical data				
■	221 Oscillating male hinge (up to Ø 63 only)													For the maximum suppliable strokes, look at the technical data			
■	222 Oscillating female hinge (up to Ø 63 only)														For the maximum suppliable strokes, look at the technical data		
■	223 Single-acting, through-rod															For the maximum suppliable strokes, look at the technical data	

- ◆ In the code of cylinder with letter in fourth position Ø 100 becomes A1
- Available up to Ø 63
- ▼ Available from Ø 20

- Only available for non-magnetic versions (S) and with aluminium piston (A or Z)
- ▲ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only

DIMENSIONS: SAME AS 222 VERSION (FEMALE HINGE MOD. B)

+ = ADD THE STROKE

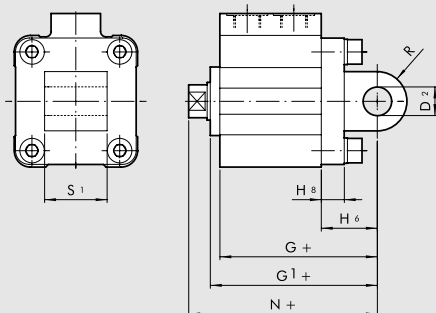


Ø	stroke	D ₂	G	G	H ₆	H ₈	N	R	S ₁	S ₂
32	5 to 70	10	59	62.8	22	10	70.3	11	26	45
40	5 to 70	12	64.5	69.7	25	10	78.2	13	28	52
50	5 to 110	12	66.5	73.2	27	12	80.2	13	32	60
63	5 to 110	16	74	80.7	32	12	89.7	17	40	70

Note: For other dimensions, refer to the standard version

DIMENSIONS: SAME AS 221 VERSION (MALE HINGE MOD. BA)

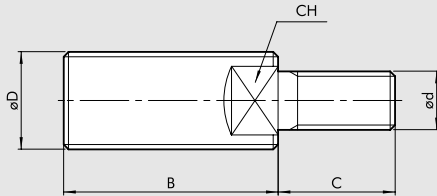
+ = ADD THE STROKE



Ø	stroke	D ₂	G	G ₁	H ₆	H ₈	N	R	S ₁
32	5 to 70	10	59	62.8	22	10	70.3	11	26
40	5 to 70	12	64.5	69.7	25	10	78.2	13	28
50	5 to 110	12	66.5	73.2	27	12	80.2	13	32
63	5 to 110	16	74	80.7	32	12	89.7	17	40

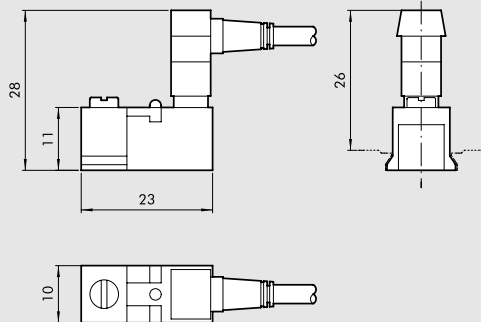
Note: For other dimensions, refer to the standard version.

DIMENSIONS OF MALE NIPPLE FOR PISTON ROD



Code	Ø	Ø D	Ø d	B	C	CH	Weight [g]
219001200	12	M6	M3	16	6	4	3
219001600	16	M8	M5	20	9	6	8
219001600	20	M8	M5	20	9	6	8
219002500	25	M10x1.25	M5	22	9	7	12
219003200	32	M10x1.25	M6	22	12	7	14
219004000	40	M12x1.25	M6	24	12	10	14
219005000	50	M16x1.5	M8	32	15	13	20
219005000	63	M16x1.5	M8	32	15	13	20
219008000	80	M20x1.5	M10	40	15	17	96
219010000	100	M20x1.5	M12	40	18	17	102

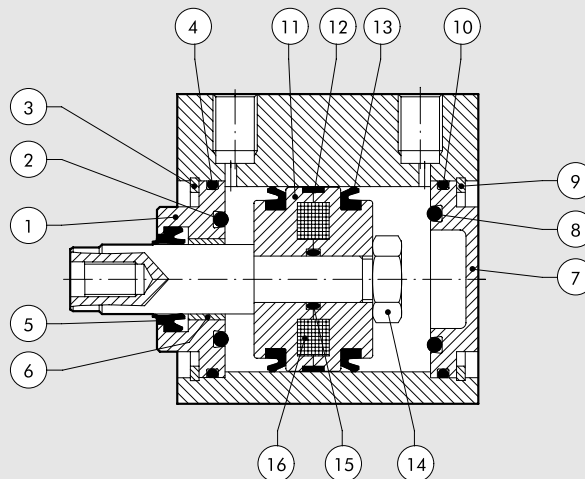
ACCESSORIES FOR SHORT-STROKE CYLINDERS: MAGNETIC SENSORS



Code	Bore	Model	Version
W0950000252	12 to 100	Reed sensor DCB 2C-425	Reed connector + bracket - CB
W0950000253	12 to 100	Sensor HALL PNP DCB3-N225	Hall PNP connector + bracket - CB
W0950014360	12 to 100	Sensor HALL NPN DCB3-M225	Hall NPN connector + bracket - CB

N.B.: For technical data see page 1-287

SPARES PARTS FOR SHORT-STROKE CYLINDERS



Code	Bores	Type	Parts
009 ... 0010	Ø 12 to 100	Complete polyurethane front head kit	1 2 3 4 5 6
009 ... 0011	Ø 12 to 100	Complete NBR front head kit	1 2 3 4 5 6
009 ... 0015	Ø 12 to 100	Complete NBR rear head kit	7 8 9 10
009 ... 0021	Ø 12 to 100	Complete polyurethane piston kit	11 12 13 14 15
009 ... 0023	Ø 12 to 100	Complete NBR piston kit	11 12 13 14 15
009 ... 0005	Ø 12 to 100	Complete set of polyurethane gaskets	2 4 5 8 10 13 15
009 ... 0006	Ø 12 to 100	Complete set of NBR gaskets	2 4 5 8 10 13 15
009 ... 0007	Ø 12 to 100	Complete set of high temperature gaskets	2 4 5 8 10 13 15
009 ... 0031	Ø 12 to 100	Complete polyurethane front+rear head kit + piston	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
009 ... 0033	Ø 12 to 100	Complete NBR front+rear head kit + piston	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
009 ... 0001	Ø 12 to 100	Magnet	16

CARTRIDGE MICRO-CYLINDER SERIES CRTC

Single-acting micro-cylinders with threaded body for fixing in small space or directly inside the machine body, owing to the external O-ring which ensures perfect seal.

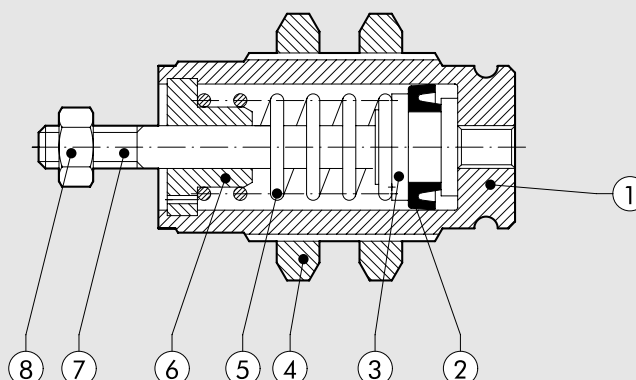
ATTENTION: in case of cycles with high frequencies it's advisable that the piston doesn't reach the end of the stroke during the rod coming out stage.



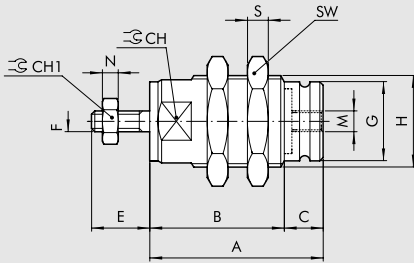
TECHNICAL DATA					
Operating pressure	bar	2 to 6			
	MPa	0.2 to 0.6			
Temperature range	°C	-10 to +80			
		Lubricated or unlubricated air.			
Fluid		Lubrication, if used, must be continuous			
Bores	mm	6 ; 10 ; 16			
Strokes	mm	5 ; 10 ; 15			
Port		M5			
Versions		Single-acting			
Design		Mechanically edged			
Seal OR on the body (not included in the supply)		Ø	OR		
		6	7x1		
		10	9.5x1.5		
		16	16x1.5		
Weight	g	Ø	STROKE		
			5	10	15
		6	14	16	19
		10	30	35	40
		16	76	84	90

COMPONENTS

- ① Nickel-plated brass body
- ② NBR rubber piston rod gasket
- ③ AISI 303 steel piston/piston rod (for Ø 6 - Ø 10)
Brass piston (for Ø 16)
- ④ Steel spring
- ⑤ Zinc-plated steel nut
- ⑥ Brass bushing
- ⑦ AISI 303 steel piston rod (for Ø 16)
- ⑧ Zinc-plated steel nut

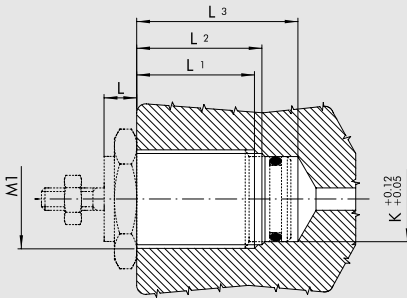


CARTRIDGE CYLINDER DIMENSIONS, Ø 6, 10, 16



Ø	A			B			C	CH	CH1	E	F	G	H	M	N	S	SW
	Stroke			Stroke													
6	19.5	26.5	33.5	14.5	21.5	28.5	5	9	5.5	8	M3	8.5	M10x1	M5	2.4	3	14
10	23	29.5	36.5	16	22.5	29.5	7	14	7	10.5	M4	12	M15x1.5	M5	2	4	19
16	27	32	37	21	26	31	6	20	8	13	M5	19	M22x1.5	M5	4	5	27

ASSEMBLY SEAT DIMENSIONS



Ø	L			L1			L2			L3			K	M1
	Stroke			Stroke			Stroke			Stroke				
6	5	10	15	5	10	15	5	10	15	5	10	15	8.5	M10x1
10	6	6	6	11	17	24	13	19	26	20	26	34	12	M15x1.5
16	7	7	7	15	20	25	17	21	27	26	31	36	19	M22x1.5

KEY TO CODES

Code	Description
W1000060005	CYL. CRTC-006-0005-S000-00
W1000060010	CYL. CRTC-006-0010-S000-00
W1000060015	CYL. CRTC-006-0015-S000-00
W1000100005	CYL. CRTC-010-0005-S000-00
W1000100010	CYL. CRTC-010-0010-S000-00
W1000100015	CYL. CRTC-010-0015-S000-00
W1000160005	CYL. CRTC-016-0005-S000-00
W1000160010	CYL. CRTC-016-0010-S000-00
W1000160015	CYL. CRTC-016-0015-S000-00

KEY TO CODES

CYL	C R T C	0 1 0	0 0 1 0	S 0 0 0	0 0	0 0
	TYPE	DIAMETER	STROKE	TYPE	FURTHER DESCRIPTION	SPECIAL DESIGN
	Cartridge microcylinder	006 010 016	0005 0010 0015	Single-acting retracted piston rod		

COMPACT GUIDED CYLINDERS SERIES CMPG

The guided compact cylinder series CMPG is a robust and practical solution with a built-in guide unit. The rod guiding bushes are mounted directly in the anodized aluminium alloy lining.

Two guiding solutions are available: sintered bronze bushes coupled with ground carbon chromed steel rods, or ball recirculation bushes coupled with tempered, chromed and ground steel rods.

There are grooves on one side of the body to house the retractable sensors.

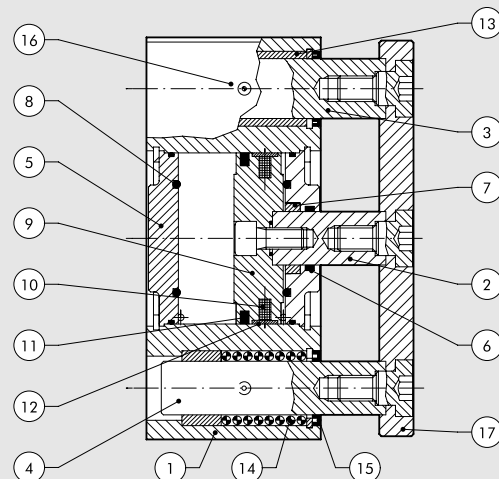
In the non-cushioned version, the stop is silenced by NBR front gaskets, and the cushioned version has adjustable pins to graduate braking. Threaded holes and calibrated holes are provided for fixing the dowel pins.



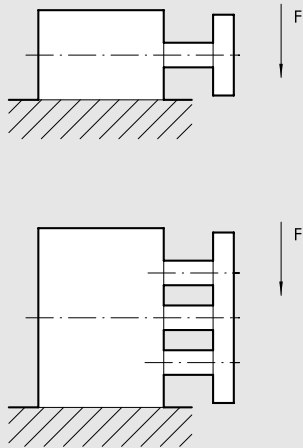
TECHNICAL DATA		CUSHIONED	NO-CUSHIONED
Operating pressure	bar		1 to 10
	MPa		0.1 to 1
	psi		14.5 to 145
	°C		-10 to +80
Temperature range	°C		-10 to +80
	°F		14 to 176
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	16; 20; 25; 32; 40; 50; 63	16; 20; 25; 32; 40; 50; 63; 80; 100
Strokes	mm	Ø 16: 20 - 30-40-50	Ø 16: 10-20-25*-30-40-50-75-100-150-200
		Ø 20; Ø 25: 20-30-40-50-75-100-150	Ø 20; Ø 25: 20-25*-30-40-50-75-100-150-200
		Ø 32 to Ø 63: 25-50-75-100-150-175	Ø 32 to Ø 100: 25-50-75-100-150-200
Version		With bronze bushings With ball bearings See page 1-9	
Weights		* only bronze bushings version	

COMPONENTS

- ① BARREL: anodized aluminium alloy
- ② PISTON ROD: grinded chrome steel
- ③ GUIDE ROD: grinded chrome steel
- ④ GUIDE ROD: hardened and tempered chrome steel
- ⑤ REAR BASE: anodized aluminium alloy
- ⑥ FRONT BASE: anodized aluminium alloy
- ⑦ GUIDE BUSHING: self-lubricating bronze
- ⑧ BUFFER GASKET: NBR
- ⑨ PISTON: aluminium alloy
- ⑩ MAGNET: plastoferrite
- ⑪ PISTON GASKET: (PARKER PRADIFA) NBR
- ⑫ GUIDE RING: PTFE
- ⑬ SLIDE BUSHING: sintered bronze
- ⑭ BALL BEARINGS
- ⑮ DUST SCRAPER RING: NBR or FKM/FPM
- ⑯ GREASE NIPPLES: zinc-plated or stainless steel
- ⑰ FLANGE: anodized aluminium alloy



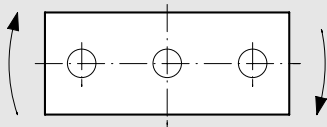
MAXIMUM SIDE LOAD



Ø mm	Guide unit	Stroke (mm)										
		10	20	25	30	40	50	75	100	150	175	200
16	Bushes	35	29	27	26	23	20	16	14	10	-	8
	Balls	29	31	-	27	38	34	29	24	12	-	8
20	Bushes	-	52	50	45	39	35	58	49	38	-	31
	Balls	-	56	-	48	79	70	54	50	27	-	32
25	Bushes	-	71	67	61	54	48	78	66	50	-	41
	Balls	-	72	-	62	78	73	60	52	37	-	30
32	Bushes	-	-	197	-	-	168	138	109	78	70	65
	Balls	-	-	89	-	-	60	276	217	138	122	110
40	Bushes	-	-	197	-	-	168	138	109	78	70	65
	Balls	-	-	89	-	-	60	276	217	138	122	110
50	Bushes	-	-	295	-	-	256	216	177	125	112	103
	Balls	-	-	138	-	-	89	393	314	184	163	148
63	Bushes	-	-	295	-	-	256	216	177	125	112	103
	Balls	-	-	138	-	-	89	393	314	184	163	148
80	Bushes	-	-	354	-	-	305	256	207	153	-	128
	Balls	-	-	236	-	-	158	864	687	413	-	335
100	Bushes	-	-	540	-	-	471	413	344	254	-	213
	Balls	-	-	471	-	-	314	1374	1074	629	-	511

NB: Forces are expressed in N

MAXIMUM TORQUE ON PLATE

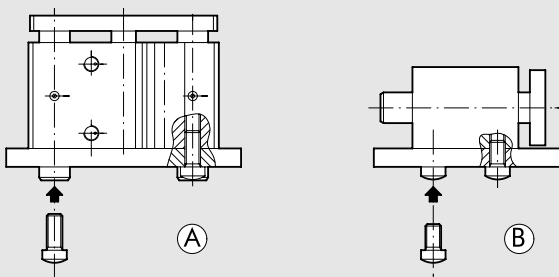


Ø mm	Guide unit	Stroke (mm)										
		10	20	25	30	40	50	75	100	150	175	200
16	Bushes	0.51	0.45	0.40	0.36	0.32	0.28	0.24	0.20	0.46	-	0.12
	Balls	0.74	0.60	-	0.50	0.72	0.65	0.54	0.45	0.35	-	0.25
20	Bushes	-	0.92	0.85	0.79	0.72	0.64	1.05	0.90	0.69	-	0.56
	Balls	-	1.28	-	1.08	1.78	1.59	1.24	1	0.61	-	0.49
25	Bushes	-	1.55	1.42	1.32	1.18	1.04	1.70	1.44	1.10	-	0.90
	Balls	-	1.98	-	1.70	2.16	2.20	1.66	1.4	1.02	-	0.82
32	Bushes	-	-	3.94	-	-	2.95	2.46	1.97	1.55	1.38	1.24
	Balls	-	-	1.97	-	-	1	2.96	2.44	2.40	2.43	2.18
40	Bushes	-	-	4.40	-	-	3.45	2.96	2.46	1.70	1.55	1.40
	Balls	-	-	2.46	-	-	1.45	6.38	5.4	3	2.73	2.40
50	Bushes	-	-	7.36	-	-	5.9	4.90	4.4	3	2.78	2.50
	Balls	-	-	3.45	-	-	2.44	10.8	8.35	4.5	4.06	3.60
63	Bushes	-	-	7.85	-	-	6.38	5.40	4.9	3.4	3.05	2.80
	Balls	-	-	3.94	-	-	2.46	11.77	9.3	5	4.46	4
80	Bushes	-	-	11.78	-	-	9.80	7.84	6.88	5.30	-	4.40
	Balls	-	-	9.34	-	-	5.88	31.38	24.5	10.40	-	11.7
100	Bushes	-	-	22.55	-	-	19.62	16.68	14.7	10.65	-	8.90
	Balls	-	-	21.56	-	-	13.73	63.72	49.1	26.6	-	21.6

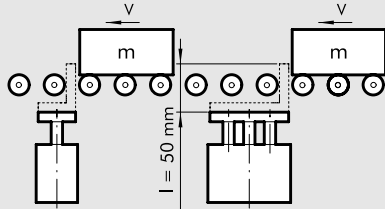
NB: Forces are expressed in Nm

ASSEMBLY OPTIONS

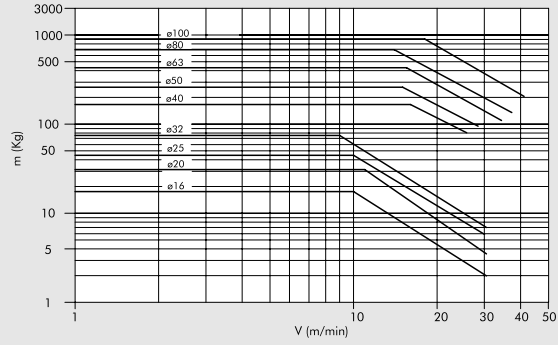
If the compact guided cylinder is mounted as shown in figure A, there need to be two through holes in the frame for the guide columns.



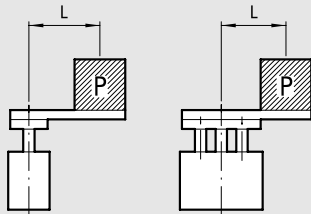
STOPPER FUNCTIONS



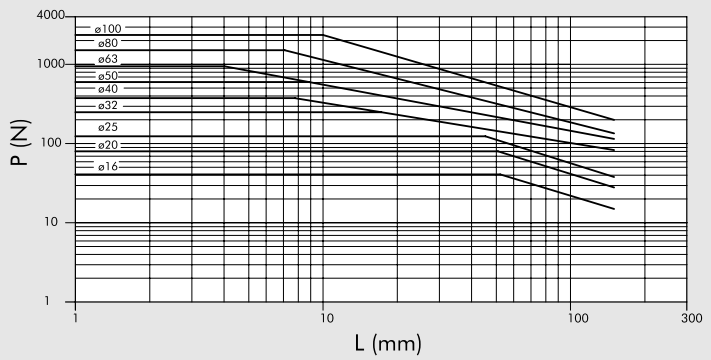
The graph refers to a 50mm-stroke cylinder.



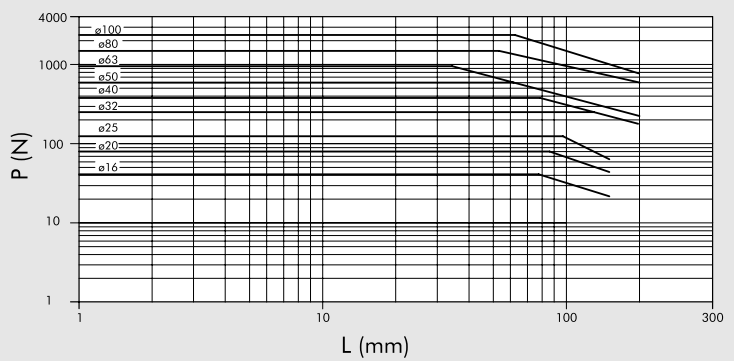
LIFTING FUNCTIONS



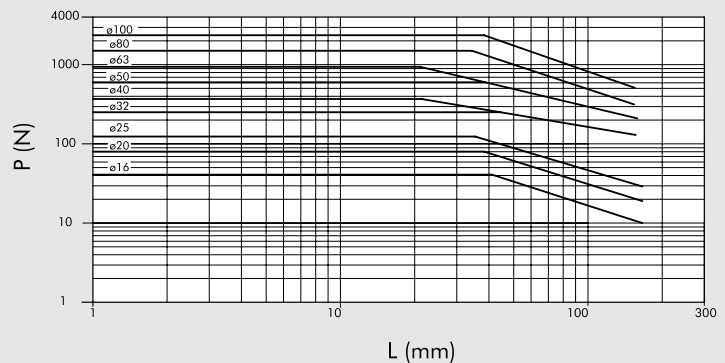
The graph refers from 25 to 50 mm-stroke cylinders with ball re-circulation guide unit



The graph refers from 75 to 100 mm-stroke cylinders with ball re-circulation guide unit

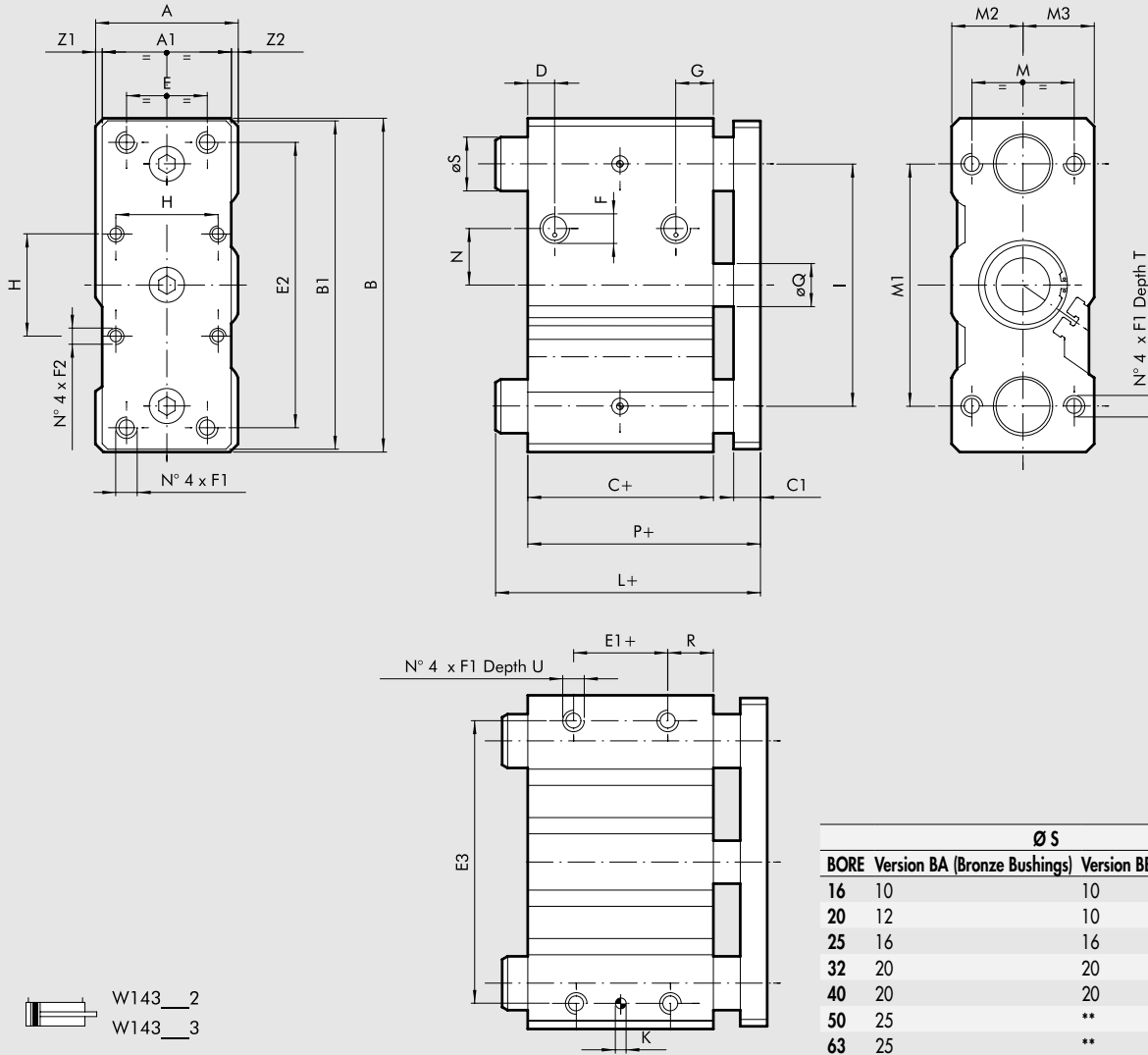


The graph refers to 50 mm-stroke cylinders with bushing guide unit



DIMENSIONS OF NO-CUSHIONED COMPACT GUIDED CYLINDERS

+ = ADD THE STROKE



BORE	Ø S	
	Version BA (Bronze Bushings)	Version BB (Ball Bearings)
16	10	10
20	12	10
25	16	16
32	20	20
40	20	20
50	25	**
63	25	**
80	28	25
100	35	30

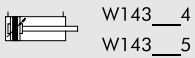
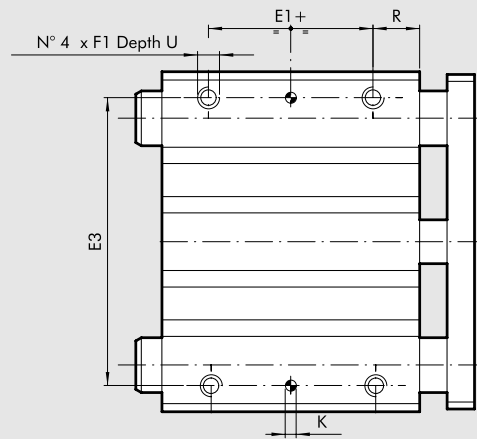
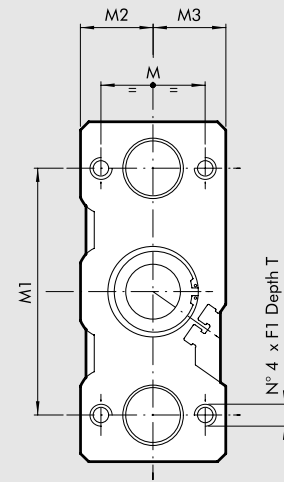
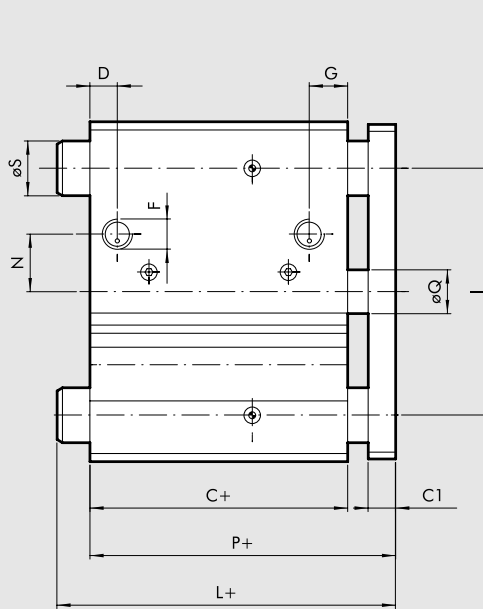
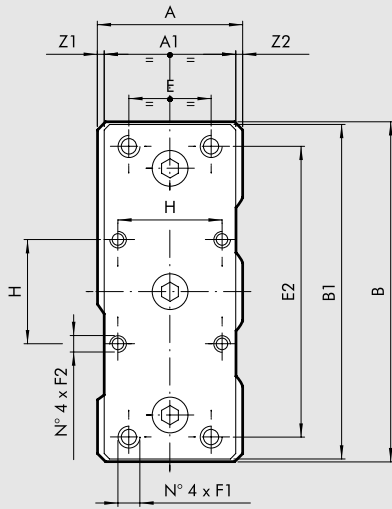
** for strokes 25 and 50 = 20
for strokes ≥75 = 25

BORE	stroke	
	0 to 50	75 to 200
16	45	74.5
20	49	79
25	49.5	79.5

Ø	A	A1	B	B1	C	C1	D	E	E1	E2	E3	F	F1	F2	G	H	K ^{Ø7}	I	L	M	M1	M2	M3	N	P	ØQ	R	T	U	Z1	Z2
16	33	25	64	62	33	10	9	16	7	52	54	M5	M5	-	10.5	-	4	40	*	22	42	15	18	6	45	8	13	20	8	5.5	2.5
20	36	29	74	72	37	10	9	18	10	60	64	1/8 M5	-	-	11	-	5	46	*	26	52	17	19	8	49	10	13	20	8	4.5	2.5
25	42	38	88	86	37.5	10	9	26	10	70	76	1/8 M6	-	-	11.5	-	5	56	*	32	62	21	21	8	49.5	12	14	25	9	2	2
32	51	49	114	112	37.5	10	9	30	5	96	100	1/8 M8	M6	12.5	32.5	6	80	73.5	38	80	25.5	25.5	14	49.5	16	16	20	11	1.5	1.5	
40	51	49	124	122	44	10	11	30	10	106	110	1/8 M8	M6	14	38	6	90	73.5	38	90	25.5	25.5	21	56	16	17	20	11	1.5	1.5	
50	59	56	140	138	44	12	11	40	10	120	124	1/4 M10	M8	14	46.5	6	100	83	44	100	29.5	29.5	27	58	20	17	25	12.5	1.5	1.5	
63	72	69	150	148	49	12	11	50	10	130	132	1/4 M10	M8	14	56.5	6	110	83	44	110	36	36	33	63	20	20	25	15	1.5	1.5	
80	92	88	188	185	56.5	16	15.5	60	15	160	166	3/8 M12	M10	19	72	6	140	93	56	140	46	46	36	74.5	25	21	30	18	2	2	
100	112	108	224	221	66	16	19	80	15	190	200	3/8 M14	M10	23	89	8	170	105	62	170	56	56	40	84	30	25	35	21	2	2	

DIMENSIONS OF CUSHIONED COMPACT GUIDED CYLINDERS

+ = ADD THE STROKE



Ø S		
BORE	Version BA (Bronze Bushings)	Version BB (Ball Bearings)
16	10	10
20	12	10
25	16	16
32	20	20
40	20	20
50	25	**
63	25	**

** for strokes 25 and 50 = 20
for strokes ≥75 = 25

BORE	stroke	
	0 to 50	75 to 200
16	73	-
20	78	105.5
25	78.5	108.5

Ø	A	A1	B	B1	C	C1	D	E	E1	E2	E3	F	F1	F2	G	H	K ¹⁷	I	L	M	M1	M2	M3	N	P	ØQ	R	T	U	Z1	Z2
16	33	25	64	62	58	10	9	16	32	52	54	M5	M5	-	10.5	-	4	40	*	22	42	15	18	8	73	8	13	20	8	5.5	2.5
20	36	29	74	72	62	10	9	18	35	60	64	1/8 M5	-	-	11	-	5	46	*	26	52	16.5	19.5	8.5	78	10	13	20	8	4.5	2.5
25	42	38	88	86	62.5	10	9	26	35	70	76	1/8 M6	-	-	11.5	-	5	56	*	32	62	21	21	13.5	78.5	12	14	25	9	2	2
32	51	49	114	112	62.5	10	9	30	30	96	100	1/8 M8	M6	12.5	32.5	6	80	106.5	38	80	25.5	25.5	15	82.5	16	16.5	20	11	1.5	1.5	
40	51	49	124	122	69	10	11	30	35	106	110	1/8 M8	M6	14	38	6	90	106.5	38	90	25.5	25.5	20.5	89	16	17	20	11	1.5	1.5	
50	59	56	140	138	69	12	11	40	35	120	124	1/4 M10	M8	14	46.5	6	100	118	44	100	29.5	29.5	27	93	20	17	25	12.5	1.5	1.5	
63	72	69	150	148	74	12	11	50	35	130	132	1/4 M10	M8	14	56.5	6	110	118	44	110	36	36	31.5	98	20	20	25	15	1.5	1.5	

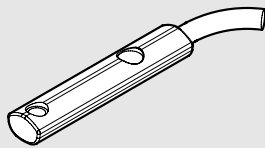
KEY TO CODES

W 1 4 3 TYPE	0 3 2 DIAMETER	2 VERSION	0 2 5 STROKE
	16 20 25 32 40 50 63 * 80 * A1=100	2 bronze bushings 3 ball bearings 4 cushioned with brass bushings 5 cushioned with ball bearings	CUSHIONED VERSION Ø 16: 20, 30, 40, 50 Ø 20 to 25: 20, 30, 40, 50, 75, 100, 150 Ø 32 to 63: 25, 50, 75, 100, 150, 175 NOT CUSHIONED VERSION ♦ Ø 16: 10, 20, ● 25, 30, 40, 50, 75, 100, 150, 200 Ø 20 to 25: 20, ● 25, 30, 40, 50, 75, 100, 150, 200 Ø 32 to 100: 25, 50, 75, 100, 150, 200 ♦ Other strokes on request but with the same cylinder dimensions as the standard stroke immediately above.

- * Not cushioned version only
- Bronze bushings version only

ACCESSORIES FOR COMPACT GUIDED CYLINDER: MAGNETIC SENSORS

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
 NB: For technical data see page 1-288

NOTES

RODLESS CYLINDER SERIES STD

Rodless cylinders come in five different bores - Ø 16, 25, 32, 40 and 63 mm – and the design incorporates numerous innovations.

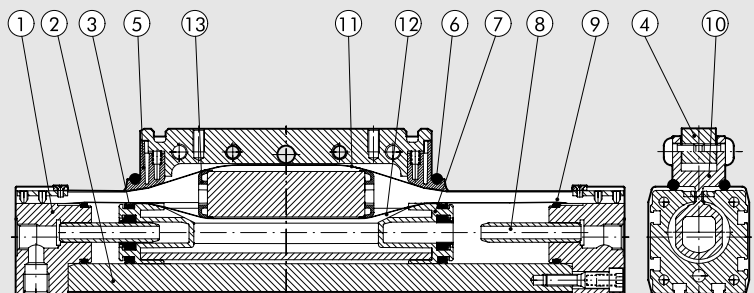
- Calibrated extruded anodized aluminium alloy barrel
- Sensor slots and accessory slots in the barrel itself
- Longitudinal seal by means of specially-shaped indeformable stainless steel strips
- Strokes 100 to 5700 mm with 1mm intervals
- Adjustable integrated pneumatic cushioning
- Adjustable limit switches and decelerations can be applied at any time
- For this type of cylinder (size 32 and upwards), the valves can be fitted directly using the retracting sensors without requiring any intermediate brackets. Refer to the table on page 1-46



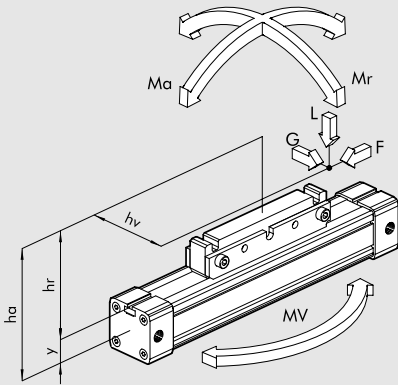
TECHNICAL DATA		NBR	FKM/FPM
Operating pressure	bar		1 to 8
	MPa		0.1 to 0.8
	psi		14.5 to 116
	°C		-10 to +80
Temperature range	°C		-10 to +80
	°F		14 to 176
Fluid		50 µm unlubricated filtered air Lubrication, if used, must be continuous.	
Bores	mm	Ø 16, 25, 32, 40, 63	
Type of construction		Double-acting rodless cylinder with direct transmission system	
Strokes	mm	Ø 16: from 100 to 5000 with 1mm interval	
		Ø 25, 32 e 40: from 100 to 5700 with 1mm interval	
		Ø 63: from 100 to 5500 with 1mm interval	
Recommended speeds	m/s	< 1	≥ 1
Max. speed with decelerators	m/s	< 1	2
Weight		See page 1-9	
Notes		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.	

COMPONENTS

- ① CYLINDER HEAD: aluminium alloy
- ② BARREL: profiled anodized aluminium alloy
- ③ PISTON GASKET: NBR or FKM/FPM
- ④ CENTRAL ELEMENT: aluminium alloy
- ⑤ SCRAPER: Hostaform®
- ⑥ O-RING: FKM/FPM
- ⑦ PISTON: Hostaform®
- ⑧ CUSHIONING CONE: aluminium alloy
- ⑨ STATIC O-RINGS: NBR or FKM/FPM
- ⑩ SLIDE: aluminium alloy
- ⑪ OUTER STRIP: stainless steel
- ⑫ INNER STRIP: stainless steel
- ⑬ BAND SUPPORT: Hostaform®



DIMENSIONING - FORCE AND TORQUE



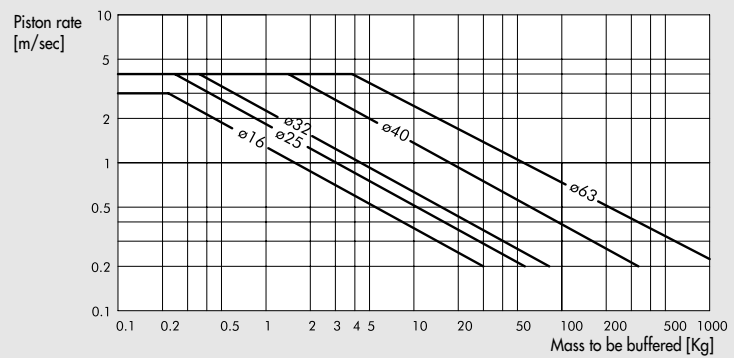
Bore	Centre Distance Y	Actual Force F at 6 bar [N]	Cushioning stroke [mm]	Max. load L [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
16	9	110	15	120	4	0.3	0.5
25	14	250	21	300	15	1	3
32	18	420	26	450	30	2	4
40	22	640	32	750	60	4	8
63	44	1550	40	1650	200	8	24

N.B.: When the cylinder is subjected simultaneously to torque and force, it is advisable to keep to the following equations.
 $Ma = F \times ha$ $Mr = L \times hv + G \times hr$ $Mv = F \times hv$

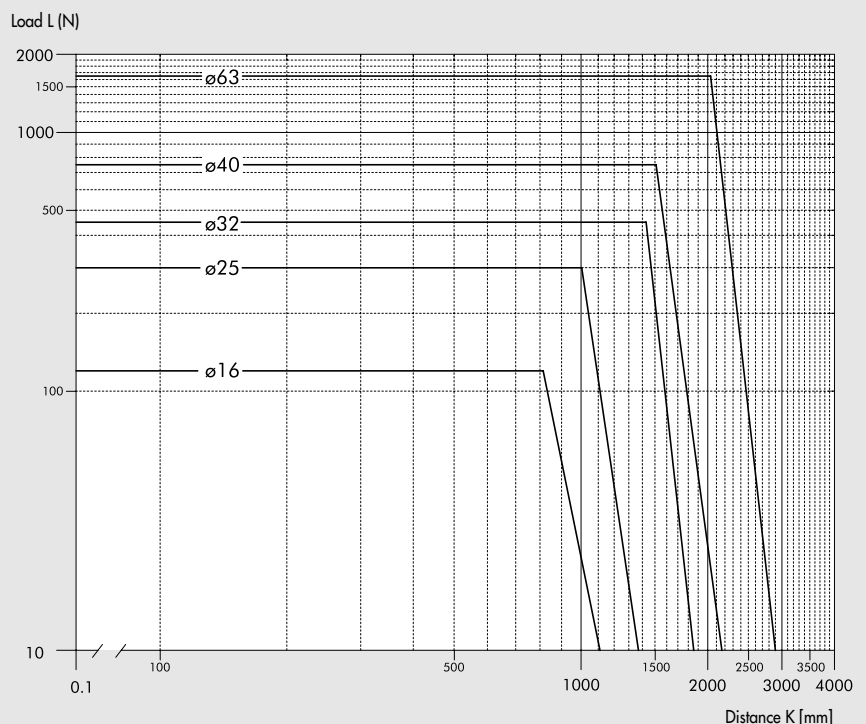
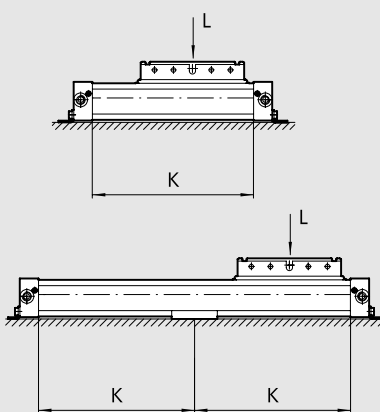
$$\frac{Mv}{Mv_{max}} \leq 1; \quad \frac{L}{L_{max}} \leq 1; \quad \frac{Ma}{Ma_{max}} + \frac{Mr}{Mr_{max}} + 0.22 \times \frac{Mv}{Mv_{max}} + 0.4 \frac{L}{L_{max}} \leq 1$$

DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

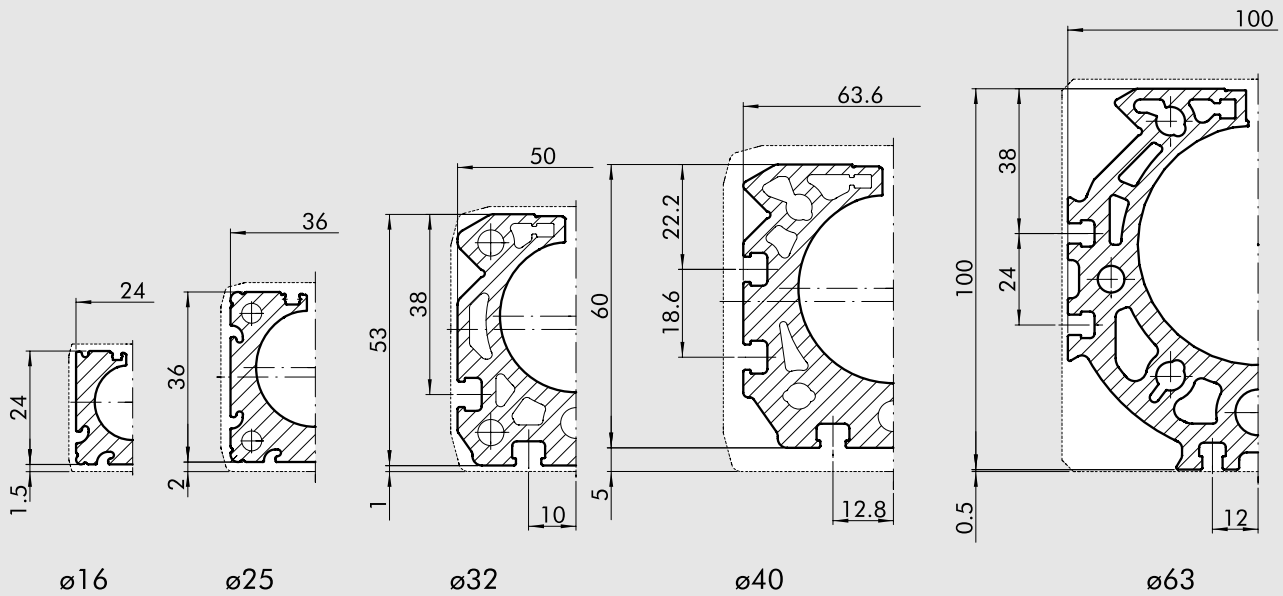
For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated. The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders. The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS

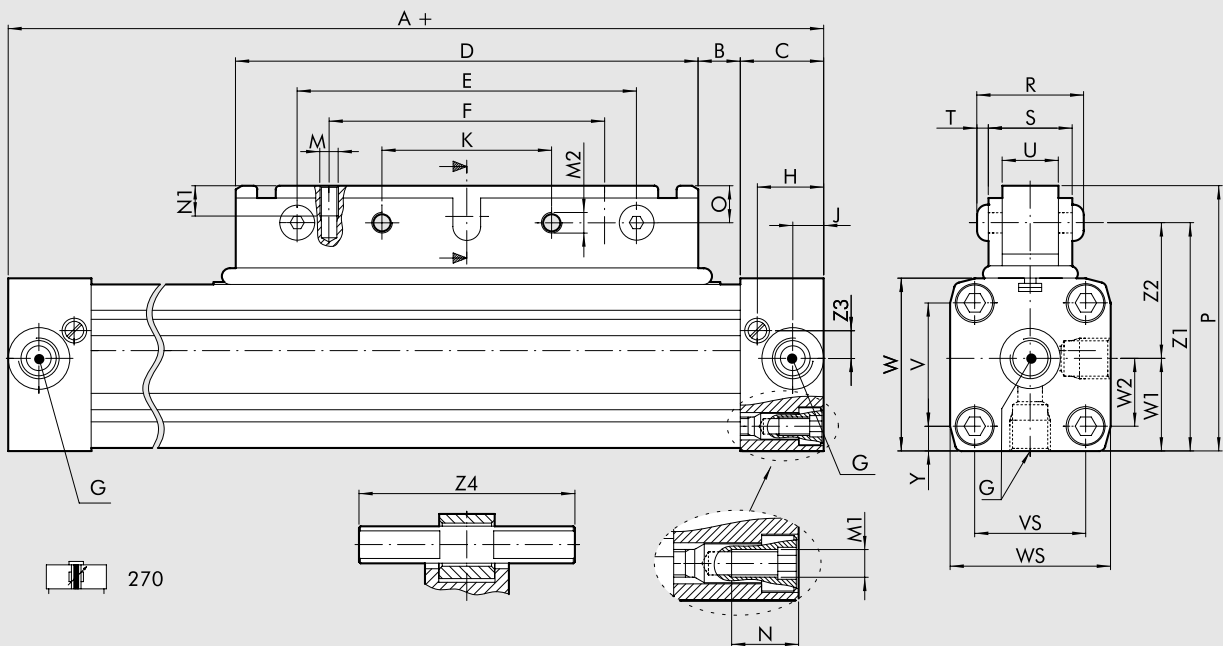


BARREL CROSS SECTION



DIMENSIONS Ø 16 to 40

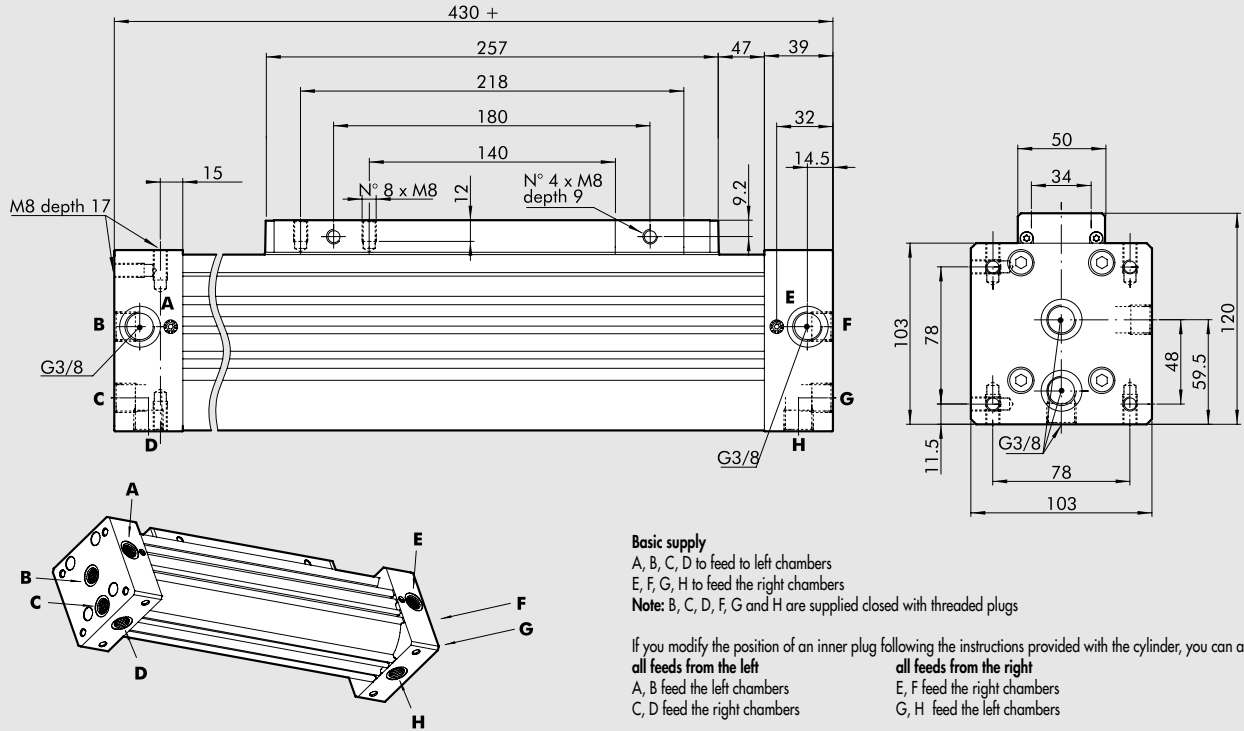
+ = ADDED STROKE



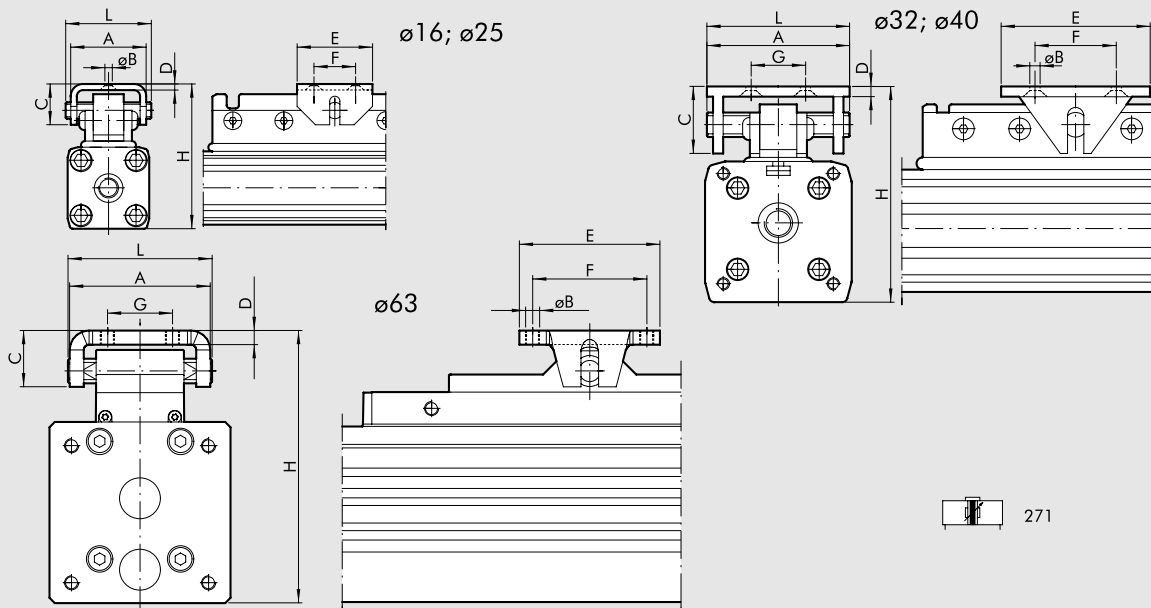
Ø	A	B	C	D	E	F	G	H	J	K	M	M1	M2	N	N1	O	P	R	S	T	U	V	VS	W	WS	W1	W2	Y	Z1	Z2	Z3	Z4
16	130	12	15	76	64	48	M5	12	6.4	32	M4	M3	M5	7	8	6	43.5	23.5	18	2.75	10	18	18	27	27	13.5	9	4.5	37.5	24	4.5	28
25	200	17	23	120	100	80	1/8	18.5	8.5	50	M5	M5	M6	12	11	13	66	29.6	23	3.3	15	27	27	40	40	20	13.5	6.5	53	33	6.5	42
32	250	23	27	150	110	90	1/4	22	10.5	55	M6	M6	M8	14	12	12	86	36	27	4.4	18	40	36	56	52	30	22	8	74	44	8	70
40	300	45	30	150	110	90	1/4	24	15	55	M6	M6	M8	17.5	12	12	97	36.8	28	4.4	18	54	54	69	72	36	27	9	85	49	11.8	70

DIMENSIONS Ø 63

+ = ADDED STROKE



VERSION WITH SWING CARRIAGE

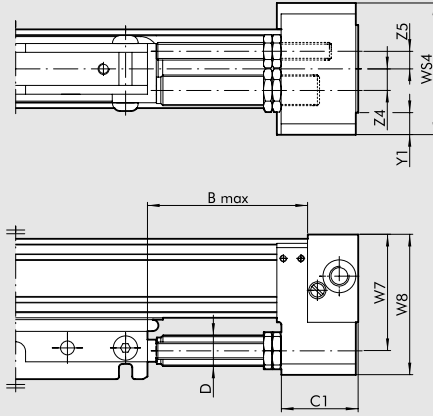


NOTE: For other dimensions see code 270

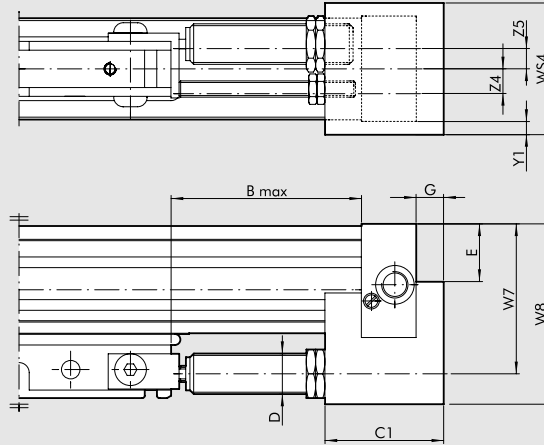
Ø	A	ØB	C	D	E	F	G	H	L
16	25	4.5	13	2	20	10	-	47-50	28
25	37	5.5	20	3	30	16	-	72-75	42
32	70	6.5	38	5	90	75	55	91-100	70
40	70	6.5	38	5	90	75	55	111-120	70
63	80	M8	32	8	80	65	37	155-162	82

DIMENSIONS VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS

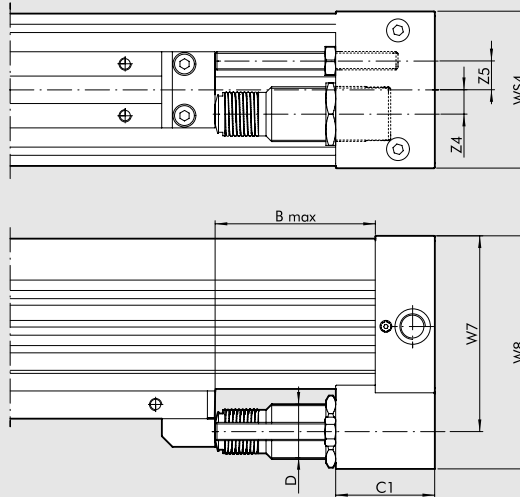
ø16



ø25 ÷ ø40



ø63



Ø	B Max	C1	D	E	G	W7	W8	WS4	Y1	Z4	Z5	Stroke	Max. cushioned force		Max. impact force [N]	Max. thrust force [N]
													For stroke [J]	For hour [J]		
16	42	22	M12x1	-	-	38	46	42	7.5	7	7.5	10.4	10	14125	1000	220
25	72	44	M14x1.5	17	9	53	67	50	5	8	9.8	16	26	34000	2800	530
32	90	56	M20x1.5	29	11	74	89	60	4	10	12.2	22	54	53700	3750	890
40	105	74	M25x1.5	32.8	14	89	108	75	1.5	12.5	12.7	25	90	70000	5500	1550
63	105	65	M36x1.5	-	-	128.5	153	103	-	16	19	25	160	91000	11120	2220

For graphs to help choose shock absorbers see page 1-137

KEY TO CODES

CYL	27	0	0	2 5	0 1 5 0	C	N
	TYPE			BORE	STROKE		GASKETS
	27 Rodless cylinder	0 Standard 1 With swing drive + 2 Twin cushioned series "Double" 3 Double-acting cushioned Magnetic + adjustable limit switches and shock absorbers	0 Magnetic S Non-magnetic ■ G No stick slip	16 25 32 40 63	Ø 16: from 100 to 5000 mm Ø 25 to 40: from 100 to 5700 mm Ø 63 from 100 to 5500 mm		N NBR gasket ● V FKM/FPM gasket

■ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only ● For speed ≥ 1/m/s + Available up to Ø 32

RODLESS CYLINDER WITH GUIDE "V"

Two opposed V-shaped guide units are obtained directly in the anodized aluminium cylinder liner, on which a cover with two acetalic resin wear-resistant pads slides.

The cover has a tip-up-type carriage-piston rod coupling. In this way the carriage only transfers loads axially and does not support loads and moments in other directions.

The play of the pads can be adjusted by means of side threaded grub screws. Therefore, it is possible to recover the wear of pads, which can be replaced without the need for dismantling the cylinder.

This family of rodless cylinders has the same features as the basic versions: such as an integrated adjustable pneumatic cushioning, sensor slots and accessory holding slots.

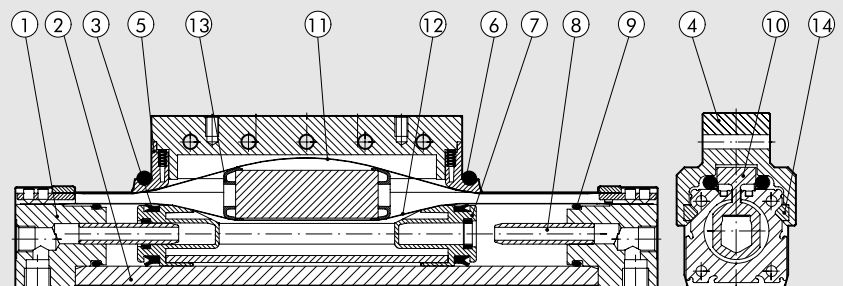
A version is available with adjustable limit switches and hydraulic decelerators. They can be purchased separately and applied at any time to the basic cylinders as well.



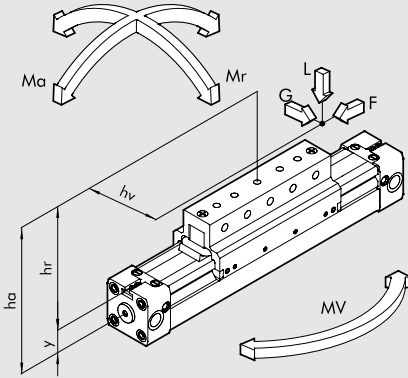
TECHNICAL DATA		NBR	FKM/FPM
Operating pressure	bar		1.5 to 8
	MPa		0.15 to 0.8
	psi		21.8 to 116
	°C		-10 to +80
Temperature range	°C		-10 to +80
	°F		14 to 176
Fluid		50 µm unlubricated filtered air Lubrication, if used, must be continuous	
Bores	mm	25, 32, 40, 63	
Type of construction		Double-acting rodless cylinder with direct transmission system	
Strokes	mm	Ø 25, 32 and 40: from 100 to 5700 with 1mm interval	
		Ø 63: from 100 to 5500 with 1mm interval	
Recommended speeds	m/s	<1	≥1
Max. speed with decelerators	m/s	<1	2
Weight		See page 1-9	
Notes		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.	

COMPONENTS

- ① CYLINDER HEAD: aluminium alloy
- ② BARREL: profiled anodized aluminium alloy
- ③ PISTON GASKET: NBR or FKM/FPM
- ④ CENTRAL ELEMENT: aluminium alloy
- ⑤ SCRAPER: Hostaform®
- ⑥ O-RING: FKM/FPM
- ⑦ PISTON: Hostaform®
- ⑧ CUSHIONING CONE: aluminium alloy
- ⑨ STATIC O-RINGS: NBR or FKM/FPM
- ⑩ SLIDE: aluminium alloy
- ⑪ OUTER STRIP: stainless steel
- ⑫ INNER STRIP: stainless steel
- ⑬ BAND SUPPORT: Hostaform®
- ⑭ "V" GUIDE PLATE: Hostaform®



DIMENSIONING - FORCE AND TORQUE



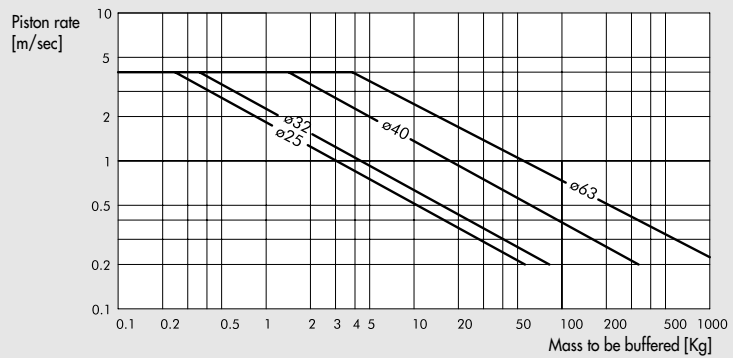
Bore	Centre Distance Y	Actual Force F at 6 bar [N]	Cushioning stroke L [mm]	Max. load L [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
25	14	200	21	350	22	5	22
32	18	300	26	400	40	10	40
40	22	490	32	700	70	26	70
63	44	1300	40	1800	250	80	250

N.B.: The loads can be applied for speeds below 0.2 m/s. For higher speeds, it is advisable not to exceed 1 m/s
N.B.: When the cylinder is subjected simultaneously to torque and force, it is advisable to keep to the following equations
 $Ma = F \times ha$ $Mr = L \times hv + G \times hr$ $Mv = F \times hv$

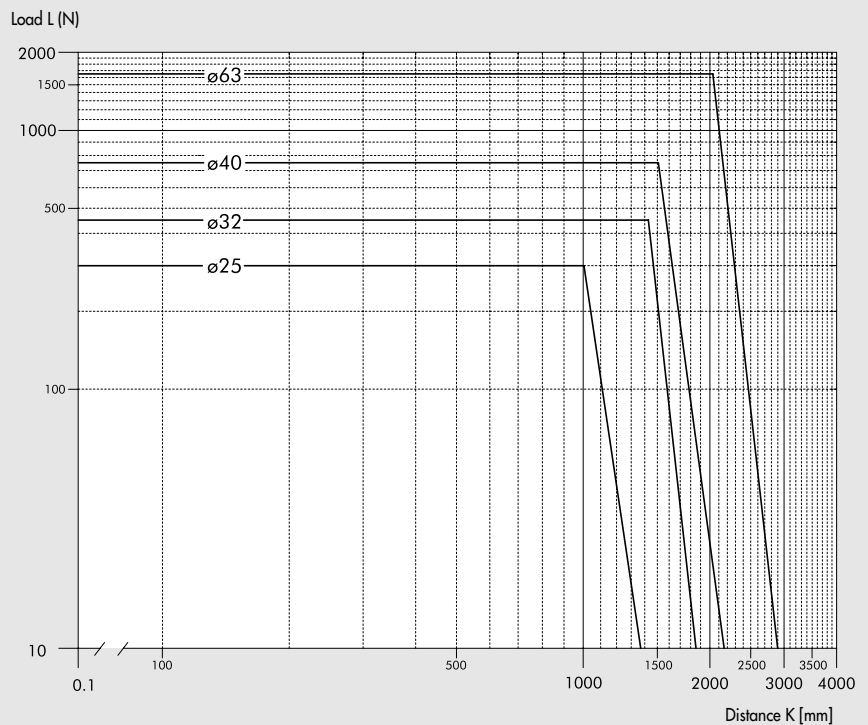
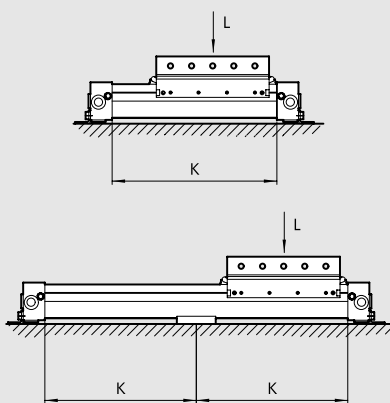
$$\frac{Mv}{Mv_{max}} \leq 1; \quad \frac{L}{L_{max}} \leq 1; \quad \frac{Ma}{Ma_{max}} + \frac{Mr}{Mr_{max}} + 0.22 \times \frac{Mv}{Mv_{max}} + 0.4 \frac{L}{L_{max}} \leq 1$$

DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

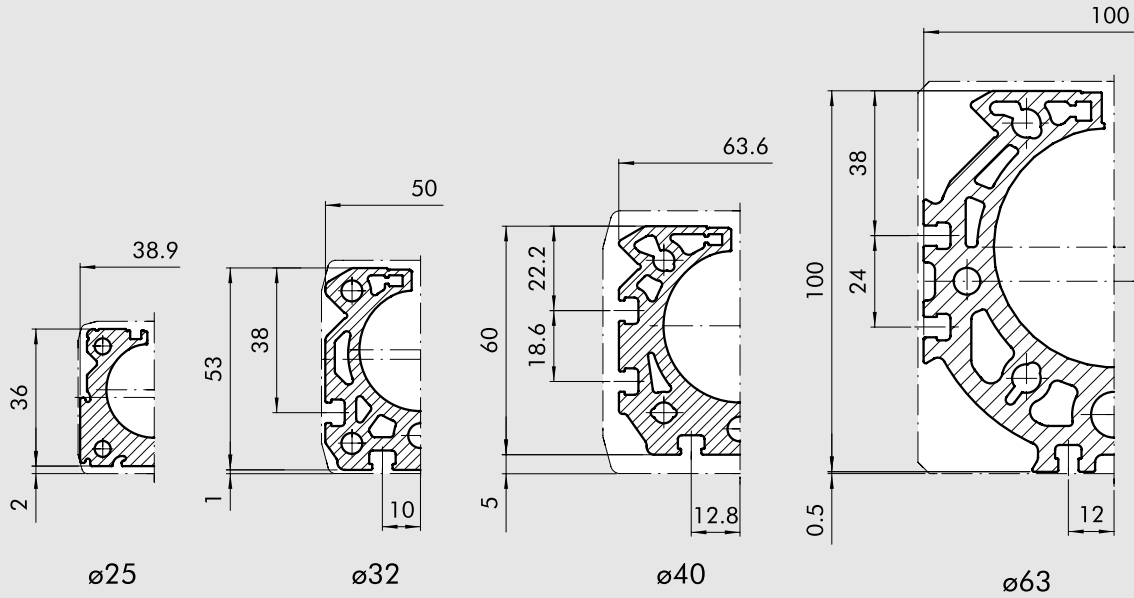
For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated. The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders. The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS

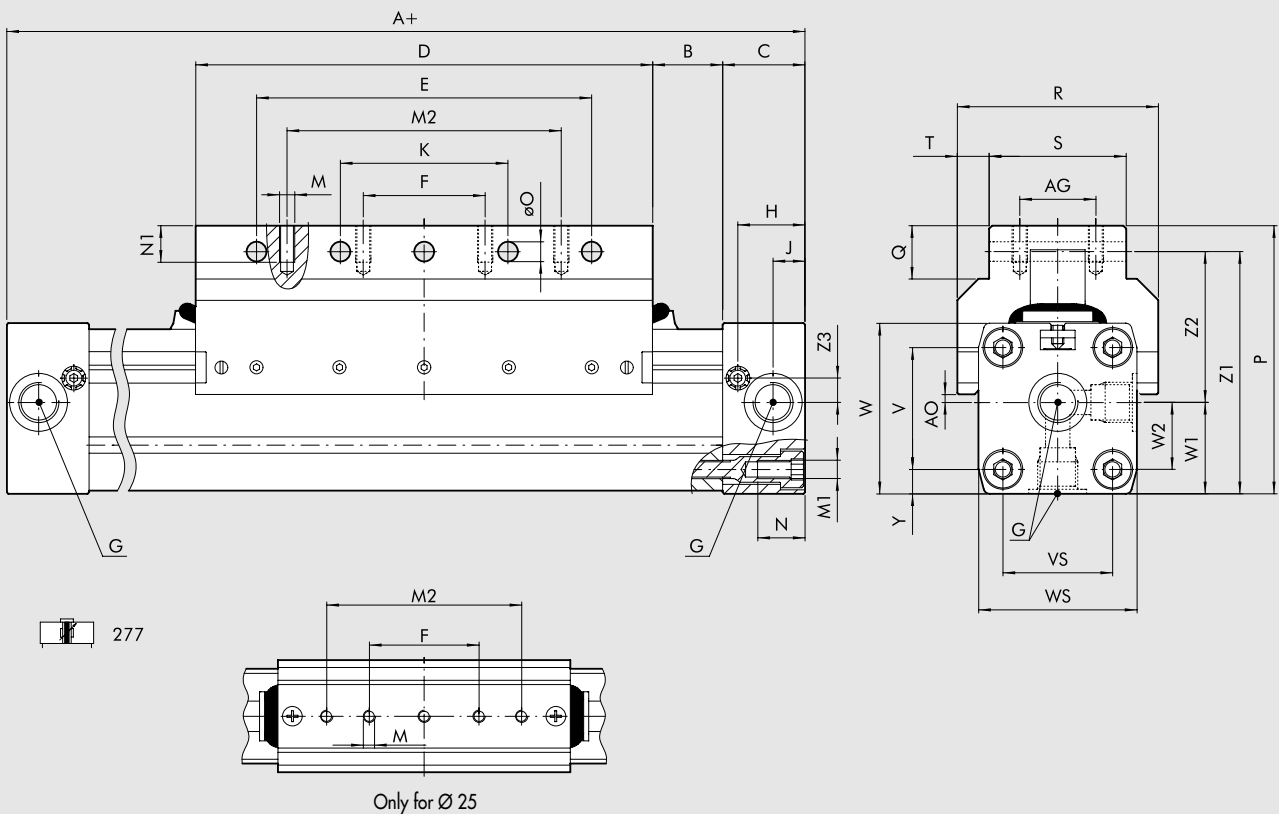


BARREL CROSS SECTION



DIMENSIONS Ø 25 to 40

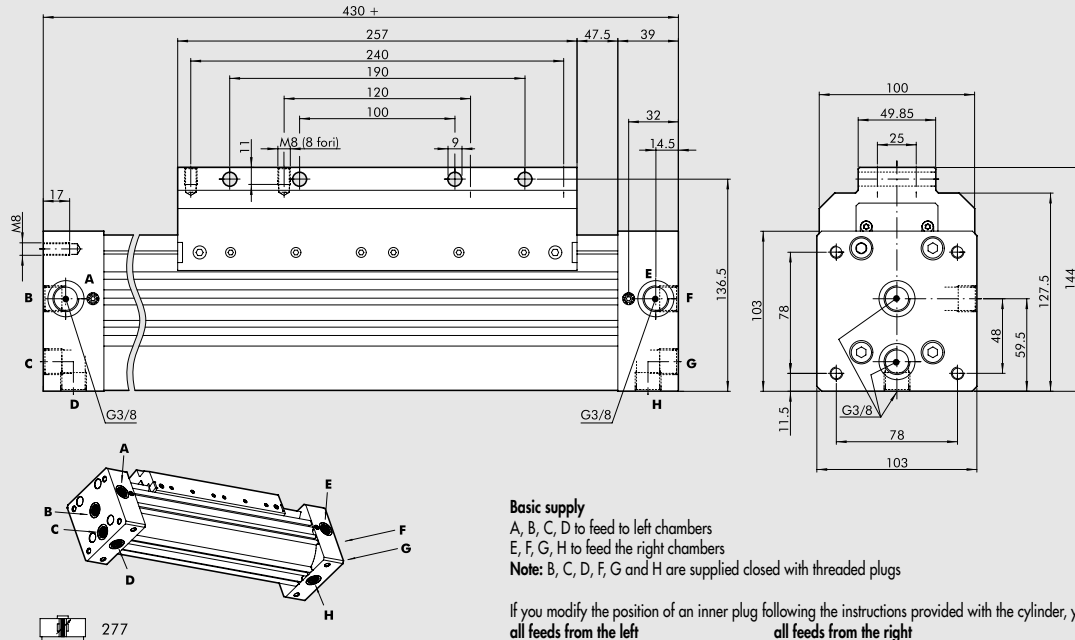
+ = ADDED STROKE



Ø	A	AG	AO	B	C	D	E	F	G	H	J	K	M	M1	M2	N	NI	øO	P	Q	R	S	T	V	VS	W	WS	W1	W2	Y	Z1	Z2	Z3
25	200	-	2	17	23	120	90	45	1/8	18.5	8.5	45	M5	M5	80	12	8	5.5	67.5	21	46	26	10	27	27	40	40	20	13.5	6.5	57.5	37.5	6.5
32	250	25	2.6	23	27	150	110	40	1/4	22	10.5	55	M5	M6	90	15	12	6.4	88	17.5	66	45	10.5	40	36	56	52	30	22	8	79.5	49.5	8
40	300	25	9.4	45	30	150	110	40	1/4	24	15	55	M6	M6	90	17.5	12	6.4	98.5	17.5	80	45	17.5	54	54	69	72	36	27	9	89.9	53.9	11.8

DIMENSIONS Ø 63

+ = ADDED STROKE



Basic supply

A, B, C, D to feed to left chambers
E, F, G, H to feed the right chambers

Note: B, C, D, F, G and H are supplied closed with threaded plugs

If you modify the position of an inner plug following the instructions provided with the cylinder, you can arrange:

all feeds from the left

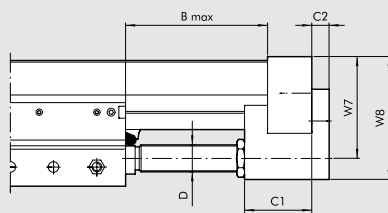
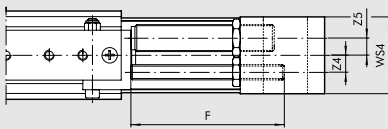
A, B feed the left chambers
C, D feed the right chambers

all feeds from the right

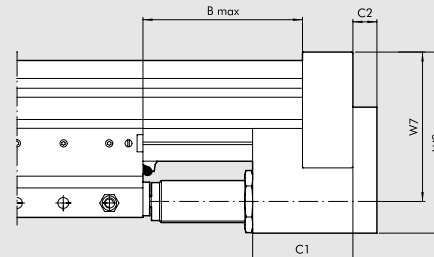
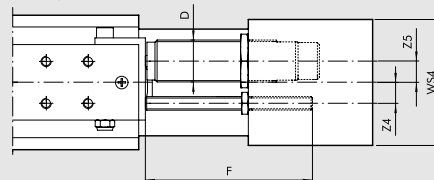
E, F feed the right chambers
G, H feed the left chambers

DIMENSIONS VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS

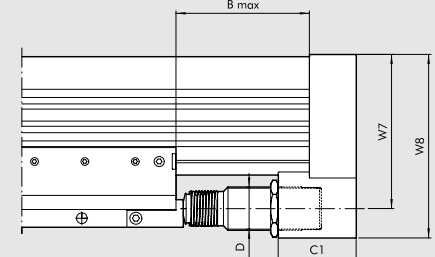
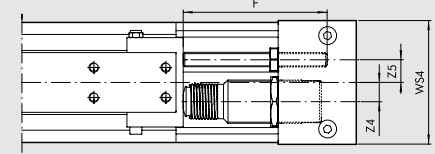
Ø 25



Ø 32; Ø 40



Ø 63



278

Ø	B Max	C1	C2	D	F	W7	W8	WS4	Z4	Z5	Stroke	Max. cushioned force		Max. impact force [N]	Max. thrust force [N]
												For stroke [J]	For hour [J]		
25	84	35	9	M14x1.5	80	53	67	50	8	9.8	16	26	34000	2800	530
32	110	45	11	M20x1.5	100	74	89	60	10	12.2	22	54	53700	3750	890
40	120	60	14	M25x1.5	100	89	108	75	12.5	12.7	25	90	70000	5500	1550
63	122	65	-	M36x1.5	120	128.5	153	103	16	19	25	160	91000	11120	2220

For graphs to help choose shock absorbers see page 1-137

KEY TO CODES

CYL	27	7	0	2 5	0 1 5 0	C	N
TYPE				BORE	STROKE		GASKETS
27 Rodless cylinder	7 Double-acting cushioned Magnetic with guide "V"	0 Magnetic	25	Ø 25 to 40:			N NBR gasket
	8 Double-acting cushioned Magnetic with guide "V" + adjustable limit switches and decelerator	S Non-magnetic	32	from 100 to 5700 mm			● V FKM/FPM gasket
		* G No stick slip	40	Ø 63			
			63	from 100 to 5500 mm			

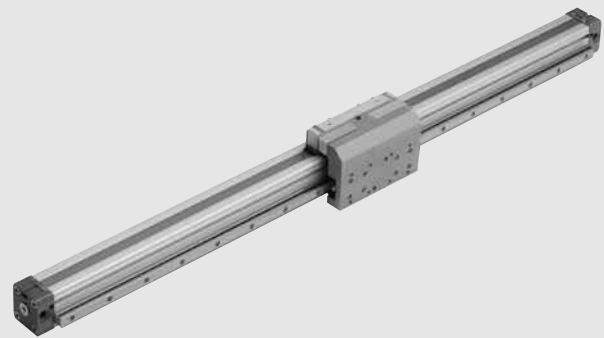
* For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only ● For speed ≥ 1/m/s

RODLESS CYLINDER WITH BALL RECIRCULATING GUIDE

The range of rodless cylinders with ball circulation guides is available with five different bores \varnothing 16, 25, 32, 40 and 63. The bore 63 can be supplied in two versions: the "standard" one for intermediate loads and the "heavy" one for considerably weighty loads. Besides the general features specified for standard rodless cylinders, the other main features are:

- Very high load capacity, acting in all directions without discharging onto the cylinder slide.
- Hardened steel guide connected firmly to the cylinder barrel.
- Ball circulation shoes constructed using special technology that make them very silent when the guide slides, with very long maintenance intervals. For example, they only need lubricating every 2000 km or once a year, using type 2 grease, preferably containing lithium soap.
- Extra sturdy slide support with various holes for fixing the loads. Holes for centring pins are also provided.
- 100 to 2650 stroke at intervals of 1 mm.
- Integrated pneumatic adjustable cushioning.
- Adjustable limit switches and decelerations can be applied at any time.

For this type of cylinder (size 32 and upwards), the valves can be fitted directly using the retracting sensors without requiring any intermediate brackets. Refer to the table on page 1-46



TECHNICAL DATA		NBR	FKM/FPM
Operating pressure	bar	1 to 8	
	MPa	0.1 to 0.8	
	Psi	14.5 to 116	
Temperature range	$^{\circ}$ C	-10 to +80	
	$^{\circ}$ F	14 to 176	
Fluid		50 μ m unlubricated filtered air lubrication, if used, must be continuous	
Bores	mm	\varnothing 16, 25, 32, 40, 63	
Type of construction		Double-acting rodless cylinder with direct transmission system	
Strokes	mm	\varnothing 16: from 100 to 1350 with 1 interval	
		\varnothing 25: from 100 to 2300 with 1 interval	
		\varnothing 32: from 100 to 2300 with 1 interval	
		\varnothing 40: from 100 to 2250 with 1 interval	
		\varnothing 63 standard: from 100 to 2100 with 1 interval	
		\varnothing 63 heavy: from 100 to 2650 with 1 interval	
Threaded ports		M5, G1/8", G1/4", G3/8"	
Assembly		As required	
Recommended speed	m/s	<1	\geq 1
Max. speed with decelerators	m/s	<1	2
Weight		See page 1-7	
Notes		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip	

COMPONENTS

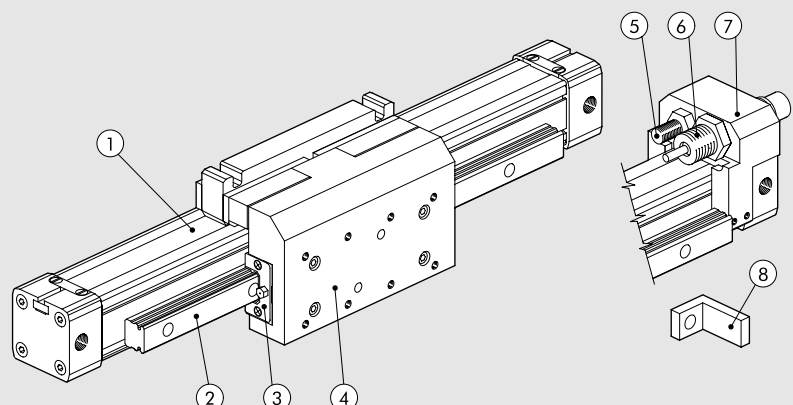
For version 275

- ① CYLINDER: see construction details on page 1-118
- ② GUIDE: hardened steel
- ③ SHOE: steel with hardened ball circulation
- ④ SLIDE SUPPORT: anodised aluminium

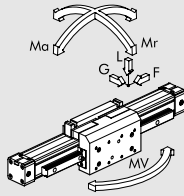
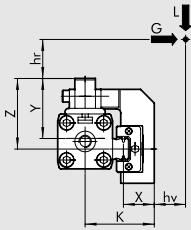
For version 276

Besides the details specified above:

- ⑤ END-OF-STROKE STUD PIN: zinc-plated steel, complete with 2 zinc-plated nuts for fixing
- ⑥ DECELERATOR: burnished steel, complete with 2 zinc-plated or burnished nuts for fixing
- ⑦ DECELERATOR SUPPORT: anodised aluminium
- ⑧ BRACKET: hardened-and-tempered and zinc-plated steel



DIMENSIONING - FORCES AND MOMENTS



Ø	Version	Actual force F at 6 bar [N]	Cushioning stroke [mm]	K [mm]	X [mm]	Y [mm]	Z [mm]	Max load L [N]	Max load G [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
16	-	110	15	35	16	29	33	500	500	16	15	16
25	-	250	21	50.5	21	44	51.5	1500	1500	100	50	100
32	-	420	26	59	22.5	53.5	70	3000	3000	200	100	200
40	-	640	32	68	24.7	58	73	4000	4000	200	140	200
63	standard	1550	40	84	23.1	79	100	6000	6000	400	140	400
63	heavy	1550	40	91	29.2	79	88	10000	10000	600	400	600

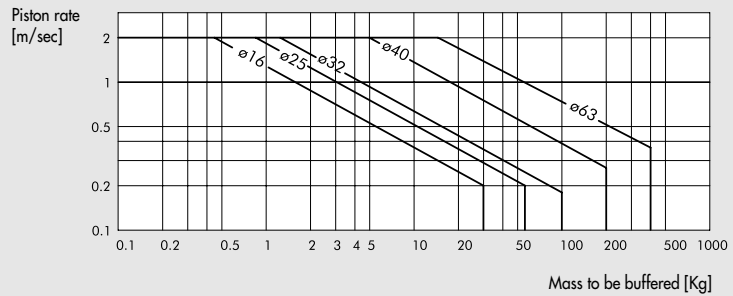
N.B.: when the cylinder is subjected simultaneously to torque and force, it is advisable to keep to the following equations

$$Ma = F \times (hr + Y) \quad Mr = G \times (hr + z) + Lx (hv + X) \quad Mv = F \times (K + hv)$$

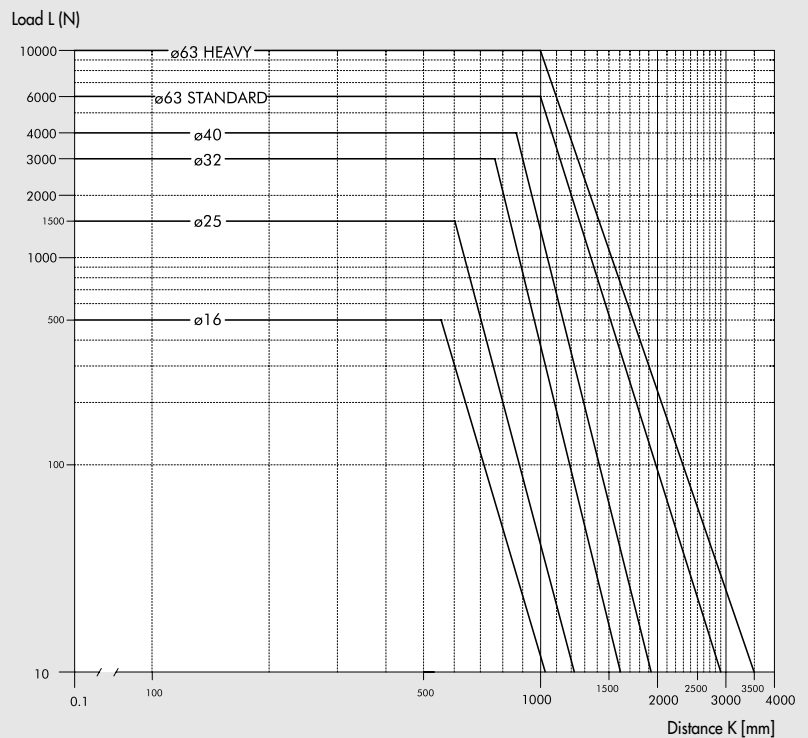
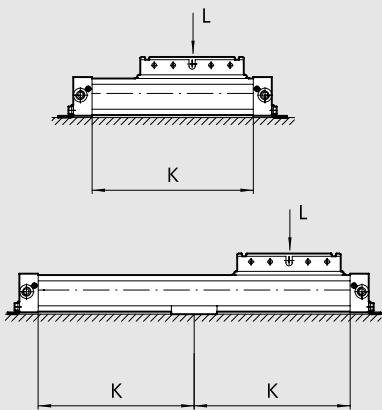
$$\frac{Ma}{Ma_{max}} + \frac{Mr}{Mr_{max}} + \frac{Mv}{Mv_{max}} + \frac{L}{L_{max}} + \frac{G}{G_{max}} \leq 1$$

DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated. The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders. The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.

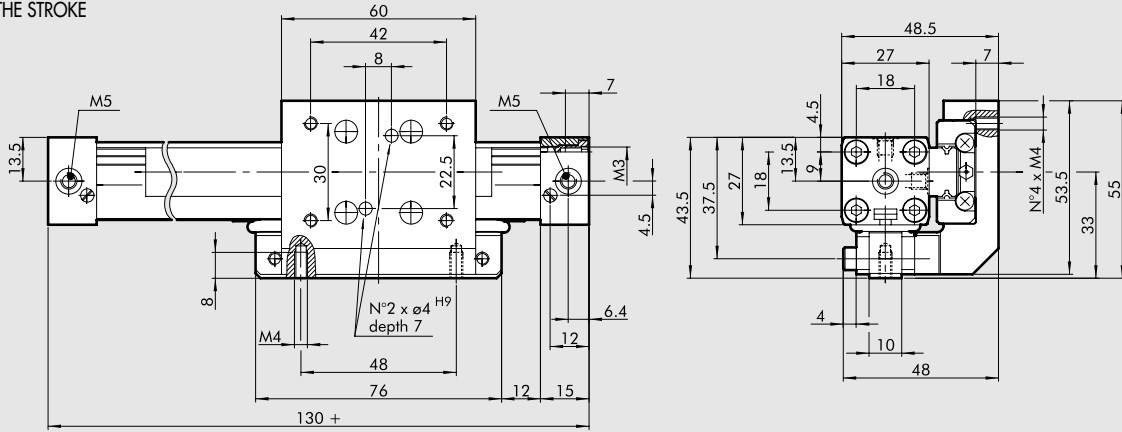


MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS



DIMENSIONS Ø 16

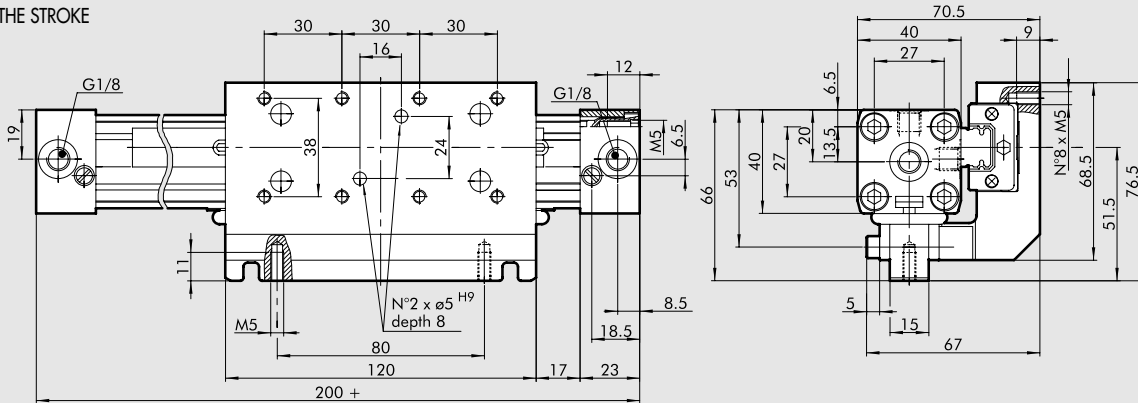
+ = ADD THE STROKE



275

DIMENSIONS Ø 25

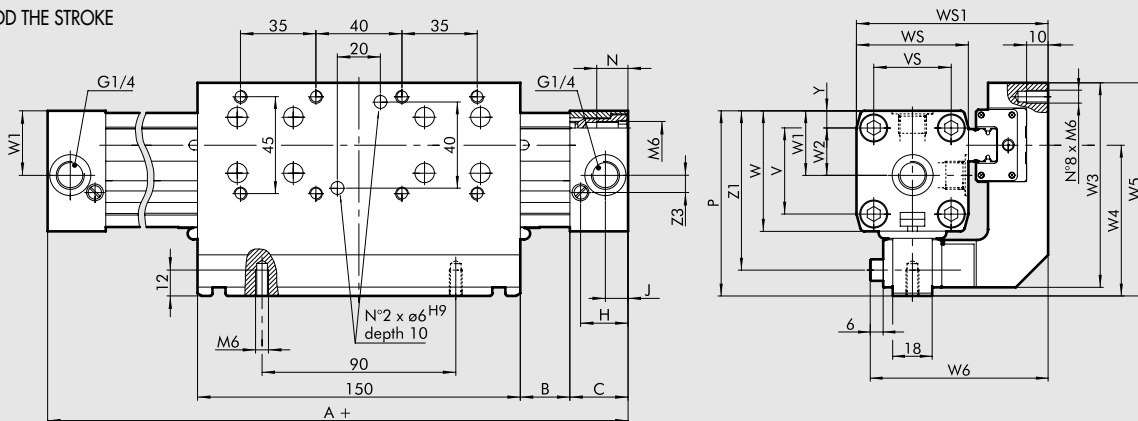
+ = ADD THE STROKE



275

DIMENSIONS Ø 32; Ø 40

+ = ADD THE STROKE

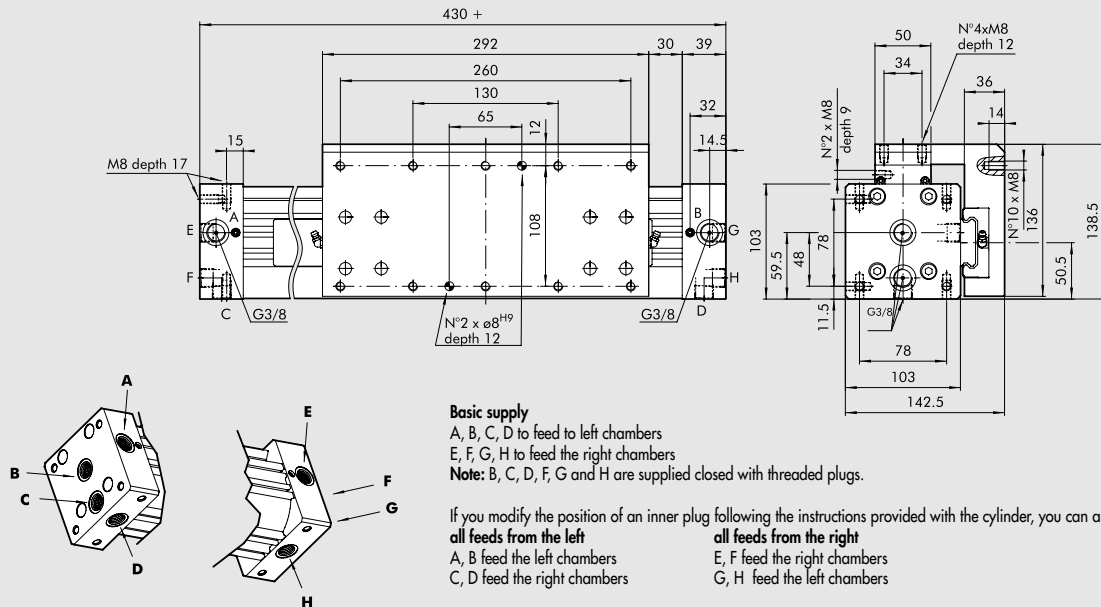


275

Ø	A	B	C	H	J	N	P	V	VS	W	WS	WS1	W1	W2	W3	W4	W5	W6	Y	Z1	Z3
32	250	23	27	22	10.5	14	86	40	36	56	52	85	30	22	95	70	99	78.5	8	74	8
40	300	45	30	24	15	17.5	97	54	54	69	72	104	36	27	98	73	102	88	9	85	11.8

DIMENSIONS Ø 63

HEAVY



Basic supply

A, B, C, D to feed to left chambers
E, F, G, H to feed the right chambers

Note: B, C, D, F, G and H are supplied closed with threaded plugs.

If you modify the position of an inner plug following the instructions provided with the cylinder, you can arrange:

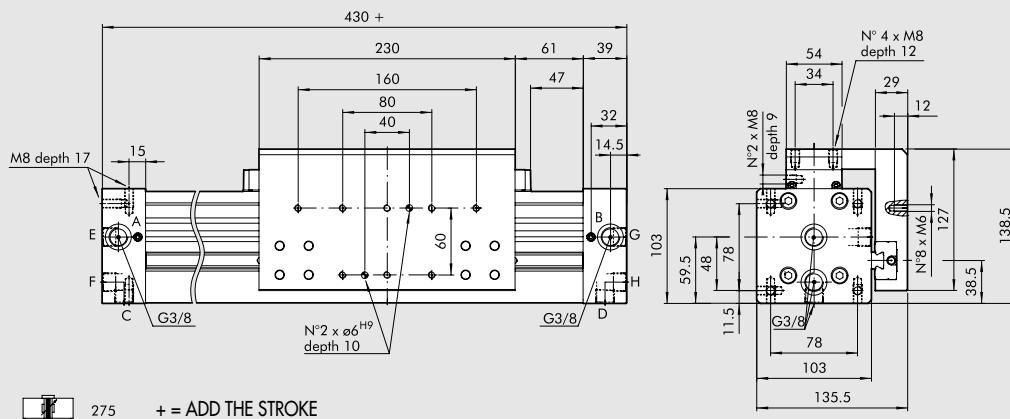
all feeds from the left

A, B feed the left chambers
C, D feed the right chambers

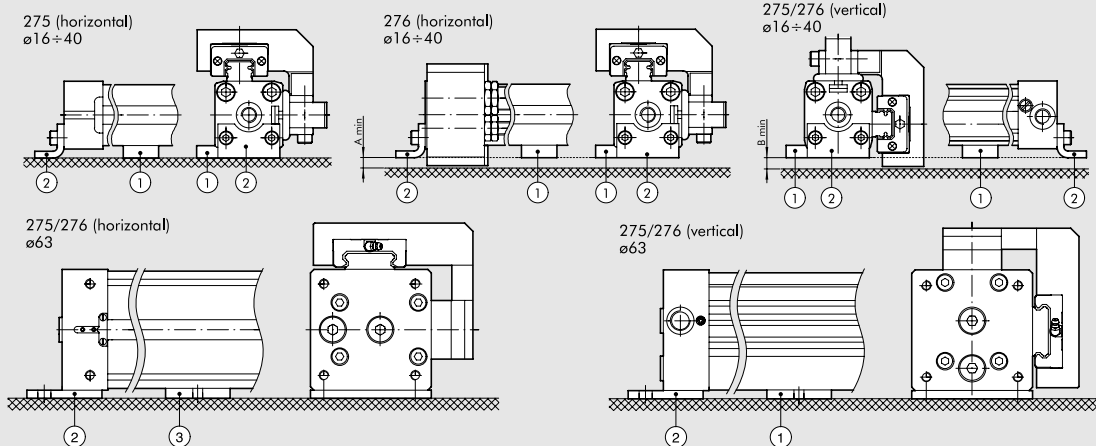
all feeds from the right

E, F feed the right chambers
G, H feed the left chambers

STANDARD

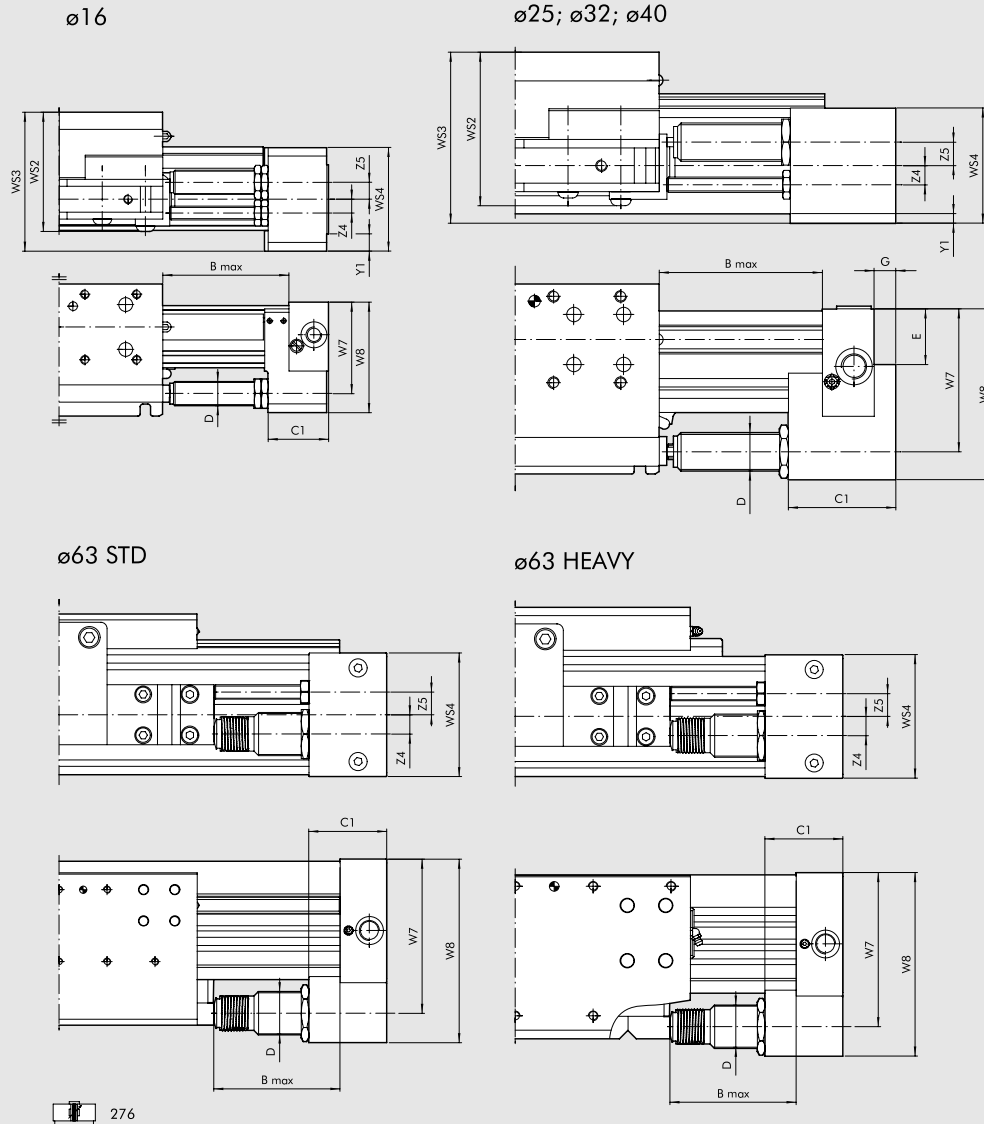


ASSEMBLY DIAGRAMS



Ø	A min	Horizontal layout		B min	Vertical layout	
		Intern. support code (1)	Leg code (2)		Intern. support code (1)	Leg code (2)
16	8	W0950164004	W0950167001	12	W0950164004	W0950167001
25	10	W0950254004	W0950257001	10	W0950254004	W0950257001
32	4	W0950324004	W0950328035	11	W0950324004	W0950327001
40	3	W0950404004	W0950407001	5	W0950404004	W0950407001
63	-	W0950637032	W0950637001	-	W0950637036	W0950637001

DIMENSION VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS Ø 16 to 63



 276

Ø	Version	B max	C1	D	E	G	W7	W8	WS2	WS3	WS4	Y1	Z4	Z5	Stroke	Max. cushioned force		Max. impact force [N]	Max. thrust force [N]
																Per stroke [J]	Per hour [J]		
16	-	50	22	M12x1	-	-	38	46	52	56	42	7.5	7	7.5	10.4	10	14125	1000	220
25	-	72	44	M14x1.5	17	9	53	67	71	80.5	50	5	8	9.8	16	26	34000	2800	530
32	-	90	56	M20x1.5	29	11	74	89	82.5	91	60	4	10	12.2	22	54	53700	3750	890
40	-	105	74	M25x1.5	32.8	14	89	108	92	108	75	1.5	12.5	12.7	25	90	70000	5500	1550
63	standard	105	65	M36x1.5	-	-	128.5	153	-	-	103	-	16	19	25	160	91000	11120	2220
63	heavy	105	65	M36x1.5	-	-	128.5	153	-	-	103	-	16	19	25	160	91000	11120	2220

For graphs to help choose shock absorbers see page 1-137

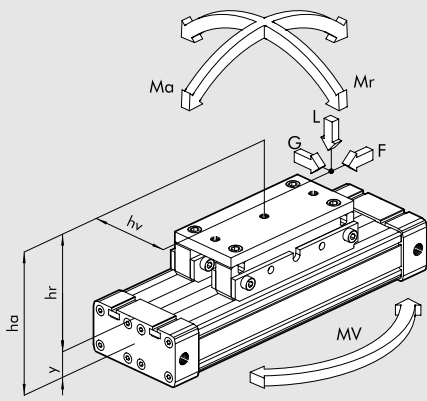
KEY TO CODES

CYL	2 7 TYPE	5	0	2 5 BORE	0 1 5 0 STROKE	C	N GASKETS
	27 Rodless cylinder	5 Double-acting cushioned magnetic with ball circulation guides 6 Double-acting cushioned magnetic with ball circulation guides + adjustable limit switch and shock absorbers	0 STD Magnetic S STD Non-magnetic ■ G STD No stick slip A HEAVY Magnetic ■ B HEAVY No stick slip C HEAVY Non-magnetic	16 25 32 40 63	Ø 16: 100 to 1350 mm Ø 25 - 32: 100 to 2300 mm Ø 40: 100 to 2250 mm Ø 63 std: 100 to 2100 mm Ø 63 heavy: 100 to 2650 mm		N NBR gasket ● V FKM/FPM gasket

■ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only ● For speed ≥ 1/m/s

RODLESS CYLINDER SERIES DOUBLE

DIMENSIONING - FORCES AND MOMENTS



Bore Ø	Actual force F at 6 bar [N]	Cushioning stroke [mm]	Max load L [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
2x16	200	15	240	8	2.4	1
2x25	480	21	600	30	8	6
2x32	820	26	900	60	16.5	10

N.B.: When the cylinder is subjected simultaneously to torque and force, it is advisable to keep to the following equations.

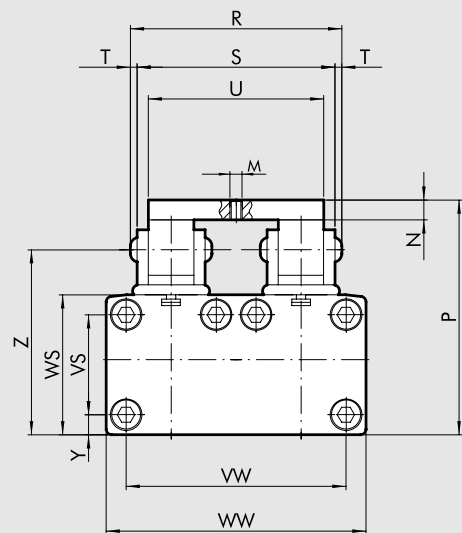
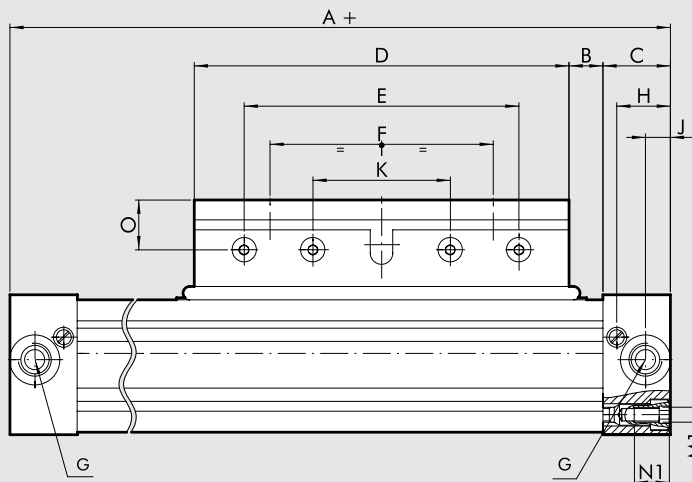
$$Ma = F \times ha \quad Mr = L \times hv + G \times hr \quad Mv = F \times hv$$

$$\frac{Mv}{Mv_{max}} \leq 1; \quad \frac{L}{L_{max}} \leq 1; \quad \frac{Ma}{Ma_{max}} + \frac{Mr}{Mr_{max}} + 0.22 \times \frac{Mv}{Mv_{max}} + 0.4 \frac{L}{L_{max}} \leq 1$$

For technical data see page 1-118
For the weights see page 1-9

DIMENSIONS OF RODLESS CYLINDER, DOUBLE SERIES

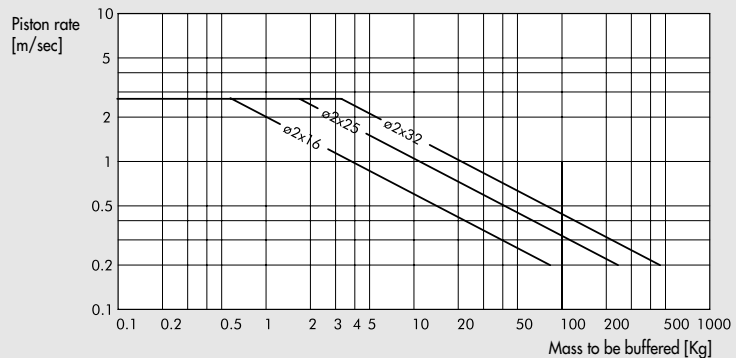
+ = ADD THE STROKE



Ø	A	B	C	D	E	F	G	H	J	K	M	N	M1	N1	O	P	R	S	T	U	VW	VS	WW	WS	Y	Z
2x16	130	12	15	76	64	48	M5	12	6.4	32	M5	10	M3	7	16	53.5	48	42	3	34	42	18	51	27	4.5	37.5
2x25	200	17	23	120	100	80	1/8	18.5	8.5	50	M6	15	M5	12	20	74	66	59	3.5	50	63	27	72	41	7	53.5
2x32	250	23	27	150	110	90	1/4	22.5	10.5	55	M6	12	M6	14	20	95	86.5	77.5	4.5	70	86	40	100	56	8	74

DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated. The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders. The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.

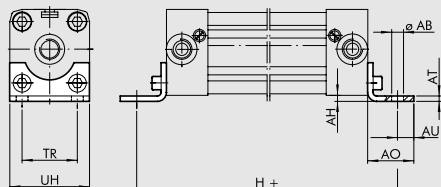


ACCESSORIES FOR RODLESS STD, GUIDE "V", WITH BALL RECIRCULATING GUIDE CYLINDERS



FOOT Ø 16; 25

+ = ADDED STROKE

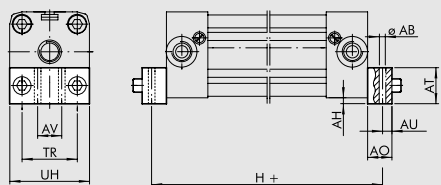


Code	Ø	ØAB	AH	AO	AT	AU	TR	UH	H	Weight [g]
W0950167001	16	3.6	1.5	14	1.6	4	18	26	150	10
W0950257001	25	5.5	2	22	2.5	6	27	40	232	32

Note: Individually packed with 2 screws

FOOT Ø 32; 40

+ = ADDED STROKE

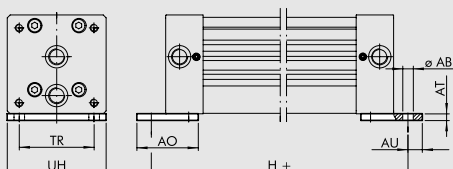


Code	Ø	ØAB	AH	AO	AT	AU	AV	TR	UH	H	Weight [g]
W0950327001	32	6.6	4	25	20	8	20	36	51	284	88
W0950407001	40	9	2	25	20	11.5	30	54	71	327	112

Note: Individually packed with 2 screws

FOOT Ø 63

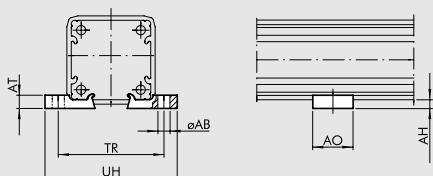
+ = ADDED STROKE



Code	Ø	ØAB	AT	AO	AU	TR	UH	H	Weight [g]
W0950637001	63	11	7	64	15	78	103	460	360

Note: Individually packed with 2 screws

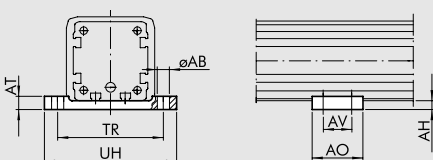
INTERMEDIATE FOOT Ø 16; 25 FOR STD AND GUIDE A "V"



Code	Ø	ØAB	AH	AO	AT	TR	UH	Weight [g]
W0950167031	16	5.5	3	20	5	41	53	4
W0950257031	25	5.5	4	20	6	48	60	6
0950254094*	25	5.5	4	20	6	48	60	6

Note: Individually packed.
* For the guide "V" version only

INTERMEDIATE FOOT Ø 32; 40 FOR STD AND GUIDE A "V"



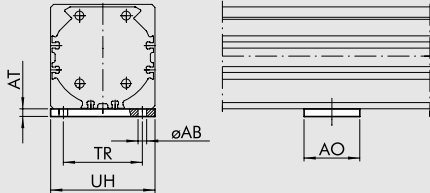
Code	Ø	ØAB	AH	AO	AT	AV	TR	UH	Weight [g]
W0950327032	32	6.5	5	55	8	40	61.5	73	72
W0950407032	40	6.5	7	60	8	45	70-75	85	104

Note: plate supplied complete with 4 screws, 4 fixing plates

INTERMEDIATE SUPPORT Ø 63 FOR VERSION STD, GUIDE "V" AND VERTICAL POSITION BALL RECIRCULATING

Code	Ø	ØAB	AH	AO	AT	TR	UH	Weight [g]
W0950637032	63	8.5	7.5	55	7.5	78	103	330

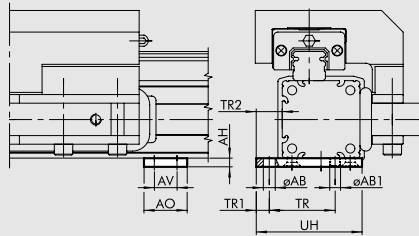
Note: plate supplied complete with 4 screws, 4 fixing plates



INTERMEDIATE SUPPORT Ø 16 to 25 FOR BALL RECIRCULATING

Code	Ø	ØAB	ØAB1	AH	AO	AV	TR	TR1	TR2	UH
W0950164004	16	3.5	M3	3	12	6	20	4	8	32.5
W0950254004	25	5.5	M5	4	20	10.5	30.5	6	12	49

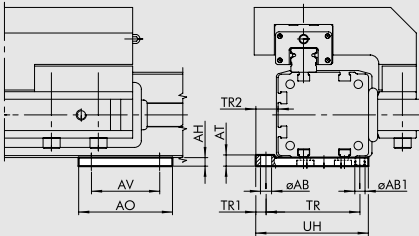
Note: Supplied complete with 4 screws



INTERMEDIATE SUPPORT Ø 32 to 40 FOR BALL RECIRCULATING

Code	Ø	ØAB	ØAB1	AH	AO	AT	AV	TR	TR1	TR2	UH
W0950324004	32	6.5	M6	5	55	5	40	55	6	13	66
W0950404004	40	6.5	M6	6.6	60	8	45	63	7.5	15	77

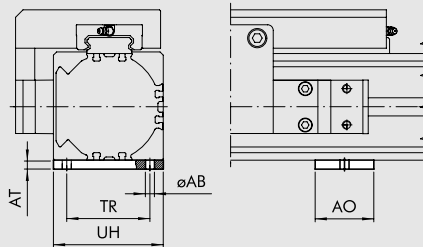
Note: Supplied complete with 4 screws, 4 plates.



INTERMEDIATE SUPPORT KIT Ø 63 FOR HORIZONTAL POSITION BALL RECIRCULATING

Code	Ø	ØAB	AH	AO	AT	TR	UH
W0950637036	63	8.5	7.5	55	8.5	78	103

Note: Supplied complete with 4 screws, 4 plates.

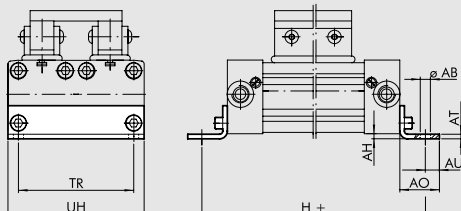


NOTES

ACCESSORIES FOR RODLESS CYLINDER SERIE DOUBLE

FOOT Ø 16; 25

+ = ADD STROKE

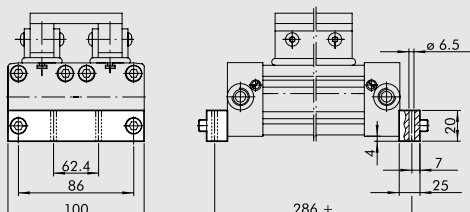


Code	Ø	ØAB	AH	AO	AT	AU	TR	UH	H	Weight [g]
W0950168001	2x16	3.6	1.5	14	1.6	4	42	51	150	18
W0950258001	2x25	5.5	2	22	2.5	6	63	72	232	54

Note: Individually packed complete with 2 screws

FOOT Ø 32

+ = ADD STROKE

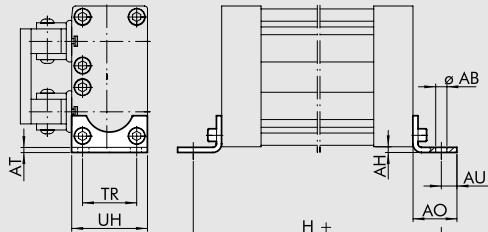


Code	Descrizione	Weight [g]
W0950328036	Foot DOUBLE Ø 32	156

Note: Individually packed complete with 2 screws

VERTICAL FOOT Ø 16; 25

+ = ADD STROKE

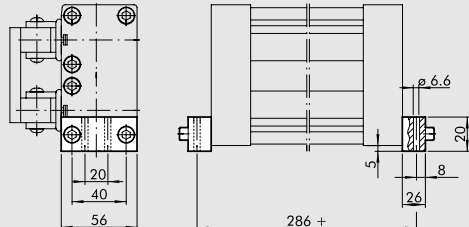


Code	Ø	ØAB	AH	AO	AT	AU	TR	UH	H	Weight [g]
W0950167001	2x16	3.6	1.5	14	1.6	4	18	26	150	10
W0950257001	2x25	5.5	4	22	2.5	6	27	40	232	32

Note: Individually packed complete with 2 screws

VERTICAL FOOT Ø 32

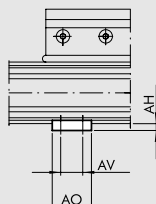
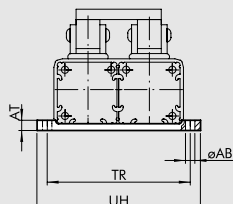
+ = ADD STROKE



Code	Description	Weight [g]
W0950328035	Vertical foot Ø 32	92

Note: Individually packed complete with 2 screws

INTERMEDIATE FOOT Ø 16 to 32



Code	Ø	ØAB	AH	AO	AT	AV	TR	UH	Weight [g]
W0950168037	2x16	3.5	3	12	6	6	60.5	64	16
W0950258037	2x25	5.5	4	20	6	10.5	84.5	96	34
W0950328037	2x32	6.5	5	55	8	40	111.5	123	96

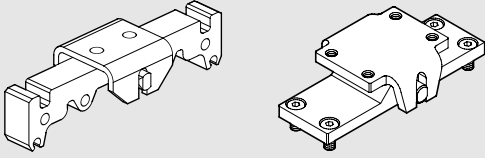
Note: Supplied complete with 8 screws, 8 fixing plates (plates for Ø 32 only)

ACCESSORIES FOR CONVERTING STD RODLESS CYLINDERS INTO SWING CYLINDERS

KIT TO TRANSFORM INTO SWING VERSION

Ø16 to 40

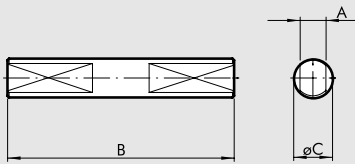
Ø63



Code	Ø	Weight [g]
W0950167035	16	34
W0950257035	25	118
W0950327035	32	450
W0950327035	40	450
W0950637035	63	810

Note: Ø 16 to 40: Supplied complete with 1 adaptor, 1 support, 1 pin, 1 bushing
 Ø 63: Supplied complete with 1 plate, 1 support, 1 pin, 2 bushings, 4 screws

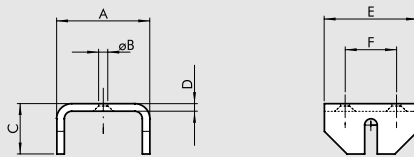
DRIVE PIN



Code	Ø	A	B	ØC	Weight [g]
W0950167034	16	2.9	28	5	6
W0950257034	25	5	42	8	16
W0950327034	32	8	70	12	52
W0950327034	40	8	70	12	52
W0950637034	63	10	82	14	100

Note: Individually packed

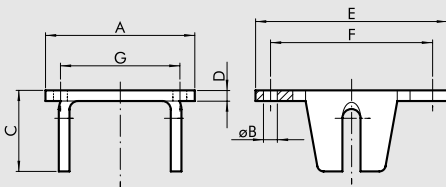
SWING SUPPORT Ø 16; 25



Code	Ø	A	ØB	C	D	E	F	Weight [g]
W0950167033	16	25	4.5	13	2	20	10	14
W0950257033	25	37	5.5	20	3	30	16	40

Note: Individually packed

SWING SUPPORT Ø 32; 40; 63

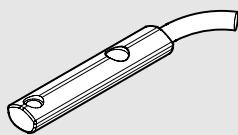


Code	Ø	A	ØB	C	D	E	F	G	Weight [g]
W0950327033	32	70	6.5	38	5	90	75	55	274
W0950327033	40	70	6.5	38	5	90	75	55	274
W0950637033	63	80	M8	32	8	80	65	37	400

Note: Individually packed

ACCESSORIES: SENSOR MAGNETIC

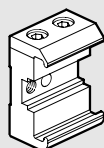
RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

For use on the rodless cylinder guide "V" Ø25 or when standard sensors do not detect the magnet, e.g. near metal masses. For technical data see page 1-288.

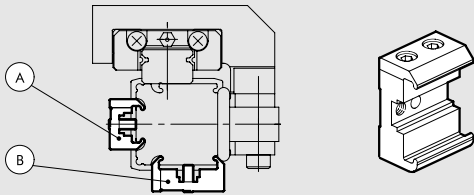
SENSOR SUPPORT Ø 16; 25



Code	Description
0950164001	Sensor support STD

Note: Supplied with 1 stud pin, 2 screws

SENSOR SUPPORT Ø 16 FOR RODLESS CYLINDER WITH BALL RECIRCULATING

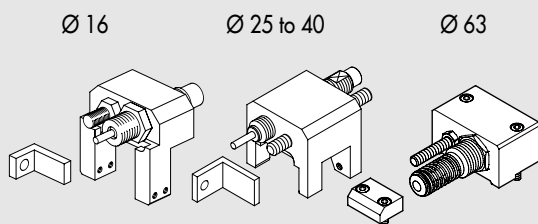


Code sensor support	Description sensor support	Type sensor support	Mounting on the carriage opposite side	Mounting on the guide opposite side
0950164003	Sensor support short	A	•	
0950164001	Sensor support std	B		•

Note: Supplied complete with 2 screws, 1 pin

ACCESSORIES: SHOCK ABSORBERS

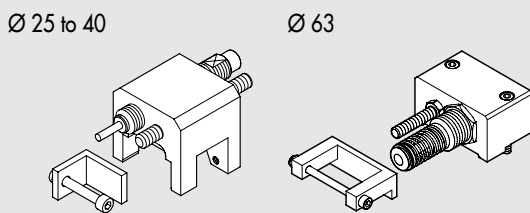
ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS KIT



Code	Description	Weight [g]
0950164002	Rodless cylinder limit switch and shock absorbers Ø 16	125
0950254002	Rodless cylinder limit switch and shock absorbers Ø 25	260
0950324002	Rodless cylinder limit switch and shock absorbers Ø 32	460
0950404002	Rodless cylinder limit switch and shock absorbers Ø 40	730
0950634002	Rodless cylinder limit switch and shock absorbers Ø 63	1620

Note: Supplied complete with 1 shock absorber support, 1 standard shock absorber, 1 shock absorber nut, 1 limit switch grub screw, 1 grub screw nut (2 for Ø 63), 1 bracket, 1 bracket screw, 4 locking grub screws (for Ø 16 and Ø 25), 4 locking plates and 4 screws (for Ø 32 and Ø 40)

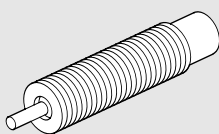
ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS KIT FOR RODLESS CYLINDER WITH GUIDE "V"



Code	Description	Weight [g]
0950254004	Rodless cylinder limit switch and shock absorbers Ø 25	260
0950324004	Rodless cylinder limit switch and shock absorbers Ø 32	460
0950404004	Rodless cylinder limit switch and shock absorbers Ø 40	730
0950634004	Rodless cylinder limit switch and shock absorbers Ø 63	1620

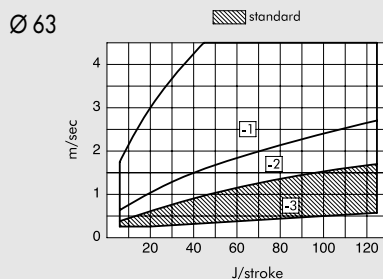
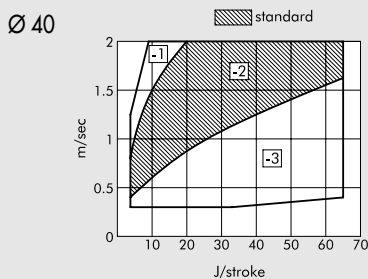
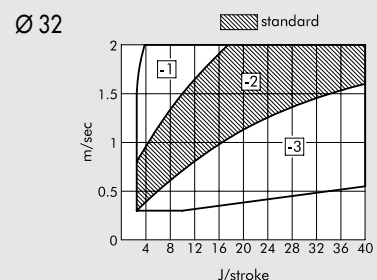
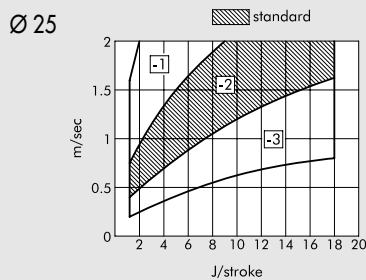
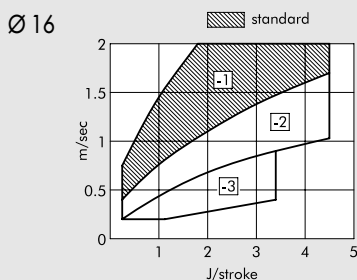
Note: Supplied complete with 1 shock absorber support, 1 standard shock absorber, 1 shock absorber nut, 1 limit switch grub screw, 1 grub screw nut (2 for Ø 63), 1 bracket, 1 bracket screw, 4 locking grub screws (for Ø 25), 4 locking plates and 4 screws (for Ø 32 and Ø 40)

SHOCK ABSORBERS



Code	Description	Ø
0950004003	Shock absorbers PR015 MF1 + nut M12x1	16
0950004004	Shock absorbers PR025 MC2 + nut M14x1.5	25
0950004005	Shock absorbers PR050 MC2 + nut M20x1.5	32
0950004006	Shock absorbers PR100 MF2 + nut M25x1.5	40
0950004007	Shock absorbers PR0125 MF3 + nut M36x1.5	63

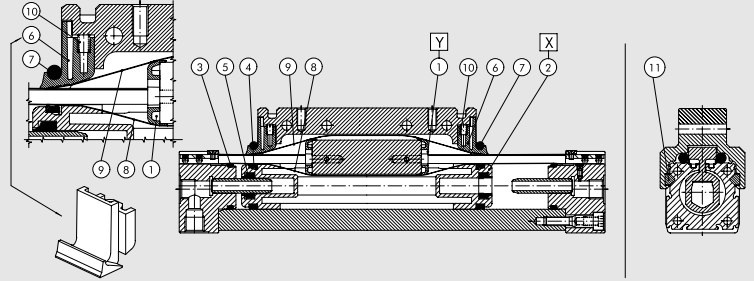
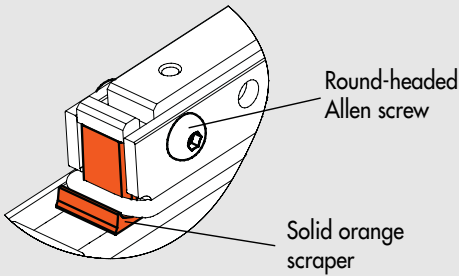
GRAPHS TO HELP CHOOSE THE RIGHT SHOCK ABSORBERS



The dotted areas indicate that the SHOCK ABSORBERS is supplied standard. Other options can be selected depending on the speed [m/sec] and the maximum work force [J/stroke] to dissipate at each stroke. Refer to the diagrams above to select the correct option.

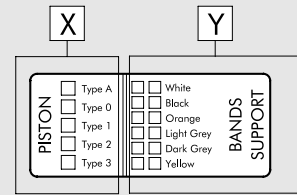
SPARE PARTS FOR STD RODLESS CYLINDERS, GUIDE "V", BALL RECIRCULATING GUIDE, DOUBLE

"LAST RELEASE" CYLINDER



- ① Bands support Kit
- ② Piston kit
- ③ ④ ⑤ ⑥ ⑦ ⑩ NBR gaskets Kit (FKM/FPM for ⑦)
- ③ ④ ⑤ ⑥ ⑦ ⑩ FKM/FPM gaskets Kit
- ⑧ ⑨ Bands Kit (inner/outer)
- ⑪ "V" guide plate kit

Spare parts label on one cylinder side



BANDS SUPPORT KIT POS 1 (Y)

Ø	Code White	Code Black	Code Orange	Code Light grey	Code Dark grey	Code Yellow
16	0090165080	0090165081	0090165082	0090165083	0090165084	0090165085
25	0090255080	0090255081	0090255082	0090255083	0090255084	0090255085
32	0090325080	0090325081	0090325082	0090325083	0090325084	0090325085
40	0090405080	0090405081	0090405082	0090405083	0090405084	0090405085
63	*0090635080	*0090635081	*0090635082	*0090635083	*0090635084	*0090635085

* For Ø 63, the kit includes a strip support and a shim in the colour ordered
Therefore, two kits must be ordered for each cylinder

BANDS KIT (INNER AND OUTER) POS 8-9

Ø	Code
16	0090166...
25	0090256...
32	0090326...
40	0090406...
63	0090636...

Complete the code with the 4 figure cylinder stroke

"V" GUIDE PLATE KIT POS 11

Ø	Code
25	0090255060
32	0090325060
40	0090325060
63	0090635060

PISTON KIT POS 2 (X)

Ø	Code Type 0 (0 rings)	Code Type 1 (1 rings)	Code Type 2 (2 rings)	Code Type 3 (3 rings)	Code Type A (4 rings)
16	0090165015	0090165016	0090165017	0090165018	-
25	0090255015	0090255016	0090255017	0090255018	0090255019
32	0090325015	0090325016	0090325017	0090325018	0090325019
40	0090405015	0090405016	0090405017	0090405018	-
63	0090635015	0090635016	0090635017	0090635018	-

NBR GASKET KIT POS 3-4-5-6-7-10

Ø	Code
16	0090165022
25	0090255022
32	0090325022
40	0090405022
63	0090635022

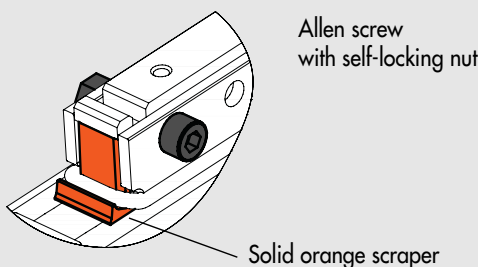
FKM/FPM GASKET KIT POS 3-4-5-6-7-10

Ø	Code
16	0090165023
25	0090255023
32	0090325023
40	0090405023
63	0090635023

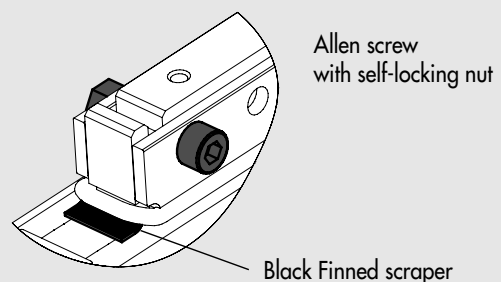
NOTES

If the ends of the carriage appear as below indicated, please contact our commercial department for the spare parts

"INTERMEDIATE RELEASE"



"OLD RELEASE"



RODLESS CYLINDER SERIES PU

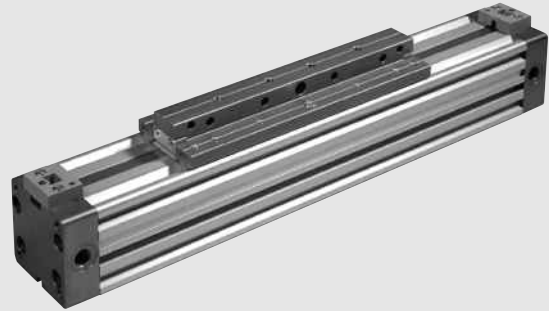
Series PU rodless cylinders have an internal strip for longitudinal tightness made of polyurethane (PU) with a harmonic steel wire core. This solution gives excellent air tightness values. It is particularly suitable for high-speed and highly cyclical applications, even with long strokes.

The external strip, which merely provides protection against foreign bodies entry, is made of harmonic steel. The anodised aluminium cylinder liner has a T-slot on either side for housing the retracting sensors.

Cylinder control solenoid valves can also be housed in these slots and secured by means of plates and screws (see General Catalogue page 1-46). There are plastic anti-wear guide shoes on either side of the carriage to increase the load capacity. They engage V-slots in the cylinder liner.

All the cylinders incorporate adjustable pneumatic cushioning.

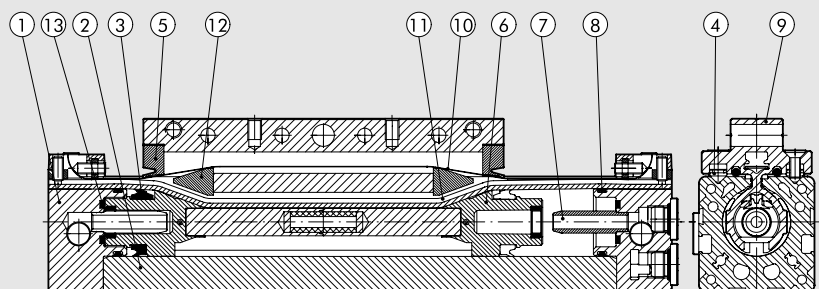
One version has hydraulic decelerators + adjustable limit switches. These can also be added at a later stage by purchasing the relevant kit. The balanced drive version avoids having to transmit transverse torques and forces to the carriage whenever the load is supported by guides outside the cylinder.



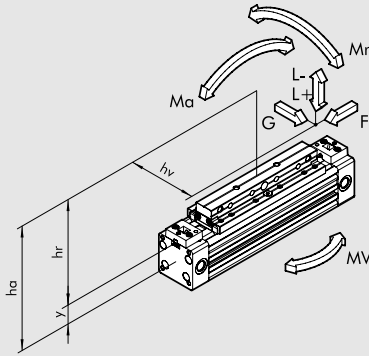
TECHNICAL DATA		NBR
Operating pressure	bar	1 to 8
	MPa	0.1 to 0.8
	psi	14.5 to 116
Temperature range	°C	-10 to +80
	°F	14 to +176
Fluid		50 µm unlubricated filtered air Lubrication, if used, must be continuous
Bores	mm	25, 32, 40, 50
Type of construction		Double-acting rodless cylinder with direct transmission system
Strokes		from 100 to 5700 mm with 1mm interval
Recommended speeds	m/s	< 2
Max. speed with decelerators	m/s	< 2
Weight		See page 1-9
Notes		For speeds lower than 0.2 m / s to prevent surging, use the version No stick-slip and non-lubricated air

COMPONENTS

- ① CYLINDER HEAD: anodized aluminium alloy
- ② BARREL: profiled anodized aluminium alloy
- ③ PISTON GASKET: polyurethane
- ④ V-SHAPED GUIDE SHOE: Hostaform®
- ⑤ DUST SCRAPER: Hostaform®
- ⑥ PISTON: Hostaform®
- ⑦ CUSHIONING CONE: anodized aluminium alloy
- ⑧ STATIC O-RINGS: NBR
- ⑨ SLIDE: anodized aluminium alloy
- ⑩ OUTER STRIP: stainless steel
- ⑪ INTERNAL STRAP: polyurethane + steel strands
- ⑫ DIRECTION CHANGE: Hostaform®
- ⑬ BUFFER: NBR



DIMENSIONING - FORCE AND TORQUE



Bore Y	Centre Distance Y	Cushioning stroke [mm]	Actual Force F at 6 bar [N]	G [N]	Max. load L+ [N]	Max. load L- [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
25	16.5	20	250	350	480	350	22	5	10
32	20.1	24	420	450	650	450	40	10	20
40	25.3	33	640	750	900	750	70	26	35
50	30.4	39	1000	900	1100	900	90	32	45

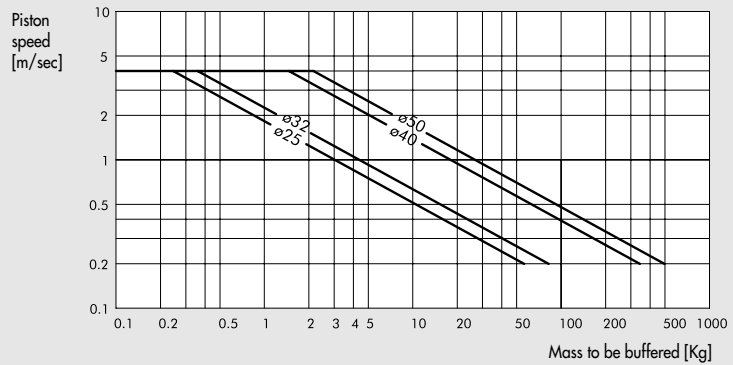
N.B.: When the cylinder is subjected simultaneously to torque and force, it is advisable to keep to the following equations.

$$Ma = F \times ha \quad Mr = L \times hv + G \times hr \quad Mv = F \times hv$$

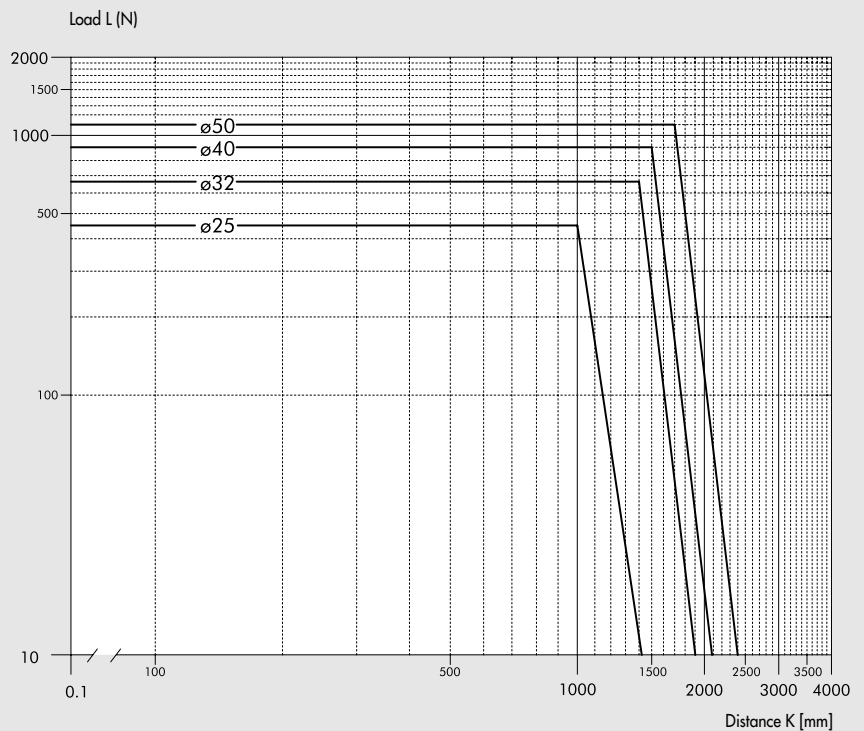
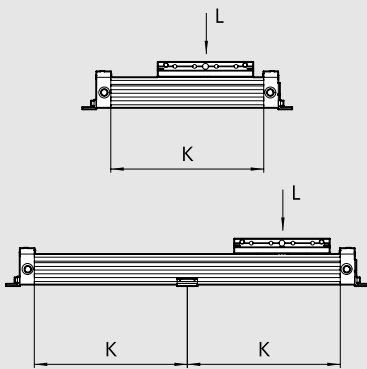
$$\frac{Mv}{Mv_{max}} \leq 1; \quad \frac{L}{L_{max}} \leq 1; \quad \frac{Ma}{Ma_{max}} + \frac{Mr}{Mr_{max}} + 0.22 \times \frac{Mv}{Mv_{max}} + 0.4 \times \frac{L}{L_{max}} \leq 1$$

DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

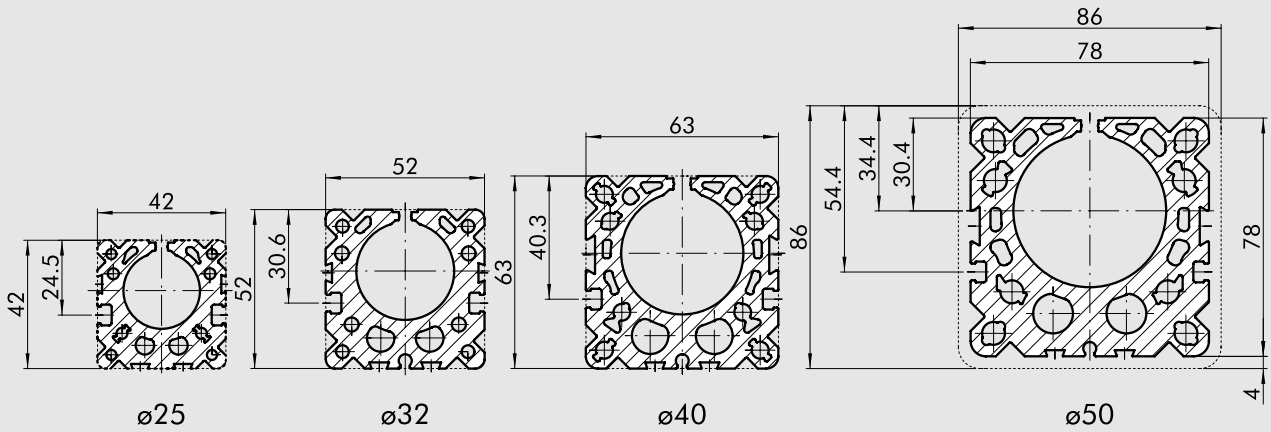
For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated. The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders. The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



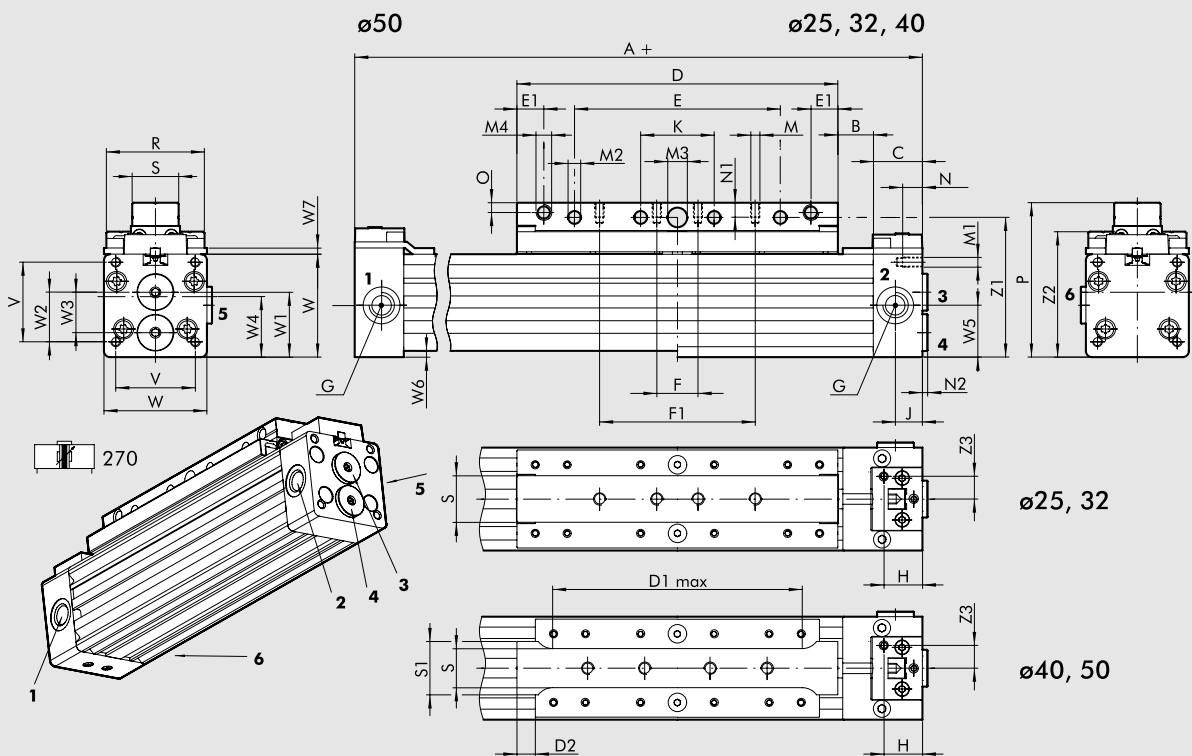
MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS



BARREL CROSS SECTION



DIMENSIONS



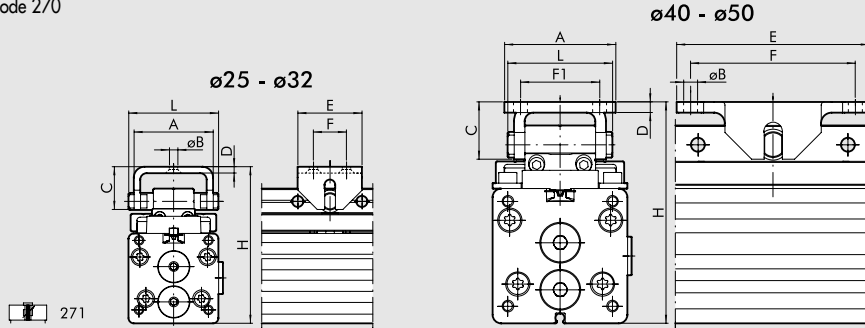
1 and 6 feed the left-hand chamber from the left side
 4 feeds the left-hand chamber from the right side
 2, 3 and 5 feed the right-hand chamber from the right side
 NOTE: 3, 4, 5 and 6 are closed with threaded caps

Ø	A	B	C	D	D1 max	D2	E	E1	F	F1	G	H	J	K	M	M1	M2	M3 ^{H10}	M4	N	N1	N2	O	P	R	S	S1	V	W	W1	W2
25	200	14.5	20	131	-	-	84	11	50	-	G1/8	15.7	11	30	M5	M4	5.2	8	M6	13	7.5	2.1	4	63	40	19	-	32.5	42	26.5	20.3
32	250	19.5	20	171	-	-	124	11	30	100	G1/8	15.7	11	50	M5	M5	5.2	8	M6	13.5	7.5	2.1	4	73	48	19	-	40	52	31.2	24.3
40	300	19.8	23	214.5	168	10	150	5.2	40	130	G1/4	18	12.5	70	M6	M5	6.5	10	M5	15	11	2	5.5	92.5	60	21	33	49	63	37.7	29.7
50	350	19.9	23	264.3	198	10	170	6.2	50	150	G1/4	18	12.5	80	M8	M6	8.5	12	M6	16	12.5	2	6.5	115	74	24	42	72	86	53.4	46.4

Ø	W3	W4	W5	W6	W7	Z1	Z2	Z3
25	16.5	25.5	21.2	-	2.5	57	51.2	9.3
32	19	31.9	27	-	2.5	67	61	9.3
40	22	37.7	31.5	-	2.5	83.5	75.7	11
50	31.8	51.6	43	4	2.5	106	97	11

RODLESS CYLINDER WITH SWING CARRIAGE

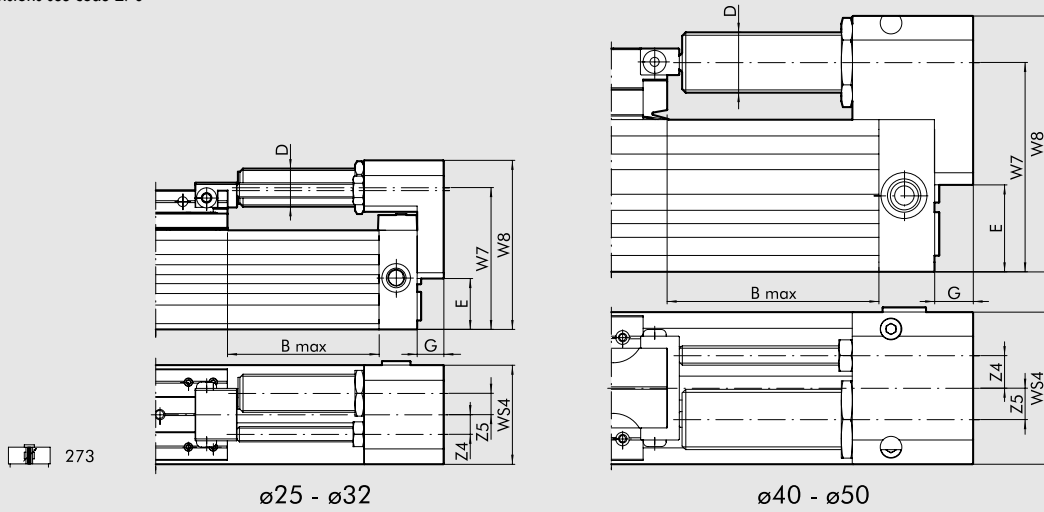
NOTE: For other dimensions see code 270



Ø	A	ØB	C	D	E	F	F1	H	L
25	37	5.5	20	3	30	16	-	73-75	42
32	37	5.5	20	3	30	16	-	83-85	42
40	52	6.5	26.8	5	90	77	37	103.5-105.5	49
50	52	6.5	26.8	5	90	77	37	125.3-128.3	49

DIMENSIONS VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS

NOTE: For other dimensions see code 270



Ø	B Max	D	E	G	W7	W8	WS4	Z4	Z5	Stroke	Max. cushioned force		Max. impact force [N]	Max. thrust force [N]
											For stroke [J]	For hour [J]		
25	50	M14x1.5	21.5	12	61.5	72	42	9.2	6	16	26	34000	2800	530
32	75	M20x1.5	26.7	14	74.4	88.7	52	10.3	11.2	22	54	53700	3750	890
40	88	M25x1.5	36	16	86.7	106	63	13.5	13	25	90	70000	5500	1550
50	82	M25x1.5	49	20	108.5	129	86	17.5	9	25	90	70000	5500	1550

For graphs to help choose shock absorbers see page 1-144

KEY TO CODES

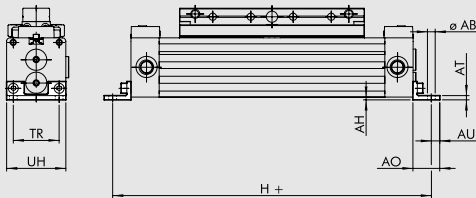
CYL	27 TYPE	0	0	2 5 BORE	0 100 STROKE	C	P GASKETS
	27 Rodless cylinder	0 Double acting cushioned magnetic 1 Double acting with swing carriage 3 Double acting + adjustable limit switch and shock absorbers	3 Magnetic 4 No stick slip 5 Non-magnetic	25 32 40 50	from 100 to 5700 mm	C	P Polyurethane gaskets

■ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only.

ACCESSORIES FOR RODLESS CYLINDER SERIES PU

FOOT

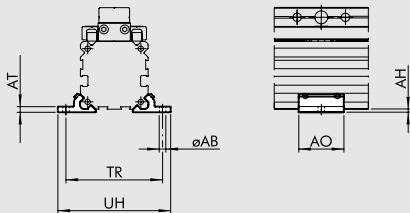
+ = ADDED STROKE



Code	Ø	ØAB	AH	AO	AT	AU	TR	UH	H	Weight [g]
0950254041	25	5.5	2	19	3	6	32.5	42	226	30
0950324041	32	6.6	3	24	4	7	38	52	284	60
0950404041	40	6.6	3	26	5	8.5	45	63	335	90
0950504041	50	9	6-10	36	6	11	65	86	400	203

Note: Individually packed with 2 screws

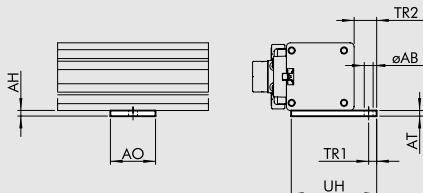
INTERMEDIATE FOOT



Code	Ø	ØAB	AH	AO	AT	TR	UH	Weight [g]
W0950257038	25	5.5	2	28	3.5	60	70	16
W0950327038	32	6.6	3	33	4	73	85	30
W0950407038	40	9	3	38	4.5	90	105	42
W0950507038	50	9	10	43	12	106	122	121

Nota: 2 brackets and 4 grub screws per pack (Ø 25-32-40); 2 brackets, 4 grub screws and 2 plates for pack (Ø 50)

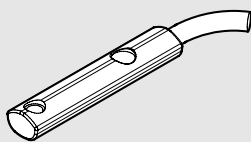
SIDE INTERMEDIATE FOOT



Code	Ø	ØAB	AH	AO	AT	TR1	TR2	UH	Weight [g]
0950254051	25	5.5	3.5	28	3.5	5	14	57.5	20
0950324051	32	5.5	4	40	4	5	12	61	32
0950404051	40	7	4	40	4	8	16	75	36
0950504051	50	7	10	40	10	8	19	90	101

Nota: 1 bracket, 2 screws and 2 plates per pack

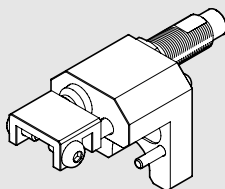
RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
For technical data see page 1-288

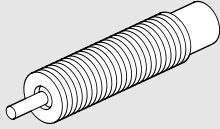
ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS KIT



Code	Ø	Description	Weight [g]
0950254013	25	Rodless cylinder limit switch and shock absorbers Ø 25 series PU	220
0950324013	32	Rodless cylinder limit switch and shock absorbers Ø 32 series PU	420
0950404013	40	Rodless cylinder limit switch and shock absorbers Ø 40 series PU	675
0950504013	50	Rodless cylinder limit switch and shock absorbers Ø 50 series PU	967

Note: supplied complete with 1 decelerator bracket, 1 standard decelerator, 1 decelerator nut, 1 limit switch grub screw, 1 limit switch grub screw nut, 1 limit switch block, 2 block screws and 2 decelerator bracket screws (nr 4 decelerator bracket screw for Ø 40 and Ø 50)

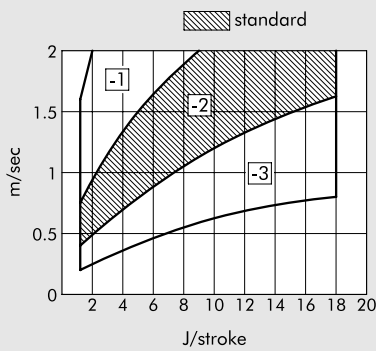
SHOCK ABSORBERS



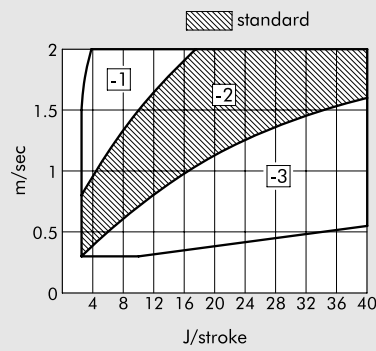
Code	Ø	Description
0950004004	25	Shock absorbers PRO25 MC2 + nut M14x1.5
0950004005	32	Shock absorbers PRO50 MC2 + nut M20x1.5
0950004006	40-50	Shock absorbers PRO100 MF2 + nut M25x1.5

GRAPHS TO HELP CHOOSE THE RIGHT SHOCK ABSORBERS

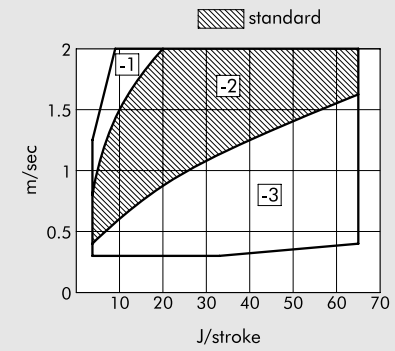
Ø 25



Ø 32

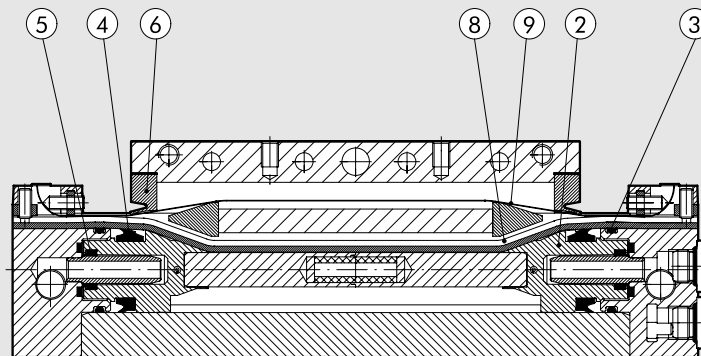


Ø 40-50



The dotted areas indicate that the SHOCK ABSORBERS is supplied standard.
 Other options can be selected depending on the speed [m/sec] and the maximum work force [J/stroke] to dissipate at each stroke.
 Refer to the diagrams above to select the correct option.

SPARE PARTS FOR RODLESS CYLINDER SERIES PU



**DUST SCRAPER KIT
POS 6**

Code	Ø
0090255025P	25
0090255032P	32
0090405025P	40
0090505025P	50

Note: 2 dust scrapers

**GASKET KIT
POS 3-4-5**

Code	Ø
0090255024P	25
0090325024P	32
0090405024P	40
0090505024P	50

Note: 2 gasket for position

**BANDS KIT
(inner and outer) POS 8-9**

Code	Ø
0090256 - - - - P	25
0090326 - - - - P	32
0090406 - - - - P	40
0090506 - - - - P	50

Complete the code with the 4-figure cylinder stroke

**PISTON KIT
POS 2**

Code	Ø
0090255009P	25
0090325009P	32
0090405009P	40
0090505009P	50

Note: 2 pistons

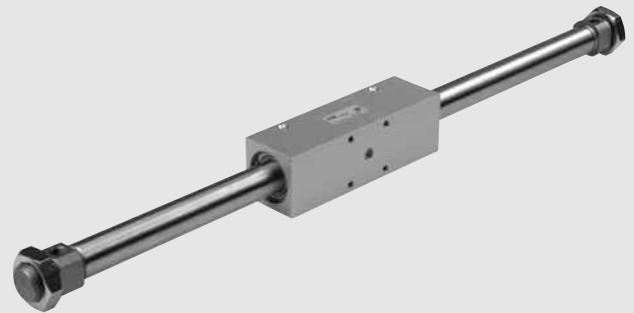
NOTES

NOTES

NOTES

RODLESS CYLINDER WITH MAGNETIC SLIDING SERIES MAGNETIC SLIDE

The magnetic-slide rodless cylinder operates pneumatically and is equipped with a piston and a slide with magnets. The slide runs freely along the liner, following the piston movements, thanks to the magnetic coupling force between the two. If an axial force exceeding the magnetic coupling force is applied to the slide, it disengages. It is therefore important to operate within the pressure, force and speed ranges shown in the catalogue. The load is fixed onto the slide using four threaded holes. The cylinder is secured at the ends by means of nuts, flanges and brackets. This solution is recommended when there is limited space for assembly, there must be no air leaks or impurities must be prevented from entering. Available with three bores \varnothing 16-20-25, in the basic or swinging versions, with adjustable pneumatic cushioning or non-adjustable cushioning. Designed for use with magnetic sensors.

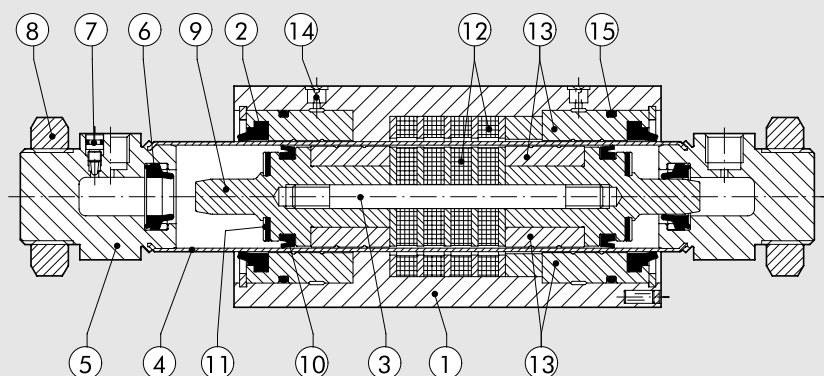


N.B.: We always suggest to use flow microregulators. During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.

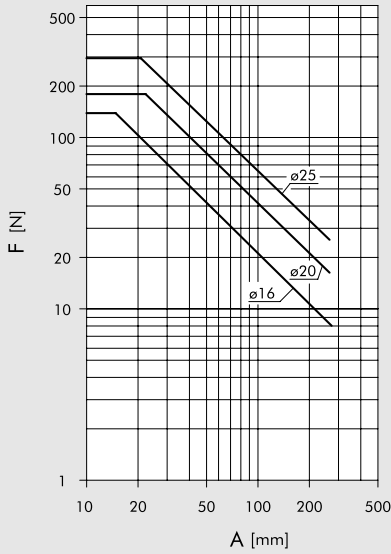
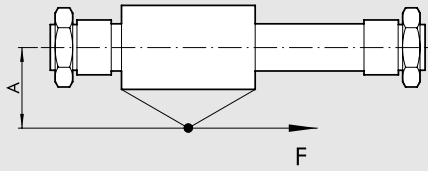
TECHNICAL DATA		\varnothing 16	\varnothing 20	\varnothing 25
Operating pressure	bar		2 to 7	
	MPa		0.2 to 0.7	
Temperature range	psi		29 to 101	
	$^{\circ}$ C		-10 to 60	
	$^{\circ}$ F		14 to 140	
Fluid		Unlubricated 50 μ m filtered air. Lubrication, if used, must be continuous		
Bores	mm	16; 20; 25		
Strokes	mm	from 10 to 1000 with 1 intervals		
Versions		Magnetic uncushioned/cushioned		
		Swinging magnet uncushioned/cushioned		
Design		Double-acting rodless cylinder, with magnetic coupling transmission system		
Position sensing		Magnet for limit switch sensor		
Fixing		Hex nuts (supplied standard) - Legs - Flanges		
Theoretic force at 6 bar	N	118	185	288
Magnetic coupling force (static condition)	N	200	300	500
Max speed	m/s	0.4	0.4	0.4
Weight		See page 1-9		
Notes		Lubricate the slide every 2000 km or once a year, through the lubricators		

COMPONENTS

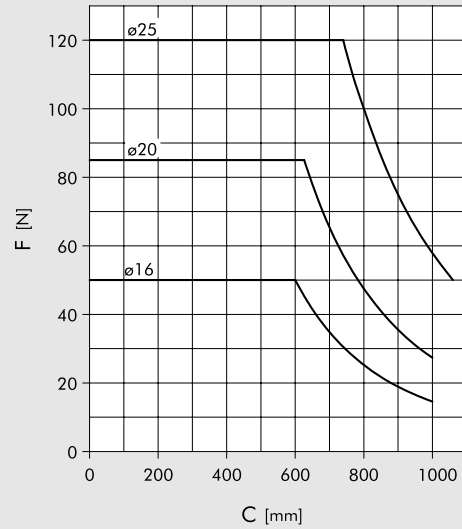
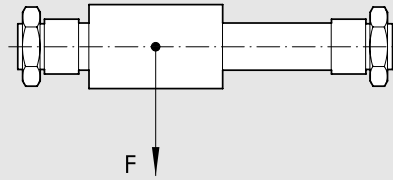
- ① SLIDE: anodized aluminium alloy
- ② WIPER RING: polyurethane
- ③ TIE ROD: stainless steel, thick-chromed
- ④ BARREL: AISI 304 stainless steel
- ⑤ HEAD: anodized aluminium alloy
- ⑥ CUSHIONING GASKET: NBR
- ⑦ NEEDLE: OT 58 with needle-out movement safety system, even when fully open
- ⑧ HEAD NUT: OT 58 nickel-plated
- ⑨ HALF-PISTON: aluminium alloy
- ⑩ PISTON GASKET: polyurethane
- ⑪ BUFFER: NBR
- ⑫ INT/EXT MAGNETS: neodymium
- ⑬ INT/EXT GUIDES: thermoplastic resin with lubricating additive
- ⑭ GREASE NIPPLE: steel
- ⑮ Static O-rings: NBR



ADMISSIBLE AXIAL FORCE "F"
AS A FUNCTION OF THE LEVER ARM "A"

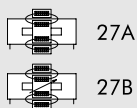
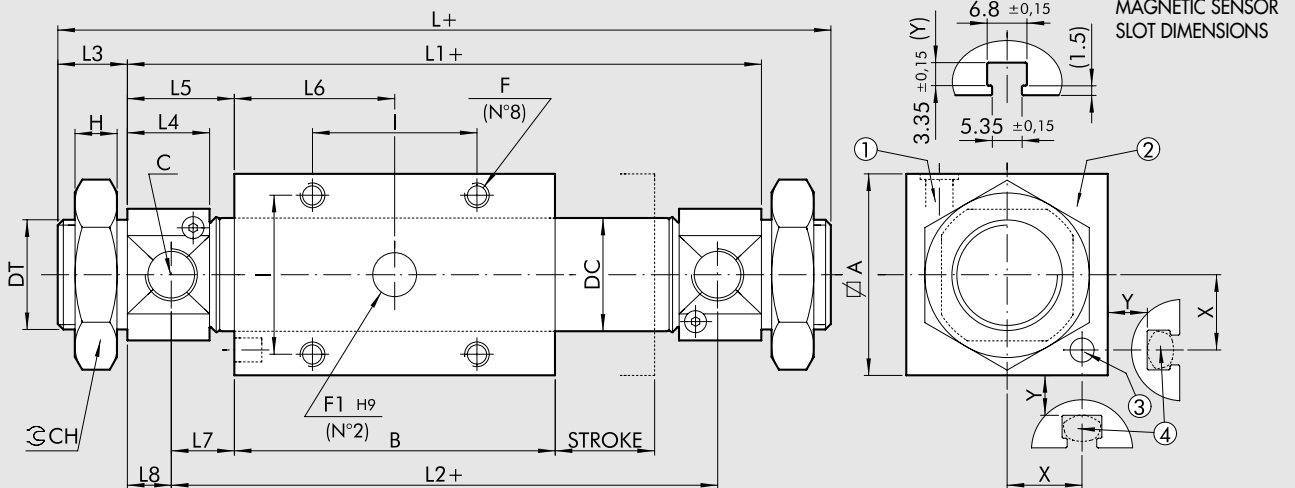


ADMISSIBLE AXIAL FORCE "F"
AS A FUNCTION OF THE STROKE "C"



DIMENSIONS

+ = ADD STROKE



- ① Grease nipple
- ② External cursor, 360° adjustment
- ③ Sensor magnet
- ④ Position for magnetic sensors
(N.B. customer must provide supports)

Ø	A	B	C	DC	DT	F	F1	I	L	L1	L2	L3	L4	L5	L6	L7	L8	CH	H	X	Y
16	35	125	M5	17.3	M16x1.5	M5x7	8x3	26	205	181	169	12	10	28	62.5	22	6	24	8	14	9
20	42	135	G1/8	21.3	M22x1.5	M5x10	8x3	32	217	185	169	16	15.5	25	67.5	17	8	32	7	17.5	9
25	50	150	G1/8	26.5	M22x1.5	M6x11	10x4	36	238	206	188	16	17.1	28	75	19	9	32	7	21.5	9

KEY TO CODES

CYL	27 TYPE	A VERSION	0	1 6 BORE	0 0 5 0 STROKE	X MATERIAL	P GASKETS
	27 Rodless cylinder	A Magnetic sliding DEM B Magnetic sliding DEMA C Magnetic sliding swinging DEM D Magnetic sliding swinging DEMA	0 Magnetic	16 20 25	For the maximum suppliable strokes, look at the technical data	X Standard	P Polyurethane

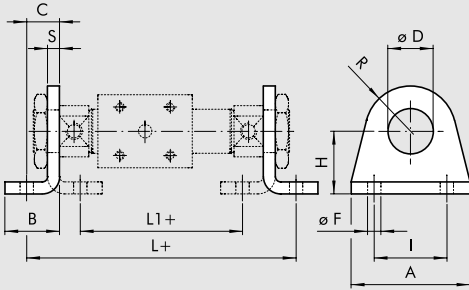
DEM: Magnetic double-acting (non-cushioned)
 DEMA: Magnetic double-acting (cushioned)

NOTES

ACCESSORIES FOR RODLESS CYLINDER WITH MAGNETIC SLIDING: FIXING

FOOT

+ = ADD STROKE

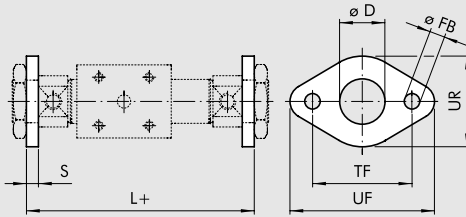


Code	Ø	D	A	B	C	H ±0.3	R	F ±0.2	I ±0.1	L	L1	S	Weight [g]
0950164040	16	16	42	20	14	27	13	5.5	32	209	161	4	50
0950204040	20	22	54	25	17	30	20	6.5	40	219	161	5	105
0950204040	25	22	54	25	17	30	20	6.5	40	240	182	5	105

Note: individually pocket

FLANGIA MOD. C

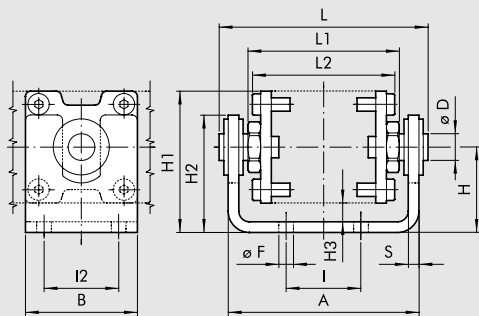
+ = ADD STROKE



Code	Ø	D	FB H13	TF ±14	UF	UR	L	S	Weight [g]
W0950120002	16	16	5.5	40	52	30	189	4	26
W0950200002	20	22	6.5	50	66	40	195	5	52
W0950200002	25	22	6.5	50	66	40	216	5	52

Note: individually pocket

KIT FOR SWING VERSION



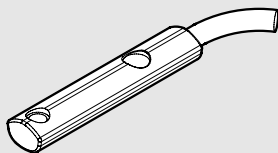
Code	Ø	A	B	D	F ±0.1	H	H1	H2	H3	I	I2	L	L1	L2	S	Weight [g]
0950164050	16	67	40	10	5.5	28.5	46	40	7	26	26	73.5	53	52	4	288
0950204050	20	74	42	10	5.5	32	53	43	7	32	32	80.5	60	59	4	345
0950254050	25	87	50	12	6.5	38	63	50	8	36	36	96.5	68	68	5	576

Note: individually pocket. Supplied with 8 screws

The swinging version kit can be used to avoid bending moments and lateral loads on the slide. It can also be used to compensate for misalignments with respect to the load guide. Max alignment error ±1mm.

ACCESSORIES: MAGNETIC SENSOR

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses. For technical data see page 1-288. Note: Individually packed.

STAINLESS STEEL ISO 6432 MINI-CYLINDER

ISO 6432 stainless steel micro-cylinders are available in various versions with a wide range of accessories

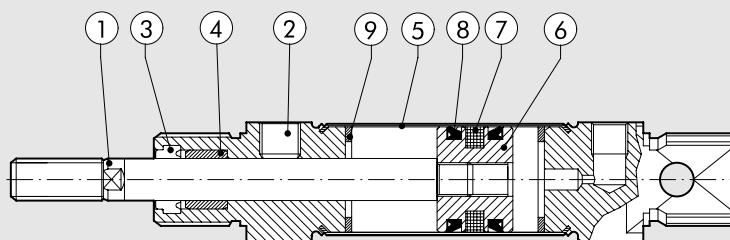
- with or without magnet execution
- double-acting - single or through-rod
- gaskets: Polyurethane or FKM/FPM (for high temperatures)
- fixing accessories



TECHNICAL DATA		POLYURETHANE	FKM/FPM
Max operating pressure	bar	10	
	MPa	1	
Temperature range	°C	-10 to +80	-10 to +150 (non-magnetic cylinders)
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	16; 20; 25	
Design		Chamfered heads	
Standard strokes ⁺	mm	max 500	
Versions		Double-acting, Double-acting through-rod	
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request.	
Notes		⁺ Maximum recommended strokes. Higher values can create operating problems	

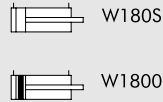
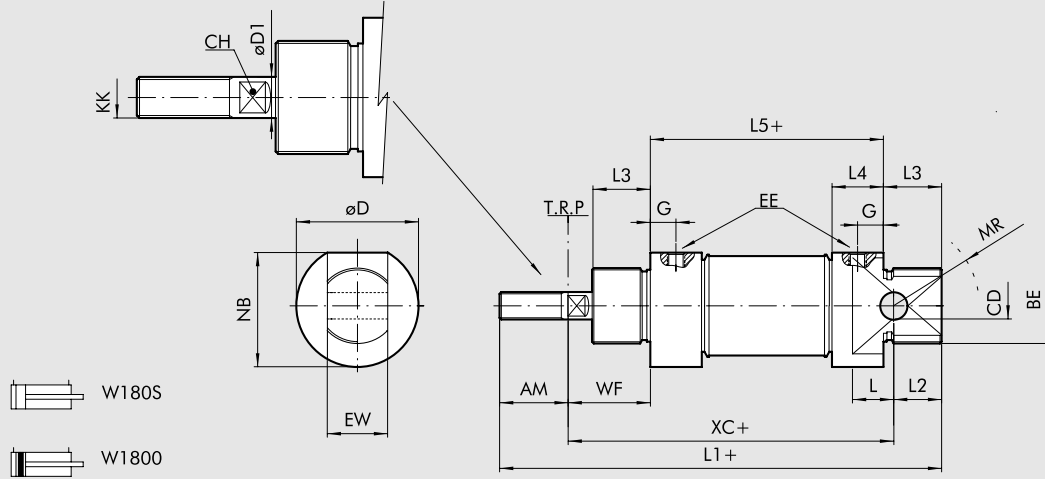
COMPONENTS

- ① PISTON ROD: AISI 316 steel
- ② HEAD: AISI 304 steel
- ③ PISTON ROD GASKET: polyurethane or FKM/FPM
- ④ GUIDE BUSHING: sintered bronze
- ⑤ BARREL: AISI 304 steel
- ⑥ PISTON: brass
- ⑦ PISTON GASKET: polyurethane or FKM/FPM
- ⑧ MAGNET: plastoferrite
- ⑨ Static O-rings: NBR or FKM/FPM



DIMENSIONS OF DOUBLE-ACTING

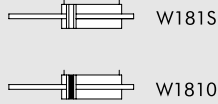
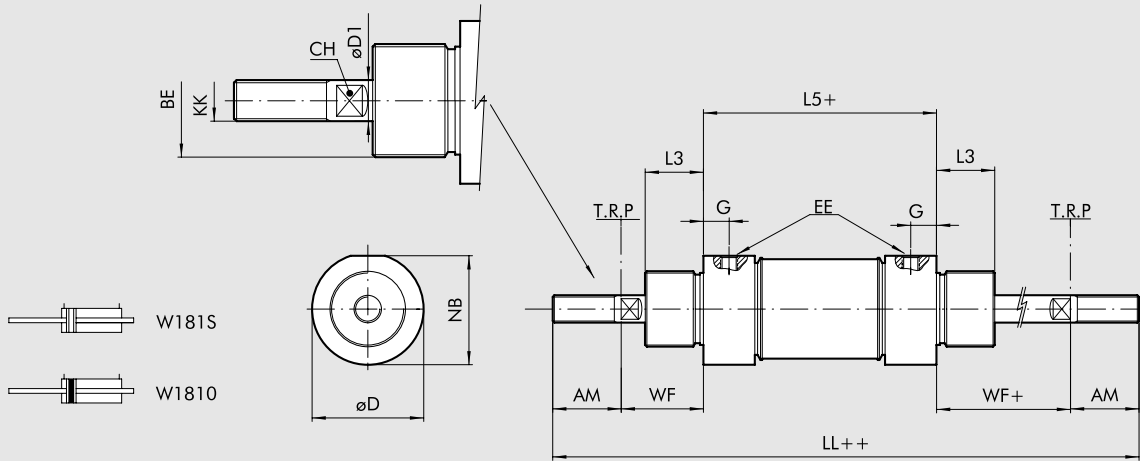
+ = ADD STROKE



Ø	AM	BE	øCD ^{H9}	CH	øD	øD1	EE	EW ^{d13}	G	KK	L	L1	L2	L3	L5	MR	NB	WF	XC
16	16	M16x1.5	6	5	19	6	M5	12	5	M6	9	109	11	18	53	16	18	22	82
20	20	M22x1.5	8	7	27	8	G 1/8	16	8	M8	12	131	16	20	67	18	25.5	24	95
25	22	M22x1.5	8	9	30	10	G 1/8	16	8	M10x1.25	12	140	14	22	68	21	28.5	28	104

DIMENSIONS DOUBLE-ACTING THROUGH-ROD

+ = ADD STROKE
 ++ = ADD TWICE THE STROKE



Ø	AM	BE	CH	øD	øD1	EE	G	KK	LL	L3	L5	NB	WF ^{±1,2}
16	16	M16x1.5	5	19	6	M5	5	M6	129	18	53	18	22
20	20	M22x1.5	7	27	8	G 1/8	8	M8	155	20	67	25.5	24
25	22	M22x1.5	9	30	10	G 1/8	8	M10x1.25	168	22	68	28.5	28

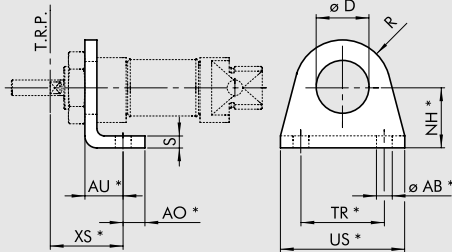
KEY TO CODES

W 1 8	0	0	1 6	0 0 2 0
	TYPE	VERSION	DIAMETER	STROKE
Stainless steel cylinder	0 DEM 1 DEM through-rod	0 Standard (magnetic) S Non-magnetic ● V FKM/FPM gasket	16 20 25	+ 0 to 500 mm

DEM: Magnetic double-acting (non-cushioned)
 + Maximum recommended strokes. Higher values can create operating problems
 ● For this version the cylinder will be not magnetic

ACCESSORIES FOR STAINLESS STEEL ISO 6432 MINI-CYLINDER: FIXINGS

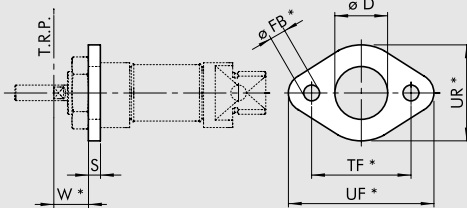
STAINLESS STEEL LEG MODEL A



Code	Ø	ØAB	AU	AO	D	NH	XS ^{±1.4}	R	S	TR	US	Weight [g]
W095X120001	16	5.5	14	6	16.1	20	22	13	4	32	42	42
W095X200001	20	6.6	17	8	22.1	25	36	20	5	40	54	90
W095X200001	25	6.6	17	8	22.1	25	40	20	5	40	54	90

*ISO 6432 values
Note: Individually packed

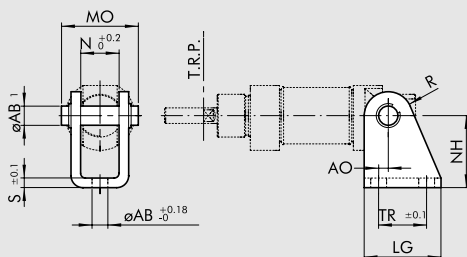
STAINLESS STEEL FLANGE MODEL C



Code	Ø	D	FB	W ^{±1.4}	S	TF	UF	UR	Weight [g]
W095X120002	16	16	5.5	18	4	40	52	30	26
W095X200002	20	22	6.6	19	5	50	66	40	52
W095X200002	25	22	6.6	23	5	50	66	40	52

*ISO 6432 values
Note: Individually packed

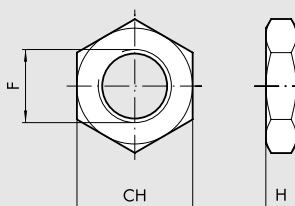
STAINLESS STEEL COUNTER-HINGE MODEL BC



Code	Ø	AB1	AB	AO	LG	MO	N	NH	R	S	TR	Weight [g]
W095X120005	16	6	5.5	2	25	24	12.1	27	7	3	15	40
W095X200005	20	8	6.6	4	32	31	16.1	30	10	4	20	78
W095X200005	25	8	6.6	4	32	31	16.1	30	10	4	20	78

Note: Supplied complete with 1 pin and 2 snap rings

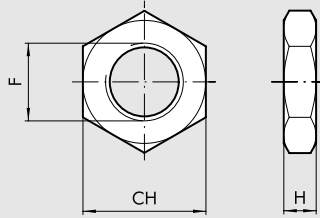
STAINLESS STEEL NUT FOR HEADS



Code	Ø	CH	F	H
W095X120010	16	22	M16x1.5	5
W095X200010	20	27	M22x1.5	8
W095X200010	25	27	M22x1.5	8

Note: Individually packed

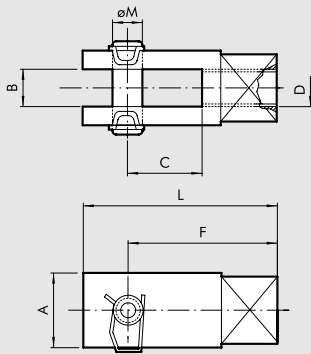
STAINLESS STEEL NUT FOR PISTON RODS



Code	Ø	CH	F	H	Weight [g]
W095X120011	16	10	M6	4	1
W095X200011	20	13	M8	5	3
W095X322011	25	17	M10x1.25	6	7

Note: Individually packed

STAINLESS STEEL FORK-MODEL GK-M

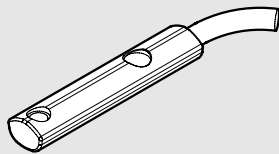


Code	Ø	A	B	C	D	F	L	Ø M
W095X120020	16	12	6	12	M6	24	31	6
W095X200020	20	16	8	16	M8	32	42	8
W095X322020	25	20	10	20	M10x1.25	40	52	10

Note: Individually packed

ACCESSORIES: MAGNETIC SENSORS

SLIM SENSOR



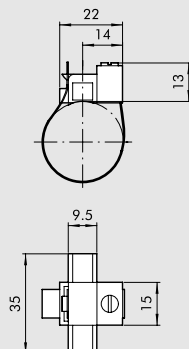
Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-288

Note: Individually packed

SENSOR CIRCLIP



Code	Bore	Description
W0950001103	8 to 63	Sensor circlip

Note: Individually packed

MATERIAL

Circlip: stainless steel
Sensor holder: plastic

STAINLESS STEEL ROUND CYLINDERS RNDC



Stainless steel clean profile cylinders available in different versions:

- with or without magnet execution
- double-acting - single or through-rod
- gaskets: Polyurethane or FKM/FPM (for high temperatures)



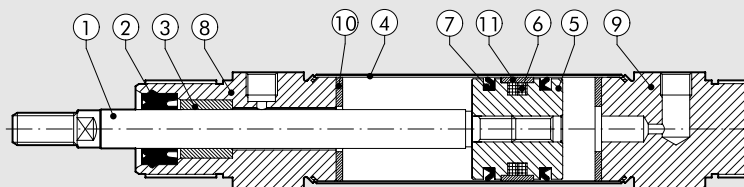
ACTUATORS

STAINLESS STEEL ROUND CYLINDERS RNDC

TECHNICAL DATA		POLYURETHANE	FKM/FPM
Max operating pressure	bar		10
	MPa		1
	psi		145
Temperature range	°C	-10 to +80	-10 to +150 (non-magnetic cylinders)
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	32; 40; 50; 63	
Design		Chamfered heads	
Versions		Double-acting, Double-acting through-rod	
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request.	
Standard strokes +	mm	max 500	
Notes		+ Maximum recommended strokes. Higher values can create operating problems	

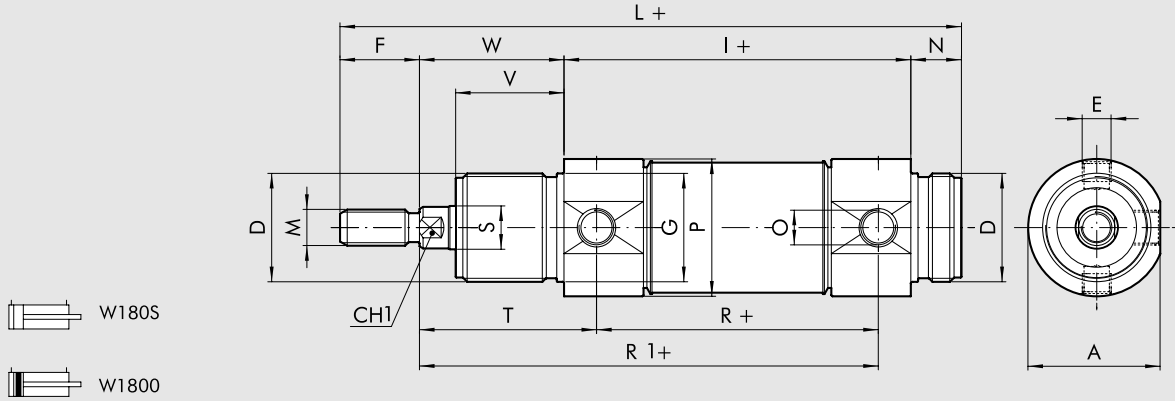
COMPONENTS

- ① PISTON ROD: AISI 316 steel
- ② PISTON ROD GASKET: polyurethane or FKM/FPM
- ③ GUIDE BUSHING: sintered bronze
- ④ BARREL: AISI 304 steel
- ⑤ PISTON: aluminium
- ⑥ MAGNET: plastoferrite
- ⑦ PISTON GASKET: polyurethane or FKM/FPM
- ⑧ ⑨ HEAD: AISI 304 steel
- ⑩ BUFFER: polyurethane
- ⑪ GUIDE RING: PTFE



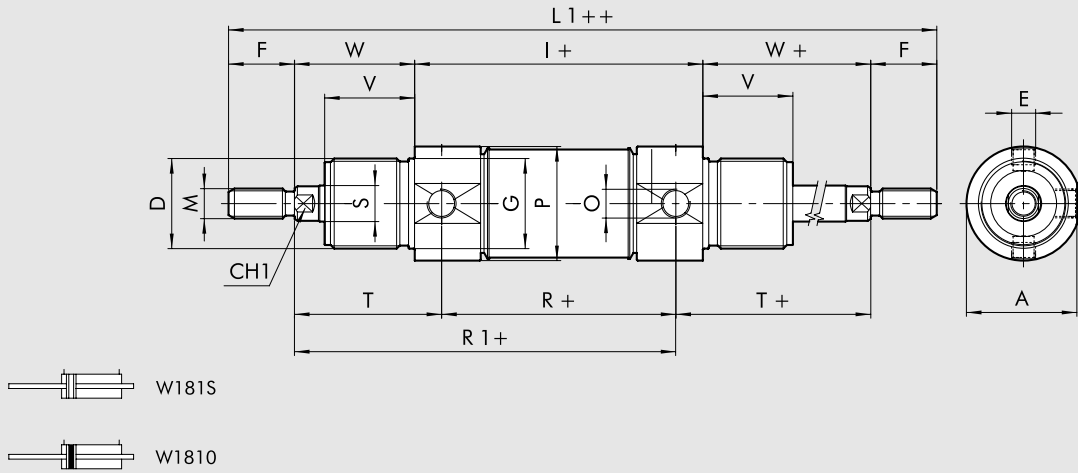
DIMENSIONS OF DOUBLE-ACTING

+ = ADD STROKE



DIMENSIONS DOUBLE-ACTING THROUGH-ROD

+ = ADD STROKE
++ = ADD TWICE THE STROKE



Ø	A	CH1	D	E	F	ØG	I	L	L1	M	N	O	ØP	R	ØS	T	V	W
32	36.5	10	M30x1.5	M8x1	20	30	96	168	212	M10x1.5	14	G1/8	38	78	12	47	30	38
40	44	13	M38x1.5	M10x1	24	38	113	198	251	M12x1.75	16	G1/4	46	89	16	57	35	45
50	55	17	M45x1.5	M12x1.5	32	45	120	220	284	M16x2	18	G1/4	57	96	20	62	38	50
63	67.5	17	M45x1.5	M14x1.5	32	45	124	224	288	M16x2	18	G3/8	70	98	20	63	38	50

CHIAVE DI CODIFICA

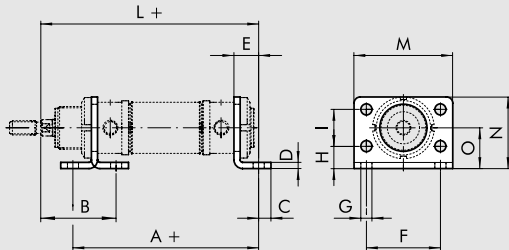
W 1 8	0	0	3 2	0 0 3 2
	TYPE	VERSION	DIAMETER	STROKE
Stainless steel cylinder	0 DEM 1 DEM through-rod	0 Standard (magnetic) S Non-magnetic ● V FKM/FPM gasket	32 40 50 63	+ Ø 32 to 63 stroke 0 to 500 mm

DEM: Magnetic double-acting (non-cushioned)
+ Maximum recommended strokes. Higher values can create operating problems
● For this version the cylinder will be not magnetic

ACCESSORIES FOR STAINLESS STEEL ROUND CYLINDER: FIXINGS

STAINLESS STEEL LEG MODEL AC

+ = ADD STROKE

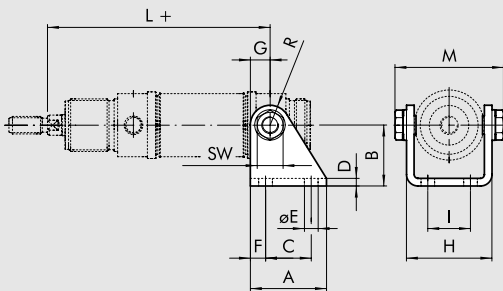


Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	O
W095X320002	32	124	48	7	4	14	52	7	14	28	148	66	49	28
W095X400002	40	153	60	10	5	20	60	9	18	30	178	80	58	33
W095X500002	50	160	64	10	6	20	70	9	20	40	190	90	70	40
W095X630002	63	164	64	10	6	20	76	9	20	50	194	96	80	45

Note: Individually packed

STAINLESS STEEL COUNTER-HINGE MODEL BC

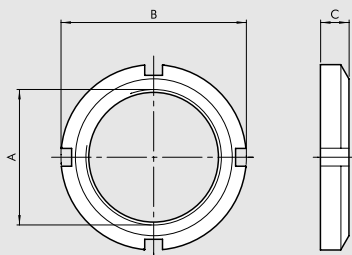
+ = ADD STROKE



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	R
W095X320005	32	40	35	24	4	7	8	12	46.1	20	125	58.1	12
W095X400005	40	50	40	30	5	9	10	13	56.1	28	146	70.1	13
W095X500005	50	54	45	34	6	9	10	14	69.1	36	158	86.1	14
W095X630005	63	65	50	35	6	9	15	16	82.1	42	161	99.1	16

Note: Supplied complete with 2 screws

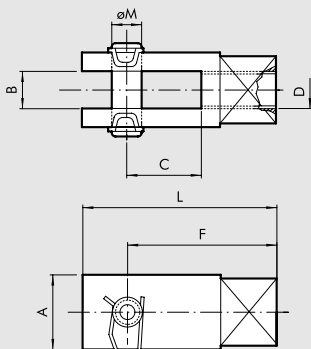
STAINLESS STEEL HEAD RING NUT MODEL G



Code	Ø	A	B	C
W095X320010	32	M30x1.5	45	7
W095X400010	40	M38x1.5	52	8
W095X500010	50	M45x1.5	58	9
W095X630010	63	M45x1.5	58	9

Note: Individually packed

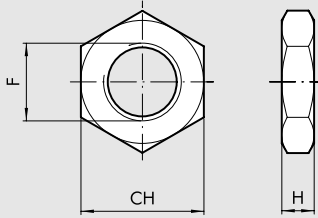
STAINLESS STEEL FORK-MODEL GK-M



Code	Ø	A	B	C	D	F	L	ØM
W095X320020	32	20	10	20	M10x1.5	40	52	10
W095X400020	40	24	12	24	M12x1.75	48	62	12
W095X500020	50	32	16	32	M16x2	64	83	16
W095X630020	63	32	16	32	M16x2	64	83	16

Note: Individually packed

STAINLESS STEEL NUT FOR PISTON RODS

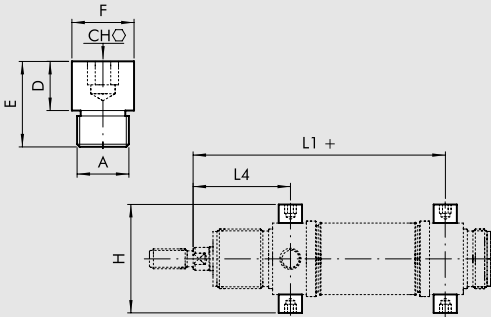


Code	Ø	F	CH	H	Weight [g]
W095X320011	32	M10x1.5	17	6	6
W095X400011	40	M12x1.75	19	7	12
W095X500011	50	M16x2	24	8	20
W095X500011	63	M16x2	24	8	20

Note: Individually packed

STAINLESS STEEL OSCILLATING PIN

+ = ADD STROKE

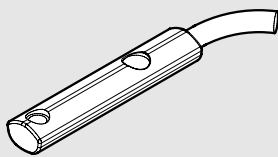


Code	Ø	A	CH	D	E	øF	H	L1	L4
W095X320007	32	M8X1	5	8	14	10	51	125	47
W095X400007	40	M10X1	6	9.5	16.5	12	61	146	57
W095X500007	50	M12X1.5	6	11	20	14	75	158	62
W095X630007	63	M14X1.5	8	13	26	16	92	161	63

Note: 2- piece pack

ACCESSORIES: MAGNETIC SENSORS

SLIM SENSOR



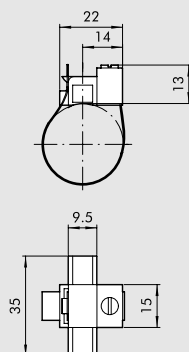
Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-288

Note: Individually packed

SENSOR CIRCLIP



Code	Bore	Description
W0950001103	8 to 63	Sensor circlip

Note: Individually packed

MATERIAL

Circlip: stainless steel
Sensor holder: plastic

STAINLESS STEEL ISO 15552 CYLINDERS (EX ISO 6431)

Stainless steel cylinders made to ISO 15552 available in various versions and with a wide range of accessories:

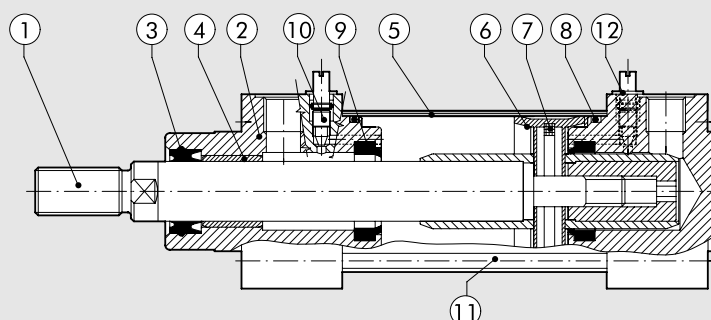
- with or without magnet execution
- double-acting – single- or through-rod
- gaskets: Polyurethane or FKM/FPM (for high temperatures)
- fixing accessories, guide units and mechanical piston rod lock



TECHNICAL DATA		POLYURETHANE	FKM/FPM
Max operating pressure	bar		10
	MPa		1
	psi		145
Temperature range	°C	-10 to +80	-10 to +150 (non magnetic cylinders)
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	32; 40; 50; 63; 80; 100	
Design		Heads with tie rods	
Standard strokes †	mm	max 1000	
Versions		Double-acting cushioned, Double-acting through-rod cushioned	
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request	
Notes		† Maximum recommended strokes. Higher values can create operating problems	

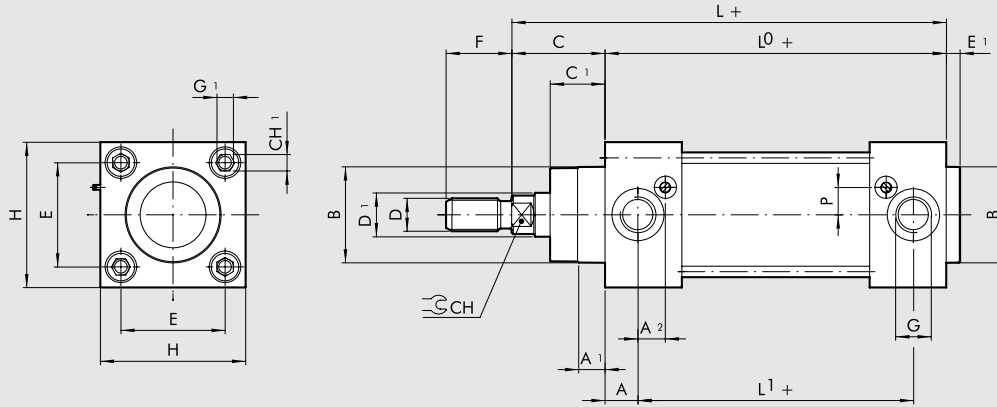
COMPONENTS

- ① PISTON ROD: AISI 316 steel
- ② HEAD: AISI 304 steel
- ③ PISTON ROD GASKET: polyurethane or FKM/FPM
- ④ GUIDE BUSHING: sintered bronze
- ⑤ BARREL: AISI 304 steel
- ⑥ ENBLOC GASKET: NBR or FKM/FPM
- ⑦ MAGNET: plastoferrite
- ⑧ Static O-rings: NBR or FKM/FPM
- ⑨ CUSHIONING GASKET: polyurethane or FKM/FPM
- ⑩ CUSHIONING NEEDLE: AISI 304 steel
- ⑪ TIE ROD: AISI 316 steel
- ⑫ NEEDLE-RETAINING RING: technopolymer



DIMENSIONS OF DOUBLE-ACTING

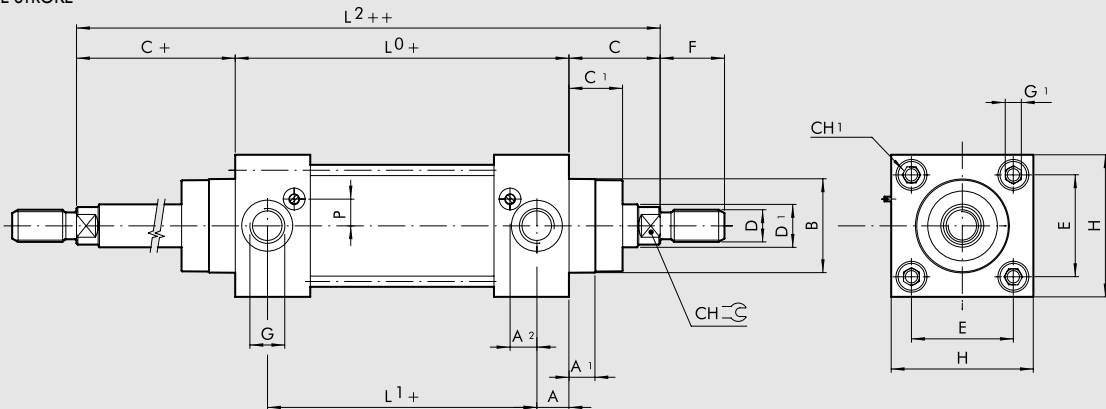
+ = ADD STROKE



W184

DIMENSIONS DOUBLE-ACTING THROUGH-ROD

+ = ADD STROKE
 ++ = ADD TWICE THE STROKE



W185

Ø	A	A ₁	A ₂	B	C	C ₁	CH	CH ₁	D	D ₁	E	E ₁	F	G	G ₁	H	L	L ₀	L ₁	L ₂	P
32	14	9	11.3	30	26	18	10	6	M10x1.25	12	32.5	4	22	G1/8	M6	50	121	95	67	147	6
40	14	9	13	35	30	22	13	6	M12x1.25	16	38	4	24	G1/4	M6	55	135	105	77	165	8
50	14	9	12.7	40	37	25.5	16	8	M16x1.5	20	46.5	4	32	G1/4	M8	65	143	106	78	180	11.8
63	16	9	15.8	45	37	25	16	8	M16x1.5	20	56.5	4	32	G3/8	M8	75	158	121	89	195	11.7
80	16	9	16.3	45	46	35	21	10	M20x1.5	25	72	4	40	G3/8	M10	95	174	128	96	220	15.5
100	18	9	15.5	55	51	38	21	10	M20x1.5	25	89	4	40	G1/2	M10	110	189	138	102	240	15.5

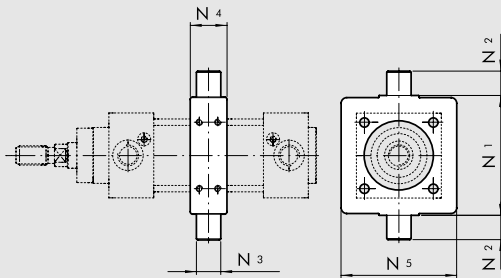
KEY TO CODES

W 1 8	4	0	3 2	0 0 3 2
	TYPE	VERSION	DIAMETER	STROKE
Stainless steel cylinder	4 DEMA 5 DEMA through-rod	0 Standard (magnetic) S Non-magnetic ● V FKM/FPM gasket	32 40 50 63 80 A1=100	+ 0 to 1000 mm

DEMA: Magnetic double-acting (cushioned)
 + Maximum recommended strokes. Higher values can create operating problems
 ● For this version the cylinder will be not magnetic

ACCESSORIES FOR STAINLESS ISO 15552 CYLINDER: FIXINGS

STAINLESS STEEL INTERMEDIATE HINGE - MODEL EN

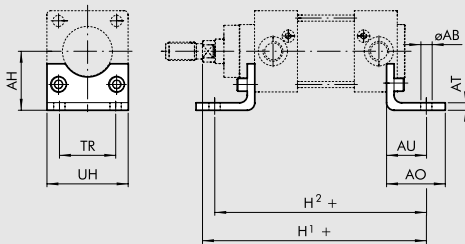


Code	Ø	N ₁	N ₂	N ₃	N ₄	N ₅
W095X322007	32	50	12	12	22	65
W095X402007	40	63	16	16	28	75
W095X502007	50	75	16	16	32	95
W095X632007	63	90	20	20	35	105
W095X802007	80	110	20	20	40	130
W095XA12007	100	132	25	25	45	145

Note: Supplied complete with 8 grub screws

STAINLESS STEEL SHORT FOOT MOUNTING

+ = ADD THE STROKE

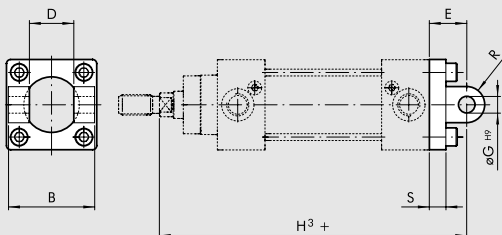


Code	Ø	Ø AB	AH	AO	AT	AU	TR	UH	H ₁	H ₂
W095X322001	32	7	32	35	4	24	32	45	145	143
W095X402001	40	9	36	36	4	28	36	52	163	161
W095X502001	50	9	45	47	5	32	45	65	175	170
W095X632001	63	9	50	45	5	32	50	75	190	185
W095X802001	80	12	63	55	6	41	63	95	215	210
W095XA12001	100	14	71	57	6	41	75	115	230	220

Note: Individually packed with 2 screws

STAINLESS STEEL FEMALE HINGE - MODEL B

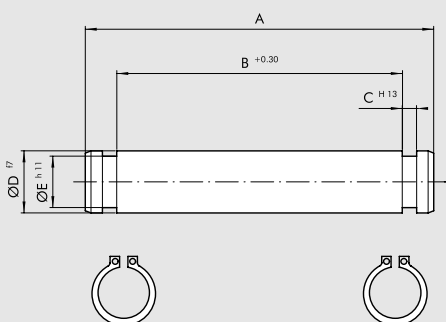
+ = ADD THE STROKE



Code	Ø	B	D	E	Ø G	H ₃	R	S
W095X322003	32	45	26	22	10	142	10	9
W095X402003	40	52	28	25	12	160	12	9
W095X502003	50	65	32	27	12	170	12	11
W095X632003	63	75	40	32	16	190	16	11
W095X802003	80	95	50	36	16	210	16	14
W095XA12003	100	115	60	41	20	230	20	14

Note: Supplied with 4 screws, 4 washers. **WITHOUT PIN.**

STAINLESS STEEL FEMALE HINGE PIN

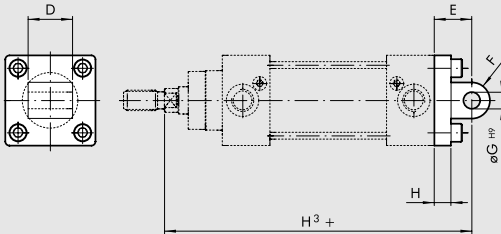


Code	Ø	A	B	C	D	E
W095X322050	32	53	46	1.1	10	9.6
W095X402050	40	60	53	1.1	12	11.5
W095X502050	50	68	61	1.1	12	11.5
W095X632050	63	78	71	1.1	16	15.2
W095X802050	80	98	91	1.1	16	15.2
W095XA12050	100	118	111	1.3	20	19

Note: Supplied with 2 snap-rings

STAINLESS STEEL MALE HINGE - MODEL BA

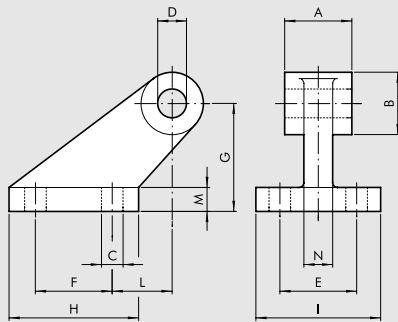
+ = ADD THE STROKE



Code	Ø	D	E	F	Ø G	H	H ₃
W095X322004	32	26	22	10	10	9	143
W095X402004	40	28	25	12	12	9	160
W095X502004	50	32	27	12	12	11	170
W095X632004	63	40	32	16	16	11	190
W095X802004	80	50	36	16	16	14	210
W095XA12004	100	60	41	20	20	14	230

Note: Supplied with 4 screws, 4 washers

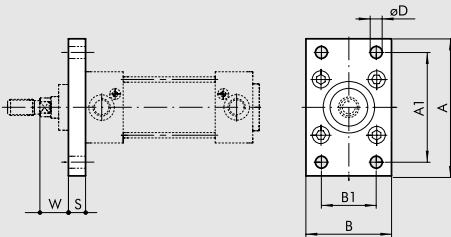
STAINLESS STEEL ISO COUNTER-HINGE FOR MODEL B - MODEL GS



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N
W095X322008	32	26	20	6.6	10	38	18	32	31	51	3	8	10
W095X402008	40	28	22	6.6	12	41	22	36	35	54	2	10	15
W095X502008	50	32	26	9	12	50	30	45	45	65	3	12	16
W095X632008	63	40	30	9	16	52	35	50	50	67	2	14	16
W095X802008	80	50	30	11	16	66	40	63	60	86	7	14	20
W095XA12008	100	60	38	11	20	76	50	71	70	96	5	17	20

Note: Individually packed

STAINLESS STEEL FRONT FLANGE - MODEL C

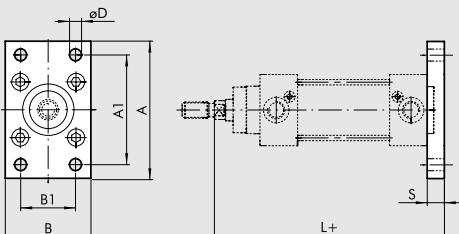


Code	Ø	A	A ₁	B	B ₁	S	ØD	W
W095X322002	32	80	64	45	32	10	7	16
W095X402002	40	90	72	52	36	10	9	20
W095X502002	50	110	90	65	45	12	9	25
W095X632002	63	120	100	75	50	12	9	25
W095X802002	80	150	126	95	63	16	12	30
W095XA12002	100	170	150	115	75	16	14	35

Note: Supplied with 4 screws

STAINLESS STEEL REAR FLANGE - MODEL C

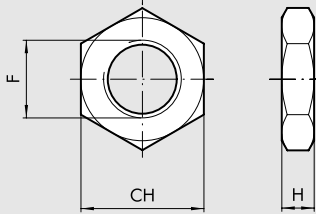
+ = ADD THE STROKE



Code	Ø	A	A ₁	B	B ₁	S	ØD	L
W095X322002	32	80	64	45	32	10	7	105
W095X402002	40	90	72	52	36	10	9	115
W095X502002	50	110	90	65	45	12	9	118
W095X632002	63	120	100	75	50	12	9	133
W095X802002	80	150	126	95	63	16	12	144
W095XA12002	100	170	150	115	75	16	14	154

Note: Supplied with 4 screws

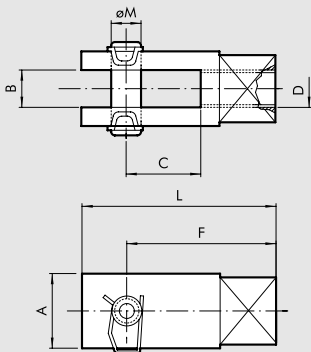
STAINLESS STEEL NUT FOR PISTON RODS



Code	Ø	F	H	CH	Weight [g]
W095X322011	32	M10x1.25	6	17	6
W095X402011	40	M12x1.25	7	19	12
W095X502011	50	M16x1.5	8	24	20
W095X502011	63	M16x1.5	8	24	20
W095X802011	80	M20x1.5	9	30	32
W095X802011	100	M20x1.5	9	30	32

Note: Individually packed

STAINLESS STEEL FORK-MODEL GK-M

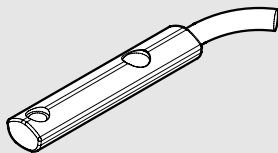


Code	Ø	A	B	C	D	F	L	Ø M
W095X322020	32	20	10	20	M10x1.25	40	52	10
W095X402020	40	24	12	24	M12x1.25	48	62	12
W095X502020	50	32	16	32	M16x1.5	64	83	16
W095X502020	63	32	16	32	M16x1.5	64	83	16
W095X802020	80	40	20	40	M20x1.5	80	105	20
W095X802020	100	40	20	40	M20x1.5	80	105	20

Note: Individually packed

ACCESSORIES: MAGNETIC SENSORS

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



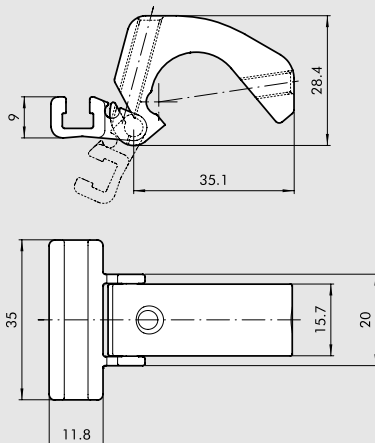
Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-288

Note: Individually packed

SENSOR BRACKET



Code	Bore	Description
W0950001100	32 to 100	Sensor bracket

Note: Individually packed

MATERIAL

Bracket: zinc-plated aluminium
 Sensor holder: zinc-plated aluminium
 Fixing screw: zinc-plated aluminium

NOTES

● **GENERAL TECHNICAL DATA GRIPPERS**

PAGE 1-168



● **GRIPPERS WITH TWO PARALLEL JAWS, SERIES P1**

PAGE 1-172



● **GRIPPERS WITH TWO PARALLEL JAWS, SERIES P2**

PAGE 1-174



● **GRIPPERS WITH TWO PARALLEL JAWS, LONG STROKE, SERIES P4**

PAGE 1-176



● **GRIPPERS WITH TWO HINGED JAWS, SERIES P7**

PAGE 1-179



● **TECHNOPOLYMER HINGED GRIPPERS, SERIES P8**

PAGE 1-181



● **GRIPPERS 180° WITH 2 HINGED JAWS SERIES P9**

PAGE 1-183



● **GRIPPERS WITH THREE PARALLEL JAWS, SERIES P11**

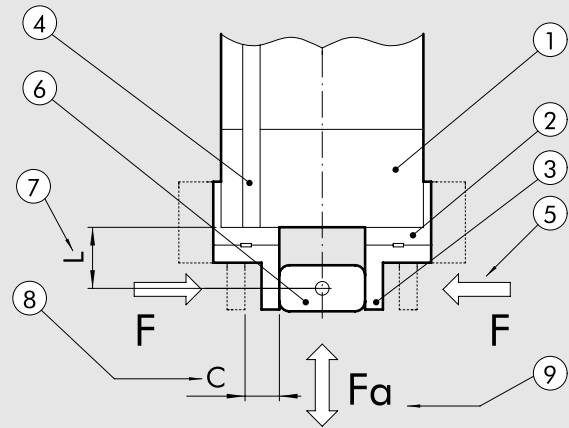
PAGE 1-185

GENERAL TECHNICAL DATA GRIPPERS

NOMENCLATURE

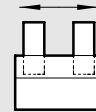
- ① Pneumatic gripper
- ② Jaws
- ③ Clamping finger
- ④ Sensor slot
- ⑤ F = clamping force of one jaw only
If a gripper has three jaws, with $F = 25\text{ N}$, so the total clamping force is $25 \times 3 = 75\text{ N}$
- ⑥ Load
- ⑦ L = distance between the barycentre of the load and the reference surface
- ⑧ C = stroke of a single jaw
- ⑨ F_a = maximum axial force applied to the grippers

FIG. 1.1



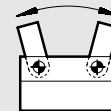
TYPES

Parallel gripper: the jaws move in a straight line. There may be two, three or even four jaws.

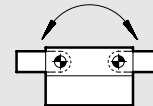


Hinged gripper: the jaws are hinged and move along the arc of a circle. It is generally cheaper than a parallel gripper but there are some limitations (see fig. 1.5):

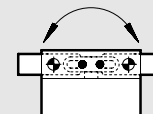
- If the part has varying dimensions, the contact area changes (see fig. 1.6)
- If the part is cylindrical with varying dimensions, the position of the axis of the clamped part varies (see fig. 1.7)



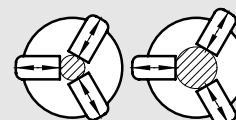
Gripper with retracting jaws: the jaws have an opening angle of about 90° . The clamping fingers can retract fully from the work top, and so, in certain cases, it is possible to avoid one linear retraction motion (see fig. 1.5).



Toggle gripper: a hinged gripper with a toggle-action mechanism to achieve high clamping forces. Clamping is irreversible even when there is no pressure, so the part cannot be released accidentally. The opening angle is 90° so it acts as retracting gripper. The clamping force is high within a limited angle only.



Number of jaws: two-jaw grippers are used for prism-shaped parts or cylindrical ones with a single diameter. Three-jaw grippers can be used for cylindrical parts with different diameters.



CLAMPING FINGERS

The clamping fingers must be as light and short as possible to keep inertia to a minimum. The longer the clamping fingers, the less force is available (see fig. 1.2). Wider fingers are only heavier, they do not increase friction (see fig. 1.3).

FIG. 1.2

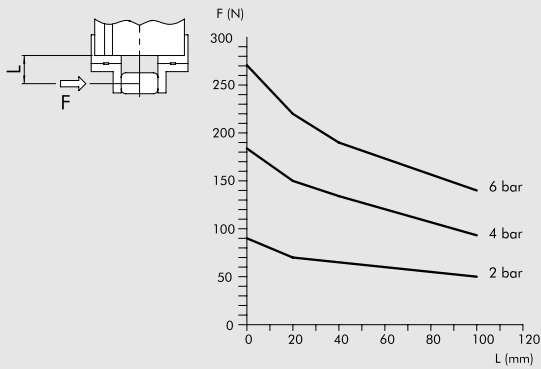
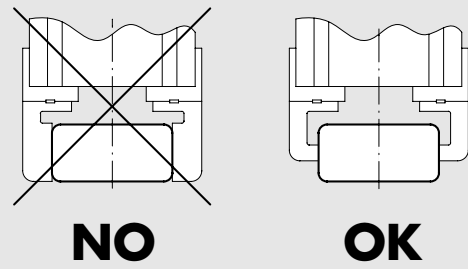
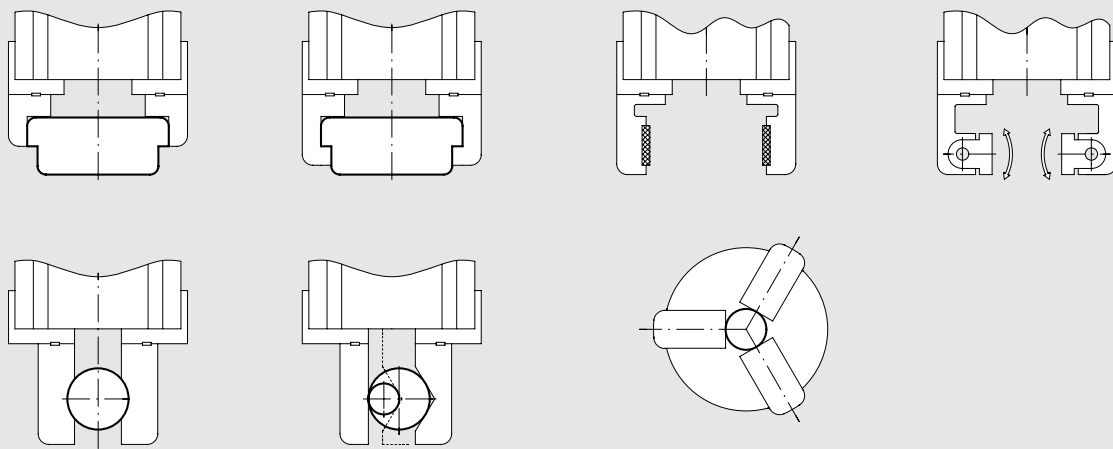


FIG. 1.3



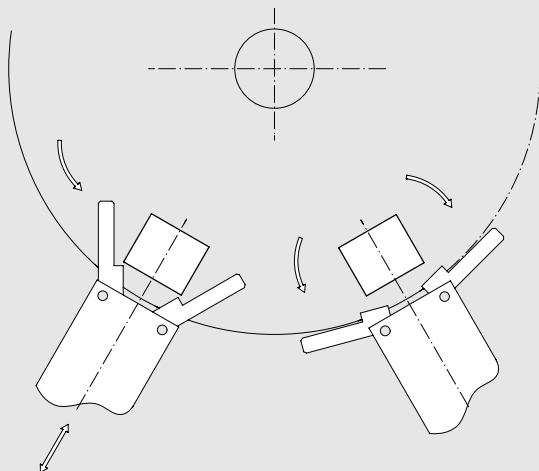
EXAMPLE OF CLAMPING FINGERS

FIG. 1.4



EXAMPLE OF RETRACTING HINGED GRIPPERS

FIG. 1.5



EXAMPLE OF USE LIMITATIONS OF HINGED GRIPPERS

FIG. 1.6

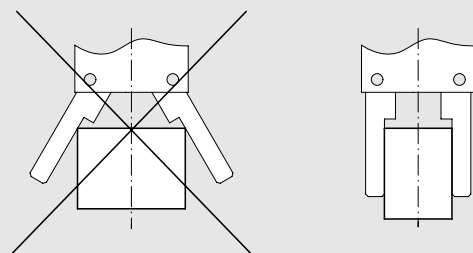
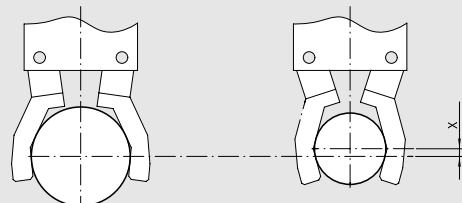


FIG. 1.7

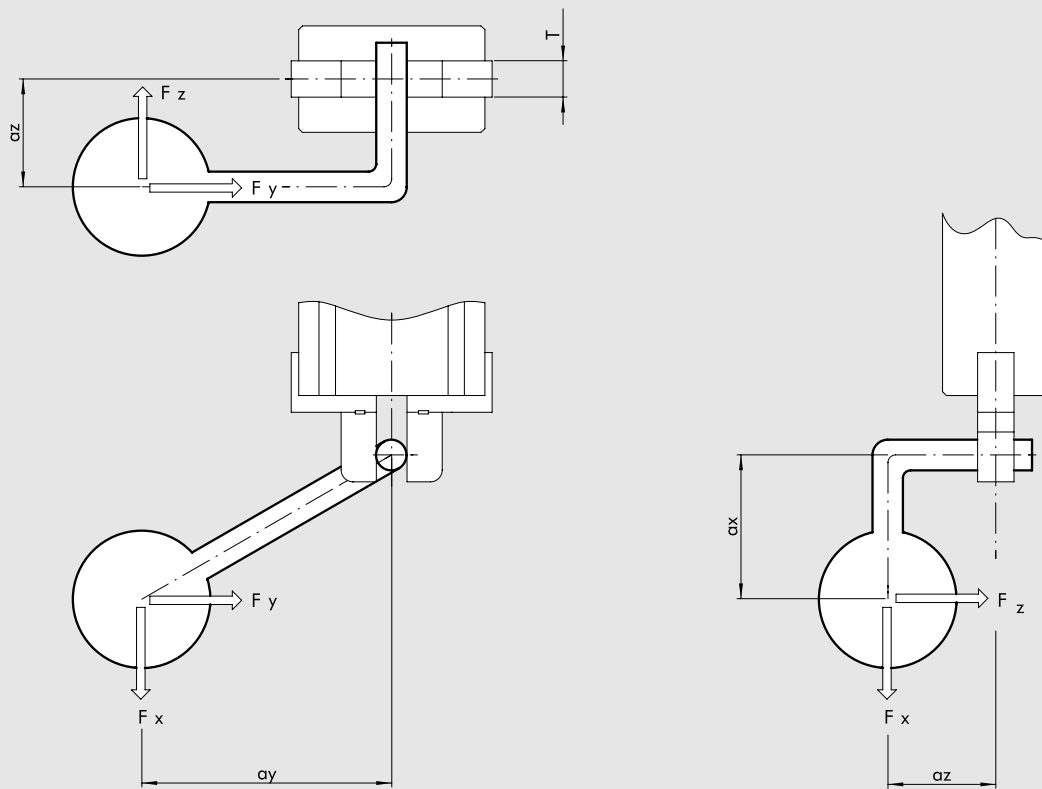


CALCULATIONS

First of all, determine the necessary clamping force.
 Then decide which type of gripper can ensure this force with required pressure and clamping distance.
 To help designers calculate the clamping force, we propose two levels of calculation.

DRAWING TO CALCULATE GRIPPER CLAMPING FORCE

FIG. 1.8



APPROXIMATION METHOD

Clamping force of each jaw [N] $\geq 200 \times$ weight of part [kg] / number of jaws.

Data	Unit of measurement	Formula	Example
M	Mass of part	kg	1.2
n	Number of jaws	-	3
F	Clamping force of each jaw	N	$\geq 200 \times M/n$ $\geq 200 \times 1.2/3 = 80$

PRECISION COMPUTING METHOD

	Data	Unit of measur.	Formula	Example
M	Mass of part	kg		1.2
a	Acceleration	m/s ²		5 in direction Y
Ω	Angle speed	rad/s		0
T	Width of clamping finger	mm		8
d	Clamping diameter of part	mm		16
ax	Distance along X of the barycentre from clamping centre	mm		0
ay	Distance along Y of the barycentre from clamping centre	mm		0
az	Distance along Z of the barycentre from clamping centre	mm		25
μ	Finger/part friction coefficient			0.2
	Some examples:			
	Smooth steel on smooth metal		μ = 0.1	
	Rough steel on smooth metal		μ = 0.2 - 0.3	
	Soft material, e.g. Vulkolan		μ = 0.4	
	Coupled shape (vedi fig. 1.4)		μ = 1	
	Forces applied to barycentre of part. When determining the forces, assess for each direction:			
	Force x weight	N	M x 9.81	
	Force of inertia x linear acceleration	N	M x a	
	Force of inertia x angular velocity	N	M x Ω ² x r	
Fx	Force along gripper axis	N		Fx = weight 1.2 x 9.81 = 11.8 N
Fy	Force perpendicular to jaw	N		Fy = F. of inertia = 1.2 x 5 = 6 N
Fz	Force tangent to jaw	N		Fz = 0
	Force equivalent to clamping centre:			
Ft eq	Equivalent tangential force	N	$\sqrt{\left[F_x \cdot \left(\frac{az + \frac{T}{2}}{T} + \frac{ay + \frac{d}{2}}{d} \right) + F_z \cdot \frac{ax}{T} + F_y \cdot \frac{ax}{d} \right]^2 + F_z^2}$	$\sqrt{\left[11.8 \cdot \left(\frac{25 + \frac{8}{2}}{8} + \frac{1}{2} \right) + 0 \right]^2} = 48.6 \text{ N}$
Fy eq	Equivalent perpendicular force	N	$F_y \cdot \frac{az + \frac{T}{2}}{T} + F_z \cdot \frac{ay}{T}$	$= 6 \cdot \frac{\left(25 + \frac{8}{2} \right)}{8} = 75 \text{ N}$
Fs teo	Theoretical clamping force	N	Greater of (Fteq/2μ) and (Fyeq)	Greater of (48.8/2.02) and 75 = 107
F	Clamping force	N	FsTeo · 1.5 (safety coefficient)	= 107 · 1.5 = 160 N

NOTES

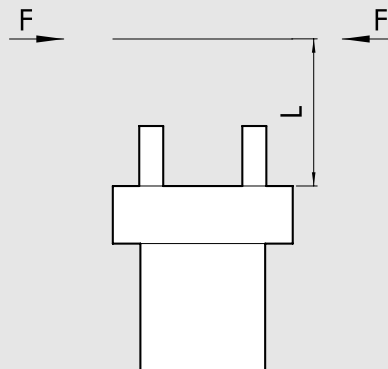
GRIPPER WITH 2 PARALLEL JAWS SERIES P1

- Dual-acting parallel gripper for internal and external clamping.
- Anodized aluminium alloy body and tempered steel jaws.
- Bottom or side fixing.
- All sizes come with magnets and sensor slots.

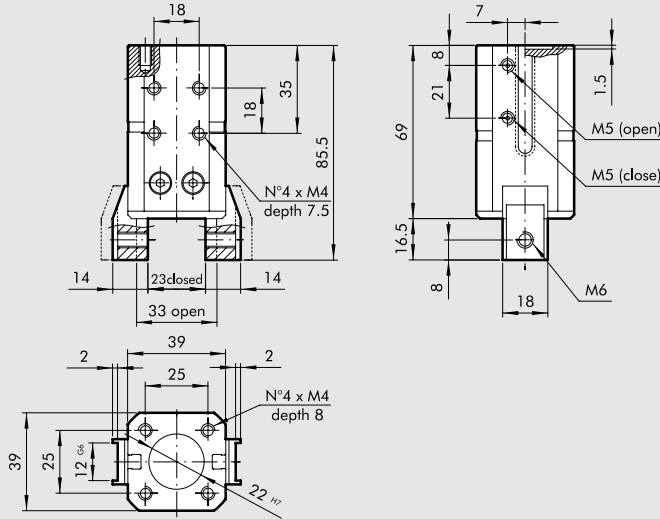


TECHNICAL DATA		P1-20	P1-32
Operating pressure	bar	2 to 8	
	MPa	0.2 to 0.8	
	psi	29 to 116	
Temperature range	°C	5 to 70	
Fluid		20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous	
Bores	mm	20	32
Clamping force at 6.3 bar 20 mm from the top surface during opening and closing	N	70	170
Single jaw stroke	mm	5	5
Weight	Kg	0.50	0.70

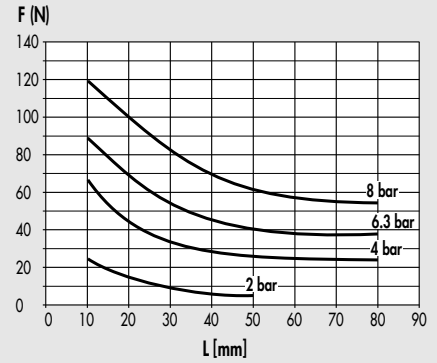
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



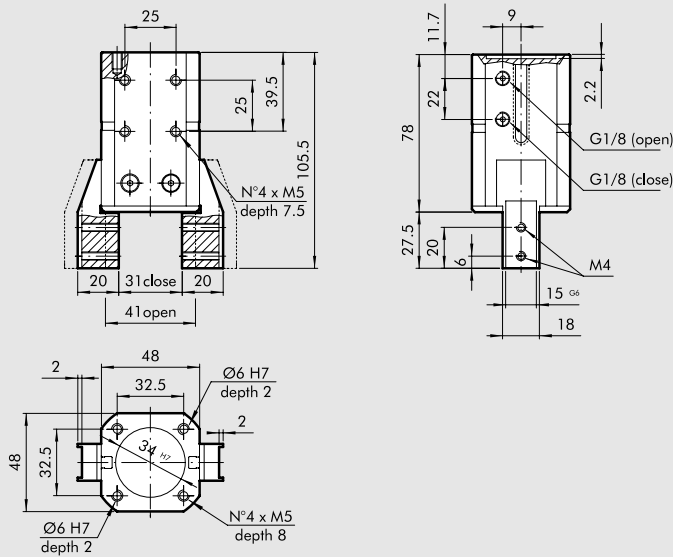
DIMENSIONS OF GRIPPERS P1-20



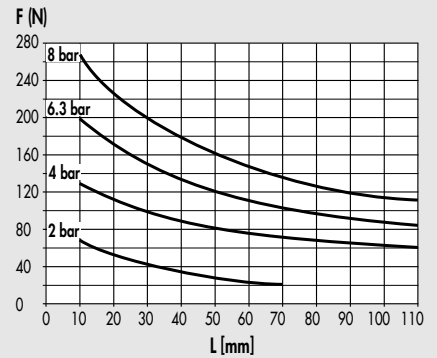
Code	Description
W155020001	Gripper with 2 parallel jaws P1-20



DIMENSIONS OF GRIPPERS P1-32

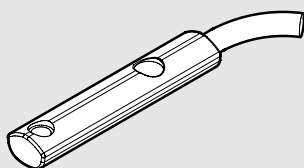


Code	Description
W1550320001	Gripper with 2 parallel jaws P1-32



ACCESSORIES

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-288

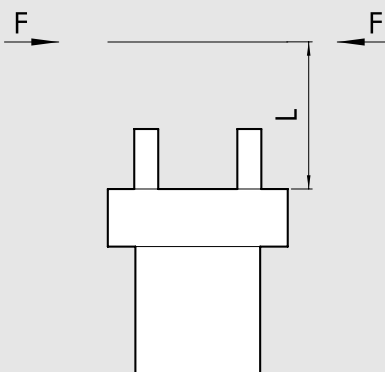
GRIPPERS WITH 2 PARALLEL JAWS SERIES P2

Double-acting system with clamping in both directions.
All the grippers come with magnet and sensor slots.

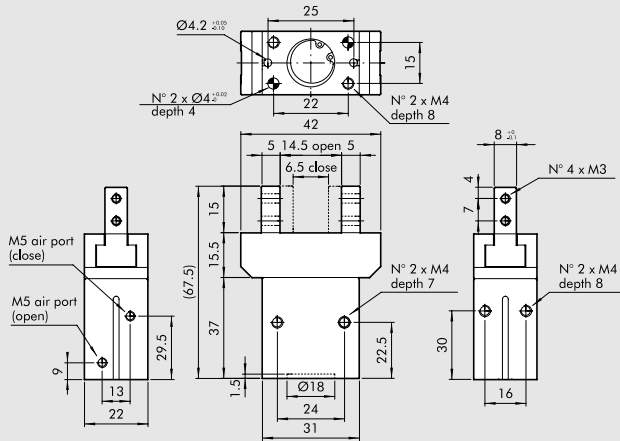


TECHNICAL DATA		P2 -16	P2-20	P2- 25
Operating pressure	bar		2 to 8	
	MPa		0.2 to 0.8	
	psi		29 to 116	
Operating temperature	°C		-10 to +80	
Maximum operating frequency	cycles/s		2	
Fluid		20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous.		
Size		16	20	25
Bore	mm	16	20	25
Single jaw stroke	mm	4	5	7
Clamping force at 6.3 bar 20 mm from the top surface during opening and closing	N	45	100	135
Weight	Kg	0.12	0.24	0.45

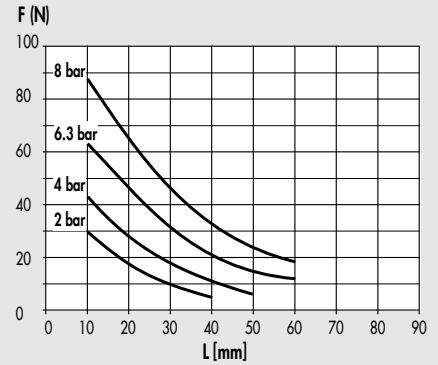
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



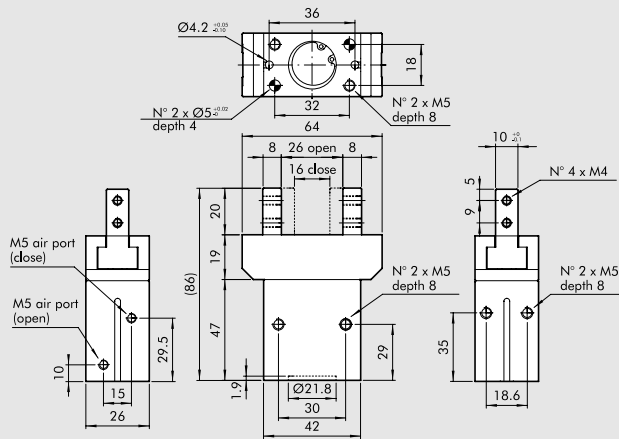
DIMENSIONS OF GRIPPER P2-16



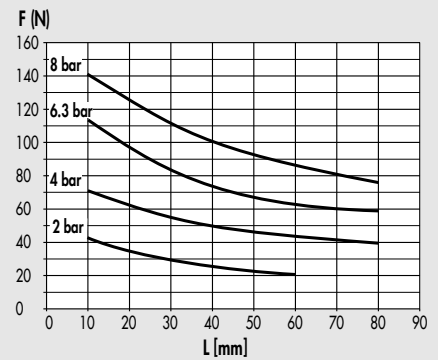
Code W1570160200 **Description** Gripper with 2 parallel jaws P2-16



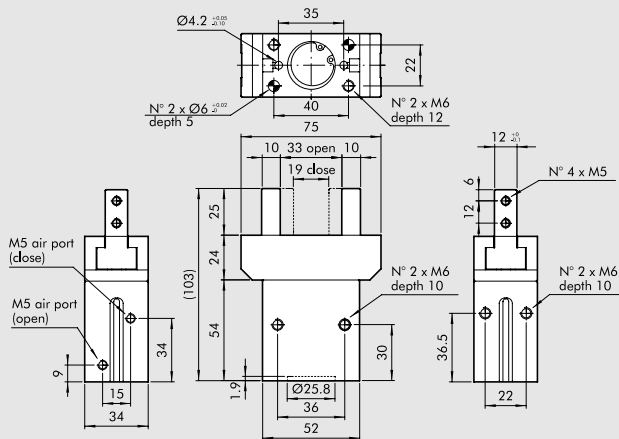
DIMENSIONS OF GRIPPER P2-20



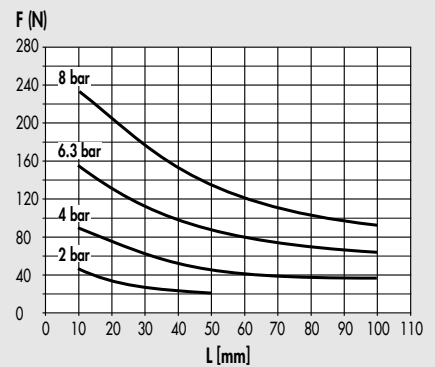
Code W1570200200 **Description** Gripper with 2 parallel jaws P2-20



DIMENSIONS OF GRIPPER P2-25

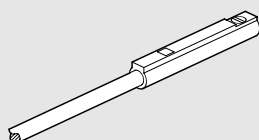


Code W1570250200 **Description** Gripper with 2 parallel jaws P2-25



ACCESSORIES

SENSOR



Code W0950044180 **Description** Sensor REED 2 wires 24 VDC 1 m
Code W0950045390* **Description** Sensor HALL 3 wires 24 VDC 2 m

* For technical data see page 1-289

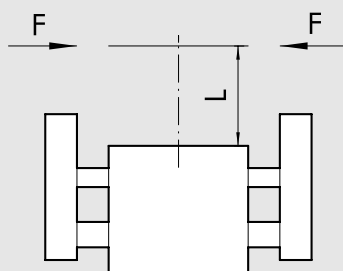
GRIPPERS WITH 2 PARALLEL LONG-STROKE JAWS – SERIES P4

These are grippers with 2 parallel long-stroke jaws. The mechanical design makes them suitable for clamping bulky parts. All grippers, except for the smallest ones, can mount a retracting magnetic proximity sensor.

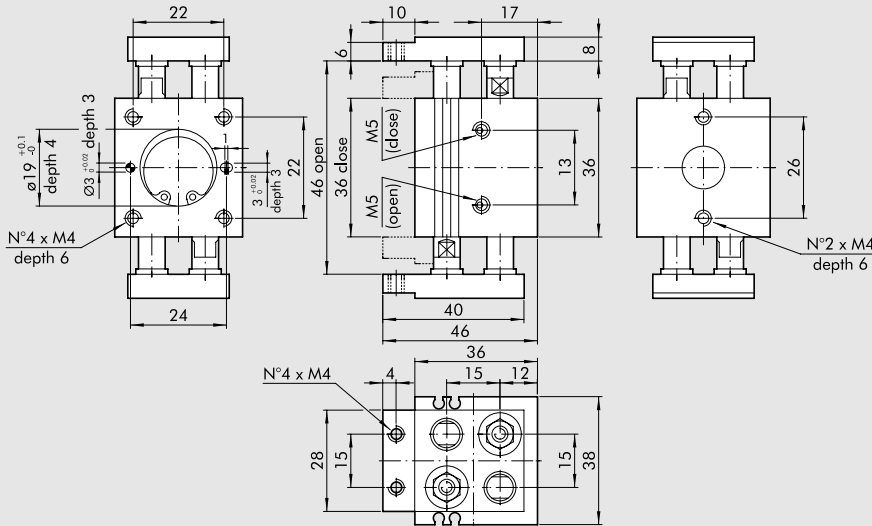


TECHNICAL DATA		P4-10	P4-12	P4-16	P4-25	P4-30
Operating pressure	bar			3 to 7		
	MPa			0.3 to 0.7		
	psi			43 to 101		
Operating temperature	°C			-10 to +80		
Maximum operating frequency	cycles/s			1		
Fluid		20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous				
Bore	mm	2 x 10	2 x 12	2 x 16	2 x 30	2 x 30
Single jaw stroke	mm	5	10	15	30	60
Clamping force at 6.3 bar 20 mm from the top surface during opening and closing	N	30	45	75	280	280
Weight	kg	0.18	0.3	0.5	2.95	3.7

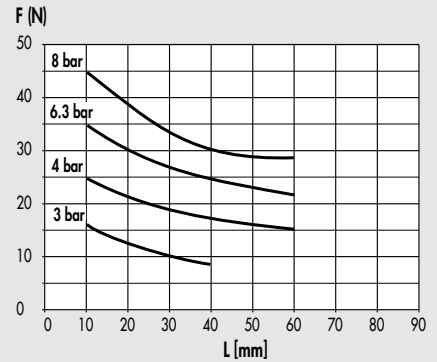
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



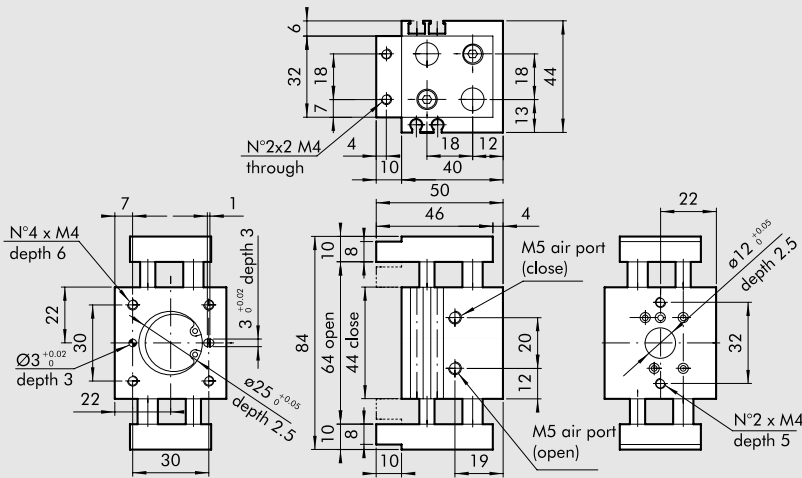
DIMENSIONS OF GRIPPER P4-10



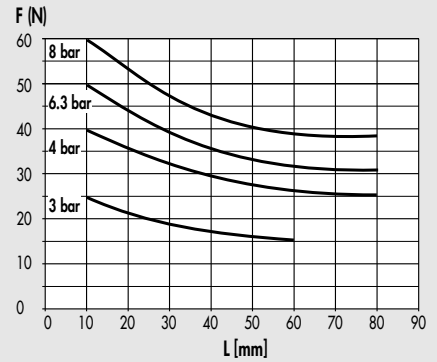
Code W1580100200 **Description** Gripper with 2 long-stroke jaws P4-10



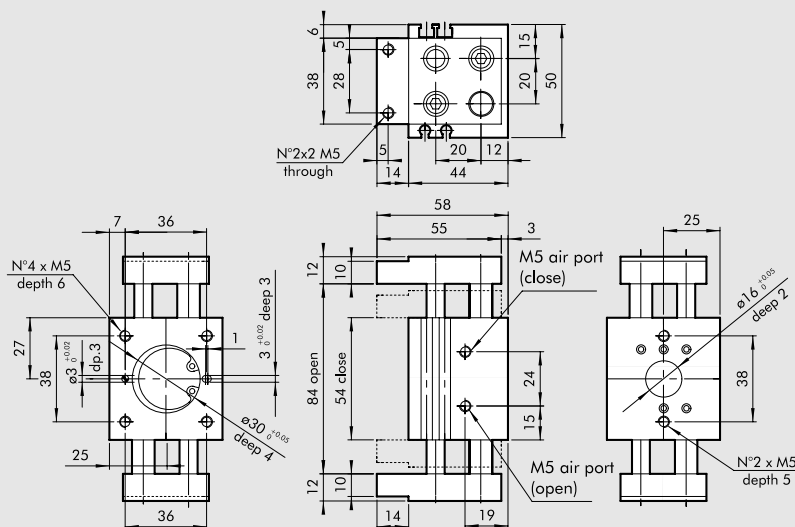
DIMENSIONS OF GRIPPER P4-12



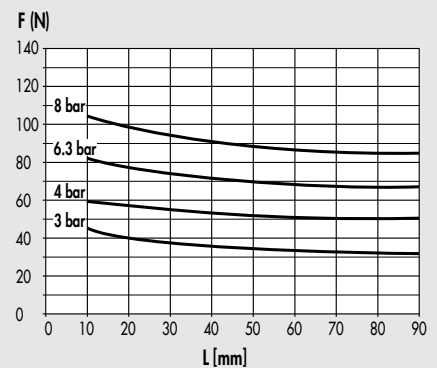
Code W1580120200 **Description** Gripper with 2 long-stroke jaws P4-12



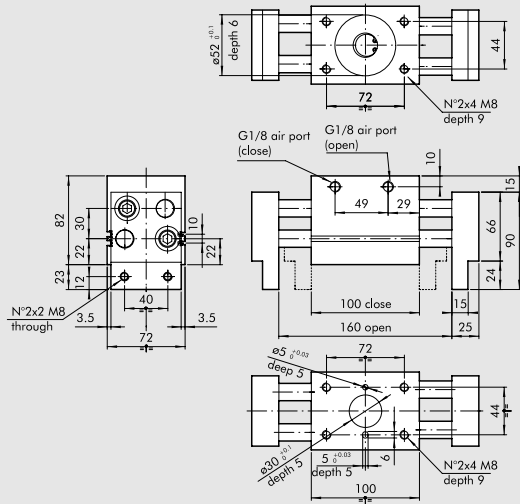
DIMENSIONS OF GRIPPER P4-16



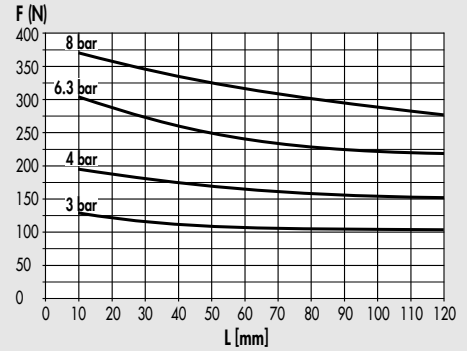
Code W1580160200 **Description** Gripper with 2 long-stroke jaws P4-16



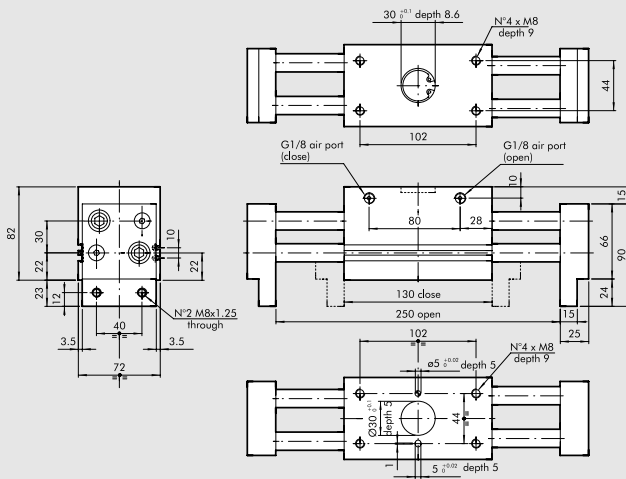
DIMENSIONS OF GRIPPER P4-25



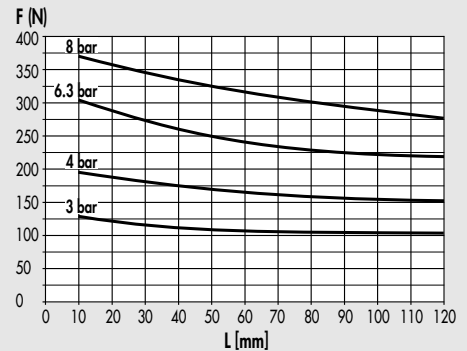
Code	Description
W1580250200	Gripper with 2 long-stroke jaws P4-25



DIMENSIONS OF GRIPPER P4-30

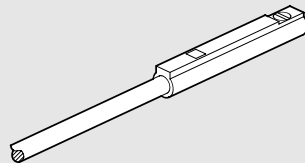


Code	Description
W1580300200	Gripper with 2 long-stroke jaws P4-30



ACCESSORIES

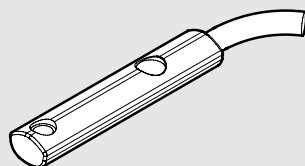
SENSOR FOR P4 10



Code	Description
W0950044180	Sensor REED 2 wires 24 VDC 1 m
W0950045390*	Sensor HALL 3 wires 24 VDC 2 m

* For technical data see page 1-289

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE FOR P4-12-30

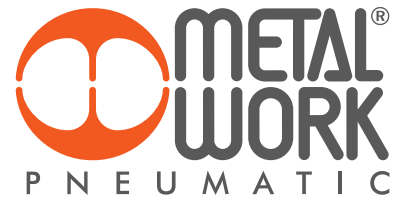


Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

* For technical data see page 1-288

GRIPPERS WITH 2 HINGED JAWS – SERIES P7



Hinged grippers with 30° opening angle. Bores 16, 20, 32 and 50 mm.
All grippers are magnetic with slots in the body with retracting sensors.

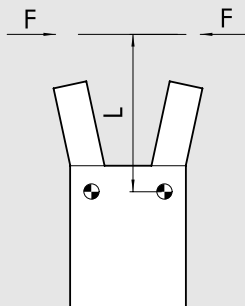


ACTUATORS

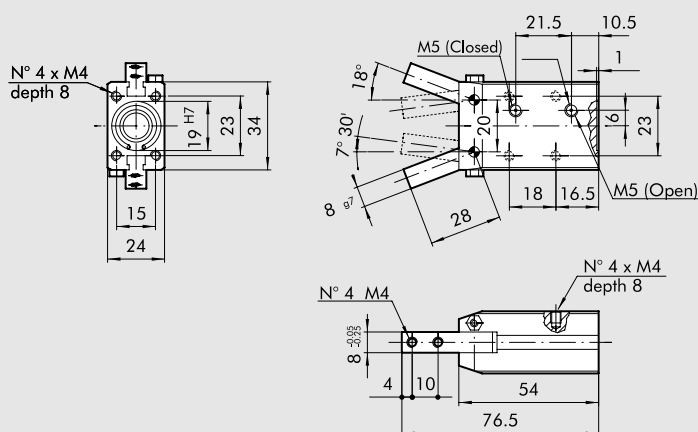
GRIPPERS WITH 2 HINGED JAWS – SERIES P7

TECHNICAL DATA		P7-16	P7-20	P7-32	P7-50
Operating pressure	bar	2 to 10	2 to 10	2 to 10	2 to 10
	MPa	0.2 to 1	0.2 to 1	0.2 to 1	0.2 to 1
	psi	29 to 145	29 to 145	29 to 145	29 to 145
Fluid	20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous.				
Temperature range	°C	-10 to +80			
Clamping force at 6.3 bar 20 mm from the centre of rotation of the jaws, during opening and closing	N	27	50	120	380
Weight	kg	0.12	0.19	0.5	1.6

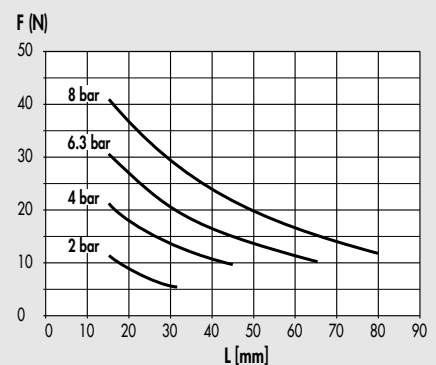
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



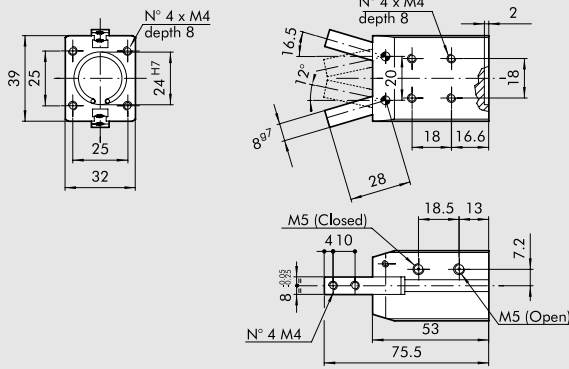
DIMENSIONS OF GRIPPERS P7-16



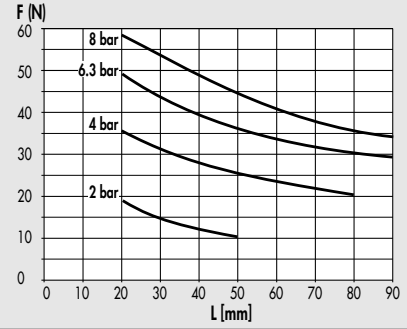
Code **W1590160200** Description **Gripper with 2 hinged jaws P7-16**



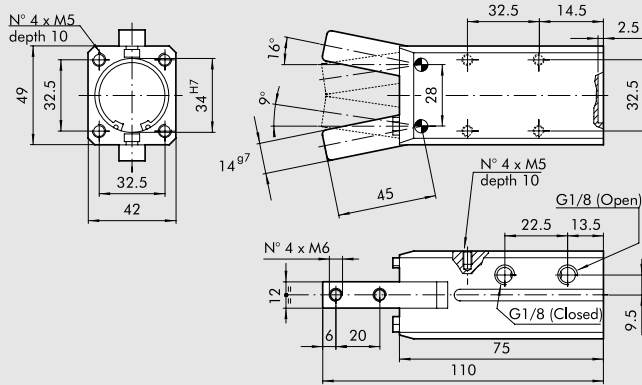
DIMENSIONS OF GRIPPERS P7-20



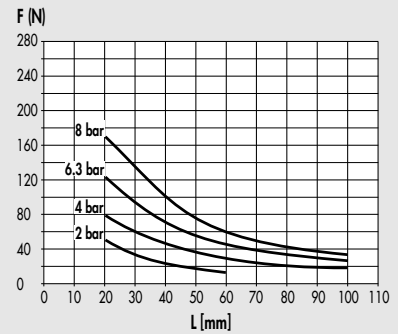
Code W1590200200 **Description** Gripper with 2 hinged jaws P7-20



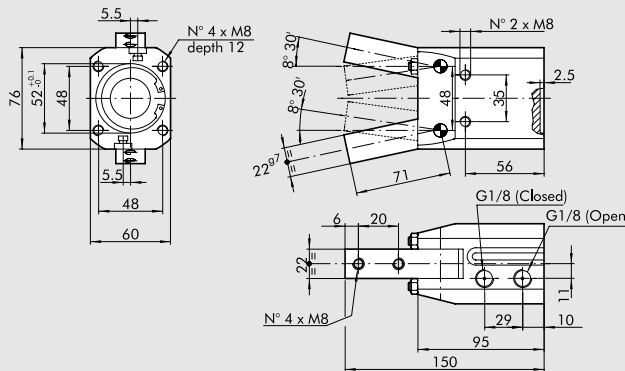
DIMENSIONS OF GRIPPERS P7-32



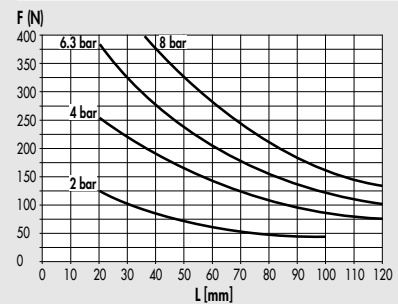
Code W1590320200 **Description** Gripper with 2 hinged jaws P7-32



DIMENSIONS OF GRIPPERS P7-50

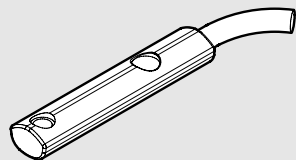


Code W1590500200 **Description** Gripper with 2 hinged jaws P7-50



ACCESSORIES

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE

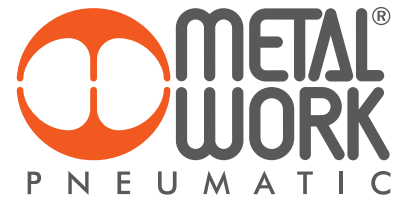


- | Code | Description |
|--------------|---|
| W0952025390 | HALL N.O. sensor, vertical insertion 2.5 m |
| W0952029394 | HALL N.O. sensor, vertical insertion 300 mm M8 |
| W0952022180 | REED N.O. sensor, vertical insertion 2.5 m |
| W0952028184 | REED N.O. sensor, vertical insertion 300 mm M8 |
| W0952125556 | HALL N.O. sensor, vertical insertion 2 m ATEX |
| W0952025500* | HALL N.O. sensor, vertical insertion HS 2.5 m |
| W0952029504* | HALL N.O. sensor, vertical insertion HS 300 mm M8 |
| W0952022500* | REED N.O. sensor, vertical insertion HS 2.5 m |
| W0952128184* | REED N.O. sensor, vertical insertion HS 300 mm M8 |

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

* For technical data see page 1-288

TECHNOPOLYMER HINGED GRIPPERS SERIES P8



Single-acting hinged grippers, normally open, made entirely of technopolymer. Three sizes with clamping force 25-80 N at 6 bar. This solution makes the entire system lighter. This gripper is corrosion-resistant and antimagnetic. It comes complete with spring-loaded bracket for pre-loading the piece (force 1.5-6 N) and sensor holders.



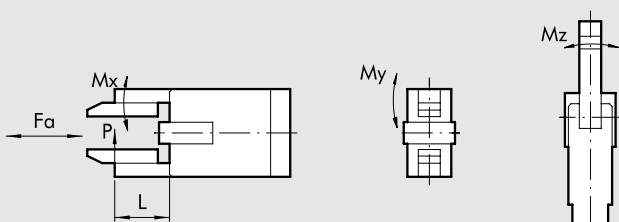
ACTUATORS

TECHNOPOLYMER HINGED GRIPPERS SERIES P8

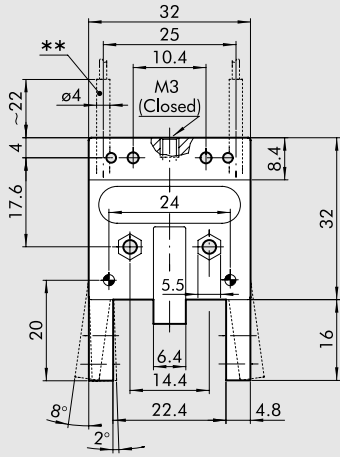
TECHNICAL DATA		P8-32	P8-40	P8-50
Operating pressure	bar		4 to 7	
	MPa		0.4 to 0.7	
Operating temperature	bar		58 to 101	
	°C		-10 to +60	
Fluid		20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous		
Life		Over 2 million cycles		
Jaw opening angle		8°		
Clamping force per jaw at 6 bar	N	22.5	48	80
Applicable weight (recommended)	kg	0.2	0.4	0.8
Air consumption per cycle	cm ³	0.5	1	1.8
Opening time	sec	0.04	0.05	0.05
Closing time	sec	0.06	0.08	0.08
Weight of grippers	g	36	45	60
Moment of inertia	kg cm ²	0.04	0.12	0.15
Repeatability	mm	0.1	0.1	0.1

TABLE OF MOMENTS

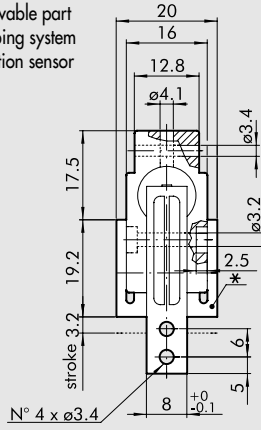
Gripper	FA (N)	Mx (Ncm)	My (Ncm)	Mz (Ncm)	P (N)
P8 - 32	3	9	10	10	22.5
P8 - 40	5	23	20	20	47.5
P8 - 50	8	49	30	40	80



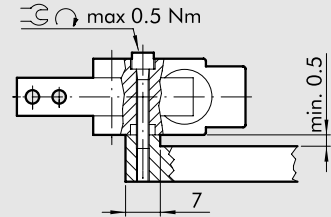
DIMENSIONS OF GRIPPERS P8-32



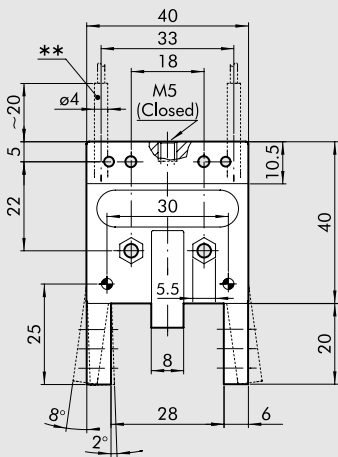
- * Removable part clamping system
- ** Induction sensor



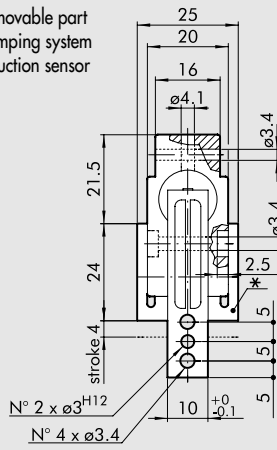
Code	Description
W0710010002	Tecnopolimer hinged grippers P8-32



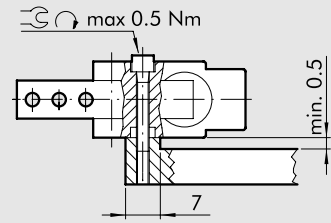
DIMENSIONS OF GRIPPERS P8-40



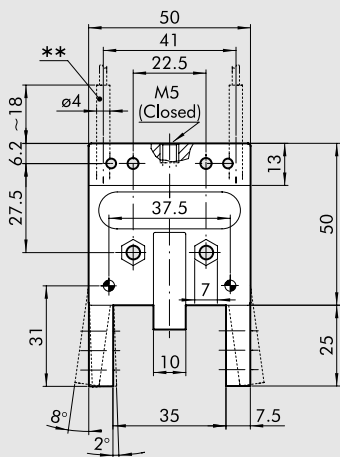
- * Removable part clamping system
- ** Induction sensor



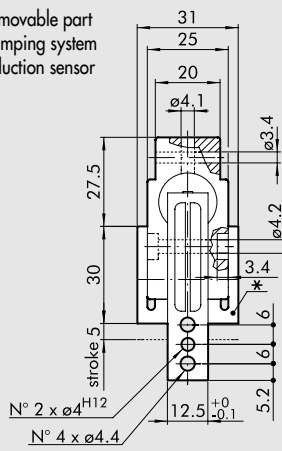
Code	Description
W0710010003	Tecnopolimer hinged grippers P8-40



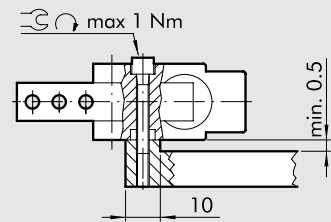
DIMENSIONS OF GRIPPERS P8-50



- * Removable part clamping system
- ** Induction sensor

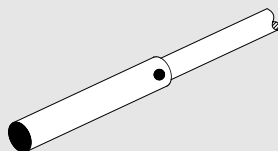


Code	Description
W0710010004	Tecnopolimer hinged grippers P8-50



ACCESSORIES

INDUCTION SENSOR



Code	Description
W0950037391	Induction sensor Ø 4 mm PNP-NO-2 m

GRIPPER 180° WITH 2 HINGED JAWS SERIES P9



- Toggle-type pivoted grippers, with adjustable opening angle.
- High clamping forces.
- Body made of hard anodized aluminium, jaws and moving parts made of tempered steel.
- Bottom or side fixing.
- All sizes come with magnets and sensor slots.

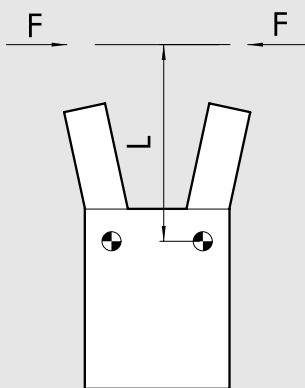


ACTUATORS

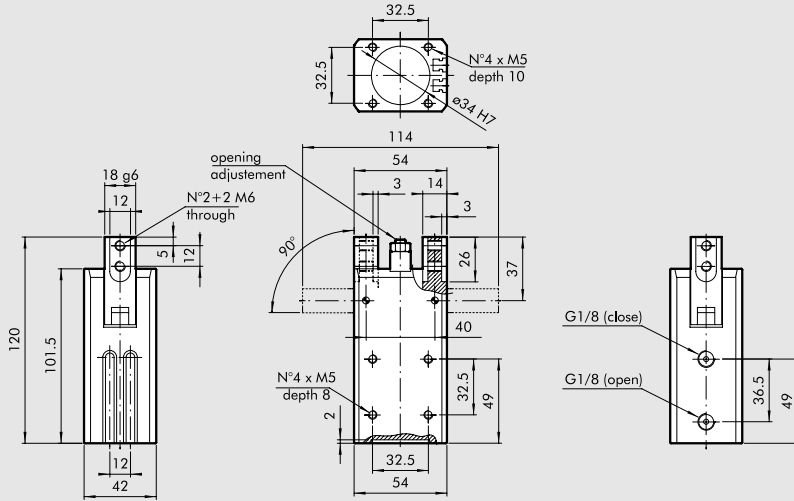
GRIPPER 180° WITH 2 HINGED JAWS SERIES P9

TECHNICAL DATA		P9-32	P9-40
Operating pressure	bar	2 to 8	
	MPa	0.2 to 0.8	
	psi	29 to 116	
Temperature range	°C	-10 to +80	
Fluid		Filtered, lubricated or unlubricated air; lubrication if used, it must be continuous.	
Bores	mm	32	40
Jaw opening angle		Adjustable 180°	
Clamping force at 6.3 bar 40 mm from the jaw pivot during opening and closing	N	160	260
Weight	kg	0.85	1.5

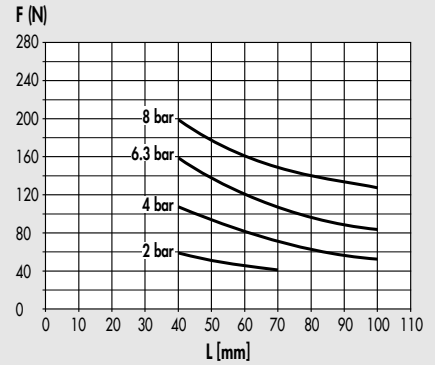
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



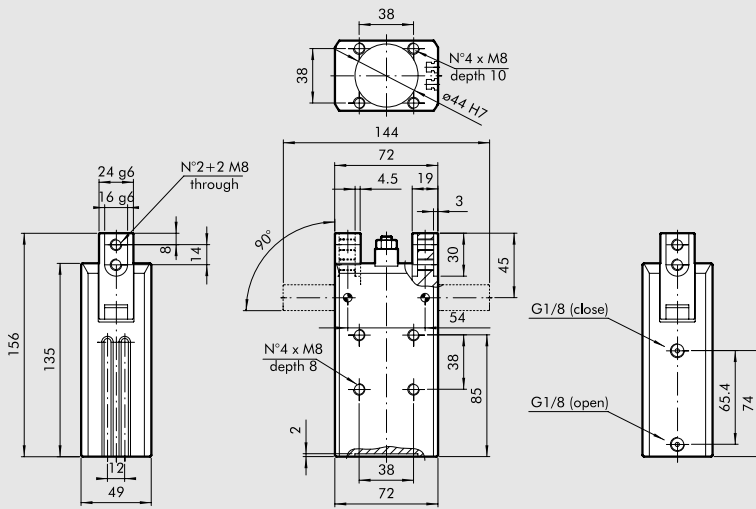
DIMENSIONS OF GRIPPERS P9-32



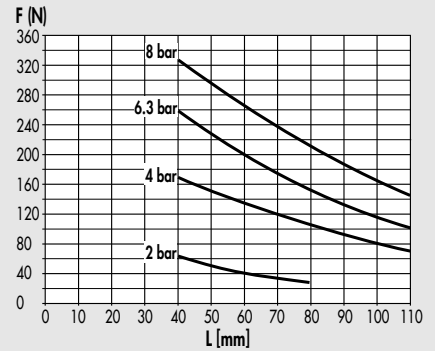
Code	Description
W1530320180	Hinged gripper P9-32



DIMENSIONS OF GRIPPERS P9-40

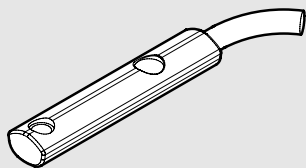


Code	Description
W1530400180	Hinged gripper P9-40



ACCESSORIES

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
* For technical data see page 1-288

GRIPPERS WITH 3 PARALLEL JAWS SERIES P11



Double-acting grippers with three self-centring jaws, internal and external clamping. The body contains slots for mounting retracting magnetic sensors.

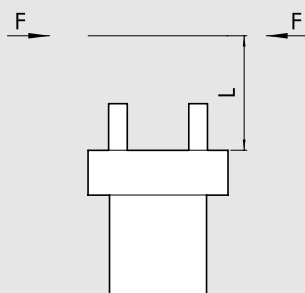


ACTUATORS

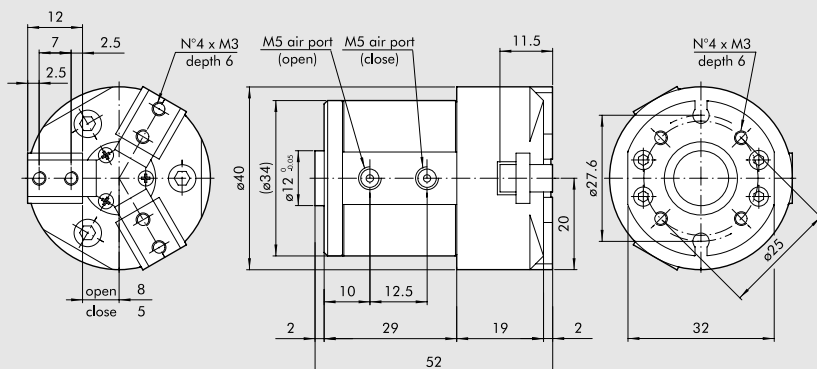
GRIPPERS WITH 3 PARALLEL JAWS - SERIES P11

TECHNICAL DATA		P11-16	P11-20	P11-25	P11-60
Min./max. operating pressure	bar		2 to 7		
	MPa		0.2 to 0.7		
	psi		29 to 101		
Temperature range	°C		-10 to +80		
Fluid		20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous.			
Bore	mm	16	20	25	60
Single jaw stroke	mm	3	4	5	12.5
Clamping force at 6.3 bar 22 mm from the top surface, during opening and closing	N	38	62	110	900
Weight	kg	0.12	0.21	0.3	2.7
Maximum operating frequency	cycles/s	1.5	1.5	1.5	1.2

TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



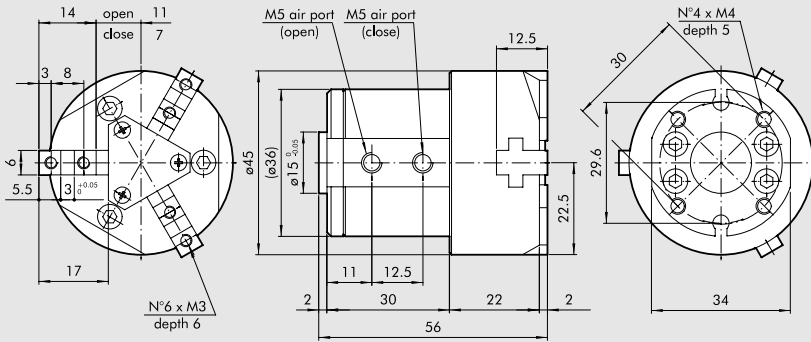
DIMENSIONS OF GRIPPER P11-16



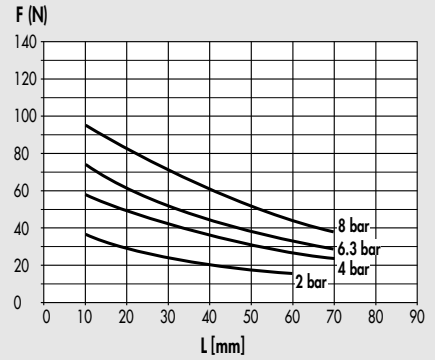
Code **W1570160300** Description **Grippers with 3 parallel jaws P11-16**



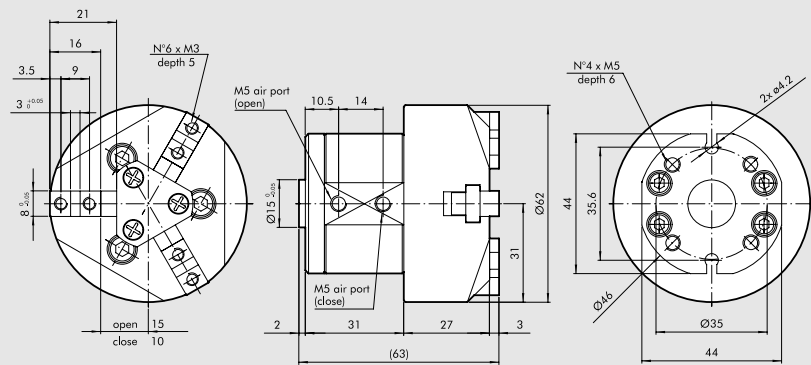
DIMENSIONS OF GRIPPER P11-20



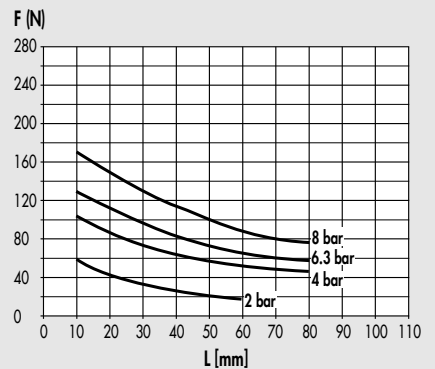
Code W1570200300 **Description** Grippers with 3 parallel jaws P11-20



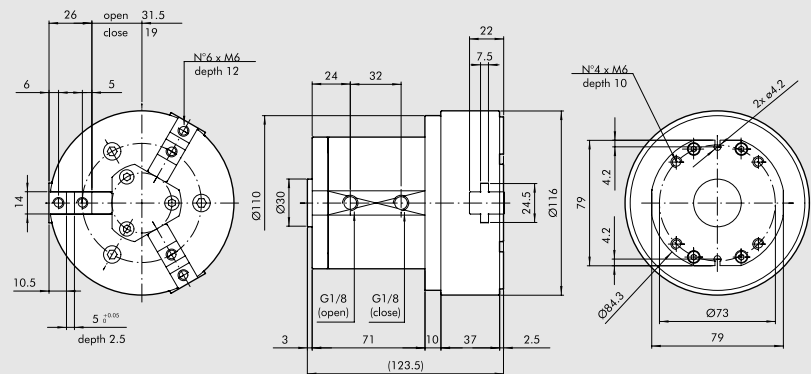
DIMENSIONS OF GRIPPER P11-25



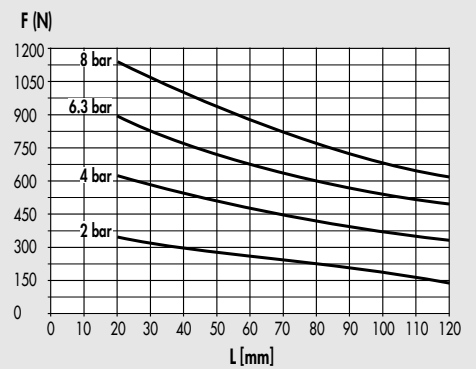
Code W1570250300 **Description** Grippers with 3 parallel jaws P11-25



DIMENSIONS OF GRIPPER P11-60

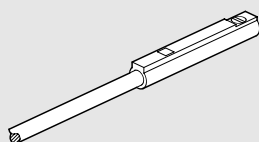


Code W1570600300 **Description** Grippers with 3 parallel jaws P11-60



ACCESSORIES

SENSOR FOR P11 16-60



Code W0950044180 **Description** Sensor REED 2 wires 24 VDC 1 m
Code W0950045390* **Description** Sensor HALL 3 wires 24 VDC 2 m

* For technical data see page 1-289

● GENERAL TECHNICAL DATA ROTARY ACTUATORS

PAGE 1-188

● ROTARY ACTUATORS SERIES R1

PAGE 1-189



● ROTARY ACTUATORS SERIES R2

PAGE 1-192



● ROTARY ACTUATORS SERIES R3

PAGE 1-195



● ROTARY ACTUATORS SERIES R3 WITH EXTERNAL SHOCK ABSORBERS

PAGE 1-200



GENERAL TECHNICAL DATA

ROTARY ACTUATORS

DEVICES

The use of hydraulic decelerators means it is possible to increase absorbed power. Some models in the catalogue have built-in decelerators. For those without, the user can mount decelerators outside the actuator. With horizontal axis rotation, if the masses are distributed asymmetrically it may be difficult to keep a constant rotation speed using flow regulators only. In this case it is advisable to use a decelerator.

CALCULATIONS

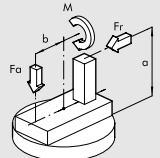
The following needs to be calculated:

- Absorbed kinetic energy
- Axial forces on the shaft or rotating flange
- Radial force on the shaft or rotating flange
- Overturning moment

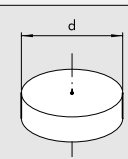
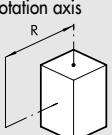
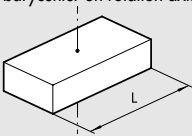
Then compare each of the 4 sizes with the admissible ones shown in the catalogue for each rotary actuator. Remember that the application of optional hydraulic decelerator, where envisaged, doubles the kinetic energy that can be absorbed by the actuator.

SIZING

HOW TO CALCULATE KINETIC ENERGY

Denomination	Unit of measurement	Formula	Example	
				
α	Angle of rotation	rad	$= \text{degrees} \cdot \frac{\pi}{180}$	$= 90^\circ = \frac{\pi}{2} \text{ rad.}$
t	Rotation time	s		2
J_{α}	Moment of inertia of rotating masses N.B.: added those of the individual masses	Kg m^2	$= \sum J_i$	$= 0.078 + 0.02 + 0.133 = 0.232$
E	Kinetic energy	Nm	$= 1/2 J \omega^2 = 2J \cdot \left(\frac{\alpha}{t}\right)^2$	$= 2 \cdot 0.232 \cdot \left(\frac{\pi}{2}\right)^2 = 0.57$
F_r	Radial force (Remember to take into account centrifugal forces)	N	$(F_c = M \cdot \omega^2 \cdot R)$	50
F_a	Axial force	N		10
M	Overturning moment	Nm	$= M + F_r \cdot a + F_a \cdot b$	$= 50 \times 0.1 + 10 \times 0 = 5$

MOMENTS OF INERTIA FOR THE MOST COMMON SHAPES

Denomination	Unit of measurement	Formula	Example	
		Disco		
M	Disk mass	Kg		7
d	Disk diameter	m		0.3
J	Moment of inertia of the disk	Kg m^2	$= \frac{Md^2}{8}$	$= \frac{7 \cdot 0.3^2}{8} = 0.0787$
		Mass distant from rotation axis		
M	Mass	Kg		0.5
R	Distance between barycenter and rotation axis	m		0.2
J	Moment of inertia of the mass	Kg m^2	$= MR^2$	$= 0.5 \times 0.2^2 = 0.02$
		Parallelepiped with barycenter on rotation axis		
M	Mass	Kg		10
L	Side of the parallelepiped	m		0.4
J	Moment of inertia of the mass	Kg m^2	$= M \frac{L^2}{12}$	$= \frac{10 \cdot 0.4^2}{12} = 0.13$

ROTARY ACTUATORS SERIES R1 Ø 32 to 100

Rack-type rotary cylinders in various configurations:

- Configuration with standard magnet
- Version with male pinion or female hole
- Mechanical stroke adjustment
- Special configurations on request

The central body has ISO bore holes for wall fixing using ISO pin and/or flange fittings.

N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.



TECHNICAL DATA		32	40	50	63	80	100
Gaskets		NBR					
Operating pressure	bar	10					
	MPa	1					
	psi	145					
Temperature range	°C	- 10 to + 80					
Fluid		Filtered lubricated or unlubricated air.					
		Lubrication, if used, must be continuous.					
		Ø 32 ; Ø 40 ; Ø 50 ; Ø 63 ; Ø 80 ; Ø 100					
Bores	mm	90°; 180°; 270°; 360°					
Rotation angle		Extruded profile					
Type of construction		Magnetic standard cushioned					
Configuration							
Axial load	N	2500	2800	4500	5600	8500	12200
Max. moment (6 bar - 0.6 Mpa)	Nm	4.5	12.5	16	32	70	120

N.B. The product is supplied with negative end-of-stroke piston (in the proximity of head A).

The first cycle involves movement of the piston (towards head B) with consequent anti-clockwise rotation of the pinion.

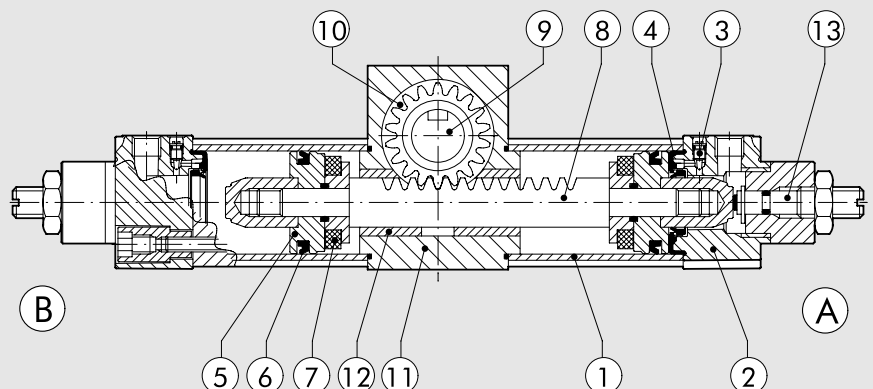
ACTUAL ROTATION ANGLE

Cylinders without regulation of the rotation angle: the manufacturing tolerance is $+ 4^\circ/0^\circ$ compared to the nominal value

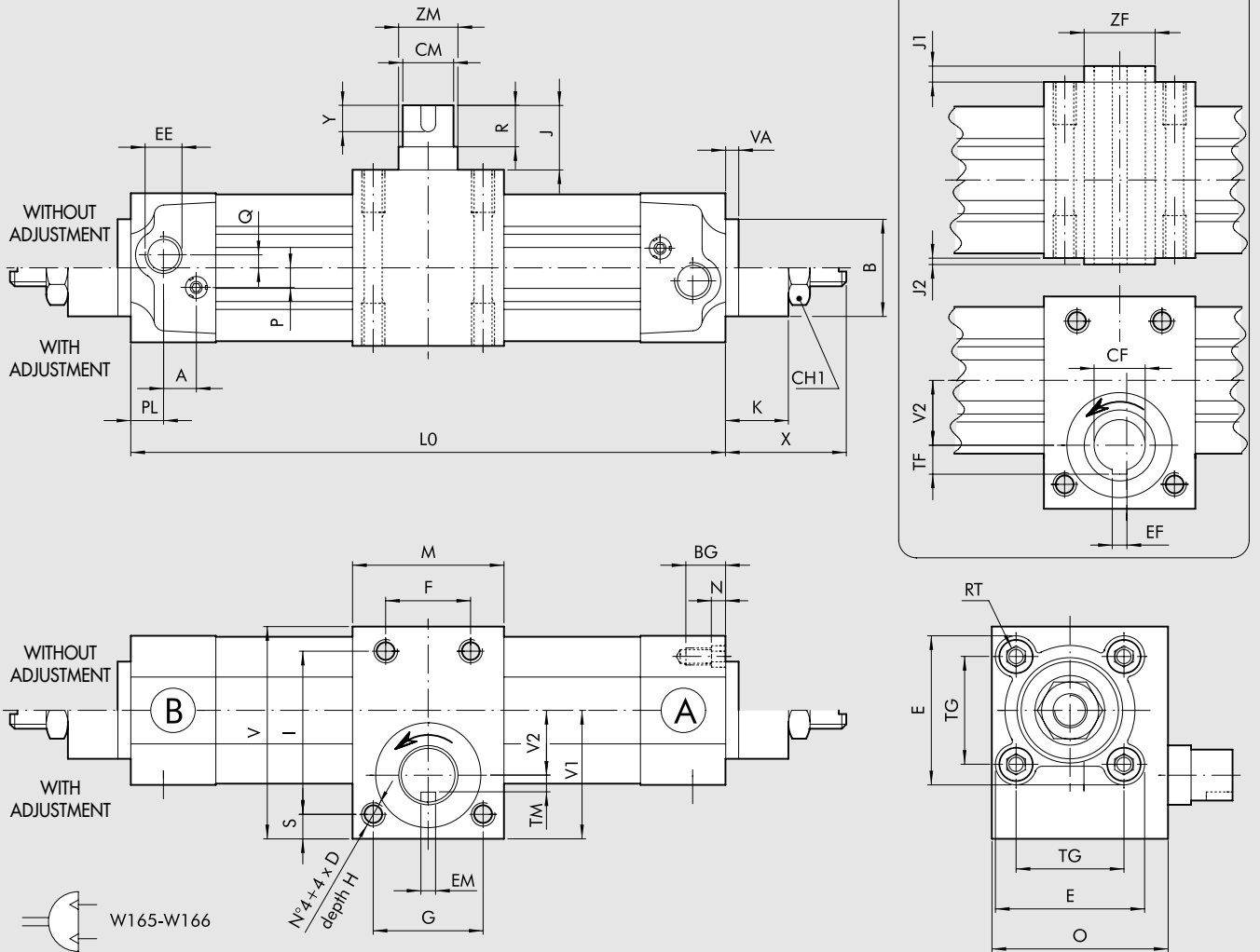
Cylinders with regulation of the rotation angle: the possible regulation ranges from $+ 2^\circ/- 20^\circ$.

COMPONENTS

- ① BARREL: profiled anodised aluminium alloy
- ② HEAD: die cast aluminium
- ③ CUSHIONING NEEDLE: OT 58 with needle out movement safety system even when fully open
- ④ BUFFER + Static O-rings: NBR or FKM/FPM
- ⑤ PISTON: aluminium
- ⑥ PISTON GASKET: NBR
- ⑦ MAGNET: plastoferrite
- ⑧ RACK: AISI 304
- ⑨ PIGNON MALE/FEMALE: nitrided alloy steel
- ⑩ BALL BEARING
- ⑪ CENTRAL BODY: anodised aluminium
- ⑫ RACK GUIDE BUSH: self-lubricating sintered bronze
- ⑬ REGULATION SCREW: AISI 303



DIMENSIONS OF ROTARY CYLINDER Ø 32 to 100



Note: with the key slot in the position specified, the piston is in contact with head (A)

Ø	L0 ±1 for ROTATION ANGLE				Δ	A	B	BG	CM ^{g7}	CF ^{g7}	CH1	D	E	EE	EF ^{D10}	EM ^{H9}	F	G	H	I	J
	90°	180°	270°	360°																	
32	218.7	261.1	303,5	345.9	0.236	10	30	15.5	14	10	22	M6	46	G1/8	3	5	30	30	14	50	34.5
40	241.4	288.6	335,6	382.8	0.262	10	35	15.5	16	12	22	M6	54	G1/4	4	5	30	30	14	60	39.5
50	265.9	322.4	379,0	435.5	0.314	10	40	18.5	19	14	27	M8	64.5	G1/4	5	6	32	45	16	65	46.5
63	295.1	358.0	420,8	483.6	0.349	10	45	18.5	24	16	27	M10	75.5	G3/8	5	8	38	52	17	73	47.5
80	358.3	443.1	528,0	612.8	0.471	12	45	21.5	28	25	36	M12	94	G3/8	8	8	48	70	20	100	58.5
100	399.8	500.4	600,9	701.4	0.559	12	55	21.5	38	30	36	M14	111	G1/2	8	10	60	80	25	120	67

Ø	J1	J2	K	M	N	O	P	PL	Q	R	RT	S	TG	TF	TM	V	V1	V2	VA	X	Y	ZM	ZF
32	4.5	-	16	47	4.5	47	6	10	4	30	M6	9	32.5	6.4	4	68	44.5	19	4	32 - 35.5	20	15	15
40	5	2	20	52.5	4.5	54.5	6	12	4	35	M6	7	38	7.8	5	74	45	22	4	45.5 - 50	25	17	17
50	7	-	25	63	5.5	64	6	14	6	40	M8	10	46.5	9.3	6	85	51	25	4	48.5 - 53	25	20	20
63	2,5	-	25	75	5.5	75	6	16	6	45	M8	11	56.5	10.3	8	95	56	27.5	4	46.5 - 51	30	25	25
80	8.5	-	33	95	5.5	95	10	18	7	50	M10	12.5	72	15.8	10	125	76	39	4	61 - 67	35	35	35
100	7	-	38	108	5.5	110	10	20	7	60	M10	15	89	18.3	14	150	90.5	45.5	4	66.5 - 74.5	45	45	45

Δ = Linear displacement (mm) for each degree of rotation

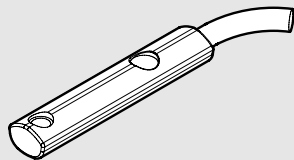
KEY TO CODES

W165 TYPE		050 BORES	1 VERSION	090 ANGLE OF ROTATION •
W165	cylinder with male pinion	032	1	090
W166	cylinder with female pinion	040	2	180
		050		270
		063		360
		080		
		100		

• expressed in sexagesimal degrees.

ACCESSORIES: MAGNETIC SENSORS

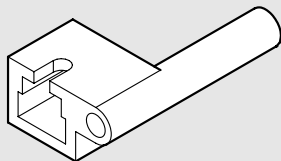
RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
For technical data see pag. 1-288

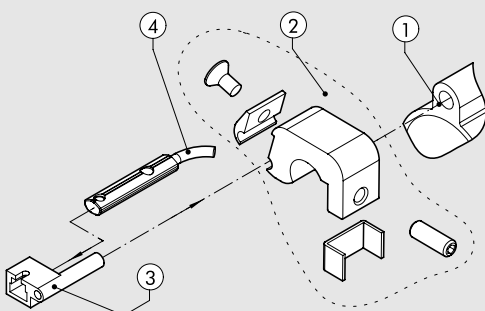
ADAPTOR FOR RETRACTABLE SENSOR



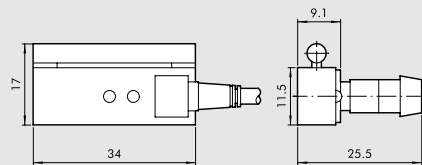
Code	Description
W0950001001	Adaptor DSS005 for DST/ST brackets

ASSEMBLY DIAGRAM

- ① ISO 15552 cylinder with barrel Serie STD or Serie 3
- ② Sensor bracket mod. DST (Ø 32 to 100)
- ③ Adaptor
- ④ Retractable sensor with insertion from above



SENSOR MOD. DSM

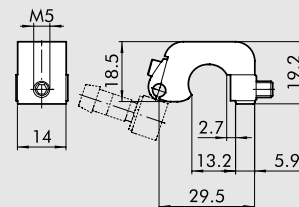


Code	Description
W0950000201	REED sensor DSM2-C525 HS
W0950000222	E.HALL PNP sensor DSM3-N225
W0950000232	E. HALL NPN sensor DSM3-M225

For technical data see pag. 1-286

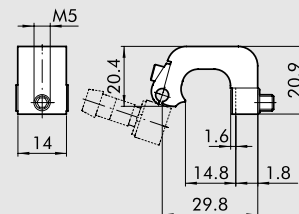
SENSOR SUPPORT BRACKETS FOR SENSORS DSM

Ø 32 to 40



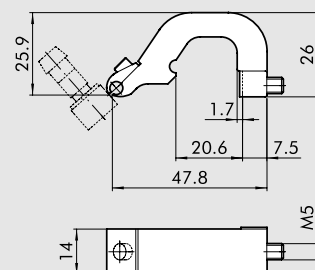
Code	Description
W0950000711	Bracket D.32 DST 80

Ø 50 to 63



Code	Description
W0950000712	Bracket D.50 DST 81

Ø 80 to 100



Code	Description
W0950000713	Bracket D.80-100-125 DST 82

ROTARY ACTUATORS SERIES R2

Actuator with double rack and play take-up.
Four sizes – 12, 16, 20 and 25. Two angles of rotation – 90° and 180°.
Stroke adjustment system for all sizes. Pneumatic cushioning for all sizes except the smallest. There are slots in the body to house a magnetic proximity sensor. Air supply, stroke adjustment and cushioning adjustment are all on the same side.

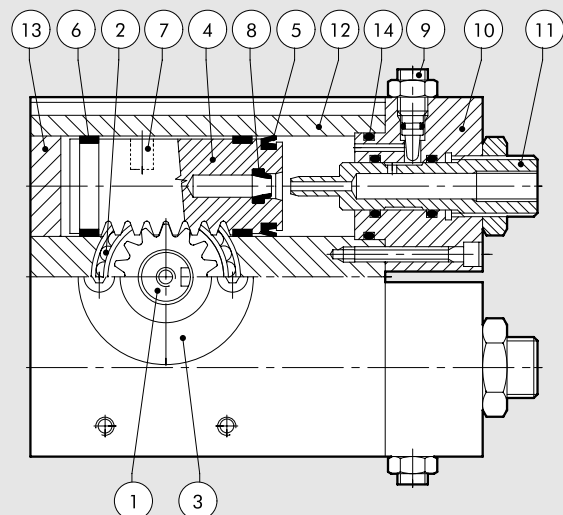
N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.



TECHNICAL DATA		R2-12	R2-16	R2-20	R2-25
Operating pressure	bar	1.5 to 7			
	MPa	0.15 to 0.7			
	psi	22 to 101			
Temperature range	°C	-10 to +80			
Angle adjustment	degrees	35° (about +10° -25°)			
Fluid		20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous			
Versions		90°/180° rotation			
Ports		Both at the front			
Sizes	mm	12	16	20	25
Theoretical torque (ΔP= pressure in bar)	Nm	0.065 x P	0.14 x P	0.25 x P	0.48 x P
Max. axial load	N	8	14	40	80
Max. radial load	N	8	14	40	80
Weight with 90° rotation	Kg	0.18	0.26	0.63	0.8
Weight with 180° rotation	Kg	0.21	0.31	0.72	1
Rotation time without load:					
• 90° angle	s	0.2	0.2	0.2	0.2
• 180° angle	s	0.3	0.3	0.3	0.3

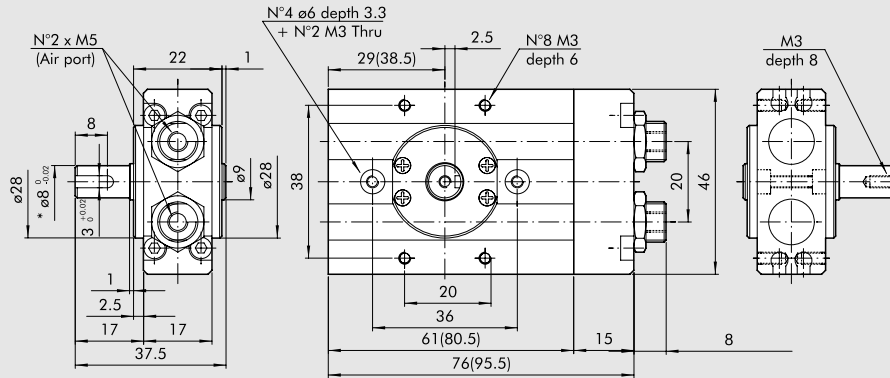
COMPONENTS

- ① ROTARY SHAFT / PINION: hardened and tempered steel
- ② BALL BEARING
- ③ FLANGE: anodised aluminium
- ④ PISTON / RACK: hardened and tempered steel
- ⑤ PISTON GASKET: NBR
- ⑥ GUIDE SHOE: PTFE
- ⑦ MAGNET: neodymium
- ⑧ CUSHIONING GASKET: NBR
- ⑨ CUSHIONING PIN: zinc-plated steel
- ⑩ HEAD: anodised aluminium
- ⑪ PNEUMATIC CONNECTION / STROKE ADJUSTMENT: steel
- ⑫ BARREL: anodised aluminium
- ⑬ BASE: anodised aluminium
- ⑭ SEAL: NBR



ROTARY ACTUATOR R2-12 90°/180°

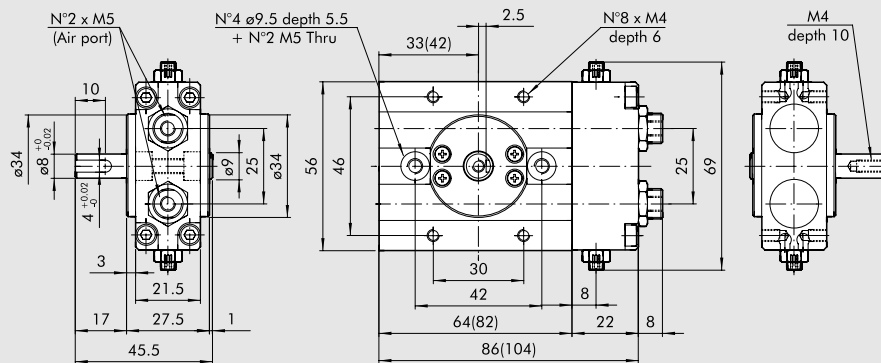
Code	Description
W1620122090	Rotary actuator R2-12-90°
W1620122180	Rotary actuator R2-12-180°



* For the version R2-12-90° it was $\phi 6$ mm; spare actuators code W1620122091 can be still supplied
Dimensions for 180° rotation are given in brackets

ROTARY ACTUATOR R2-16 90°/180°

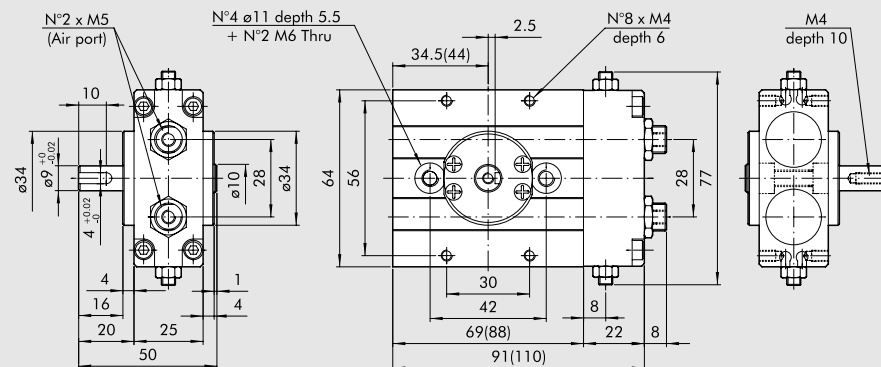
Code	Description
W1620162090	Rotary actuator R2-16-90°
W1620162180	Rotary actuator R2-16-180°



Dimensions for 180° rotation are given in brackets

ROTARY ACTUATOR R2-20 90°/180°

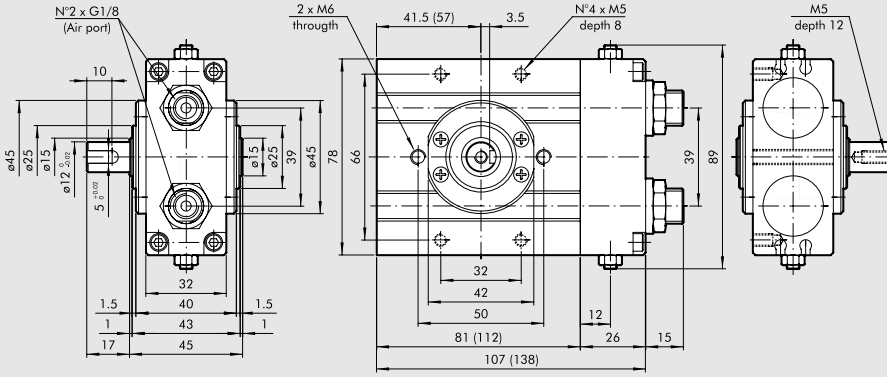
Code	Description
W1620202090	Rotary actuator R2-20-90°
W1620202180	Rotary actuator R2-20-180°



Dimensions for 180° rotation are given in brackets

ROTARY ACTUATOR R2-25 90°/180°

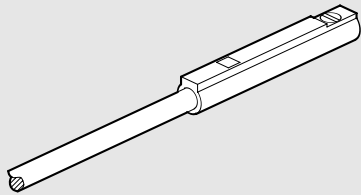
Code	Description
W1620252090	Rotary actuator R2-25-90°
W1620252180	Rotary actuator R2-25-180°



Dimensions for 180° rotation are given in brackets

ACCESSORIES

MAGNETIC SENSOR Ø 4



Code	Description
W0950044180	Sensor REED 2 wires 24 VDC 1 m
W0950045390*	Sensor HALL 3 wires 24 VDC 2 m

* For technical data see page 1-289

NOTES

ROTARY ACTUATORS SERIES R3

Actuator with double rack and play take-up. Angle of rotation adjustable from 0 to 180°. The R3 rotary actuator can come with a mechanical stop or hydraulic end-of-stroke cushioning.

There is a version with flange and one with shaft (for $\varnothing 16-20-25-30$).

There are slots in the body for retracting magnetic proximity sensors, two on each side. There is hole in the flange for air pipes or wires.

N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.



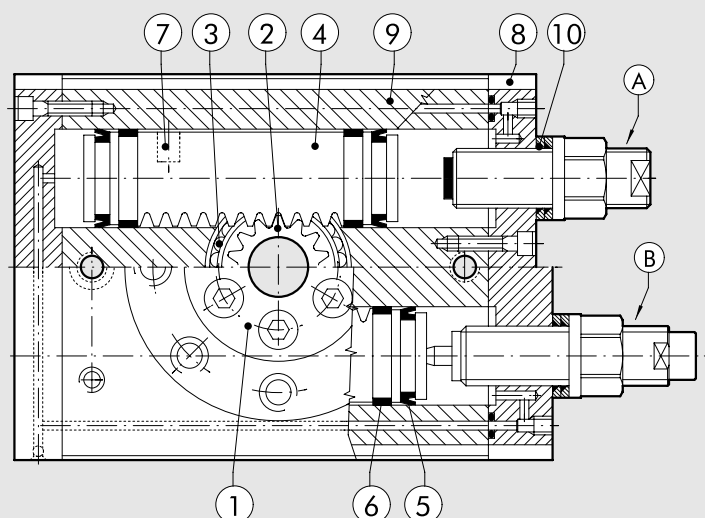
TECHNICAL DATA		R3-16	R3-20	R3-22	R3-25	R3-30	R3-40
Operating pressure	bar						3 to 7
	MPa						0.3 to 0.7
	psi						43.5 to 101
	degrees						0° to 180°
Temperature range	°C						-10 to +80
Angle adjustment	degrees						0° to 180°
Fluid		20 μ m filtered, lubricated or unlubricated air; lubrication if used, it must be continuous					
Versions		With mechanical stop / hydraulic decelerator					
Sizes		16	20	22	25	30	40
Bores	mm	2 x 16	2 x 20	2 x 22	2 x 25	2 x 30	2 x 40
Theoretical torque at 6 bar	Nm	0.9	1.8	2.7	4.6	9.3	22
Max. axial load	N	74	135	195	300	340	360
Max. radial load	N	78	137	360	450	490	560
Weight	Kg	0.53	0.99	1.29	2.08	3.9	6.7
Rotation time without load	s	0.2	0.2	0.2	0.2	0.3	0.3
Admissible kinetic energy	Joule						
WITH MECHANICAL STOP		0.007	0.025	0.049	0.082	0.090	0.150
(with flange W1630__2180 and with shaft W1630__5180)							
WITH HYDRAULIC DECELERATOR		-	-	-	0.29	1.10	1.60
(with flange W1630__2180 and with shaft W1630__5180)							

COMPONENTS

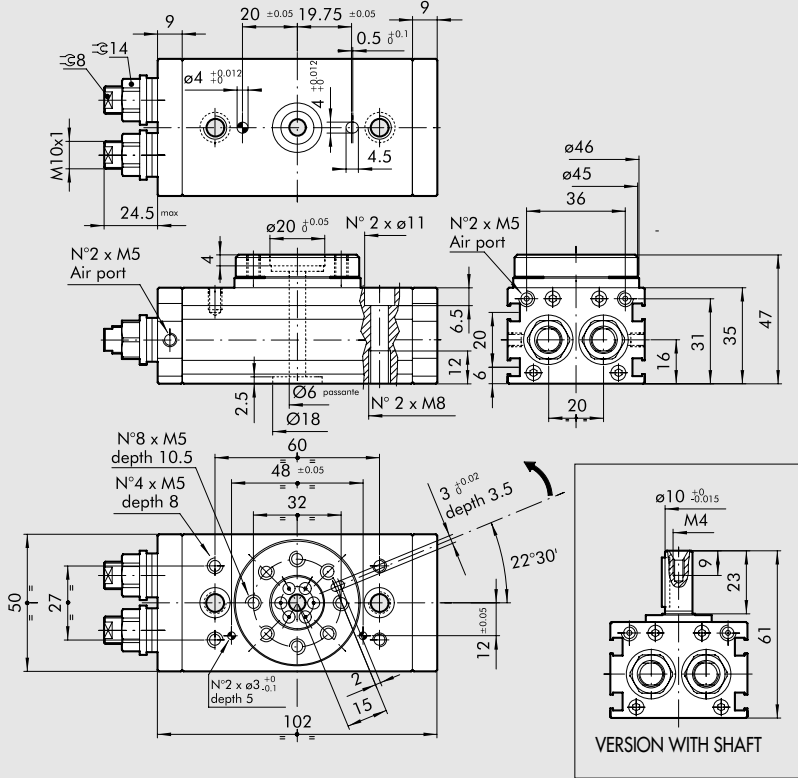
- ① ROTARY FLANGE: anodised aluminium
- ② PINION: hardened and tempered steel
- ③ BALL BEARING
- ④ PISTON / RACK: hardened and tempered steel
- ⑤ CUSHIONING GASKET: NBR
- ⑥ GUIDE SHOE: PTFE
- ⑦ MAGNET: neodymium
- ⑧ HEAD: anodised aluminium
- ⑨ BARREL: anodised aluminium
- ⑩ SEAL: NBR

VERSIONS:

- A Stroke adjustment
- B Stroke adjustment with inside hydraulic shock absorbers (available from $\varnothing 25$)

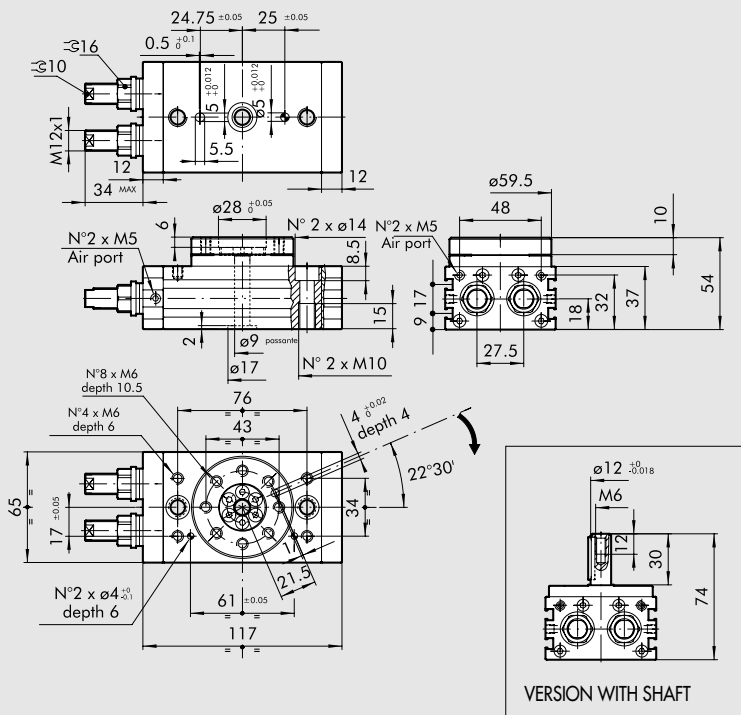


ROTARY ACTUATOR R3-16



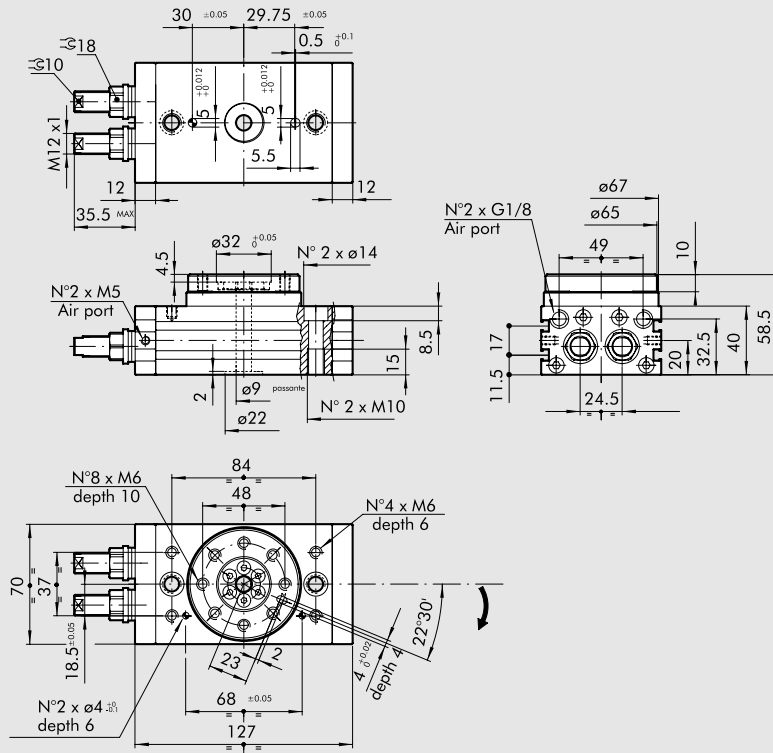
Code	Description
W1630162180	Rotary actuator with flange R3-16
W1630165180	Rotary actuator with shaft R3-16

ROTARY ACTUATOR R3-20



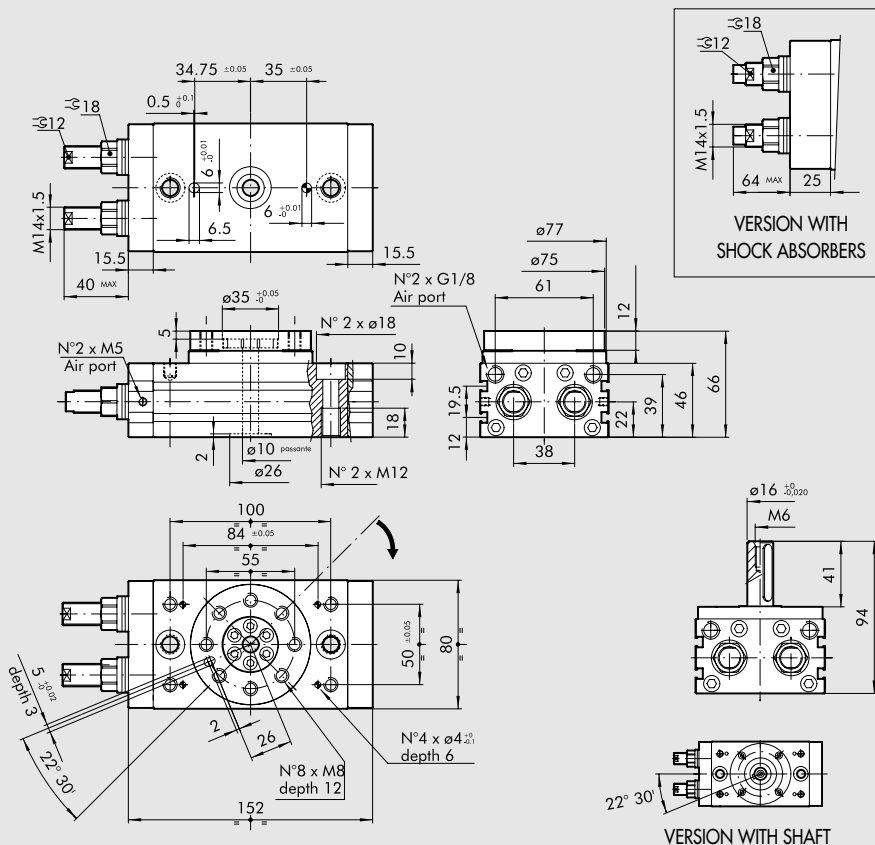
Code	Description
W1630202180	Rotary actuator with flange R3-20
W1630205180	Rotary actuator with shaft R3-20

ROTARY ACTUATOR R3-22



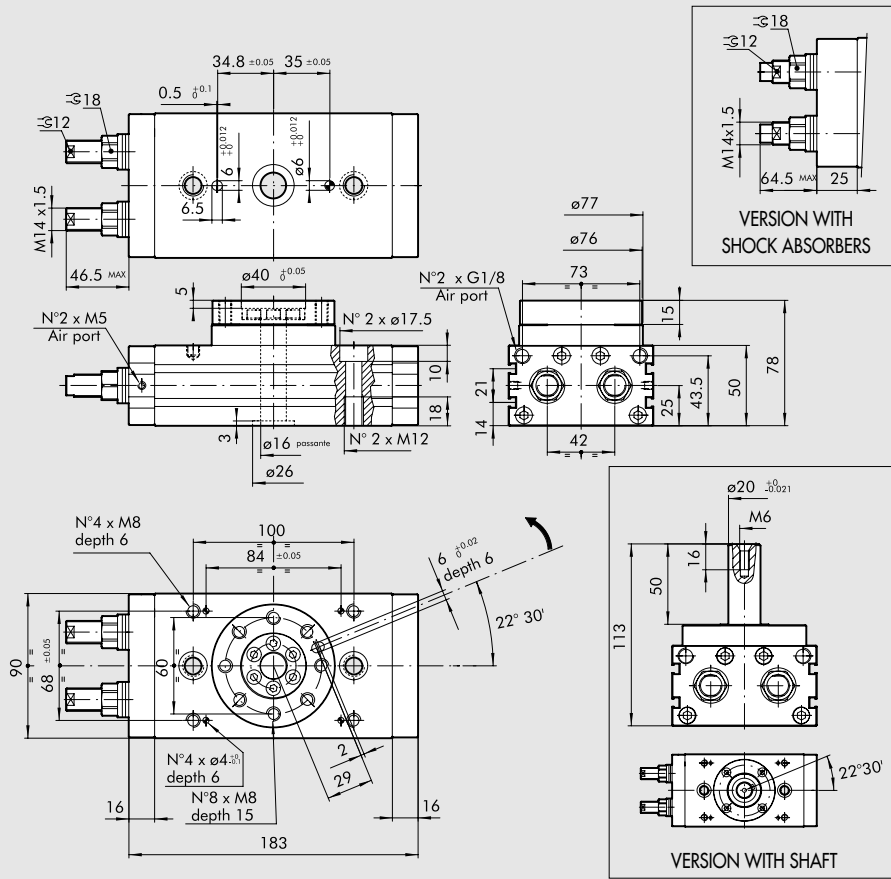
Code	Description
W163022180	Rotary actuator with flange R3-22

ROTARY ACTUATOR R3-25



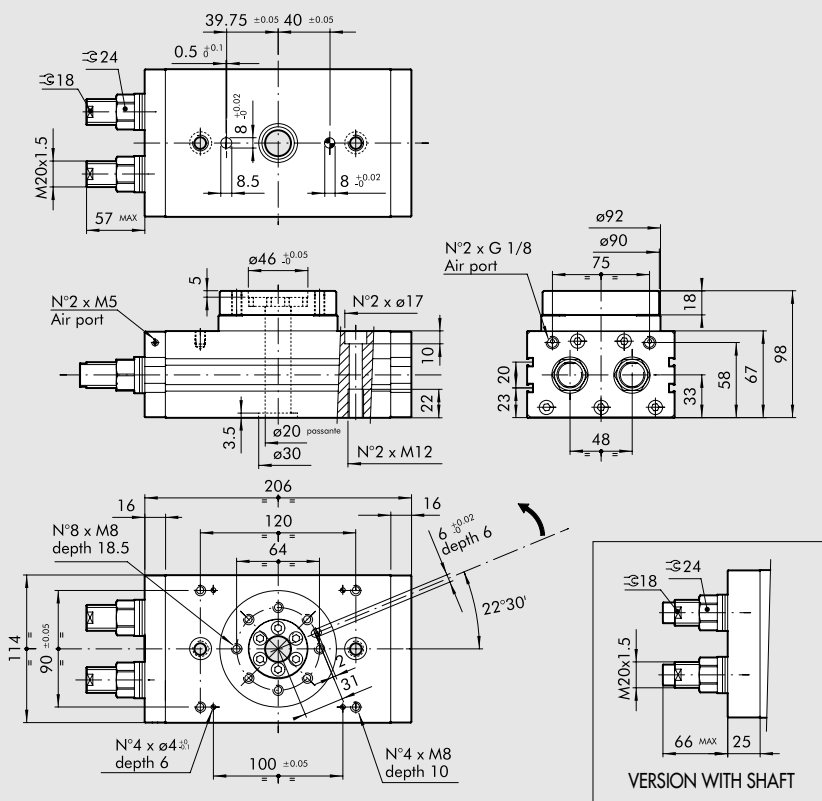
Code	Description
W1630252180	Rotary actuator with flange R3-25
W1630253180	Rotary actuator with flange + shock absorbers R3-25
W1630255180	Rotary actuator with shaft R3-25
W1630256180	Rotary actuator with shaft + shock absorbers R3-25

ROTARY ACTUATOR SERIES R3-30



Code	Description
W1630302180	Rotary actuator with flange R3-30
W1630303180	Rotary actuator with flange + shock absorbers R3-30
W1630305180	Rotary actuator with shaft R3-30
W1630306180	Rotary actuator with shaft + shock absorbers R3-30

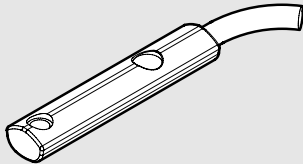
ROTARY ACTUATOR SERIES R3-40



Code	Description
W1630402180	Rotary actuator with flange R3-40
W1630403180	Rotary actuator with flange + shock absorbers R3-40

ACCESSORIES

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



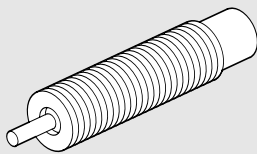
Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-288

SPARE PARTS

SHOCK ABSORBERS



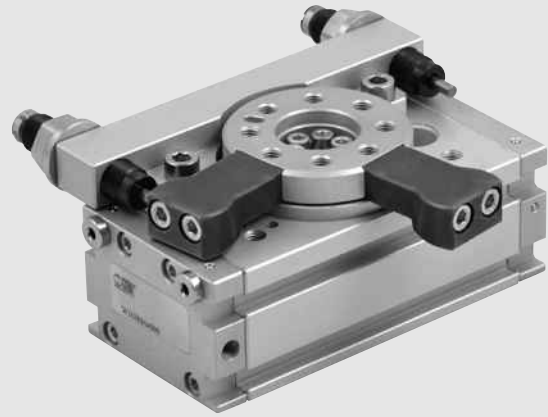
Code	Ø	Description
0950004011	Ø 25	Shock absorbers SPM25 MC3 short M14x1.5
0950004008	Ø 30	Shock absorbers PM25 MC3 M14x1.5
0950004005	Ø 40	Shock absorbers PR050 MC2 + nut M20x1.5

NOTES

ROTARY ACTUATORS SERIES R3 WITH EXTERNAL SHOCK ABSORBERS

Dual-rack actuator with automatic adjustment for wear. Hydraulic shock absorbers are arranged externally and operate at a distance from the axis of rotation which is considerably higher than for internal ones. This means that the absorbable kinetic energy is 4 to 8 times higher. It is reduced in length as there are no adjusting screws. A 90° and a 180° versions are available. Grooves are provided in the body to fix retractable magnetic proximity sensors, two on each side. A hole has been drilled in the flange for the passage of air pipes or power cables.

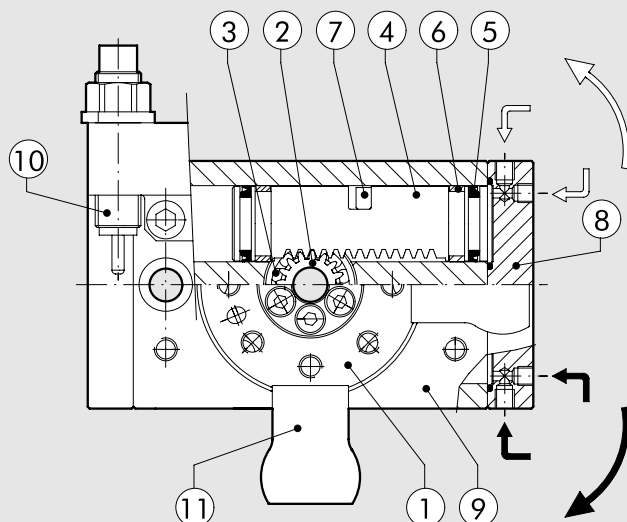
N.B.: We always suggest to use flow microregulators. During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.



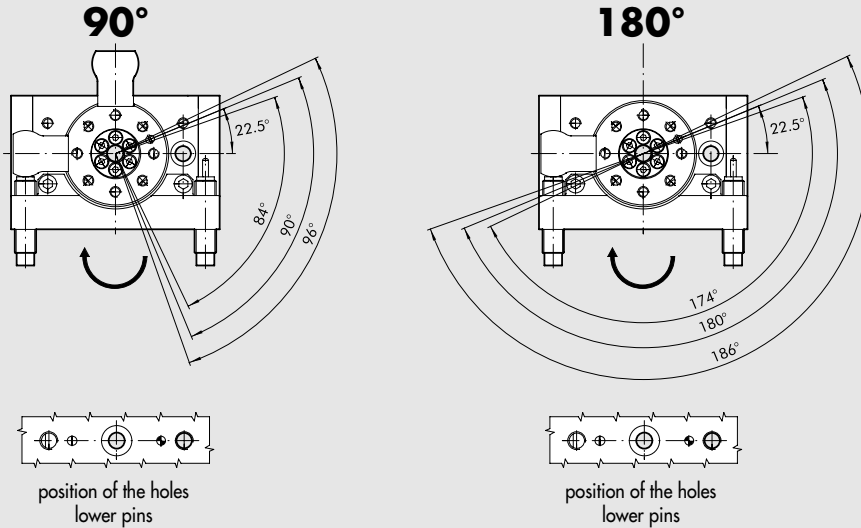
TECHNICAL DATA		R3-16	R3-20	R3-22	R3-25	R3-30	R3-40
Operating pressure	bar	3 to 7					
	MPa	0.3 to 0.7					
	psi	43.5 to 101					
Temperature range	°C	-10 to +80					
Angle adjustment	degrees	90° o 180° ± 3°					
Fluid		20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous					
Sizes	mm	16	20	22	25	30	40
Bore	mm	2 x 16	2 x 20	2 x 22	2 x 25	2 x 30	2 x 40
Theoretical torque at 6 bar	Nm	0.9	1.8	2.7	4.6	9.3	22
Max. axial load	N	74	135	195	300	340	360
Max. radial load	N	78	137	360	450	490	560
Max overturning moment	Nm	2.4	4	5.3	9.7	12	18
Admissible kinetic energy	J	0.16	0.55	0.85	1.40	1.85	3.35
Rotation time without load	s	0.2	0.2	0.2	0.2	0.3	0.3

COMPONENTS

- ① ROTARY FLANGE: anodised aluminium
- ② PINION: hardened and tempered steel
- ③ BALL BEARING
- ④ PISTON / RACK: hardened and tempered steel
- ⑤ CUSHIONING GASKET: NBR
- ⑥ GUIDE SHOE: PTFE
- ⑦ MAGNET: neodymium
- ⑧ HEAD: anodised aluminium
- ⑨ BARREL: anodised aluminium
- ⑩ STROKE REGULATOR WITH HYDRAULIC SHOCK ABSORBERS
- ⑪ Block for 90° version



ROTATION ANGLE

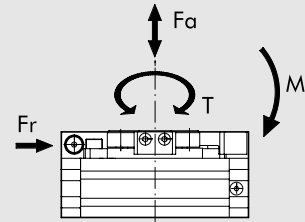


ADMISSIBLE KINETIC ENERGY Joule [J]

Bore Ø	With flange, 90° rotation°: W1630_4090	With flange, 180° rotation°: W1630_4180
16	0.16	
20	0.55	
22	0.85	
25	1.40	
30	1.85	
40	3.35	

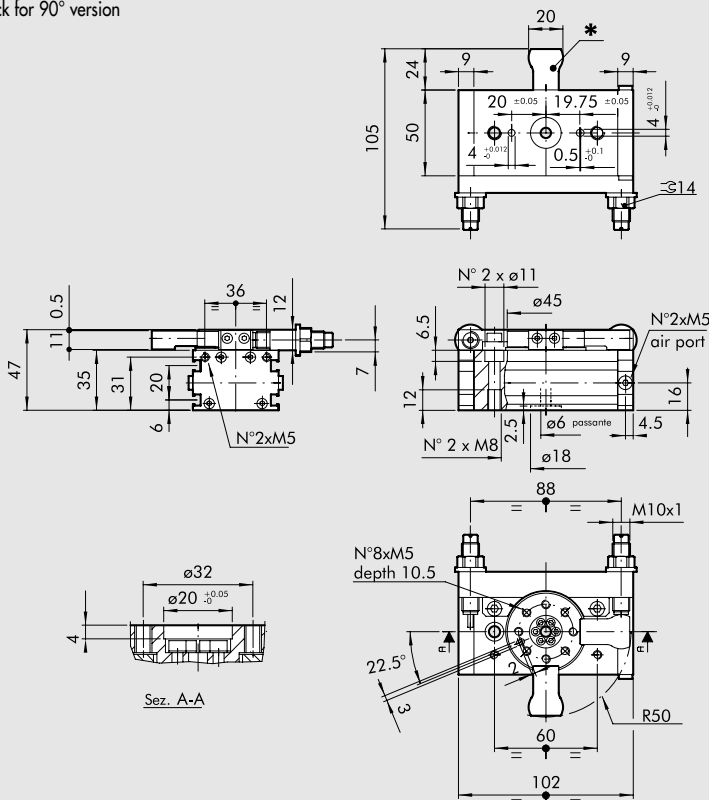
DIMENSIONES - FORCES AND MOMENTS

Bore Ø	T Theoretical torque at 6 bar [Nm]	FA Max. axial load [N]	FR Max. radial load [N]	M Averturing momnet [Nm]
16	0.9	74	78	2.4
20	1.8	135	137	4
22	2.7	195	360	5.3
25	4.6	300	450	9.7
30	9.3	340	490	12
40	22	360	560	18



ROTARY ACTUATOR SERIES R3-16 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

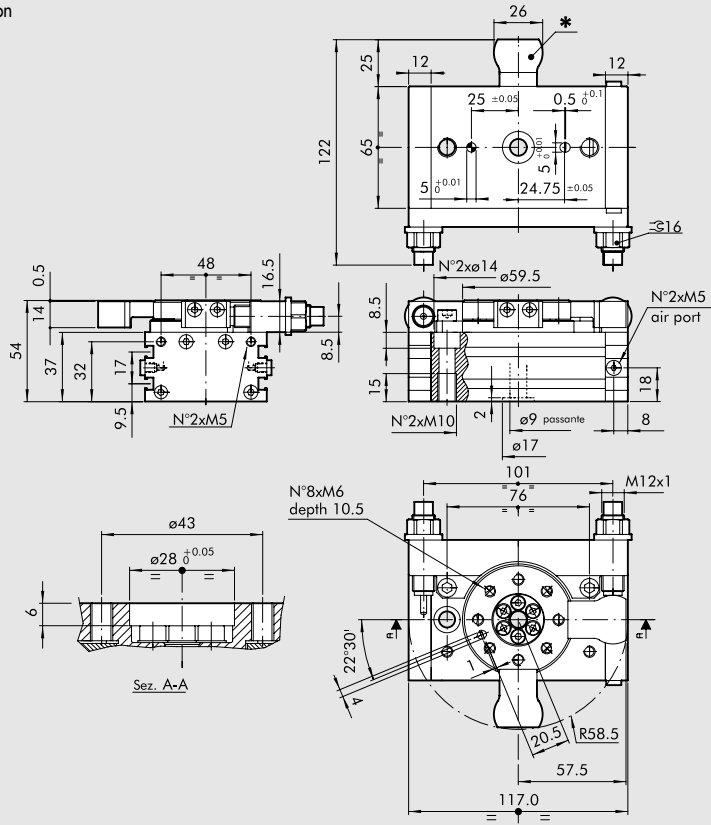
* Block for 90° version



Code	Description
W1630164090	Rotary actuator with flange + shock absorbers R3-16-90
W1630164180	Rotary actuator with flange + shock absorbers R3-16-180

ROTARY ACTUATOR SERIES R3-20 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

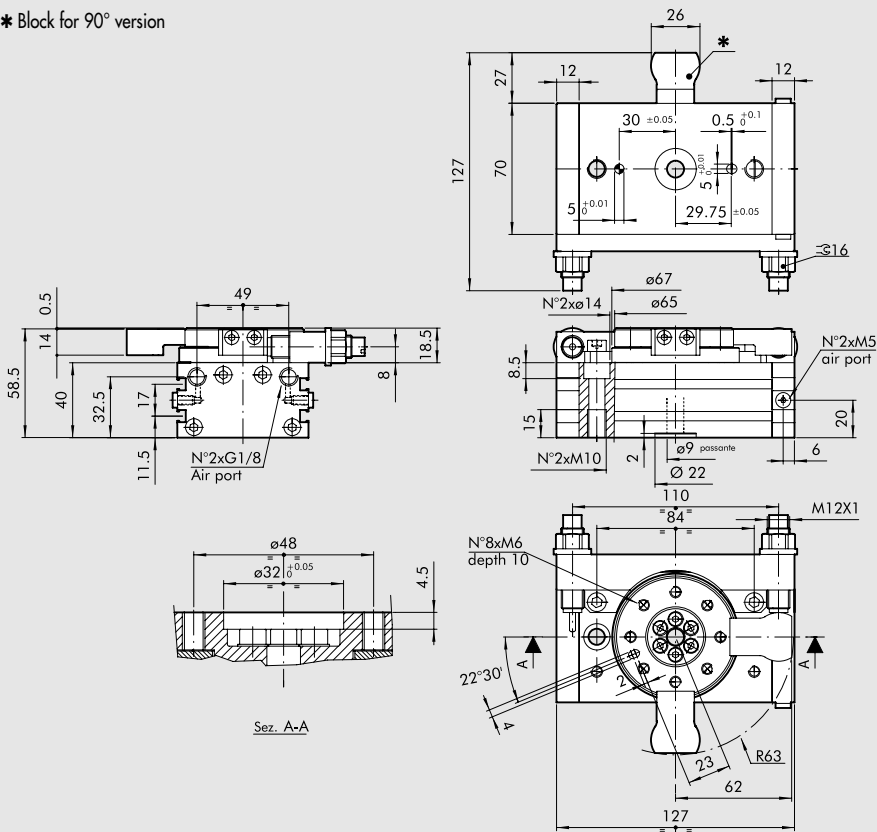
* Block for 90° version



Code	Description
W1630204090	Rotary actuator with flange + shock absorbers R3-20-90
W1630204180	Rotary actuator with flange + shock absorbers R3-20-180

ROTARY ACTUATOR SERIES R3-22 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

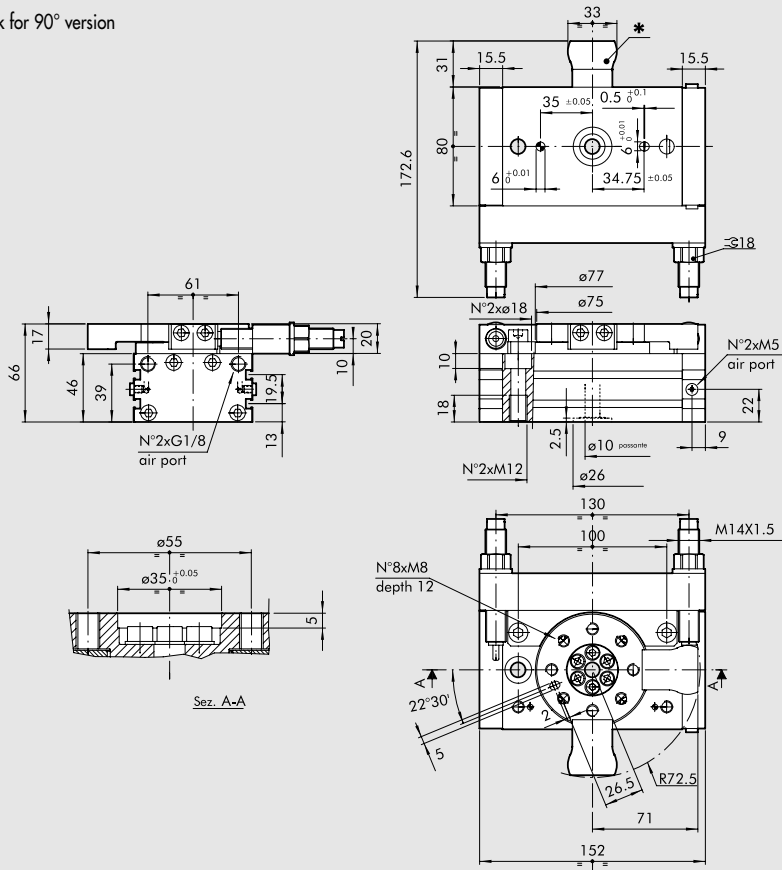
* Block for 90° version



Code	Description
W1630224090	Rotary actuator with flange + shock absorbers R3-22-90
W1630224180	Rotary actuator with flange + shock absorbers R3-22-180

ROTARY ACTUATOR SERIES R3-25 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

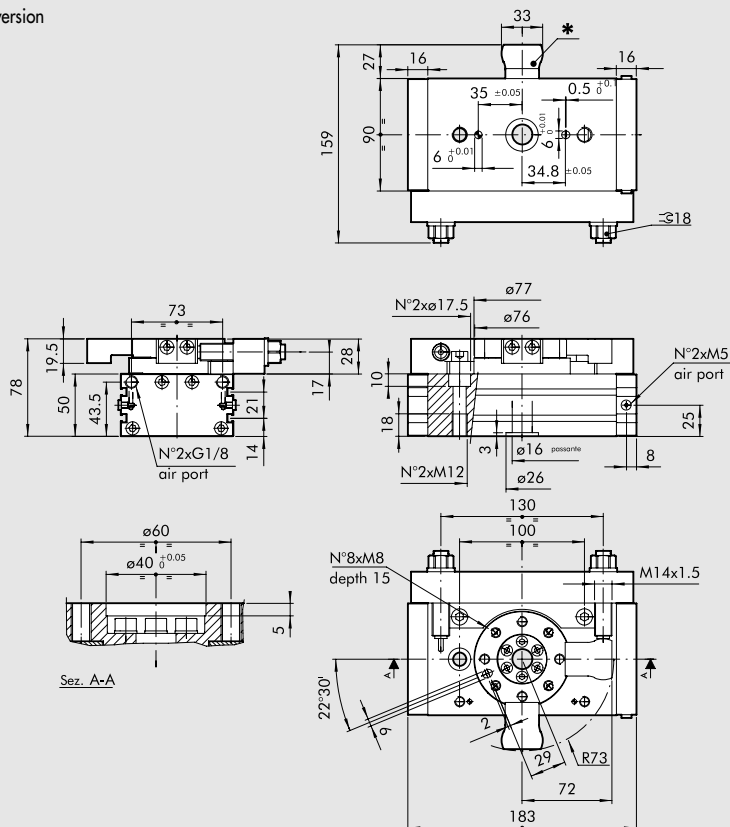
* Block for 90° version



Code	Description
W1630254090	Rotary actuator with flange + shock absorbers R3-25-90
W1630254180	Rotary actuator with flange + shock absorbers R3-25-180

ROTARY ACTUATOR SERIES R3-30 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

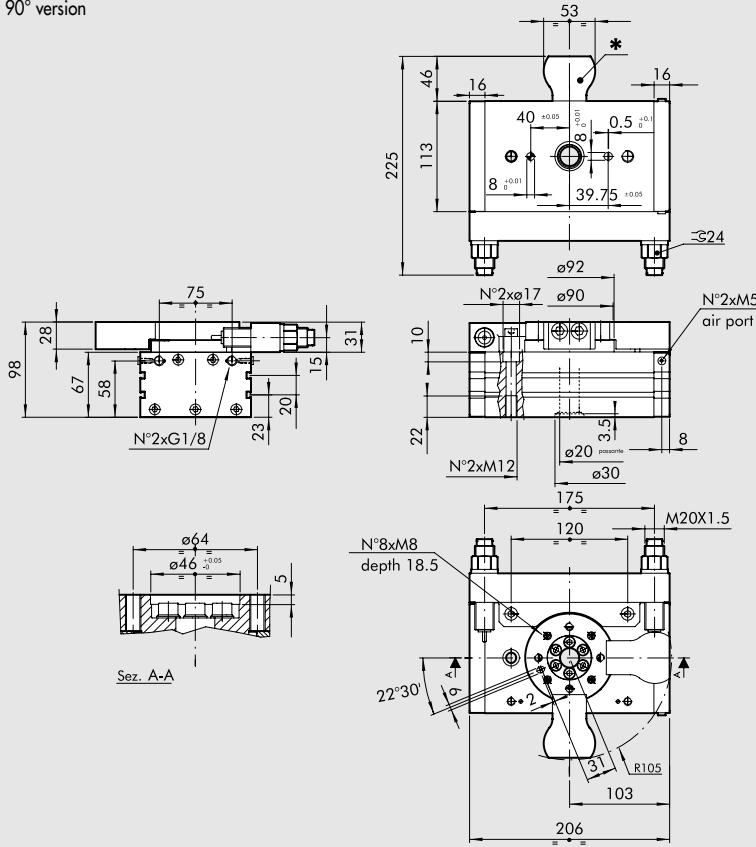
* Block for 90° version



Code	Description
W1630304090	Rotary actuator with flange + shock absorbers R3-30-90
W1630304180	Rotary actuator with flange + shock absorbers R3-30-180

ROTARY ACTUATOR SERIES R3-40 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

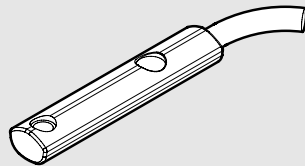
* Block for 90° version



Code	Description
W1630404090	Rotary actuator with flange + shock absorbers R3-40-90
W1630404180	Rotary actuator with flange + shock absorbers R3-40-180

ACCESSORIES

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



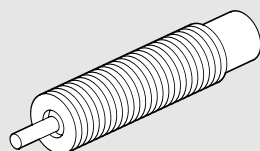
Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-288

SPARE PARTS

SHOCK ABSORBERS



Code	Ø	Description
0950004009	Ø 16	Shock absorbers PMX 10 MF3 M10x1
0950004010	Ø 22	Shock absorbers PM 1.5 MF3 M12x1
0950004011	Ø 25 ÷ 30	Shock absorbers SPM 25 MC-C M14x1.5
0950004005	Ø 40	Shock absorbers PR50 MC2 + nut M20x1.5

● **GENERAL TECHNICAL DATA SLIDES**

PAGE 1-206



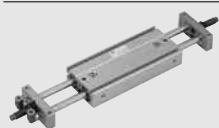
● **TWIN CYLINDERS SERIES S10**

PAGE 1-207



● **TWIN CYLNDERS SLIDE WITH FIXED BODY SERIES S11**

PAGE 1-211



● **TWIN CYLNDERS SLIDE WITH FIXED PLATES SERIES S12**

PAGE 1-217



● **PRECISION SLIDES SERIES S13**

PAGE 1-223

OTHER GUIDE UNITS AND SLIDE



● **GDS, GDH AND GDM GUIDE UNITS FOR ISO 6432**

PAGE 1-19



● **GDS, GDH AND GDM GUIDE UNITS FOR ISO 15552**

PAGE 1-42



● **SHORT-STROKE ANTI-ROTATION CYLINDERS**

PAGE 1-105



● **COMPACT ANTI-ROTATION CYLINDERS SERIES CMPC**

PAGE 1-76



● **ISO 21287 ANTI-ROTATION CYLINDERS SERIES LINER**

PAGE 1-65



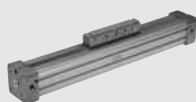
● **TWIN-ROD CYLINDERS SERIES TWNC**

PAGE 1-49



● **COMPACT GUIDES CYLINDERS SERIES CMPG**

PAGE 1-112



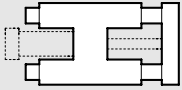
● **RODLESS CYLINDERS SERIE STD**

PAGE 1-118

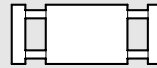
GENERAL TECHNICAL DATA SLIDES

TYPES

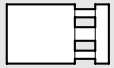
The range of guide units and slides is very extensive. Guides are grouped into families.



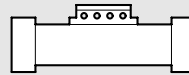
Guide units to couple with standard cylinders.
These are separate units to which an ISO 6432 or ISO 15552 cylinder is attached.



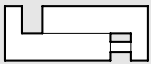
Twin pneumatic cylinder.
The barrel has two calibrated holes for housing two pistons and rods side by side. There are versions with a single piston rod, through piston rod and different power supplies depending on whether you wish to fix the barrel or the flanges to the ends of the piston rod.



Pneumatic single piston cylinders with supports at the end of the piston rod.
The common factor in all the various configurations is that, as well the calibrated hole for the piston in the cylinder body or front head, there are other slots housing bushes or guide bearings for additional piston rods.



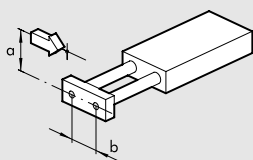
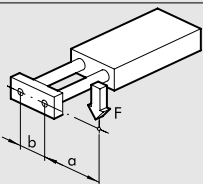
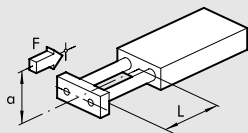
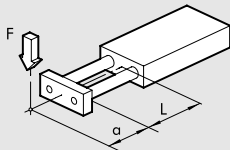
Rodless cylinders.
In these cylinders the piston rod is integral with a carriage on the outside of the barrel, so there is no piston rod. We offer versions in which the barrel is open, with a C-shaped section, and piston and carriage linked mechanically.



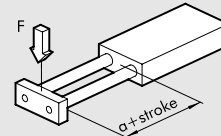
Guides with pneumatic actuator.
The main part of this actuators is the guiding section which determines the shape, applications, loads, maximum strokes and cost. The pneumatic part is housed in one of the bodies of the unit or it comes as a complete cylinder housed inside the guide.

LOAD CONDITIONS

Admitted loads for each guide unit are shown in the catalogue. If the load is not aligned with the moving plate, it is possible to determine the equivalent load or stroke with a good approximation.

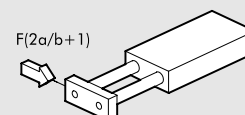
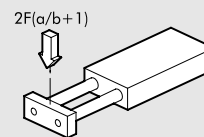
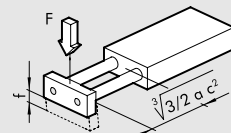
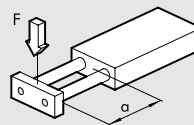


LOAD OR STROKE EQUIVALENCE



To check the admissible load

To check the arrow



TWIN CYLINDER SERIES S10

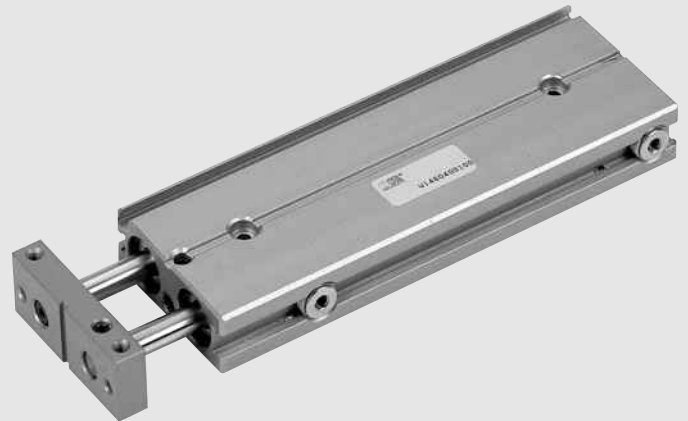
There are two sliding systems available:

- on bushes
- on ball recirculating bearings

The frame is made up of two paired cylinders with a common anodized aluminium body containing slots for retracting sensors.

There are 5 bores available:

2 x Ø 12, 2 x Ø 16, 2 x Ø 20, 2 x Ø 25 and 2 x Ø 30.



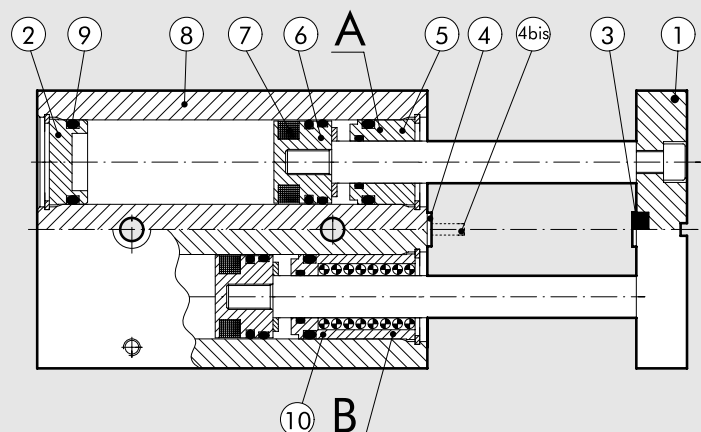
TECHNICAL DATA		S10-12	S10-16	S10-20	S10-25	S10-30
Pressure range	bar	3 to 7				
	MPa	0.3 to 0.7				
	psi	43.5 to 101				
Temperature range	°C	-10 to +80				
	Fluid	10 µm dried or lubricated filtered air. Lubrication, if used, must be continuous.				
Piston speed	mm/s	30 to 100				
Versions		System with sliding bushes/System with ball bushes available with stop screw or hydraulic decelerator				
Sizes		12	16	20	25	30
Bores	mm	2 x 12	2 x 16	2 x 20	2 x 25	2 x 30
Piston rod diameter	mm	6	8	10	12	16
	mm	15	15	25	25	25
Strokes	mm	25	25	50	50	50
	mm	50	50	75	75	75
	mm	-	75	100	100	100
Weight (C = stroke mm)					125	125
	• Sliding version	kg	0.12 + (0.002 x C)	0.24 + (0.0025 x C)	0.51 + (0.005 x C)	0.76 + (0.006 x C)
• Ball bearing version	kg	0.21 + (0.002 x C)	0.48 + (0.0025 x C)	0.77 + (0.005 x C)	0.18 + (0.006 x C)	1.92 + (0.009 x C)
Theoretical thrust (P = relative pressure in bar)		(Multiply the value shown by the pressure in bar)				
• Thrust force	da N	2.26 x P	4 x P	6.28 x P	9.8 x P	14.1 x P
• Pull force	da N	1.69 x P	3 x P	4.11 x P	7.5 x P	10.1 x P
Max. loads		(The values shown refer to the min. and max. strokes)				
• Sliding version	N	3 to 1.5	6 to 3	10 to 3.5	12 to 5.6	20 to 7
• Ball bearing version	N	6 to 4	11 to 6	20 to 7	26 to 8	36 to 11

COMPONENTS

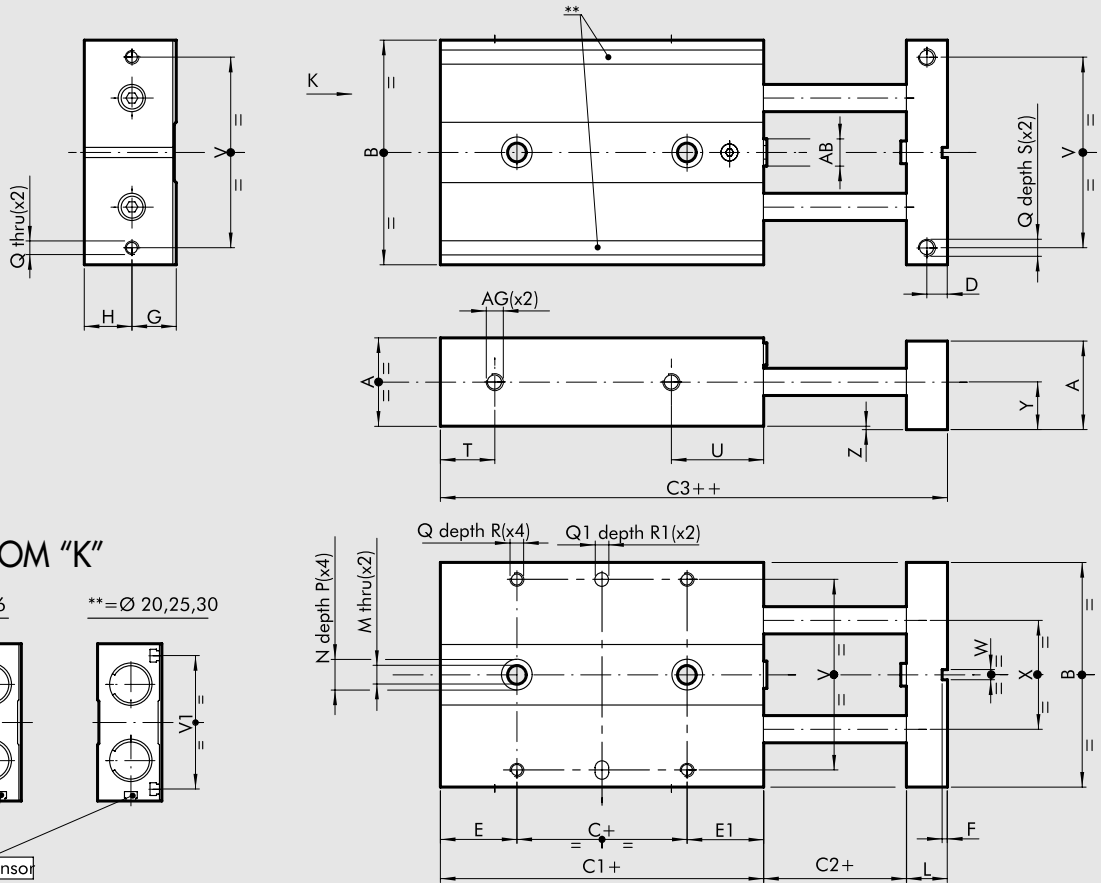
- ① FLANGE: anodized aluminium
- ② REAR BASE: anodized aluminium
- ③ BUFFER: rubber
- ④ ADJUSTABLE STRIKER PLATE. Zinc-plated steel
- ④bis HYDRAULIC DECELERATOR
- ⑤ FRONT BASE: brass
- ⑥ PISTON: brass
- ⑦ MAGNET: Plastroferrite
- ⑧ CYLINDER BODY: anodized aluminium
- ⑨ STATIC O-RING: NBR
- ⑩ BALL RE-CIRCULATION BUSH

VERSIONS:

- Ⓐ With sliding bushes
- Ⓑ With ball bushes



DIMENSIONS OF TWIN CYLINDER SERIES S10, ON BUSHES Ø 12 to 30 mm



+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

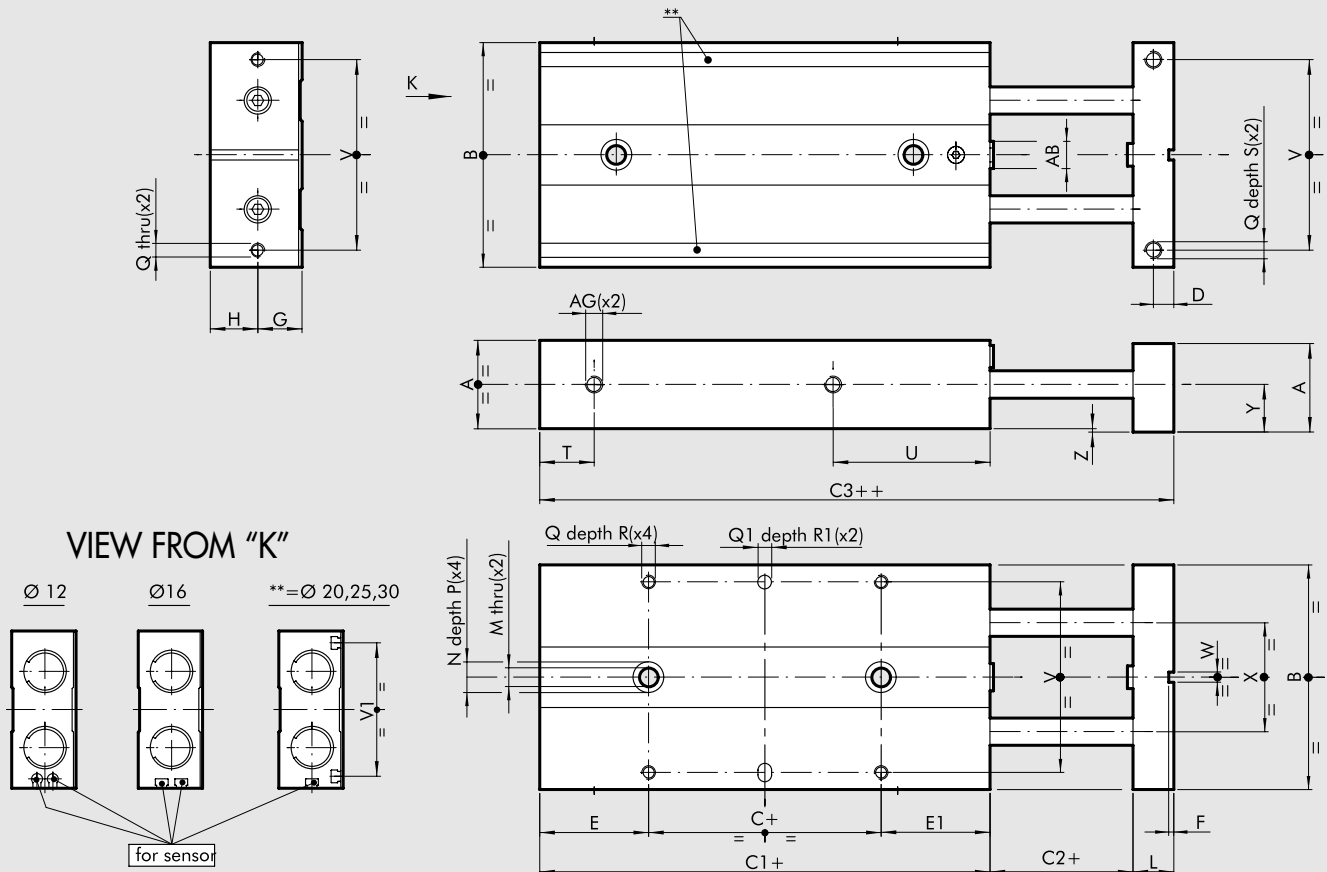
Code	Ø	A	B	C	C1	C2	C3	D	E	E1	F	G	H	L	M	N	P	Q	Q1 ^{H7}	R	R1	S	T
W1440122...	12	18	46	10	50	2	60	4	20	20	1.5	9	10	8	4.3	8	4	M3	4	5	3	8	9
W1440162...	16	22	56	10	62	2	74	5	26	20	1.5	11	12	10	4.3	8	4	M4	4	6	3	8	10
W1440202...	20	26	66	10	68	2	82	6	29	29	1.5	13	14	12	5.5	9	5	M4	4	7	3	10	11
W1440252...	25	32	78	10	74	2	90	7	32.5	31.5	2.5	16	17	14	6.5	10.5	6	M5	4	7	3	12	11
W1440302...	30	36	98	10	87	2	105	8	37.5	39.5	2.5	18	19	16	8.5	14	8	M6	6	8	5	12	13

Ø	U	V	V1	W	X	Y	Z	AB	AG
12	28	38	-	3	20	10	1	M5	M5
16	33	46	-	3	26	12	1	M6	M5
20	40	56	54	3	30	14	1	M8	M5
25	42	66	64	5	39	17	1	M10	M5
30	51	86	82	5	52	19	1	M12	G 1/8"

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1440122050)

- Strokes for bore 12 mm 15; 25; 50;
- Strokes for bore 16 mm 15; 25; 50; 75;
- Strokes for bore 20 mm 25; 50; 75; 100;
- Strokes for bore 25 mm 25; 50; 75; 100; 125;
- Strokes for bore 30 mm 25; 50; 75; 100; 125;

DIMENSIONS OF TWIN CYLINDER SERIES S10, ON BALL BEARINGS Ø 12 to 30 mm



+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	D	E	E1	F	G	H	L	M	N	P	Q	Q1 ^{H7}	R	R1	S	T
W1440123...	12	18	46	10	69	2	79	4	29.5	29.5	1.5	9	10	8	4.3	8	4	M3	4	5	3	8	9
W1440163...	16	22	56	10	90	2	98	5	42	38	1.5	11	12	10	4.3	8	4	M4	4	6	3	8	10
W1440203...	20	26	66	10	100	2	111	6	46.5	43.5	1.5	13	14	12	5.5	9	5	M4	4	7	3	10	11
W1440253...	25	32	78	10	108	2	120	7	51.5	46.5	2.5	16	17	14	6.5	10.5	6	M5	4	7	3	12	11
W1440303...	30	36	98	10	124	2	142	8	56	58	2.5	18	19	16	8.5	14	8	M6	6	8	5	12	13

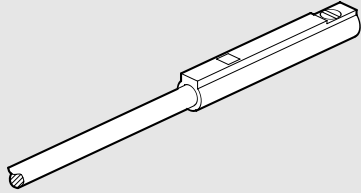
Ø	U	V	V1	W	X	Y	Z	AB	AG
12	47	38	-	3	20	10	1	M5	M5
16	57	46	-	3	26	12	1	M6	M5
20	69	56	54	3	30	14	1	M8	M5
25	72	66	64	5	39	17	1	M10	M5
30	88	86	82	5	52	19	1	M12	G 1/8"

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1440123050)

- Strokes for bore 12 mm 15; 25; 50;
- Strokes for bore 16 mm 15; 25; 50; 75;
- Strokes for bore 20 mm 25; 50; 75; 100;
- Strokes for bore 25 mm 25; 50; 75; 100; 125;
- Strokes for bore 30 mm 25; 50; 75; 100; 125;

ACCESSORIES

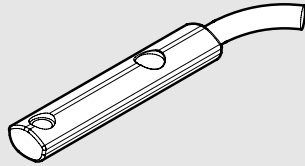
MAGNETIC SENSOR Ø 4, FOR SLIDE S10 Ø 12



Code	Description
W0950044180	Sensor REED 2 wires 24 VDC 1 m
W0950045390*	Sensor HALL 3 wires 24 VDC 2 m

* For technical data see page 1-289

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE, FOR SLIDE S10 Ø16 to 30



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-288

NOTES

TWIN CYLINDER SLIDE WITH FIXED BODY SERIES S11

There are two sliding systems available:

- on bushes
- on ball bearings

The frame is made up of two paired through-rod cylinders with a common anodized aluminium body containing slots for retracting sensors.

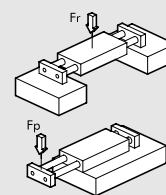
There are 5 bores available:

2 x Ø 12; 2 x Ø 16; 2 x Ø 20; 2 x Ø 25 and 2 x Ø 30.

The piston rods are united by means of a plate on which mechanical stops or hydraulic shock absorbers can be mounted.



TECHNICAL DATA		S11-12	S11-16	S11-20	S11-25	S11-30
Fluid		20 µm filtered air				
Pressure range	bar	1.5 to 7				
	MPa	0.15 to 0.7				
	psi	43.5 to 101				
Temperature range	°C	-10 to +80				
Piston speed	mm/s	30 to 200				
Versions		With sliding bushes / With ball bearing bushes / With stop screw / With hydraulic shock absorbers				
Bores	mm	12	16	20	25	30
Piston rod diameter	mm	6	8	10	12	16
Strokes	mm	25	25	25	25	25
		50	50	50	50	50
		75	75	75	75	75
		-	100	100	100	100
		-	-	125	125	125
		-	-	-	150	150
Weight = X + (Y · C) where C = stroke	kg					
• Sliding version		X = 0.14	X = 0.25	X = 0.5	X = 0.7	X = 1.24
		Y = 0.002	Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
• Ball bearing version		X = 0.25	X = 0.37	X = 0.78	X = 1.04	X = 1.98
		Y = 0.002	Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
Theoretical thrust (P = relative pressure in bar)	N	16.9 x P	30 x P	47 x P	75 x P	101 x P
Max. loads		(The values shown refer to the min. and max. strokes)				
• Loads with sliding version	N	Fr: 7 to 3 Fp: 4 to 1.5	Fr: 20 to 4 Fp: 4 to 1.5	Fr: 35 to 4.5 Fp: 12 to 3	Fr: 50 to 5.4 Fp: 15 to 3.5	Fr: 80 to 12 Fp: 20 to 4.5
	N	Fr: 13 to 5 Fp: 6 to 3	Fr: 35 to 6.5 Fp: 11 to 3	Fr: 58 to 7 Fp: 18 to 5	Fr: 80 to 8 Fp: 23 to 6	Fr: 130 to 18 Fp: 50 to 8

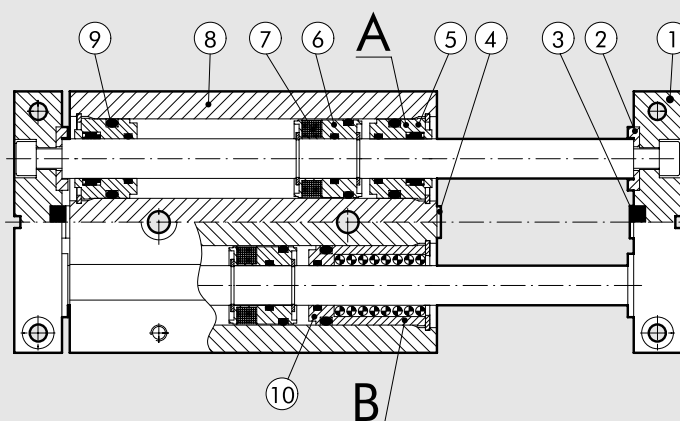


COMPONENTS

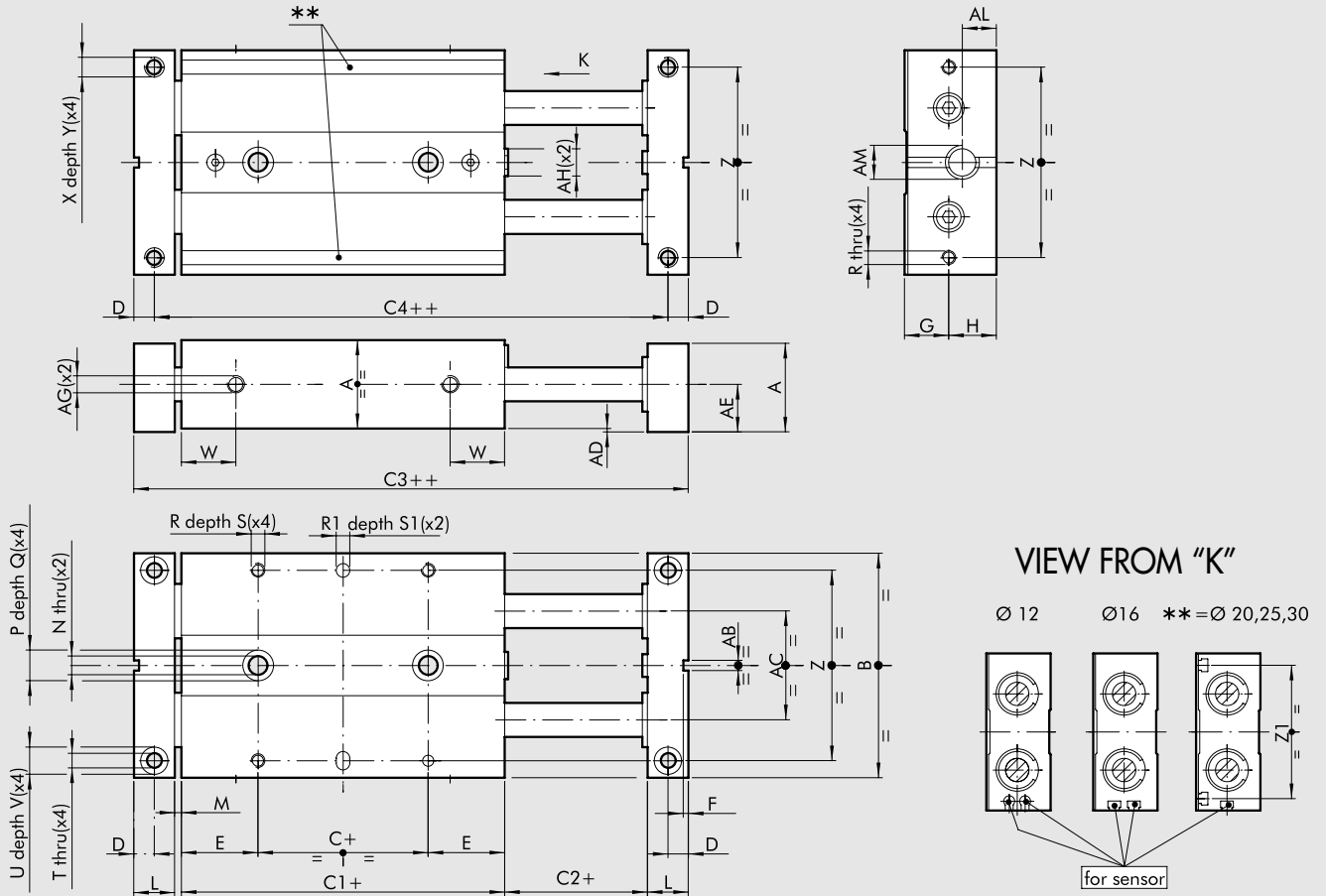
- ① FLANGE: anodized aluminium
- ② WASHER: steel
- ③ BUFFER: rubber
- ④ ADJUSTABLE STRIKER PLATE: Zinc-plated steel
- ⑤ BASE: brass
- ⑥ PISTON: brass
- ⑦ MAGNET: plastoferrite
- ⑧ CYLINDER BODY: anodized aluminium
- ⑨ STATIC O-RINGS: NBR
- ⑩ BUSH: ball bearing

VERSIONS:

- Ⓐ With sliding bushes
- Ⓑ With ball bearing bushes



DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS SERIES S11, ON BUSHES Ø 12 to 30



+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

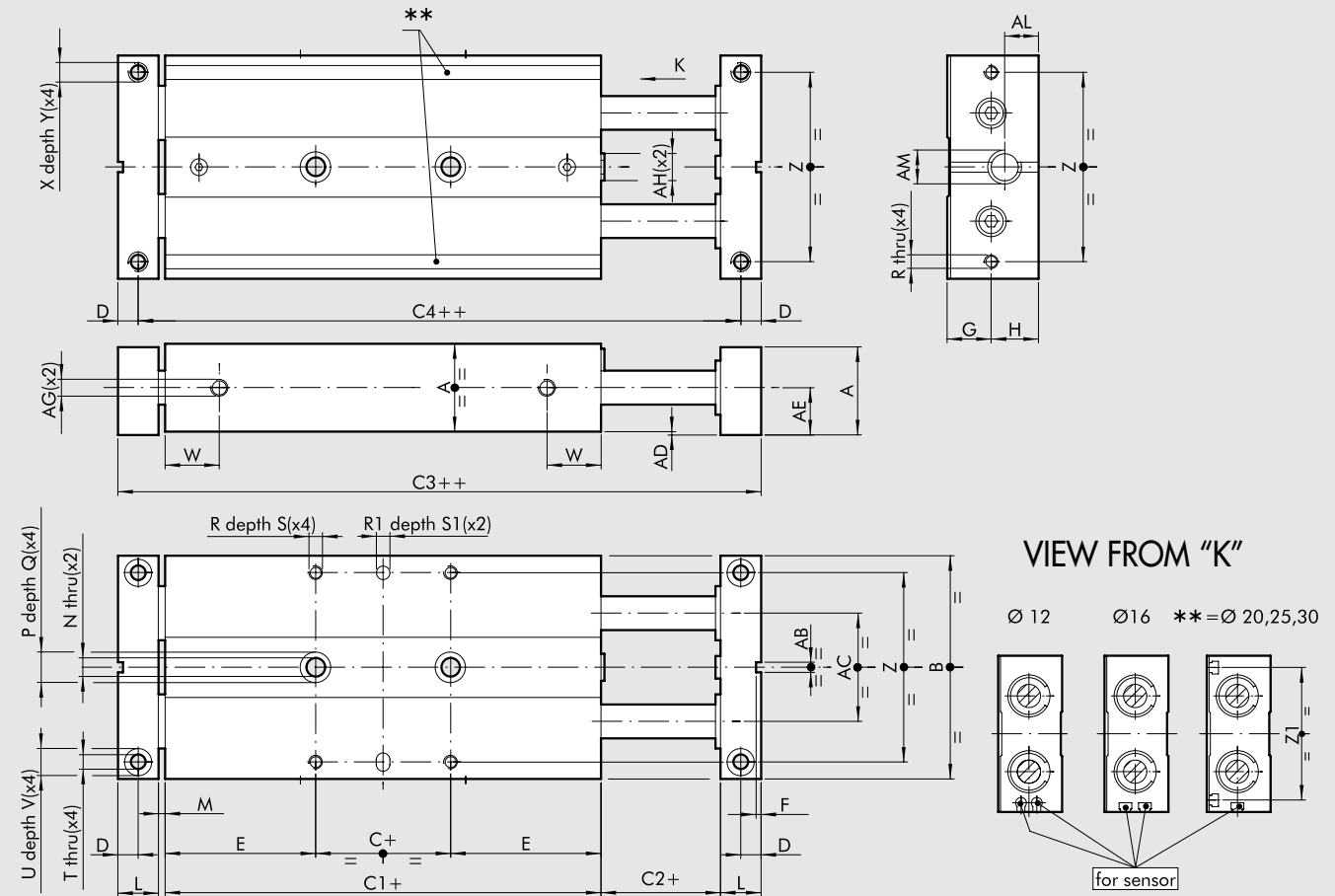
Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 ^{H7}	S	S1	T
W1450122...	12	18	46	5	45	2	65	57	4	20	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450162...	16	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450202...	20	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450252...	25	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450302...	30	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AM	AL
12	6	3	14	M4	6	38	-	3	20	1	10	4	M5	M8x1	7
16	8	4	15	M5	8	46	-	3	26	1	12	5	M5	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	M10x1	9
25	9	5	19	M6	12	66	64	5	39	1	17	6	M5	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450122050)

- Strokes for bore 12 mm 25; 50; 75
- Strokes for bore 16 mm 25; 50; 75; 100
- Strokes for bore 20 mm 25; 50; 75; 100; 125
- Strokes for bore 25 mm 25; 50; 75; 100; 125; 150
- Strokes for bore 30 mm 25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS SERIES S11, ON BALL BEARINGS Ø 12 to 30



+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

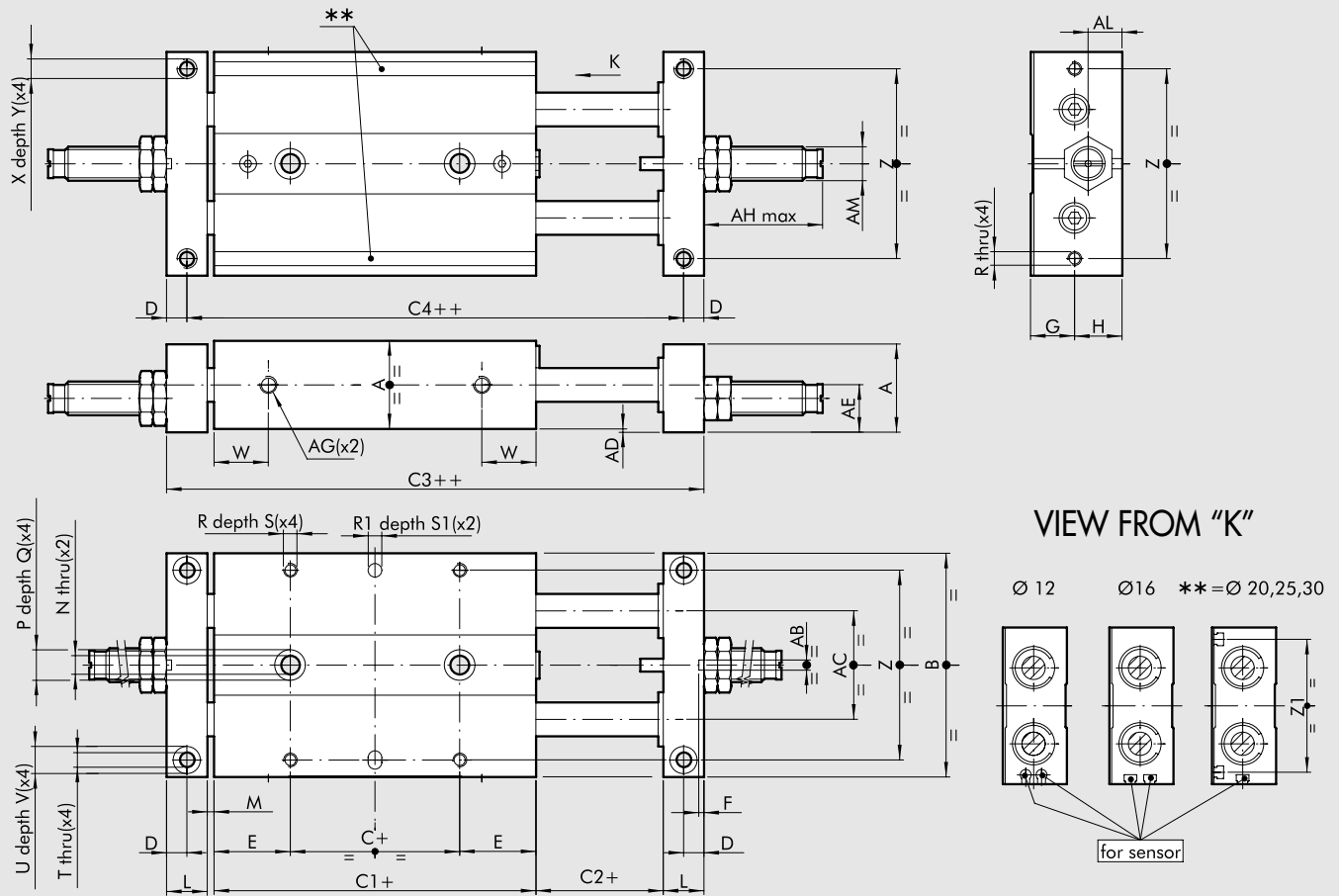
Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 ^{H7}	S	S1	T
W1450123...	12	18	46	5	71	2	91	83	4	33	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450163...	16	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450203...	20	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450253...	25	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450303...	30	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
12	6	3	28	M4	6	38	-	3	20	1	10	4	M5	M5	M8x1	7
16	8	4	33	M5	8	46	-	3	26	1	12	5	M5	M6	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	M8	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	M10	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	M12	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450123050)

- Strokes for bore 12 mm 25; 50; 75
- Strokes for bore 16 mm 25; 50; 75; 100
- Strokes for bore 20 mm 25; 50; 75; 100; 125
- Strokes for bore 25 mm 25; 50; 75; 100; 125; 150
- Strokes for bore 30 mm 25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS WITH SHOCK ABSORBERS SERIES S11, ON BUSHES Ø 12 to 30



+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

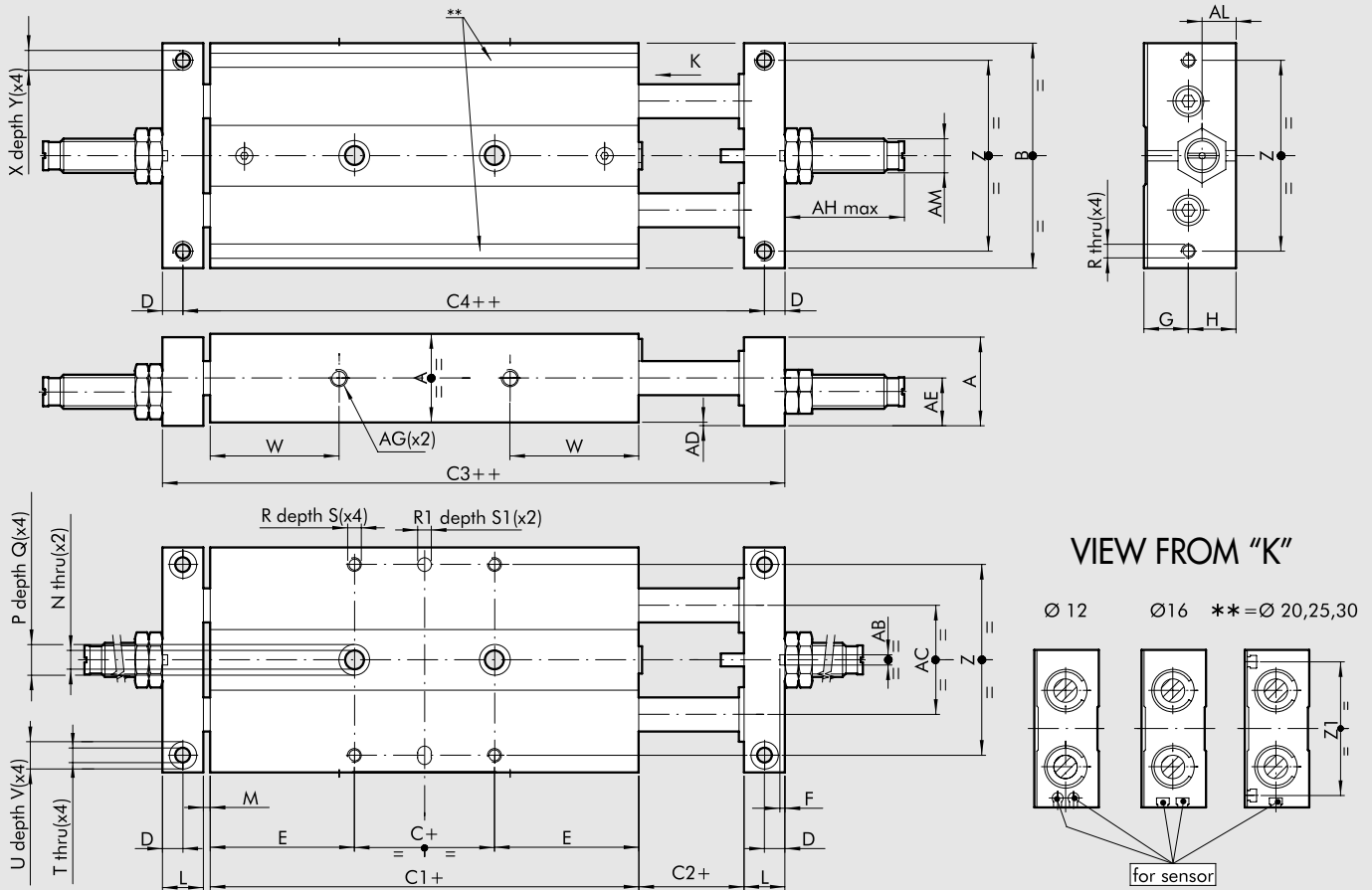
Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 ^{H7}	S	S1	T
W1450124...	12	18	46	5	45	2	65	57	4	20	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450164...	16	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450204...	20	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450254...	25	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450304...	30	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
12	6	3	14	M4	6	38	-	3	20	1	10	4	M5	30	M8x1	7
16	8	4	15	M5	8	46	-	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	19	M6	12	66	69	5	39	1	17	6	M5	36	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450124050)

- Strokes for bore 12 mm 25; 50; 75
- Strokes for bore 16 mm 25; 50; 75; 100
- Strokes for bore 20 mm 25; 50; 75; 100; 125
- Strokes for bore 25 mm 25; 50; 75; 100; 125; 150
- Strokes for bore 30 mm 25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS, BALL BEARING VERSION WITH SHOCK ABSORBERS SERIES S11 Ø 12 to 30



+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 ^{H7}	S	S1	T
W1450125...	12	18	46	5	71	2	91	83	4	33	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450165...	16	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450205...	20	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450255...	25	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450305...	30	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
12	6	3	28	M4	6	38	-	3	20	1	10	4	M5	30	M8x1	7
16	8	4	33	M5	8	46	-	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	36	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450125050)

Strokes for bore 12 mm 25; 50; 75

Strokes for bore 16 mm 25; 50; 75; 100

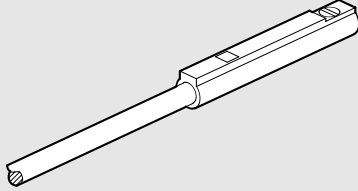
Strokes for bore 20 mm 25; 50; 75; 100; 125

Strokes for bore 25 mm 25; 50; 75; 100; 125; 150

Strokes for bore 30 mm 25; 50; 75; 100; 125; 150

ACCESSORIES

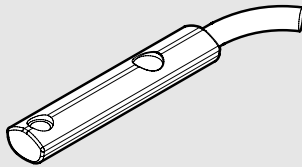
MAGNETIC SENSOR Ø 4, FOR SLIDE S11 Ø 12



Code	Description
W0950044180	Sensor REED 2 wires 24 VDC 1 m
W0950045390*	Sensor HALL 3 wires 24 VDC 2 m

* For technical data see page 1-289

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE, FOR SLIDE S11 Ø 16 to 30



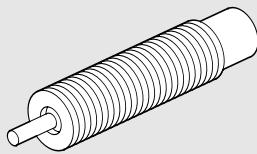
Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-288

SPARE PARTS

SHOCK ABSORBERS



Code	Ø	Description
0950004001	12	Shock absorbers PMX 10 MF3 + nut M10x1
0950004002	16 - 20	Shock absorbers PM 15 MF3 + nut M12x1
0950004003	25	Shock absorbers SPM 25 MC-C + nut M14x1
0950004004	30	Shock absorbers PR50 MC2 + nut M20x1.5

NOTES

TWIN CYLINDER SLIDE WITH FIXED PLATES SERIES S12

Two sliding systems are available:

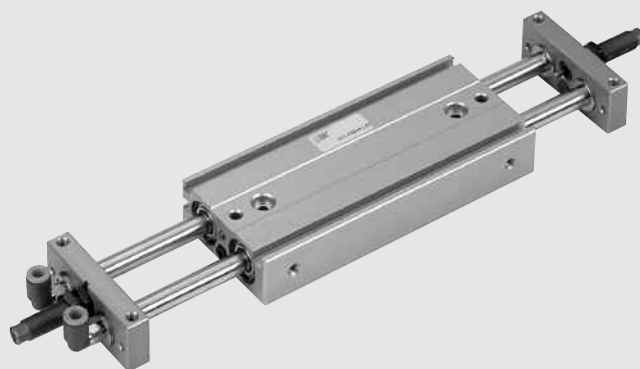
- on bushes
- on ball bearings

The structure is made up of two paired through-rod cylinders with a common anodized aluminium body with grooves for mounting the retractable sensor.

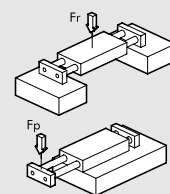
Five bores available: 2 x Ø 16; 2 x Ø 20; 2 x Ø 25; 2 x Ø 30.

The rods are joined together by means of a plate on which the mechanical limit switches or hydraulic shock absorbers can be mounted.

The compressed air ports are at the end of the piston rods.



TECHNICAL DATA		S12-16	S12-20	S12-25	S12-30
Fluid		20 µm filtered air			
Pressure range	bar	1.5 to 7			
	MPa	0.15 to 0.7			
	psi	21.5 to 101			
Temperature range	°C	-10 to +80			
Piston speed	mm/s	30 to 200			
Versions		With sliding bushes / With ball bearing bushes / With stop screw / With hydraulic shock absorbers			
Bores	mm	16	20	25	30
Piston rod diameter	mm	8	10	12	16
Strokes	mm	25	25	25	25
		60	50	50	50
		75	75	75	75
		100	100	100	100
		-	125	125	125
		-	-	150	150
Weight = X + (Y · C) where C = stroke	kg				
• Sliding version		X = 0.25	X = 0.5	X = 0.7	X = 1.24
		Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
• Ball bearing version		X = 0.37	X = 0.78	X = 1.04	X = 1.98
		Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
Theoretical thrust (P = relative pressure in bar)	N	30 x P	47 x P	75 x P	101 x P
Max. loads		(The values shown refer to the min. and max. strokes)			
• Loads with sliding version	N	Fr: 20 to 4 Fp: 4 to 1.5	Fr: 35 to 4.5 Fp: 12 to 3	Fr: 50 to 5.4 Fp: 15 to 3.5	Fr: 80 to 12 Fp: 20 to 4.5
	N	Fr: 35 to 6.5 Fp: 11 to 3	Fr: 58 to 7 Fp: 18 to 5	Fr: 80 to 8 Fp: 23 to 6	Fr: 130 to 18 Fp: 50 to 8
• Loads with ball bearing version	N				

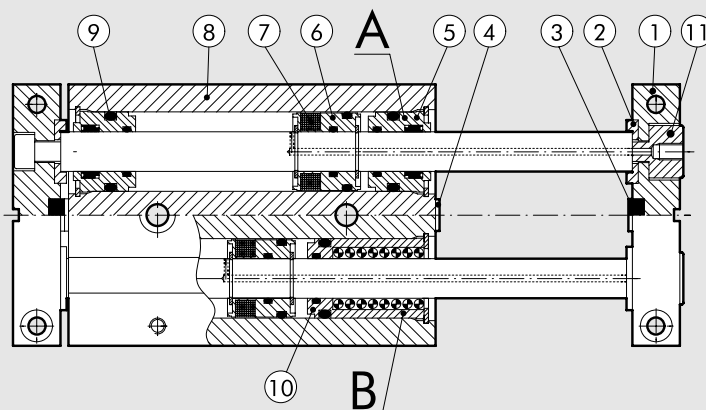


COMPONENTS

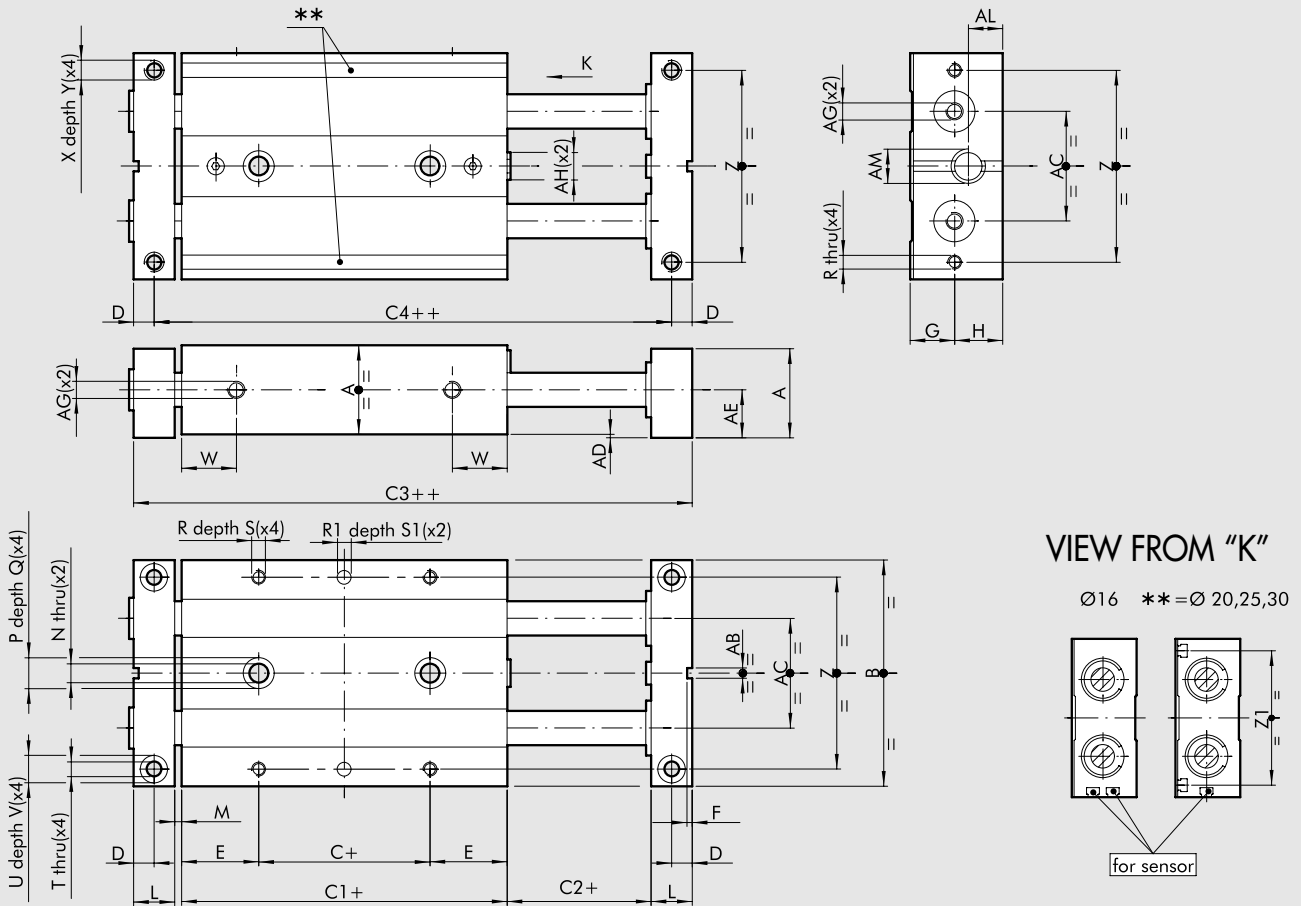
- ① FLANGE: anodized aluminium
- ② WASHER: steel
- ③ BUFFER: rubber
- ④ ADJUSTABLE STRIKER PLATE: Zinc-plated steel
- ⑤ BASE: brass
- ⑥ PISTON: brass
- ⑦ MAGNET: Plastroferrite
- ⑧ CYLINDER BODY: anodized aluminium
- ⑨ STATIC O-RINGS: NBR
- ⑩ BUSH: ball bearing
- ⑪ SCREW: pneumatically powered

VERSIONS:

- Ⓐ With sliding bush
- Ⓑ With ball bearing bush



DIMENSIONS OF TWIN-CYLINDER SLIDE SERIES S12 Ø 16 to 30



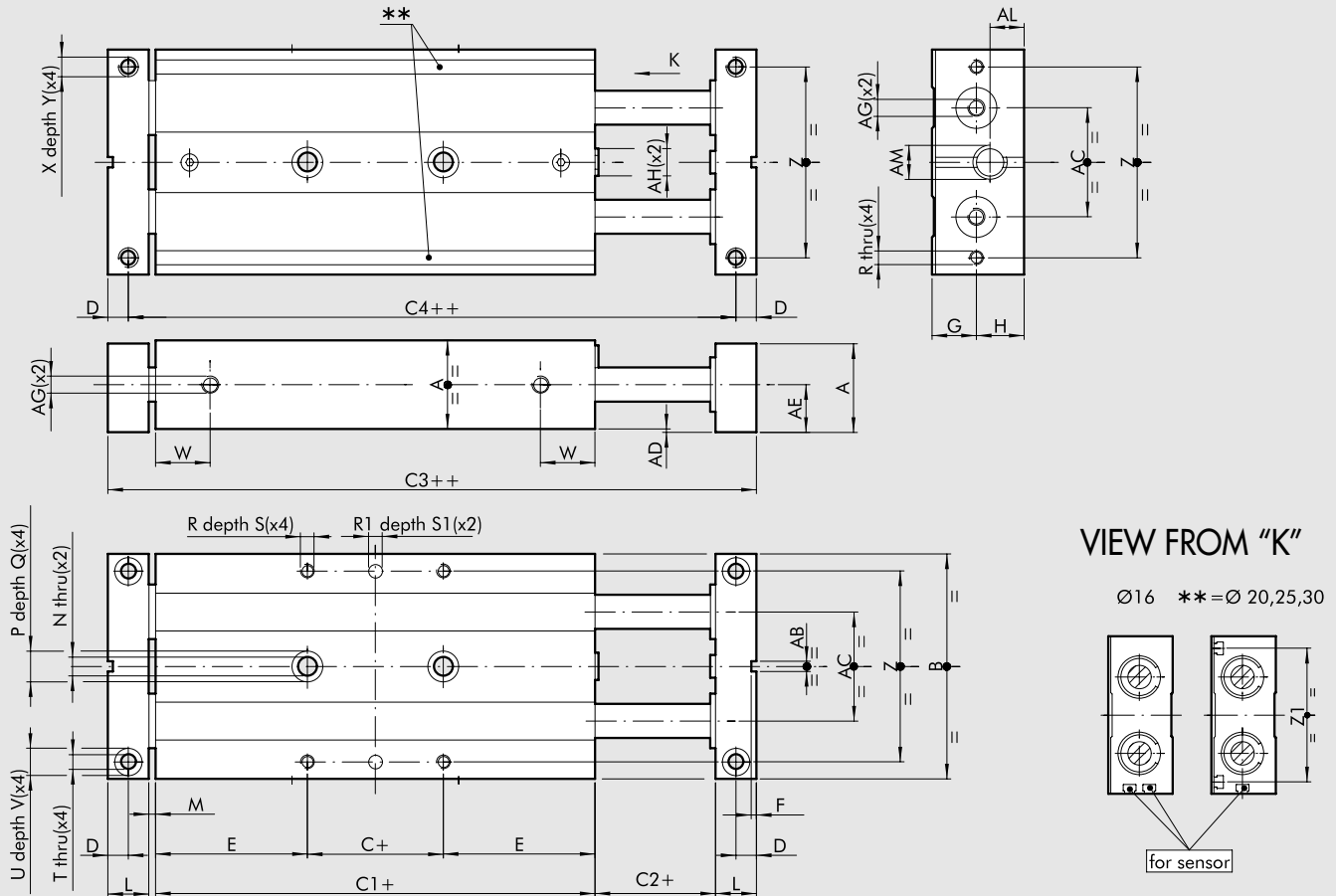
+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 ^{H7}	S	S1	T
W1460162...	16	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460202...	20	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460252...	25	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460302...	30	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	15	M5	8	46	-	3	26	1	12	5	M5	M6	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	M8	M10x1	9
25	9	5	19	M6	12	66	64	5	39	1	17	6	M5	M10	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	M12	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450162050)
 Strokes for bore 16 mm 25; 50; 75; 100
 Strokes for bore 20 mm 25; 50; 75; 100; 125
 Strokes for bore 25 mm 25; 50; 75; 100; 125; 150
 Strokes for bore 30 mm 25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER SLIDE SERIES S12 Ø 16 to 30



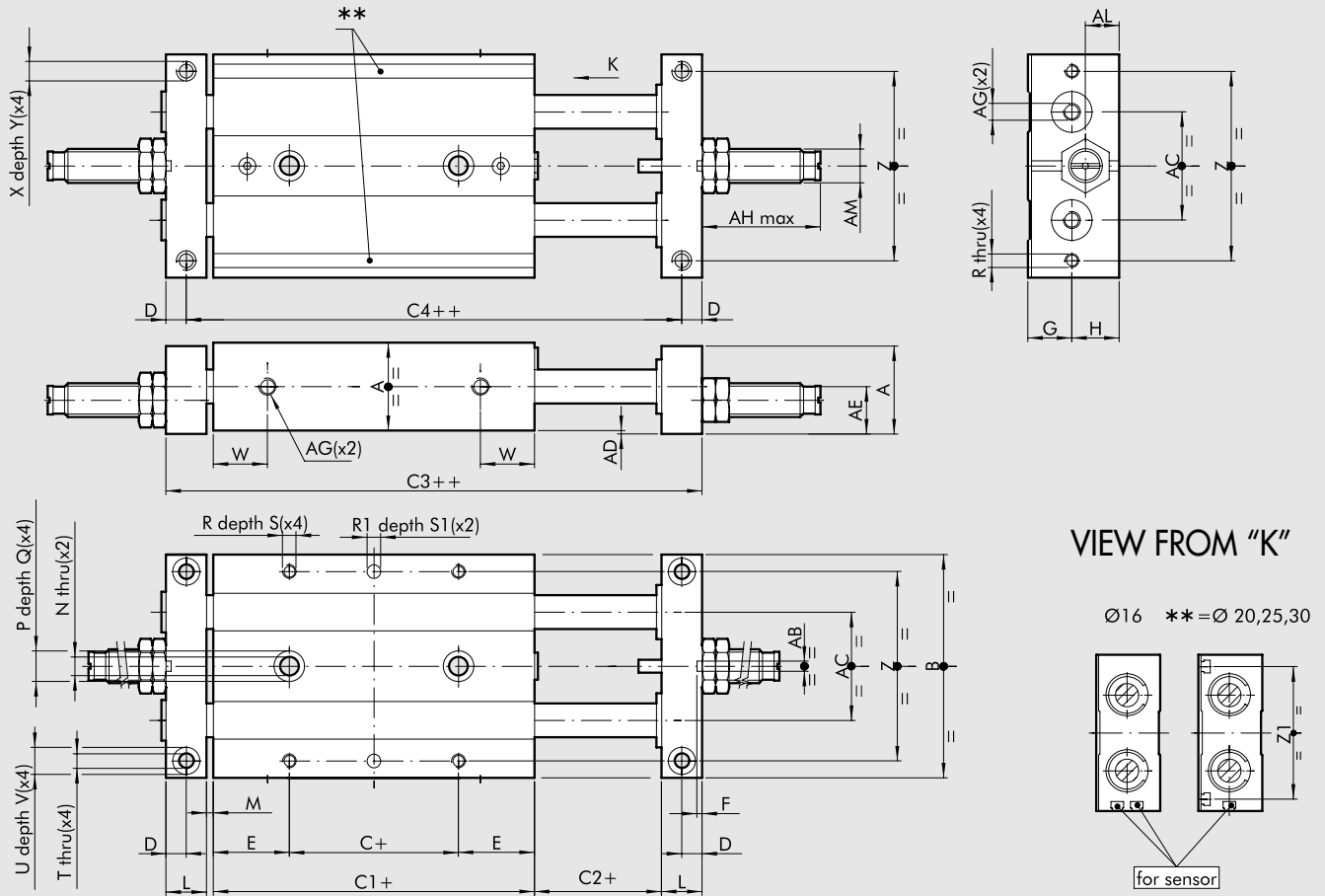
+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 ^{H7}	S	S1	T
W1460163...	16	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460203...	20	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460253...	25	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460303...	30	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	33	M5	8	46	-	3	26	1	12	5	M5	M6	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	M8	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	M10	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	M12	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450163050)
 Strokes for bore 16 mm 25; 50; 75; 100
 Strokes for bore 20 mm 25; 50; 75; 100; 125
 Strokes for bore 25 mm 25; 50; 75; 100; 125; 150
 Strokes for bore 30 mm 25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER SLIDE WITH SHOCK ABSORBERS SERIES S12 Ø 16 to 30



+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

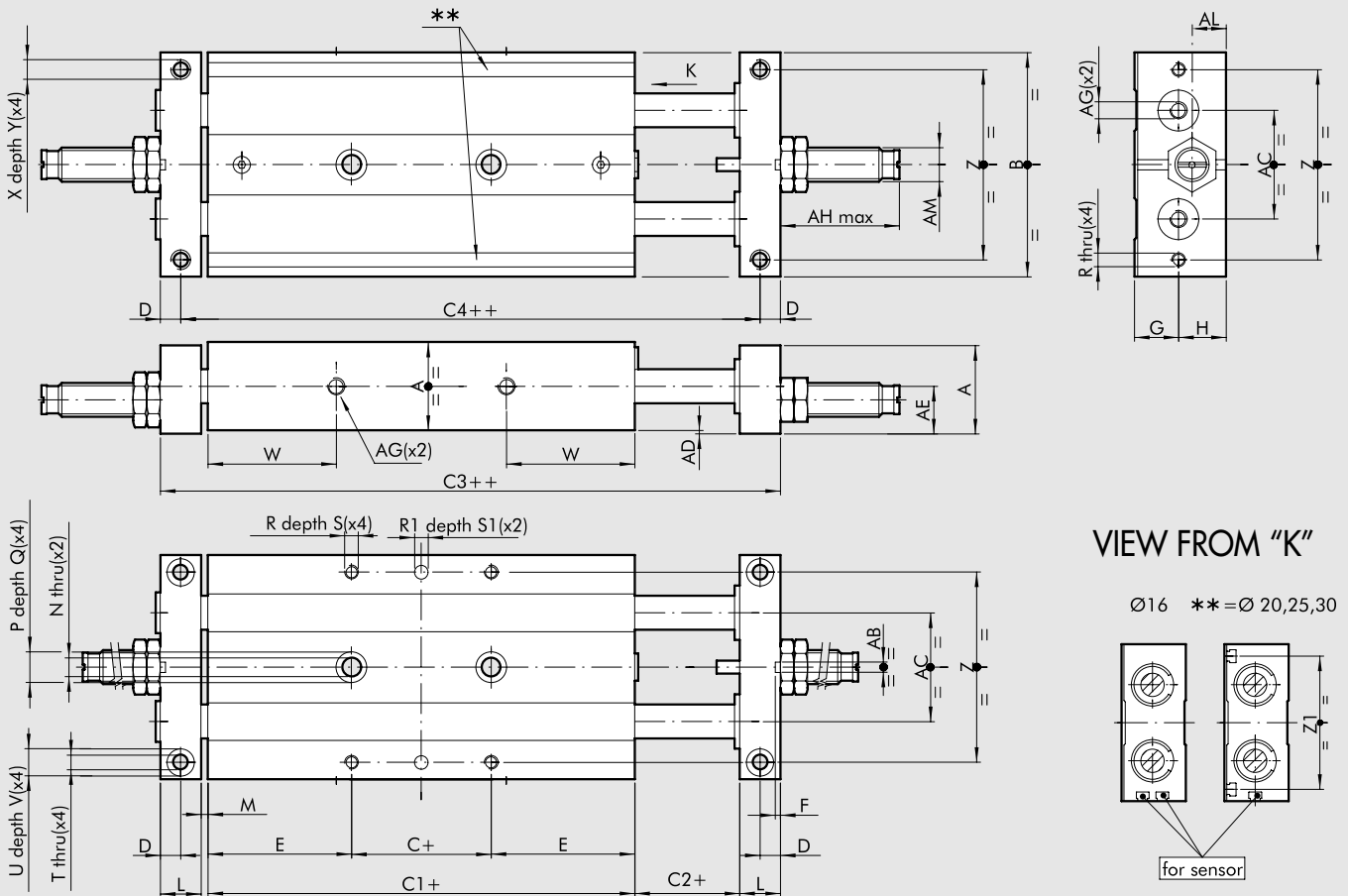
Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 ^{H7}	S	S1	T
W1460164...	16	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460204...	20	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460254...	25	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460304...	30	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	15	M5	8	46	-	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	19	M6	12	66	64	5	39	1	17	6	M5	36	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450164050)

- Strokes for bore 16 mm 25; 50; 75; 100
- Strokes for bore 20 mm 25; 50; 75; 100; 125
- Strokes for bore 25 mm 25; 50; 75; 100; 125; 150
- Strokes for bore 30 mm 25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER SLIDE WITH SHOCK ABSORBERS SERIES S12 Ø 16 to 30



+ = ADD THE STROKE
 ++ = ADD TWICE THE STROKE

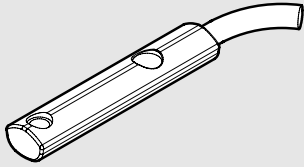
Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 ^{H7}	S	S1	T
W1460165...	16	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460205...	20	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460255...	25	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460305...	30	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	33	M5	8	46	-	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	36	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450165050)
 Strokes for bore 16 mm 25; 50; 75; 100
 Strokes for bore 20 mm 25; 50; 75; 100; 125
 Strokes for bore 25 mm 25; 50; 75; 100; 125; 150
 Strokes for bore 30 mm 25; 50; 75; 100; 125; 150

ACCESSORIES

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE, FOR SLIDE S11 Ø 16 to 30



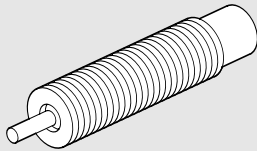
Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.

For technical data see page 1-288

SPARES

SHOCK ABSORBERS



Code	Ø	Description
0950004002	ø 16 - 20	Shock absorbers PM10 MF2 + nut M10x1
0950004003	ø 25	Shock absorbers PR015 MF1 + nut M12x1
0950004004	ø 30	Shock absorbers PR025 MC2 + nut M14x1.5

NOTES

PRECISION SLIDES SERIES S13

Series S13 precision slides feature a dual-acting pneumatic cylinder that has the sole purpose of pushing and pulling the load, a ground steel guide that is integral with the body, and a ball recirculation pad that is fixed onto the moving table and is designed to withstand all the loads and movements applied. This ensures accurate movement with virtually no play, and the piston rods do not suffer wear as there are no lateral loads.

All the slides are equipped with sensor magnets.

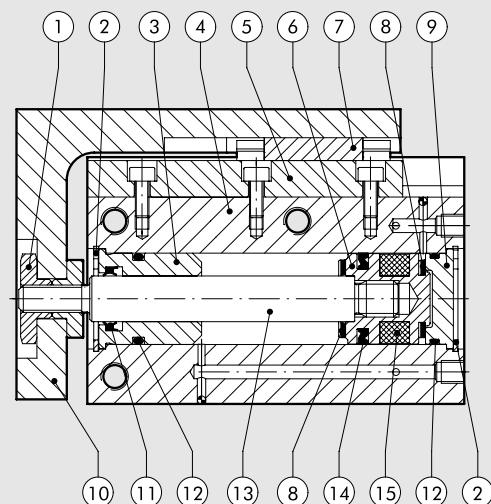
The body can be secured on many sides. The load side can be fixed onto the table from the top or the front. The compressed air supply can be connected on three sides. The retractable sensors can be fitted on the right or on the left. All these possibilities make the application extremely flexible. The width is extremely reduced to allow installation in small spaces and the combination of several reduced-pitch slides.



TECHNICAL DATA		Ø 6	Ø 10	Ø 16	Ø 20
Operating pressure	bar	2 to 8			
	MPa	0.2 to 0.8			
	psi	29 to 116			
Operating temperature	°C	-10 to +80			
Fluid		Lubricated and unlubricated compressed air at 20 µm, must be uninterrupted when lubricated			
Minimum and maximum speed	mm/s	30 to 500			
Pneumatic fittings		M5			
Type of guide		Ball recirculation			
Versions		Magnetic dual-acting with rubber buffer			
Strokes	mm	10	10	10	10
		25	25	25	25
		---	---	50	50
Theoretical thrust force, at 6 bar	N	17	47	120	188
Theoretical pull force, at 6 bar	N	13	40	104	158
Admitted loads		See diagrams page 1-224			
Admitted kinetic energy	Joule	0.012	0.025	0.050	0.100
Stroke tolerance	mm	0 / +1.0			
Assembly position		Any (horizontal and vertical)			
Weight	kg	See table page 1-224			

COMPONENTS

- ① NUT: stainless steel
- ② SNAP RING: galvanised steel
- ③ FRONT BASE: bronze
- ④ BODY: anodized aluminium
- ⑤ GUIDE: tempered stainless steel
- ⑥ PISTON: aluminium
- ⑦ BALL RECIRCULATION PAD: stainless steel
- ⑧ BUFFER: NBR
- ⑨ REAR BASE: anodized aluminium
- ⑩ PLATE: anodized aluminium
- ⑪ PISTON ROD GASKET: type EM, NBR
- ⑫ O-RING: NBR
- ⑬ PISTON ROD: stainless steel
- ⑭ PISTON GASKET: type PZ, NBR
- ⑮ MAGNET: neodymium (Ø 6 and Ø 10)
plastoferrite (Ø 16 and Ø 20)



WEIGHTS

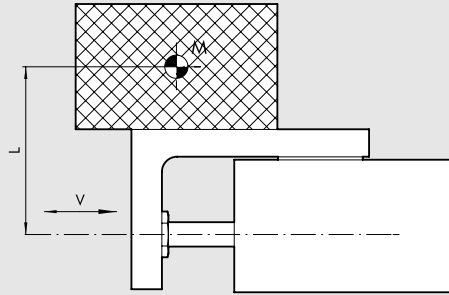
WEIGHT [gr]				
Stroke	Bore			
	6	8	16	20
10	68	125	230	455
25	90	160	280	550
50	---	---	350	660

WEIGHT OF MOVING PART [gr]

Stroke	Bore			
	6	8	16	20
10	30	50	100	180
25	40	68	125	220
50	---	---	167	290

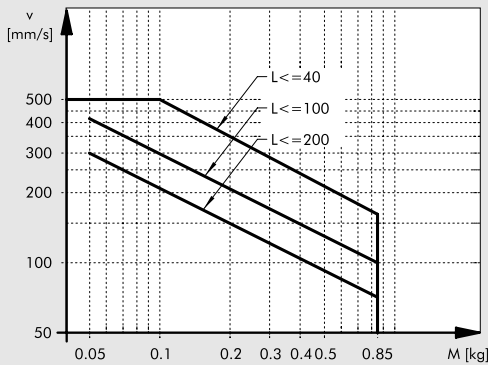
MASS/VELOCITY DIAGRAM

- M (kg) = Mass applied
- L (mm) = Distance between the axis of the piston rod and the barycentre of the mass
- v (mm/s) = Velocity of the slide
- vert = Limit with vertical movement

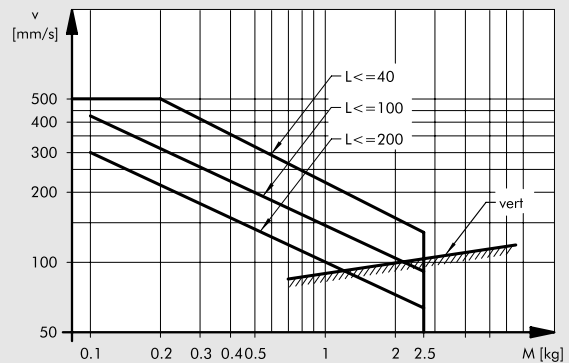


ADMITTED LOADS DIAGRAM

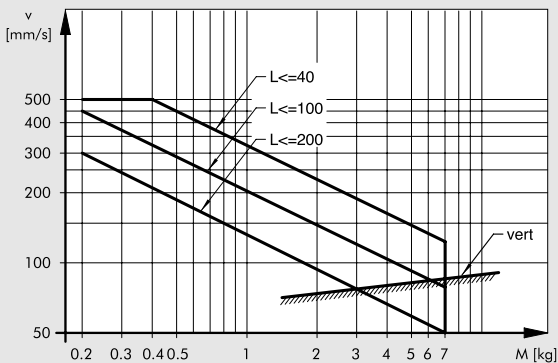
S13-6



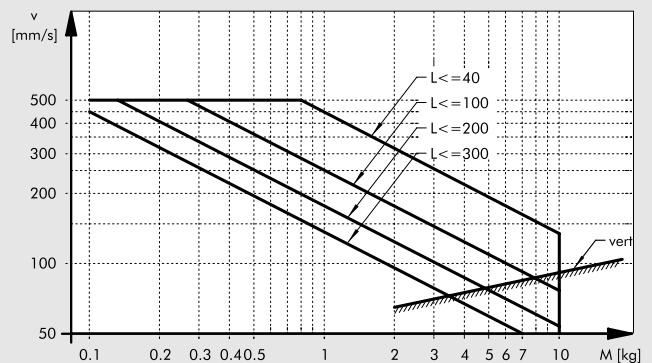
S13-10



S13-16



S13-20



FIXING OPTIONS

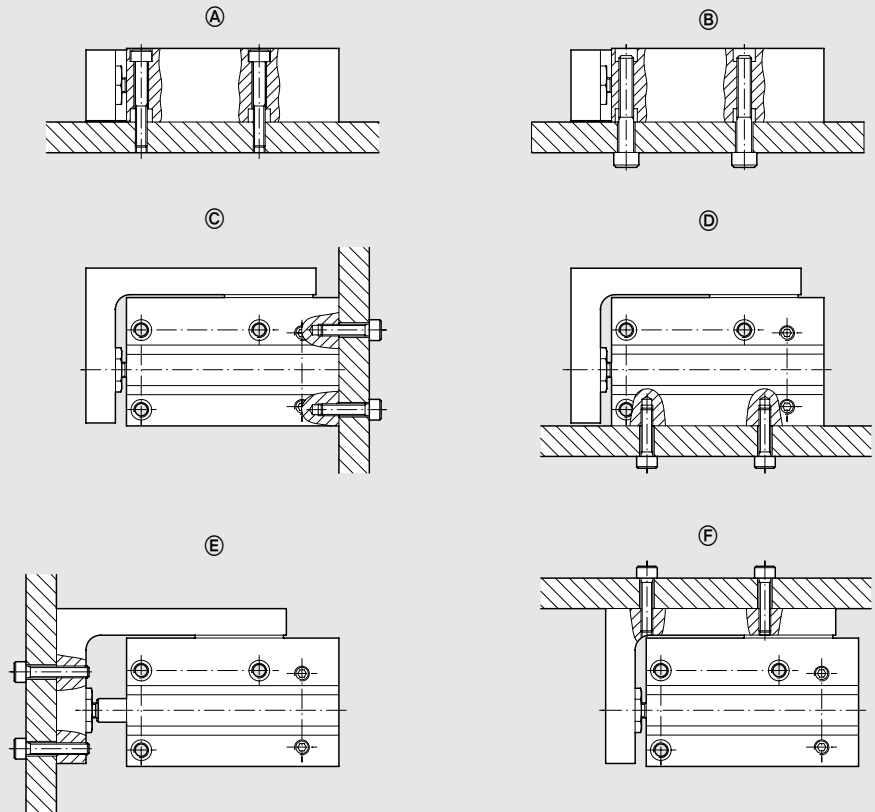
FIXING THE BODY

- Ⓐ Lateral, via the through holes
- Ⓑ Lateral, on the hole threads
- Ⓒ Rear, on the threaded holes
- Ⓓ Vertical, on the threaded holes

FIXING THE MOVING TABLE

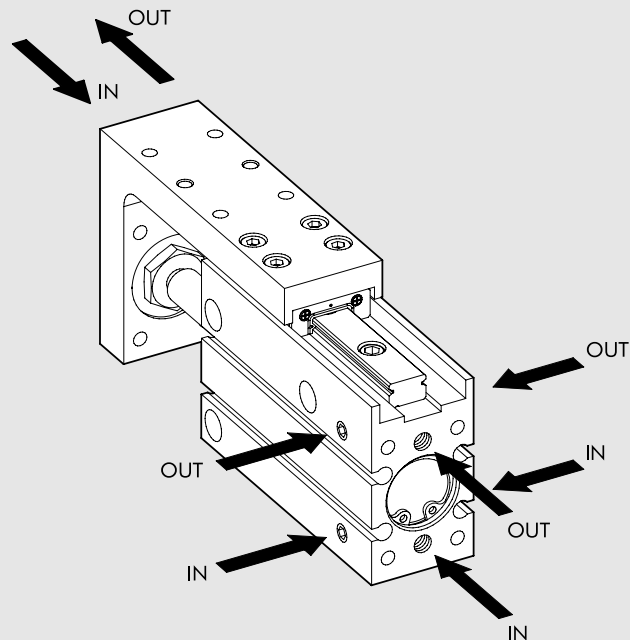
- Ⓔ Front, on the threaded holes
- Ⓕ Top, on the threaded holes

N.B. Since the table is supported by a ball guide/pad, avoid applying excessive torques or forces. When securing the screws, hold the table, not the body, so that the torque discharges through the ball pad.

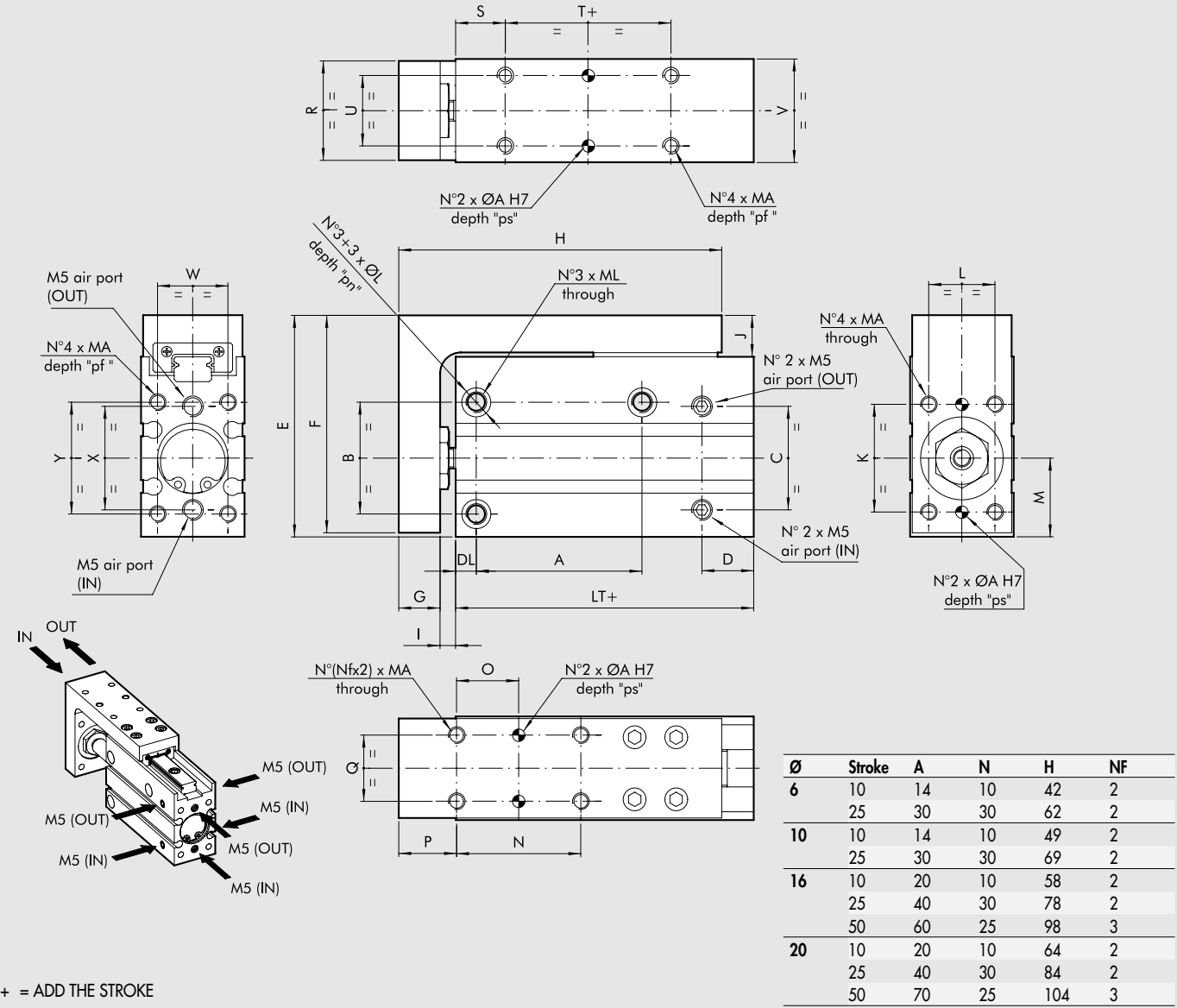


COMPRESSED-AIR SUPPLY

The compressed air supply can be from the back, from the left or from the right. The slide comes with holes on the left and right that are plugged with screws and O-ring seals. If you wish to use the holes, remove the screws and O-rings and fix them in the holes in the back, applying a drop of adhesive to the screw thread.



DIMENSIONS



Ø	Stroke	A	N	H	NF
6	10	14	10	42	2
	25	30	30	62	2
10	10	14	10	49	2
	25	30	30	69	2
16	10	20	10	58	2
	25	40	30	78	2
	50	60	25	98	3
20	10	20	10	64	2
	25	40	30	84	2
	50	70	25	104	3

+ = ADD THE STROKE

Code	Ø	LT	B	C	D	E	F	G	I	J	K	MA	pf	ØA	ps	L	M	O	P	Q	R	S
W1471063...*	6	31	19	18	10	39	38	5.5	2.9	7.5	15	M3	5	2	4.5	9	14.5	N/2	8	9	15	10
W1471103...*	10	35	23	20	12.5	47	46	7.5	4	9	18	M4	6	2	4.5	11	15.5	N/2	11	11	19	12
W1471163...*	16	42	27	25	12.5	53.5	52.5	10	3.75	10	26	M4	7	3	7.5	16	19	N/2	14	16	24	12
W1471203...*	20	52.5	34	32	15	64.5	63.5	11	4.5	10.5	34	M5	9	3	7.5	20	23	N/2	14	20	31	15

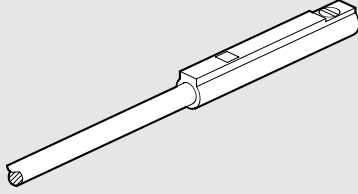
Ø	T	U	V	W	X	Y	ØL	pn	ML	DL
6	5	9	16	10.5	18	19	6	3.5	M4	4
10	5	13	20	13	20	23	7.5	4.5	M5	5
16	10	17	25	17	25	27	7.5	4.5	M5	5
20	10	20	32	20	32	34	9.5	7.5	M6	6

* Enter the stroke in mm (e.g. Ø 6 stroke 10=W1471063010)

- Standard strokes:
 Bore Ø 6 -> 10; 25 mm
 Bore Ø 10 -> 10; 25 mm
 Bore Ø 16 -> 10; 25; 50 mm
 Bore Ø 20 -> 10; 25; 50 mm

ACCESSORIES

MAGNETIC SENSOR Ø 4, FOR SLIDE S13



Code	Description
W0950044180	Sensor REED 2 wires 24 VDC 1 m
W0950045390*	Sensor HALL 3 wires 24 VDC 2 m

* For technical data see page 1-289

NOTES

NOTES



● **HYDRAULIC BRAKE SERIES BRK**

PAGE 1-230



● **INTEGRATED HYDRAULIC BRAKE**

PAGE 1-239

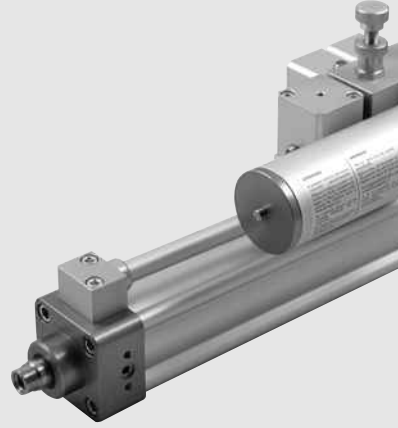
BRK HYDRAULIC BRAKE

This is a closed-loop hydraulic brake without its own power source. It is normally associated with an ISO 15552 pneumatic cylinder. It consists of an oil-filled cylinder, one or more regulation valves and a tank compensating for oil leaks.

It is available in two versions:

- with regulation in piston rod extension, in retraction or both
- SKIP valve (slow/fast) or STOP valve or both, with NC or NO control

After a certain operating time, the brake compensation tank needs to be topped up. Refer to the minimum mark on the dipstick. With the piston rod fully extended, the dipstick must project at least 15 mm from the tank cap. Use only DEXRON ATF hydraulic oil. During the first few work cycles, excess oil is ejected through a hole in the tank.



TECHNICAL DATA		NBR
Operating temperature	°C	From -10 to +70
Fluid		Lubricated or unlubricated filtered air. Lubrication, if used, must be continuous.
Adjustable load	N	7000
Speed	mm/min	10 to 6000
Standard strokes	mm	50, 100, 150, 200, 250, 300, 350, 400, 450 special strokes up to 1000 on request.
Versions		Regulation in piston rod extension and/or retraction. SKIP Tank in-line or on the side.
Cylinder coupling		Flange kit
Connectable cylinders	mm	ISO 15552 cylinders with bore Ø 40 to Ø 125

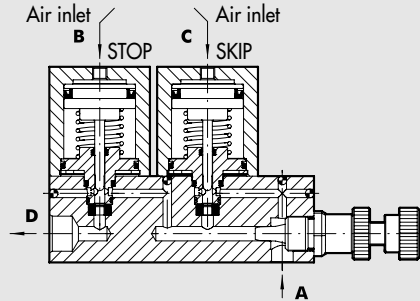
COMPONENTS

- ① PISTON ROD: thick chromed steel
- ② HEADS: anodised aluminium alloy
- ③ PISTON ROD GASKET: NBR rubber
- ④ PISTON ROD GUIDE BUSHING: steel strip with bronze and PTFE insert
- ⑤ JACKET: drawn anodised aluminium alloy
- ⑥ PISTON: aluminium alloy
- ⑦ PISTON GASKET: NBR rubber
- ⑧ OIL SEAL GASKET: polyurethane
- ⑨ Static O-rings: NBR rubber
- ⑩ SEALING DISK: plastic
- ⑪ SPRINGS: zinc-plated steel
- ⑫ SECURING/ASSEMBLY SCREW: self-threading screw (Tap Tite)
- ⑬ OIL LEVEL STICK: zinc-plated steel
- ⑭ OIL RECOVERY TANK
- ⑮ VALVE for OIL FILLING
- ⑯ FLOW REGULATION NEEDLE
- ⑰ MINIMUM LEVEL

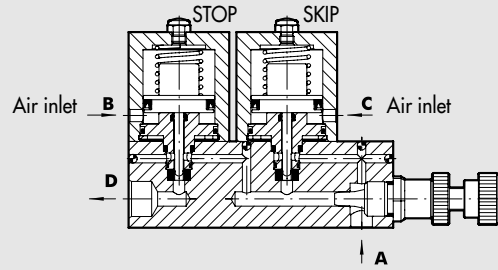


SKIP-STOP APPLICATION WITH VALVES

NO



NC



In normally-open (NO) valves, flow moves freely from A to D. When port C is supplied, this operates the SKIP valve and the fluid is forced through the bottleneck generated by the adjusting pin. When port B is supplied, this operates the STOP valve and interrupts the flow of fluid. In normally-closed NC valves, flow is normally inhibited. When port B is supplied, the fluid flows through but it is forced through the bottleneck generated by the adjusting pin. When port C is supplied, flow moves freely from A to D.

DIMENSIONS AND ORDERING CODES

HYDRAULIC BRAKE WITH REGULATION IN PISTON ROD EXTENSION



Stroke	B	U max
1÷50	109	23
51÷150	129	39
151÷250	154	55
251÷350	174	71
351÷450	204	87
451÷500	229	95

Symbol

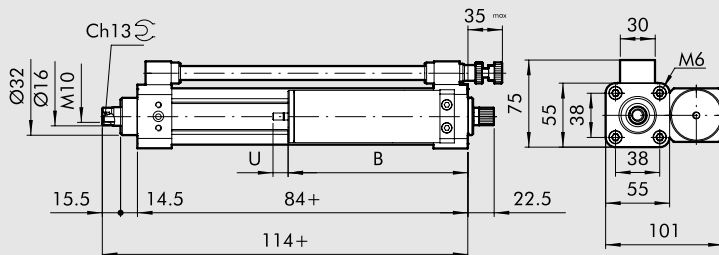


Code

W170001___ Hydraulic brake with regulation in piston rod extension

Description

+ = ADD THE STROKE



___ = Enter the stroke
Weight for stroke 0 mm = 1340 g
Weight each mm = 4.2 g

HYDRAULIC BRAKE WITH REGULATION IN PISTON ROD EXTENSION, IN-LINE TANK



Stroke	B	U max
1÷50	92	23
51÷150	112	39
151÷250	137	55
251÷350	157	71
351÷450	187	87
451÷500	212	95

Symbol

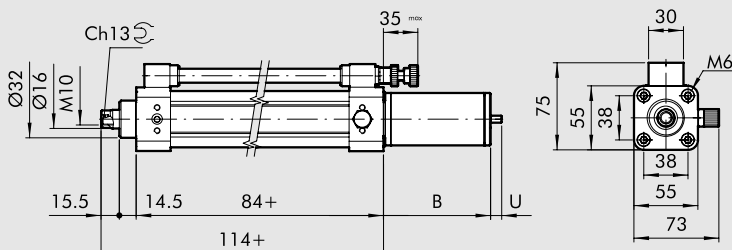


Code

W170001___L Hydraulic brake with regulation in piston rod extension, in-line tank

Description

+ = ADD THE STROKE



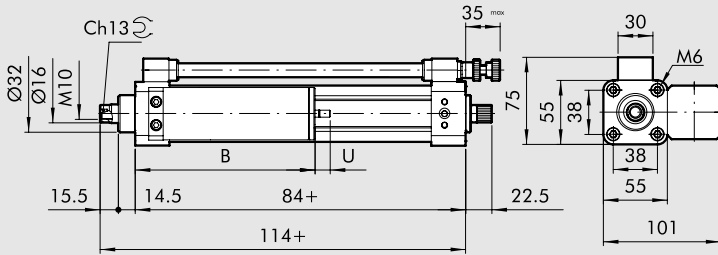
___ = Enter the stroke
Weight for stroke 0 mm = 1300 g
Weight each mm = 4.2 g

HYDRAULIC BRAKE WITH REGULATION IN PISTON ROD RETRACTION



Stroke	B	U max
1÷50	109	23
51÷150	129	39
151÷250	154	55
251÷350	174	71
351÷450	204	87
451÷500	229	95

+ = ADD THE STROKE



Symbol	Code	Description
	W170011 _____	Hydraulic brake with regulation in piston rod retraction

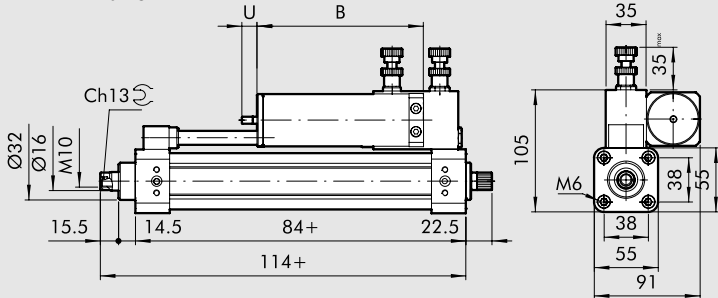
_____ = Enter the stroke
 Weight for stroke 0 mm = 1340 g
 Weight each mm = 4.2 g

HYDRAULIC BRAKE WITH REGULATION IN PISTON ROD EXTENSION/RETRACTION



Stroke	B	U max
1÷50	98	23
51÷150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95

+ = ADD THE STROKE



Symbol	Code	Description
	W170021 _____	Hydraulic brake with regulation in piston rod extension/retraction

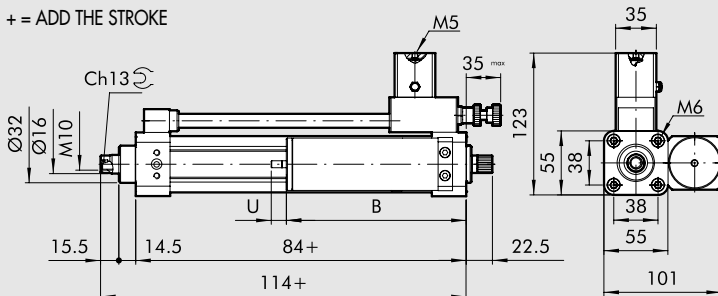
_____ = Enter the stroke
 Weight for stroke 0 mm = 1710 g
 Weight each mm = 4.2 g

**HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + SKIP VALVE
 HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + STOP VALVE**



Stroke	B	U max
1÷50	109	23
51÷150	129	39
151÷250	154	55
251÷350	174	71
351÷450	204	87
451÷500	229	95

+ = ADD THE STROKE



Symbol	Code	Description
	W170101 _____	Hydraulic brake with regulation in extension + NO SKIP valve
	W170201 _____	Hydraulic brake with regulation in extension + NO STOP valve
	W170102 _____	Hydraulic brake with regulation in extension + NC SKIP valve
	W170202 _____	Hydraulic brake with regulation in extension + NC STOP valve

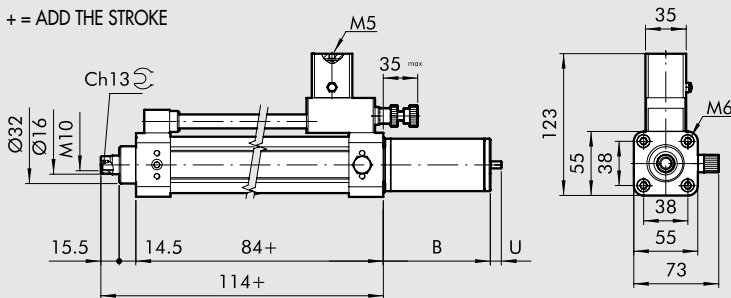
_____ = Enter the stroke
 Weight for stroke 0 mm = 1555 g
 Weight each mm = 4.2 g

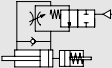



HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + SKIP VALVE, IN-LINE TANK
HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + STOP VALVE, IN-LINE TANK



Stroke	B	U max
1÷50	92	23
51÷150	112	39
151÷250	137	55
251÷350	157	71
351÷450	187	87
451÷500	212	95

+ = ADD THE STROKE



Symbol	Code	Description
	W170101 ___ L	Hydraulic brake with regulation in extension + NO SKIP valve, in-line tank
	W170201 ___ L	Hydraulic brake with regulation in extension + NO STOP valve, in-line tank
	W170102 ___ L	Hydraulic brake with regulation in extension + NC SKIP valve, in-line tank
	W170202 ___ L	Hydraulic brake with regulation in extension + NC STOP valve, in-line tank

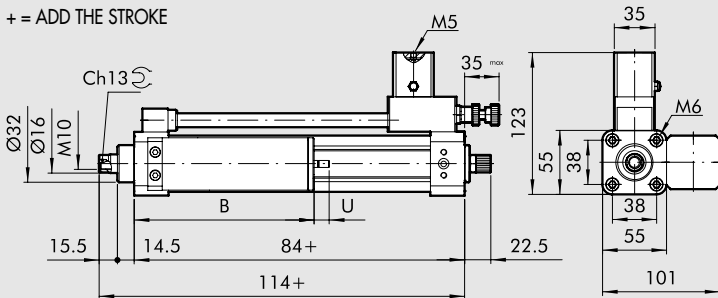
___ = Enter the stroke
 Weight for stroke 0 mm = 1510 g
 Weight each mm = 4.2 g

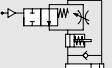
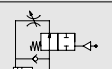
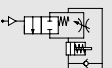
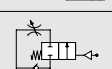
HYDRAULIC BRAKE WITH REGULATION IN RETRACTION + SKIP VALVE
HYDRAULIC BRAKE WITH REGULATION IN RETRACTION + STOP VALVE



Stroke	B	U max
1÷50	109	23
51÷150	129	39
151÷250	154	55
251÷350	174	71
351÷450	204	87
451÷500	229	95

+ = ADD THE STROKE



Symbol	Code	Description
	W170111 ___	Hydraulic brake with regulation in retraction + NO SKIP valve
	W170211 ___	Hydraulic brake with regulation in retraction + NO STOP valve
	W170112 ___	Hydraulic brake with regulation in retraction + NC SKIP valve
	W170212 ___	Hydraulic brake with regulation in retraction + NC STOP valve

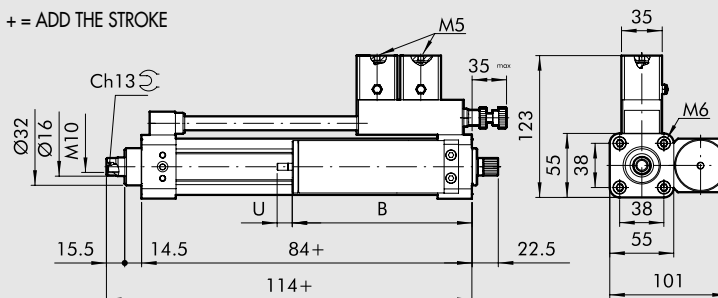
___ = Enter the stroke
 Weight for stroke 0 mm = 1555 g
 Weight each mm = 4.2 g

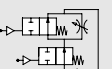
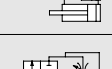
HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + SKIP/STOP VALVES



Stroke	B	U max
1÷50	109	23
51÷150	129	39
151÷250	154	55
251÷350	174	71
351÷450	204	87
451÷500	229	95

+ = ADD THE STROKE



Symbol	Code	Description
	W170301 ___	Hydraulic brake with regulation in extension + NO SKIP/STOP valves
	W170302 ___	Hydraulic brake with regulation in extension + NC SKIP/STOP valves

___ = Enter the stroke
 Weight for stroke 0 mm = 1730 g
 Weight each mm = 4.2 g

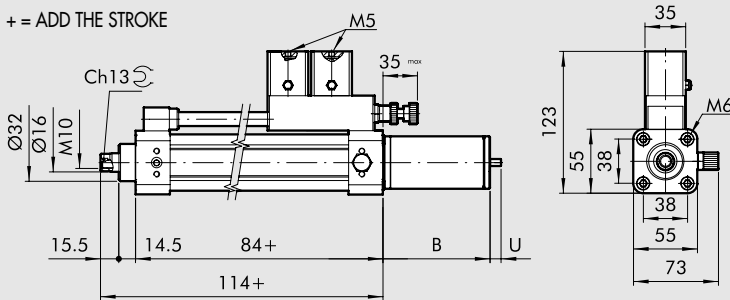
HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + SKIP/STOP VALVES, IN-LINE TANK



Stroke	B	U max
1÷50	92	23
51÷150	112	39
151÷250	137	55
251÷350	157	71
351÷450	187	87
451÷500	212	95

Symbol	Code	Description
	W170301 ___ L	Hydraulic brake with regulation in extension + NO SKIP/STOP valves, in-line tank
	W170302 ___ L	Hydraulic brake with regulation in extension + NC SKIP/STOP valves, in-line tank

+ = ADD THE STROKE



___ = Enter the stroke
 Weight for stroke 0 mm = 1690 g
 Weight each mm = 4.2 g

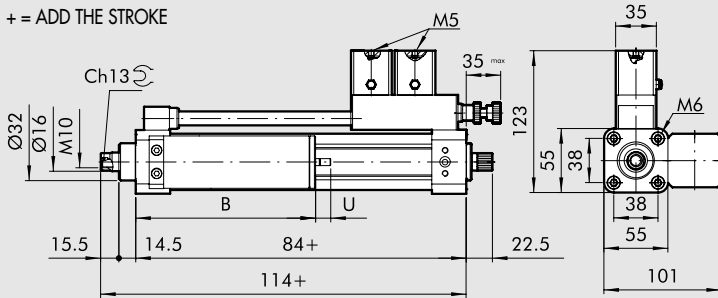
HYDRAULIC BRAKE WITH REGULATION IN RETRACTION + SKIP/STOP VALVES



Stroke	B	U max
1÷50	109	23
51÷150	129	39
151÷250	154	55
251÷350	174	71
351÷450	204	87
451÷500	229	95

Symbol	Code	Description
	W170311 ___	Hydraulic brake with regulation in retraction + NO SKIP/STOP valves
	W170312 ___	Hydraulic brake with regulation in retraction + NC SKIP/STOP valves

+ = ADD THE STROKE



___ = Enter the stroke
 Weight for stroke 0 mm = 1730 g
 Weight each mm = 4.2 g

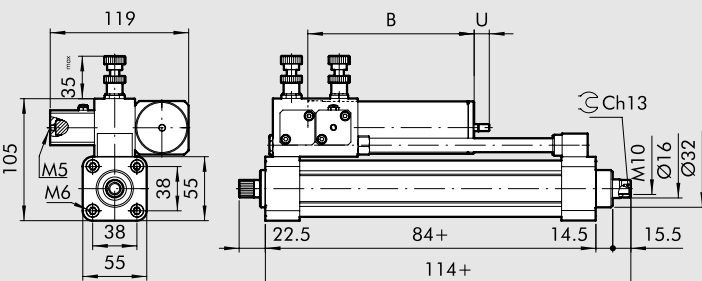
HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + EXTENSION SKIP VALVE



Stroke	B	U max
1÷50	98	23
51÷150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95

Symbol	Code	Description
	W17002A ___	Hydraulic brake with regulation in extension/retraction + extension NO SKIP valve
	W17002B ___	Hydraulic brake with regulation in extension/retraction + extension NC SKIP valve

+ = ADD THE STROKE

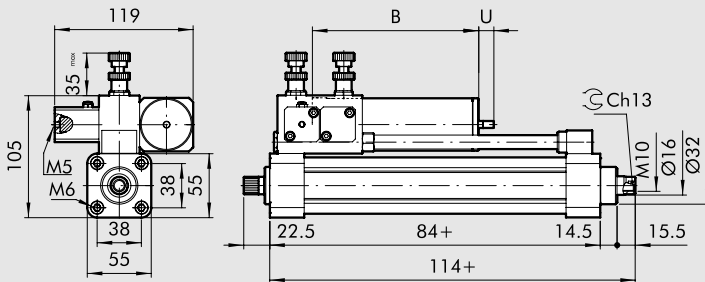


___ = Enter the stroke
 Weight for stroke 0 mm = 1850 g
 Weight each mm = 4.2 g

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + RETRACTION SKIP VALVE

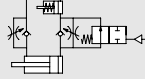


+ = ADD THE STROKE



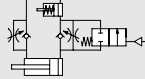
Stroke	B	U max
1÷50	98	23
51÷150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95

Symbol



Code

W17002C ____ Hydraulic brake with regulation in extension/retraction + retraction NO SKIP valve



Code

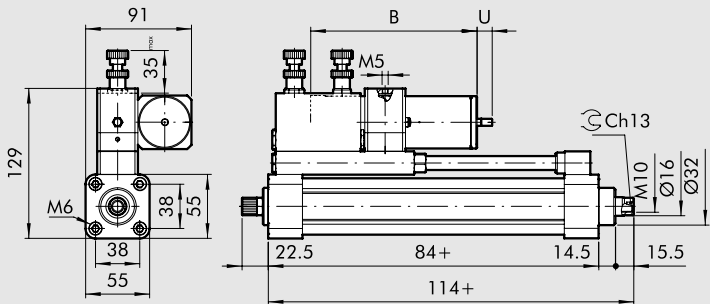
W17002D ____ Hydraulic brake with regulation in extension/retraction + retraction NC SKIP valve

____ = Enter the stroke
 Weight for stroke 0 mm = 1850 g
 Weight each mm = 4.2 g

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + EXTENSION STOP VALVE

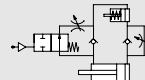


+ = ADD THE STROKE



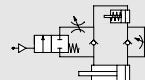
Stroke	B	U max
100÷150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95

Symbol



Code

W170023 ____ Hydraulic brake with regulation in extension/retraction + extension NO STOP valve



Code

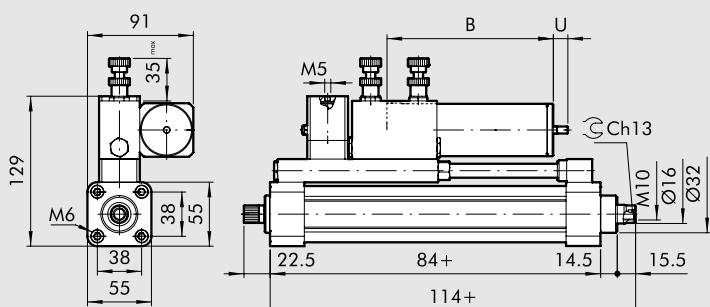
W170024 ____ Hydraulic brake with regulation in extension/retraction + extension NC STOP valve

____ = Enter the stroke
 Note: minimum stroke 100 mm
 Weight for stroke 0 mm = 1990 g
 Weight each mm = 4.2 g

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + RETRACTION STOP VALVE

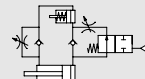


+ = ADD THE STROKE



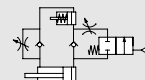
Stroke	B	U max
100÷150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95

Symbol



Code

W170025 ____ Hydraulic brake with regulation in extension/retraction + retraction NO STOP valve



Code

W170026 ____ Hydraulic brake with regulation in extension/retraction + retraction NC STOP valve

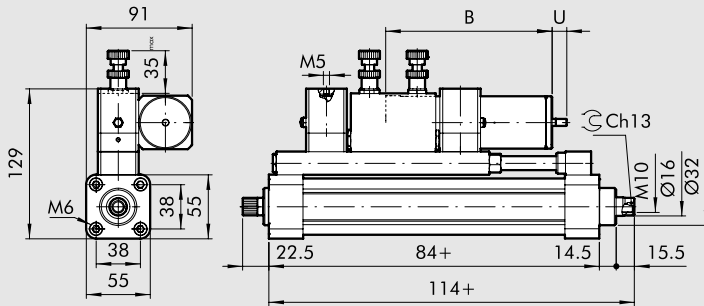
____ = Enter the stroke
 Note: minimum stroke 100 mm
 Weight for stroke 0 mm = 2080 g
 Weight each mm = 4.2 g

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL STOP VALVE



+ = ADD THE STROKE

Stroke	B	U max
150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95



Symbol	Code	Description
	W170221 ____	Hydraulic brake with regulation in extension/retraction + dual NO STOP valve

	W170222 ____	Hydraulic brake with regulation in extension/retraction + dual NC STOP valve
--	---------------------	--

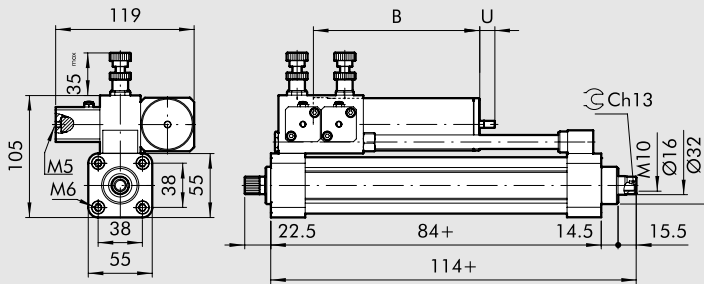
____ = Enter the stroke
 Note: minimum stroke 150 mm
 Weight for stroke 0 mm = 2260 g
 Weight each mm = 4.2 g

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL SKIP VALVE



+ = ADD THE STROKE

Stroke	B	U max
1÷50	98	23
51÷150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95



Symbol	Code	Description
	W170121 ____	Hydraulic brake with regulation in extension/retraction + dual NO SKIP valve

	W170122 ____	Hydraulic brake with regulation in extension/retraction + dual NC SKIP valve
--	---------------------	--

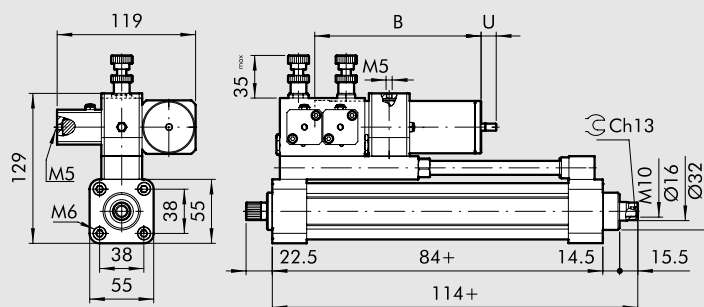
____ = Enter the stroke
 Weight for stroke 0 mm = 1850 g
 Weight each mm = 4.2 g

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL SKIP VALVE + PISTON ROD EXTENSION STOP VALVE



+ = ADD THE STROKE

Stroke	B	U max
100÷150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95

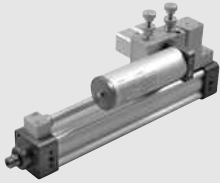


Symbol	Code	Description
	W170123 ____	Hydraulic brake with regulation in extension/retraction + dual SKIP valve + piston rod extension NO STOP valve

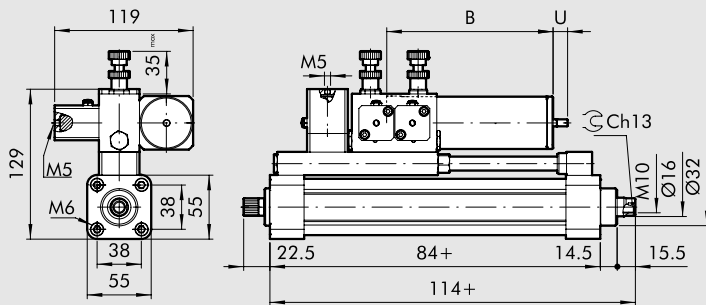
	W170124 ____	Hydraulic brake with regulation in extension/retraction + dual SKIP valve + piston rod extension NC STOP valve
--	---------------------	--

____ = Enter the stroke
 Note: minimum stroke 100 mm
 Weight for stroke 0 mm = 2110 g
 Weight each mm = 4.2 g

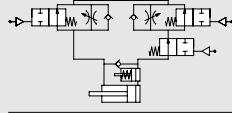
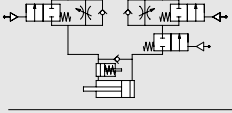
HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL SKIP VALVE + PISTON ROD RETRACTION STOP VALVE



+ = ADD THE STROKE

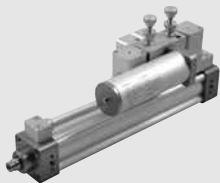


Stroke	B	U max
100÷150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95

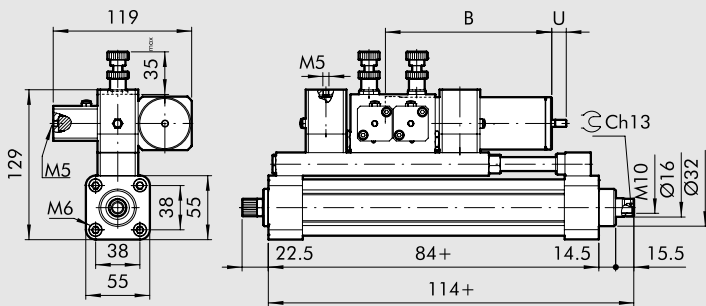
Symbol	Code	Description
	W170125 ____	Hydraulic brake with regulation in extension/retraction + dual SKIP valve + piston rod retraction NO STOP valve
	W170126 ____	Hydraulic brake with regulation in extension/retraction + dual SKIP valve + piston rod retraction NC STOP valve

____ = Enter the stroke
 Note: minimum stroke 100 mm
 Weight for stroke 0 mm = 2210 g
 Weight each mm = 4.2 g

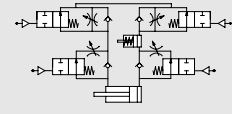
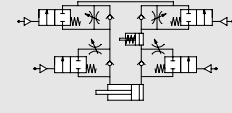
HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL SKIP VALVE + DUAL STOP VALVE



+ = ADD THE STROKE



Stroke	B	U max
150	118	39
151÷250	143	55
251÷350	163	71
351÷450	193	87
451÷500	218	95

Symbol	Code	Description
	W170321 ____	Hydraulic brake with regulation in extension/retraction + dual SKIP valve + dual NO STOP valve
	W170322 ____	Hydraulic brake with regulation in extension/retraction + dual SKIP valve + dual NC STOP valve

____ = Enter the stroke
 Note: minimum stroke 150 mm
 Weight for stroke 0 mm = 2415 g
 Weight each mm = 4.2 g

KEY TO CODES

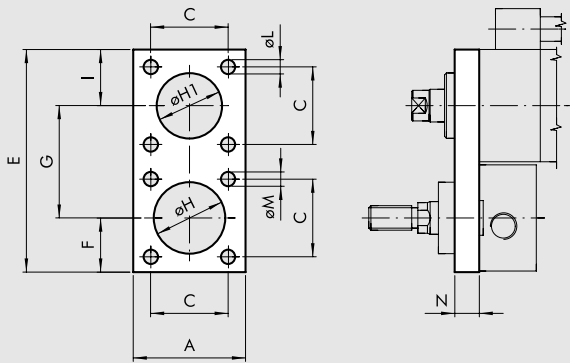
W 1 7 0	0	1	2	0300 STROKE	L
W170 BRK hydraulic brake	0 Regulation 1 Regulation + SKIP 2 Regulation + STOP 3 Regulation + SKIP + STOP	0 Extension 1 Retraction 2 Extension and retraction	1 No valve or NO 2 NC * 3 + NO STOP in extension * 4 + NC STOP in extension * 5 + NO STOP in retraction * 6 + NC STOP in retraction ▲ A + NO SKIP in extension ▲ B + NC SKIP in extension ▲ C + NO SKIP in retraction ▲ D + NC SKIP in retraction	Enter the desired stroke in four digits (e.g. 0500 for stroke 500)	● L In-line tank, if present

- Only for versions with piston rod regulation in extension
- * In combination with regulation in extension/retraction or regulation + SKIP in extension/retraction
- ▲ In combination with regulation in extension/retraction

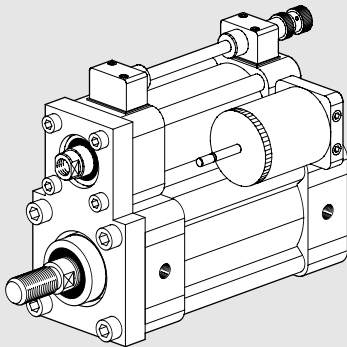
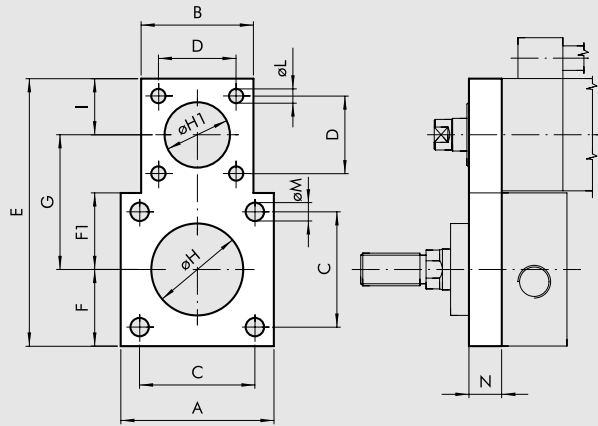
ACCESSORIES

FLANGE FOR MOUNTING WITH ISO 15552 CYLINDER

Ø 40



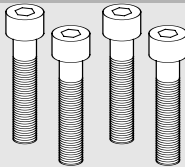
Ø 50-63-80-100



Code	Ø	A	B	C	D	E	F	FI	G	ØH	ØH1	I	ØL	ØM	N	Weight [g]
W0950402012	40	55	-	38	38	109	26.5	-	55	35	32	27.5	7	7	12	418
W0950502012	50	65	55	46.5	38	121	32.5	32.5	61	40	32	27.5	7	9	12	540
W0950632012	63	75	55	56.5	38	131	37.5	37.5	66	45	32	27.5	7	9	15	792
W0950802012	80	95	55	72	38	151	47.5	47.5	76	45	32	27.5	7	11	15	1216
W0951002012	100	112	55	89	38	168	56	56	84.5	55	32	27.5	7	11	15	1535

Note: 1 pc. per pack complete with 4+4 screws

FLANGE SCREW KIT



Code	Description	Weight [g]
W0950402111	Kit BRK-P/C-040	58
W0950502111	Kit BRK-P/C-050	93
W0950632111	Kit BRK-P/C-063	97
W0950802111	Kit BRK-P/C-080-100	151

Note: code corresponds to 4 + 4 screws

NOTES

INTEGRATED HYDRAULIC BRAKE

The integrated hydraulic brake is comprised of a pneumatic cylinder that acts as an actuator and an oleo-dynamic circuit that acts as a brake. The dimensions of the pneumatic cylinder (bore 63) comply with ISO 15552. The hydraulic circuit is comprised of a brake fluid tank and one or two flow regulation pins. It can mount one or more (slow-fast) SKIP or STOP valves that are normally open (NO) or normally closed (NC), for the piston rod extension and retraction.

The basic feature of this device is that the driving force and the braking force are coaxial, so they do not generate undesired bending moments on the piston rod and the external structures connected to it. Due to its conception, this brake is particularly compact and has reduced dimensions compared to BRK external hydraulic brakes.

After a certain operating time, the brake fluid tank must be topped up with oil. This needs doing when the oil level reaches the minimum mark on the rod. With the piston rod right out, the minimum level mark must not project less than 8-10 mm from the cap.

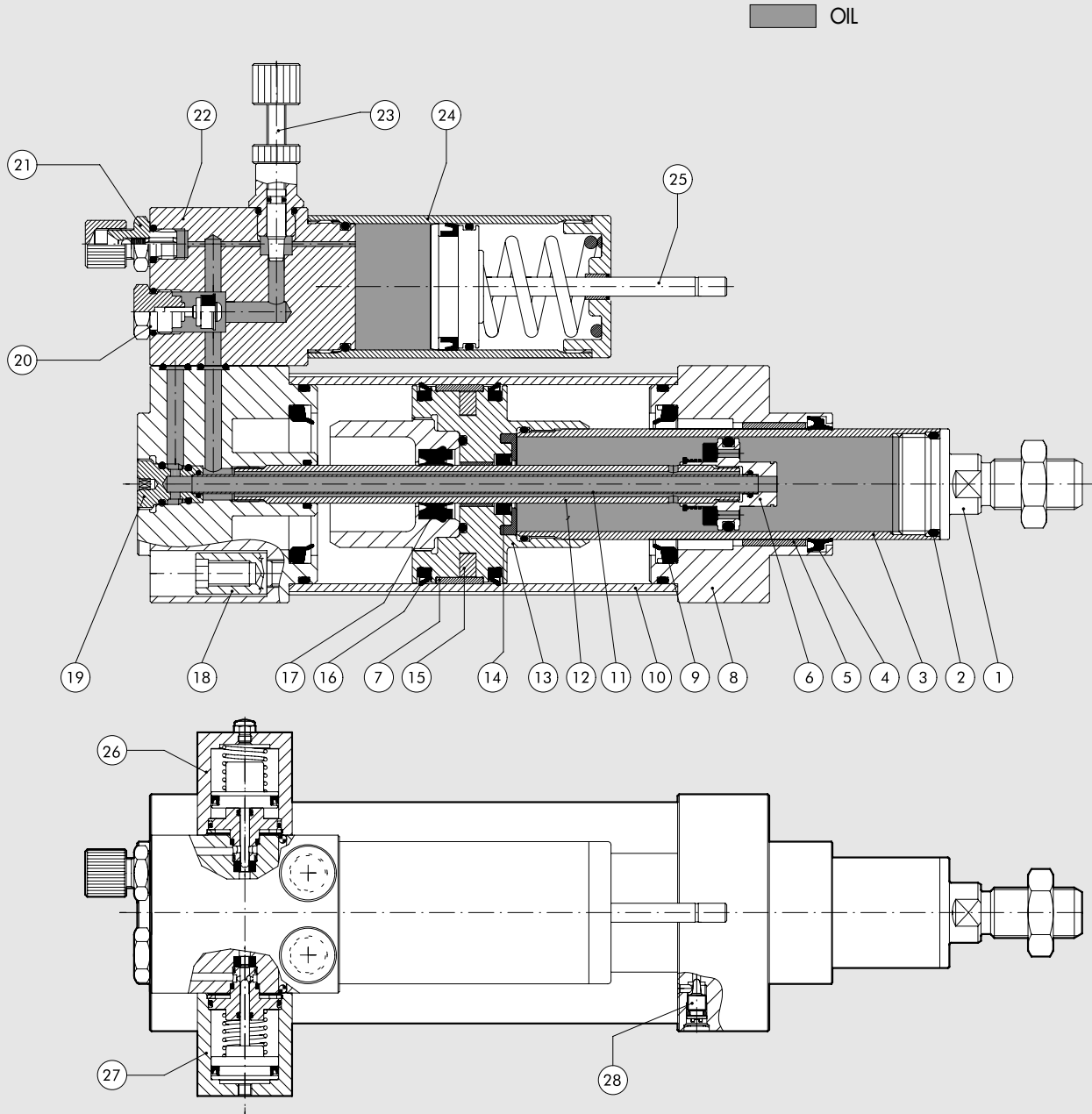
Always use DEXRON ATF hydraulic oil or another compatible product.

During the first operating cycles, excess oil is expelled through a hole in the tank.



TECHNICAL DATA		NBR-POLYURETHANE
Operating pressure	bar	1 to 8
	MPa	0.1 to 0.8
	psi	14.5 to 116
NC valve actuation pressure	bar	3 to 8
	MPa	0.3 to 0.8
	psi	43.5 to 116
Operating temperature range	°C	-10 to +70
	°F	14 to 156
Pneumatic circuit fluid		Lubricated or unlubricated filtered air.
Hydraulic circuit fluid		DEXRON ATF - the list of compatible oils is available on the web site www.metalwork.it
Bore	mm	63
Thrust force generated at 6 bar	N	1.725
Pull force generated at 6 bar	N	1.150
Maximum load which can be applied from outside while the rod is lock N		
• Version without valves and with closed pins:		
Thrust Load on the rod		6.000
Traction Load on the rod		5.000
• Version with STOP NC valves not operated:		
Thrust Load on the rod		6.000
Traction Load on the rod		5.000
• Version with STOP NO valves operated at 6 bar:		
Thrust Load on the rod		6.000
Traction Load on the rod		5.000
• Version with STOP NO valves operated at 8 bar:		
Thrust Load on the rod		6.000
Traction Load on the rod		5.000
Speeds at 6 bar and 20°C:	mm/min	
with regulation pin		30 to 7.000
with pin and NO STOP valve		30 to 4.500
with pin and NC STOP valve		30 to 4.500
with pin and NO SKIP valve		30 to 5.000
with pin and NC SKIP valve		30 to 5.000
with pin and NO STOP+SKIP valves		30 to 4.000
with pin and NC STOP+SKIP valves		30 to 4.000
without pin nor regulation (fast retraction)		30.000
		(Speeds measured on the brake with 500 mm stroke and using 10 mm Ø pipes)
Standard strokes	mm	50, 100, 150, 200, 250, 300, 350, 400, 450, 500
		Other special strokes up to 500 available on request, but the dimensions of the brake are the same of the immediately higher stroke ones, and the front damping has no action.
Valve combinations		Piston-out, piston-in and dual regulation
		The following combinations of valves can be mounted on each regulated section:
		STOP NO, STOP NC, SKIP NO, SKIP NC, DOPPIO STOP NO, DOPPIO STOP NC,
		DOPPIO SKIP NO, DOPPIO SKIP NC, STOP NO+STOP NC, SKIP NO+SKIP NC,
		STOP NO+SKIP NO, STOP NC+SKIP NC, STOP NO+SKIP NC, STOP NC+SKIP NO
Sensor magnet		All versions are provided with a magnet

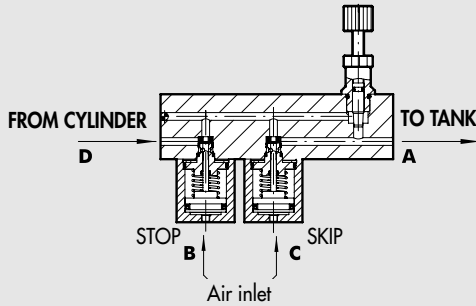
COMPONENTS



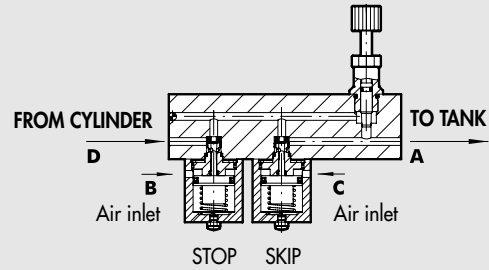
- | | | |
|---|--|--|
| <ul style="list-style-type: none"> ① GUIDE HOLD: galvanised steel ② O-RING: NBR ③ PISTON ROD: thickly chromed steel ④ PISTON ROD GASKET: polyurethane ⑤ GUIDE BUSHING: steel strip with bronze and PTFE insert ⑥ INSIDE PISTON: brass ⑦ GUIDE RING: PTFE ⑧ HEAD: anodized aluminium ⑨ CUSHIONING GASKET: NBR | <ul style="list-style-type: none"> ⑩ JACKET: anodised and calibrated aluminium section ⑪ INTERNAL PIPE: brass ⑫ INTERMEDIATE PIPE: steel ⑬ PISTON: aluminium ⑭ PISTON ROD GASKET: polyurethane ⑮ MAGNET: plastoferrite ⑯ PISTON GASKET: NBR ⑰ PISTON ROD GASKET: polyurethane ⑱ SECURING/ASSEMBLY SCREW: self-tapping | <ul style="list-style-type: none"> ⑲ BUSH: nickel-plated brass ⑳ CHECK VALVE ㉑ OIL FILLING VALVE ㉒ REGULATION UNIT: anodised aluminium ㉓ REGULATION PIN ㉔ OIL RECOVERY TANK ㉕ OIL LEVEL ROD: galvanised steel ㉖ NC VALVE ㉗ NO VALVE ㉘ CUSHIONING PIN |
|---|--|--|

SKIP-STOP APPLICATION WITH VALVES

NO



NC

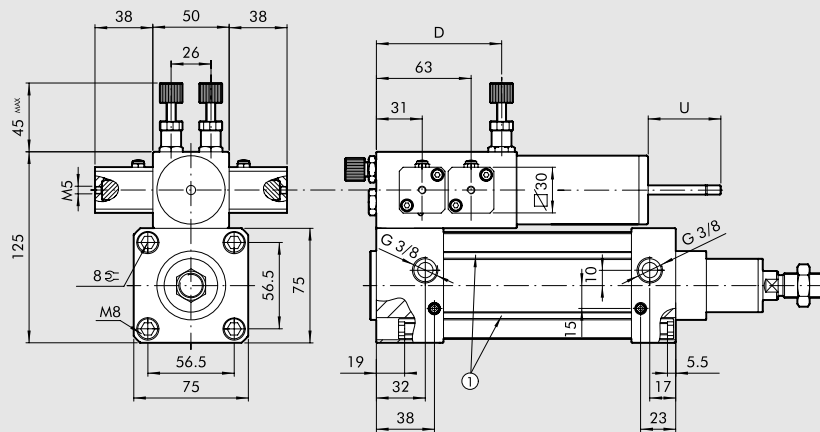


In normally-open (NO) valves, flow moves freely from A to D. When port C is supplied, this operates the SKIP valve and the fluid is forced through the bottleneck generated by the adjusting pin. When port B is supplied, this operates the STOP valve and interrupts the flow of fluid. In normally-closed NC valves, flow is normally inhibited. When port B is supplied, the fluid flows through but it is forced through the bottleneck generated by the adjusting pin. When port C is supplied, flow moves freely from A to D.

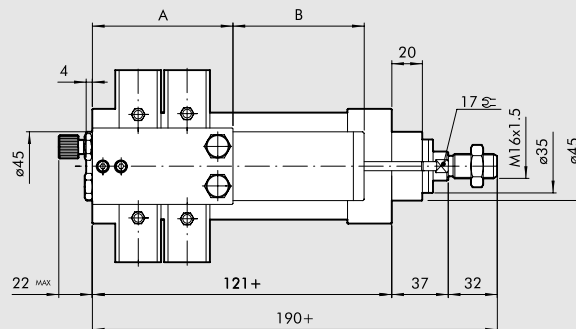
OVERALL DIMENSIONS OF THE VARIOUS VERSIONS

Stroke	B	U max
50	106	25
100	131	30
150	131	35
200	131	40
250	171	45
300	171	50
350	216	55
400	216	60
450	301	65
500	301	70

Type	A	D
Regulation only	50	40
1 valve per side	50	40
2 valve per side	82	72



① Slots for slim sensor (only on the utility ports side)



KEY TO CODES

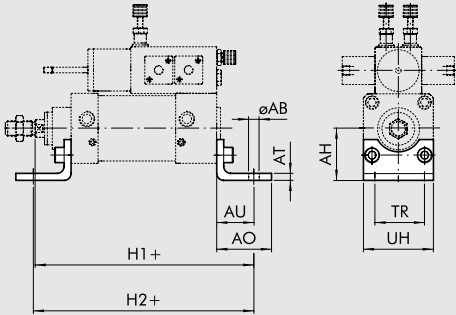
W 1 7 3	2	3	1	0	0 5 0 0
INTEGRATED BRAKE	REGULATION	PISTON ROD EXTENSION CONTROL VALVES	PISTON ROD RETRACTION CONTROL VALVES	BORE	STROKE
W173 Integrated brake	0 Out 1 In 2 Dual	0 Without valves 1 NO Stop 2 NC Stop 3 NO Skip 4 NC Skip 5 NO Stop NO Skip 6 NO Stop NC Skip 7 NC Stop NO Skip 8 NC Stop NC Skip	0 Without valves 1 NO Stop 2 NC Stop 3 NO Skip 4 NC Skip 5 NO Stop NO Skip 6 NO Stop NC Skip 7 NC Stop NO Skip 8 NC Stop NC Skip	0 D63	Specify the desired stroke in 4 digits (e.g. 0500 for stroke 500)

N.B. With at least one extension control valve and one retraction control valve, type W1732_ _ _ is required.

ACCESSORIES

FOOT - MODEL A

+ = ADD THE STROKE



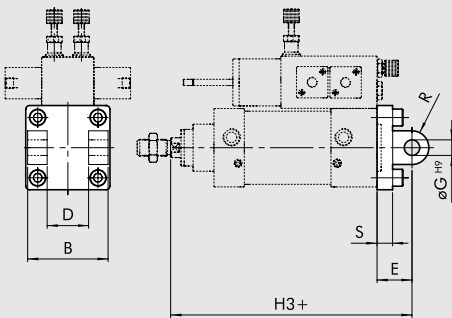
Code	Ø	Ø AB	AH	AO	AT	AU	TR	UH	H ₁	H ₂	Weight [g]
W0950632001	63	9	50	47	6	32	50	75	190	185	266

Note: Individually packed with 2 screws.

N.B.: M8x40 UNI 5931 screws are required for fixing the rear head (see kit 0950636092)

FEMALE HINGE - MODEL B

+ = ADD THE STROKE



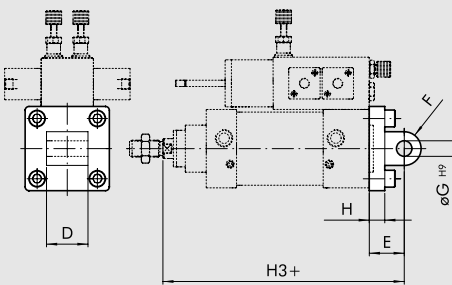
Code	Ø	B	D	E	Ø G	H ₃	R	S	Weight [g]
W0950632003	63	70	40	32	16	190	17	12	394

Note: Supplied with 4 screws, 4 washers, 2 snap rings and 1 pin.

N.B.: M8x40 UNI 5931 screws are required for fixing the rear head (see kit 0950636092)

MALE HINGE - MODEL BA

+ = ADD THE STROKE



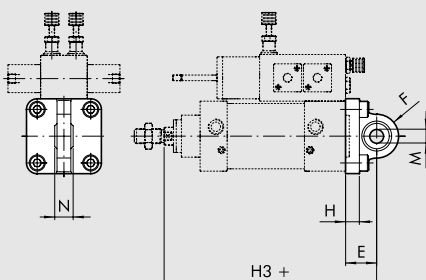
Code	Ø	D	E	F	Ø G	H	H ₃	Weight [g]
W0950632004	63	40	32	17	16	12	190	316

Note: Supplied with 4 screws, 4 washers.

N.B.: M8x40 UNI 5931 screws are required for fixing the rear head (see kit 0950636092)

ARTICULATED MALE HINGE - MODEL BAS

+ = ADD THE STROKE

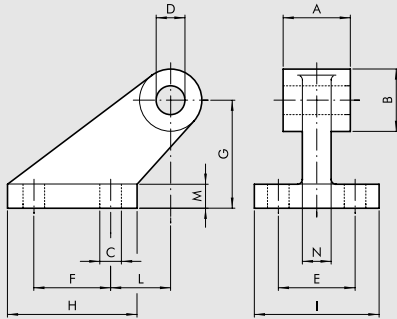


Code	Ø cil.	E	F	H	H ₃	M	N	Weight [g]
W0950632006	63	32	24	12	190	16	21	336

Note: Supplied with 4 screws, 4 washers.

N.B.: M8x40 UNI 5931 screws are required for fixing the rear head (see kit 0950636092)

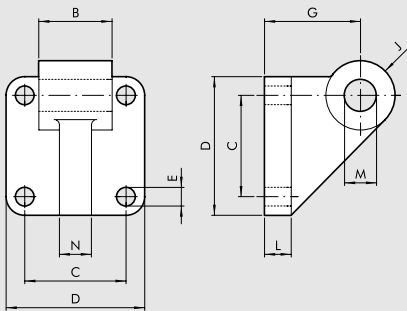
CETOP HINGE FOR MODEL B - MODEL GL



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440

Note: Supplied with 4 screws, 4 washers.

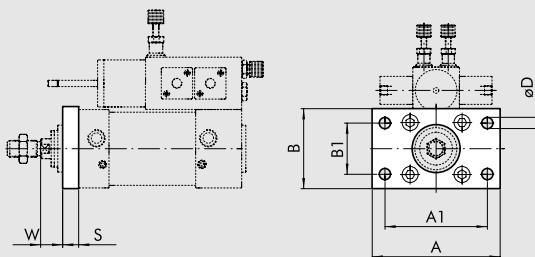
ISO HINGE FOR MODEL B - MODEL GS



Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]
W0950632108	63	39.5	56.5	75	9	50	17	12	16	15	350

Note: Supplied with 4 screws, 4 washers.

FRONT FLANGE - MODEL C

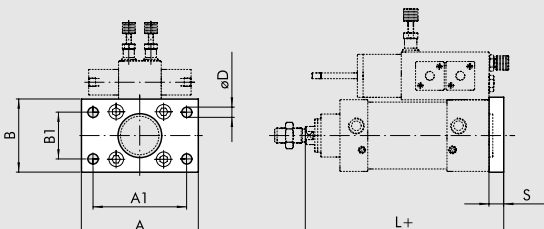


Code	Ø	A ₁	A	B	S	B ₁	ØD ₄	W	Weight [g]
W0950632002	63	100	120	75	12	50	9	25	670

Note: Supplied with 4 screws.

REAR FLANGE - MODEL C

+ = ADD THE STROKE

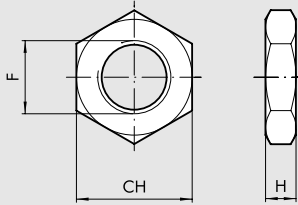


Code	Ø	A ₁	A	B	S	B ₁	ØD ₄	L	Weight [g]
W0950632002	63	100	120	75	12	50	9	170	670

Note: Supplied with 4 screws.

N.B.: M8x40 UNI 5931 screws are required for fixing the rear head (see kit 0950636092)

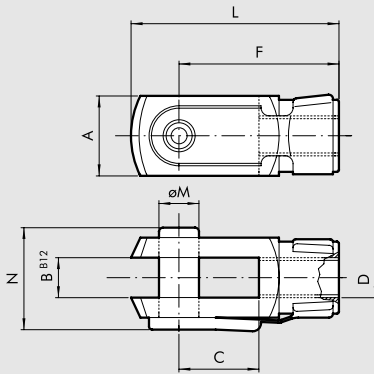
ROD NUT - MODEL S



Code	Ø	F	H	CH	Weight [g]
0950502010	63	M16x1.5	8	24	20

Note: Individually packed.

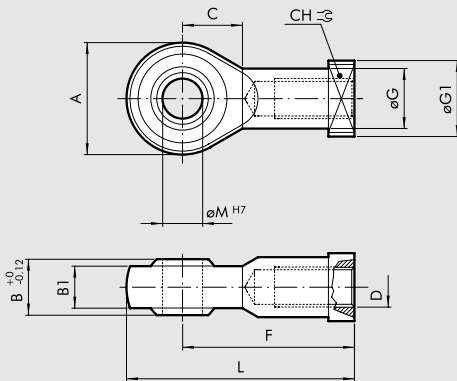
FORK MODEL GK-M



Code	Ø	ØM	C	B	A	L	F	D	N	Weight [g]
W0950502020	63	16	32	16	32	83	64	M16x1.5	40	340

Note: Individually packed.

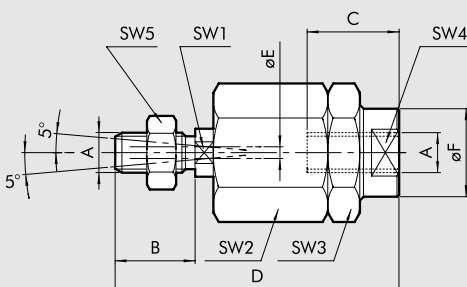
ROD EYE - MODEL GA-M



Code	Ø	ØM	C	B1	B	A	L	F	D	ØG	CH	ØG1	Weight [g]
W0950502025	63	16	22	15	21	42	85	64	M16x1.5	22	22	22	226

Note: Individually packed.

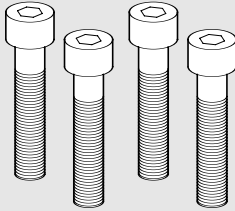
SELF ALIGNING ROD COUPLER - MODEL GA-K



Code	Ø	A	B	C	D	ØF	ØE	SW ₁	SW ₂	SW ₃	SW ₄	SW ₅	Weight [g]
W0950502030	63	M16x1.5	32	32	103	32	4	20	41	41	30	24	620

Note: Individually packed.

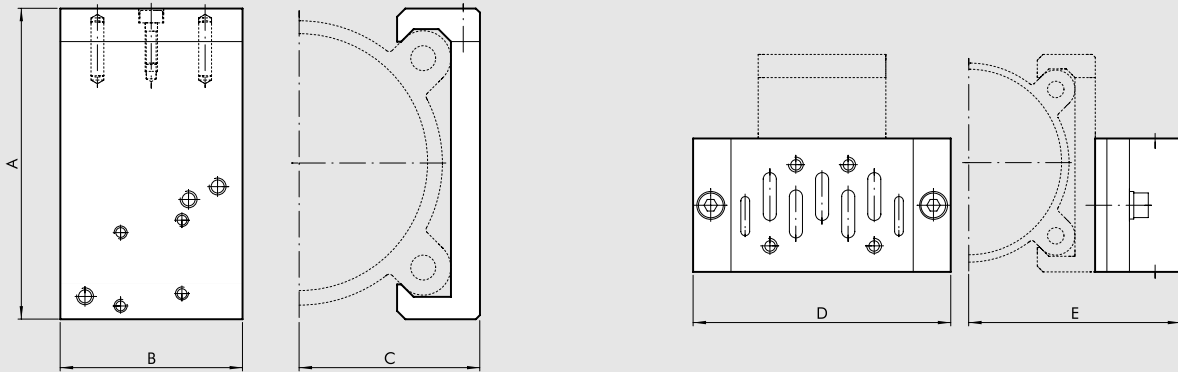
KIT OF REAR HEAD SCREWS



Code	Description
0950636092	Kit of M8x40 UNI 5931 rear head fixing screws

Note: 4 items per pack.

CYLINDER BRACKET - VALVE SERIES KCV

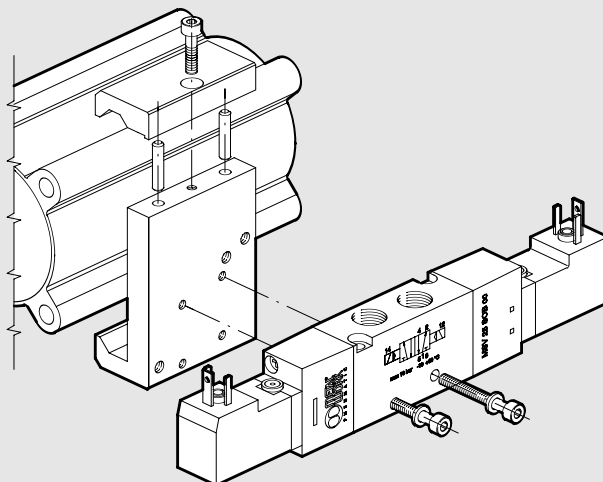


Code	Ø	A	B	C	ISO 1		ISO 1		Applicable valves	Weight [g]
					D	E	D	E		
0950632090	63	81.5	40	42	110	77	1124	83	MACH 16 Series 70 1/8-1/4 ISO 1 - ISO 2	101

KIT FOR FIXING VALVES TO BRACKETS

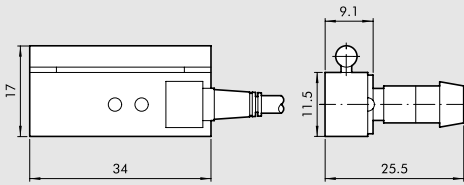
Code	Valve KIT	Composition	Weight [g]
0950002003	MACH 16	2 HEX. screws M3x25 with washer	4
0950002004	Series 70 1/8-1/4	2 HEX. screws M4x50 with washer	8
0950002001	ISO 1	Adaptor + ISO1 base side + screws + washers	230
0950002002	ISO 2	Adaptor + ISO2 base side + screws + washers	350

VALVE ASSEMBLY ON HYDRAULIC BRAKE



ACCESSORIES: MAGNETIC SENSORS

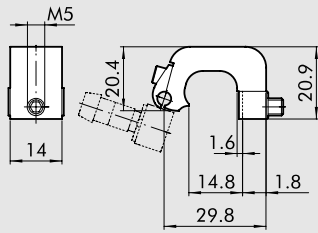
SENSOR



Code	Description
W0950000201	Sensor REED DSM2-C525 HS
W0950000222	Sensor E. HALL PNP DSM3-N225
W0950000232	Sensor E. HALL NPN DSM3-M225

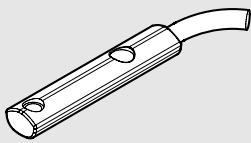
For technical data see page 1-286

SENSOR BRACKETS



Code	Description
W0950000712	Bracket D.50-63 DST 81

SLIM SENSOR



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
For technical data see page 1-288

NOTES



● **ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552**

PAG. 1-248



● **ELECTRIC MOTORS**

PAG. 1-261



● **DRIVES FOR MOTORS**

PAG. 1-272

● **CALCULATIONS FOR CHOOSING AN ELECTRIC CYLINDER**

PAG. 1-279

ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552

An electric cylinder with a connection interface in accordance with ISO 15552.

The piston rod extension is controlled by a system with a hardened screw and recirculating ball screw. The piston has a guide strip calibrated to reduce to a minimum play with the barrel and hence vibration during ball screw rotation.

The cylinder can be equipped with a built-in non-rotating system featuring two opposing slides that run in separate longitudinal slots in the barrel.

The piston comes with magnets and the barrel has longitudinal slots for housing sensors. The piston rod has increased outside diameter and thickness to make it extra rigid and more resistant to radial and peak loads.

A system for greasing the screws is included. Numerous standard accessories for pneumatic cylinders, including intermediate hinge, can be used for mounting the cylinder.

The motor can be selected from an optimised range, which encompasses both STEPPING and BRUSHLESS motors.

There is a version for in-line assembly, where the drive shaft is jointed directly onto the screw. There is also a geared motor version, where transmission is provided by pulleys and a cog belt with a transmission ratio of 1:1.

Suitable motor drives are provided.

Special adaptor flanges and joints can be provided if the customer wishes to use a particular make of motor.

in-line version



geared version



TECHNICAL DATA	32	50	63
Piston rod thread	M10x1.25	M16x1.5	M16x1.5
Environmental temperature range for STEPPING motors	°C		
BRUSHLESS motors	°C		
Electrical protection rating with STEPPING motors	IP40 or IP55 (see key to codes on page 1-257)		
BRUSHLESS motors	IP40 or IP65 (see key to codes on page 1-257)		
Maximum relative humidity of the air for IP55 STEPPING motor	90% at 40°C; 57% at 50°C (no condensate)		
IP65 BRUSHLESS motor	90% (no condensate)		
Minimum stroke for version with non-rotating	Twice the screw pitch (to guarantee ball lubrication)		
Minimum stroke for version without non-rotating	mm		
Maximum stroke	mm		
Overall radial oscillation of the piston rod (without load) for 100 mm of stroke	mm		
Versions	With or without piston rod non-rotating		
Uncontrolled impact at the end of stroke	NOT ALLOWED (it provides an extra-stroke minimum 5 mm)		
Sensor magnet	YES		
Maximum angle of twist of the piston rod for non-rotating version	1°30'	1°	0°45'
Work position	Any		

MECHANICAL FEATURES	32		50			63		
Worm screw pitch (p)	4	12	5	10	16	5	10	20
Worm screw diameter	12	12	16	16	16	20	20	20
Static axial load (F _s)	3200		4000			6500		
Dynamic axial load (F)	5200	5600	10500	6670	4330	10010	12800	4880
Maximum number of revs	4000		3000			2500		
Maximum speed (V _{max})	267	800	250	500	800	208	417	833
	Calculate mean axial load and the calculate life (see graphs on pages 1-251 and 1-252)							

WEIGHTS	32		50			63		
Worm screw pitch (p)	4	12	5	10	16	5	10	20
Weight at stroke 0	896	973	1990	2043	2086	2942	3209	3056
Additional weight per mm of stroke	3.98	3.96	6.64	6.62	6.55	6.25	6.32	6.32
Moving mass at stroke 0 (non-rotating version)	270	353	586	629	703	956	1215	1067
Additional moving mass per mm of stroke	1.25		1.84			1.98		

MASS MOMENTS OF INERTIA

		32		50			63		
Worm screw pitch	mm	4	12	5	10	16	5	10	20
J0 at stroke 0	kgmm ²	1.2407	2.4309	5.3455	6.1360	9.1113	12.4043	14.8767	23.5427
J1 per metre of stroke	kgmm ² /m	12.2592	17.8468	35.2305	38.5264	49.1936	86.2990	96.6652	116.3671
J2 per kg of load	kgmm ² /kg	0.4053	4.0858	0.6333	2.5332	6.4849	0.6333	2.5332	10.1327

Total mass moment o inertia Jtot = J0 + J1 · stroke [m] + J2 · load [kg]

CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

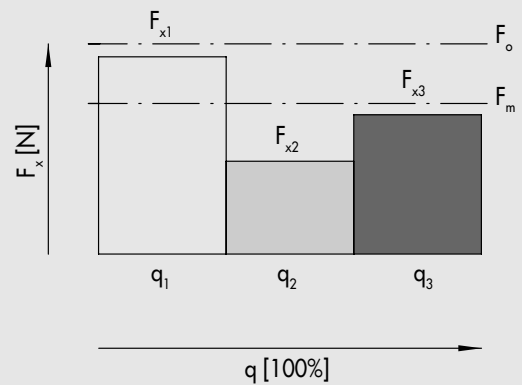
Peak axial load in a work cycle must not exceed the static axial load F_o . The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

Mean axial load F_m

$$F_m = \sqrt[3]{\sum F_x^3 \times \frac{V_x}{V_m} \times \frac{q}{100}} =$$

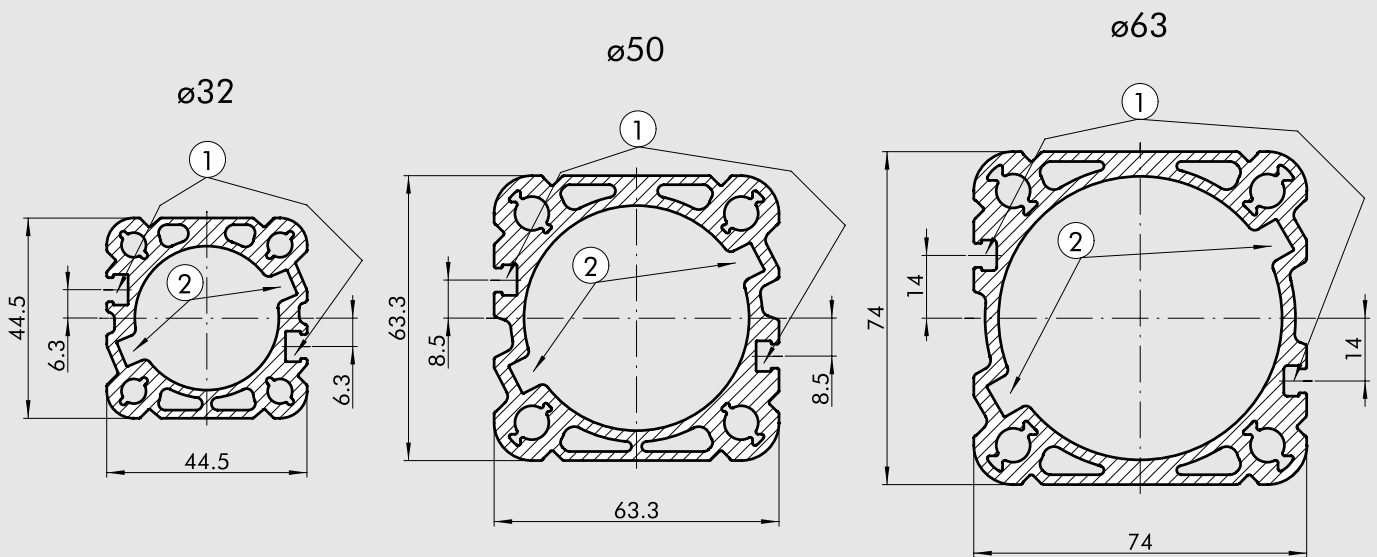
$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{x1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{x2}}{V_m} \times \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{x3}}{V_m} \times \frac{q_3}{100} + \dots}$$

- F_x = Axial load at stage x
- F_m = Mean axial load during extension
- F_o = Static axial load
- q = Time segment
- V_x = Speed in the phase x
- V_m = Average speed



The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
 The graphs on pages 1-251 and 1-252 show screw life as a function of F_m

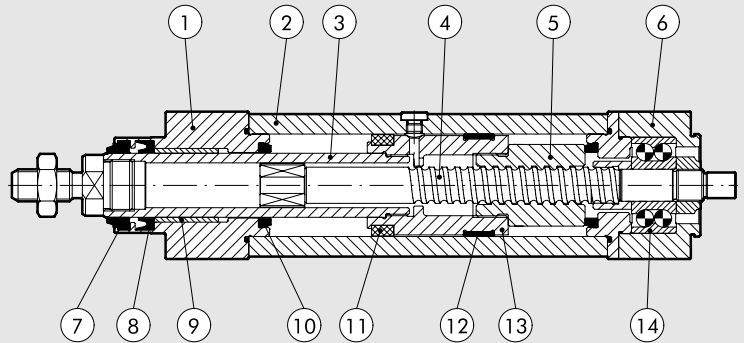
BARREL CROSS SECTION



- ① Slots for sensors
- ② Slots for anti-rotation

COMPONENTS

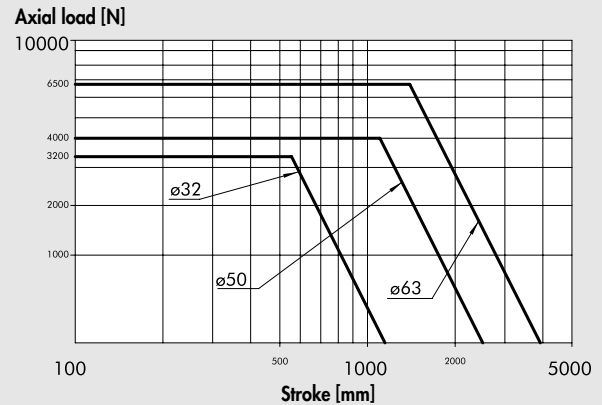
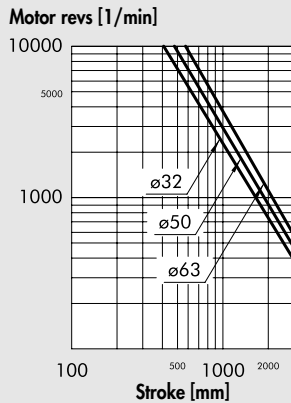
- ① FRONT CYLINDER HEAD: anodised aluminium
- ② BARREL: extruded and anodised aluminium alloy
- ③ PISTON ROD: ground chrome steel
- ④ WORM SCREW: hardened steel
- ⑤ BALL SCREW: steel
- ⑥ REAR CYLINDER HEAD: anodised aluminium
- ⑦ WIPER RING: polyurethane
- ⑧ PISTON ROD GASKET: NBR (IP55/ IP65 version only)
- ⑨ GUIDE BUSHING: steel strip with bronze and PTFE insert
- ⑩ BUFFER: technopolymer
- ⑪ MAGNET: plastoferrite
- ⑫ GUIDE STRIP: self-lubricated calibrated technopolymer
- ⑬ PISTON: aluminium
- ⑭ BEARING: oblique with two ball rings



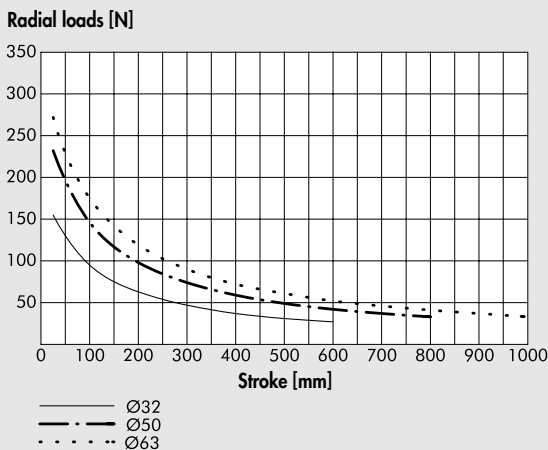
CRITICAL VELOCITY – PEAK LOADS

The two variables (stroke and motor revs) must meet the conditions in the graph below, otherwise resonance could be generated and affect the system.

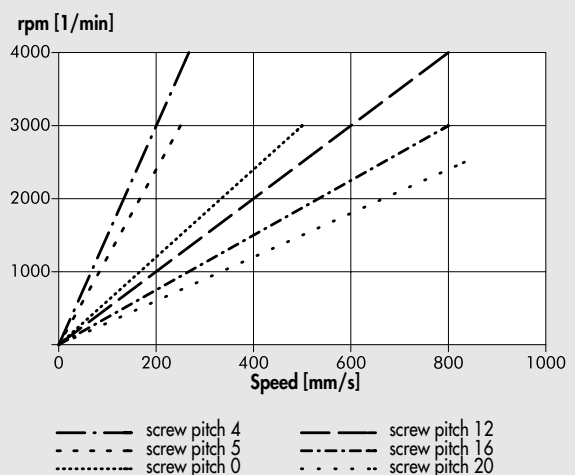
With vertical installations, the following load conditions applied to the piston rod must be met.



MAXIMUM RADIAL LOADS ON PISTON ROD



PISTON ROD SPEED AS A FUNCTION OF rpm



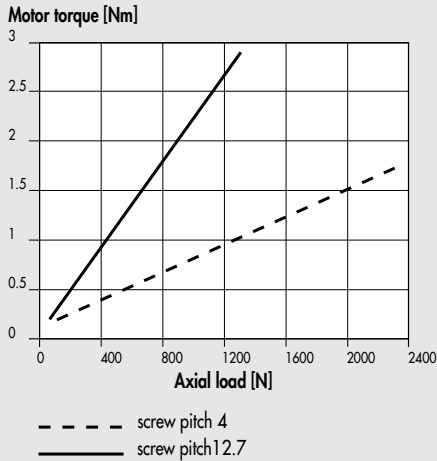
Radial loads can be applied to the piston rod. They must not exceed the values in the table above, otherwise the guides on the piston rod and piston will be subjected to excessive wear.

The graph shows the direct correspondence between the number of turns (1/min) and the translation speed of the stem (mm/s). In any case all the other conditions and limitations of each specific cylinder will have to be complied.

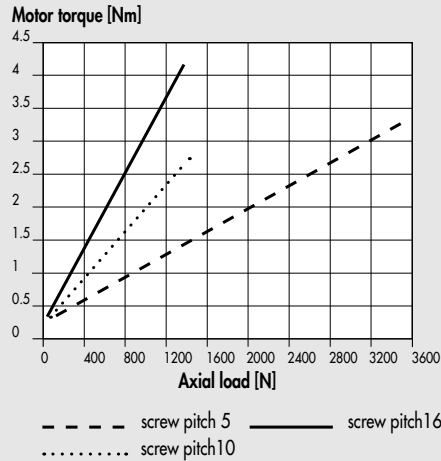
DRIVE TORQUE AS A FUNCTION OF THE AXIAL LOAD APPLIED TO THE PISTON ROD

The friction generated in the mechanical system is taken into account.

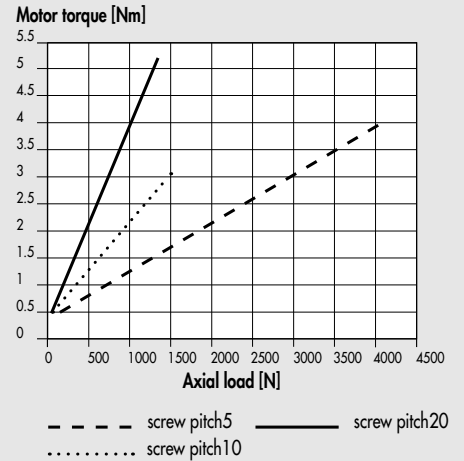
Ø 32



Ø 50

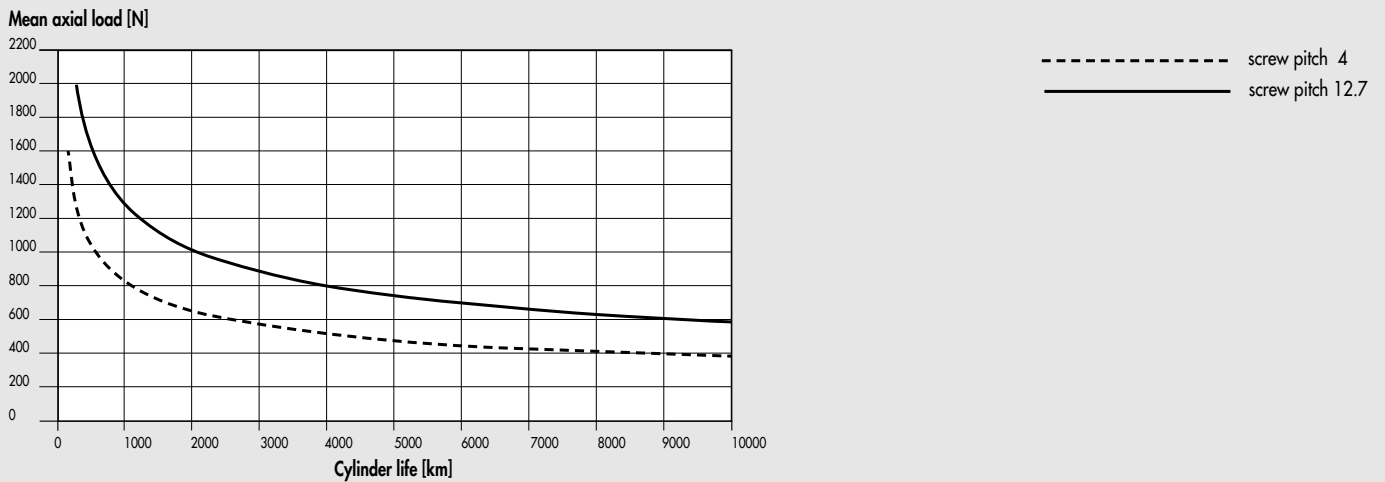


Ø 63

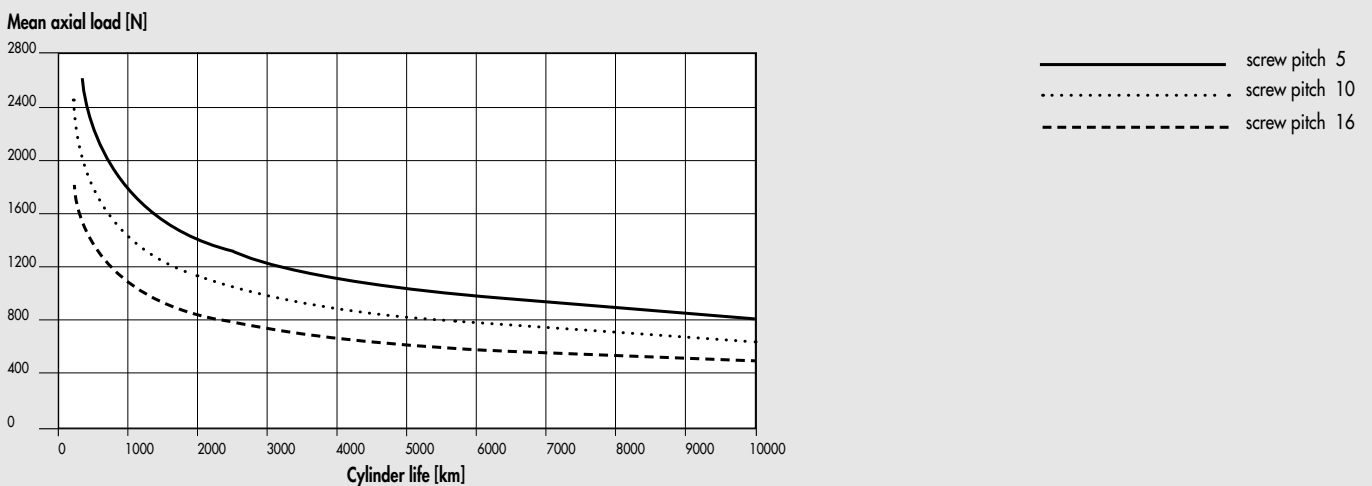


LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD

Ø 32

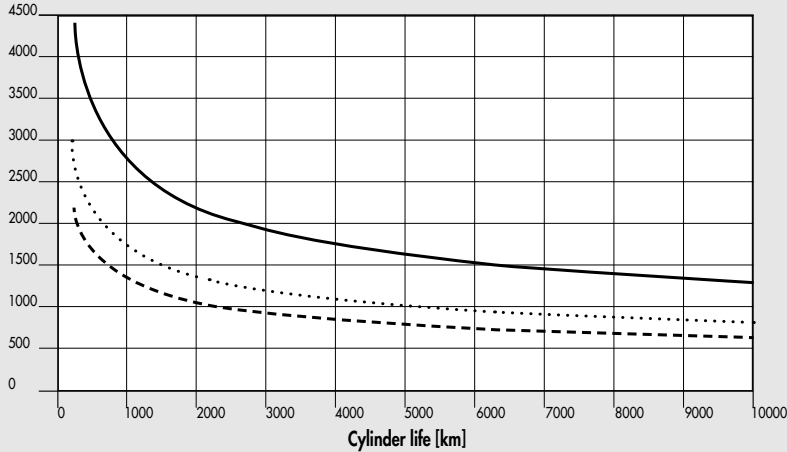


Ø 50



Ø 63

Mean axial load [N]

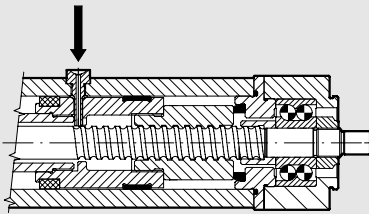


..... screw pitch 5
 ——— screw pitch 10
 - - - screw pitch 20

Life characteristics can vary considerably from those indicated in the graphs due to different operating conditions (radial loads, temperature, lubrication status, etc.).

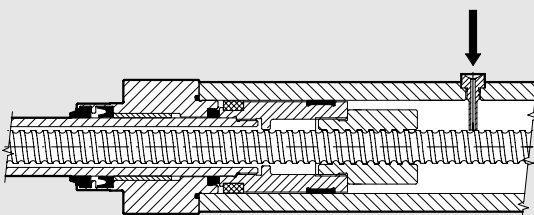
LUBRICATION DIAGRAMS

LUBRICATION OF VERSION WITH NON-ROTATING PISTON ROD



- Retract the piston rod towards the rear head. The piston rod/piston/ball screw/system must rest against the buffer of the rear head
- Unscrew the cap on the lubricator port (see note 1 to the drawing on page 1-253)
- Screw the lubricating pin (see accessory on page 1-259) into the thread. Make sure you enter the corresponding hole in the piston below
- Pump grease (code 9910506) in 4-5 times using a suitable lubricator
- Unscrew the lubricating pin and make the piston rod perform four complete strokes. The piston rod should end up in the initial (retracted) position
- Repeat the last two operations
- The operation of re-greasing will have to be repeated every 200 km, approximately.

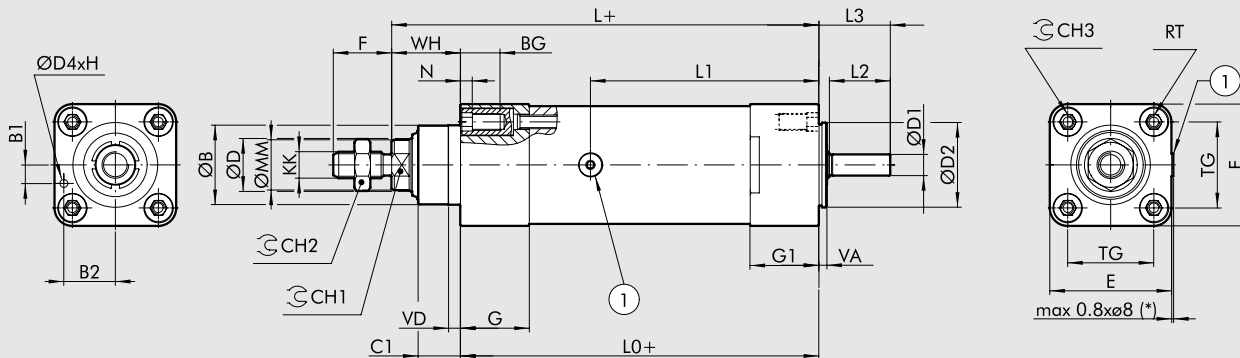
LUBRICATION OF VERSION WITHOUT NON-ROTATING PISTON ROD



- Extend the piston rod completely. The piston rod/piston/ball screw/system must rest against the buffer of the front head
- Unscrew the cap on the lubricator port (see note 1 to the drawing on page 1-253)
- Screw the lubricating pin (see accessory on page 1-259) into the thread. Make sure you enter the corresponding hole in the piston below.
- Pump grease (code 9910506) in 4-5 times using a suitable lubricator
- Unscrew the lubricating pin and make the piston rod perform four complete strokes. The piston rod should end up in the initial (extended) position
- Repeat the last two operations
- The operation of re-greasing will have to be repeated every 200 km, approximately.

DIMENSIONS

DIMENSIONS OF SINGLE CYLINDERS



1 = lubricator port
(*) = for Ø 63 only

Ø	ØB (d11)	B1	B2	BG	C1	CH1	CH2	CH3	ØD (f7)	ØD1 (h7)	ØD2	ØD4 (h7)	E	F	G	G1	H	KK	L	L0
32	30	7	19.5	14.5	16	17	17	6	20	6.35	32	3	46	22	26	26	9	M10x1.25	160	134
50	40	7	28	17.5	25	21	24	8	25	10	50	3	64.5	32	30	30	9	M16x1.5	194	157
63	45	9	34.5	17.5	25	26	24	8	30	12	63	3	75.5	32	32	32	9	M16x1.5	210	173

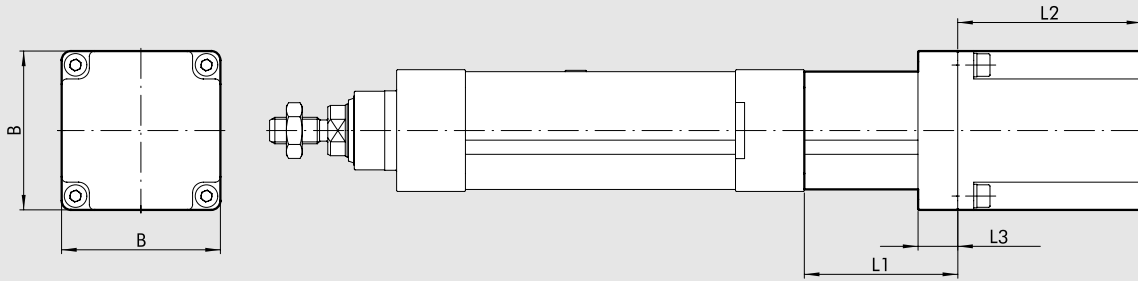
Ø	L1	L2	L3	ØMM	N	RT	TG	VA	VD	WH
32	86.3	23	27	19	4.5	M6	32.5	3	4.5	26
50	100.8	24	28.4	24	5.5	M8	46.5	5.5	5.5	37
63	112.3	34	39.5	29	5.5	M8	56.5	5.5	6.5	37

MOTOR-DRIVE COUPLINGS FOR VARIOUS CYLINDER BORES

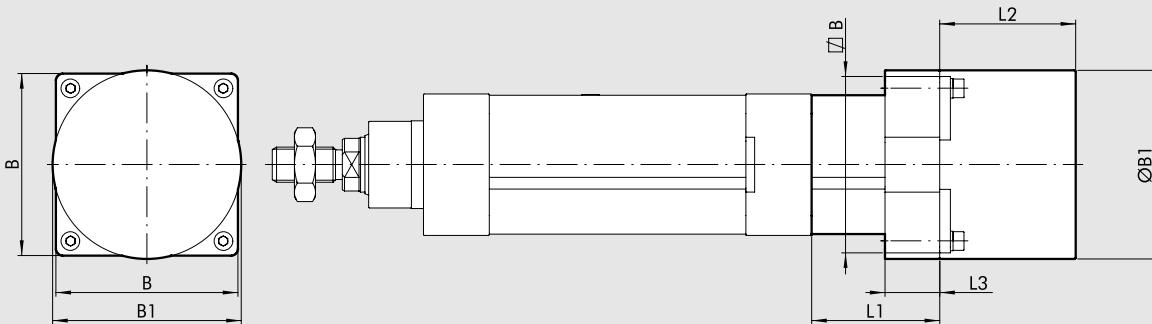
		DRIVES CODES		
		37D1221000 (4.4A from 24 to 45VDC)	37D1332000 (6A from 24 to 75VDC)	37D1442000 (6A from 77 to 140VDC)
STEPPING MOTOR CODES	37M1110000	Ø 32	-	-
	37M1120000	Ø 32	Ø 32	-
	37M1120001	-	Ø 32	-
	37M1430000	-	Ø 50	-
	37M1440000	-	Ø 50	Ø 50
	37M1450000	-	Ø 63	Ø 63

		DRIVES CODES	
		37D2200000 (200W)	37D2400000 (from 400 to 750W)
BRUSHLESS MOTOR CODES	37M2200000	Ø 32	-
	37M2220000	-	Ø 32
	37M2220000	-	Ø 50
	37M2330000	-	Ø 50
	37M2330000	-	Ø 63

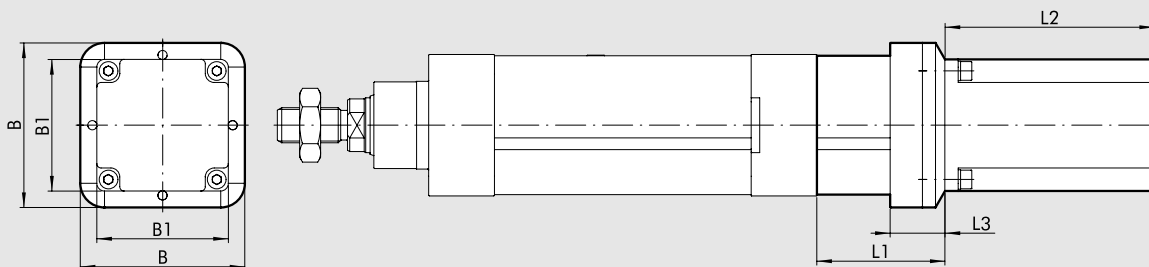
DIMENSIONS OF IN-LINE CYLINDERS



Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	L1	L2	L3
32	BRUSHLESS	371032...2200	37M2200000	0.64	60	60	62	69.5	15
		371032...2220	37M2220000	1.27	60	60	62	95.5	15
	STEPPING	371032...1110	37M1110000	0.8	NEMA 23	56	45	53.8	12
		371032...1120	37M1120000	1.2	NEMA 23	56	45	75.8	12
		371032...1121	37M1120001	1.2	NEMA 23	56	45	75.8	12
50	BRUSHLESS	371050...2330	37M2330000	2.39	80	80	77.4	107.3	35
63	STEPPING	371063...1450	37M1450000	6.7	NEMA 34	85.5	63.5	127	16

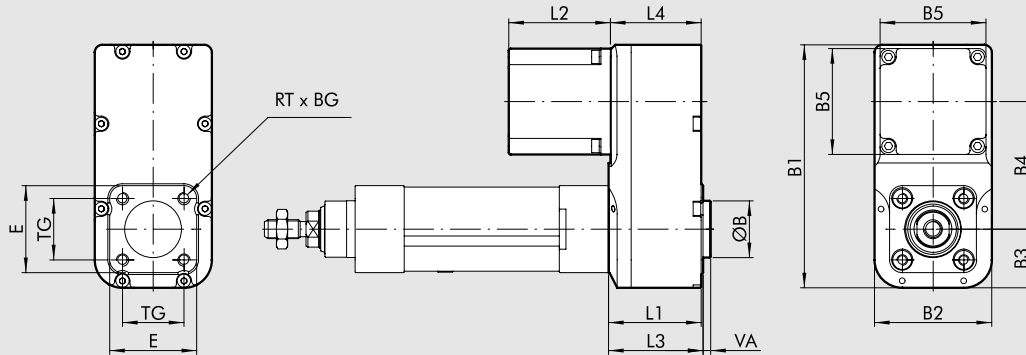


Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	Ø B1	L1	L2	L3
50	STEPPING	371050...1430	37M1430000	2.4	NEMA 34	83	86	61.4	62	25
		371050...1440	37M1440000	4.2	NEMA 34	83	86	61.4	92.2	25

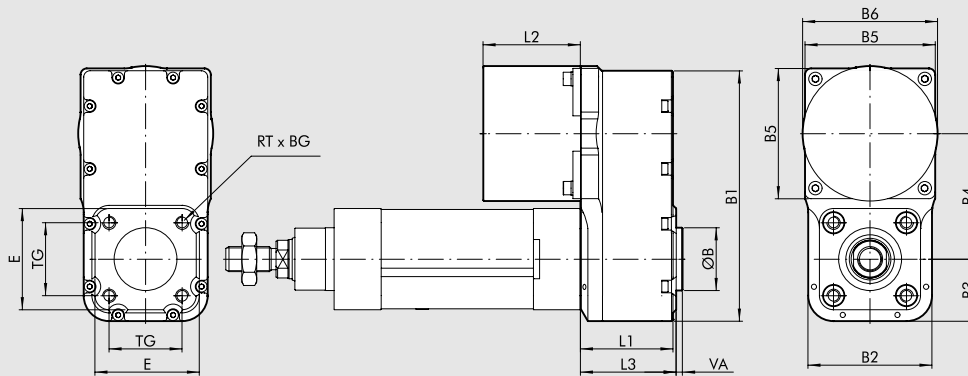


Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	B1	L1	L2	L3
50	BRUSHLESS	371050...2220	37M2220000	1.27	60	74.5	60	61.4	95.5	25
63	BRUSHLESS	371063...2330	37M2330000	2.39	80	94	80	78.5	107.3	25

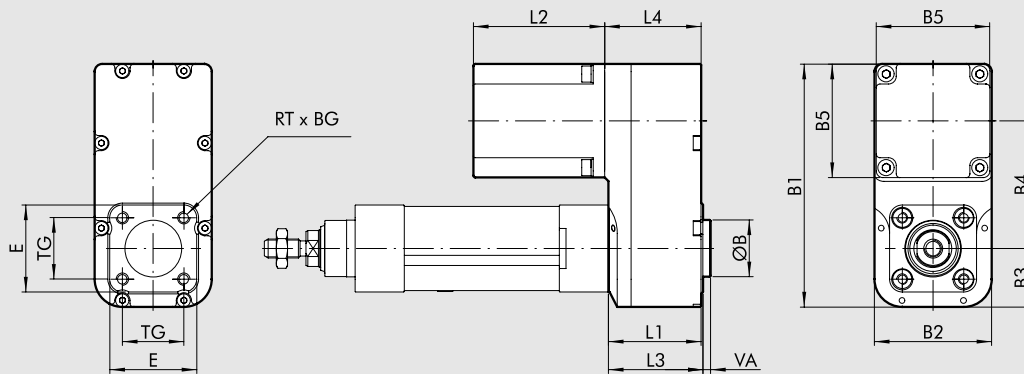
DIMENSIONS OF GEARED CYLINDERS



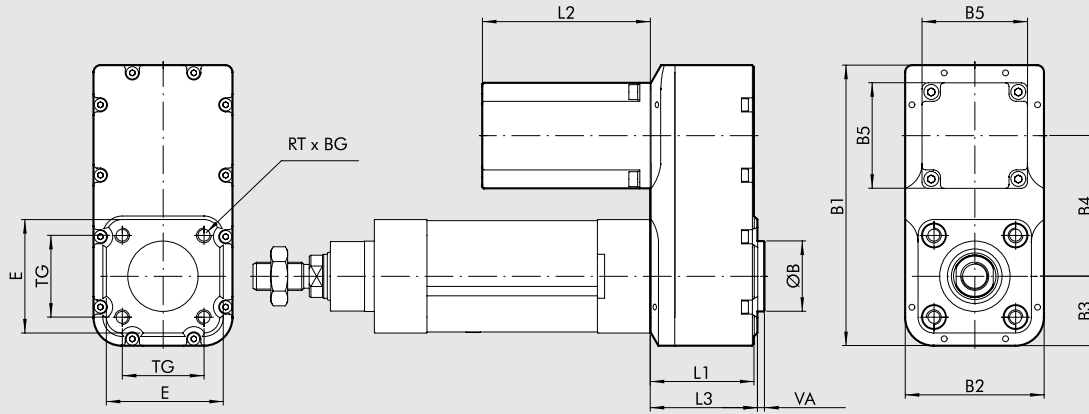
Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	B6	BG	E	L1	L2	L3	L4	TG	RT	VA
32	STEPPING	371032_1110	37M1110000	0.8	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	53.8	50	48	32.5	M6	4	
		371032_1120	37M1120000	1.2	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	75.8	50	48	32.5	M6	4	
		371032_1121	37M1120001	1.2	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	75.8	50	48	32.5	M6	4	
63	STEPPING	371063_1450	37M1450000	6.7	NEMA 34	45	179.5	92	46	87.5	84.5	17	75.5	70	127	72	68	56.5	M8	4	



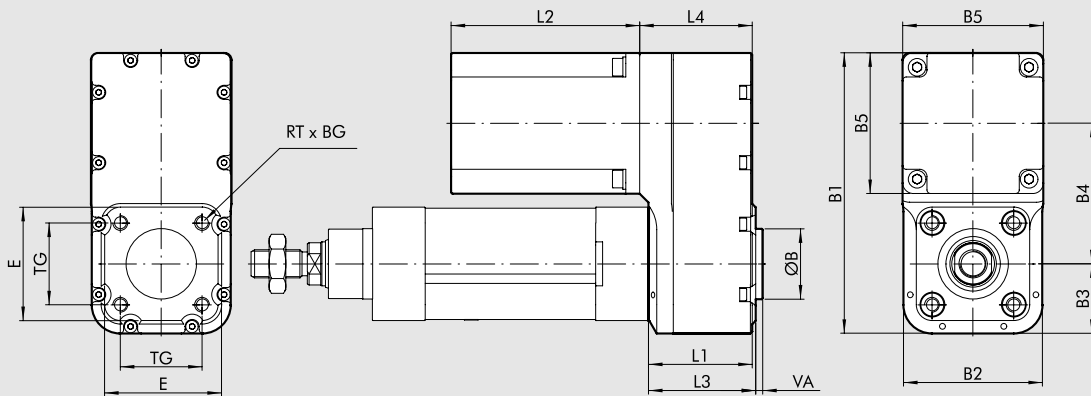
Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	ØB6	BG	E	L1	L2	L3	TG	RT	VA
50	STEPPING	371050_1430	37M1430000	2.4	NEMA 34	40	159.5	79	39.5	80	80	86	17	64.5	59	62	61	46.5	M8	4
		371050_1440	37M1440000	4.2	NEMA 34	40	159.5	79	39.5	80	83	86	17	64.5	59	92.2	61	46.5	M8	4



Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	BRUSHLESS	371032_2200	37M2200000	0.64	60	30	128.5	62	31	67.5	60	15	46	49	69.5	50	51	32.5	M6	4
		371032_2220	37M2220000	1.27	60	30	128.5	62	31	67.5	60	15	46	49	95.5	50	51	32.5	M6	4



Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	TG	RT	VA
50	BRUSHLESS	371050 2220	37M2220000	1.27	60	40	159.5	79	39.5	80	60	17	64.5	59	95.5	61	46.5	M8	4
63	BRUSHLESS	371063 2330	37M2330000	2.39	80	45	179.5	92	46	87.5	80	17	75.5	70	107.3	72	56.5	M8	4



Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
50	BRUSHLESS	371050 2330	37M2330000	2.39	80	40	159.5	79	39.5	80	80	17	64.5	59	107.3	61	64	46.5	M8	4

NOTES

KEY TO CODES – SINGLE CYLINDER

CYL	37 TYPE	1	0	32 BORE	0100 STROKE	1 SCREW PITCH	5 VERSION
	37 Electric actuators	1 ISO 15552 electric cylinder	0 STD	32 50 63		1 Screw pitch 4 2 Screw pitch 5 4 Screw pitch 10 5 Screw pitch 12 6 Screw pitch 16 7 Screw pitch 20	5 Without antirotation IP40 6 With antirotation IP40 7 Without antirotation IP55/IP65 8 With antirotation IP55/IP65

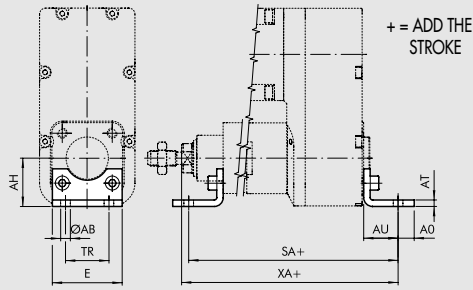
KEY TO CODES - ELECTRIC CYLINDER WITH MOTOR

CYL	37 TYPE	1	0	32 BORE	0100 STROKE	1 SCREW PITCH	1 VERSION	1	1	1	0
								DRIVE			
	37 Electric actuators	1 ISO 15552 electric cylinder	0 STD	32 50 63		1 Screw pitch 4 2 Screw pitch 5 4 Screw pitch 10 5 Screw pitch 12 6 Screw pitch 16 7 Screw pitch 20	<ul style="list-style-type: none"> ● 1 In-line without antirotation IP40 ● 2 In-line with antirotation IP40 ■ 3 In-line without antirotation IP55/IP65 ■ 4 In-line with antirotation IP55/IP65 ● 5 Geared without antirotation IP40 ● 6 Geared with antirotation IP40 ■ 7 Geared without antirotation IP55/IP65 ■ 8 Geared with antirotation IP55/IP65 	1 STEPPING motor 2 BRUSHLESS motor	1 NEMA flange 23 2 Flange 60 3 Flange 80 4 NEMA flange 34	0 Torque 0.64 Nm 1 Torque 0.8 Nm 2 Torque 1.2 to 1.3 Nm 3 Torque 2.2 to 2.4 Nm 4 Torque 4.2 Nm 5 Torque 6.7 Nm	0 Base 1 Greater rpm

● version available for all STEPPING and BRUSHLESS motors, all sizes.
 ■ version IP55 available for STEPPING motors, for only the sizes 50 and 63 all the motors. For Ø 32 only for motor code 37M1120001;
 version IP65 available for BRUSHLESS motors, all sizes.

ACCESSORIES FOR ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552: FIXINGS

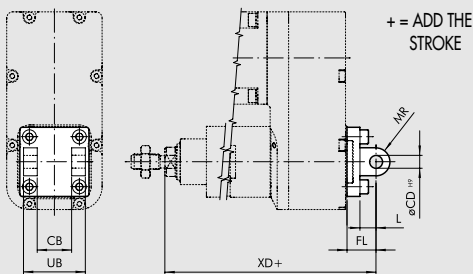
FOOT - MODEL A



Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	XA	SA	Weight [g]
W0950322001	32	7	32	11	4	24	32	45	234	232	76
W0950502001	50	9	45	15	4	32	45	45	287	282	162
W0950632001	63	9	50	15	6	32	50	75	314	309	266

Note: Individually packed with 2 screws

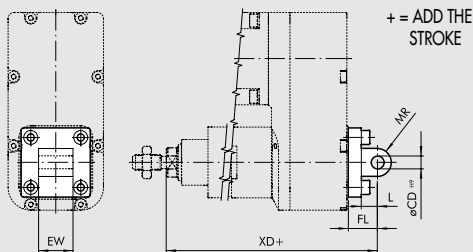
FEMALE HINGE - MODEL B



Code	Ø	UB	CB	FL	øCD	XD	MR	L	Weight [g]
W0950322003	32	45	26	22	10	232	10	12	116
W0950502003	50	60	32	27	12	282	12	15	252
W0950632003	63	70	40	32	16	314	16	20	394

Note: Supplied with 4 screws, 4 washers, 2 snap-rings, 1 pin

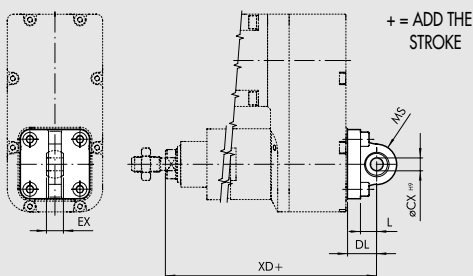
MALE HINGE - MODEL BA



Code	Ø	EW	FL	MR	øCD	L	XD	Weight [g]
W0950322004	32	26	22	11	10	12	232	94
W0950502004	50	32	27	13	12	15	282	220
W0950632004	63	40	32	17	16	20	314	316

Note: Supplied with 4 screws, 4 washers

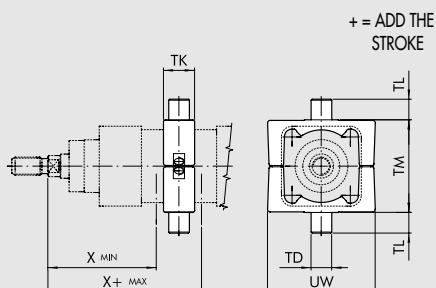
ARTICULATED MALE HINGE - MODEL BAS



Code	Ø	DL	MS	L	XN	øCX	EX	Weight [g]
W0950322006	32	22	16	12	232	10	14	106
W0950502006	50	27	19	15	282	12	16	236
W0950632006	63	32	24	20	314	16	21	336

Note: Supplied with 4 screws, 4 washers

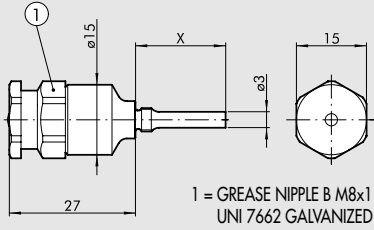
INTERMEDIATE HINGE - MODEL EN



Code	Ø	X _(min)	X _(max)		TM	TL	TD _{e9}	TK	UW	Weight [g]
			IN LINE	GEARED						
0950322107	32	63	123	*	50	12	12	22	65	170
0950502107	50	83	148	*	75	16	16	28	95	580
0950632107	63	88	163	*	90	20	20	36	105	950

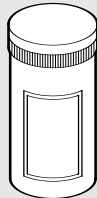
* Depending on motor length

Note: Supplied with 8 grub screws, 2 pins

GREASING NEEDLE


Code	Ø	X
0950327108	32	12
0950507108	50	19.3
0950637108	63	23.6

Note: Individually packed

GREASE


Code	Description	Weight [g]
9910506	Grease pipe RHEOLUBE 363 AX1	400

CETOP HINGE FOR MODEL B - MODEL GL


Code	Ø
W0950322008	32
W0950502008	50
W0950632008	63

See page 1-37

ISO HINGE FOR MODEL B - MODEL GS


Code	Ø
W0950322108	32
W0950502108	50
W0950632108	63

See page 1-38

ISO 15552 HINGE FOR MODEL B - MODEL AB7


Code	Ø
W0950322017	32
W0950502017	50
W0950632017	63

See page 1-38

FRONT FLANGE - MODEL C


Code	Ø
W0950322002	32
W0950502002	50
W0950632002	63

See page 1-38

ROD NUT - MODEL S


Code	Ø
0950322010	32
0950502010	50
0950502010	63

See page 1-38

FORK MODEL GK-M


Code	Ø
W0950322020	32
W0950502020	50
W0950502020	63

See page 1-39

ROD EYE - MODEL GA-M

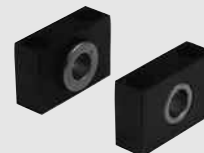

Code	Ø
W0950322025	32
W0950502025	50
W0950502025	63

See page 1-39

SELF ALIGNING ROD COUPLER - MODEL GA-K


Code	Ø
W0950322030	32
W0950502030	50
W0950502030	63


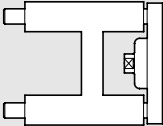
See page 1-39

COUNTER-HINGE FOR MODEL EN - MODEL EL


Code	Ø
W0950322009	32
W0950402009	50
W0950632009	63

See page 1-40

GUIDE UNIT

Version		Code	Bore
Sliding on bronze bushings (GDH)	 	W0700322...	32
		W0700502...	50
		W0700632...	63

Note: The guide units must only be used with anti-rotation cylinders.

For technical data and dimensions see page 1-42

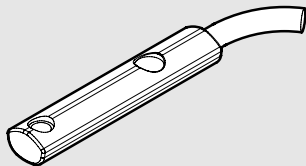
Sliding on ball bearing (GDM)

W0700323...	32
W0700503...	50
W0700633...	63

Note: The guide units must only be used with anti-rotation cylinders.

For technical data and dimensions see page 1-42

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



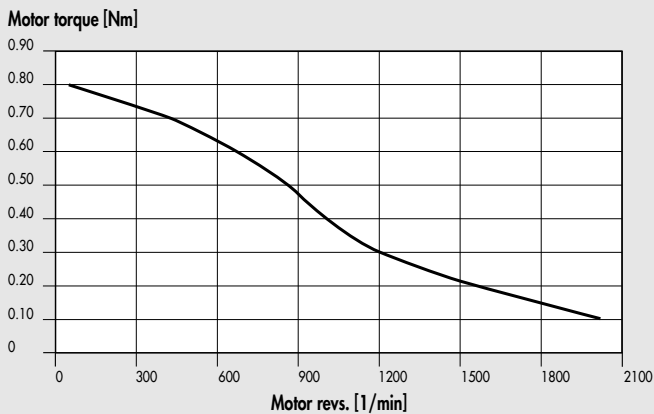
Code	Description
W0952025390	HALL NO sensor, vertical insertion 2.5 m
W0952029394	HALL NO sensor, vertical insertion 300 mm M8
W0952022180	REED NO sensor, vertical insertion 2.5 m
W0952028184	REED NO sensor, vertical insertion 300 mm M8
W0952125556	HALL NO sensor, vertical insertion 2 m ATEX
W0952025500*	HALL NO sensor, vertical insertion HS 2.5 m
W0952029504*	HALL NO sensor, vertical insertion HS 300 mm M8
W0952022500*	REED NO sensor, vertical insertion HS 2.5 m
W0952128184*	REED NO sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
For technical data see page 1-288



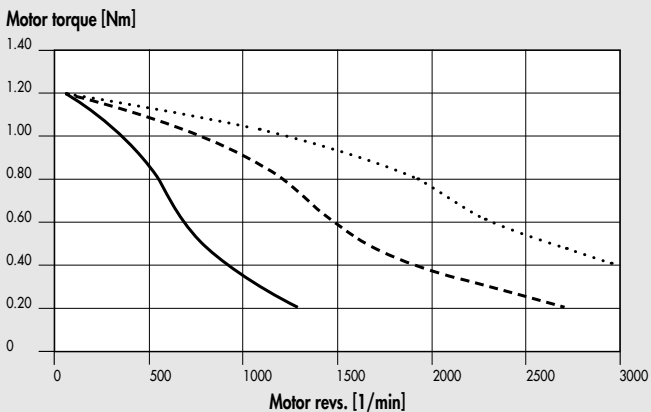
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS

STEPPING motor code **37M1110000** + drive code **37D1221000** (24VDC)



— 37M1110000 + 37D1221000 (24VDC)

STEPPING motor code **37M1120000** + drive code **37D1221000** (24VDC);
 STEPPING motor code **37M1120000** + drive code **37D1332000** (from 48 to 75VDC)

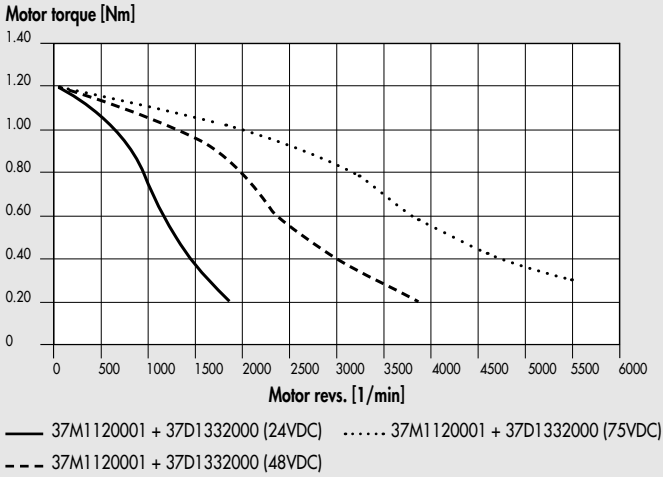


— 37M1120000 + 37D1221000 (24VDC) 37M1120000 + 37D1332000 (75VDC)
 - - - 37M1120000 + 37D1332000 (48VDC)

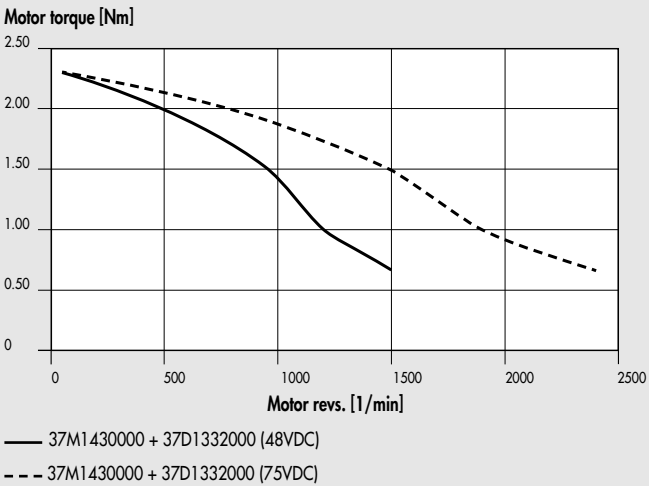
MOTOR SPECIFICATIONS		
Motor code		37M1110000
Motor type		STEPPING
Seal torque (with motor stopped)	Nm	0.8
Coupling flange		NEMA 23
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.41
Inductance	mH	1.6
Bipolar retaining torque	Nm	1.1
Rotor inertia	kgmm ²	21
Theoretical acceleration	rad · s ⁻²	50000
Back E.M.F.	V/krpm	20
Mass	kg	0.65
Degree of protection		IP40
24VDC drive code		37D1221000

MOTOR SPECIFICATIONS		
Motor code		37M1120000
Motor type		STEPPING
Seal torque (with motor stopped)	Nm	1.2
Coupling flange		NEMA 23
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.48
Inductance	mH	2.2
Bipolar retaining torque	Nm	1.65
Rotor inertia	kgmm ²	36
Theoretical acceleration	rad · s ⁻²	45800
Back E.M.F.	V/krpm	31
Mass	kg	1
Degree of protection		IP40
24VDC drive code		37D1221000
from 48 to 75VDC drive code		37D1332000

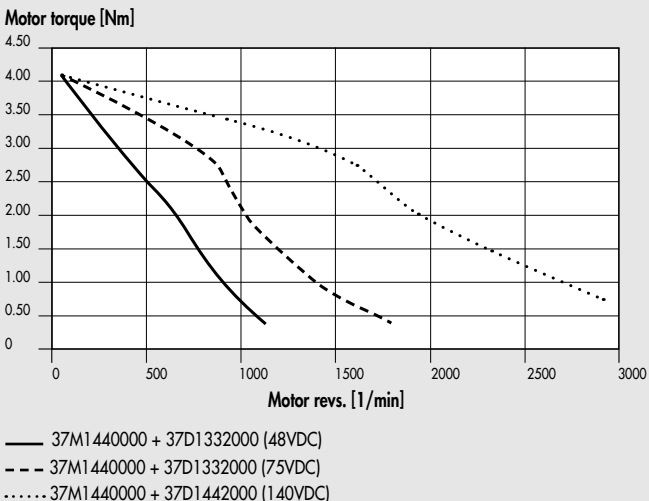
STEPPING motor code **37M1120001** + drive code **37D1332000** (24-48-75VDC)



STEPPING motor code **37M1430000** + drive code **37D1332000** (from 48 to 75VDC)



STEPPING motor code **37M1440000** + drive code **37D1332000** (from 48 to 75VDC);
 STEPPING motor code **37M1440000** + drive code **37D1442000** (140VDC)



MOTOR SPECIFICATIONS

Motor code		37M1120001
Motor type		STEPPING
Seal torque (with motor stopped)	Nm	1.2
Coupling flange		NEMA 23
Base step angle		1.8°±0.09°
Bipolar current	A	5.6
Resistance	Ω	0.3
Inductance	mH	0.85
Bipolar retaining torque	Nm	1.65
Rotor inertia	kgmm ²	36
Theoretical acceleration	rad · s ⁻²	45800
Back E.M.F.	V/krpm	23
Mass	kg	1
Degree of protection		IP43
from 24 to 75VDC drive code		37D1332000

MOTOR SPECIFICATIONS

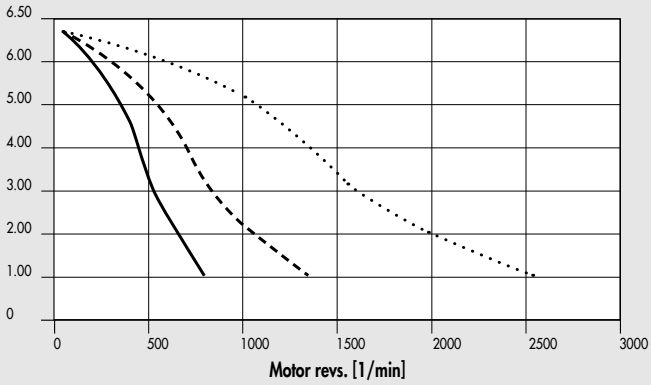
Motor code		37M1430000
Motor type		STEPPING
Seal torque (with motor stopped)	Nm	2.4
Coupling flange		NEMA 34
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.3
Inductance	mH	1.65
Bipolar retaining torque	Nm	3
Rotor inertia	kgmm ²	145
Theoretical acceleration	rad · s ⁻²	20600
Back E.M.F.	V/krpm	50
Mass	kg	1.5
Degree of protection		IP43
from 48 to 75VDC drive code		37D1332000

MOTOR SPECIFICATIONS

Motor code		37M1440000
Motor type		STEPPING
Seal torque (with motor stopped)	Nm	4.2
Coupling flange		NEMA 34
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.35
Inductance	mH	2.7
Bipolar retaining torque	Nm	5.6
Rotor inertia	kgmm ²	290
Theoretical acceleration	rad · s ⁻²	19300
Back E.M.F.	V/krpm	93
Mass	kg	2.5
Degree of protection		IP43
from 48 to 75VDC drive code		37D1332000
140VDC drive code		37D1442000

STEPPING motor code **37M1450000** + drive code **37D1332000** (from 48 to 75VDC);
 STEPPING motor code **37M1450000** + drive code **37D1442000** (140VDC)

Motor torque [Nm]



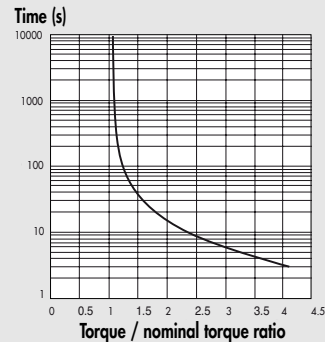
— 37M1450000 + 37D1332000 (48VDC) 37M1450000 + 37D1442000 (140VDC)
 - - - 37M1450000 + 37D1332000 (75VDC)

MOTOR SPECIFICATIONS

Motor code		37M1450000
Motor type		STEPPING
Seal torque (with motor stopped)	Nm	6.7
Coupling flange		NEMA 34
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.46
Inductance	mH	3.8
Bipolar retaining torque	Nm	9.2
Rotor inertia	kgmm ²	450
Theoretical acceleration	rad · s ⁻²	20500
Back E.M.F.	V/krpm	161
Mass	kg	4
Certifications		UL, CSA, CE, RoHS
Tension d'isolement		250VAC (350VDC)
Degree of protection		IP43 - F
from 24 to 75VDC drive code		37D1332000
140VDC drive code		37D1442000

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS

The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.



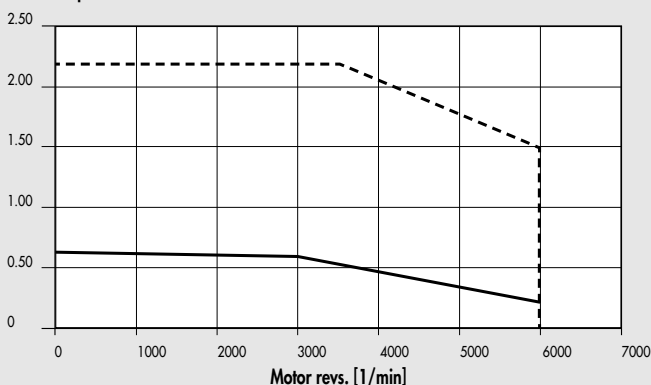
TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS

The following diagrams show the torque delivered by the motor with changing speed (rpm). Each diagram shows two separate curves:

- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

BRUSHLESS motor code **37M2200000** + drive code **37D2200000** (200W)

Motor torque [Nm]

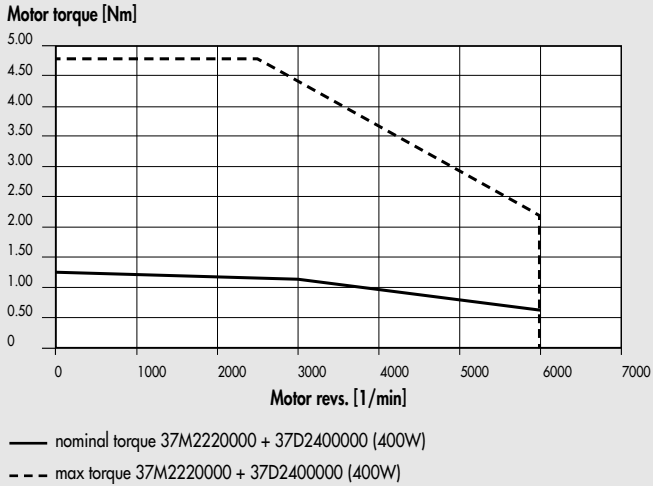


— Nominal torque 37M2200000 + 37D2200000 (200W)
 - - - Max torque 37M2200000 + 37D2200000 (200W)

MOTOR SPECIFICATIONS

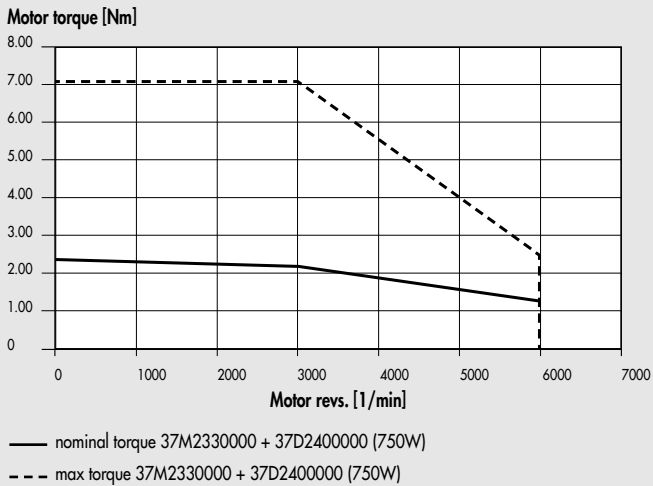
Motor code		37M2200000
Motor type		BRUSHLESS
Nominal torque	Nm	0.64
Coupling flange (square)	mm	60
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Inertia	kgmm ²	21.9
Encoder	pulse/rev	131072 (17 bit)
Mass	kg	0.84
Degree of protection		IP65
Drive code		37D2200000
Motor-drive connecting cable code		37C2130000
3 metres series R (fixed)		
Motor-drive encoder cable code		37C2230000
3 metres series R (fixed)		
Motor-drive connecting cable code		37C2150000
5 metres series R (fixed)		
Motor-drive encoder cable code		37C2250000
5 metres series R (fixed)		

BRUSHLESS motor code **37M2220000** + drive code **37D2400000** (400W)



MOTOR SPECIFICATIONS		
Motor code		37M2220000
Motor type		BRUSHLESS
Nominal torque	Nm	1.27
Coupling flange (square)	mm	60
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Inertia	kgmm ²	41.2
Encoder	pulse/rev	131072 (17 bit)
Mass	kg	1.3
Degree of protection		IP65
Drive code		37D2400000
Motor-drive connecting cable code		37C2130000
3 metres series R (fixed)		
Motor-drive encoder cable code		37C2230000
3 metres series R (fixed)		
Motor-drive connecting cable code		37C2150000
5 metres series R (fixed)		
Motor-drive encoder cable code		37C2150000
5 metres series R (fixed)		

BRUSHLESS motor cod. **37M2330000** + drive code **37D2400000** (750W)



MOTOR SPECIFICATIONS		
Motor code		37M2330000
Motor type		BRUSHLESS
Nominal torque	Nm	2.39
Coupling flange (square)	mm	80
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	2.55
Maximum torque	Nm	7.1
Inertia	kgmm ²	182
Encoder	pulse/rev	131072 (17 bit)
Mass	kg	1.3
Degree of protection		IP65
Drive code		37D2400000
Motor-drive connecting cable code		37C2130000
3 metres series R (fixed)		
Motor-drive encoder cable code		37C2230000
3 metres series R (fixed)		
Motor-drive connecting cable code		37C2150000
5 metres series R (fixed)		
Motor-drive encoder cable code		37C2250000
5 metres series R (fixed)		

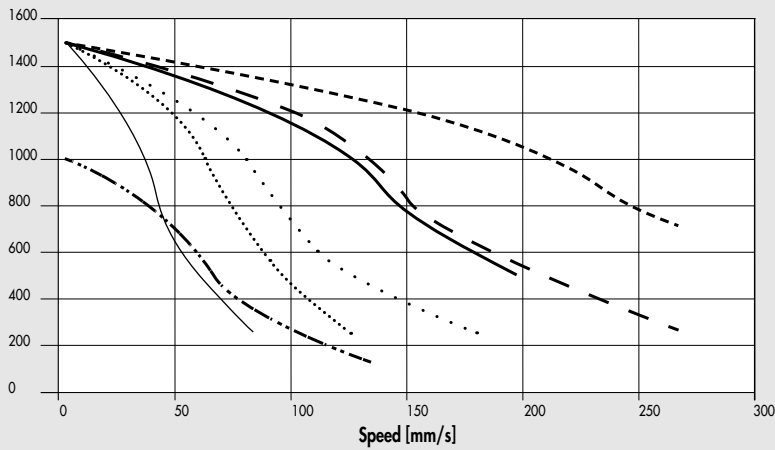
NOTES

AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPELTE WITH MOTOR AND DRIVE)

N.B.: The load values already take into account the efficiency of the system.

Ø 32 with pitch 4 screw, STEPPING motors

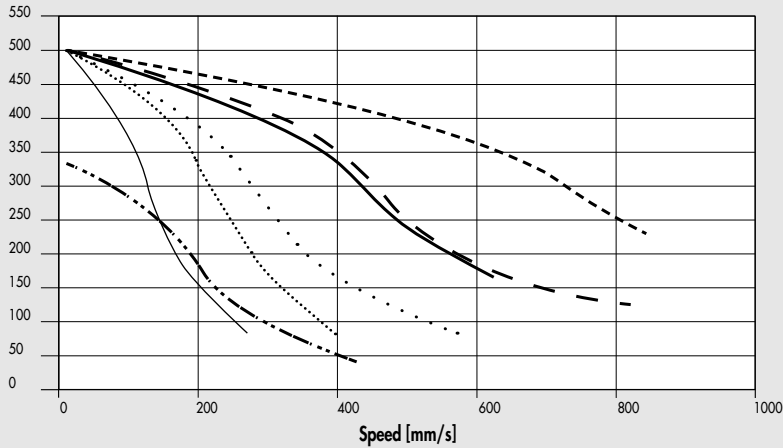
Axial load [N]



- 37M1110000 + 37D1221000 (24VDC)
- 37M1120000 + 37D1221000 (24VDC)
- 37M1120000 + 37D1332000 (48VDC)
- 37M1120000 + 37D1332000 (75VDC)
- 37M1120001 + 37D1332000 (24VDC)
- 37M1120001 + 37D1332000 (48VDC)
- 37M1120001 + 37D1332000 (75VDC)

Ø 32 with pitch 12 screw, STEPPING motors

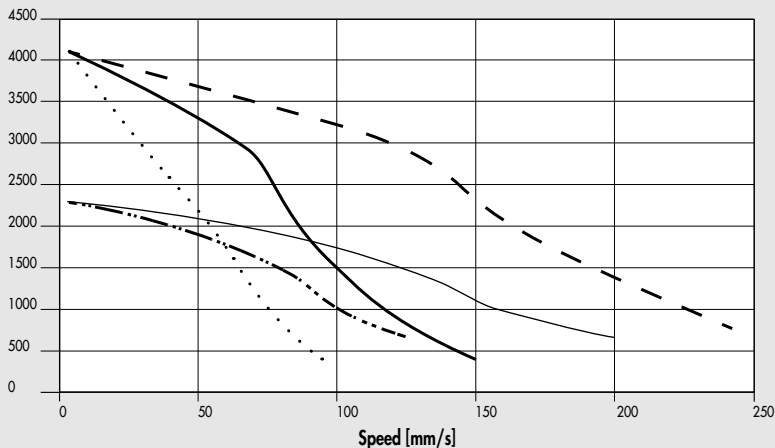
Axial load [N]



- 37M1110000 + 37D1221000 (24VDC)
- 37M1120000 + 37D1221000 (24VDC)
- 37M1120000 + 37D1332000 (48VDC)
- 37M1120000 + 37D1332000 (75VDC)
- 37M1120001 + 37D1332000 (24VDC)
- 37M1120001 + 37D1332000 (48VDC)
- 37M1120001 + 37D1332000 (75VDC)

Ø 50 with pitch 5 screw, STEPPING motors

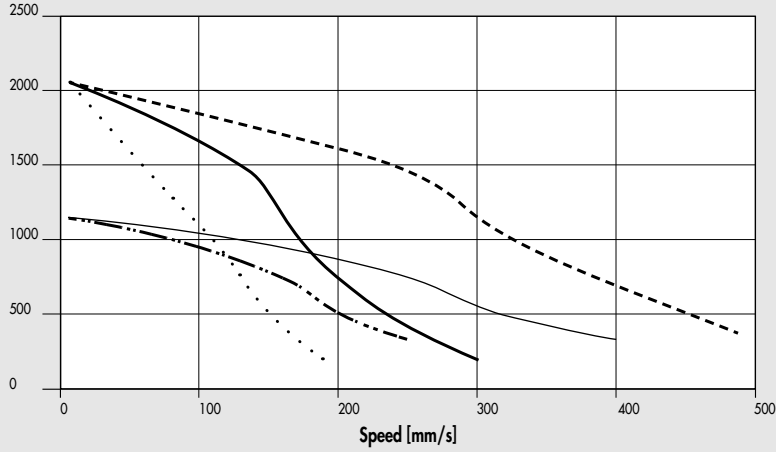
Axial load [N]



- 37M1430000 + 37D1332000 (48VDC)
- 37M1430000 + 37D1332000 (75VDC)
- 37M1440000 + 37D1332000 (48VDC)
- 37M1440000 + 37D1332000 (75VDC)
- 37M1440000 + 37D1442000 (140VDC)

Ø 50 with pitch 10 screw, STEPPING motors

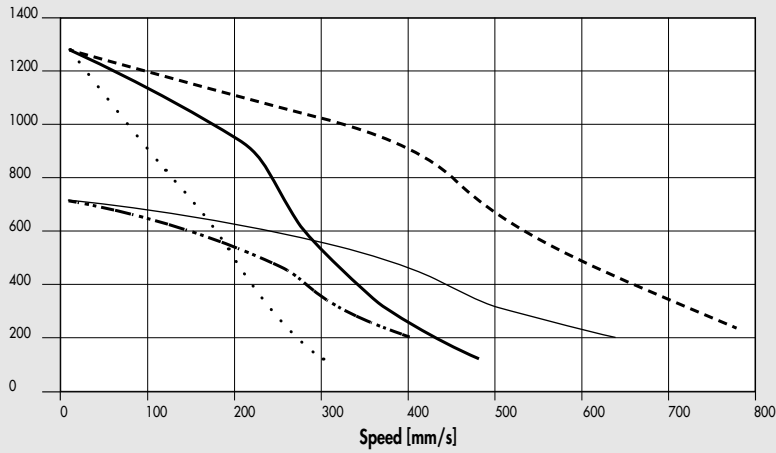
Axial load [N]



- 37M1430000 + 37D1332000 (48VDC)
- 37M1430000 + 37D1332000 (75VDC)
- 37M1440000 + 37D1332000 (48VDC)
- 37M1440000 + 37D1332000 (75VDC)
- 37M1440000 + 37D1442000 (140VDC)

Ø 50 with pitch 16 screw, STEPPING motors

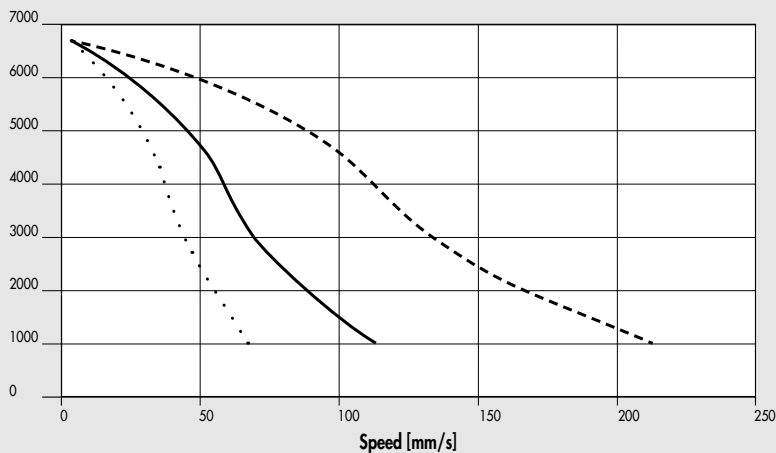
Axial load [N]



- 37M1430000 + 37D1332000 (48VDC)
- 37M1430000 + 37D1332000 (75VDC)
- 37M1440000 + 37D1332000 (48VDC)
- 37M1440000 + 37D1332000 (75VDC)
- 37M1440000 + 37D1442000 (140VDC)

Ø 63 with pitch 5 screw, STEPPING motors

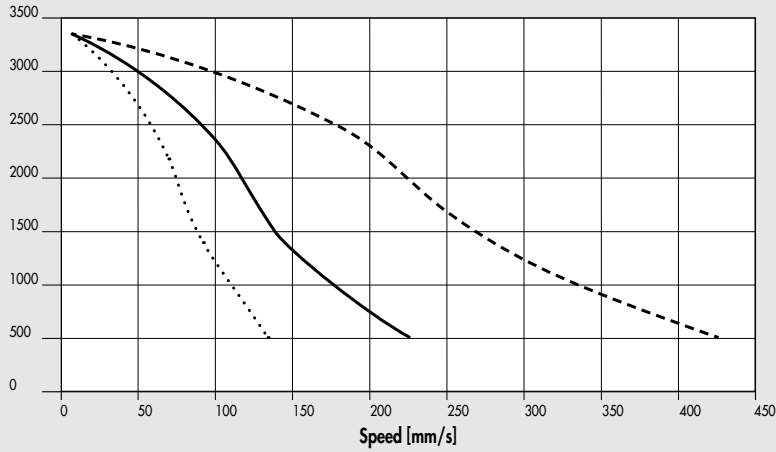
Axial load [N]



- 37M1450000 + 37D1332000 (48VDC)
- 37M1450000 + 37D1332000 (75VDC)
- 37M1450000 + 37D1442000 (140VDC)

Ø 63 with pitch 10 screw, STEPPING motors

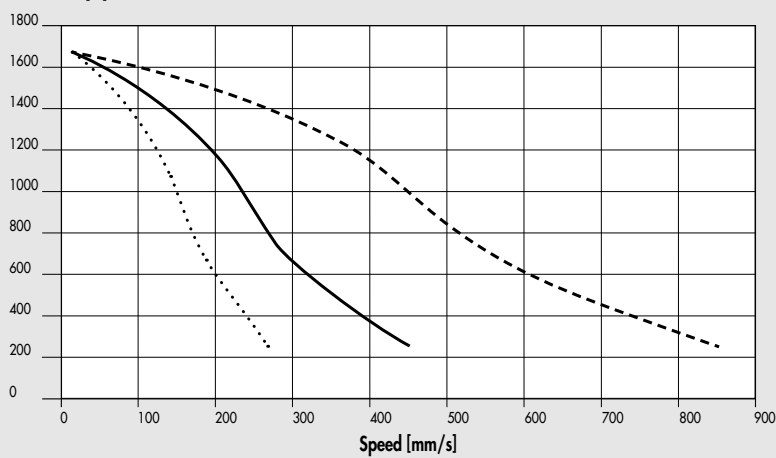
Axial load [N]



- 37M1450000 + 37D1332000 (48VDC)
- 37M1450000 + 37D1332000 (75VDC)
- 37M1450000 + 37D1442000 (140VDC)

Ø 63 with pitch 20 screw, STEPPING motors

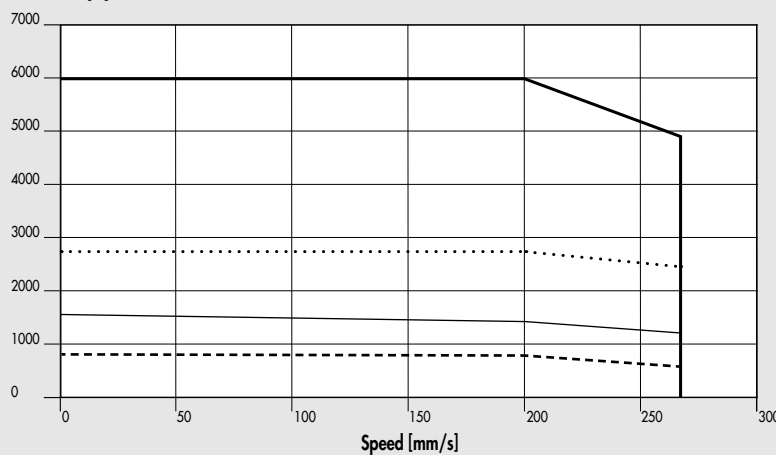
Axial load [N]



- 37M1450000 + 37D1332000 (48VDC)
- 37M1450000 + 37D1332000 (75VDC)
- 37M1450000 + 37D1442000 (140VDC)

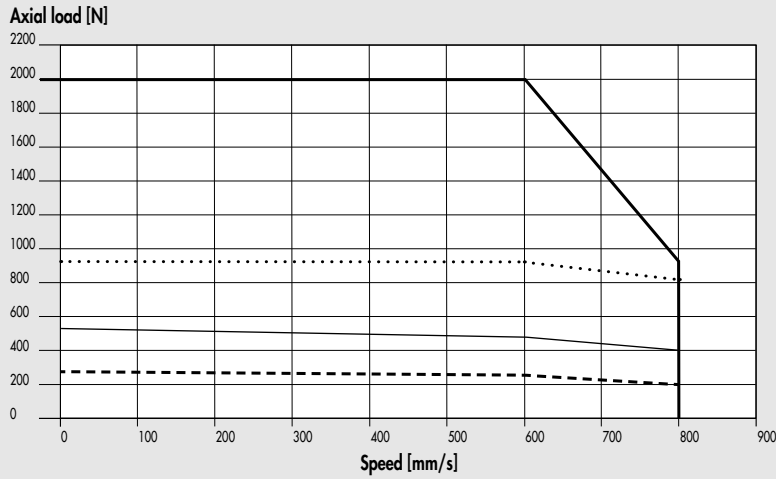
Ø 32 with pitch 4 screw, BRUSHLESS motors

Axial load [N]



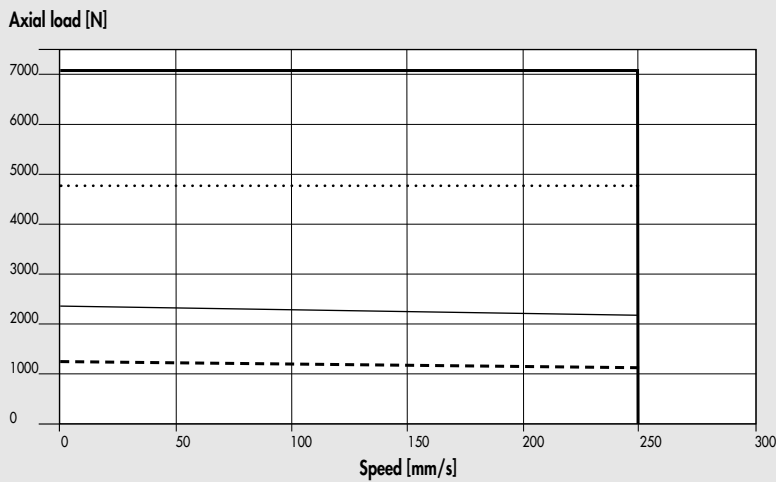
- nominal torque 37M2200000 + 37D2200000 (200W)
- nominal torque 37M2220000 + 37D2400000 (400W)
- max torque 37M2200000 + 37D2200000 (200W)
- max torque 37M2220000 + 37D2400000 (400W)

Ø 32 with pitch 12 screw, BRUSHLESS motors



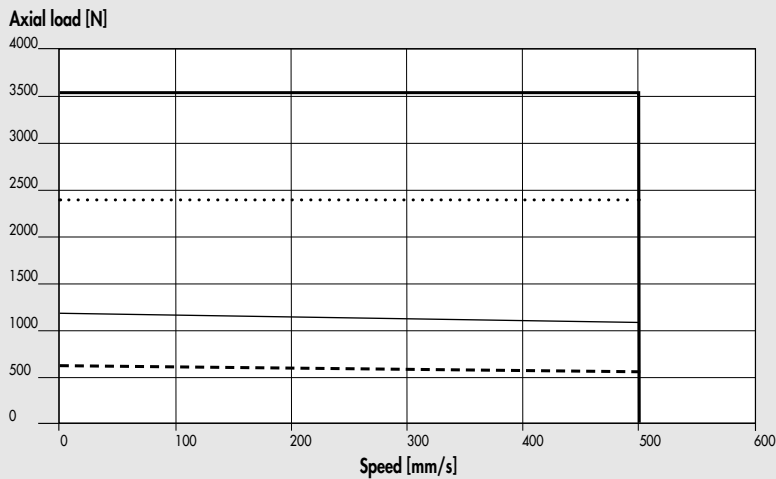
- nominal torque 37M2200000 + 37D2200000 (200W)
- _____ nominal torque 37M2220000 + 37D2400000 (400W)
- max torque 37M2200000 + 37D2200000 (200W)
- _____ max torque 37M2220000 + 37D2400000 (400W)

Ø 50 with pitch 5 screw, BRUSHLESS motors



- nominal torque 37M2220000 + 37D2400000 (400W)
- _____ nominal torque 37M2330000 + 37D2400000 (750W)
- max torque 37M2220000 + 37D2400000 (400W)
- _____ max torque 37M2330000 + 37D2400000 (750W)

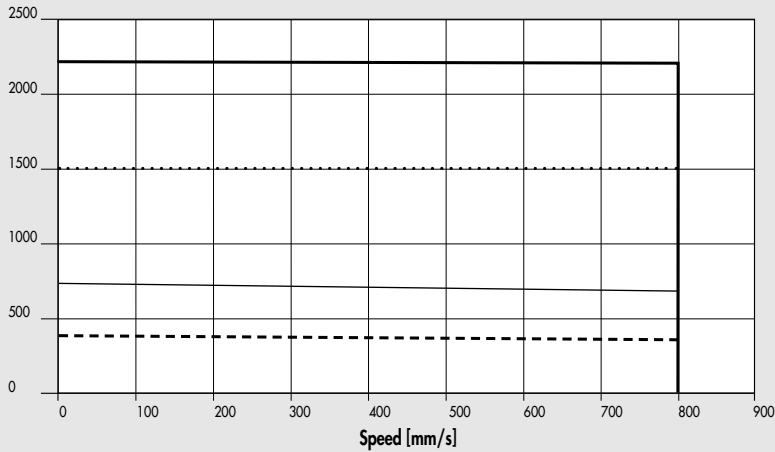
Ø 50 with pitch 10 screw, BRUSHLESS motors



- nominal torque 37M2220000 + 37D2400000 (400W)
- _____ nominal torque 37M2330000 + 37D2400000 (750W)
- max torque 37M2220000 + 37D2400000 (400W)
- _____ max torque 37M2330000 + 37D2400000 (750W)

Ø 50 with pitch 16 screw, BRUSHLESS motors

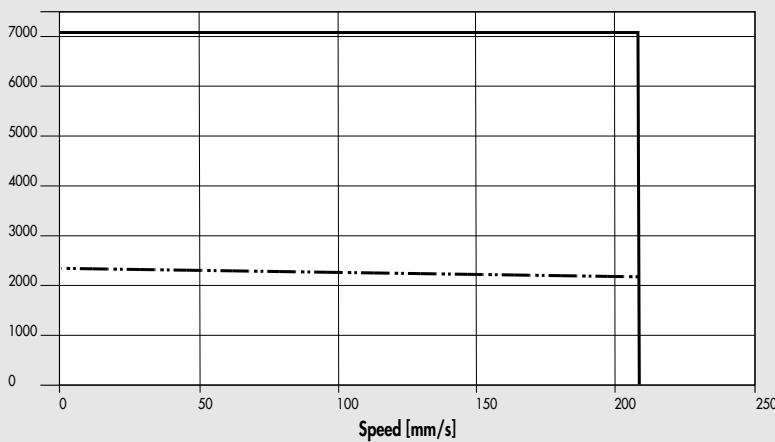
Axial load [N]



- nominal torque 37M2220000 + 37D2400000 (400W)
- _____ nominal torque 37M2330000 + 37D2400000 (750W)
- max torque 37M2220000 + 37D2400000 (400W)
- max torque 37M2330000 + 37D2400000 (750W)

Ø 63 with pitch 5 screw, BRUSHLESS motors

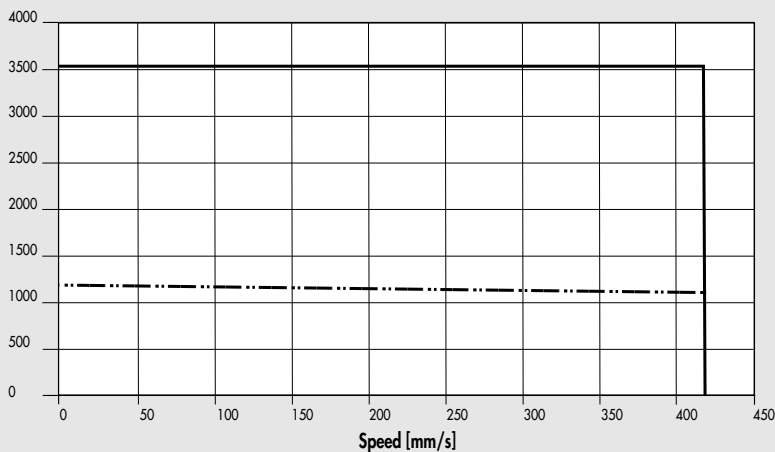
Axial load [N]



- · - · - · nominal torque 37M2330000 + 37D2400000 (750W)
- max torque 37M2330000 + 37D2400000 (750W)

Ø 63 with pitch 10 screw, BRUSHLESS motors

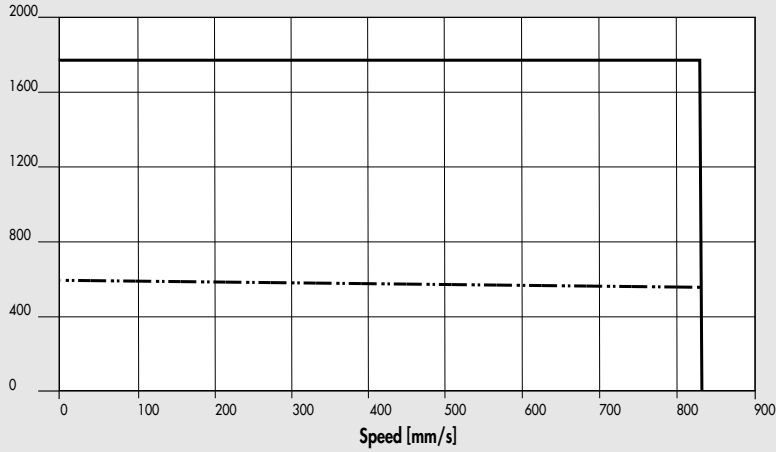
Axial load [N]



- · - · - · nominal torque 37M2330000 + 37D2400000 (750W)
- max torque 37M2330000 + 37D2400000 (750W)

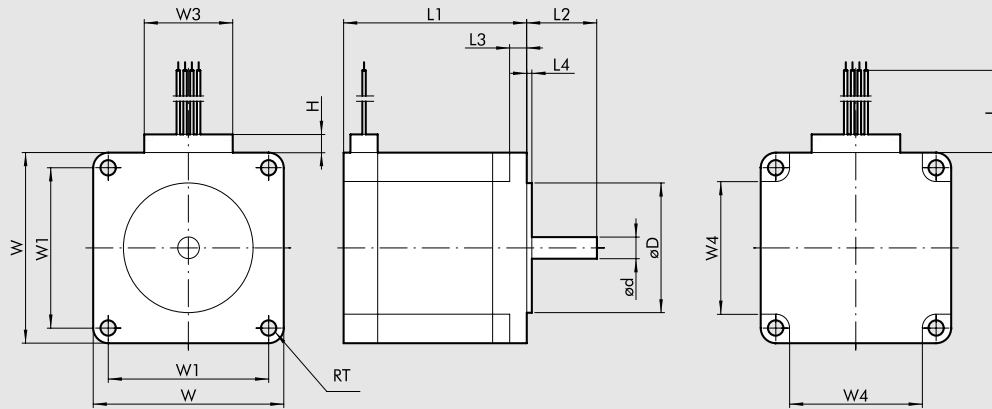
Ø 63 with pitch 20 screw, BRUSHLESS motors

Axial load [N]

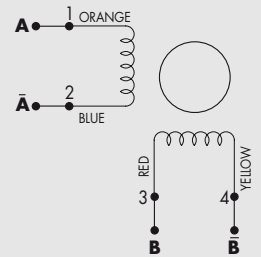


--- nominal torque 37M2330000 + 37D2400000 (750W)
 — max torque 37M2330000 + 37D2400000 (750W)

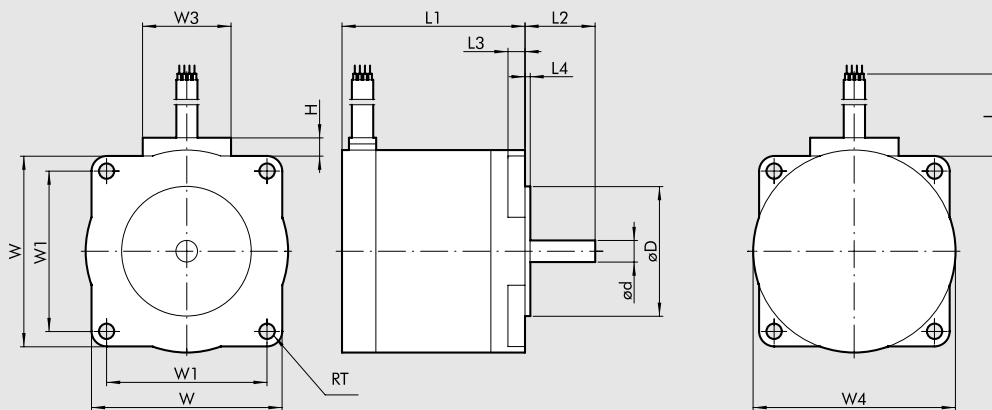
DIMENSIONS OF ELECTRIC MOTORS



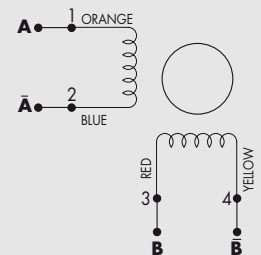
WIRING DIAGRAM



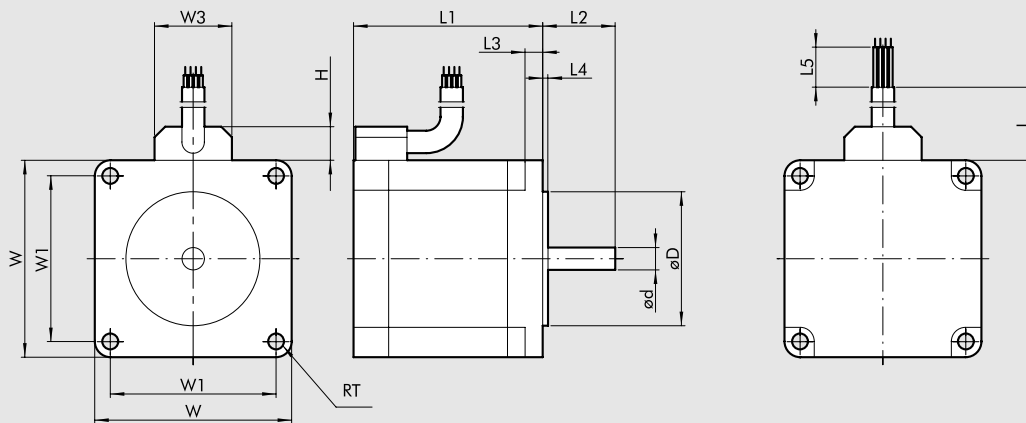
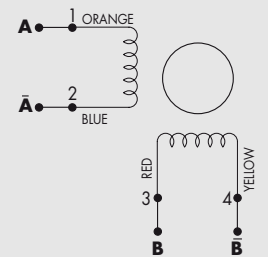
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5
STEPPING	37M1110000	0.8	NEMA 23	6.35	38.1	7	305	53.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120000	1.2	NEMA 23	6.35	38.1	7	305	75.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120001	1.2	NEMA 23	6.35	38.1	10	305	75.8	20.6	5	1.5	4.5	56	47.14	39	39



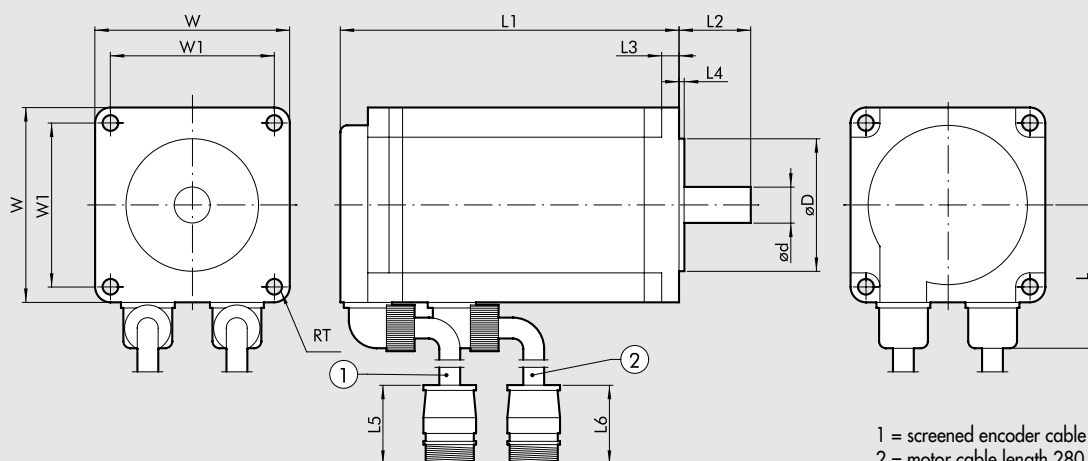
WIRING DIAGRAM



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H	L min	L1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.2	W3	W4 ±0.5
STEPPING	37M1430000	2.4	NEMA 34	9.525	73.025	10	305	62	30	4.8	1.5	5.4	82.5	69.6	37	85.8
	37M1440000	4.2	NEMA 34	12	73.025	10	305	92.2	30	4.8	1.5	5.4	82.5	69.6	37	85.8


WIRING DIAGRAM


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød	øD	H max	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	L5	RT	W ±0.5	W1 ±0.25	W3 max
STEPPING	37M1450000	6.7	NEMA 34	14	73.025	12	305	127	30	8	1.5	50	5.6	85.5	69.6	27



1 = screened encoder cable length 280 mm
2 = motor cable length 280 mm

Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød	øD h7	L	L1 ±1	L2 ±1	L3	L4	L5	L6	RT	W	W1
BRUSHLESS	37M2200000	0.64	60	14	50	44.6	69.5	30	6	3	55	58	5.5	60	49.5
	37M2220000	1.27	60	14	50	44.6	95.5	30	6	3	55	58	5.5	60	49.5
	37M2330000	2.39	80	16	70	54.4	107.3	40	8	3	55	58	6.6	80	63.6

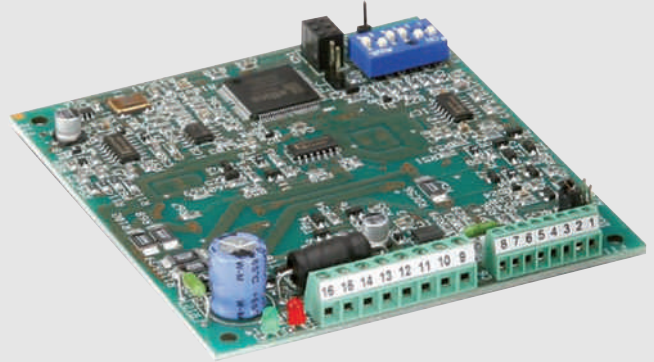
TABLE OF METAL WORK CODES AND SANYO DENKI MOTORS

Metal Work code	Description
37M1110000	STEPPING motor 103-H7123-1749
37M1120000	STEPPING motor 103-H7126-1740
37M1120001	STEPPING motor 103-H7126-6640
37M1430000	STEPPING motor 103-H8221-6241
37M1440000	STEPPING motor 03-H8222-6340
37M1450000	STEPPING motor SM-2863-5255
37M2200000	BRUSHLESS motor R2AA06020F
37M2220000	BRUSHLESS motor R2AA06040F
37M2330000	BRUSHLESS motor R2AA08075F

DRIVES FOR STEPPING MOTORS

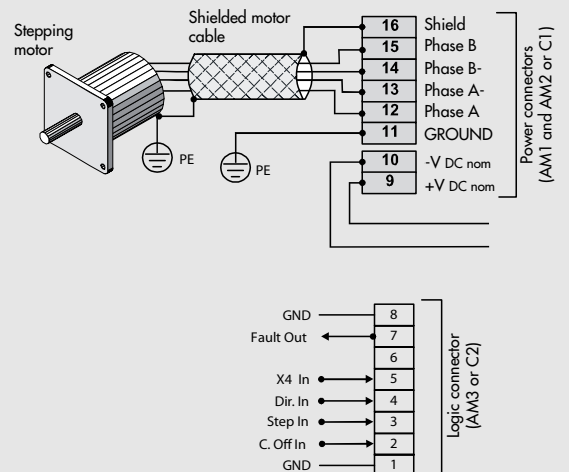
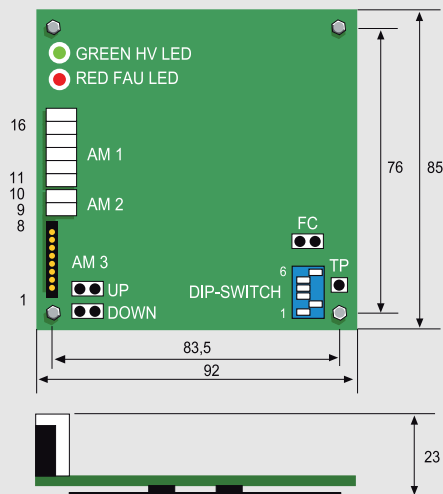
4.4A 45V DC DRIVE FOR STEPPING MOTORS, CODE 37D1221000

The 37D1221000 is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals. It has a supply voltage range of 45V DC. It comprises an open frame board and comes with separate logic and power screw connectors. It can control STEPPING motors with a nominal current up to 4.4A, the perfect choice for medium-low power applications using small motors.



DRIVE TECHNICAL DATA		37D1221000
Drive code		Board
Type of STEPPING motor drive		92 x 85 x 23
Dimensions	mm	Screw type
Connectors		NO
Onboard power supply		Step and direction
Control		24 - 45
Operating voltage range	VDC	2.6 - 4.4
Current range	A	8
Current values selected via a dip-switch		400, 800, 1600, 3200
Pulses per rev values selected by dip-switch	pulse/rev	YES (50%)
Automatic current reduction with motor off		Pull-up or Pull-down, settable
Type of inputs		Maximum and minimum voltage.
Protections		Motor output short-circuiting.
		Thermal protection.
		Electronic damping circuit for maximum control of noise and vibration.
Suitable for motors code		37M1110000; 37M1120000

OVERALL DIMENSIONS AND WIRING DIAGRAM



6A 75V DC DRIVE FOR STEPPING MOTORS, CODE 37D1332000

This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.

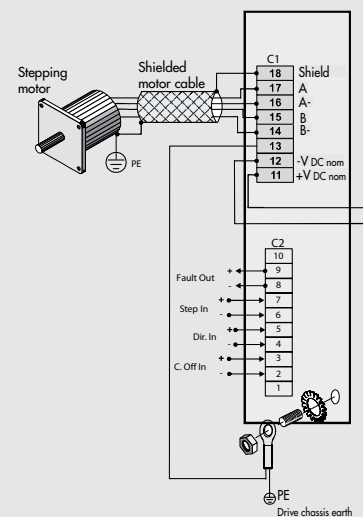
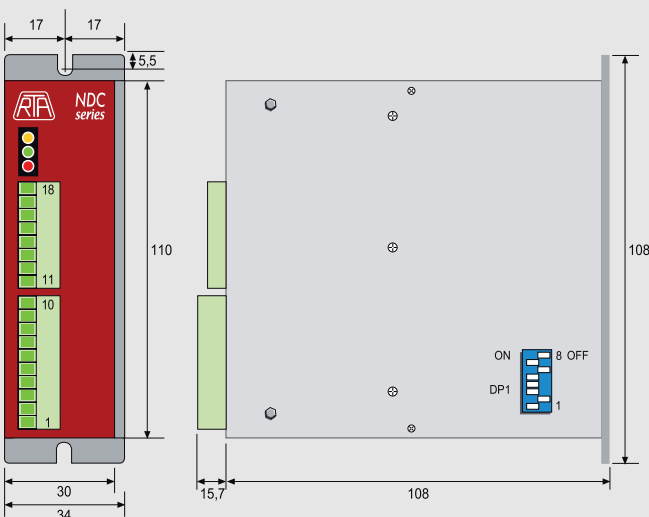
It has a supply voltage range up to 75V DC, compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box and comes with separate logic and power pull-out screw connectors. It can control STEPPING motors with a nominal current up to 6A, the perfect choice for medium power applications using small and medium-size motors.



DRIVE TECHNICAL DATA

Drive code		37D1332000
Type of STEPPING motor drive		Metal box
Dimensions	mm	110 x 108 x 34
Connectors		Screw type, pull-out
Onboard power supply		NO
Control		Step and direction
Operating voltage range	VDC	24 - 75
Current range	A	1.9 - 6
Current values selected via a dip-switch		8
Pulses per rev values selected by dip-switch	pulse/rev	400, 500, 800, 1000, 1600, 2000, 3200, 4000
Automatic current reduction with motor off		YES (50%)
Type of inputs		Opto-isolated
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection.
		Electronic damping circuit for maximum control of noise and vibration.
Suitable for motors code		37M1120000; 37M1120001; 37M1430000; 37M1440000; 37M1450000

OVERALL DIMENSIONS AND WIRING DIAGRAM



6A 140V DC DRIVE FOR STEPPING MOTORS, CODE 37D1442000

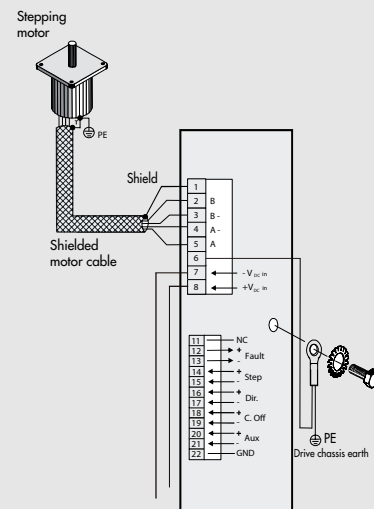
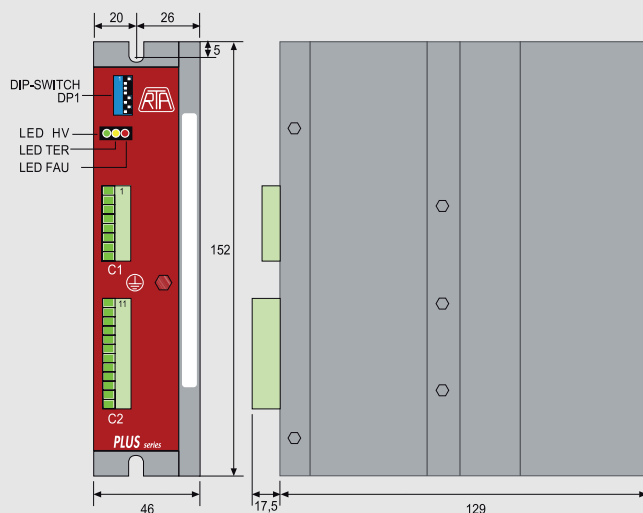
This is a ministepp bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-high power two-stage STEPPING motors with four, six or eight terminals. It has a supply voltage range up to 140VDC, compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box. It does not require external ventilation and comes with separate logic and power pull-out screw connectors. It can control STEPPING motors with a nominal current up to 6A, the perfect choice for medium power applications requiring a DC supply.



DRIVE TECHNICAL DATA

Drive code		37D1442000
Type of STEPPING motor drive		Metal box
Dimensions	mm	152 x 129 x 46
Connectors		Screw type, pull-out
Onboard power supply		NO
Control		Step and direction
Operating voltage range	VDC	77 - 140
Current range	A	1.9 - 6
Current values selected via a dip-switch		8
Pulses per rev values selected by dip-switch	pulse/rev	400, 500, 800, 1000, 1600, 2000, 3200, 4000
Automatic current reduction with motor off		YES (50%)
Type of inputs		Opto-isolated
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection. Electronic damping circuit for maximum control of noise and vibration.
Suitable for motors code		37M1440000; 37M1450000

OVERALL DIMENSIONS AND WIRING DIAGRAM



15A DRIVE FOR BRUSHLESS MOTORS, CODE 37D2200000

This drive made by SANYO DENKI is suitable for piloting BRUSHLESS motors.
It features compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic. It can control BRUSHLESS motors with a nominal current up to 15A.



DRIVE TECHNICAL DATA	
Drive code	37D2200000
Type of drive for BRUSHLESS motors	Metal box
Dimensions	45 x 168 x 130
Power connectors and motor power	Screw-type, pull-out
Encoder connectors and signals	Plug-type 3M
Max output current	15
Motor output stage	IGBT, PWM control, sinusoidal current
Power voltage	Single-phase or three-phase (user configurable) 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Logic voltage	Single-phase 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Control	With analogue signal (proportional to speed and torque). Pulse-train (clock + direction; forward + backward pulse; 90° phase difference) 8 inputs and 8 outputs, user configurable
Auto-tuning	Yes
Communication interface	RS232 for settings and monitoring via a personal computer
Protections	Integrated against overloads, input extra-voltages, incorporated filters for suppressing the system's own resonance frequencies.
Standards	CE, UL and CSA.
Other features	5-digit display and programming keypad. Integrated closed-loop system with position, speed and torque control modes. Instant changeover option: position + speed; position + torque; speed + torque. Automatic dynamic braking circuit in a alarm and power-off conditions. Connector for external braking resistance (optional). Configuration and control software (optional).
Code for 3-metre motor-drive connecting cable series R (fixed position)	37C2130000
Code for 3-metre motor-drive encoder cable series R (fixed position)	37C2230000
Code for 5-metre motor-drive connecting cable series R (fixed position)	37C2150000
Code for 5-metre motor-drive encoder cable series R (fixed position)	37C2250000
Suitable for motors code	37M2200000

30A DRIVE FOR BRUSHLESS MOTORS, CODE 37D2400000

This drive made by RTA Srl is suitable for piloting BRUSHLESS motors. It features compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic. It can control BRUSHLESS motors with a nominal current up to 30A. All the system parameters can be configured and controlled using (optional) R-Set up software.

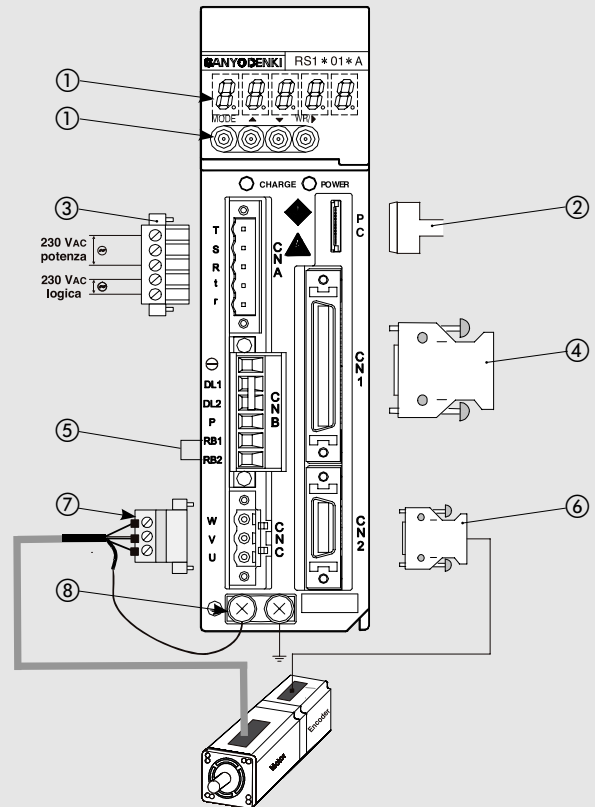


DRIVE TECHNICAL DATA	
Drive code	37D2400000
Type of drive for BRUSHLESS motors	Metal box
Dimensions	50 x 168 x 130
Power connectors and motor power	Screw-type, pull-out
Encoder connectors and signals	Plug-type 3M
Max output current	30
Motor output stage	IGBT, PWM control, sinusoidal current
Power voltage	Single-phase or three-phase (user configurable) 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Logic voltage	Single-phase 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Control	With analogue signal (proportional to speed and torque). Pulse-train (clock + direction; forward + backward pulse; 90° phase difference) 8 inputs and 8 outputs, user configurable.
Auto-tuning	Yes
Communication interface	RS232 for settings and monitoring via a personal computer.
Protections	Integrated against overloads, input extra-voltages, incorporated filters for suppressing the system's own resonance frequencies
Standards	CE, UL and CSA.
Other features	5-digit display and programming keypad. Integrated closed-loop system with position, speed and torque control modes. Instant changeover option: position + speed; position + torque; speed + torque. Automatic dynamic braking circuit in a alarm and power-off conditions. Connector for external braking resistance (optional). Configuration and control software (optional).
Code for 3-metre motor-drive connecting cable series R (fixed position)	37C2130000
Code for 3-metre motor-drive encoder cable series R (fixed position)	37C2230000
Code for 5-metre motor-drive connecting cable series R (fixed position)	37C2150000
Code for 5-metre motor-drive encoder cable series R (fixed position)	37C2250000
Suitable for motors code	37M2220000; 37M2330000

WIRING DIAGRAM FOR BRUSHLESS MOTOR DRIVES

- ① 5-DIGIT DISPLAY and PROGRAMMING KEYPAD: to display and modify parameters and monitor system operation in real time.
- ② PC CONNECTOR: settings and monitoring by PC via RS232 (supplied with configuration software kit)
- ③ POWER CONNECTOR: 230VAC, single-phase and three-phase (user configurable). **Included in the supply.** Separate supply section for logic/signal and power electronics. Integrated circuits protecting against overloads and input extra-voltages.
- ④ SIGNAL CONNECTOR: pulse-train command (clock + direction; forward + backward pulse; 90° phase difference) or with analogue signal (proportional to speed or torque) 8 inputs and 8 outputs, user configurable. **Included in the supply.**
- ⑤ CONNECTOR: for external braking resistance (optional)
- ⑥ ENCODER CONNECTOR: compatible with any type of Sanyo Denki encoder
- ⑦ MOTOR POWER CONNECTOR
- ⑧ EARTH CONNECTION

Log on to www.metalwork.it to view the instruction manual.



⑥ ENCODER CABLE



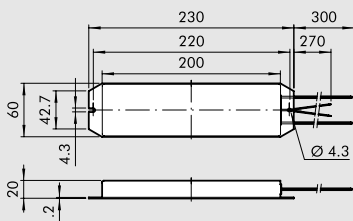
Code	Description
37C2230000	Drive-encoder connecting cable 3 m series R
37C2250000	Drive-encoder connecting cable 5 m series R

⑦ MOTOR POWER CABLE



Code	Description
37C2130000	Drive-motor connecting cable 3 m series R
37C2150000	Drive-motor connecting cable 5 m series R

EXTERNAL BRAKING RESISTANCES



Code	Description
37D2R00000	220W 50 Ω braking resistance for RS1A03

Under certain operating conditions, such as sudden deceleration with high inertial load, it may be necessary to dissipate externally the reverse energy generated by the motor. The drive indicates this requirement via a specific alarm. Excess energy is dissipated externally via a braking resistance.

TABLE OF METAL WORK CODES FOR RTA OR SANYO DENKI DRIVES

Metal Work code	Description
37D1221000	RTA CSD04V 4.4A from 24 to 45VDC
37D1332000	RTA NDC96 (box type) 6A from 24 to 75VDC
37D1442000	RTA PLUS A4 6A from 77 to 140VDC
37D2200000	SANYO DENKI RS1A01
37D2400000	SANYO DENKI RS1A03

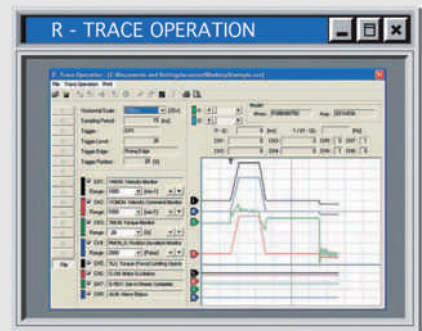
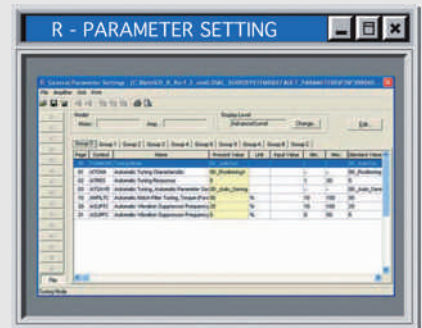
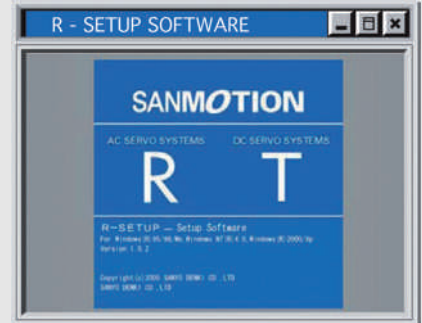
CONFIGURATION SOFTWARE + PC CONNECTING CABLE KIT

R-SETUP SOFTWARE CODE 37D2S00000

R-Setup communication software is used for parameter setting and complete control of all functions of the system. Access to parameter configuration can take place at three levels: basic level, standard level, advanced level. The software includes a detailed description of each parameter. In addition to parameter setting R-Setup software can accurately analyse operation of the system via the following functions.

- Monitor Display: real-time display of all details about the system.
- Trace Operation: a complete oscilloscope with 4 analogue channels and 4 digital channels. Use to save and print traces and settings.
- System Analysis: used to study the system's frequency response to identify and correct any mechanical resonance phenomena.

JOG modes for speed (Jogging Operation) and position (Operation Pulse Feed Jogging) are also available.



GRAPHIC MONITOR

Thanks to the integrated oscilloscope function, some important system parameters, such as speed and torque, can be displayed on the PC monitor. Data can be downloaded and saved in compatible Excel format. The time setting range is 10 ms to 2 s. Single values acquired and displayed can be read using the cursor.

NOTES

CALCULATIONS FOR CHOOSING AN ELECTRIC CYLINDER

When choosing an electric cylinder, it is necessary to follow a set procedure.

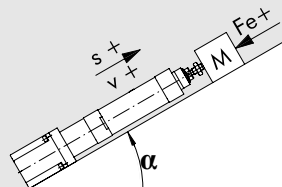
First you need to determine the following for each stage of the operating cycle (piston rod extension, any pause time, retraction, and so on):

- piston rod stroke
- stroke time available
- cylinder inclination with respect to the horizontal axis
- mass to move
- any coefficient of friction between mass and surface
- external forces to overcome

Using these values you can choose one or more cylinders suitable for the purpose based on piston rod thrust and load velocity.

When a force needs to be exerted with the piston rod still (e.g. to create a locking vice), a BRUSHLESS motor must be chosen, because STEPPING motors are not suitable. Both BRUSHLESS and STEPPING motors are suitable in other cases.

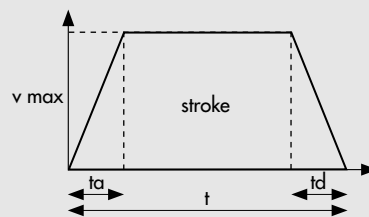
Once the electric cylinder (including motor and drive) has been chosen, you can make a detailed assessment of it based on the inertia of the moving part of the cylinder and the motor that are not known beforehand.



CALCULATION METHOD FOR BRUSHLESS MOTORS

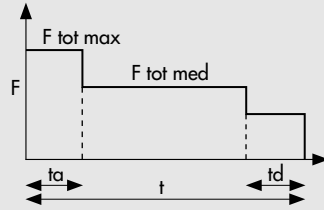
Denomination	Unit of measurement	Formula	Example
M Mass to move	kg		60
s Displacement	mm		200
t Total time	s		1
ta Acceleration time	s		0.2
td Deceleration time	s		0.2
α Angle of inclination	°		90
μ Coefficient of friction			0
Fp Weight force	N	$M \cdot 9.81 \cdot \sin \alpha$	$60 \cdot 9.81 \cdot \sin 90 = 590$
Fμ Friction	N	$M \cdot 9.81 \cdot \mu \cdot \cos \alpha$	$60 \cdot 9.81 \cdot \cos 90 = 0$
Fe Other external forces	N		40

1- Determination of maximum velocity and maximum acceleration



Denomination	Unit of measurement	Formula	Example
v max Maximum piston rod velocity	mm/s	$\frac{s}{t - \frac{(ta + td)}{2}}$	$\frac{200}{1 - \frac{(0.2 + 0.2)}{2}} = 250$
a Piston rod acceleration and deceleration	mm/s ²	$\frac{v \max}{ta}$	$\frac{250}{0.2} = 1250$
Fi Force of inertia of the mass	N	$\frac{M \cdot a}{1000}$	$\frac{60 \cdot 1250}{1000} = 75$
Ftot Total force - In acceleration - At constant v - In deceleration	N	ΣF sullo stelo $Fp + Fe + Fi + F\mu$ $Fp + Fe + F\mu$ $Fp + Fe - Fi + F\mu$	$590 + 40 + 75 + 0$ = 705 $590 + 40 + 0$ = 630 $590 + 40 - 75 + 0$ = 555
The calculation assumes the load is raised. In descent it would be:			
Ftot Total force - In acceleration - At constant v - In deceleration	N	ΣF sullo stelo $-Fp - Fe + Fi + F\mu$ $-Fp - Fe + F\mu$ $-Fp - Fe - Fi + F\mu$	$-590 - 40 + 75 + 0$ = 505 $-590 - 40 + 0$ = 630 $-590 - 40 - 75 + 0$ = 705

2 - Algebraic sum of the forces on the piston rod



3 - Choosing an electric cylinder

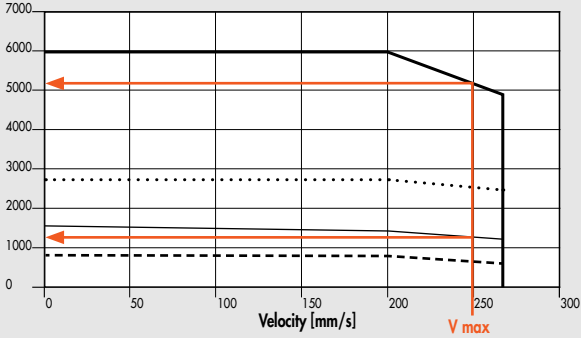
The choice is made using the diagrams in the catalogue, which express the axial force as a function of velocity.

Check that:

- the electric cylinder can deliver the maximum total force ($F_{tot\ max}$) during acceleration (short period)
- the electric cylinder can deliver the mean total force ($F_{tot\ med}$) during movement at a constant velocity
- the cylinder can reach the maximum velocity required

For example, you can choose the $\varnothing 32$ cylinder with $\varnothing 12$ pitch 4 screw driven by a BRUSHLESS motor (37M2220000) and 400 W drive (37D2400000).

Axial load [N]

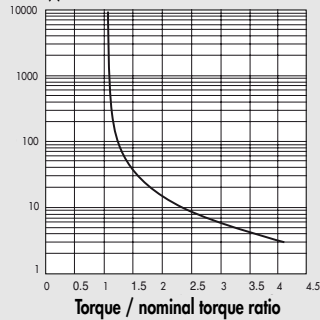


- nominal torque 37M2200000 + 37D2200000 (200W)
- nominal torque 37M2220000 + 37D2400000 (400W)
- max torque 37M2200000 + 37D2200000 (200W)
- max torque 37M2220000 + 37D2400000 (400W)

BRUSHLESS motors can, for short periods, deliver torques exceeding nominal torques.

The diagram below shows the ratio of maximum current and nominal input current (and hence maximum torque and nominal torque) and the duration of the possible overload.

Time (s)



Denomination	Unit of measurement	Formula	Example
Verification of $F_{tot\ max}$	N	$F_{available} > F_p + F_e + F_i + F_{\mu}$ (for a short period, upper curve)	$5150 \geq 705$
Verification of $F_{tot\ med}$	N	$F_{available} > F_p + F_e + F_{\mu}$ (at steady rate, lower curve)	$1200 \geq 630$
Verification of v_{max}	mm/s	$v_{available} > v_{max}$	$267 \geq 250$

4 - Verification of the choice made

Having chosen the electric cylinder, you now know the data required to test it on the drive shaft.

Denomination data	Unit of measurement	Formula	Example
pitch Screw pitch	mm		4
n max Maximum number of motor revs	rpm	$\frac{v \text{ max} \cdot 60}{\text{pitch}}$	$\frac{250 \cdot 60}{4} = 3750$
ω Maximum angular acceleration of the motor	rad/s ²	$\frac{a \cdot 2\pi}{\text{pitch}}$	$\frac{1250 \cdot 2\pi}{4} = 1963$

Moments of mass inertia	32			50			63		
Worm screw pitch	mm	4	12	5	10	16	5	10	20
J0 at stroke 0	kgmm ²	1.3262	2.4309	5.3455	6.1360	9.1113	12.4043	14.8767	23.5427
J1 for metre of stroke	kgmm ² /m	10.4223	17.8468	35.2305	38.5264	49.1936	86.9290	96.6652	116.3671
J2 for kg of load	kgmm ² /kg	0.4053	4.0858	0.6333	2.5332	6.4849	0.6333	2.5332	10.1327

The moment of inertia of total mass Jtot is: Jtot = J0 + J1 x stroke [m] + J2 x load [kg]

Denomination data	Unit of measurement	Formula	Example
J tot' Moment of inertia of the moving parts of the cylinder	kgmm ²	$J0 + J1 \cdot \frac{s}{1000}$	$1.3 + 10.4 \cdot \frac{200}{1000} = 3.4$
J tot'' Moment of inertia for acceleration of the mass reduced at the motor	kgmm ²	J2 · M	0.4 · 60 = 24
J mot. Moment of inertia of the motor	kgmm ²	Motor specifications	41.2
J rid Total moment of inertia reduced at the motor	kgmm ²	J tot' + J tot'' + J mot.	3.4 + 24 + 41.2 = 68.6
C acc Torque required to overcome inertia during acceleration	Nm	$\frac{J \text{ rid} \cdot \omega}{1 \cdot 10E6}$	$\frac{68.6 \cdot 1963}{1 \cdot 10E6} = 0.13$

Weights	32			50			63			
Worm screw pitch (p)	mm	4	12	5	10	16	5	10	20	
Weight at stroke 0	g	875	973	2043	2084	2086	2942	3209	3056	
Additional weight per mm of stroke	g	3.98	3.96	6.62	6.56	6.55	6.25	6.32	6.32	
Moving mass at stroke 0 (non-rotating version)	g	246	353	629	696	703	956	1215	1067	
Additional moving mass per mm of stroke	g	1.25			1.84			1.98		

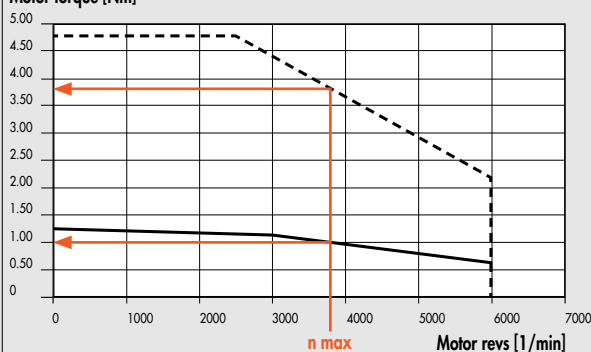
The weight of the moving parts of the cylinder (piston rod, piston, etc.) that the cylinder has to support must also be taken into consideration.

Denomination data	Unit of measurement	Formula	Example
Mc Mass of the components	kg		0.246 + 0.00125 · 300 = 0.6
Fpc Weight of the components	N	Mc · 9.81 · sine α	0.5 · 9.81 · sine 90 = 4.9
C car Torque required to overcome friction, loads and external forces (consider a system efficiency of 0.8)	Nm	$\frac{\text{pitch} \cdot (Fp + Fpc + Fe + Fp)}{2\pi \cdot 0.8 \cdot 1000}$	$\frac{4 \cdot (590 + 4.9 + 40 + 0)}{2\pi \cdot 0.8 \cdot 1000} = 0.4$
C tot Total torque required	Nm	C acc + C car	0.13 + 0.4 = 0.53

At this stage just check that: - the motor can deliver C tot during acceleration (short period)
- the motor can deliver C car during movement at a constant velocity

BRUSHLESS motor code **37M2220000** + drive code **37D2400000** (400W)

Motor torque [Nm]



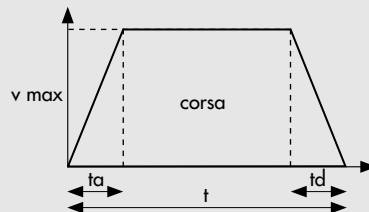
— nominal torque 37M2220000 + 37D2400000 (400W)
- - - maximum torque 37M2220000 + 37D2400000 (400W)

Denomination data	Unit of measurement	Formula	Example
Verification of C tot	Nm	C available > C tot (for a short period, upper curve)	3.8 ≥ 0.53
Verification of C car	Nm	C available > C car (at steady rate, lower curve)	1 ≥ 0.4

CALCULATION METHOD FOR STEPPING MOTORS

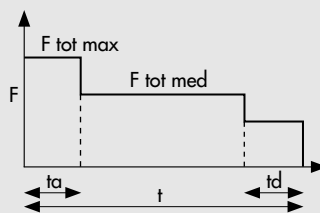
Denomination data	Unit of measurement	Formula	Example
M Mass to move	kg		60
s Displacement	mm		300
t Total time	s		2
ta Acceleration time	s		0.2
td Deceleration time	s		0.2
α Angle of inclination	°		0
μ Coefficient of friction			0.1
Fp Weight force	N	$M \cdot 9.81 \cdot \text{sine } \alpha$	$60 \cdot 9.81 \cdot \text{sine } 0 = 0$
Fμ Friction	N	$M \cdot 9.81 \cdot \mu \cdot \text{cos } \alpha$	$60 \cdot 9.81 \cdot 0.1 \cdot \text{cos } 0 = 60$
Fe Other external forces	N		40

1 - Determination of maximum velocity and maximum acceleration



Denomination data	Unit of measurement	Formula	Example
v max Maximum piston rod velocity	mm/s	$\frac{s}{t \cdot \frac{(ta + td)}{2}}$	$\frac{300}{2 \cdot \frac{(0.2 + 0.2)}{2}} = 167$
a Piston rod acceleration and deceleration	mm/s ²	$\frac{v \text{ max}}{ta}$	$\frac{167}{0.2} = 835$
Fi Force of inertia	N	$\frac{M \cdot a}{1000}$	$\frac{60 \cdot 835}{1000} = 50$
Ftot Total force - In acceleration - At constant v - In deceleration	N	$\Sigma F \text{ on the piston rod}$ $F_p + F_e + F_i + F_{\mu}$ $F_p + F_e + F_{\mu}$ $F_p + F_e - F_i + F_{\mu}$	$0 + 40 + 50 + 60$ = 150 $0 + 40 + 60$ = 100 $0 + 40 - 50 + 60$ = 50

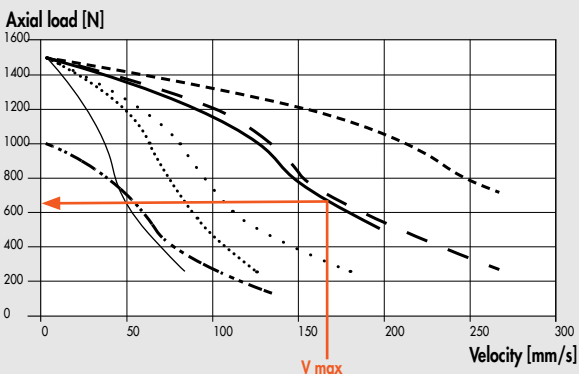
2 - Algebraic sum of the forces on the piston rod



3 - Choosing an electric cylinder

The choice is made using the diagrams in the catalogue, which express the axial force as a function of velocity.
Check that: - the electric cylinder can deliver the maximum total force during acceleration (up to maximum speed)
- the cylinder can reach the maximum velocity required

For example, you can choose the **Ø 32 cylinder with Ø 12 pitch 4 screw driven by a STEPPING motor (37M1120001) and 48VDC drive (37D1332000).**



- 37M1110000 + 37D1221000 (24VDC)
- _____ 37M1120000 + 37D1221000 (24VDC)
- 37M1120000 + 37D1332000 (48VDC)
- _____ 37M1120000 + 37D1332000 (75VDC)
- 37M1120001 + 37D1332000 (24VDC)
- _____ 37M1120001 + 37D1332000 (48VDC)
- 37M1120001 + 37D1332000 (75VDC)

Denomination data	Unit of measurement	Formula	Example
Verification of $F_{tot\ max}$	N	$F\ available > F_p + F_e + F_i + F_\mu$	$650 \geq 150$
Verification of $v\ max$	mm/s	$v\ available > v\ max$	$250 \geq 167$

4 - Verification of the choice made

Having chosen the electric cylinder, you now know the data required to test it on the drive shaft.

Denomination data	Unit of measurement	Formula	Example
pitch Screw pitch	mm		4
n max Maximum number of motor revs	rpm	$\frac{v\ max \cdot 60}{pitch}$	$\frac{167 \cdot 60}{4} = 2505$
ω Maximum angular acceleration of the motor	rad/s ²	$\frac{\alpha \cdot 2\pi}{pitch}$	$\frac{835 \cdot 2\pi}{4} = 1311$

Moments of mass inertia

		32		50			63		
Worm screw pitch	mm	4	12	5	10	16	5	10	20
J0 at stroke 0	kgmm ²	1.3262	2.4309	5.3455	6.1360	9.1113	12.4043	14.8767	23.5427
J1 for metre of stroke	kgmm ² /m	10.4223	17.8468	35.2305	38.5264	49.1936	86.2990	96.6652	116.3671
J2 for kg of load	kgmm ² /kg	0.4053	4.0858	0.6333	2.5332	6.4849	0.6333	2.5332	10.1327

The moment of inertia of total mass Jtot is: $J_{tot} = J_0 + J_1 \times stroke\ [m] + J_2 \times load\ [kg]$

Denomination data	Unit of measurement	Formula	Example
J tot' Moment of inertia of the moving parts of the cylinder	kgmm ²	$J_0 + J_1 \cdot \frac{s}{1000}$	$1.3 + 10.4 \cdot \frac{300}{1000} = 4.4$
J tot'' Moment of inertia for acceleration of the mass reduced at the motor	kgmm ²	$J_2 \cdot M$	$0.4 \cdot 60 = 24$
J mot. Moment of inertia of the motor	kgmm ²	Motor specifications	36
J rid Total moment of inertia reduced at the motor	kgmm ²	$J_{tot'} + J_{tot''} + J_{mot.}$	$4.4 + 24 + 36 = 64.4$
C acc Torque required to overcome inertia during acceleration	Nm	$\frac{J_{rid} \cdot \omega}{1 \cdot 10E6}$	$\frac{64.4 \cdot 1311}{1 \cdot 10E6} = 0.1$

Weights

		32		50			63		
Worm screw pitch (p)	mm	4	12	5	10	16	5	10	20
Weight at stroke 0	g	875	973	2043	2084	2086	2942	3209	3056
Additional weight per mm of stroke	g	3.98	3.96	6.62	6.56	6.55	6.25	6.32	6.32
Moving mass at stroke 0 (non-rotating version)	g	246	353	929	696	703	956	1215	1067
Additional moving mass per mm of stroke	g	1.25		1.84			1.98		

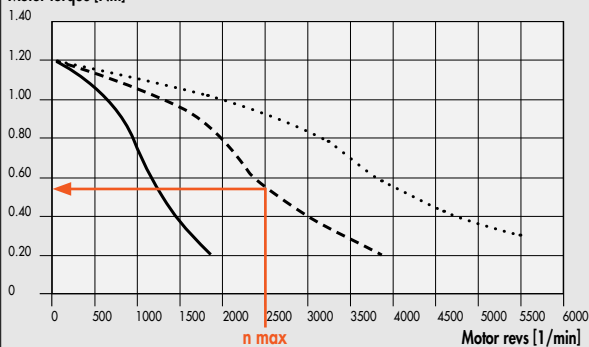
The weight of the moving parts of the cylinder (piston rod, piston, etc.) that the cylinder has to support must also be taken into consideration.

Denomination data	Unit of measurement	Formula	Example
Mc Mass of the components	kg		$0.246 + 0.00125 \cdot 300 = 0.6$
Fpc Weight of the components	N	$M_c \cdot 9.81 \cdot \sin \alpha$	$0.6 \cdot 9.81 \cdot \sin 0 = 0$
C car Torque required to overcome friction, loads and external forces (consider a system efficiency of 0.8)	Nm	$\frac{pitch \cdot (F_p + F_{pc} + F_e + F_\mu)}{2 \cdot \pi \cdot 0.8 \cdot 1000}$	$\frac{4 \cdot (0 + 0 + 40 + 60)}{2\pi \cdot 0.8 \cdot 1000} = 0.1$
C tot Total torque required	Nm	$C_{acc} + C_{car}$	0.2

At this stage just check that the motor can deliver C tot during acceleration (up to maximum speed).

STEPPING motor code **37M1120001** + drive code **37D1332000** (24-48-75VDC)

Motor torque [Nm]



— 37M1120001 + 37D1332000 (24VDC)
 - - - 37M1120001 + 37D1332000 (48VDC)
 37M1120001 + 37D1332000 (75VDC)

Denomination data	Unit of measurement	Formula	Example
Verification of C tot	Nm	$C\ available > C_{tot}$	$0.55 \geq 0.2$

VERIFICATION OF THE RECIRCULATING BALL SCREW AND THE BEARING

Verification of the recirculating ball screw takes into consideration the maximum axial load and the weighted average axial load.

The peak value of axial load in a movement cycle must not exceed the static axial load F_o shown on the data sheet.

The average axial load in a movement cycle must not exceed the dynamic axial load F shown on the data sheet.

If these conditions are not met, the recirculating ball screw and/or the bearing will be subject to greater wear and hence a shorter life.

The calculation of average axial load takes into consideration movements at constant speed during the cycle (nil acceleration and deceleration) and the respective axial loads on the piston rod.

The F_m value thus calculated is used in the diagrams on pages 1-251 and 1-252 – Life characteristics as a function of the mean axial load – to determine the expected life of the cylinder.

$$F_m = \sqrt[3]{\sum F_x^3 \times \frac{V_x}{V_m} \times \frac{q}{100}} =$$

$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{x1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{x2}}{V_m} \times \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{x3}}{V_m} \times \frac{q_3}{100} + \dots}$$

F_x = Axial load at stage x

F_m = Mean forward axial load

F_o = Static axial load of the screw

q = Time segment

V_x = Speed in the phase x

V_m = Average speed

SUMMARY SENSORS AND ACCESSORIES T-SLOT



● **ACCESSORIES: MAGNETIC SENSORS**

PAGE 1-286



● **ACCESSORIES FOR T-SLOT**

PAGE 1-290



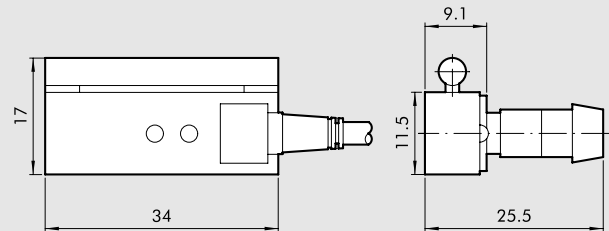
● **SENSOR TESTER**

PAGE 1-291

ACCESSORIES: MAGNETIC SENSORS

SENSOR SERIES DSM

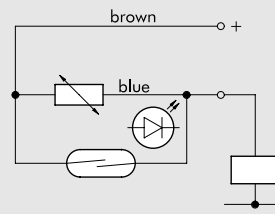
Code	Description
W0950000201	Reed sensor DSM2-C525 HS
W0950000222	E.HALL PNP sensor DSM3-N225
W0950000232	E. HALL NPN sensor DSM3-M225



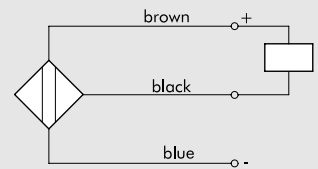
TECHNICAL DATA SERIE DSM

Type		REED + VARISTOR + LED 2 WIRES	HALL VERSION PNP/NPN 3 WIRES
Contact		REED + VARISTOR + LED NO	HALL EFFECT NO PNP/NPN
Max AC/DC voltage	V	3 to 48 V(DC); 3 to 220 (AC)	6-24 V DC
Max current at 25°C	mA	500	250
Power with inductive load	VA	10	-
Power with resistive load	Watt	50	6
Switch-on time	m sec	1.2	0.8
Switch-off time	m sec	0.1	3
Switch-on point	Gauss	110	15
Switch-off point	Gauss	95	8
Operating life		10 ⁷ impulses	10 ⁹ impulses
Contact resistance		0.1	-
Cable length	m	2.5	2.5
Cable cross section	mm ²	0.35	0.35
Cable material		Soft PVC	Soft PVC
Circuit			

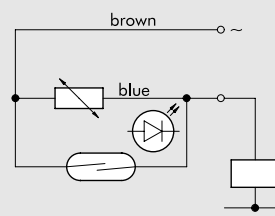
DC



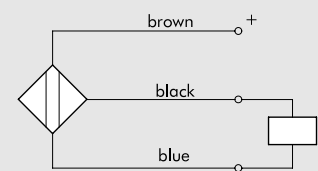
Version NPN



AC

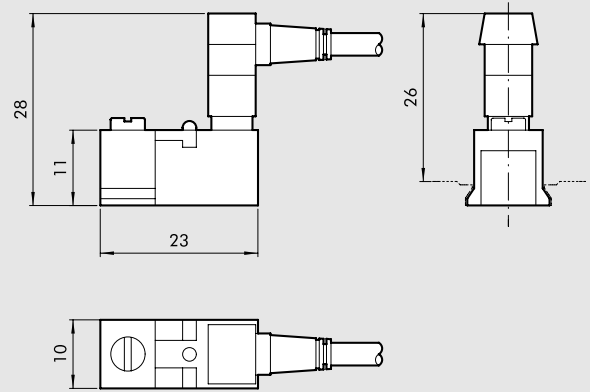


Version PNP



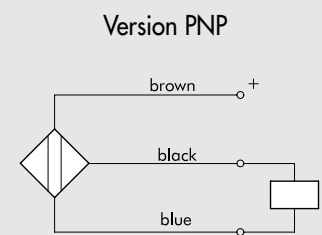
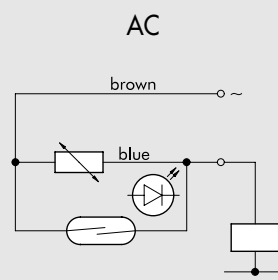
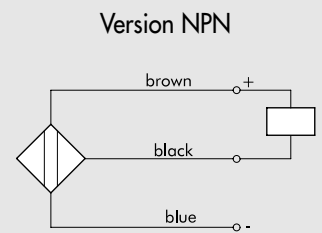
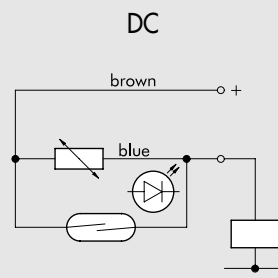
SENSOR SERIE DCB

Code	Bore	Model	Version
W0950000252	12 to 100	REED sensor DCB 2C-425	Reed connector + bracket - CB
W0950000253	12 to 100	HALL PNP sensor DCB3-N225	Hall PNP connector + bracket - CB
W0950014360	12 to 100	HALL NPN sensor DCB3-M225	Hall NPN connector + bracket - CB



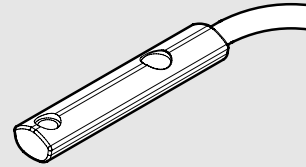
TECHNICAL DATA SERIE DCB

	REED + VARISTOR + LED 2 WIRES		REED + VARISTOR + LED NO		HALL VERSION PNP/NPN 3 WIRES	
Type						
Contact						
Max AC/DC voltage	V		3 to 48 (DC); 3 to 110 (AC)		6-24 V DC	
Max current at 25°C	mA		300		250	
Power with inductive load	VA		8		-	
Power with resistive load	Watt		15		6	
Switch-on time	m sec		0.5		0.8	
Switch-off time	m sec		0.1		3	
Switch-on point	Gauss		110		15	
Switch-off point	Gauss		60		8	
Operating life			10 ⁷ impulses		10 ⁹ impulses	
Contact resistance			0.1		-	
Cable length	m		2.5		2.5	
Cable cross section	mm ²		0.35		0.35	
Cable material			Soft PVC		Soft PVC	
Circuit						



RETRACTABLE SENSOR WITH INSERTION FROM ABOVE

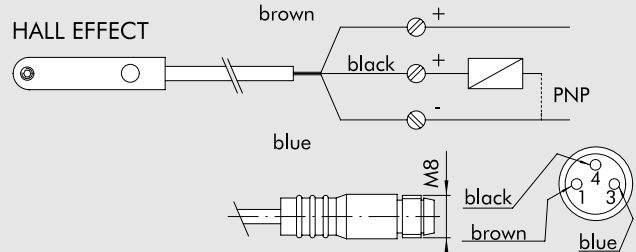
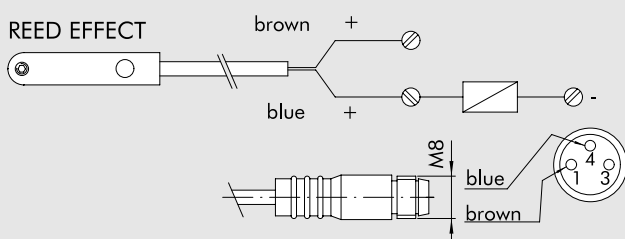
Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8



* For use on the rodless cylinder guide "V" Ø25 or when standard sensors do not detect the magnet, e.g. near metal masses.

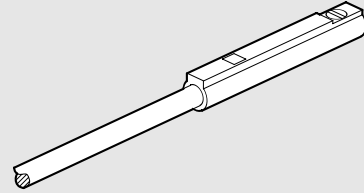
TECHNICAL DATA	REED	HALL EFFECT	ATEX
Type of contact	N.O.	N.O.	HALL EFFECT N.O.
Switch	-	PNP	PNP
Supply voltage (U _b)	V 10 to 30 AC/DC	10 to 30 DC	18 to 30 DC
Power	W 3 (peak valve = 6)	3	≤ 1.7
Voltage variation	-	≤ 10% of U _b	≤ 10% of U _b
Voltage drop	V -	≤ 2	≤ 2.2
Input current	mA -	≤ 10	≤ 10
Output current	mA ≤ 100	≤ 100	≤ 70
Switching frequency	Hz ≤ 400	≤ 5000	1000
Short-circuit protection	-	Yes	Yes
Over-voltage suppression	-	Yes	Yes
Polarity inversion protection	-	Yes	Yes
EMC	EN 60 947-5-2	EN 60 947-5-2	EN 60 947-5-2
LED display	Yellow	Yellow	Yellow
Magnetic sensitivity	2.8 mT ± 25%	2.8 mT ± 25%	2.6
Repeatability	1.9 mT ± 20% (for HS) ≤ 0.1 mT	2.1 mT ± 20% (for HS) ≤ 0.1 mT	≤ 0.1 mT (U _b and t _a fixed)
Degree of protection (EN 60529)	IP 67	IP 67	IP 68, IP 69K
Vibration and shock resistance	30 g, 11 ms, 10 to 55 Hz, 1 mm	30 g, 11 ms, 10 to 55 Hz, 1 mm	30 g, 11 ms, 10 to 55 Hz, 1 mm
Operating life	10 ⁷ impulses	10 ⁹ impulses	10 ⁹ impulses
Temperature range	°C -25 to +75	-25 to +75	-20 to +45
Sensor capsule material	PA66 + PA6I/6T	PA66 + PA6I/6T	PA
2.5 m/2 m connecting cable	PVC; 2 x 0.12 mm ²	PVC; 3 x 0.14 mm ²	PVC; 3 x 0.12 mm ²
Connecting cable with M8x1	Polyurethane; 2 x 0.14 mm ²	Polyurethane; 3 x 0.14 mm ²	-
Wire NO.	2	3	3
Category ATEX	-	-	II 3G Ex nA op is IIC T4 Gc X II 3D Ex tc IIIC T135°C Dc IP67 X
Certifications			

WIRING DIAGRAM



SENSOR Ø 4

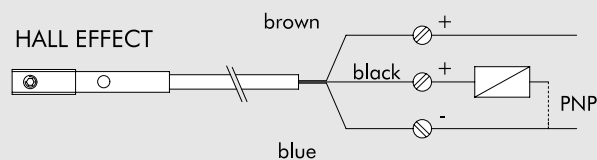
Code	Description
W0950044180	Sensor REED 2 wires 24 VDC 1 m
W0950045390	Sensor HALL 3 wires 24 VDC 2 m



TECHNICAL DATA FOR W0950045390

Switch		HALL EFFECT
Tension in DC	V	PNP
Tension in AC	V	From 6 to 30
Current at 25°C	A	---
Power (ohmic load)	W	0.2
On time	µs	MAX 6
Off time	µs	0.8
On point	Gauss	0.3
Off point	Gauss	30
Electric life (pulses)		25
On voltage drop	V	10 ⁹
Nominal operating point	Gauss	< 1
Operating frequency	Hz	From 30 to 50
Polarity reversal protection		MAX 200
Short-circuit protection		YES
Degree of protection (EN 60529)		NO
Temperature range	°C	IP 67
Sensor capsule material		From -10 to +70
LED display		PA (+G)
Wiring NO.		YELLOW
		3

WIRING DIAGRAM FOR W0950045390

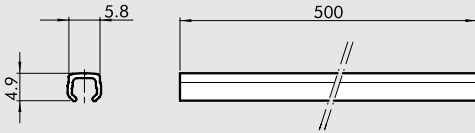


ACCESSORIES T-SLOT

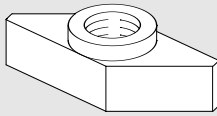
BAR FOR GROOVING

Code	Description
W0950000160	Bar for grooving L = 500 mm

Note: The code corresponds to 1 piece.



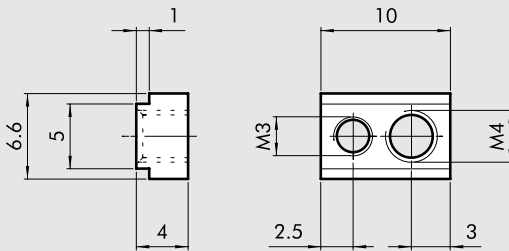
SLOTTED FIXING PLATE



Code	Description	Weight [g]
0950003001	M4 T-slotted fixing plate	1
0950003002	M3 T-slotted fixing plate	1

Note: Individually packed

SLOTTED FIXINGPLATE



Code	Description	Weight [g]
0950003000	Fixing block	2

Note: Supplied complete with 1 M3 grub screw and 1 M4 grub screw

NOTES

This sensor tester features the following:

- a green light and acoustic signal indicating correct operation
- sensors can be checked without having to be disassembled
- M8 and M12 connections, and terminal board for direct connection to the wires
- PNP or NPN switching button
- 9V battery power supply
- automatic switch-off

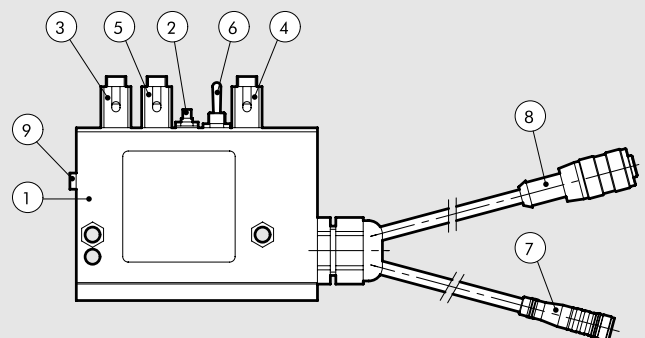


TECHNICAL DATA

Container material	PA 6.6 blue
Degree of protection	IP00
Connections	M8 and M12 plug-socket type with 40 cm cable
Additional connections	3 terminals for wire connection
Power supply	9V DC (battery type 6LR61)
Internal voltage	15V DC
Green light	tester switched on
Yellow light	sensor in operation
Red light	battery flat

COMPONENTS

- ① CONTAINER (PA 6.6 blue)
- ② START BUTTON
- ③ WIRE CONNECTION + (brown)
- ④ WIRE CONNECTION - (blue)
- ⑤ OUTPUT CONNECTION (black)
- ⑥ PNP/NPN SELECTOR
- ⑦ M8x1 CONNECTOR
- ⑧ M12x1 CONNECTOR
- ⑨ LED COVER



Code	Description	Dimension [mm]	Weight [g]
W0950060000	Sensor tester	63x88x24	192