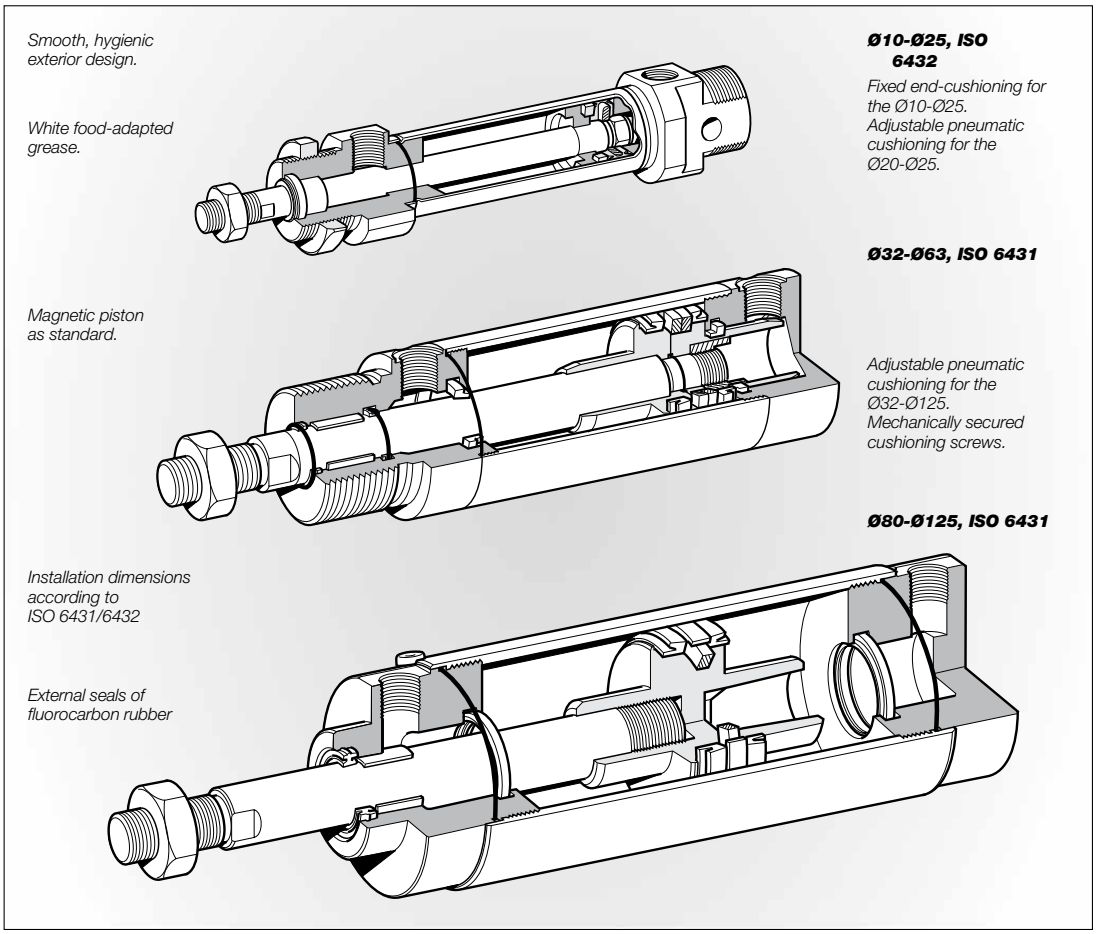
P

Stainless Steel Cylinders

P1S Series
According to ISO 6431 / 6432



Stainless steel cylinders

P

Parker Pneumatic's range of stainless steel cylinders has been specially designed for use in difficult environments. Hygienic design, external seals of fluorianted rubber and prelubrication with our food-industry-approved grease according to USDA-H1 make the cylinders particularly suitable for food industry use.

All cylinders have magnetic pistons for proximity position sensing. Fixing dimensions to ISO 6431/6432 simplify installation and make the cylinders physically interchangeable throughout the world.

ISO 6432

The cylinders are available in two versions. One with fixed end-cushioning and is available in 10, 12, 16, 20 and 25 mm diameters. A single-acting version with spring return in the negative direction, is available in the same diameters.

One version has adjustable pneumatic end-cushioning and is available in 20 and 25 mm diameters.

ISO 6431-cylinders

The ISO cylinders are double-acting round cylinders with several types of cylinder mountings as standard. The cylinders are available in 32 to 125 mm diameters, incorporating adjustable end-cushioning. As with the ISO 6432 it is designed to comply with hygiene requirements in accordance with the EU Machine Directive.

The cylinder can be dismantled to facilitate service and maintenance.

= Products suitable for the food industry.

Stainless steel construction

The cylinders are made for use in particularly demanding environments. The piston rod, cylinder tube and end covers are all of stainless steel.

Effective end-cushioning

A version of ISO 6432 Ø10-Ø25 incorporates fixed end-cushioning, while the cylinders Ø20-Ø125 have pneumatic end-cushioning with adjusting screws for exact setting, permitting heavier loads and higher speeds for short cycle times.

Smooth external design

The end covers have no recesses or other grooves that could collect dirt or liquid. Cleaning is easy and effective.

Dry operation

Particular attention has been paid to the design of the cylinders' scraper rings, piston rod bearings and piston rod seals. Self-lubricating materials permit regular washing/degreasing of the piston rod. This is important in applications where hygiene and cleaning must be of high standard.

Proximity position sensing

All cylinders in normal temperature design are fitted with a magnet for proximity position sensing. Electronic type sensors and reed switches are available. They are supplied with either flying lead or cable plug connector.

Complete range of mountings

A complete range of stainless steel mounting accessories with ISO dimensions is available.

Variants

In addition to the basic design, several standard variants of these stainless steel cylinders are available to fulfill more demanding requirements in terms of performance and environmental conditions:

Cylinders with special stroke lengths

Cylinders with extended piston rods

Through piston rods (not Ø32-Ø63)

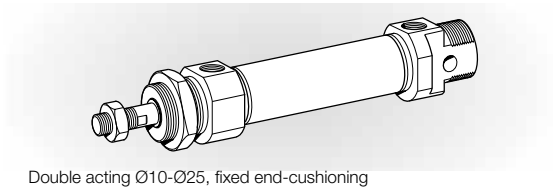
Single-acting cylinders with spring return, (Ø10-Ø25)

High-temperature versions for operation in temperature range Ø10 to Ø16 mm from -10 °C to +120 °C (not magnetic pistons)

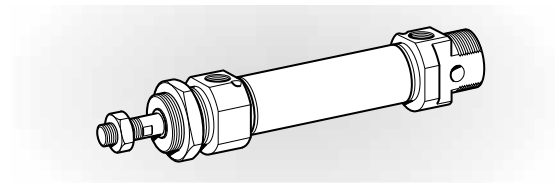
Ø20 to Ø125 mm from -10 °C to +150 °C (not magnetic pistons)

Low-temperature versions for operation in temperature range from -40 °C to +60 °C (not magnetic pistons, not Ø32-Ø63)

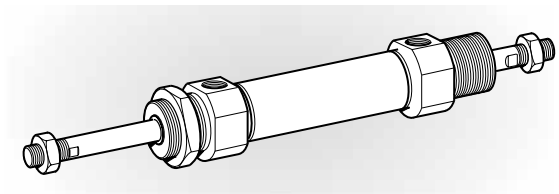
Cylinders with different mounts (Ø32-Ø125)



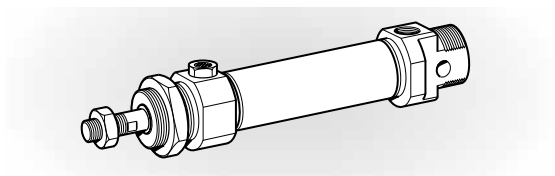
Double acting Ø10-Ø25, fixed end-cushioning



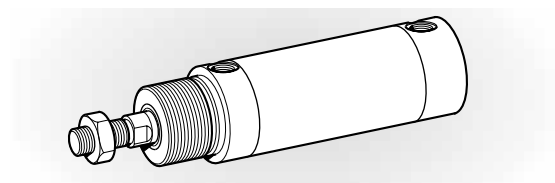
Double acting Ø20-Ø25, adjustable end-cushioning



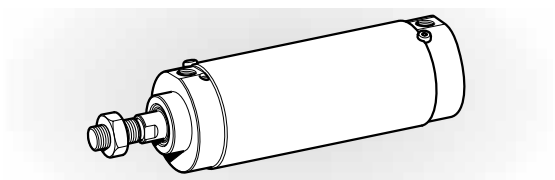
Double acting Ø10-Ø25, through piston rod



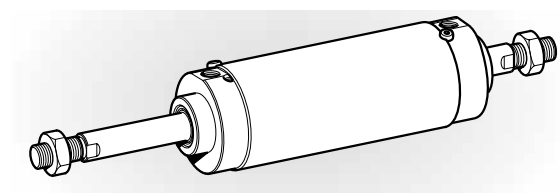
Single acting Ø10-Ø25, spring return



Double acting Ø32-Ø63



Double acting Ø80-Ø125



Double acting Ø80-Ø125, through piston rod

P

Guide for selecting suitable tubing

The selection of the correct size of tubing is often based on experience, with no great thought to optimizing energy efficiency and cylinder velocity. This is usually acceptable, but making a rough calculation can result in worthwhile economic gains.

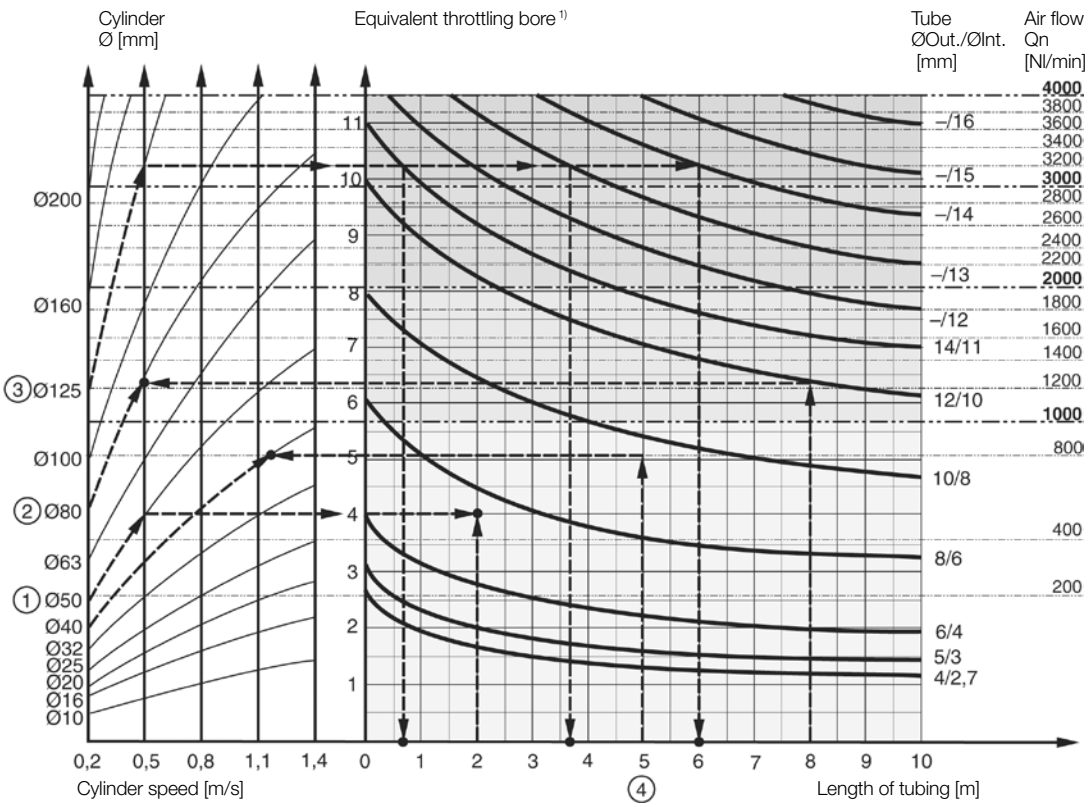
The following is the basic principle:

1. The primary line to the working valve could be over sized (this does not cause any extra air consumption and consequently does not create any extra costs in operation).
2. The tubes between the valve and the cylinder should, however, be optimized according to the principle that an insufficient bore throttles the flow and thus limits the cylinder speed, while an oversized pipe creates a dead volume which increases the air consumption and filling time.

The chart below is intended to help when selecting the correct size of tube to use between the valve and the cylinder.

The following prerequisites apply:

The *cylinder load should be about 50%* of the theoretical force (= normal load). A lower load gives a higher velocity and vice versa. The tube size is selected as a function of the *cylinder bore*, the desired *cylinder velocity* and the *tube length* between the valve and the cylinder.
If you want to use the capacity of the valve to its maximum, and obtain maximum speed, the tubing should be chosen so that they at least correspond with the equivalent restriction diameter (see description below), so that the tubing does not restrict the total flow. This means that a short tubing must have at least the equivalent restriction diameter. If the tubing is longer, choose it from the table below. Straight fittings should be chosen for highest flow rates. (Elbow and banjo fittings cause restriction.)



1) The "equivalent throttling bore" is a long throttle (for example a tube) or a series of throttles (for example, through a valve) converted to a short throttle which gives a corresponding flow rate. This should not be confused with the "orifice" which is sometimes specified for valves. The value for the orifice does not normally take account of the fact that the valve contains a number of throttles.

2) Qn is a measure of the valve flow capacity, with flow measured in litre per minute (l/min) at 6 bar(e) supply pressure and 1 bar pressure drop across the valve.

Example ①: Which tube diameter should be used?

A 50 mm bore cylinder is to be operated at 0.5 m/s. The tube length between the valve and cylinder is 2 m. In the diagram we follow the line from 50 mm bore to 0.5 m/s and get an "equivalent throttling bore" of approximately 4 mm. We continue out to the right in the chart and intersect the line for a 2 m tube between the curves for 4 mm (6/4 tube) and 6 mm(8/6 tube). This means that a 6/4 tube throttles the velocity somewhat, while an 8/6 tube is a little too large. We select the 8/6 tube to obtain full cylinder velocity.

Example ②: What cylinder velocity will be obtained?

A 80 mm bore cylinder will be used, connected by 8 m 12/10 tube to a valve with Qn 1200 Nl/min. What cylinder velocity will we get? We refer to the diagram and follow the line from 8 mm tube length up to the curve for 12/10 tube. From there, we go horizontally to the curve for the Ø80 cylinder. We find that the velocity will be about 0.5 m/s.

Example ③: What is the minimum inner diameter and maximum lenght of tube?

For a application a 125 mm bore cylinder will be used. Maximum velocity of piston rod is 0.5 m/s. The cylinder will be controlled by a valve with Qn 3200 Nl/min. What diameter of tube can be used and what is maximum lenght of tube.

We refer to the diagram. We start at the left side of the diagram cylinder Ø125. We follow the line until the intersection with the velocity line of 0.5 m/s. From here we draw a horizontal line in the diagram. This line shows us we need an equivalent throttling bore of approximately 10 mm. Following this line horizontally we cross a few intersections. These intersections shows us the minimum inner diameter (rightside diagram) in combination with the maximum length of tube (bottomside diagram).

For example:
Intersection one: When a tube (14/11) will be used, the maximum length of tube is 0.7 meter.
Intersection two: When a tube (—/13) will be used, the maximum length of tube is 3.7 meter.
Intersection three: When a tube (—/14) will be used, the maximum length of tube is 6 meter.

Example 4 : Determining tube size and cylinder velocity with a particular cylinder and valve?

For an application using a 40 mm bore cylinder with a valve with Qn=800 Nl/min. The distance between the cylinder and valve has been set to 5 m.
Tube dimension: What tube bore should be selected to obtain the maximum cylinder velocity? Start at pipe length 5 m, follow the line up to the intersection with 800 Nl/min. Select the next largest tube diameter, in this case Ø10/8 mm.
Cylinder velocity: What maximum cylinder velocity will be obtained? Follow the line for 800 Nl/min to the left until it intersects with the line for the Ø40 mm cylinder. In this example, the speed is just above 1.1 m/s.

Valve series with respective flows in Nl/minute

Valve series	Qn in Nl/Min
Valvetronic Solstar	33
Interface PS1	100
Adex A05	173
Moduflex size 1, (2 x 3/2)	220
Valvetronic PVL-B 5/3 closed centre, 6 mm push in	290
Moduflex size 1, (4/2)	320
B43 Manual and mechanical	340
Valvetronic PVL-B 2 x 2/3, 6 mm push in	350
Valvetronic PVL-B 5/3 closed centre, G1/8	370
Compact Isomax DX02	385
Valvetronic PVL-B 2 x 3/2 G1/8	440
Valvetronic PVL-B 5/2, 6 mm push in	450
Valvetronic PVL-B 5/3 vented centre, 6 mm push in	450
Moduflex size 2, (2 x 3/2)	450
Flowstar P2V-A	520
Valvetronic PVL-B 5/3 vented centre, G1/8	540
Valvetronic PVL-B 5/2, G1/8	540
Valvetronic PVL-C 2 x 3/2, 8 mm push in	540
Adex A12	560
Valvetronic PVL-C 2 x 3/2 G1/8	570
Compact Isomax DX01	585
VIKING Xtreme P2LAX	660
Valvetronic PVL-C 5/3 closed centre, 8 mm push in	700
Valvetronic PVL-C 5/3 vented centre, G1/4	700
B3-Series	780
Valvetronic PVL-C 5/3 closed centre, G1/4	780
Moduflex size 2, (4/2)	800
Valvetronic PVL-C 5/2, 8 mm push in	840
Valvetronic PVL-C 5/3 vented centre, 8 mm push in	840
Valvetronic PVL-C 5/2, G1/4	840
Flowstar P2V-B	1090
ISOMAX DX1	1150
B53 Manual and mechanical	1160
B4-Series	1170
VIKING Xtreme P2LBX	1290
B5-Series, G1/4	1440
Airline Isolator Valve VE22/23	1470
ISOMAX DX2	2330
VIKING Xtreme P2LCX, G3/8	2460
VIKING Xtreme P2LDX, G1/2	2660
ISOMAX DX3	4050
Airline Isolator Valve VE42/43	5520
Airline Isolator Valve VE82/83	13680

P

Main data: P1S-S, ISO 6432

Cylinder designation	Cylinder bore	area	Piston rod bore	area	thread	Total mass at 0 mm stroke	addition per 10 mm stroke	Air consump-tion	Port thread
	mm	cm^2	mm	cm^2		kg	kg	litres	
Double acting with fixed end-cushioning									
P1S-S010D	10	0,78	4	0,13	M4	0,04	0,003	0,0100 [1]	M5
P1S-S012D	12	1,13	6	0,28	M6	0,07	0,004	0,0139 [1]	M5
P1S-S016D	16	2,01	6	0,28	M6	0,09	0,005	0,0262 [1]	M5
P1S-S020D	20	3,14	8	0,50	M8	0,18	0,007	0,0405 [1]	G1/8
P1S-S025D	25	4,91	10	0,78	M10x1,25	0,25	0,011	0,0633 [1]	G1/8
Double acting with adjustable end-cushioning									
P1S-S020M	20	3,14	8	0,50	M8	0,18	0,007	0,0405 [1]	G1/8
P1S-S025M	25	4,91	10	0,78	M10x1,25	0,25	0,011	0,0633 [1]	G1/8
Single acting:									
P1S-S010SS	10	0,78	4	0,13	M4	0,04	0,003	0,0055 [1]	M5
P1S-S012SS	12	1,13	6	0,28	M6	0,08	0,004	0,0079 [1]	M5
P1S-S016SS	16	2,01	6	0,28	M6	0,10	0,005	0,0141 [1]	M5
P1S-S020SS	20	3,14	8	0,50	M8	0,18	0,007	0,0220 [1]	G1/8
P1S-S025SS	25	4,91	10	0,78	M10x1,25	0,26	0,011	0,0344 [1]	G1/8

1)Free air consumption per 10 mm stroke length for a double stroke at 600 kPa (6 bar)

Cylinder forces

Indicated cylinder forces are theoretical and should be reduced according to the working conditions.

Cylinder designation	Cylinder bore	Theoretical cylinder force at 600 kPa (6 bar) exp. stroke	retraction stroke
	mm	N	N
Double acting			
P1S-S010D	10	47	39
P1S-S012D	12	67	50
P1S-S016D	16	120	103
P1S-S020D	20	188	158
P1S-S025D	25	294	247
P1S-S020M	20	188	158
P1S-S025M	25	294	247

P

Cylinder designation	Theoretical cylinder force at 600 kPa (6 bar) expanding stroke Nmax	Nmin	spring retraction Nmax	Nmin
Single acting				
P1S-S010SS-0010	38	36	11	9
P1S-S010SS-0015	38	36	11	9
P1S-S010SS-0025	39	36	11	8
P1S-S010SS-0040	38	34	13	9
P1S-S010SS-0050	39	34	13	8
P1S-S010SS-0080	39	34	13	8
P1S-S012SS-0010	53	51	16	14
P1S-S012SS-0015	53	51	16	14
P1S-S012SS-0025	55	51	16	12
P1S-S012SS-0040	52	48	19	15
P1S-S012SS-0050	53	48	19	14
P1S-S012SS-0080	55	48	19	12
P1S-S016SS-0010	102	99	21	18
P1S-S016SS-0015	103	99	21	17
P1S-S016SS-0025	105	99	21	15
P1S-S016SS-0040	106	95	25	14
P1S-S016SS-0050	108	95	25	12
P1S-S016SS-0080	107	95	25	13
P1S-S020SS-0010	163	161	27	25
P1S-S020SS-0015	164	161	27	24
P1S-S020SS-0025	167	161	27	21
P1S-S020SS-0040	166	159	29	22
P1S-S020SS-0050	168	159	29	20
P1S-S020SS-0080	170	161	27	18
P1S-S025SS-0010	256	253	41	38
P1S-S025SS-0015	258	253	41	36
P1S-S025SS-0025	262	253	41	32
P1S-S025SS-0040	261	250	44	33
P1S-S025SS-0050	264	250	44	30
P1S-S025SS-0080	264	251	43	30

Additional data

Working pressure	max 1000 kPa (10 bar)
Working temperature	max +80 °C
	min –20 °C
High-temperature version	max +120 °C (Ø10 - Ø 16 mm)
	max +150 °C (Ø20 - Ø 25 mm)
	min –10 °C
Low-temperture version	max +60 °C
	min –40 °C

Prelubricated, further lubrication is not normally necessary.

If additional lubrication is introduced it must be continued.

Cushioning diagram

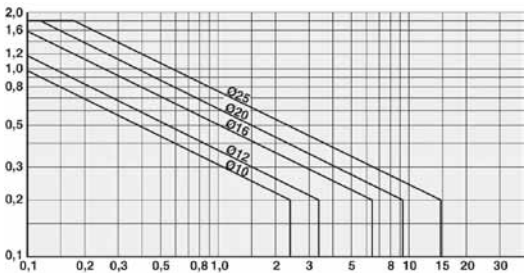
Use the diagram below to determine the necessary size of cylinder to provide the requisite cushioning performance. The maximum cushioning performance, as indicated in the diagram, is based on the following assumptions:

- Low load, i.e. low pressure drop across the piston
- Steady-state piston speed
- Correctly adjusted cushioning screw

The load is the sum of the internal and external friction, together with any gravity forces. At high relative loading it is recommended that, for a given speed, the load should be reduced by a factor of 2.5, or that, for a given mass, the speed should be reduced by a factor of 1.5. These factors apply in relation to the maximum performance as shown in the diagram.

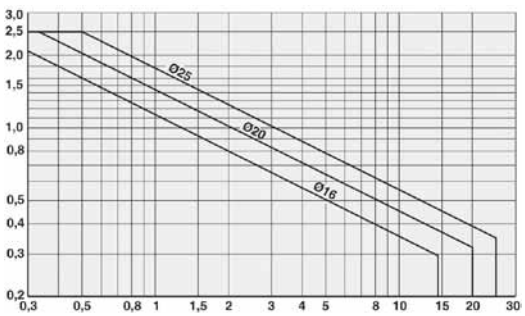
Fixed end-cushioning

Speed [m/s]



Adjustable pneumatic end-cushioning

Speed [m/s]



Material specification Ø10-Ø25

Piston rod	Stainless steel, DIN X 10 CrNiS 18 9
Piston rod seal	Fluorocarbon rubber FPM
Piston rod bearing	Multilayer PTFE/steel
End covers	Stainless steel, DIN X 10 CrNiS 18 9
O-ring, internal	NBR
Cylinder barrel	Stainless steel, DIN X 5 CrNi 18 10
Piston, complete	NBR/steel
Magnet holder	Thermoplastic elastomer
Magnet	Plastic-coated magnetic material
Return spring	Surface-treated steel
Cushioning screw	Stainless steel, DIN X 10 CrNiS 18 9

Variants Ø10-Ø25:

Low-temperature version, type L

Piston rod seal	NBR
Piston, complete	NBR/steel

High-temperature version, type F

Piston rod seal	Fluorocarbon rubber, FPM	
Piston complete,	Ø10-Ø16	HNBR/steel
Piston complete,	Ø20-Ø25	FPM/steel

Working medium, air quality

Working medium	Dry, filtered compressed air to ISO 8573-1 class 3.4.3.

Recommended air quality for cylinders

For best possible service life and trouble-free operation, ISO 8573-1 quality class 3.4.3 should be used. This means 5 µm filter (standard filter) dew point +3 °C for indoor operation (a lower dew point should be selected for outdoor operation) and oil concentration 1.0 mg oil/m³, which is what a standard compressor with a standard filter gives.

ISO 8573-1 quality classes

Quality class	Pollution particle size (µm)	Pollution max con-centration (mg/m³)	Water max. press. dew point (°C)	Oil max con-centration (mg/m³)
1	0,1	0,1	-70	0,01
2	1	1	-40	0,1
3	5	5	-20	1,0
4	15	8	+3	5,0
5	40	10	+7	25
6	-	-	+10	-

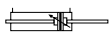
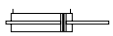
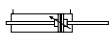
P

Order key

P1S – S 016 M S – 0025

Cylinder bore mm
010
012
016
020
025

	Cylinder version
S	Standard cylinder acc. to Cylinder type/Function

	Cylinder type/Function	
M		Double acting, adjustable cushioning Ø20 - Ø25 Not for sealing material type F and L
D		Double acting, fixed cushioning Ø10 - Ø25
F		Double acting, adjustable cushioning, through piston rod, Ø20 - Ø25 Not for sealing material type F and L
K		Double acting, fixed cushioning, through piston rod, Ø10 - Ø25
H		Double acting, adjustable cushioning, through piston rod (hollow), Ø20 - Ø25, max stroke 125 mm Not for sealing material type F and L
P		Double acting, fixed cushioning, through piston rod (hollow), Ø20 - Ø25, max stroke 125 mm
S		Single acting, fixed cushioning, spring return for retract stroke, Ø10 - Ø25

Stroke in mm

E.g. **0025** = 25 mm
For standard stroke length and max length, see table below

	Sealing material	
S		Standard, -20 °C to +80 °C Magnetic piston
F		High temperature, -10 °C to +120 °C Ø10 - Ø16 mm -10 °C to +150 °C Ø20 - Ø25 mm Non magnetic piston
L		Low temperature, -40 °C to +60 °C Non magnetic piston

Stroke length

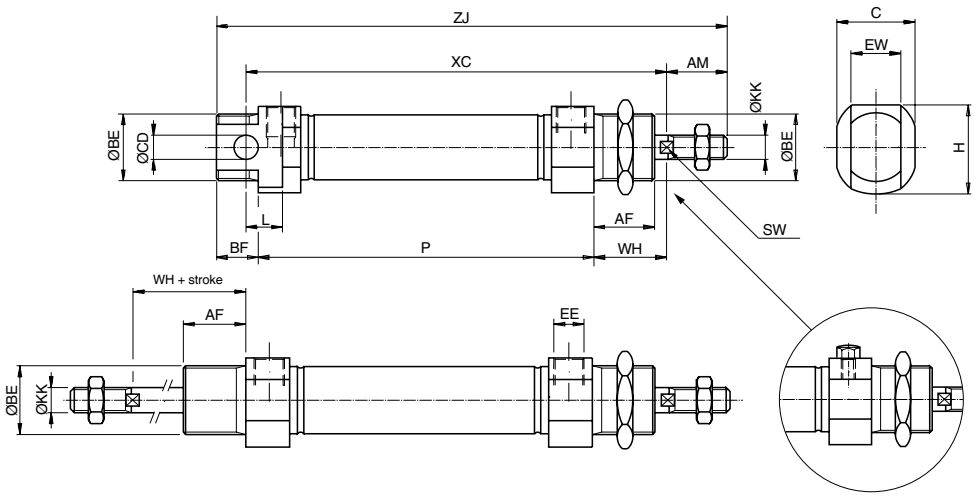
● Standard stroke length in mm ▭ Non standard stroke length

Cylinder designation	Cylinder bore	10	15	20	25*	30	40	50*	80*	100*	125*	160*	200*	250*	320*	400*	500*
Double acting with fixed end-cushioning:																	
P1S-S 010 D	10	●	●	●	●	●	●	●	●	●	●						
P1S-S 012 D	12	●	●	●	●	●	●	●	●	●	●	●	●				
P1S-S 016 D	16	●	●	●	●	●	●	●	●	●	●	●	●				
P1S-S 020 D	20	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
P1S-S 025 D	25	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Double acting with adjustable end-cushioning:																	
P1S-S 020 M	20			●	●	●	●	●	●	●	●	●	●	●	●	●	●
P1S-S 025 M	25			●	●	●	●	●	●	●	●	●	●	●	●	●	●
Single acting:																	
P1S-S 010 SS	10	●	●		●		●	●	●								
P1S-S 012 SS	12	●	●		●		●	●	●								
P1S-S 016 SS	16	●	●		●		●	●	●								
P1S-S 020 SS	20	●	●		●		●	●	●								
P1S-S 025 SS	25	●	●		●		●	●	●								

*Standard stroke length in mm according to ISO 4393

P

CAD drawings on the Internet
Our home page www.parker.com/euro_pneumatic includes the AirCad Drawing Library with 2D and 3D drawings for the main versions.



Dimensions

Cyl. bore mm	AM 0/-2 mm	BE	AF mm	BF mm	C mm	CDH9 mm	EE	EW mm	H mm	KK	L mm	SW mm	WH±1,2 mm
10	12	M12x1,25	12	10	14	4	M5	8	19	M4	6	–	16
12	16	M16x1,5	18	13	18	6	M5	12	19	M6	9	5	22
16	16	M16x1,5	18	13	18	6	M5	12	19	M6	9	5	22
20	20	M22x1,5	20	14	24	8	G1/8	16	29	M8	12	7	24
25	22	M22x1,5	22	14	28	8	G1/8	16	32	M10x1,25	12	9	28

Double acting cylinders

Cyl. bore mm	XC mm	ZJ mm	P mm
10	64 + stroke	84 + stroke	46 + stroke
12	75 + stroke	99 + stroke	48 + stroke
16	82 + stroke	104 + stroke	53 + stroke
20	95 + stroke	125 + stroke	67 + stroke
25	104 + stroke	132 + stroke	68 + stroke

Single acting with spring return, type SS

Stroke/	10	15	25	40	50	80	10	15	25	40	50	80	10	15	25	40	50	80
Cyl. bore	XC	XC	XC	XC	XC	XC	ZJ	ZJ	ZJ	ZJ	ZJ	ZJ	P	P	P	P	P	P
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
10	74	79	89	126	136	174	94	99	109	146	156	194	56	61	71	108	118	156
12	85	90	100	132	142	185	109	114	124	156	166	209	58	63	73	105	115	158
16	92	97	107	122	132	184	114	119	129	144	154	206	63	68	78	93	103	155
20	105	110	120	135	145	191	135	140	150	165	175	221	77	82	92	107	117	163
25	114	119	129	144	154	201	142	147	157	172	182	229	78	83	93	108	118	165

Length tolerances ±1 mm

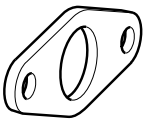
Stroke length tolerances +1,5/0 mm

Cylinders are supplied complete with mounting and adjusting nuts.

Cylinders with through piston rod are supplied complete with two adjusting nuts and one mounting nut.

Cylinder mountings

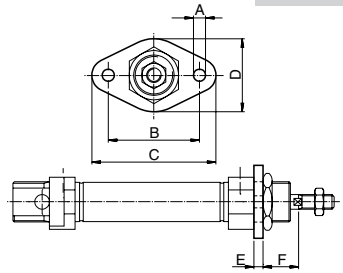
Flange-MF8



Intended for fixed attachment of the cylinder. The flange is designed for mounting on the front or rear end-covers.

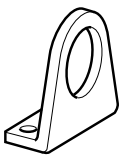
Material:
Stainless steel, DIN X 10 CrNiS 18 9

Cyl. bore Ømm	Weight kg	Order code
10	0,012	**P1S-4CMB**
12-16	0,025	**P1S-4DMB**
20-25	0,045	**P1S-4HMB**



Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm
10	4,5	30	40	22	3	13
12-16	5,5	40	52	30	4	18
20	6,6	50	66	40	5	19
25	6,6	50	66	40	5	23

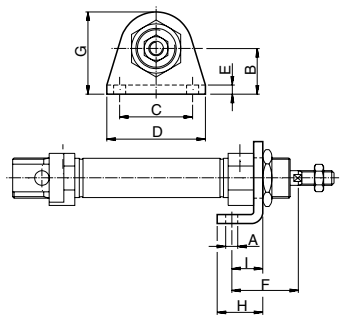
Foot-MS3



Intended for fixed attachement of the cylinder. The bracket is designed for mounting on the front or rear end-covers.

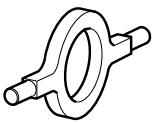
Material:
Stainless steel, DIN X 10 CrNiS 18 9

Cyl. bore Ømm	Weight kg	Order code
10	0,020	**P1S-4CMF**
12-16	0,040	**P1S-4DMF**
20-25	0,080	**P1S-4HMF**



Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm
10	4,5	16	25	35	3	24	26	16	11
12-16	5,5	20	32	42	4	32	32,5	20	14
20	6,5	25	40	54	5	36	45	25	17
25	6,5	25	40	54	5	40	45	25	17

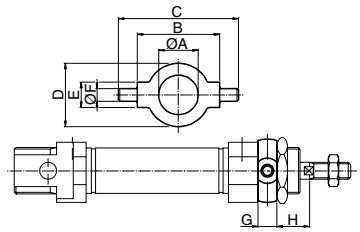
Cover trunnion



Intended for articulated mounting of the cylinder. The flange is designed for mounting on the front or rear end-covers.

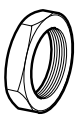
Material:
Stainless steel, DIN X 10 CrNiS 18 9

Cyl. bore Ømm	Weight kg	Order code
10	0,014	**P1A-4CMJ**
12-16	0,033	**P1A-4DMJ**
20-25	0,037	**P1A-4HMJ**



Cylinder Ø mm	A mm	B h14 mm	C mm	D mm	E e9 mm	F mm	G mm	H mm
10	12,5	26	38	20	8	4	6	10
12-16	16,5	38	58	25	10	6	8	14
20	22,5	46	66	30	10	6	8	16
25	22,5	46	66	30	10	6	8	20

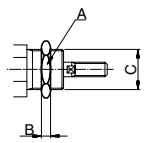
Mounting nut



Intended for fixed mounting of the cylinder.
Cylinders are supplied complete with one mounting nut.

Material:
Stainless steel, DIN X 5 CrNi 18 10

Cyl. bore Ømm	Weight kg	Order code
10	0,009	**9127385111**
12-16	0,018	**9127385112**
20-25	0,042	**9127385113**



Cylinder Ø mm	A mm	B mm	C
10	16	3	M12x1,25
12-16	20	4	M16x1,50
20-25	27	5	M22x1,50

Cylinder mountings

Clevis bracket

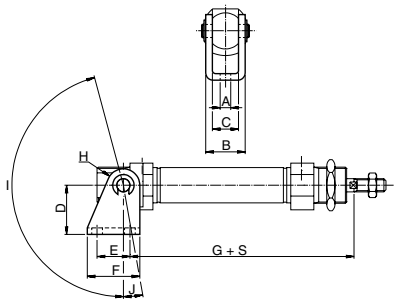
Intended for articulated mounting of the cylinder. Supplied with shaft for mounting on the rear end cover.

Material:
Bracket: stainless steel, DIN X 5 CrNi 18 10
Pin: tempered stainless steel, DIN X 20 Cr 13
Locking rings: stainless steel, DIN X 5 CrNi 18 10

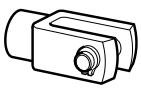
Cyl. bore Ømm	Weight kg	Order code
10	0,020	**P1S-4CMT**
12-16	0,040	**P1S-4DMT**
20-25	0,080	**P1S-4HMT**

Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I °	J °
10	4,5	13	8	24	12,5	20	65,3	5	160	17
12	5,5	18	12	27	15	25	73	7	170	15
16	5,5	18	12	27	15	25	80	7	170	15
20	6,5	24	16	30	20	32	91	10	165	10
25	6,5	24	16	30	20	32	100	10	165	10

S=stroke



Clevis

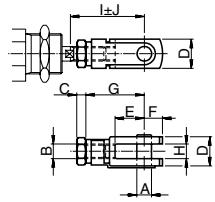


According to ISO 8140
Intended for articulated mounting of the cylinder. This mounting is adjustable in the axial direction. Supplied complete with pin.

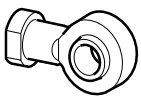
Material:
Stainless steel, DIN X 5 CrNi 18 10

Cyl. bore Ømm	Weight kg	Order code
10	0,007	**P1S-4CRD**
12-16	0,022	**P1S-4DRD**
20	0,045	**P1S-4HRD**
25	0,095	**P1S-4JRD**

Cylinder Ø mm	A mm	B	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm
10	4	M4	2,2	8	8	5	16	4	22	2
12-16	6	M6	3,2	12	12	7	24	6	31	3
20	8	M8	4	16	16	10	32	8	40,5	3,5
25	10	M10x1,25	5	20	20	12	40	10	49	3



Swivel rod eye

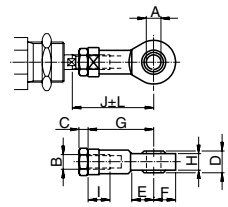


According to ISO 8139
Intended for articulated mounting of the cylinder. This mounting is adjustable in the axial direction.

Material:
Swivel rod eye: stainless steel, DIN X 5 CrNi 18 10
Ball: hardened stainless steel, DIN X 5 CrNi 18 10

Cyl. bore Ømm	Weight kg	Order code
10	0,017	**P1S-4CRT**
12-16	0,025	**P1S-4DRT**
20	0,045	**P1S-4HRT**
25	0,085	**P1S-4JRT**

Cylinder Ø mm	A mm	B	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm
10	5	M4	2,2	8	10	9	27	6	8	33	9	2
12-16	6	M6	3,2	9	10	10	30	6,8	9	38,5	11	1,5
20	8	M8	4	12	12	12	36	9	12	46	14	2
25	10	M10x1,25	5	14	14	14	43	10,5	15	52,5	17	2,5



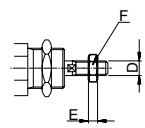
Rod nut

Intended for fixed mounting on the piston rod. Cylinders are supplied complete with one rod nut. (cylinders with through piston rod are supplied with two rod nuts.)

Material:
Stainless steel, DIN X 5 CrNi 18 10

Cyl. bore Ømm	Weight kg	Order code
10	0,001	**9127385121**
12-16	0,002	**9127385122**
20	0,005	**9127385123**
25	0,007	**9126725404**

Cylinder Ø mm	D	F mm	E mm
10	M4	7	2,2
12-16	M6	10	3,2
20	M8	13	4
25	M10x1,25	17	5



P

Main data: ISO 6431

Cylinder designation	Cylinder bore	Piston rod area	Piston rod diam.	Cushioning area	Total mass thread	Moving mass ning distance	at 0 mm stroke	Air addition per 10 mm stroke	Port at 0 mm stroke	addition per 10 mm stroke	consumption	thread
	mm	cm^2	mm	cm^2		mm	kg	kg	kg	kg	litres	
P1S-•032M	32	8,0	12	1,1	M10x1,25	15	0,59	0,026	0,10	0,009	0,105 [1]	G1/8
P1S-•040M	40	12,6	16	2,0	M12x1,25	18	0,99	0,036	0,19	0,016	0,162 [1]	G1/4
P1S-• 050M	50	19,6	20	3,1	M16x1,5	19	1,63	0,057	0,32	0,024	0,253 [1]	G1/4
P1S-•063M	63	31,2	20	3,1	M16x1,5	22	2,75	0,065	0,36	0,024	0,414 [1]	G3/8
P1S-•080M	80	50,3	25	4,9	M20x1,5	24	5,09	0,099	1,11	0,039	0,669 [1]	G3/8
P1S-•100M	100	78,5	25	4,9	M20x1,5	29	8,68	0,115	1,41	0,039	1,043 [1]	G1/2
P1S-•125M	125	122,7	32	8,0	M27x2	32	15,31	0,174	2,90	0,063	1,662 [1]	G1/2

1)Free air consumption per 10 mm stroke length for a double stroke at 600 kPa (6 bar)

Cylinder forces

Indicated cylinder forces are theoretical and should be reduced in relation to working conditions.

Cylinder designation	Theoretical cylinder force at 600 kPa (6 bar) exp. stroke N	return stroke N
P1S-•032M	480	415
P1S-•040M	754	633
P1S-•050M	1180	990
P1S-•063M	1870	1680
P1S-•080M	3016	2721
P1S-•100M	4712	4417
P1S-•125M	7363	6880

Working medium, air quality

Working medium: Dry, filtered compressed air to ISO 8573-1 class 3.4.3.

Recommended air quality for cylinders

For best possible service life and trouble-free operation, ISO 8573-1 quality class 3.4.3 should be used. This means 5 µm filter (standard filter) dew point +3 ºC for indoor operation (a lower dew point should be selected for outdoor operation) and oil concentration 1.0 mg oil/m^3, which is what a standard compressor with a standard filter gives.

ISO 8573-1 quality classes

Quality class	Pollution particle size (µm)	Pollution max concentration (mg/m^3)	Water max. press. dew point (°C)	Oil max concentration (mg/m^3)
1	0,1	0,1	-70	0,01
2	1	1	-40	0,1
3	5	5	-20	1,0
4	15	8	+3	5,0
5	40	10	+7	25
6	-	-	+10	-

Additional data

Working pressure	max 10bar
Working temperature	max +80°C
	min –20°C
High-temperature version	max +150°C
	min –10°C
Low-temperature version	max +40°C
Ø80 - Ø125	min –40°C

Prelubricated, further lubrication is not normally necessary.

If additional lubrication is introduced it must be continued.

Cushioning diagram

Use the diagram below to determine the necessary size of cylinder to provide the requisite cushioning performance. The maximum cushioning performance, as indicated in the diagram, is based on the following assumptions:

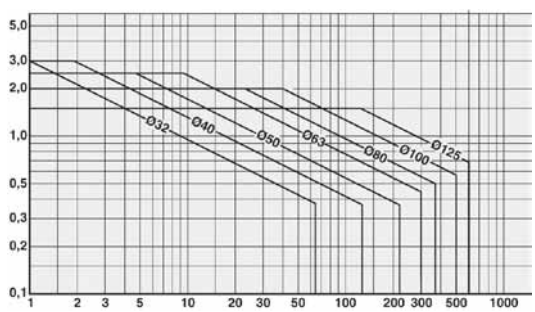
–Low load, i.e. low pressure drop across the piston

–Steady-state piston speed

–Correctly adjusted cushioning screw

The load is the sum of the internal and external friction, together with any gravity forces. At high relative loading it is recommended that, for a given speed, the load should be reduced by a factor of 2.5, or that, for a given mass, the speed should be reduced by a factor of 1.5. These factors apply in relation to the maximum performance as shown in the diagram.

Speed [m/s]



Order key

P1S – D **032** **M** **S** **–** **0025**

	Cylinder version
A	Trunnion pegs in front end cover, only Ø80 - Ø125
B	Trunnion pegs in rear end cover, only Ø80 - Ø125
C	Threaded front end
D	Threaded front end + 4 mounting holes in rear end cover
E	4 mounting holes in front end cover, only Ø80 - Ø125
F	4 mounting holes in rear end cover
J	2 mounting holes in front end cover, only Ø80 - Ø125
K	2 mounting holes in rear end cover
L	4 mounting holes in front and rear end cover, only Ø80 - Ø125
M	4 mounting holes in front and 2 in rear end cover, only Ø80 - Ø125
Q	2 mounting holes in front and 4 in rear end cover, only Ø80 - Ø125
V	2 mounting holes in front and rear end cover, only Ø80 - Ø125

Cylinder bore mm
032
040
050
063
080
100
125

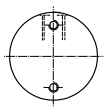
	Cylinder type/Function	
M		Double acting, adjustable cushioning
F		Double acting, adjustable cushioning, through piston rod, only Ø80 - Ø125

Stroke in mm

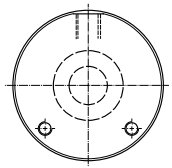
E.g. **0025** = 25 mm
For standard stroke length and max length, see table below

	Sealing material	
S		Standard, -20 °C to +80 °C Magnetic piston
F		High temperature, -10 °C to +150 °C Non magnetic piston
L		Low temperature, -40 °C to +60 °C Non magnetic piston only Ø80 - Ø125
Q		Stainless steel scraper for piston rod -20 °C to +80 °C Magnetic piston only Ø80 - Ø125

Ø32 - Ø63
Ø80 - Ø125
Cylinder version **K**



Cylinder version **J, K, M, Q, V**



Stroke length

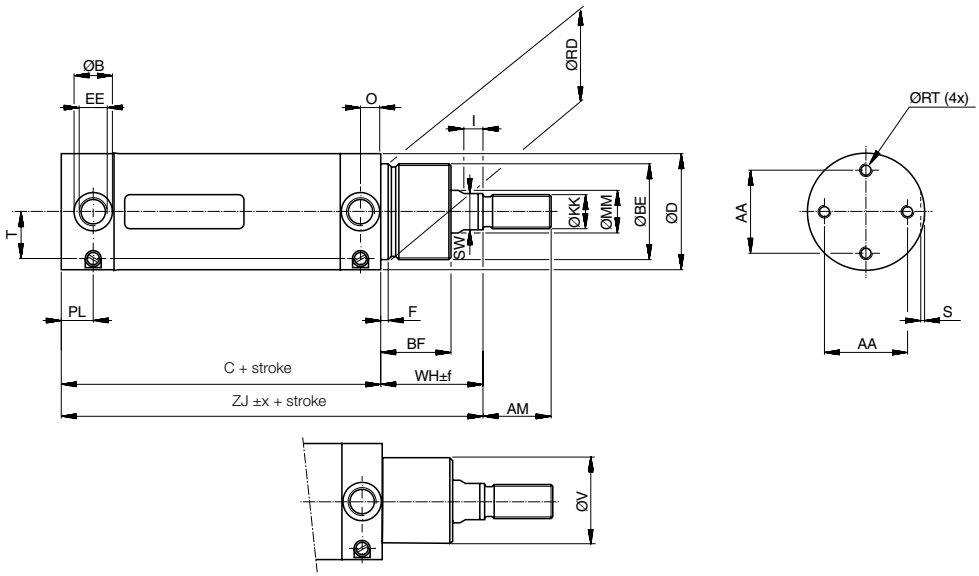
Cylinder designation	Cylinder bore	25	50	80	100	125	160	200	250	320	400	500
P1S-•032M	32	●	●	●	●	●	●	●	●	●	●	●
P1S-•040M	40	●	●	●	●	●	●	●	●	●	●	●
P1S-•050M	50	●	●	●	●	●	●	●	●	●	●	●
P1S-•063M	63	●	●	●	●	●	●	●	●	●	●	●
P1S-•080M	80	●	●	●	●	●	●	●	●	●	●	●
P1S-•100M	100	●	●	●	●	●	●	●	●	●	●	●
P1S-•125M	125	●	●	●	●	●	●	●	●	●	●	●

● Standard stroke length in mm according to ISO 4393 ▭ Non standard stroke length

P

CAD drawings on the Internet
Our home page www.parker.com/euro_pneumatic includes the AirCad Drawing Library with 2D and 3D drawings for the main versions.

AirCad™ Drawing Library



Not threaded front end

Dimensions Ø32-Ø63

Cylinder designation	AA mm	AM mm	B mm	BF mm	BE	C mm	D mm	EE	F mm	I mm	KK	MM mm	O mm	PL mm	RD mm	RT mm
P1S-D032M	24,5	22	15	25	M30x1,5	88	36	G1/8	4,2	6	M10x1,25	12	8	13	30	M5
P1S-D040M	30	24	18	30	M38x1,5	97	44	G1/4	4,5	9	M12x1,25	16	9,5	15	38	M6
P1S-D050M	39	32	18	33	M45x1,5	101	55	G1/4	4,5	9	M16x1,5	20	9,5	15	45	M6
P1S-D063M	49	32	25	33	M45x1,5	117	68	G3/8	4,5	9	M16x1,5	20	13,3	20,5	45	M8

Cylinder designation	S mm	SW mm	T mm	V mm	WH mm	ZJ mm	Mounting tolerances x mm	Mounting tolerances f mm	Stroke length 0-500 mm mm
P1S-D032M	1,5	10	12,2	26	35,5	123,5	1,2	2,5	+2,0
P1S-D040M	1,5	14	16,5	35	44	141	1,0	2,2	+2,0
P1S-D050M	1,5	17	22	41	47	148	0,9	2,3	+2,0
P1S-D063M	1,5	17	26	41	47	164	1,4	2,3	+2,5

P

Material specification Ø32-Ø63

Piston rod	Stainless steel, DIN X 2 CrNiMo 17 13 2
Piston rod nut	Stainless steel, DIN X 5 CrNi 18 10
Piston rod seal	UHMWPE-plastic/NBR
Scraper ring	UHMWPE-plastic/fluorocarbon rubber, FPM
Piston rod bearing	HDPE-plastic
End covers	Stainless steel, DIN X 5 CrNi 18 10
Cushioning screw	Stainless steel, DIN X 10 CrNiS 18 9
Cushioning screw lockings	Stainless steel, DIN X 5 CrNi 18 10
Cushioning sealing	NBR
O-ring, cushioning screw	Fluorocarbon, FPM
O-ring, internal	NBR
Cylinder barrel	Stainless steel, DIN X 5 CrNi 18 10
Piston	POM plastic
Piston seal	NBR
Piston nut	Zinc plated steel
Magnet	Plastic-coated magnetic material

Variants Ø32-Ø63:

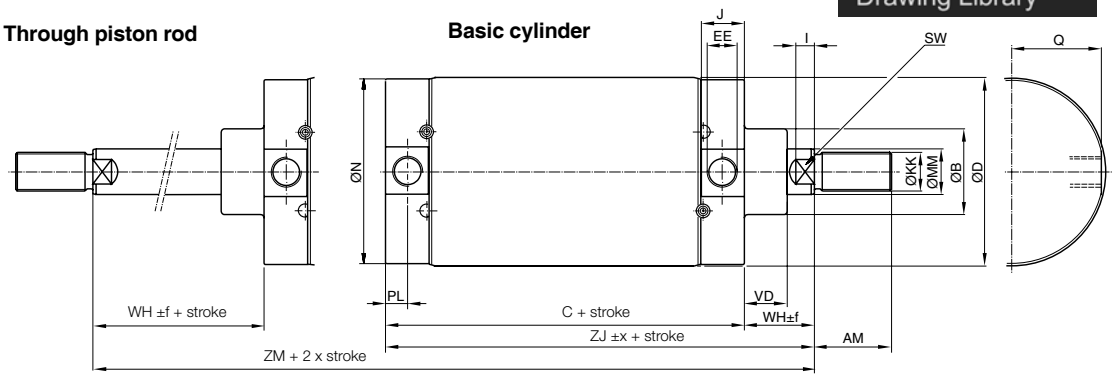
High-temperature version, type F:

Sealings/scraper ring	Fluorocarbon rubber, FPM
Piston	Anodized aluminium

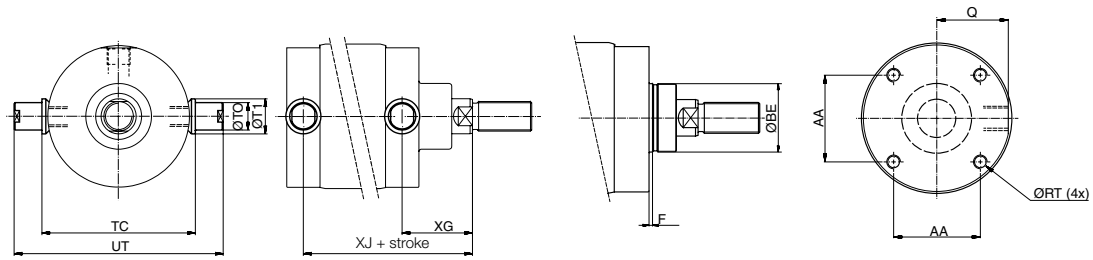
CAD drawings on the Internet
Our home page www.parker.com/euro_pneumatic includes the AirCad Drawing Library with 2D and 3D drawings for the main versions.

AirCad™ Drawing Library

Through piston rod **Basic cylinder**



Trunnion pegs on front or rear end cover **Threaded front end** **Mounting holes in the end covers**



Dimensions Ø80-Ø125

Cylinder designation	AA mm	AM mm	B mm	BE	C mm	D mm	EE	F mm	KK	I mm	J mm	MM mm	N mm	PL mm	Q mm
P1S-•080M	46	40	50	M50x1,5	141	86	G3/8	4	M20x1,5	10	24,5	25	84	12,5	40
P1S-•100M	60	40	50	M50x1,5	158	106	G1/2	4	M20x1,5	8	30	25	104	15,5	49,5
P1S-•125M	76	54	60	M60x2	183	133	G1/2	4	M27x2	13	30	32	129	15,5	62,5

Cylinder designation	RT	SW mm	TC mm	TO mm	T1 mm	UT mm	VD mm	WH mm	XG mm	X3 mm	ZJ mm	ZM mm	Mounting tol. x mm	Mounting tol. f mm	Stroke length 0-500 mm
P1S-•080M	M8	21	98	20	25	125	19	37	49,5	165,5	178	215	1,5	2,5	+2,5
P1S-•100M	M10	21	109	25	32	152	19	35	50,5	177,5	193	228	1,5	2,5	+2,5
P1S-•125M	M12	27	134	25	32	177	24	47	63	214	230	277	2,0	2,5	+4,0

Material specification Ø80-Ø125

Piston rod	Stainless steel, DIN X 2 CrNiMo 17 13 2
Piston rod nut	Acid-proof steel, A4
Piston rod seal	FPM
Scraper ring	PTFE
Piston rod bearing	Multilayer PTFE and steel
End covers	Stainless steel, DIN X 5 CrNi 18 10
Cushioning screw	Stainless steel, DIN X 10 CrNiS 18 9
Cushioning sealing	NBR
O-ring, cushioning screw	Fluorocarbon, FPM
O-ring, internal	NBR
Cylinder barrel	Stainless steel, DIN X 5 CrNi 18 10
Piston	Anodized aluminium
Piston seal	NBR
Piston bearing	UHMWPE-plastic
Magnetic band	Rubber-coated magnetic material

Variants Ø80-Ø125:

Low-temperature version, type L:

Sealings/scraper ring	NBR/PTFE

High-temperature version, type F:

Sealings/scraper ring	Fluorocarbon rubber, FPM/PTFE

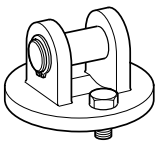
Cylinders with steel scraper ring, type Q:

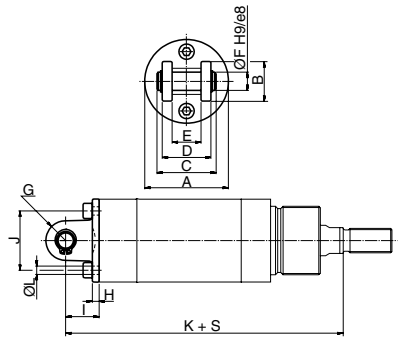
Sealings/scraper ring	NBR/Stainless steel

P

Cylinder mountings Ø32 - Ø63

Type	Description	Cyl. bore Ømm	Weight kg	Order code
Clevis bracket MP4	Intended for articulated mounting of the cylinder versions D, F or K. The bracket is mounted at the rear end cover and is supplied complete with shaft, mounting screw and O-ring for a clean joint between end cover and bracket. Material: Stainless steel, DIN X 5 CrNi 18 10	32	0,09	**P1S-4KME**
		40	0,12	**P1S-4LME**
		50	0,19	**P1S-4MME**
		63	0,34	**P1S-4NME**

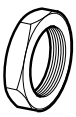


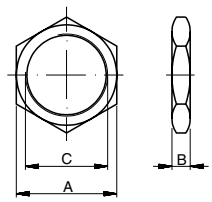


Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm
32	35,5	20	33	26	15	10	10	4,5	18,5	25	142	5,5
40	43,5	24	35	28	17	12	12	4	19	30	160	6,5
50	54,5	26	39	32	17	12	13	4,5	22	39	170	6,5
63	67,5	34	47	40	22	16	17	6	26	49	190	8,6

S = Stroke

Mounting nut	Intended for fixed mounting of the cylinder via the neck. Material: stainless steel, DIN X 5 CrNi 18 10	32	0,03	**9127294401**
		40	0,06	**9127294402**
		50-63	0,08	**9127294403**



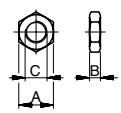


Cylinder Ø mm	A mm	B mm	C
32	36	8	M30x1,5
40	46	10	M38x1,5
50	55	10	M45x1,5
63	55	10	M45x1,5

Cylinder mountings Ø32-Ø125

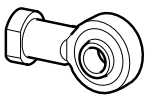
Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Acid-proof rod nut	Intended for fixed mounting on the piston rod. Cylinders are supplied complete with one rod nut. (cylinders with through piston rods are supplied with two rod nuts.) Material: Acid-proof steel A4 (Standard)	32	0,007	**0261109919**
		40	0,010	**0261109920**
		50	0,021	**0261109917**
		63	0,021	**0261109917**
		80	0,040	**0261109916**
		100	0,040	**0261109916**
		125	0,100	**0261109918**
Stainless steel rod nut	Intended for fixed mounting of accessories to the piston rod. Material: Stainless steel, A2	32	0,007	**9126725404**
		40	0,010	**9126725405**
		50	0,021	**9126725406**
		63	0,021	**9126725406**
		80	0,040	**0261109921**
		100	0,040	**0261109921**
		125	0,100	**0261109922**

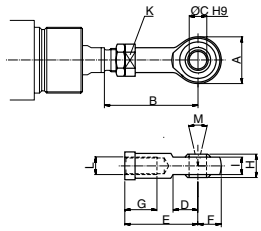
Cylinder Ø mm	A mm	B mm	C
32	17	5	M10x1,25
40	19	6	M12x1,25
50	24	8	M16x1,5
63	24	8	M16x1,5
80	30	10	M20x1,5
100	30	10	M20x1,5
125	41	13,5	M27x2



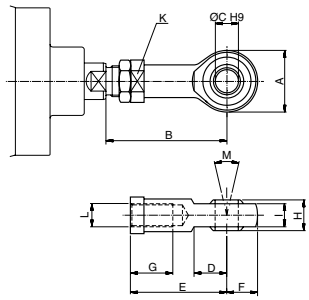
Cylinder mountings Ø32 - Ø125

Type	Description	Cyl. bore Ømm	Weight kg	Order code
Swivel rod eye	According to ISO 8139 Intended for articulated mounting of the cylinder. This mounting is adjustable in the axial direction. Materal: Swivel rod eye: stainless steel, DIN X 5 CrNi 18 10 Ball: hardened stainless steel, DIN X 5 CrNi 18 10	32	0,08	**P1S-4JRT**
		40	0,12	**P1S-4LRT**
		50-63	0,25	**P1S-4MRT**
		80-100	0,46	**P1S-4PRT**
		125	1,28	**P1S-4RRT**

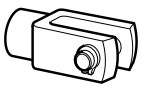


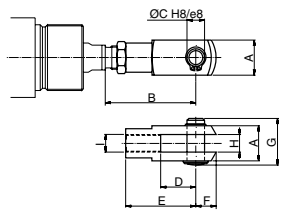


Cyl. Ø mm	A mm	B_{min} mm	B_{max} mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	K mm	L	M
32	28	50	55	10	15	43	14	15	14	10,5	17	M10x1,25	24°
40	32	56	62	12	17	50	16	22	16	12	19	M12x1,25	24°
50	42	72	80	16	22	64	21	28	21	15	22	M16x1,5	30°
63	42	72	80	16	22	64	21	28	21	15	22	M16x1,5	30°
80	50	87	97	20	26	77	25	33	25	18	32	M20x1,5	30°
100	50	87	97	20	26	77	25	33	25	18	32	M20x1,5	30°
125	70	123,5	137	30	36	110	35	51	37	25	41	M27x2	30°

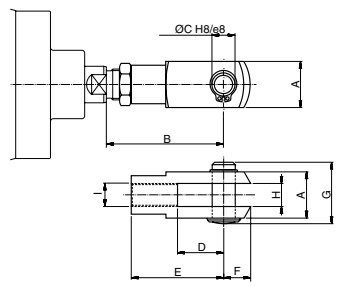


Type	Description	Cyl. bore Ømm	Weight kg	Order code
Clevis	According to ISO 8140 Intended for articulated mounting of the cylinder. This mounting is adjustable in the axial direction. Supplied complete with pin. Material: Clevis: stainless steel, DIN X 10 CrNiS 18 9 Pin: stainless steel, DIN X 5 CrNi 18 10 Locking rings according to DIN 471	32	0,09	**P1S-4JRD**
		40	0,15	**P1S-4LRD**
		50-63	0,35	**P1S-4MRD**
		80-100	0,75	**P1S-4PRD**
		125	2,10	**P1S-4RRD**



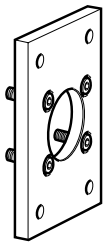


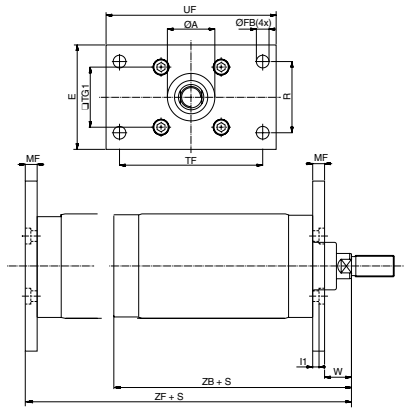
Cylinder Ø mm	A mm	B_{min} mm	B_{max} mm	C mm	D mm	E mm	F mm	G mm	H mm	I
32	20	46	52	10	20	40	12	28	10	M10x1,25
40	24	54	60	12	24	48	19	32	12	M12x1,25
50	32	72	80	16	32	64	25	42	16	M16x1,5
63	32	72	80	16	32	64	25	42	16	M16x1,5
80	40	90	100	20	40	80	32	50	20	M20x1,5
100	40	90	100	20	40	80	32	50	20	M20x1,5
125	55	123,5	137	30	54	110	45	72	30	M27x2



Cylinder mountings

Type	Description	Cyl. bore Ømm	Weight kg	Order code
Flange MF1/MF2	Intended for fixed attachment of cylinder version D, E, F, L, M or Q. The flange is designed for mounting on the front or rear end covers. Material: Stainless steel, DIN X 5 CrNiMo 17 13 3	80 100 125	0,97 1,42 1,55	**P1S-4PMB** **P1S-4QMB** **P1S-4RMB**

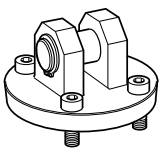


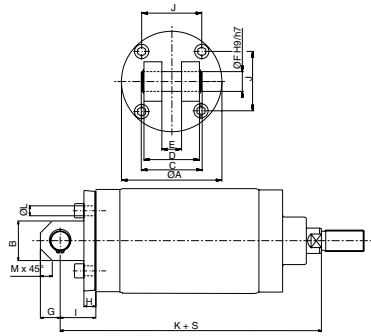


Cylinder Ø mm	A mm	FB mm	E mm	R mm	TF mm	TG1 mm	UF mm	MF mm	I1 mm	W mm	ZB mm	ZF mm
80	50,2	12	86	63	126	46	150	12	6	25	178	190
100	51	14	106	75	150	60	170	12	6	23	193	205
125	61	16	132	90	180	76	205	15	8	32	230	245

S = Stroke

Clevis bracket MP4 Intended for articulated mounting of cylinder versions D, F, L or Q. The bracket is mounted on the rear end cover and is supplied complete with shaft, mounting screw and O-ring for a clean joint between end cover and bracket. Material: Bracket: stainless steel, DIN X 5 CrNi 18 10 Pin: stainless steel, DIN X 5 CrNiMo 17 13 3	80 100 125	0,78 1,42 2,06	**P1S-4PME** **P1S-4QME** **P1S-4RME**

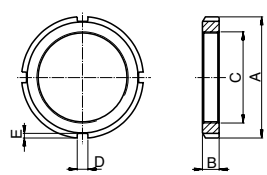




Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M mm
80	80	30	57	50	16	16	15	12	32	46	210	8,6	9
100	103	42	67	60	20	20	21	12	37	60	230	10,6	12
125	127	50	77	70	25	25	25	15	45	76	275	12,6	15

S = Stroke

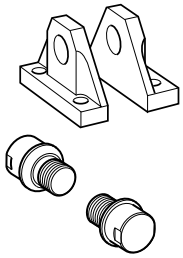
Mounting nut Intended for fixed mounting on the front end cover of cylinders according to cylinder version C or D. Material: Stainless steel, DIN X 5 CrNi 18 10	80-100 125	0,16 0,19	**9126461304** **9126461305**

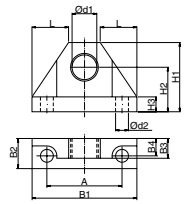


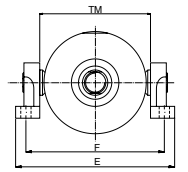
Cylinder Ø mm	A mm	B mm	C	D mm	E mm
80	70	11	M50x1,5	6	2,5
100	70	11	M50x1,5	6	2,5
125	80	11	M60x2	7	3

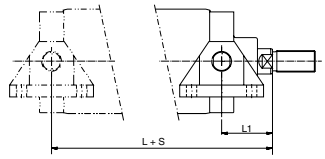
Cylinder mountings

Type	Description	Cyl. bore Ømm	Weight kg	Order code
Bearing bracket for trunnion pegs	Intended for articulated mounting of the cylinder. The trunnion pegs are factory mounted on the front or rear end cover and are combined with bearing brackets. Supplied in pairs. Material: Bearing brackets: stainless steel, DIN X 5 CrNi 18 10 Journal bearing: stainless steel, DIN X 5 CrNiMo 17 13 3/PTFE	80 100-125	0,90 1,30	**P1S-4PMW** **P1S-4QMW**









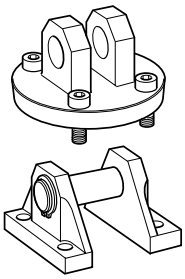
Cylinder Ø mm	A mm	B1 mm	B2 mm	B3 mm	B4 mm	d1 mm	d2 mm	H1 mm	H2 mm	H3 mm	L mm
80	60	90	28	15	15,5	20	11	58	37	12	34,5
100-125	76	106	30	20	17,5	25	13	70	45	15	40

Cylinder Ø mm	E mm	F mm	L1 mm	L2 mm	TM mm
80	154	129	49,5	165,5	98
100	169	144	50,5	177,5	109
125	194	169	63	214	134

S = Stroke

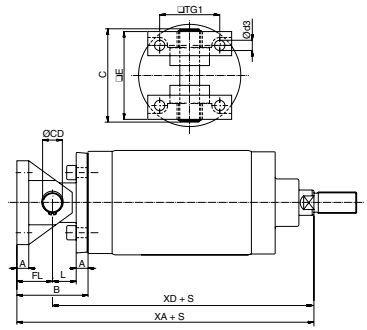
	80 100 125	1,29 2,33 3,30	**P1S-4PML** **P1S-4QML** **P1S-4RML**

Combinated mounting MP2/MP4



Intended for articulated mounting of cylinder versions D, F, L or Q. The unit is mounted on the rear end cover and is combined with bearing brackets MP2 and is supplied complete with shaft, mounting screw and O-ring for a clean joint between end cover and bracket.

Material:
Bearing brackets: stainless steel, DIN X 5 CrNi 18 10
Journal bearing: stainless steel,
Journal bearing: DIN X 5 CrNiMo 17 13 3/PTFE
Bracket: stainless steel, DIN X 5 CrNi 18 10
Pin: stainless steel, DIN X 5 CrNiMo 17 13 3



Cylinder Ø mm	A mm	B mm	C mm	CD mm	d3 mm	E mm	FL mm	L mm	TG1 mm	XA mm	XD mm
80	12	64	82	16	9	74	32	20	46	242	210
100	12	74	98	20	11	90	37	25	60	267	230
125	15	90	118	25	13	110	45	30	76	320	275

S = Stroke

P

Our global series of sensors

This series of sensors is already being used or will be used in all future ranges in our global product programme involving cylinders/actuators. The sensors have small installation dimensions and either fit into the groove in the case profile or, as shown here, are fastened to the cylinder using a special attachment.

You can choose from electronic or reed sensors with a range of cable lengths fitted with 8 mm or M12 terminals.

Electronic sensors

The new electronic sensors are "Solid State", i.e. they have no moving parts at all. They are provided with short-circuit protection and transient protection as standard. The built-in electronics make the sensors suitable for applications with high on and off switching frequency, and where very long service life is required.

Technical data

Design	GMR (Giant Magnetic Resistance) magneto-resistive function
Installation	Sensor mounting P8S-TMC01
Outputs	PNP, normally open (also available in NPN design, normally closed, on request)
Voltage range	10-30 VDC
	10-18 V DC, ATEX sensor
Ripple	max 10%
Voltage drop	max 2,5 V
Load current	max 100 mA
Internal consumption	max 10 mA
Actuating distance	min 9 mm
Hysteresis	max 1,5 mm
Repeatability accuracy	max 0,2 mm
On/off switching frequency	max 5 kHz
On switching time	max 2 ms
Off switching time	max 2 ms
Encapsulation	IP 67 (EN 60529)
Temperature range	–25 °C to +75 °C
	–20 °C to +45 °C, ATEX sensor
Indication	LED, yellow
Material housing	PA 12
Material screw	Stainless steel
Cable	PVC or PUR 3x0.25 mm^2 see order code respectively

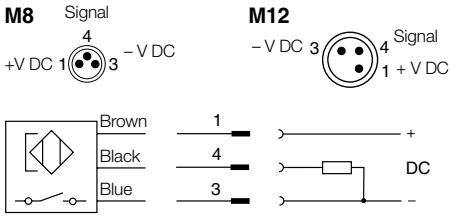
Reed sensors

The sensors are based on proven reed switches, which offer reliable function in many applications. Simple installation, a protected position on the cylinder and clear LED indication are important advantages of this range of sensors.

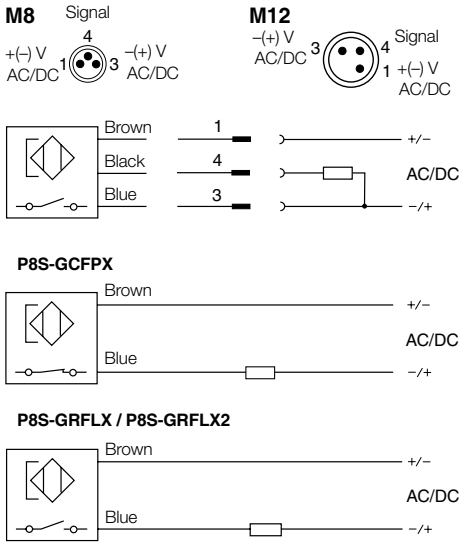
Technical data

Design	Reed element
Mounting	Sensor mounting P8S-TMC01
Output	Normally open , or normally closed
Voltage range	10-30 V AC/DC or 10-120 V AC/DC
	24-230 V AC/DC
Load current	max 500 mA for 10-30 V or max 100 mA for 10-120 V
	max 30 mA for 24-230 V
Breaking power (resistive)	max 6 W/VA
Actuating distance	min 9 mm
Hysteresis	max 1,5 mm
Repeatability accuracy	0,2 mm
On/off switching frequency	max 400 Hz
On switching time	max 1,5 ms
Off switching time	max 0,5 ms
Encapsulation	IP 67 (EN 60529)
Temperature range	–25 °C to +75 °C
Indication	LED, yellow
Material housing	PA12
Material screw	Stainless steel
Cable	PVC or PUR 3x0.14 mm^2 see order code respectively

Electronic sensors

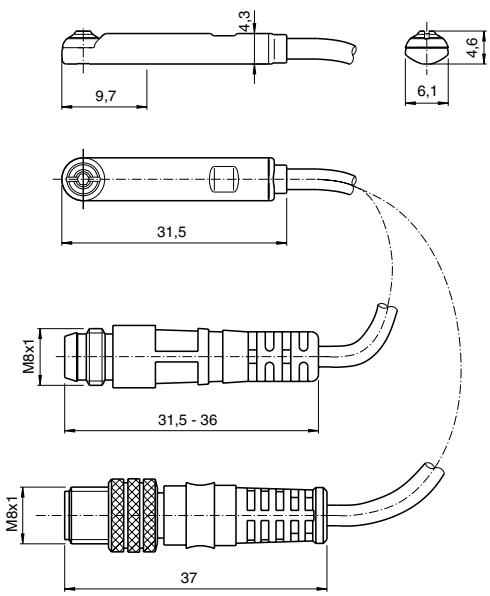


Reed sensors

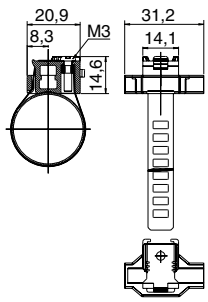


Dimensions

Sensors



Sensor mounting P8S-TMC01



P

Ordering data

Output/function	Cable/connector	Weight kg	Order code
Electronic sensors , 10-30 V DC			
PNP type, normally open	0,27 m PUR-cable and 8 mm snap-in male connector	0,007	**P8S-GPSHX**
PNP type, normally open	1,0 m PUR-cable and 8 mm snap-in male connector	0,013	**P8S-GPSCX**
PNP type, normally open	1,0 m PUR-cable and M8 screw male connector	0,013	**P8S-GPCCX**
PNP type, normally open	0,27 m PUR-cable and M12 screw male connector	0,015	**P8S-GPMHX**
PNP type, normally open	3 m PVC-cable without connector	0,030	**P8S-GPFLX**
PNP type, normally open	10 m PVC-cable without connector	0,110	**P8S-GPFTX**
Electronic sensor 18-30 V DC ATEX-certified			
CE Ex **II3G EEx nA II T4X II3D 135 °C IP67**			
Type PNP , normally open	3 m PVC-cable without connector	0,030	**P8S-GPFLX/EX**
Reed sensors , 10-30 V AC/DC			
Normally open	0,27 m PUR-cable and 8 mm snap-in male connector	0,007	**P8S-GSSHX**
Normally open	1,0 m PUR-cable and 8 mm snap-in male connector	0,013	**P8S-GSSCX**
Normally open	1,0 m PUR-cable and M8 male connector	0,013	**P8S-GSCCX**
Normally open	0,27 m PUR-cable and M12 screw male connector	0,015	**P8S-GSMHX**
Normally open	1,0 m PUR-cable and M12 screw male connector	0,023	**P8S-GSMCX**
Normally open	3 m PVC-cable without connector	0,030	**P8S-GSFLX**
Normally open	10 m PVC-cable without connector	0,110	**P8S-GSFTX**
Normally closed	5m PVC-cable without connector [1]	0,050	**P8S-GCFPX**
Reed sensors, 10-120 V AC/DC			
Normally open	3 m PVC-cable without connector	0,030	**P8S-GRFLX**
Reed sensorer, 24-230 V AC/DC			
Normally open	3 m PVC-cable without connector	0,030	**P8S-GRFLX2**

1) Without LED

Sensor mounting

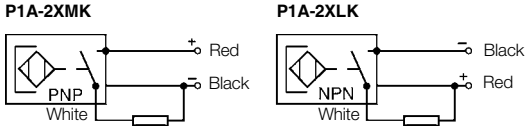
Description	Weight kg	Order code
Sensor mounting for cylinder P1A cylinder bore Ø10 to Ø25 mm	0,07	**P8S-TMC01**

P

Sensors for special applications

Sensors for applications where the short installation length and the 90 degree cable outlet are important factors. This type of sensor is an good alternative if a cylinder has a short stroke or tight installation, and installation is easier than our global series of sensors.

Electronic sensor symbol

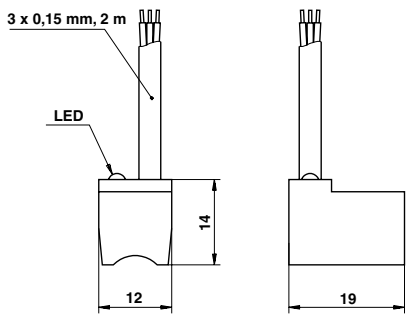


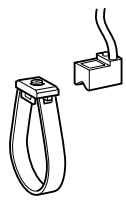
Technical data

Design	Hall element
Output	PNP resp. NPN, N.O.
Voltage range	10-30 VDC
Max permissible ripple	10%
Max voltage drop	≤0,5 V at 100 mA
Max load current, P1A-2XMK, LK	150 mA
P1A-2XHK, EK, JH, FH	100 mA
Max breaking power (resistive)	6 W
Internal consumption	<30 mA at 30 V
Min actuating distance	5 mm
Hysteresis	1,1 - 1,3 mm
Repeatability accuracy	±0,1 mm
Max on/off switching frequency	1 kHz
Max on/off switching time	0,8/3,0 µs
Encapsulation, P1A-2XJH, FH	IP 65
Encapsulation, P1A-2XHK, EK, MK, LK	IP 67
Temperature range	–10 °C to +60 °C
Indication	LED
Shock resistance	40 g
Material, housing	Polyamid 11
Material, mould	Epoxy
Cable	PVC 3x0,15 mm²
Cable incl. female part connector	PVC 3x0,15 mm²
Connector	Diam. 8 mm snap on
Mounting	Mounting yoke
Material, mounting	Acetal/Stainless steel
Material, screw	Stainless steel

Dimensions

P1A-2XMK and P1A-2XLK





Ordering data

Output	Cable length	Weight kg	Order code
Electronic sensors			
PNP, N.O.	2 m	0,040	**P1A-2XMK**
NPN, N.O.	2 m	0,040	**P1A-2XLK**
Mountngs for sensors			
For cylinder Ø10		0,005	**P1A-2CCC**
For cylinder Ø12		0,005	**P1A-2DCC**
For cylinder Ø16		0,008	**P1A-2FCC**
For cylinder Ø20		0,008	**P1A-2HCC**
For cylinder Ø25		0,010	**P1A-2JCC**

P

Connecting cables with one connector

The cables have an integral snap-in female connector.

Type of cable	Cable/connector	Weight kg	Order code
Cables for sensors, complete with one female connector			
Cable, Flex PVC	3 m, 8 mm Snap-in connector	0,07	**9126344341**
Cable, Flex PVC	10 m, 8 mm Snap-in connector	0,21	**9126344342**
Cable, Super Flex PVC	3 m, 8 mm Snap-in connector	0,07	**9126344343**
Cable, Super Flex PVC	10 m, 8 mm Snap-in connector	0,21	**9126344344**
Cable, Polyurethane	3 m, 8 mm Snap-in connector	0,01	**9126344345**
Cable, Polyurethane	10 m, 8 mm Snap-in connector	0,20	**9126344346**
Cable, Polyurethane	5 m, M12 screw connector	0,07	**9126344348**
Cable, Polyurethane	10 m, M12 screw connector	0,20	**9126344349**

Male connectors for connecting cables

Cable connectors for producing your own connecting cables. The connectors can be quickly attached to the cable without special tools. Only the outer sheath of the cable is removed. The connectors are available for M8 and M12 screw connectors and meet protection class IP 65.

Connector	Weight kg	Order code
M8 screw connector	0,017	**P8SCS0803J**
M12 screw connector	0,022	**P8SCS1204J**

P

Connection block Valvetronic 110

The Valvetronic 110 is a connection block that can be used for collecting signals from sensors at various points on a machine and connecting them to the control system via a multicore cable. Valvetronic 110 can also be used for central connection of the multi-core cable to the outputs of a control system, and can be laid to a machine where the output signals can be connected. The connection block has ten 8 mm snap-in circular connectors and a multi-core cable which is available in lengths of 3 or 10 m. The connections on the block are numbered from 1 to 10. Blanking plugs are available for unused connections, as labels for marking the connections of each block.

Technical data

Connections:

Ten 3-pole numbered 8 mm round snap-in female contacts

Input block	
Pin 1	Common, +24 VDC
Pin 2	Input signal
Pin 3	Common, 0V

Output block	
Pin 1	Common, GND
Pin 2	Output signal
Pin 3	Common, 0V

Electrical data:

Voltage	24 VDC (max. 60 V AC/75 V DC)
Insulation group	according to DIN 0110 class C
Load	max. 1 A per connection total max. 3 A

Cable:

Length	3 m or 10 m
Type of cable LifYY11Y	
Conductor	12
Area	0.34 mm²
Colour marking	According to DIN 47 100

Mechanical data

Enclosure	IP 67, DIN 40050 with fitted contacts and/or blanking plugs.
Temperature	–20 °C to +70 °C

Material

Body	PA 6,6 VD according to UL 94
Contact holder	PBTP
Snap-in ring	LDPE
Moulding mass	Epoxy
Seal	NBR
Screws	Plated steel

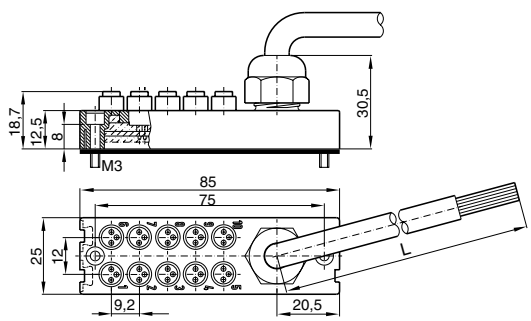
Industrial durability

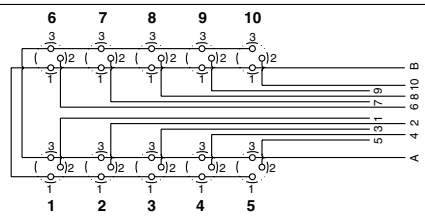
Good chemical and oil resistance. Tests should be performed in aggressive environments.

Ordering data

	Designation	Weight kg	Order code
	Connection block Valvetronic 110 with 3 m cable Connection block Valvetronic 110 with 10 m cable	0,32 0,95	**9121719001** **9121719002**
	Blanking plugs (pack of 10) Use blanking plugs to close unused connections.	0,02	**9121719003**
	Labels (pack of 10) White labels to insert in grooves on the side of the connection	0,02	**9121719004**

Dimensions and wiring diagrams





Conductor	Colour	Input	Output
1	Pink	Signal 1	Signal 1
2	Grey	Signal 2	Signal 2
3	Yellow	Signal 3	Signal 3
4	Green	Signal 4	Signal 4
5	White	Signal 5	Signal 5
6	Red	Signal 6	Signal 6
7	Black	Signal 7	Signal 7
8	Violet	Signal 8	Signal 8
9	Grey-Pink	Signal 9	Signal 9
10	Red-Blue	Signal 10	Signal 10
A	Blue	0 V	0 V
B	Brown	+24 V	PE

P

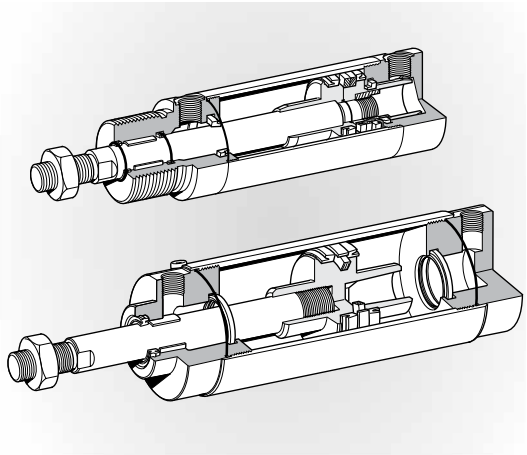
Seal kits for P1S cylinders

Complete seal kits consisting of:

Piston seals

Cushioning seals
Piston rod bearing
Piston rod seal

Scraper ring
O-rings



Standard temperature versions

Cylinder designation	Order code
P1S-•032MS	**9121659195**
P1S-•040MS	**9121659196**
P1S-•050MS	**9121659197**
P1S-•063MS	**9121659198**
P1S-•080MS	**9121718905**
P1S-•100MS	**9121718906**
P1S-•125MS	**9121718907**

High temperature versions

Cylinder designation	Order code
P1S-•032MF	**9121720595**
P1S-•040MF	**9121720596**
P1S-•050MF	**9121720597**
P1S-•063MF	**9121720598**
P1S-•080MF	**9121718925**
P1S-•100MF	**9121718926**
P1S-•125MF	**9121718927**

Low temperature versions

Cylinder designation	Order code
P1S-•080ML	**9121718935**
P1S-•100ML	**9121718936**
P1S-•125ML	**9121718937**

Standard temperature with Through rod

Cylinder designation	Order code
P1S-•080FS	**9121718955**
P1S-•100FS	**9121718956**
P1S-•125FS	**9121718957**

Standard temperature with stainless steel scraper ring

Cylinder designation	Order code
P1S-•080MQ	**9121718915**
P1S-•100MQ	**9121718916**
P1S-•125MQ	**9121718917**

Grease

Version	Weight	Order code
Standard and Low temperature	30 g	**9127394541**
High temperature	30 g	**9127394521**

P