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Pneumatic Cylinders

Series P1D-X - Ø32 to Ø125 mm
For Extreme Conditions
According to ISO 15552

PDE2662TCUK April 2015



ENGINEERING YOUR SUCCESS.

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**Important**

Before attempting any external or internal work on the cylinder or any connected components, make sure the cylinder is vented and disconnect the air supply in order to ensure isolation of the air supply.

**Note**

All technical data in this catalogue are typical data only.
Air quality is essential for maximum cylinder service life (see ISO 8573).

**WARNING**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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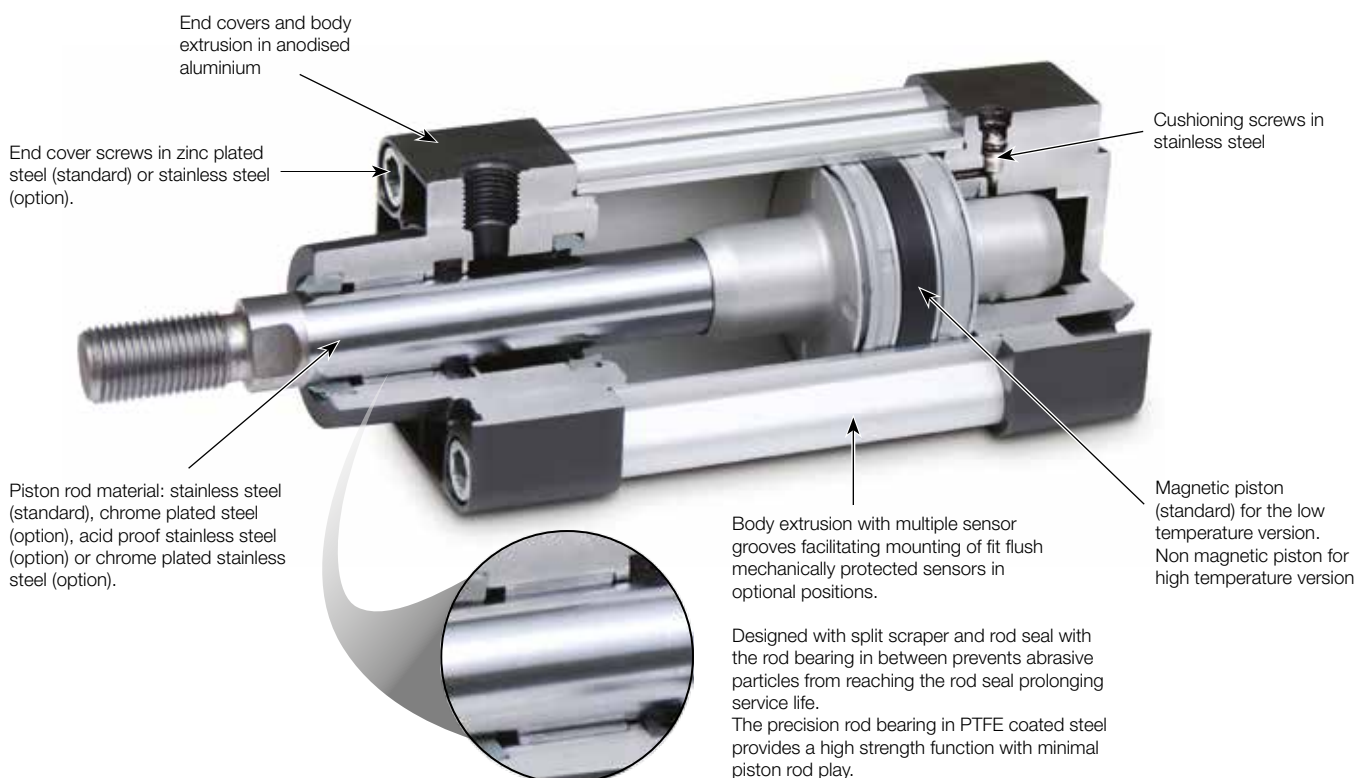
Extreme Environments



Use P1D-X Pneumatic ISO Cylinders

Challenges encountered within rigorous environments require leading engineered solutions and products. Meeting these exacting needs the P1D-X Series of ISO 15552 pneumatic cylinders provides the answer for high and low temperature applications. Engineered to provide superior performance in harsh conditions using proven class leading seal technology for reliable operation and

long service life in temperatures down to -40°C and up to $+150^{\circ}\text{C}$. With robust corrosion resistant metal body, PTFE coated steel bearing and optional metal scraper the P1D-X Series is available in bore sizes 32 to 125mm. Fully supported by a range of ISO mountings the P1D-X leads the way in today's changing climate.



Road



Industrial



Oil & Gas



Rail



Agri-Food



Forestry

Proven pneumatic cylinders up to 150°C

The new high temperature P1D-X range has been developed based on the know-how over decades from a variety of high temperature applications for pneumatic actuators e.g. for use in boilers and iron works.

More specifically the vast and in-depth experience from 40 years as leading partner for dedicated Crust Breaker cylinders to the Aluminium Smelter Industry (production of primary aluminium) has been a decisive knowledge and reference for the design work. The results from extensive testing and the long reference list of proven, successful Aluminium Smelter applications with Crust Breaker and Feeder cylinder operating continuously, year after year, in up to 150°C has given us a solid knowledge for the design of P1D-X.



Aluminium Smelter Industry

Crust Breaker Cylinders operate continuously in up to 150°C to break the crust in each pot to facilitate refilling of raw material (alumina).



Heavy Industry

- High temperature operation
- Robust and reliable
- Long service life

Seal and grease technology for high temperatures

The key for reliable operation of pneumatic cylinders in high temperatures is the seal and grease system. It takes thorough testing to arrive at the optimum and proven technology.

- Seals in proven FPM (Viton) material for reliability and long service life.
- Dedicated high temperature grease with special formula is vital for the performance of the cylinder.
- The combined system of seals and grease developed for P1D-X is the key for the excellent function in the temperature range -10°C to +150°C.

High temperature cylinder series

P1D-X ***MF

- ISO 15552 conformity
- Bore sizes Ø32 - Ø125 mm
- Temperature range -10°C to +150°C
- Corrosion resistant



Reliable low temperature pneumatic cylinders

As a developer of engineered solutions Parker Hannifin is a major supplier to companies within the Bus, Truck and Rail industries. The experience gained over the decades on these demanding applications has formed the basis for the development of our new generation of low temperature pneumatic cylinders. Repeated high reliability in extreme temperature conditions, sealing systems with low leakage and corrosion resistance design are key product properties engineered into the P1D-X Series of low temperature cylinders.

Seal technology

Parker have combined the most sought after features of seal technology to provide low temperature pneumatic cylinders with high reliability, low leakage and long service life.

- Seals engineered for low temperature in polyurethane formulated specifically for optimal performance in the temperature range -40°C to +80°C.
- Seal material retains its elastic properties with maintained performance even at extreme low temperatures.
- Low temperature characteristics but maintaining superior wear resistance.
- Industrial proven profiles.

Features

- Lightweight diecast aluminium construction but maintaining torsional rigidity
- End covers and body extrusion in anodised aluminium as well as piston rod and cushioning screws in stainless steel.
- Grease specifically formulated to support performance and reliability at low temperatures
- Proximity sensing (but please note that the sensors are normally specified for full performance down to -25°C only)
- A wide range of cylinder mountings in anodised aluminium providing the same overall corrosion resistance.

Low temperature cylinder series

P1D-X ***ML

- Temperature range -40°C to +80°C
- ISO 15552 conformity
- Bore sizes Ø32 - Ø125 mm
- Corrosion resistant



Bus Industry

- Operational reliability
- Flexible mounting
- Easily accessible adjustment
- Repairable



Road Industry

- Long life non lube service
- Leak proof design
- Corrosion resistant surface
- Easily repairable



Rail Industry

- User servicable construction
- Performance and reliability
- Low friction seal technology

P1D-X High Temperature Cylinders

All seals in the high temperature version of P1D-X are developed and validated for continuous operation up to +150° C. The combination of the seal geometry and the FPM material (Viton) ensures reliable and long service life. Certain restrictions apply when choosing sensors due to the temperature range. High temperature cylinders have no magnetic piston and cannot be fitted with sensors (the magnetic field strength in high temperatures is too low to ensure correct reliable sensor function).

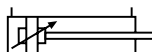
- Conforms to ISO 15552.
- Bore 32-125 mm.
- Double acting.
- Stainless steel piston rod.
- Adjustable air cushioning.
- Wide range of mountings.



Operating information

Working pressure:	Max 10 bar
Working temperature:	
High temp. version	-10°C to +150°C

P1D-X - High temperature



Ø32mm - (G¹/₈)

Stroke mm	Order code
25	P1D-X032MF-0025
50	P1D-X032MF-0050
80	P1D-X032MF-0080
100	P1D-X032MF-0100
125	P1D-X032MF-0125
160	P1D-X032MF-0160
200	P1D-X032MF-0200
250	P1D-X032MF-0250
320	P1D-X032MF-0320
400	P1D-X032MF-0400
500	P1D-X032MF-0500

Ø63mm - (G³/₈)

Stroke mm	Order code
25	P1D-X063MF-0025
50	P1D-X063MF-0050
80	P1D-X063MF-0080
100	P1D-X063MF-0100
125	P1D-X063MF-0125
160	P1D-X063MF-0160
200	P1D-X063MF-0200
250	P1D-X063MF-0250
320	P1D-X063MF-0320
400	P1D-X063MF-0400
500	P1D-X063MF-0500

Ø100mm - (G¹/₂)

Stroke mm	Order code
25	P1D-X100MF-0025
50	P1D-X100MF-0050
80	P1D-X100MF-0080
100	P1D-X100MF-0100
125	P1D-X100MF-0125
160	P1D-X100MF-0160
200	P1D-X100MF-0200
250	P1D-X100MF-0250
320	P1D-X100MF-0320
400	P1D-X100MF-0400
500	P1D-X100MF-0500

Ø40mm - (G¹/₄)

Stroke mm	Order code
25	P1D-X040MF-0025
50	P1D-X040MF-0050
80	P1D-X040MF-0080
100	P1D-X040MF-0100
125	P1D-X040MF-0125
160	P1D-X040MF-0160
200	P1D-X040MF-0200
250	P1D-X040MF-0250
320	P1D-X040MF-0320
400	P1D-X040MF-0400
500	P1D-X040MF-0500

Ø80mm - (G³/₈)

Stroke mm	Order code
25	P1D-X080MF-0025
50	P1D-X080MF-0050
80	P1D-X080MF-0080
100	P1D-X080MF-0100
125	P1D-X080MF-0125
160	P1D-X080MF-0160
200	P1D-X080MF-0200
250	P1D-X080MF-0250
320	P1D-X080MF-0320
400	P1D-X080MF-0400
500	P1D-X080MF-0500

Ø125mm - (G¹/₂)

Stroke mm	Order code
25	P1D-X125MF-0025
50	P1D-X125MF-0050
80	P1D-X125MF-0080
100	P1D-X125MF-0100
125	P1D-X125MF-0125
160	P1D-X125MF-0160
200	P1D-X125MF-0200
250	P1D-X125MF-0250
320	P1D-X125MF-0320
400	P1D-X125MF-0400
500	P1D-X125MF-0500

Ø50mm - (G¹/₄)

Stroke mm	Order code
25	P1D-X050MF-0025
50	P1D-X050MF-0050
80	P1D-X050MF-0080
100	P1D-X050MF-0100
125	P1D-X050MF-0125
160	P1D-X050MF-0160
200	P1D-X050MF-0200
250	P1D-X050MF-0250
320	P1D-X050MF-0320
400	P1D-X050MF-0400
500	P1D-X050MF-0500

The cylinders are supplied complete with a zinc plated steel piston rod nut.

P1D-X Low Temperature Cylinders

All seals in the low temperature version of P1D-X are developed and validated for continuous operation down to -40°C . Polyurethane PUR seal technology and specifically formulated grease support performance and reliability for low temperature applications. As standard supplied with a magnetic ring in the piston for proximity sensing but please note that the sensors are normally specified for full performance to -25°C only.

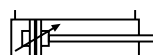


- Conforms to ISO 15552.
- Bore 32-125 mm.
- Double acting.
- Stainless steel piston rod.
- Adjustable air cushioning.
- Wide range of mountings and drop-in sensors.

Operating information

Working pressure:	Max 10 bar
Working temperature:	
Low temp. version	-40°C to $+80^{\circ}\text{C}$

P1D-X - Low temperature



Ø32mm - ($G^{1/8}$)

Stroke mm	Order code
25	P1D-X032ML-0025
50	P1D-X032ML-0050
80	P1D-X032ML-0080
100	P1D-X032ML-0100
125	P1D-X032ML-0125
160	P1D-X032ML-0160
200	P1D-X032ML-0200
250	P1D-X032ML-0250
320	P1D-X032ML-0320
400	P1D-X032ML-0400
500	P1D-X032ML-0500

Ø63mm - ($G^{3/8}$)

Stroke mm	Order code
25	P1D-X063ML-0025
50	P1D-X063ML-0050
80	P1D-X063ML-0080
100	P1D-X063ML-0100
125	P1D-X063ML-0125
160	P1D-X063ML-0160
200	P1D-X063ML-0200
250	P1D-X063ML-0250
320	P1D-X063ML-0320
400	P1D-X063ML-0400
500	P1D-X063ML-0500

Ø100mm - ($G^{1/2}$)

Stroke mm	Order code
25	P1D-X100ML-0025
50	P1D-X100ML-0050
80	P1D-X100ML-0080
100	P1D-X100ML-0100
125	P1D-X100ML-0125
160	P1D-X100ML-0160
200	P1D-X100ML-0200
250	P1D-X100ML-0250
320	P1D-X100ML-0320
400	P1D-X100ML-0400
500	P1D-X100ML-0500

Ø40mm - ($G^{1/4}$)

Stroke mm	Order code
25	P1D-X040ML-0025
50	P1D-X040ML-0050
80	P1D-X040ML-0080
100	P1D-X040ML-0100
125	P1D-X040ML-0125
160	P1D-X040ML-0160
200	P1D-X040ML-0200
250	P1D-X040ML-0250
320	P1D-X040ML-0320
400	P1D-X040ML-0400
500	P1D-X040ML-0500

Ø80mm - ($G^{3/8}$)

Stroke mm	Order code
25	P1D-X080ML-0025
50	P1D-X080ML-0050
80	P1D-X080ML-0080
100	P1D-X080ML-0100
125	P1D-X080ML-0125
160	P1D-X080ML-0160
200	P1D-X080ML-0200
250	P1D-X080ML-0250
320	P1D-X080ML-0320
400	P1D-X080ML-0400
500	P1D-X080ML-0500

Ø125mm - ($G^{1/2}$)

Stroke mm	Order code
25	P1D-X125ML-0025
50	P1D-X125ML-0050
80	P1D-X125ML-0080
100	P1D-X125ML-0100
125	P1D-X125ML-0125
160	P1D-X125ML-0160
200	P1D-X125ML-0200
250	P1D-X125ML-0250
320	P1D-X125ML-0320
400	P1D-X125ML-0400
500	P1D-X125ML-0500

Ø50mm - ($G^{1/4}$)

Stroke mm	Order code
25	P1D-X050ML-0025
50	P1D-X050ML-0050
80	P1D-X050ML-0080
100	P1D-X050ML-0100
125	P1D-X050ML-0125
160	P1D-X050ML-0160
200	P1D-X050ML-0200
250	P1D-X050ML-0250
320	P1D-X050ML-0320
400	P1D-X050ML-0400
500	P1D-X050ML-0500

The cylinders are supplied complete with a zinc plated steel piston rod nut.

P1D-X Metal Scraper Cylinders

All seals in the metal scraper of P1D-X are developed and validated for continuous operation down to -30°C . Polyurethane PUR seal technology and specifically formulated grease support performance and reliability for external applications. As standard supplied with a magnetic ring in the piston for proximity sensing but please note that the sensors are normally specified for full performance to -25°C only.



- Conforms to ISO 15552.
- Bore 32-125 mm.
- Double acting.
- Chromed plated steel piston rod.
- Adjustable air cushioning.
- Wide range of mountings and drop-in sensors.

Operating information

Working pressure:	Max 10 bar
Working temperature:	
Low temp. version	-30°C to $+80^{\circ}\text{C}$

P1D-X - Low temperature, metal scraper



Ø32mm - (G¹/₈)

Stroke mm	Order code
25	P1D-X032QK-0025
50	P1D-X032QK-0050
80	P1D-X032QK-0080
100	P1D-X032QK-0100
125	P1D-X032QK-0125
160	P1D-X032QK-0160
200	P1D-X032QK-0200
250	P1D-X032QK-0250
320	P1D-X032QK-0320
400	P1D-X032QK-0400
500	P1D-X032QK-0500

Ø63mm - (G³/₈)

Stroke mm	Order code
25	P1D-X063QK-0025
50	P1D-X063QK-0050
80	P1D-X063QK-0080
100	P1D-X063QK-0100
125	P1D-X063QK-0125
160	P1D-X063QK-0160
200	P1D-X063QK-0200
250	P1D-X063QK-0250
320	P1D-X063QK-0320
400	P1D-X063QK-0400
500	P1D-X063QK-0500

Ø100mm - (G¹/₂)

Stroke mm	Order code
25	P1D-X100QK-0025
50	P1D-X100QK-0050
80	P1D-X100QK-0080
100	P1D-X100QK-0100
125	P1D-X100QK-0125
160	P1D-X100QK-0160
200	P1D-X100QK-0200
250	P1D-X100QK-0250
320	P1D-X100QK-0320
400	P1D-X100QK-0400
500	P1D-X100QK-0500

Ø40mm - (G¹/₄)

Stroke mm	Order code
25	P1D-X040QK-0025
50	P1D-X040QK-0050
80	P1D-X040QK-0080
100	P1D-X040QK-0100
125	P1D-X040QK-0125
160	P1D-X040QK-0160
200	P1D-X040QK-0200
250	P1D-X040QK-0250
320	P1D-X040QK-0320
400	P1D-X040QK-0400
500	P1D-X040QK-0500

Ø80mm - (G³/₈)

Stroke mm	Order code
25	P1D-X080QK-0025
50	P1D-X080QK-0050
80	P1D-X080QK-0080
100	P1D-X080QK-0100
125	P1D-X080QK-0125
160	P1D-X080QK-0160
200	P1D-X080QK-0200
250	P1D-X080QK-0250
320	P1D-X080QK-0320
400	P1D-X080QK-0400
500	P1D-X080QK-0500

Ø125mm - (G¹/₂)

Stroke mm	Order code
25	P1D-X125QK-0025
50	P1D-X125QK-0050
80	P1D-X125QK-0080
100	P1D-X125QK-0100
125	P1D-X125QK-0125
160	P1D-X125QK-0160
200	P1D-X125QK-0200
250	P1D-X125QK-0250
320	P1D-X125QK-0320
400	P1D-X125QK-0400
500	P1D-X125QK-0500

Ø50mm - (G¹/₄)

Stroke mm	Order code
25	P1D-X050QK-0025
50	P1D-X050QK-0050
80	P1D-X050QK-0080
100	P1D-X050QK-0100
125	P1D-X050QK-0125
160	P1D-X050QK-0160
200	P1D-X050QK-0200
250	P1D-X050QK-0250
320	P1D-X050QK-0320
400	P1D-X050QK-0400
500	P1D-X050QK-0500

The cylinders are supplied complete with a zinc plated steel piston rod nut.

P1D-X Low Pressure Hydraulic Cylinders

All seals in the low hydraulic version of P1D-X are developed and validated for continuous operation down to -20° C. Mineral oil is used instead of compressed air at pressure lower than 10 bar.



- Conforms to ISO 15552.
- Bore 32-125 mm.
- Double acting.
- Chromed plated steel piston rod.
- Wide range of mountings.

Operating information

Working pressure:	Max 10 bar
Working temperature:	
Standard temp.:	-20°C to +80°C

P1D-X - Low Pressure Hydraulic



Ø32mm - (G¹/₈)

Stroke mm	Order code
25	P1D-X032MJ-0025
50	P1D-X032MJ-0050
80	P1D-X032MJ-0080
100	P1D-X032MJ-0100
125	P1D-X032MJ-0125
160	P1D-X032MJ-0160
200	P1D-X032MJ-0200
250	P1D-X032MJ-0250
320	P1D-X032MJ-0320
400	P1D-X032MJ-0400
500	P1D-X032MJ-0500

Ø63mm - (G³/₈)

Stroke mm	Order code
25	P1D-X063MJ-0025
50	P1D-X063MJ-0050
80	P1D-X063MJ-0080
100	P1D-X063MJ-0100
125	P1D-X063MJ-0125
160	P1D-X063MJ-0160
200	P1D-X063MJ-0200
250	P1D-X063MJ-0250
320	P1D-X063MJ-0320
400	P1D-X063MJ-0400
500	P1D-X063MJ-0500

Ø100mm - (G¹/₂)

Stroke mm	Order code
25	P1D-X100MJ-0025
50	P1D-X100MJ-0050
80	P1D-X100MJ-0080
100	P1D-X100MJ-0100
125	P1D-X100MJ-0125
160	P1D-X100MJ-0160
200	P1D-X100MJ-0200
250	P1D-X100MJ-0250
320	P1D-X100MJ-0320
400	P1D-X100MJ-0400
500	P1D-X100MJ-0500

Ø40mm - (G¹/₄)

Stroke mm	Order code
25	P1D-X040MJ-0025
50	P1D-X040MJ-0050
80	P1D-X040MJ-0080
100	P1D-X040MJ-0100
125	P1D-X040MJ-0125
160	P1D-X040MJ-0160
200	P1D-X040MJ-0200
250	P1D-X040MJ-0250
320	P1D-X040MJ-0320
400	P1D-X040MJ-0400
500	P1D-X040MJ-0500

Ø80mm - (G³/₈)

Stroke mm	Order code
25	P1D-X080MJ-0025
50	P1D-X080MJ-0050
80	P1D-X080MJ-0080
100	P1D-X080MJ-0100
125	P1D-X080MJ-0125
160	P1D-X080MJ-0160
200	P1D-X080MJ-0200
250	P1D-X080MJ-0250
320	P1D-X080MJ-0320
400	P1D-X080MJ-0400
500	P1D-X080MJ-0500

Ø125mm - (G¹/₂)

Stroke mm	Order code
25	P1D-X125MJ-0025
50	P1D-X125MJ-0050
80	P1D-X125MJ-0080
100	P1D-X125MJ-0100
125	P1D-X125MJ-0125
160	P1D-X125MJ-0160
200	P1D-X125MJ-0200
250	P1D-X125MJ-0250
320	P1D-X125MJ-0320
400	P1D-X125MJ-0400
500	P1D-X125MJ-0500

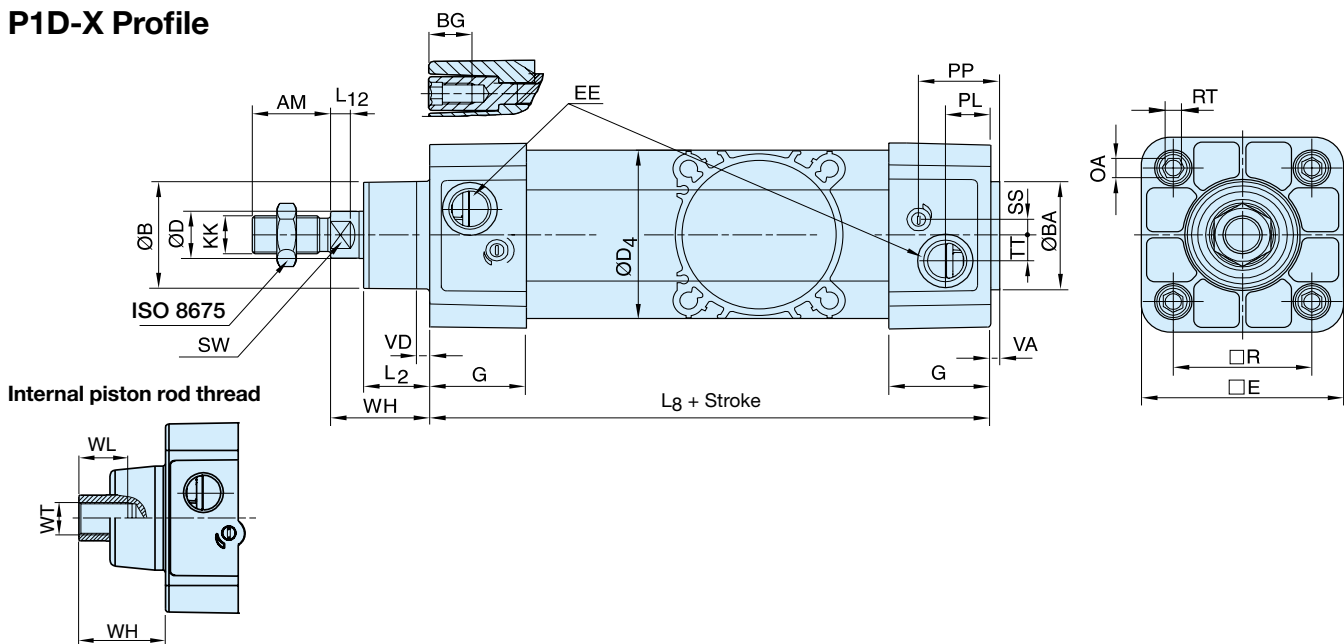
Ø50mm - (G¹/₄)

Stroke mm	Order code
25	P1D-X050MJ-0025
50	P1D-X050MJ-0050
80	P1D-X050MJ-0080
100	P1D-X050MJ-0100
125	P1D-X050MJ-0125
160	P1D-X050MJ-0160
200	P1D-X050MJ-0200
250	P1D-X050MJ-0250
320	P1D-X050MJ-0320
400	P1D-X050MJ-0400
500	P1D-X050MJ-0500

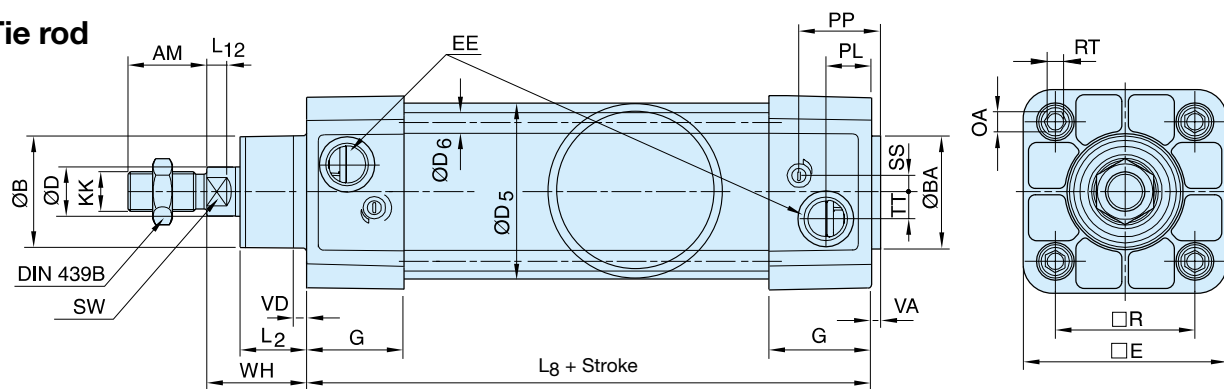
The cylinders are supplied complete with a zinc plated steel piston rod nut.

P1D-X Pneumatic ISO Cylinders

P1D-X Profile



P1D-T Tie rod



Dimensions (mm)

Cylinder bore mm	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E mm	EE mm	G mm	KK mm	L2 mm	L8 mm	L12 mm
32	22	30	30	16	12	45,0	48,0	G1/8	28,5	M10x1,25	16,8	94	6,0
40	24	35	35	16	16	52,0	53,5	G1/4	33,0	M12x1,25	19,0	105	6,5
50	32	40	40	16	20	60,7	65,2	G1/4	33,5	M16x1,5	24,0	106	8,0
63	32	45	45	16	20	71,5	75,5	G3/8	39,5	M16x1,5	24,3	121	8,0
80	40	45	45	17	25	86,7	95,0	G3/8	39,5	M20x1,5	30,0	128	10,0
100	40	55	55	17	25	106,7	114,0	G1/2	44,5	M20x1,5	34,0	138	14,0
125	54	60	60	20	32	134,0	139,0	G1/2	51,0	M27x2	45,0	160	18,0

Cylinder bore mm	OA mm	PL mm	PP mm	R mm	RT mm	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm	WL mm	WT mm
32	6,0	14,0	24,2	32,5	M6	5,5	10	4,2	3,5	4,5	26	21	M8x1
40	6,0	16,0	27,5	38,0	M6	8,0	13	5,5	3,5	4,5	30	23	M10x1,25
50	8,0	14,0	29,3	46,5	M8	9,0	17	7,5	3,5	4,5	37	31	M14x1,5
63	8,0	16,6	30,8	56,5	M8	6,5	17	10,0	3,5	4,5	37	31	M14x1,5
80	6,0	16,8	33,5	72,0	M10	0	22	11,5	3,5	4,5	46	39	M18x1,5
100	6,0	20,5	37,5	89,0	M10	0	22	14,5	3,5	4,5	51	39	M18x1,5
125	8,0	23,3	45,8	110,0	M12	0	27	15,0	5,5	6,5	65	53	M24x2

S=Stroke

Tolerances (mm)

Cylinder bore mm	B mm	BA mm	L ₃ mm	L ₉ mm	R mm	Stroke tolerance up to stroke 500 mm	Stroke tolerance for stroke over 500 mm
32	d11	d11	±0,4	±2	±0,5	+0,3/+2,0	+0,3/+3,0
40	d11	d11	±0,7	±2	±0,5	+0,3/+2,0	+0,3/+3,0
50	d11	d11	±0,7	±2	±0,6	+0,3/+2,0	+0,3/+3,0
63	d11	d11	±0,8	±2	±0,7	+0,3/+2,0	+0,3/+3,0
80	d11	d11	±0,8	±3	±0,7	+0,3/+2,0	+0,3/+3,0
100	d11	d11	±1,0	±3	±0,7	+0,3/+2,0	+0,3/+3,0
125	d11	d11	±1,0	±3	±1,1	+0,3/+2,0	+0,3/+3,0

Order Key Code (Model code with 20 digits used only for the trunnion option or for a female thread on the piston rod)

15 digit order code															20 digit order code *																																																																																						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20																																																																																		
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5					6-7-8			6 Rod extension only					7-8																																																																																								
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³⁾ -30°C for low temperature version, not available for high temp.

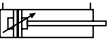
¹⁾ In combination with metal scraper

²⁾ Piston made in aluminum, not possible for P1D-T Series.

Standard strokes

Standard strokes for all P1D cylinders comply with ISO 4393.

Special strokes up to 2800 mm.

Order no	Cylinder bore (mm)	● = Standard stroke (mm)	■ = Stroke to special order
XXXX = Stroke		25 50 80 100 125 160 200 250 320 400 500 600 700 800 2800	
P1D-X			
			
P1D-X032**-XXXX	32	●	■
P1D-X040**-XXXX	40	●	■
P1D-X050**-XXXX	50	●	■
P1D-X063**-XXXX	63	●	■
P1D-X080**-XXXX	80	●	■
P1D-X100**-XXXX	100	●	■
P1D-X125**-XXXX	125	●	■

P1D-X Pneumatic ISO Cylinders

Cylinder forces, double acting variants

Cyl. bore/ pist. rod mm	Stroke	Piston area cm ²	Max theoretical force in N (bar)									
			1,0	2,0	3,0	4,0	5,0	6,0	7,0	8,0	9,0	10,0
32/12	+	8,0	80	161	241	322	402	483	563	643	724	804
	-	6,9	69	138	207	276	346	415	484	553	622	691
40/16	+	12,6	126	251	377	503	628	754	880	1005	1131	1257
	-	10,6	106	212	318	424	530	636	742	848	954	1060
50/20	+	19,6	196	393	589	785	982	1178	1374	1571	1767	1963
	-	16,5	165	330	495	660	825	990	1155	1319	1484	1649
63/20	+	31,2	312	623	935	1247	1559	1870	2182	2494	2806	3117
	-	28,0	280	561	841	1121	1402	1682	1962	2242	2523	2803
80/25	+	50,3	503	1005	1508	2011	2513	3016	3519	4021	4524	5027
	-	45,4	454	907	1361	1814	2268	2721	3175	3629	4082	4536
100/25	+	78,5	785	1571	2356	3142	3927	4712	5498	6283	7069	7854
	-	73,6	736	1473	2209	2945	3682	4418	5154	5890	6627	7363
125/32	+	122,7	1227	2454	3682	4909	6136	7363	8590	9817	11045	12272
	-	114,7	1147	2294	3440	4587	5734	6881	8027	9174	10321	11468

+ = Outward stroke
- = Return stroke

Note!

Select a theoretical force 50-100% larger than the force required

Main data: P1D-X

Cylinder designation	Cylinder bore mm	Piston rod area cm ²	Piston rod dia. mm	Piston rod area cm ²	Piston rod thread	Cushioning length mm	Consumption ²⁾ litre	Connection thread
P1D-X032••XXXX ¹⁾	32	8,0	12	1,1	M10x1,25	17	0,105	G1/8
P1D-X040••XXXX ¹⁾	40	12,6	16	2,0	M12x1,25	19	0,162	G1/4
P1D-X050••XXXX ¹⁾	50	19,6	20	3,1	M16x1,5	20	0,253	G1/4
P1D-X063••XXXX ¹⁾	63	31,2	20	3,1	M16x1,5	23	0,414	G3/8
P1D-X080••XXXX ¹⁾	80	50,3	25	4,9	M20x1,5	23	0,669	G3/8
P1D-X100••XXXX ¹⁾	100	78,5	25	4,9	M20x1,5	27	1,043	G1/2
P1D-X125••XXXX ¹⁾	125	122,7	32	8,0	M27x2	30	1,662	G1/2

Total mass including moving parts

Cylinder designation	Total mass (kg) at 0 mm stroke	Total mass (kg) Supplement per 10 mm stroke
P1D-X032••XXXX ¹⁾	0,55	0,023
P1D-X040••XXXX ¹⁾	0,80	0,033
P1D-X050••XXXX ¹⁾	1,20	0,048
P1D-X063••XXXX ¹⁾	1,73	0,051
P1D-X080••XXXX ¹⁾	2,45	0,075
P1D-X100••XXXX ¹⁾	4,00	0,084
P1D-X125••XXXX ¹⁾	6,87	0,138

Mass moving parts only (for cushioning calculation)

Cylinder designation	Mass moving parts (kg) at 0 mm stroke	Mass moving parts (kg) Supplement per 10 mm stroke
P1D-X032••XXXX ¹⁾	0,13	0,009
P1D-X040••XXXX ¹⁾	0,24	0,016
P1D-X050••XXXX ¹⁾	0,42	0,025
P1D-X063••XXXX ¹⁾	0,50	0,025
P1D-X080••XXXX ¹⁾	0,90	0,039
P1D-X100••XXXX ¹⁾	1,10	0,039
P1D-X125••XXXX ¹⁾	2,34	0,063

1) XXXX = stroke

2) Free air consumption per 10 mm stroke for a double stroke at 6 bar

P1D-X Pneumatic ISO Cylinders

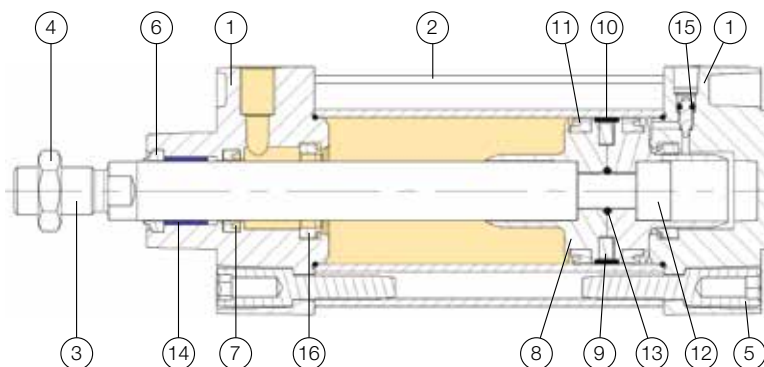
General technical data

Product type	Standard cylinder according to ISO 15552
Bore size	32 - 125 mm
Stroke length	5-2800 mm
Versions	Double acting
Cushioning	Adjustable air cushioning
Position sensing	Proximity sensor in temperature range -25°C to +80°C
Installation	P1D cylinder and piston rod mountings
Mounting position	Any

Operating and environmental data

Operating medium	For best possible service life and trouble-free operation dry, filtered compressed air to ISO 8573-1:2010 quality class 3.4.3 should be used. This specifies a dew point of +3°C for indoor operation (a lower dew point should be selected for minus temperature operation and we recommend the use of an inline dryer) and is in line with the air quality from most standard compressors with a standard filter.		
Operating pressure	0,5 bar to 10 bar	Hydraulic version : 2 bar to 10 bar	
Ambient temperature	High temp version : -10°C to +150°C Low temp version : -40°C to +80°C	Hydraulic version : Metal scraper version :	-20°C to +80°C -30°C to +80°C Standard temp version : -20°C to +80°C
Pre-lubricated	Further lubrication is normally not necessary. If additional lubrication is introduced it must be continued.		
Oil used for hydraulic version	Hydraulic oil type HLP (DIN 51524, ISO 11158). Viscosity by 40°C: 32 mm²/s (cst). Example: Shell Tellus 32 or equal.		
Corrosion resistance	High resistance to corrosion and chemicals. Materials and surface treatment have been selected for industrial applications where solvents and detergents are frequently used.		

Material specification



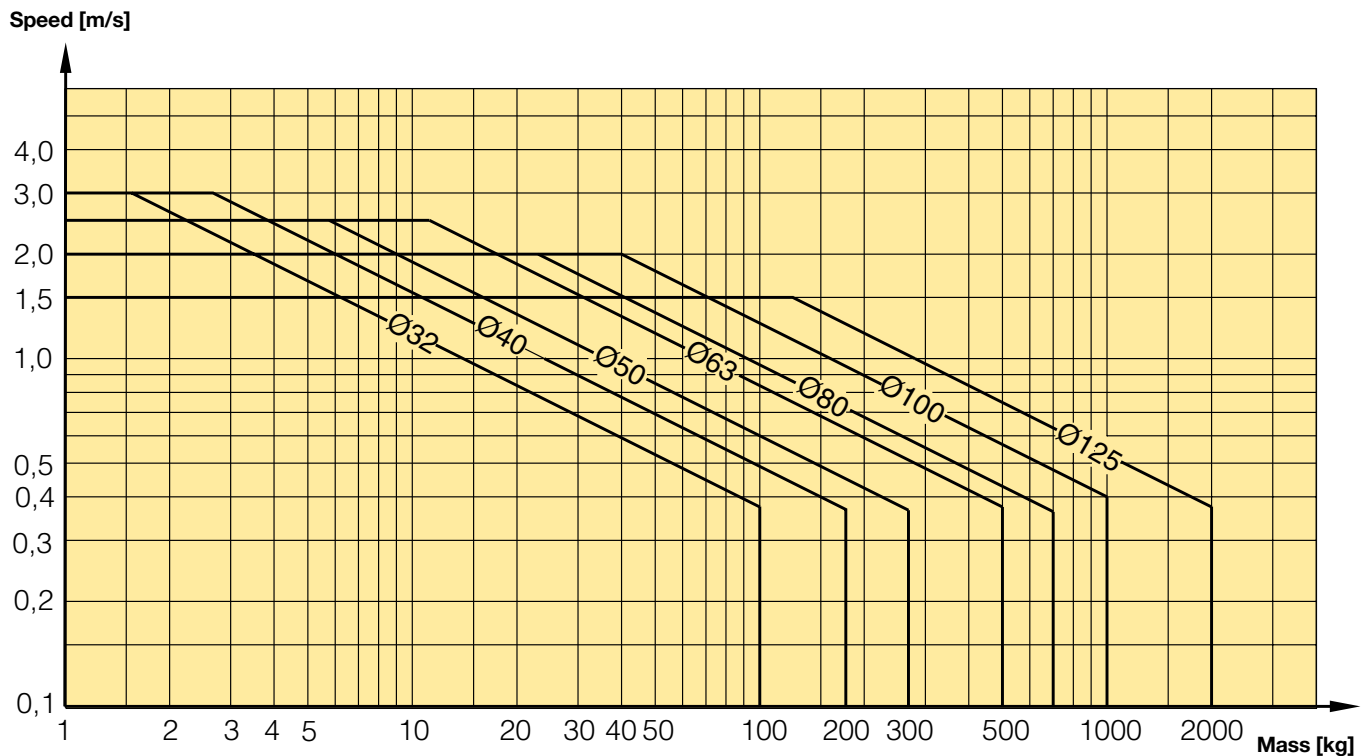
Pos	Part		Specification
1	End covers		Anodised aluminium
2	Cylinder barrel		Anodised aluminium
3	Piston rod	Standard Optional	Stainless steel, DIN X 10 CrNiS 18 9 Hard chromium plated Fe 490-2 FN Acid-proof steel Chrome plated stainless steel
4	Piston rod nut	Standard Optional Optional	Zinc plated steel Stainless steel Acid-proof steel
5	End cover screws	Standard Optional	Zinc plated steel Stainless steel
6	Scraper ring	High temperature Standard & low temperature, hydraulic Metal scraper standard temperature	FPM (Viton) PUR (Polyurethane) Stainless steel / Brass / NBR
7	Piston rod seal	High temperature Standard & low temperature Hydraulic	FPM (Viton) PUR (Polyurethane) NBR(Nitrile)
8	Piston		Aluminium
9	Magnet		Plastic coated magnetic material (Low temperature version only)
10	Piston bearing		PTFE
11	Piston seals	High temperature Standard & low temperature Hydraulic	FPM (Viton) PUR (Polyurethane) NBR(Nitrile)
12	Piston bolt		Zinc plated steel
13	O-rings		Nitrile rubber
14	Piston rod bearing		Multilayer PTFE/steel
15	Cushioning screws		Stainless steel, DIN X 10 CrNiS 18 n9
16	Cushioning seals	High temperature Standard & low temperature	FPM (Viton) PUR (Polyurethane)
	Note on materials		RoHS compliant

Cushioning characteristics

The diagram below is used for dimensioning of cylinders related to the cushioning capacity. The maximum cushioning capacity shown in the diagram assumes the following:

- Low load, i.e. low pressure drop across the piston
- Equilibrium speed
- Correctly adjusted cushioning screw
- 6 bar at cylinder port

The load is the sum of internal and external friction, plus any gravitational forces. At high relative load (pressure drop exceeding 1 bar), we recommend that for any given speed, the mass should be reduced by a factor of 2.5, or for a given mass, the speed should be reduced by a factor of 1.5. This is in relation to the maximum performance given in the diagram



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:

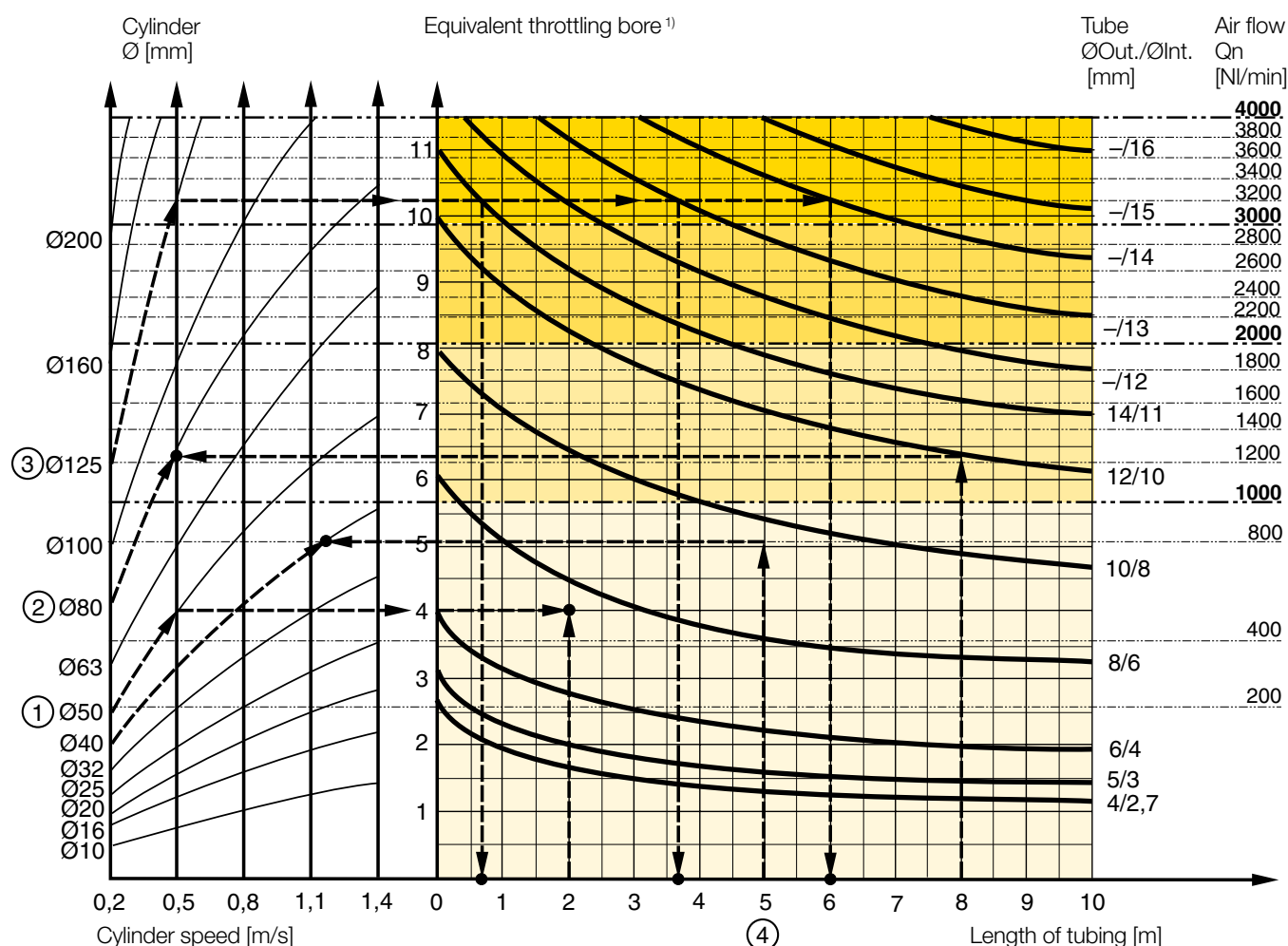
1. The primary line to the working valve could be over sized (this does not cause any extra air consumption and consequently does not create any extra costs in operation).
2. The tubes between the valve and the cylinder should, however, be optimized according to the principle that an insufficient bore 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.

P1D-X Pneumatic ISO Cylinders

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 NI/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 length of tube?

For an 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 NI/min. What diameter of tube can be used and what is maximum length 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 NI/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 NI/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 NI/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 NI/minute

Valve series	Qn in NI/Min
Interface PS1	120
Moduflex Size 1 - Double 4/2 single solenoid	165
Adex A05	173
Isys Micro - Single 5/3 APB	228
Moduflex Size 1 - Single or Double 3/2	235
Isys Micro - Double 3/2	276
Isys Micro - Single 5/2	282
Moduflex Size 1 - Single 4/2	310
ISOMAX DX02	378
ISYS ISO HB	390
Moduflex Size 2 - Single or Double 3/2	440
PVL-B stackable inline valve	540
Adex A12	560
ISOMAX DX01	588
Viking Xtrem P2LAX - G1/8"	660
Moduflex Size 2 - Single 4/2	800
ISYS ISO HA	918
ISOMAX DX1 & DX Rail	1032
PVL-C stackable inline valve	1100
ISYS ISO H1	1248
Viking Xtrem P2LBX - G1/4"	1290
ISOMAX DX2 & DX Rail	2298
Viking Xtrem P2LCX - G3/8"	2460
ISYS ISO H2	2520
Viking Xtrem P2LDX - G1/2"	2658
ISOMAX DX3 & DX Rail	3840
ISYS ISO H3	5022

P1D-X Pneumatic ISO Cylinders

Mountings

Flange MF1/MF2 ¹

Ø 32
Ø 40
Ø 50
Ø 63
Ø 80
Ø 100
Ø 125

P1C-4KMB
P1C-4LMB
P1C-4MMB
P1C-4NMB
P1C-4PMB
P1C-4QMB
P1C-4RMB

Foot brackets MS1 ²

P1C-4KMF
P1C-4LMF
P1C-4MMF
P1C-4NMF
P1C-4PMF
P1C-4QMF
P1C-4RMF

Pivot bracket with
rigid bearing AB7 ³

P1C-4KMD
P1C-4LMD
P1C-4MMD
P1C-4NMD
P1C-4PMD
P1C-4QMD
P1C-4RMD

Swivel eye bracket
MP6 ⁴

P1C-4KMSA
P1C-4LMSA
P1C-4MMSA
P1C-4NMSA
P1C-4PMSA
P1C-4QMSA
P1C-4RMSA

Clevis bracket MP2 ⁵

P1C-4KMT
P1C-4LMT
P1C-4MMT
P1C-4NMT
P1C-4PMT
P1C-4QMT
P1C-4RMT

Clevis bracket MP4 ⁶

Ø 32
Ø 40
Ø 50
Ø 63
Ø 80
Ø 100
Ø 125

P1C-4KME
P1C-4LME
P1C-4MME
P1C-4NME
P1C-4PME
P1C-4QME
P1C-4RME

Clevis bracket AB6 ⁷

P1C-4KMCA
P1C-4LMCA
P1C-4MMCA
P1C-4NMCA
P1C-4PMCA
P1C-4QMCA
P1C-4RMCA

Pivot bracket with
swivel bearing CS7 ⁸

P1C-4KMA
P1C-4LMA
P1C-4MMA
P1C-4NMA
P1C-4PMA
P1C-4QMA
P1C-4RMA

3 and 4 positions
flange JP1

P1E-6KB0
P1E-6LB0
P1E-6MB0
P1E-6NB0
P1E-6PB0
P1E-6QB0

Pivot brackets AT4 ¹⁰
for MT* trunnion

9301054261
9301054262
9301054262
9301054264
9301054264
9301054266
9301054266

Flange trunnion ¹¹
MT5/MT6

Ø 32
Ø 40
Ø 50
Ø 63
Ø 80
Ø 100
Ø 125

P1D-4KMYF
P1D-4LMYF
P1D-4MMYF
P1D-4NMYF
P1D-4PMYF
P1D-4QMYF

Intermediate
Trunnion MT4 ¹²

Factory fitted
Factory fitted
Factory fitted
Factory fitted
Factory fitted
Factory fitted
Factory fitted

Swivel rod eye AP6 ¹³

P1C-4KRS
P1C-4LRS
P1C-4MRS
P1C-4MRS
P1C-4PRS
P1C-4PRS
P1C-4RRS

Clevis AP2 ¹⁴

P1C-4KRC
P1C-4LRC
P1C-4MRC
P1C-4MRC
P1C-4PRC
P1C-4PRC
P1C-4RRC

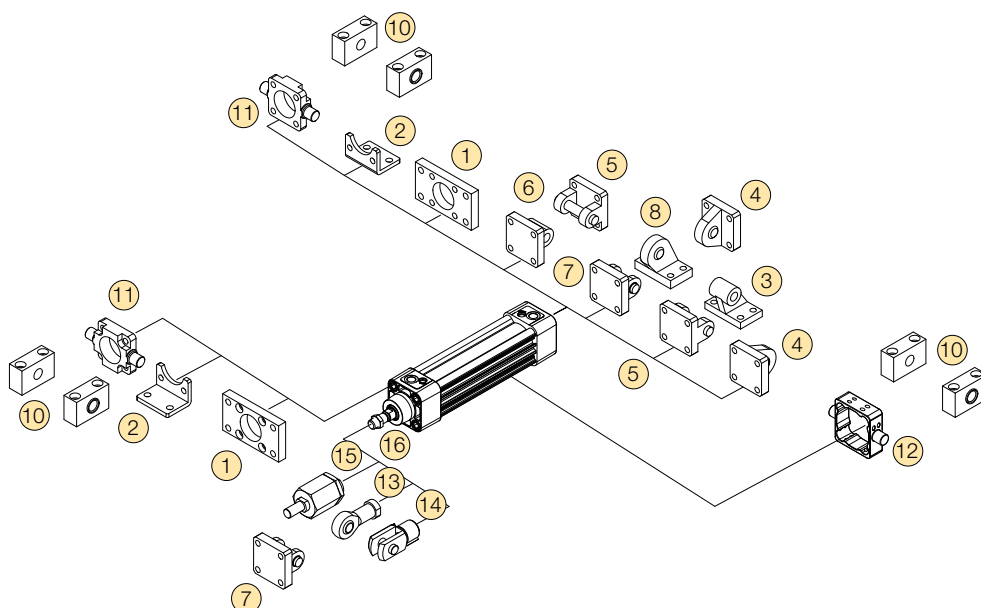
Flexo coupling PM5 ¹⁵

P1C-4KRF
P1C-4LRF
P1C-4MRF
P1C-4MRF
P1C-4PRF
P1C-4PRF
P1C-4RRF

Zinc-plated ¹⁶
steel nut MR9
(pack of 10)

Ø 32
Ø 40
Ø 50
Ø 63
Ø 80
Ø 100
Ø 125

P14-4KRPZ
P14-4LRPZ
P14-4MRPZ
P14-4MRPZ
P14-4PRPZ
P14-4PRPZ
P14-4RRPZ



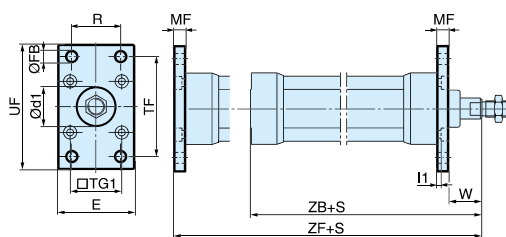
Flange MF1/MF2 ①



Intended for fixed mounting of cylinder. Flange can be fitted to front or rear end cover of cylinder.

Materials
Flange: Surface-treated steel
Mounting screws acc. to DIN 6912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



Cyl. bore mm	d1 H11 mm	FB H13 mm	TG1 mm	E mm	R JS14 mm	MF JS14 mm	TF JS14 mm	UF mm	I1 -0,5 mm	W* mm	ZF* mm	ZB* mm	Weight Kg	Order code
32	30	7	32,5	45	32	10	64	80	5,0	16	130	123,5	0,23	P1C-4KMB
40	35	9	38,0	52	36	10	72	90	5,0	20	145	138,5	0,28	P1C-4LMB
50	40	9	46,5	65	45	12	90	110	6,5	25	155	146,5	0,53	P1C-4MMB
63	45	9	56,5	75	50	12	100	120	6,5	25	170	161,5	0,71	P1C-4NMB
80	45	12	72,0	95	63	16	126	150	8,0	30	190	177,5	1,59	P1C-4PMB
100	55	14	89,0	115	75	16	150	170	8,0	35	205	192,5	2,19	P1C-4QMB
125	60	16	110,0	140	90	20	180	205	10,5	45	245	230,5	3,78	P1C-4RMB

S = Stroke length, does not apply to cylinders with lock unit or with protusion of the piston rod

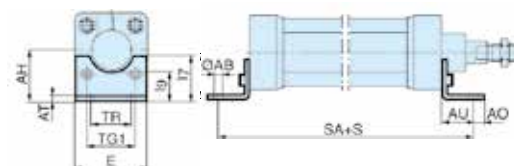
Foot brackets MS1 ②



Intended for fixed mounting of cylinder. Foot bracket can be fitted to front and rear end covers of cylinder.

Materials
Foot bracket: Surface-treated steel
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied in pairs with mounting screws for attachment to cylinder.



Cyl. bore mm	AB H14 mm	TG1 mm	E mm	TR JS14 mm	AO mm	AU mm	AH JS15 mm	I7 mm	AT mm	I9 JS14 mm	SA* mm	Weight Kg	Order code
32	7	32,5	45	32	10	24	32	30	4,5	17,0	142	0,06**	P1C-4KMF
40	9	38,0	52	36	8	28	36	30	4,5	18,5	161	0,08**	P1C-4LMF
50	9	46,5	65	45	13	32	45	36	5,5	25,0	170	0,16**	P1C-4MMF
63	9	56,5	75	50	13	32	50	35	5,5	27,5	185	0,25**	P1C-4NMF
80	12	72,0	95	63	14	41	63	49	6,5	40,5	210	0,50**	P1C-4PMF
100	14	89,0	115	75	15	41	71	54	6,5	43,5	220	0,85**	P1C-4QMF
125	16	110,0	140	90	22	45	90	71	8,0	60,0	250	1,48**	P1C-4RMF

S = Stroke length

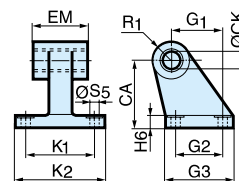
** Weight per item

Pivot bracket with rigid bearing AB7 ③



Intended for flexible mounting of cylinder. The pivot bracket can be combined with clevis bracket MP2.

Materials
Pivot bracket: Surface-treated aluminium, black
Bearing: Sintered oil-bronze bushing

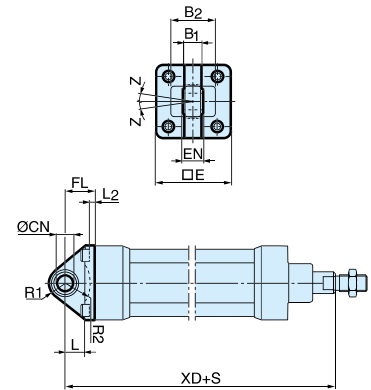


Cyl. bore mm	CK H9 mm	S5 H13 mm	K1 JS14 mm	K2 mm	G1 JS14 mm	G2 JS14 mm	EM mm	G3 mm	CA JS15 mm	H6 mm	R1 mm	Weight Kg	Order code
32	10	6,6	38	51	21	18	25,5	31	32	8	10,0	0,06	P1C-4KMD
40	12	6,6	41	54	24	22	27,0	35	36	10	11,0	0,08	P1C-4LMD
50	12	9,0	50	65	33	30	31,0	45	45	12	13,0	0,15	P1C-4MMD
63	16	9,0	52	67	37	35	39,0	50	50	12	15,0	0,20	P1C-4NMD
80	16	11,0	66	86	47	40	49,0	60	63	14	15,0	0,33	P1C-4PMD
100	20	11,0	76	96	55	50	59,0	70	71	15	19,0	0,49	P1C-4QMD
125	25	14,0	94	124	70	60	69,0	90	90	20	22,5	1,02	P1C-4RMD

Swivel eye bracket MP6 ④ Intended for use together with clevis bracket GA

Material
Bracket: Surface-treated aluminium, black
Swivel bearing acc. to DIN 648K: Hardened steel

Supplied complete with mounting screws for attachment to cylinder.



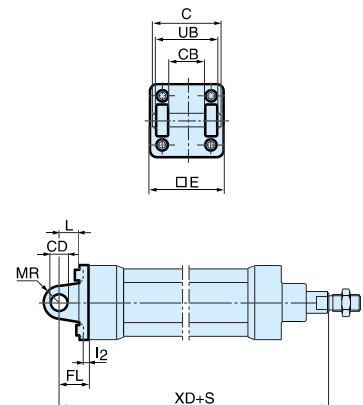
Cyl. bore mm	E	B1	B2	EN	R1	R2	FL	I2	L	CN H7	XD*	Z	Weight Kg	Order code
32	45	10,5	-	14	16	-	22	5,5	12	10	142	4°	0,08	P1C-4KMSA
40	52	12,0	-	16	18	-	25	5,5	15	12	160	4°	0,11	P1C-4LMSA
50	65	15,0	51	21	21	19	27	6,5	15	16	170	4°	0,20	P1C-4MMSA
63	75	15,0	-	21	23	-	32	6,5	20	16	190	4°	0,27	P1C-4NMSA
80	95	18,0	-	25	29	-	36	10,0	20	20	210	4°	0,52	P1C-4PMSA
100	115	18,0	-	25	31	-	41	10,0	25	20	230	4°	0,72	P1C-4QMSA
125	140	25,0	-	37	40	-	50	10,0	30	30	275	4°	1,53	P1C-4RMSA

S = Stroke length, does not apply to cylinders with lock unit or with protusion of the piston rod

Clevis bracket MP2 ⑤ Intended for flexible mounting of cylinder. Clevis bracket MP2 can be combined with clevis bracket MP4.

Materials
Clevis bracket: Surface-treated aluminium, black
Pin: Surface hardened steel
Circlips according to DIN 471: Spring steel
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



Cyl. bore mm	C	E	UB h14 mm	CB H14 mm	FL ±0,2 mm	L	I2	CD H9 mm	MR	XD*	Weight Kg	Order code
32	53	45	45	26	22	13	5,5	10	10	142	0,08	P1C-4KMT
40	60	52	52	28	25	16	5,5	12	12	160	0,11	P1C-4LMT
50	68	65	60	32	27	16	6,5	12	12	170	0,14	P1C-4MMT
63	78	75	70	40	32	21	6,5	16	16	190	0,29	P1C-4NMT
80	98	95	90	50	36	22	10,0	16	16	210	0,36	P1C-4PMT
100	118	115	110	60	41	27	10,0	20	20	230	0,64	P1C-4QMT
125	139	140	130	70	50	30	10,0	25	25	275	1,17	P1C-4RMT

S = Stroke length, does not apply to cylinders with lock unit or with protusion of the piston rod

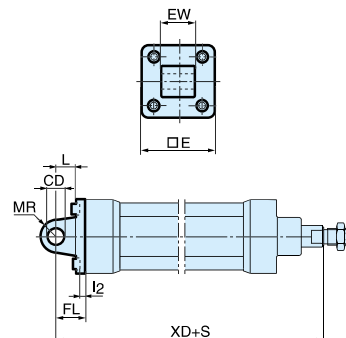
Clevis bracket MP4 ⑥

Intended for flexible mounting of cylinder. Clevis bracket MP4 can be combined with clevis bracket MP2.

Materials

Clevis bracket: Surface-treated aluminium, black
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



Cyl. bore mm	E mm	EW mm	FL mm	L ±0,2 mm	I2 mm	CD mm	MR H9 mm	XD* mm	Weight Kg	Order code
32	45	26	22	13	5,5	10	10	142	0,09	P1C-4KME
40	52	28	25	16	5,5	12	12	160	0,13	P1C-4LME
50	65	32	27	16	6,5	12	12	170	0,17	P1C-4MME
63	75	40	32	21	6,5	16	16	190	0,36	P1C-4NME
80	95	50	36	22	10,0	16	16	210	0,46	P1C-4PME
100	115	60	41	27	10,0	20	20	230	0,83	P1C-4QME
125	140	70	50	30	10,0	25	25	275	1,53	P1C-4RME

S = Stroke length, does not apply to cylinders with lock unit or with protusion of the piston rod

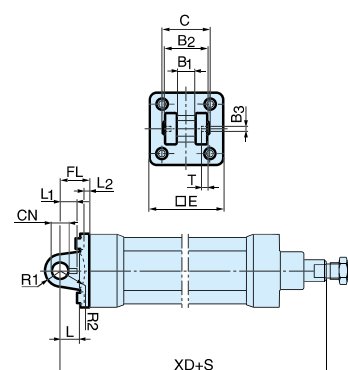
Clevis bracket AB6 ⑦

Intended for flexible mounting of cylinder. Clevis bracket GA can be combined with pivot bracket with swivel bearing, swivel eye bracket and swivel rod eye.

Materials

Clevis bracket: Surface-treated aluminium
Pin: Surface hardened steel
Locking pin: Spring steel
Circlips according to DIN 471: Spring steel
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



Cyl. bore mm	C mm	E mm	B2 d12 mm	B1 H14 mm	T mm	B3 mm	R2 mm	L1 mm	FL ±0,2 mm	I2 mm	L mm	CN F7 mm	R1 mm	XD* mm	Weight Kg	Order code
32	41	45	34	14	3	3,3	17	11,5	22	5,5	12	10	11	142	0,09	P1C-4KMCA
40	48	52	40	16	4	4,3	20	12,0	25	5,5	15	12	13	160	0,13	P1C-4LMCA
50	54	65	45	21	4	4,3	22	14,0	27	6,5	17	16	18	170	0,17	P1C-4MMCA
63	60	75	51	21	4	4,3	25	14,0	32	6,5	20	16	18	190	0,36	P1C-4NMCA
80	75	95	65	25	4	4,3	30	16,0	36	10,0	20	20	22	210	0,58	P1C-4PMCA
100	85	115	75	25	4	4,3	32	16,0	41	10,0	25	20	22	230	0,89	P1C-4QMCA
125	110	140	97	37	6	6,3	42	24,0	50	10,0	30	30	30	275	1,75	P1C-4RMCA

S = Stroke length, does not apply to cylinders with lock unit or with protusion of the piston rod

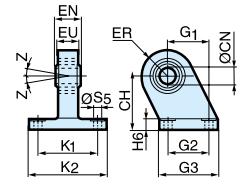
Pivot bracket with swivel bearing CS7 ⁽⁸⁾

Intended for use together with clevis bracket GA.

Material

Pivot bracket: Surface-treated steel, black

Swivel bearing acc. to DIN 648K: Hardened steel



Cyl. bore mm	CN H7 mm	S5 H13 mm	K1 JS14 mm	K2 mm	EU mm	G1 JS14 mm	G2 JS14 mm	EN mm	G3 mm	CH JS15 mm	H6 mm	ER mm	Z mm	Weight	Order code
32	10	6,6	38	51	10,5	21	18	14	31	32	10	16	4°	0,18	P1C-4KMA
40	12	6,6	41	54	12,0	24	22	16	35	36	10	18	4°	0,25	P1C-4LMA
50	16	9,0	50	65	15,0	33	30	21	45	45	12	21	4°	0,47	P1C-4MMA
63	16	9,0	52	67	15,0	37	35	21	50	50	12	23	4°	0,57	P1C-4NMA
80	20	11,0	66	86	18,0	47	40	25	60	63	14	28	4°	1,05	P1C-4PMA
100	20	11,0	76	96	18,0	55	50	25	70	71	15	30	4°	1,42	P1C-4QMA
125	30	14,0	94	124	25,0	70	60	37	90	90	20	40	4°	3,10	P1C-4RMA

3 and 4 positions flange JP1

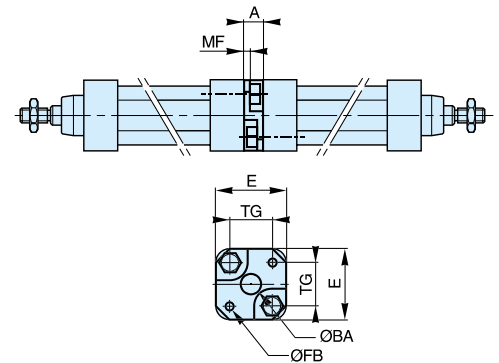
Mounting kit for back to back mounted cylinders, 3 and 4 position cylinders.



Material:

Mounting: Aluminium

Mounting screws: Zinc-plated steel 8.8



Cyl. bore mm	E mm	TG mm	ØFB mm	MF mm	A mm	ØBA mm	Weight kg	Order cod
32	50	32,5	6,5	5	16	30	0,060	P1E-6KB0
40	60	38,0	6,5	5	16	35	0,078	P1E-6LB0
50	66	46,5	8,5	6	20	40	0,162	P1E-6MB0
63	80	56,5	8,5	6	20	45	0,194	P1E-6NB0
80	100	72,0	10,5	8	25	45	0,450	P1E-6PB0
100	118	89,0	10,5	8	25	55	0,672	P1E-6QB0

Pivot brackets AT4 for MT* trunnion ⁽¹⁰⁾

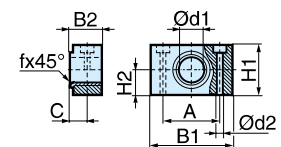
Intended for use together with the trunnion MT4.

Material

Pivot bracket: Surface-treated aluminium

Bearing acc. to DIN 1850 C: Sintered oil-bronze bushing

Supplied in pairs.



Cyl. bore mm	B1 mm	B2 mm	A mm	C mm	d1 mm	d2 H13 mm	H1 mm	H2 mm	fx45° min mm	Weight kg	Order code
32	46	18,0	32	10,5	12	6,6	30	15	1,0	0,04*	9301054261
40	55	21,0	36	12,0	16	9,0	36	18	1,6	0,07*	9301054262
50	55	21,0	36	12,0	16	9,0	36	18	1,6	0,07*	9301054262
63	65	23,0	42	13,0	20	11,0	40	20	1,6	0,12*	9301054264
80	65	23,0	42	13,0	20	11,0	40	20	1,6	0,12*	9301054264
100	75	28,5	50	16,0	25	14,0	50	25	2,0	0,21*	9301054266
125	75	28,5	50	16,0	25	14,0	50	25	2,0	0,21*	9301054266

** Weight per item

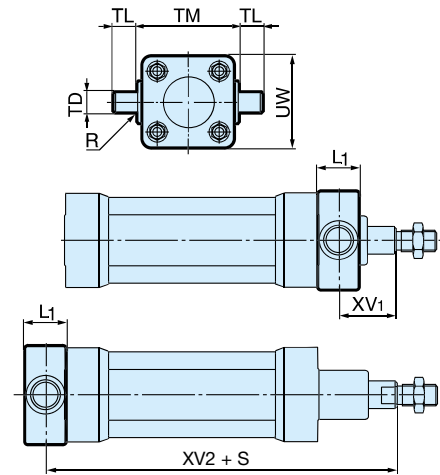
Flange trunnion ⑪
MT5/MT6

Intended for articulated mounting of cylinder. This trunnion can be flange mounted on the front or rear end covers of all P1D cylinders.

Material:
Trunnion: zinc plated steel
Screws: zinc plated steel, 8.8
Delivered complete with mounting screws for attachment to the cylinder

Cyl. bore mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	XV ₁ mm	XV ₂ mm	Weight Kg	Order code
32	50	12	12	1,0	46	14	19,5	127,0	0,17	P1D-4KMYF
40	63	16	16	1,6	59	19	21,0	144,5	0,43	P1D-4LMYF
50	75	16	16	1,6	69	19	28,0	152,5	0,55	P1D-4MMYF
63	90	20	20	1,6	84	24	25,5	170,0	1,10	P1D-4NMYF
80	110	20	20	1,6	102	24	34,5	186,0	1,66	P1D-4PMYF
100	132	25	25	2,0	125	29	37,0	203,5	3,00	P1D-4QMYF

S = Stroke length, does not apply to cylinders with lock unit or with protusion of the piston rod

**Intermediate trunnion ⑫**
MT4 for P1D-X

Intended for articulated mounting of cylinder. The trunnion is factory-fitted in the centre of the cylinder or at an optional location specified by the XV-measure – see the order code key. Combined with pivot bracket for MT4.

Material: zinc plated steel

Intermediate trunnion
MT4 for P1D-T**Trunnion centred**

The centred trunnion for the P1D-S and P1D-T is ordered with letter D in position 17 (no dimension specified in positions 18-20, letters are NNN). See the order code key.

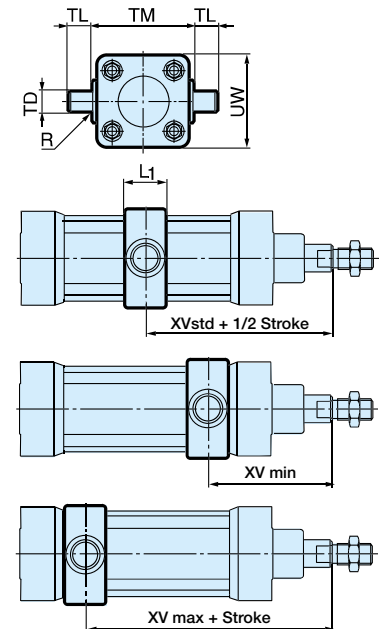
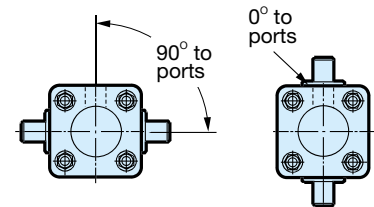
Trunnion with optional position XV measure

The intermediate trunnion for the P1D-S and P1D-T is ordered with a letter in position 17 and desired XV-measure (3-digits measure in mm) in positions 18-20). See the order code key.

Free trunnion

The centre trunnion for the P1D-S can also be ordered with the intermediate trunnion loosely fitted to the cylinder (not fixed in position). This allows the position to be established at the time of installation.

Ordered with a letter in position 17 and 000 in positions 18-20. Please refer to the order code key.

**Orientation**

Cyl. bore mm	L1		TL h14 mm	TM h14 mm	Ø TD e9 mm	R mm	UW mm	XV min			XV		XV max	
	P1D-X mm	P1D-T mm						P1D-X mm	P1D-X mm	P1D-T mm	P1D-X mm	P1D-T mm	P1D-S mm	P1D-X mm
32	18	15	12	50	12	1,0	52	63,5	62,0		73,0	73,0	82,5	84,0
40	20	20	16	63	16	1,6	59	73,0	73,0		82,5	82,5	92,0	92,0
50	20	20	16	75	16	1,6	71	80,5	89,0		90,0	90,0	99,5	99,5
63	26	25	20	90	20	1,6	84	89,5	98,0		97,5	97,5	105,5	106,0
80	26	25	20	110	20	1,6	105	98,5	188,5		110,0	110,0	121,5	122,0
100	32	30	25	132	25	2,0	129	111,5	110,5		120,0	120,0	128,5	129,5
125	33	32	25	180	25	2,0	159	132,5	132,0		145,0	145,0	157,5	158,0

Important: If the cylinder is ordered with a piston rod protusion (WH dimension), please add this extra length to XVmin, XV and XVmax.

Does not apply to cylinders with lock unit or with protusion of the piston rod

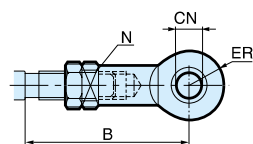
Swivel rod eye AP6 ¹³

Swivel rod eye for articulated mounting of cylinder. Swivel rod eye can be combined with clevis bracket GA. Maintenance-free.

Materials

Swivel rod eye: Zinc-plated steel

Swivel bearing according to DIN 648K: Hardened steel

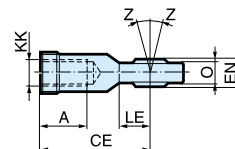
**Stainless steel swivel rod eye AP6**

Stainless-steel swivel rod eye for articulated mounting of cylinder. Swivel rod eye can be combined with clevis bracket GA. Maintenance-free.

Materials

Swivel rod eye: Stainless steel

Swivel bearing according to DIN 648K: Stainless steel



Use stainless steel nut with stainless steel swivel rod eye.

According to ISO 8139

Cyl. bore mm	A mm	B min mm	B max mm	CE mm	CN H9 mm	EN h12 mm	ER mm	KK	LE min mm	N mm	O mm	Z	Weight Kg	Order code	
														Swivel rod eye AP6	Stainless steel swivel rod eye AP6
32	20	48,0	55	43	10	14	14	M10x1,25	15	17	10,5	12°	0,08	P1C-4KRS	P1S-4JRT
40	22	56,0	62	50	12	16	16	M12x1,25	17	19	12,0	12°	0,12	P1C-4LRS	P1S-4LRT
50	28	72,0	80	64	16	21	21	M16x1,5	22	22	15,0	15°	0,25	P1C-4MRS	P1S-4MRT
63	28	72,0	80	64	16	21	21	M16x1,5	22	22	15,0	15°	0,25	P1C-4MRS	P1S-4MRT
80	33	87,0	97	77	20	25	25	M20x1,5	26	32	18,0	15°	0,46	P1C-4PRS	P1S-4PRT
100	33	87,0	97	77	20	25	25	M20x1,5	26	32	18,0	15°	0,46	P1C-4PRS	P1S-4PRT
125	51	123,5	137	110	30	37	35	M27x2	36	41	25,0	15°	1,28	P1C-4RRS	P1S-4RRT

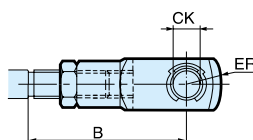
Clevis AP2 ¹⁴

Clevis for articulated mounting of cylinder.

Material

Clevis, clip: Galvanized steel

Pin: Hardened steel

**Stainless steel clevis AP2**

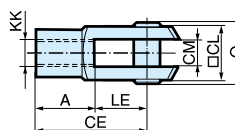
Stainless-steel clevis for articulated mounting of cylinder.

Material

Clevis: Stainless steel

Pin: Stainless steel

Circlips according to DIN 471: Stainless steel



Use stainless steel nut with stainless steel swivel rod eye.

According to ISO 8140

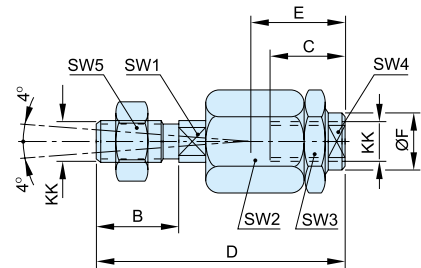
Cyl. bore mm	A mm	B min mm	B max mm	CE mm	CK h11/E9 mm	CL mm	CM mm	ER mm	KK	LE mm	O mm	Weight Kg	Order code	
													Clevis AP2	Stainless steel Clevis AP2
32	20	45,0	52	40	10	20	10	16	M10x1,25	20	28,0	0,09	P1C-4KRC	P1S-4JRD
40	24	54,0	60	48	12	24	12	19	M12x1,25	24	32,0	0,15	P1C-4LRC	P1S-4LRD
50	32	72,0	80	64	16	32	16	25	M16x1,5	32	41,5	0,35	P1C-4MRC	P1S-4MRD
63	32	72,0	80	64	16	32	16	25	M16x1,5	32	41,5	0,35	P1C-4MRC	P1S-4MRD
80	40	90,0	100	80	20	40	20	32	M20x1,5	40	50,0	0,75	P1C-4PRC	P1S-4PRD
100	40	90,0	100	80	20	40	20	32	M20x1,5	40	50,0	0,75	P1C-4PRC	P1S-4PRD
125	56	123,5	137	110	30	55	30	45	M27x2	54	72,0	2,10	P1C-4RRC	P1S-4RRD

Flexo coupling PM5 ⁽¹⁵⁾

Flexo coupling for articulated mounting of piston rod.
Flexo fitting is intended to take up axial angle errors within a range of $\pm 4^\circ$.

Material
Flexo coupling, nut: Zinc-plated steel

Supplied complete with galvanized adjustment nut.



Cyl. bore mm	KK mm	B mm	C mm	D mm	E mm	ØF mm	SW1 mm	SW2 mm	SW3 mm	SW4 mm	SW5 mm	Weight Kg	Order code
32	M10x1.25	20	23	73	31	21	12	30	30	19	17	0,21	P1C-4KRF
40	M12x1.25	24	23	77	31	21	12	30	30	19	19	0,22	P1C-4LRF
50	M16x1.5	32	32	108	45	33.5	19	41	41	30	24	0,67	P1C-4MRF
63	M16x1.5	32	32	108	45	33.5	19	41	41	30	24	0,67	P1C-4MRF
80	M20x1.5	40	42	122	56	33.5	19	41	41	30	30	0,72	P1C-4PRF
100	M20x1.5	40	42	122	56	33.5	19	41	41	30	30	0,72	P1C-4PRF
125	M27x2	54	48	147	51	39	24	55	55	32	41	1,80	P1C-4RRF

Nut MR9 * ⁽¹⁶⁾

Intended for fixed mounting of accessories to the piston rod.
Material: Zinc-plated steel

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D Ultra Clean, which is delivered with a stainless steel piston rod nut instead.

Stainless steel nut MR9 * ⁽¹⁶⁾

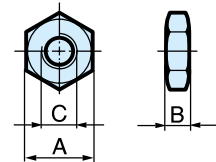
Intended for fixed mounting of accessories to the piston rod.

Material: Stainless steel A2

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D-C delivered with a stainless steel piston rod nut instead.

According to DIN 439 B

Cyl. bore mm	A mm	B mm	C	Weight ** Kg	Order code	
					Nut MR9	Stainless steel nut MR9
32	17	5,0	M10x1,25	0,007	P14-4KRPZ	P14-4KRPS
40	19	6,0	M12x1,25	0,010	P14-4LRPZ	P14-4LRPS
50	24	8,0	M16x1,5	0,021	P14-4MRPZ	P14-4MRPS
63	24	8,0	M16x1,5	0,021	P14-4MRPZ	P14-4MRPS
80	30	10,0	M20x1,5	0,040	P14-4PRPZ	P14-4PRPS
100	30	10,0	M20x1,5	0,040	P14-4PRPZ	P14-4PRPS
125	41	13,5	M27x2	0,100	P14-4RRPZ	P14-4RRPS



* Supplied as pack of 10 off

** Weight per item

Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Stainless steel screw set for MP2, MP4, MS1 and GA 	Set of stainless steel screws for fitting clevis brackets MP2, MP4 and GA onto the cylinder. The screws have an internal hexagonal head and are used in special environments, e.g. the food industry, or where there are extra demands for protection against corrosion. Material: According to DIN 912, Stainless steel, A2 4 pcs per pack.	32	0,02	9301054321
		40	0,02	9301054321
		50	0,05	9301054322
		63	0,05	9301054322
		80	0,09	9301054323
		100	0,09	9301054323
		125	0,15	9301054324
Stainless steel screw set for MF1/MF2 	Set of stainless steel screws for fitting flanges MF1/MF2 onto the cylinder. The screws have an internal hexagonal head and are used in special environments, e.g. the food industry, or where there are extra demands for protection against corrosion. Material: According to DIN 6912, Stainless steel, A2 4 pcs per pack	32	0,02	9301054331
		40	0,02	9301054331
		50	0,04	9301054332
		63	0,04	9301054332
		80	0,07	9301054333
		100	0,07	9301054333
		125	0,12	9301054334
Sealing plugs on end caps screws 	Set of 4 threaded plugs to be fitted in unused end cover screws. A rubber gasket is supplied with every plug. The seal off function is equal to IP67. The plugs can be used for all P1D cylinders to avoid collecting dirt and fluids in the end cover screw recesses. Material: Plug Polyamid PA Gasket Nitrile rubber 4 pcs per pack	32	0,01	460104801
		40	0,01	460104801
		50	0,02	460104802
		63	0,02	460104802
		80	0,02	460104803
		100	0,02	460104803
		125	0,03	460104804

Stainless steel pin AA6 set for AB6 mounting

Materials

Pin: stainless steel

Locking pin: stainless steel

Circlips according to DIN 471: stainless steel

Cyl. Bore Ø mm	Weight kg	Order code
32	0.05	9301054311
40	0.06	9301054312
50	0.07	9301054313
63	0.07	9301054314
80	0.17	9301054315
100	0.31	9301054316
125	0.54	9301054317

Stainless steel pin AA4 set for MP2 mounting

Materials

Pin: stainless steel

Locking pin: stainless steel

Circlips according to DIN 471: stainless steel

Cyl. Bore Ø mm	Weight kg	Order code
32	0.07	on request
40	0.08	on request
50	0.09	on request
63	0.09	on request
80	0.19	on request
100	0.33	on request
125	0.56	on request

Drop-in sensors

The P1D sensors can easily be installed from the side in the sensor groove, at any position along the piston stroke. The sensors are completely recessed and thus mechanically protected. Choose between electronic or reed sensors and several cable lengths and 8 mm and M12 connectors. The same standard sensors are used for all P1D versions.

**Electronic sensors**

The 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	From side, down into the sensor groove, so-called drop-in
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

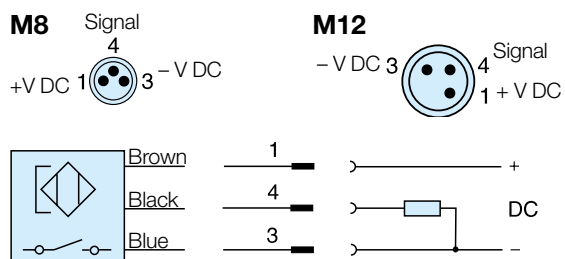
Reed sensors

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.

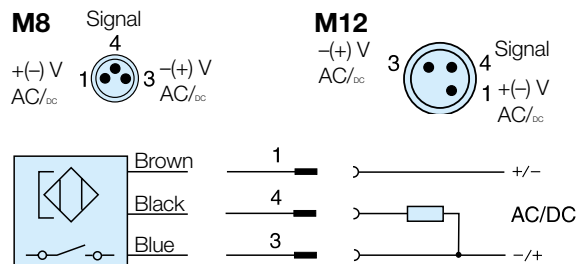
Technical data

Design	Reed element
Mounting	From side, down into the sensor groove, so-called drop-in
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

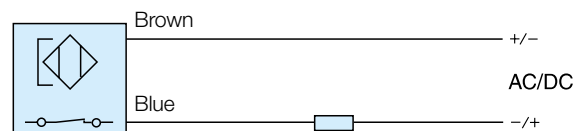
Electronic sensors



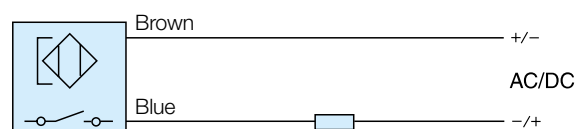
Reed sensors



P8S-GCFPX

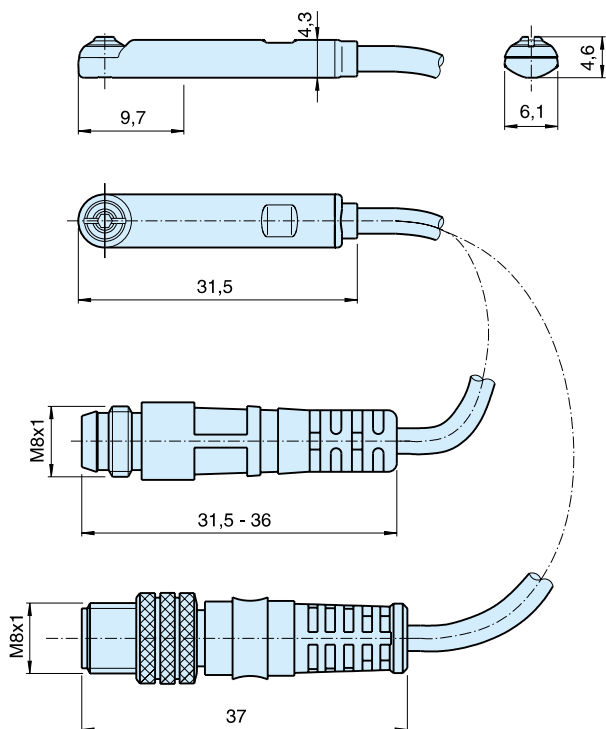


P8S-GRFLX / P8S-GRFLX2

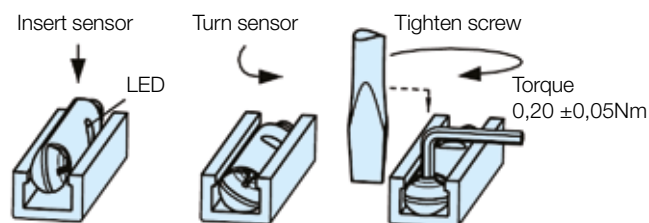


Dimensions

Sensors



Sensor Installation



Ordering data

Output/function	Cable/connector	Weight kg	Order code
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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	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

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	0,27 m PUR-cable and M12 screw male connector	0,015	P8S-GSMHX
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 ²⁾	0,050	P8S-GCFPX

Reed sensors, 10-120 V AC/DC

Normally open	3 m PVC-cable without connector	0,030	P8S-GRFLX
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Reed sensorer, 24-230 V AC/DC

Normally open	3 m PVC-cable without connector	0,030	P8S-GRFLX2
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2) Without LED

Adapter for tie-rod design

Description	Weight kg	Order code
Double jointed adapter for cylinder P1D-T cylinder bore Ø32 to Ø125 mm	0,07	P8S-TMA0X



Connecting cables with one connector

The cables have an integral snap-in female connector.



Type of cable	Cable/connector	Weight kg	Order code
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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, 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.



Technical data

Operating voltage	max. 32 V AC/DC
Operating current per contact	max. 4 A
Connection cross section	0.25...0.5mm ² (conductor diameter min 0.1mm)
Protection	IP65 and IP67 when plugged and screwed down (EN 60529)
Temperature range	-25...+85 °C

Connector	Weight kg	Order code
M8 screw connector	0,017	P8CS0803J
M12 screw connector	0,022	P8CS1204J

P1D-X Seal kits

Complete seal kits consisting of:

Piston seals

Cushioning seals

Piston rod seal

O-rings

Scraper ring



Cyl.bore mm	P1D cylinder version				
	High temp.	Low temp.	Standard temp. P1D-X (P1D-B)	Metal scraper	Hydraulic version
32	P1D-6KRFX	P1D-6KRLX	P1D-6KRNB	P1D-6KRQX	P1D-6KRHX
40	P1D-6LRF	P1D-6LRL	P1D-6LRNB	P1D-6LRQX	P1D-6LRH
50	P1D-6MRFX	P1D-6MRLX	P1D-6MRNB	P1D-6MRQX	P1D-6MRHX
63	P1D-6NRF	P1D-6NRL	P1D-6NRNB	P1D-6NRQX	P1D-6NRH
80	P1D-6PRF	P1D-6PRL	P1D-6PRNB	P1D-6PRQX	P1D-6PRH
100	P1D-6QRF	P1D-6QRL	P1D-6QRNB	P1D-6QRQX	P1D-6QRH
125	P1D-6RRF	P1D-6RRL	P1D-6RRNB	P1D-6RRQX	P1D-6RRH



Standard temperature	30g	9127394541
High temperature	30g	9127394521
Low temperature	30g	9127394541

Seal kits

= Included in seal kit
 = Socket head
 = Tightening torque

Lubricated with grease
 Locking fluid

Loctite 270 or Loctite 2701 locking fluid must be used

Cyl.-dia mm	Aluminium piston T1 Nm	AF mm	T2 Nm	AF mm	T3 Nm	NV mm	NV mm
32	15	6	8	6	6	6	
40	30	8	8	6	6	6	
50	40	10	20	8	11	8	
63	40	10	20	8	11	8	
80	120	14	20	6	20		3x16
100	120	14	20	6	20		3x16
125	120	14	70	8	40		4x18

Order code key, spare parts

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

P

1

D

-

8

0

3

2

D

G

-

0

1

0

0

8

Spare parts

Cylinder dia.
mm

032

040

050

063

080

100

125

Piston rod*

D

Standard external thread

G

Standard internal thread

H

Through rod ext. threads

J

Through rod int. threads

Cylinder barrel

A

Standard profile

B

Cylindrical (for tie rod)

Tie rod

T

Tie rod
(order 4 for a cylinder)

Piston rod

G

Stainless steel

H

Hard-chromium plateded

J

Acid-resistant steel

K

Chromium plated stainless

Cylinder barrel

A

Aluminium

Tie rods

V

Stainless steel
(order 4 for a cylinder)

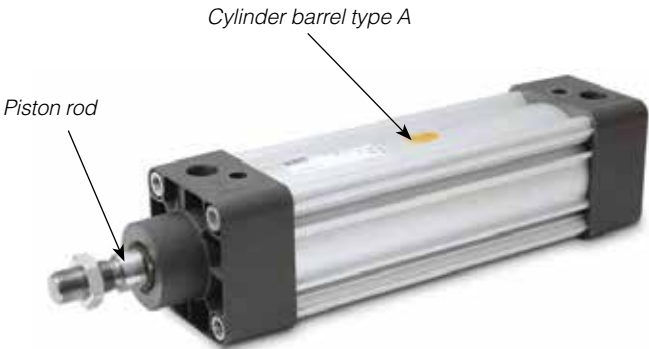
Stroke** (mm) e.g.
0100 = 100 mm

Any stroke up to
max. 2800 mm.

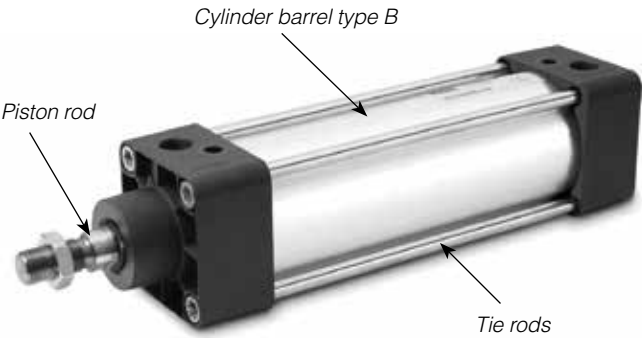
** When ordering piston
rods for cylinders with
an extended piston rod,
add together the stroke
and the extension in the
order key.
For example, a cylinder
with stroke 100 mm and
a piston rod extension
of 25 mm is ordered
with 0125 in the order
number.

* 2 piston rod pieces delivered in one
set if through rod option selected

P1D with standard profile



P1D with tie rods



Specifying air quality (purity) in accordance with ISO8573-1:2010, the international standard for Compressed Air Quality

ISO8573-1 is the primary document used from the ISO8573 series as it is this document which specifies the amount of contamination allowed in each cubic metre of compressed air.

ISO8573-1 lists the main contaminants as Solid Particulate, Water and Oil. The purity levels for each contaminant are shown separately in tabular form, however for ease of use, this document combines all three contaminants into one easy to use table.

ISO8573-1:2010 CLASS	Solid Particulate				Water		Oil
	Maximum number of particles per m³			Mass Concentration mg/m³	Vapour Pressure Dewpoint	Liquid g/m³	Total Oil (aerosol liquid and vapour)
	0,1 - 0,5 micron	0,5 - 1 micron	1 - 5 micron				mg/m³
0	As specified by the equipment user or supplier and more stringent than Class 1						
1	≤ 20 000	≤ 400	≤ 10	-	≤ -70 °C	-	0,01
2	≤ 400 000	≤ 6 000	≤ 100	-	≤ -40 °C	-	0,1
3	-	≤ 90 000	≤ 1 000	-	≤ -20 °C	-	1
4	-	-	≤ 10 000	-	≤ +3 °C	-	5
5	-	-	≤ 100 000	-	≤ +7 °C	-	-
6	-	-	-	≤ 5	≤ +10 °C	-	-
7	-	-	-	5 - 10	-	≤ 0,5	-
8	-	-	-	-	-	0,5 - 5	-
9	-	-	-	-	-	5 - 10	-
X	-	-	-	> 10	-	> 10	> 10

Specifying air purity in accordance with ISO8573-1:2010

When specifying the purity of air required, the standard must always be referenced, followed by the purity class selected for each contaminant (a different purity class can be selected for each contamination if required).

An example of how to write an air quality specification is shown below:

ISO 8573-1:2010 Class 1.2.1

ISO 8573-1:2010 refers to the standard document and its revision, the three digits refer to the purity classifications selected for solid particulate, water and total oil. Selecting an air purity class of 1.2.1 would specify the following air quality when operating at the standard's reference conditions :

Class 1 - Particulate

In each cubic metre of compressed air, the particulate count should not exceed 20,000 particles in the 0.1 - 0.5 micron size range, 400 particles in the 0.5 - 1 micron size range and 10 particles in the 1 - 5 micron size range.

Class 2 - Water

A pressure dewpoint (PDP) of -40°C or better is required and no liquid water is allowed.

Class 1 - Oil

In each cubic metre of compressed air, not more than 0.01mg of oil is allowed. This is a total level for liquid oil, oil aerosol and oil vapour.

ISO8573-1:2010 Class zero

- Class 0 does not mean zero contamination.
- Class 0 requires the user and the equipment manufacturer to agree contamination levels as part of a written specification.
- The agreed contamination levels for a Class 0 specification should be within the measurement capabilities of the test equipment and test methods shown in ISO8573 Pt 2 to Pt 9.
- The agreed Class 0 specification must be written on all documentation to be in accordance with the standard.
- Stating Class 0 without the agreed specification is meaningless and not in accordance with the standard.
- A number of compressor manufacturers claim that the delivered air from their oil-free compressors is in compliance with Class 0.
- If the compressor was tested in clean room conditions, the contamination detected at the outlet will be minimal. Should the same compressor now be installed in typical urban environment, the level of contamination will be dependent upon what is drawn into the compressor intake, rendering the Class 0 claim invalid.
- A compressor delivering air to Class 0 will still require purification equipment in both the compressor room and at the point of use for the Class 0 purity to be maintained at the application.
- Air for critical applications such as breathing, medical, food, etc typically only requires air quality to Class 2.2.1 or Class 2.1.1.
- Purification of air to meet a Class 0 specification is only cost effective if carried out at the point of use.

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