P1D Series

ISO 6431 / VDMA 24562
Pneumatic Cylinders

Parker Global Pneumatics

Contents

Parker Hannifin Corporation
Actuator Division
Wadsworth, Ohio USA

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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 ⚠
Air quality is essential for maximum cylinder service life (see ISO 8573).

Note
All technical data in this catalog are typical data only.

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Completely new ISO cylinder family, P1D

A completely new cylinder range from the ground up, with major investment in research, material and technology, demands long experience and major resources. When we developed our new cylinder range, we started from scratch, but not really. Decades of research and learning about what our customers really need world-wide has given us a very stable foundation to start from.

The new P1D is a cylinder design of the highest possible quality, every detail has been thought through, without making any compromises. It has a large number of innovations which could only be achieved by using the best possible materials and methods. The result is a complete family of ISO/VDMA cylinders, of which we are very proud.

The new Parker P1D is a high technology cylinder design for just about every conceivable application, both simple and highly complex.

The same high technology platform is used for several main versions:

- **P1D Standard Version** – the universal, general purpose cylinder with high performance and long life.
- **P1D Removable Gland Version** – the innovative design which saves space and reduces dimensions by allowing connections to be made in the front or rear end of the cylinder.
- **P1D Clean Version** – the new product for ISO/VDMA cylinders featuring a clean design with a system of integrated, adjustable sensors (patent applied for), for stringent hygiene demands.
- **P1D w/Rod Lock** – a powerful device that mechanically locks the piston-rod in both directions when air pressure is lost.

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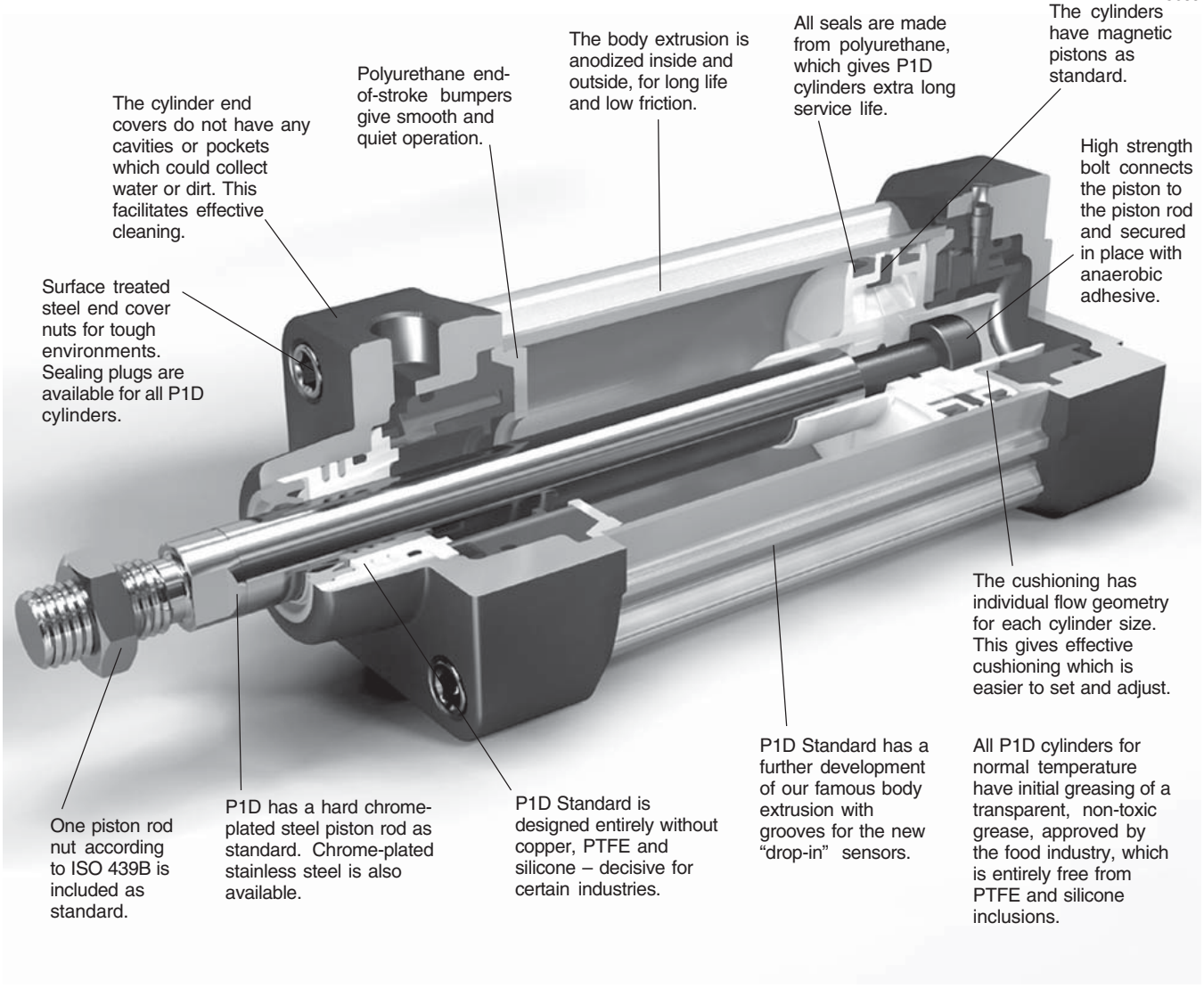

P1D Standard Version

Entirely new, the innovative P1D Series is the new generation of ISO/VDMA cylinders from Parker Hannifin. The cylinders are double-acting, with a new design of air cushioning. The light, stiff body extrusion has sensor grooves for simple and protected sensor installation.

Installation dimensions according to international standards
The new P1D Series complies with the current ISO 6431, ISO/DIS 15552, VDMA 24562 and AFNOR installation dimensional standards for customer reassurance world-wide.

High technology design
The best materials, manufacturing methods and design of every detail have been carefully tested to give the best possible product. The internal components are made of high strength plastics, for quiet operation and long service life. The aluminium end caps and the torsionally stiff aluminium body extrusion make the cylinder robust and suitable for a wide range of applications.

High quality
The P1D Series, as with other Parker cylinders, has been developed with quality in all phases – requirements, specification, design, planning, purchasing, production, distribution and service.

Even more functions and variants
The P1D Series is available with all the usual optional designs, such as: Through piston rod, high temperature, hydraulic operation, extended piston rod, etc.

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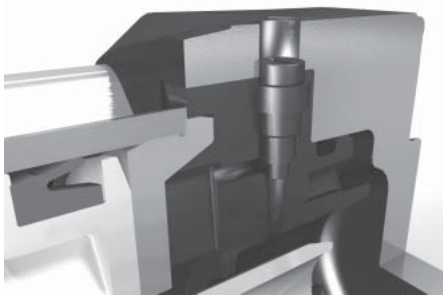
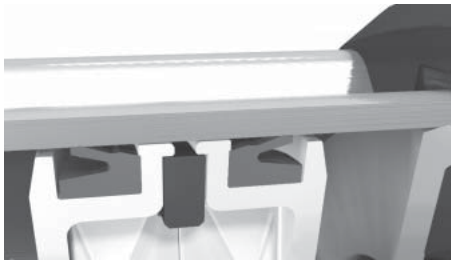
Complete accessory program
The P1D Series offers a complete ISO, VDMA and AFNOR compatible accessory program, with a wide range of piston rod and cylinder mountings for both pivoted and fixed operation. Several of these types of mountings are available in stainless steel. The new “drop-in” sensors are available with both reed and solid-state operation, with a wide range of connector types and cable lengths.

New, mechanically protected sensor technology
The body extrusion has recessed sensor grooves on three sides of the cylinder. The new sensors drop into the sensor groove quickly and easily. Both the cable and the sensor are protected. Choose a sensor with 3 or 10 m cable, 8 mm connector or the new M12 connector.

Optimized cushioning
Thanks to the plastic inserts in the end covers, each cylinder bore has been given individual flow geometry. This provides optimized cushioning, which is quicker and easier to set and adjust.



Smooth, quiet operation and long service life
All seals and end-of-stroke bumpers are made from polyurethane (PUR), the bearings and piston are made from proven engineering plastics with excellent bearing properties and all cylinders are greased at the factory with a transparent, food-grade grease. Altogether this gives the P1D Series very long service life and smooth, quiet operation.



P1D Removable Gland Version

The Removable Gland Version of the P1D has precision, lightweight aluminum end caps for those applications that require a more robust design. This version also offers a removable rod gland allowing for complete replacement of rod seals and/or rod bearing without disassembly.

High technology design
Still based on the standard P1D design, you can customize your cylinder to the application with options of a high strength plastic piston or a robust aluminum piston that contains a wear-band, which eliminates any metal-to-metal contact. Both pistons come standard with a magnet for optional use of cylinder sensors.

Common design platform
The Removable Gland Version of the P1D has the same technical platform as the standard P1D. The best materials (e.g. – PTFE filled Bronze Rod Gland), manufacturing methods and the careful attention to detail give the P1D Removable Gland Version smooth, quiet operation and long service.

Installation dimensions according to international standards
The Removable Gland Version of the P1D complies with the current ISO 6431, ISO/DIS 15552, VDMA 24562 and AFNOR installation dimensional standards for customer reassurance world-wide.

Removable Gland
An extra-long inboard bearing surface ensures lubrication from within the cylinder. Outboard of the bearing are two leak-proof seals. The rod wiper seal wipes away any dirt on the rod. This means less wear on bearing surfaces and internal parts. The result is positive, no-leak sealing, regardless of conditions. And with the famous Parker removable style gland, you can replace the rod seals and/or bearings when necessary without disassembling the rest of the cylinder and without the need of any special wrenches.

Aluminum Piston Option
For high temperature applications, an aluminum piston is available with fluorocarbon seals. The piston is threaded onto the piston rod and secured in place with anaerobic adhesive which is temperature sensitive. For applications above +121°C (+250°F) specify a pinned piston to rod connection. The polyurethane seals that are standard on the nylon piston are also an available option with the aluminum piston. The magnet that is cleverly hidden underneath the wear-band is also a standard feature on the aluminum piston. The durable wear-band prevents any metal-to-metal contact between the piston and the cylinder body wall increasing the overall life of the cylinder.

Machined End Caps with Captive Cushion Screw Adjustment
The end caps on the Removable Gland Version of the P1D are made of precision lightweight aluminum. This allows for maximum flexibility and quick response for any customization that is required. The end caps also feature a captive cushion needle valve adjustment screw for optimized cushioning that is inherent throughout the P1D family of ISO cylinders.

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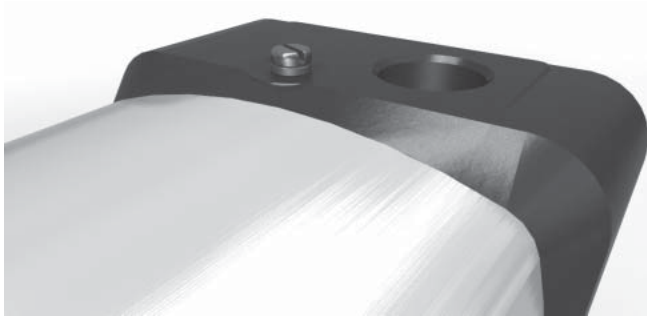
P1D Clean Version

The P1D Clean version is a new addition to our ISO cylinder system, completely designed for the food industry. Many years' experience of the stringent requirements for hygiene regarding choice of material and corrosion resistance have guided the development of this cylinder version. Great emphasis has been put on careful design of the external parts of the cylinder, including choice of materials and corrosion protection.

Main dimensions according to international standards
All the main dimensions of the P1D Clean comply with ISO 6431, ISO/DIS 1555, VDMA 24562 and AFNOR standards. The exception is the somewhat larger footprint of the end covers and envelope of the body extrusion, due to the hygienic, convex, easy-to-clean geometry of the cushioning adjustment screw and the components of the integrated sensor system.

Common, high technology design platform
The P1D Clean version has the same technical platform as the standard P1D. The best materials, manufacturing methods and the careful attention to design detail give the P1D Clean Version smooth, quiet operation and long service life.

Convex shape for optimum hygiene
What makes the P1D Clean version unique is its convex body extrusion, which allows the cylinder to be kept clean. Regardless of orientation, fluids will run off the cylinder body surfaces.



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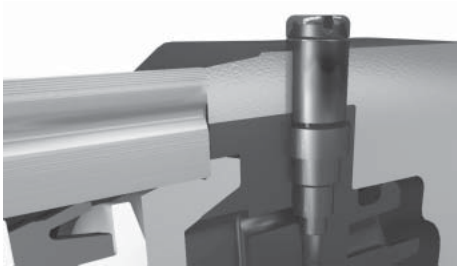
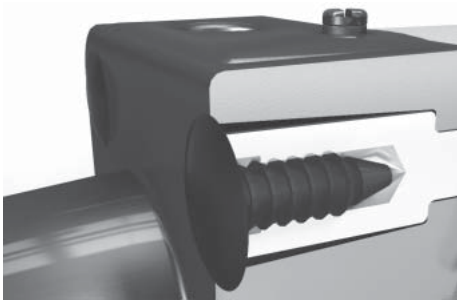
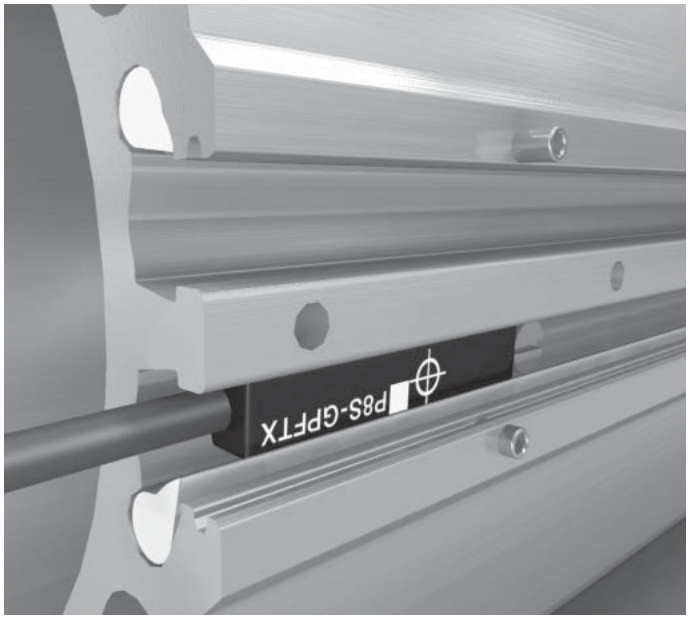
Cushioning screw with positive geometry
To offer the best hygiene properties, the projecting cushioning screw is sealed against the end cover. This eliminates dirt-collecting cavities and gives the best hygiene, since it is so easy to clean.



Sealing plugs
Plastic sealing plugs are supplied with every Clean Version of the P1D cylinder. These are installed in the end cover screws which are not used for the cylinder installation. To ensure the sealing function, the plugs can be used only once, i.e. they cannot be re-used. When installed in the end cover screws, they are tapped lightly with a hammer for high axial force.

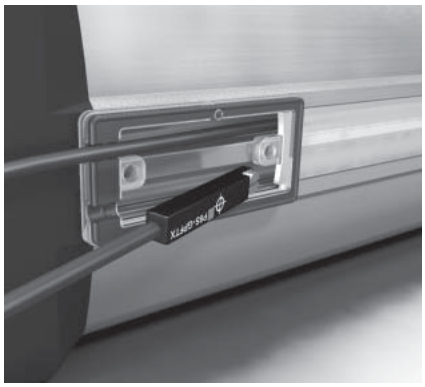


Patent applied for system of integrated standard sensors
The Clean Version of the P1D cylinder has a system of sensors, which are fully integrated into the body extrusion to give the cylinders a clean external design. Up to four sensors chosen from the range of P1D standard sensors, can be mounted in two dedicated grooves beneath a transparent, sealed molding. Tightening the stop screw onto the cam shaft will lock each sensor in the desired position. The sensor LEDs are always fully visible, which facilitates initial set-up, adjustment and trouble-shooting. The entire sensor system has a hose-proof design equivalent to IP65.

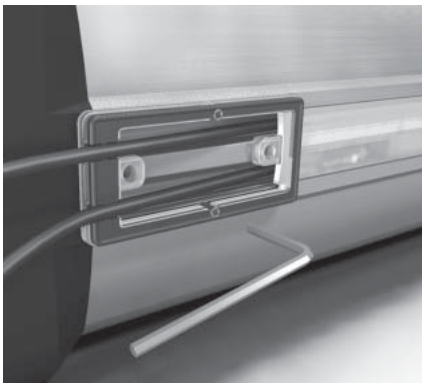


Up to four integral sensors
Cylinders for two integral sensors have two undivided camshafts along the entire stroke. Free choice of cable exit, front or rear. There is also a version with divided camshafts for up to four sensors, which are installed two from each end cover, with cable exiting both front and rear.

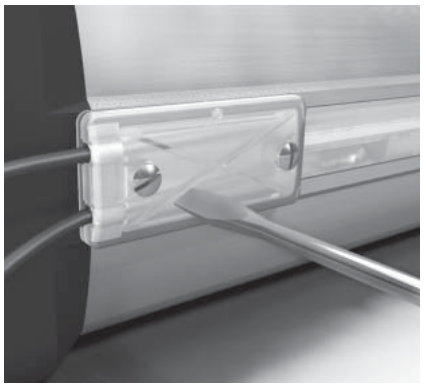
Simple sensor adjustment
The sensors are mounted into their grooves through the opening in a transparent, sealed cover. The sensor cables have strain relief and are sealed.



The sensor position is easily adjusted by undoing a set screw and using the cable to move the sensor to the desired position.



Once the sensor has been locked in its new position, the protective cover is installed again.



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P1D Tie-Rod Version

The P1D Series is also available in a tie-rod version, based on the same high level technology. This cylinder is the perfect choice wherever a true tie-rod cylinder is needed.

Installation dimensions to international standard
The P1D Tie-Rod version complies with ISO 6431, ISO/DIS 15552, VDMA 24562 and AFNOR installation dimension standards, for customer reassurance world-wide.

Smooth, quiet operation and long service life
All seals and end-of-stroke bumpers are made from polyurethane (PUR), the bearings and piston are made from proven engineering plastics with excellent bearing properties and the initial greasing at the factory with a transparent, food-grade grease. Altogether this gives the P1D very long service life and gentle, quiet operation.

Optimized cushioning
Thanks to the plastic inserts in the end covers, each cylinder bore has been given an individual flow geometry. This gives an optimized cushioning, which is quicker and easier to set and adjust.

Complete accessory program
The P1D offers a complete ISO, VDMA and AFNOR compatible accessory program, with a wide range of piston rod and cylinder mountings for both pivoted and fixed operation.

'Drop-in"sensor
The P1D Tie-Rod utilizes the same global drop-in sensors as the Standard and Clean versions. An ingenious multi-jointed adapter joins the sensors to the tie rod in any chosen position along the stroke.

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Design variants

Using P1D cylinders as a platform, a number of different designs can be produced to suit differing requirements. Please refer to the “How to Order” section for the designation of each variant.

Alternative piston rod materials
All P1D cylinders in all bores, Ø32-125 mm, can be ordered with the following piston rod materials:
– Steel, hard chrome plated (standard)
– Stainless steel, hard chrome plated
– Acid proof steel

Alternative Piston Rod Materials

Double Rod Cylinders
All P1D cylinders in all bores, Ø32-125 mm, are available with a double rod, or through rod.

Cylinders with a double rod can take higher side forces thanks to the double support for the piston rod. In addition, this design makes it easier to install external mechanical position sensors as well as giving equal force and flow on both sides of the piston.

Double Rod

High ambient temperature
For all bores, Ø32-125 mm, the P1D can be supplied in special high ambient temperature version. The cylinders have seal systems, materials and grease for elevated temperature ranges. The high temperature version does not have a magnetic piston (no function at high temperatures). The aluminum piston option is required for service above +80°C (+176°F) and a pinned piston to rod connection is required for service above +121°C (+250°F).
Ambient temperature range:
– -10°C to +121°C, peaks up to +150°C
(+14°F to +250°F, peaks up to +300°F).

High Ambient Temperature

Low pressure hydraulics
The P1D in bores Ø32 - 125 mm can be supplied with special seals for operation with low pressure hydraulics up to 10 bar. Temperature range -20 °C to +80 °C (-4°F to +176°F).

3 and 4 position cylinders
By installing two cylinders with the same or different stroke, it is possible to build a working unit with three or four positions. This type of unit is available as factory-fitted P1D Tie-Rod Version cylinders in all bores, Ø32-125 mm. Other P1D cylinders can be flange mounted back-to-back with a special mounting.

3 and 4 Position Cylinders

Tandem version
The P1D is also available as a tandem cylinder, i.e. two cylinders connected in series. This cylinder unit has almost twice the force, which is a great advantage in restricted spaces. Tandem cylinders are available as tie-rod style cylinders in all bores Ø32-125 mm.

Tandem Cylinders

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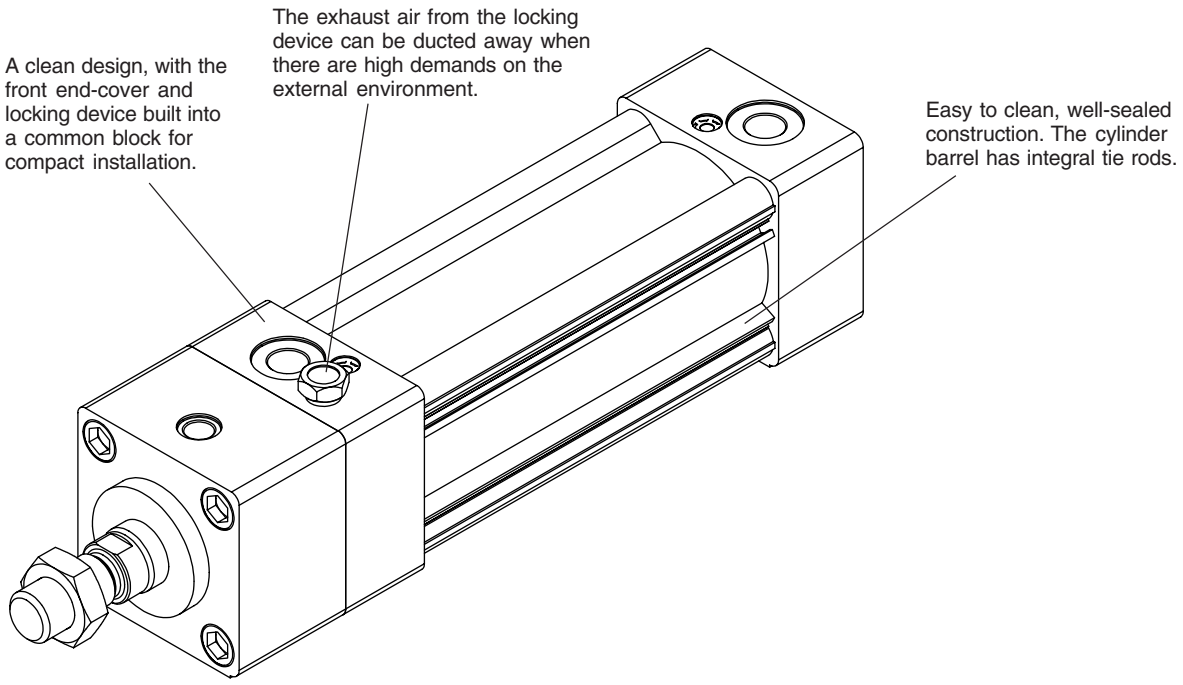

P1D Series with Piston-Rod Locking Device

The P1D Series incorporates a powerful piston – rod locking device, which clamps the piston rod and locks it in position. The locking device is of the air/spring activated type and is integrated into the front (head) cover of the cylinder.

In the absence of air signal pressure, full holding force is applied to the piston rod. When air is present, 4 bar (60psi), the locking device is released.

The locking device is available on all cylinder bore sizes. The design of the P1D cylinders with rod lock gives several valuable characteristics, such as:

- A holding force corresponding to a pressure of 7 bar (102 psi)
- A clean design, with the front (head) end cover and locking device built into a common block for compact installation.
- Easy to clean, well sealed construction.
- Exhaust air from the locking device can be piped away when there are high demands for contaminant free environment.

Application

- In material handling systems
- Position control
- In the event of air pressure or electrical control failure. See holding force chart.
- Not to be used in water service or high humidity environment or in the presence of splashing fluids.

Connection

The signal air for the locking device can be obtained directly from a main air supply, or from the air supply serving the valve that controls the cylinder itself. For controlled ON/OFF operation of the locking device, a separate quick–venting valve is used.

The piston rod should not be moving when the locking device is activated. The locking device is not intended to brake a movement in repeated sequences.

Holding Forces

Bore Sizes	Holding Forces	
	Newton (N)	Pounds (LBS)
32mm	550	123
40mm	860	193
50mm	1345	303
63mm	2140	481
80mm	3450	755
100mm	5390	1211
125mm	8425	1894

Technical Data

Working medium	dry, filtered compressed air
Working pressure	max. 1000 kPa (10 bar)
Working temperature	-10°C to +75°C
Locking pressure[1]	min. 400 kPa (4 bars) ±10%

1) Signal pressure to connection port on locking device.

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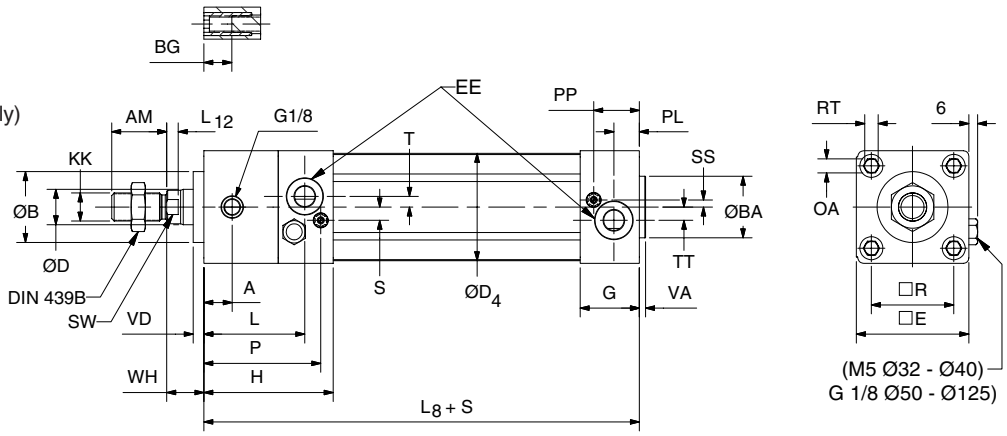
P1D with Rod Lock

Note: Cushion adjustment (head only) located at position #3 for bore size 32mm only.



Dimensions

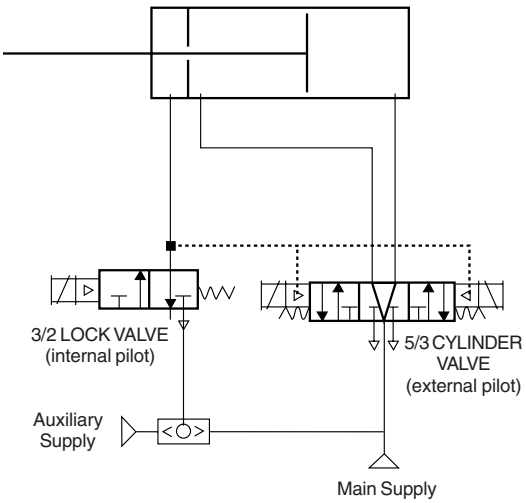
Cylinder bore mm	A mm	AM mm	B mm	BA mm	BG mm	D mm	D_4 mm	E mm	EE	G mm	H mm	KK	L mm	L_8 mm	L_{12} mm
32	16	22	30	30	16	12	45,0	46,5	G1/8	28,5	71,5	M10X1,25	56,0	137	6,0
40	16	24	35	35	16	16	52,0	52,0	G1/4	33,0	77,0	M12X1,25	56,0	149	6,5
50	18	32	40	40	16	20	60,7	63,5	G1/4	33,5	80,5	M16X1,5	62,5	153	6,5
63	26	32	45	45	16	20	71,5	76,0	G3/8	39,5	96,5	M16X1,5	74,5	178	6,5
80	35	40	45	45	17	25	86,7	95,5	G3/8	39,5	110,5	M20X1,5	87,0	199	10,0
100	50	40	55	55	17	25	106,7	114,5	G1/2	44,5	132,5	M20X1,5	106,0	226	10,0
125	60	54	60	60	20	32	134,0	140,0	G1/2	51,0	145,0	M27X2	117,0	254	13,0

Cylinder bore mm	OA mm	P mm	PL mm	PP mm	R mm	RT	S mm	SS mm	SW mm	T mm	TT mm	VA mm	VD mm	WH mm
32	6	63,5	13	21,8	32,5	M6	6	6,5	10	2,5	4,5	3,5	4,5	15
40	6	68,0	14	21,9	38,0	M6	9	8,0	13	2,0	5,5	3,5	4,5	16
50	8	73,5	14	25,9	46,5	M8	8	4,0	17	4,0	7,5	3,5	5,0	17
63	8	89,5	16	27,4	56,5	M8	8	6,5	17	2,0	11,0	3,5	5,0	17
80	–	101,5	16	30,5	72,0	M10	9	0	22	5,0	15,0	3,5	4,0	20
100	–	123,5	18	35,8	89,0	M10	12	0	22	6,0	20,0	3,5	4,0	20
125	–	136,0	23	40,5	110,0	M12	12	0	27	6,0	17,5	5,5	6,0	27

S=Stroke length

Tolerances

Cylinder bore mm	B	R mm	I8 mm	BA mm	Stroke-length tolerance mm
32	d11	±0,5	±0,4	d11	+1/-0
40	d11	±0,5	±0,7	d11	+1/-0
50	d11	±0,6	±0,7	d11	+1/-0
63	d11	±0,7	±0,8	d11	+1/-0
80	d11	±0,7	±0,8	d11	+1/-0
100	d11	±0,7	±1,0	d11	+1/-0
125	d11	±1,1	±1,0	d11	+1/-0



1. Lock valve must be maintained energized during cylinder motion, otherwise rod lock is engaged and cylinder valve shifts to mid position.

2. Cylinder valve must be maintained energized during extend or retract. Also keep energized at end of stroke until change of direction is desired.

3. Mid position of 5/3 Cylinder valve may be pressurized outlets if the combination of pressure load on the cylinder and inertia effects of the attached load do not exceed the holding force rating of the rod lock device, including allowance for wear.

4. Do not use cylinder lines for any logic functions — pressure levels vary too much.

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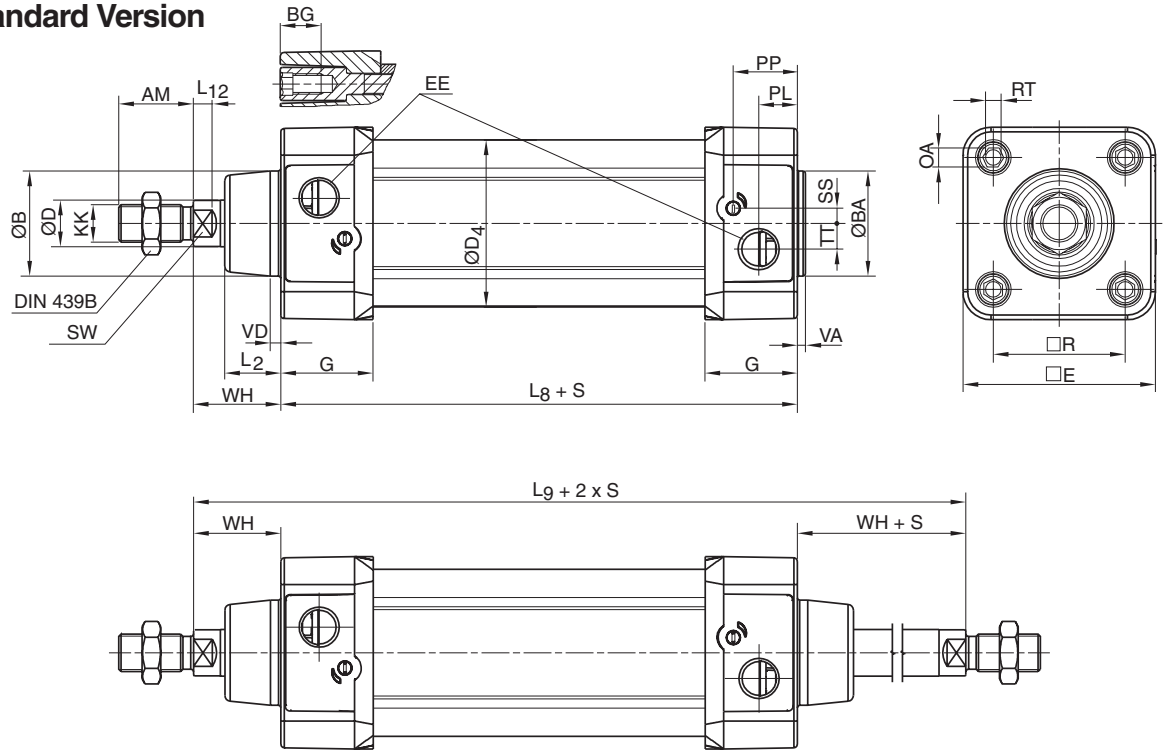
P1D Standard Version



Dimensions

Cylinder bore mm	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E	EE mm	G mm	KK	L2 mm	L8 mm	L9 mm	L12 mm
32	22	30	30	16	12	45,0	50,0	G1/8	28,5	M10x1,25	16,0	94	146	6,0
40	24	35	35	16	16	52,0	57,4	G1/4	33,0	M12x1,25	19,0	105	165	6,5
50	32	40	40	16	20	60,7	69,4	G1/4	33,5	M16x1,5	24,0	106	180	8,0
63	32	45	45	16	20	71,5	82,4	G3/8	39,5	M16x1,5	24,0	121	195	8,0
80	40	45	45	17	25	86,7	99,4	G3/8	39,5	M20x1,5	30,0	128	220	10,0
100	40	55	55	17	25	106,7	116,0	G1/2	44,5	M20x1,5	32,4	138	240	10,0
125	54	60	60	20	32	134,0	139,0	G1/2	51,0	M27x2	45,0	160	290	13,0

Cylinder bore mm	OA mm	PL mm	PP mm	R mm	RT	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm
32	6	13	21,8	32,5	M6	4,0	10	4,5	3,5	4,5	26
40	6	14	21,9	38,0	M6	8,0	13	5,5	3,5	4,5	30
50	8	14	25,9	46,5	M8	4,0	17	7,5	3,5	4,5	37
63	8	16	27,4	56,5	M8	6,5	17	11,0	3,5	4,5	37
80	6	16	30,5	72,0	M10	0	22	15,0	3,5	4,5	46
100	6	18	35,8	89,0	M10	0	22	20,0	3,5	4,5	51
125	8	23	40,5	110,0	M12	0	27	17,5	5,5	6,5	65

S=Stroke

Tolerances

Cylinder bore mm	B	BA mm	L_8 mm	L_9 mm	R mm	Stroke tolerance
32	d11	d11	±0,4	±2	±0,5	+1/-0
40	d11	d11	±0,7	±2	±0,5	+1/-0
50	d11	d11	±0,7	±2	±0,6	+1/-0
63	d11	d11	±0,8	±2	±0,7	+1/-0
80	d11	d11	±0,8	±3	±0,7	+1/-0
100	d11	d11	±1,0	±3	±0,7	+1/-0
125	d11	d11	±1,0	±3	±1,1	+1/-0

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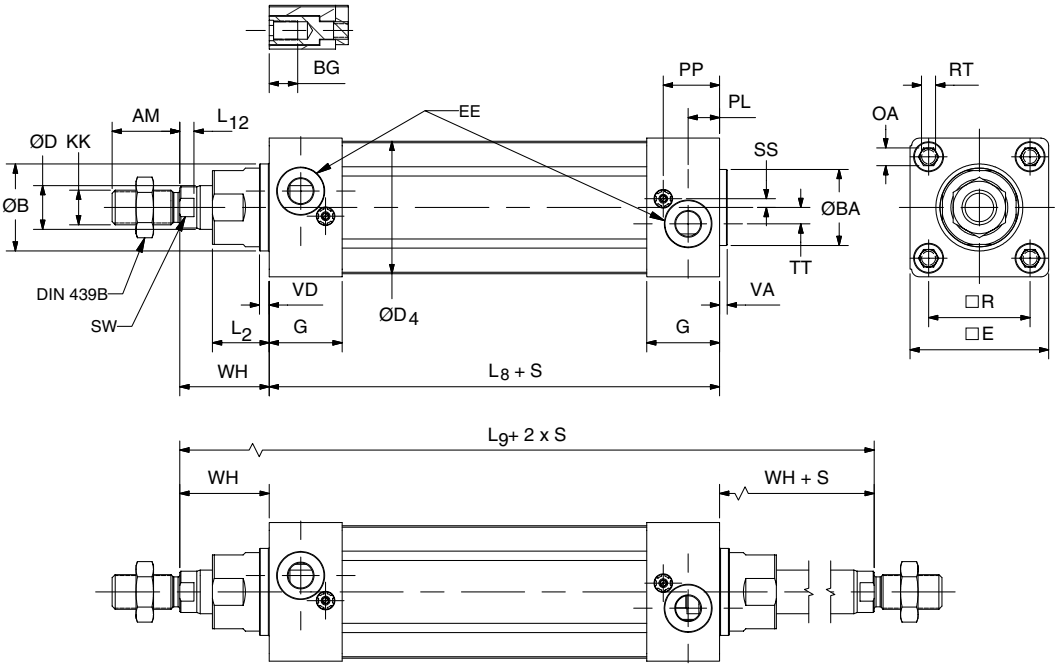
P1D Removable Gland Version



Dimensions

Cylinder bore mm	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E mm	EE	G mm	KK	L2 mm	L8 mm	L9 mm	L12 mm
32	22	30	30	16	12	45,0	46,5	G1/8	28,5	M10x1,25	18	94	146	6,0
40	24	35	35	16	16	52,0	52,0	G1/4	33,0	M12x1,25	20	105	165	6,5
50	32	40	40	16	20	60,7	63,5	G1/4	33,5	M16x1,5	26	106	180	6,5
63	32	45	45	16	20	71,5	76,0	G3/8	39,5	M16x1,5	26	121	195	6,5
80	40	45	45	17	25	86,7	95,5	G3/8	39,5	M20x1,5	33	128	220	10,0
100	40	55	55	17	25	106,7	114,5	G1/2	44,5	M20x1,5	33	138	240	10,0
125	54	60	60	20	32	134,0	140,0	G1/2	51,0	M27x2	41	160	290	13,0

Cylinder bore mm	OA mm	PL mm	PP mm	R mm	RT	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm
32	6	13	21,8	32,5	M6	6,5	10	4,5	3,5	4,5	26
40	6	14	21,9	38,0	M6	8,0	13	5,5	3,5	4,5	30
50	8	14	25,9	46,5	M8	4,0	17	7,5	3,5	4,5	37
63	8	16	27,4	56,5	M8	6,5	17	11,0	3,5	4,5	37
80	6	16	30,5	72,0	M10	0	22	15,0	3,5	4,5	46
100	6	18	35,8	89,0	M10	0	22	20,0	3,5	4,5	51
125	8	23	40,5	110,0	M12	0	27	17,5	5,5	6,5	65

S=Stroke

Tolerances

Cylinder bore mm	B	BA mm	L_8 mm	L_9 mm	R mm	Stroke tolerance
32	d11	d11	±0,4	±2	±0,5	+1/-0
40	d11	d11	±0,7	±2	±0,5	+1/-0
50	d11	d11	±0,7	±2	±0,6	+1/-0
63	d11	d11	±0,8	±2	±0,7	+1/-0
80	d11	d11	±0,8	±3	±0,7	+1/-0
100	d11	d11	±1,0	±3	±0,7	+1/-0
125	d11	d11	±1,0	±3	±1,1	+1/-0

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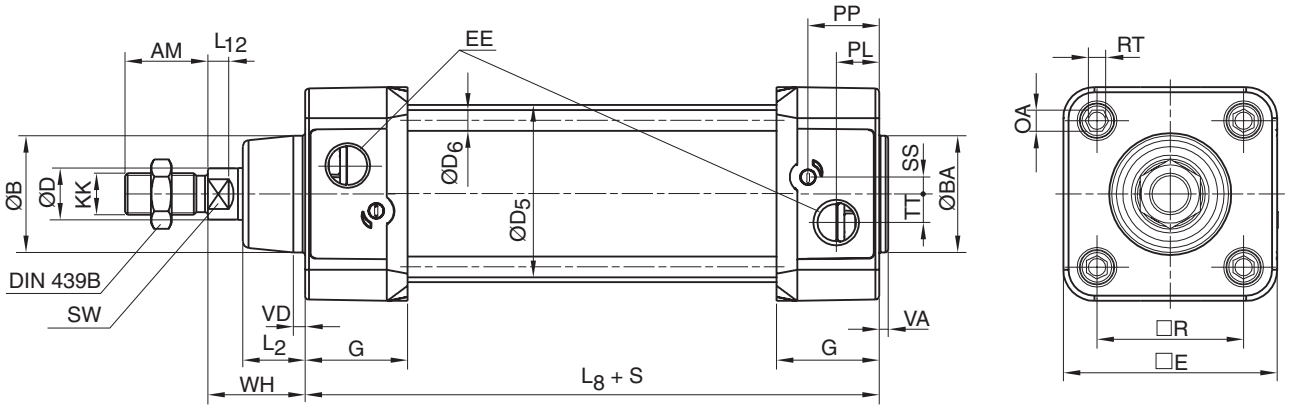
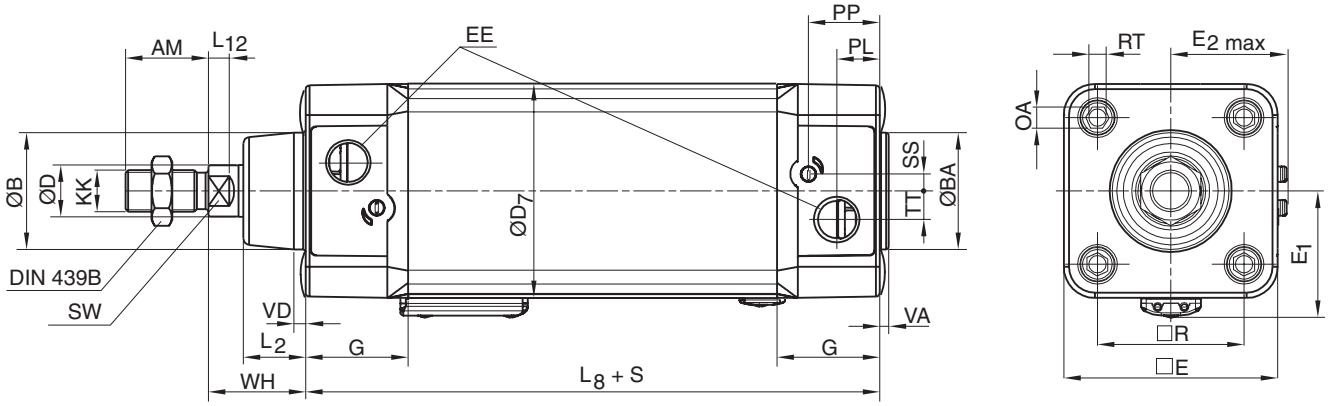
P1D Tie-Rod Version



P1D Clean Version



Dimensions

Cylinder bore mm	D5 mm	D6 mm	D7 mm	E1 mm	E2max mm
32	36	5,3	49,6	32	5
40	45	5,3	57,3	36	6
50	55	7,1	69,3	42	6
63	68	7,1	82,3	49	5
80	85	8,9	99,3	57	5
100	105	8,9	117,6	68	6
125	132	10,7	142,8	81	6

Other dimensions, see page 14.

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Specifications

Cylinder designation	Cylinder bore	Cylinder area	Piston rod dia.	Piston rod area	Piston rod thread	Cushioning length	Air consumption[2]	Connection thread
	mm	cm^2	mm	cm^2		mm	litre	
P1D-•032••-XXXX[1]	32	8,0	12	1,1	M10x1,25	17	0,105	G1/8
P1D-•040••-XXXX[1]	40	12,6	16	2,0	M12x1,25	19	0,162	G1/4
P1D-•050••-XXXX[1]	50	19,6	20	3,1	M16x1,5	20	0,253	G1/4
P1D-•063••-XXXX[1]	63	31,2	20	3,1	M16x1,5	23	0,414	G3/8
P1D-•080••-XXXX[1]	80	50,3	25	4,9	M20x1,5	23	0,669	G3/8
P1D-•100••-XXXX[1]	100	78,5	25	4,9	M20x1,5	27	1,043	G1/2
P1D-•125••-XXXX[1]	125	122,7	32	8,0	M27x2	30	1,662	G1/2

Cylinder designation	Total mass (kg) at 0 mm stroke			Total mass (kg) Supplement per 10 mm stroke			Mass moving components (kg) at 0 mm stroke	Mass moving components (kg) Supplement per 10 mm stroke
	Standard	Tie-Rod	Clean	Standard	Tie-Rod	Clean	All variants	All variants
P1D-•032••-XXXX[1]	0,55	0,54	0,60	0,023	0,022	0,047	0,13	0,009
P1D-•040••-XXXX[1]	0,80	0,79	0,88	0,033	0,030	0,063	0,24	0,016
P1D-•050••-XXXX[1]	1,20	1,20	1,32	0,048	0,048	0,094	0,42	0,025
P1D-•063••-XXXX[1]	1,73	1,73	1,86	0,051	0,051	0,101	0,50	0,025
P1D-•080••-XXXX[1]	2,45	2,47	2,63	0,075	0,079	0,142	0,90	0,039
P1D-•100••-XXXX[1]	4,00	4,00	4,22	0,084	0,084	0,168	1,10	0,039
P1D-•125••-XXXX[1]	6,87	6,73	7,01	0,138	0,129	0,248	2,34	0,063

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

Operation data

Working pressure	Max 10 bar	
Working temperature	min	max
Standard	-20°C (-4°F)	+80°C (+176°F)
High temp version	-10°C (+14°F)	+121°C (+250°F)

Aluminum piston is required for service above +80°C (+176°F)
Greased for life, does not normally need additional lubrication. If lubrication is given, this must always be continued.

Working medium, air quality

Working medium Dry, filtered compressed air to ISO 8573-1 class 3. 4. 3. or better

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 (+37°F) 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)	Water (°F)	Oil max concentration (mg/m^3)
1	0,1	0,1	-70	-94	0,01
2	1	1	-40	-40	0,1
3	5	5	-20	-4	1,0
4	15	8	+3	+37	5,0
5	40	10	+7	+44	25
6	-	-	+10	+50	-

Bores and strokes

P1D	32 - 125 mm
Max stroke	2800 mm
Min stroke, P1D Clean	25 mm

Cylinder forces

The values for cylinder forces are theoretical, and should be reduced to suit working conditions.

Cylinder designation	Cylinder bores	Theoretical cylinder force at 6 bar extend stroke	Theoretical cylinder force at 6 bar retract stroke
	mm	N	N
P1D-•032••-XXXX[3]	32	482	414
P1D-•040••-XXXX[3]	40	754	633
P1D-•050••-XXXX[3]	50	1178	989
P1D-•063••-XXXX[3]	63	1870	1681
P1D-•080••-XXXX[3]	80	3016	2721
P1D-•100••-XXXX[3]	100	4712	4417
P1D-•125••-XXXX[3]	125	7363	6880

3) XXXX = stroke
• = optional design in accordance with order key

P1D Clean Version

Protection class	Tube-proof in accordance with IP65
Chemical resistance	Tested for normally used industrial detergents, both acid and alkaline

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Material specification

Standard design

Body extrusion	Clear anodized aluminium
End cover	Powder coated or black anodized alum.
End cover inserts	POM
End cover nuts/screws	Zinc plated steel 8.8
Piston rod nut	Zinc plated steel
Piston rod	Chrome-plated steel
Scraper ring	PUR
Piston rod bearing	POM
Piston	POM
Piston bearing	POM
Magnetic ring	Plastic bound magnetic material
Piston bolt	Zinc plated steel
Piston seal	PUR
O-rings	Nitrile rubber, NBR
End-of-stroke washers	PUR
Cushioning seals	PUR
Cushioning screws	PA

P1D Clean

Transparent molding	Silicone
Transparent cover	ABS
Screws, sensor system	Stainless steel
Upper seal, cover	EPDM
Lower seal, cover	Foam rubber
Sealing plugs	PA
Piston rod nut	Stainless steel

P1D Tie-Rod

Tie-rods	Blackened steel

Design variants

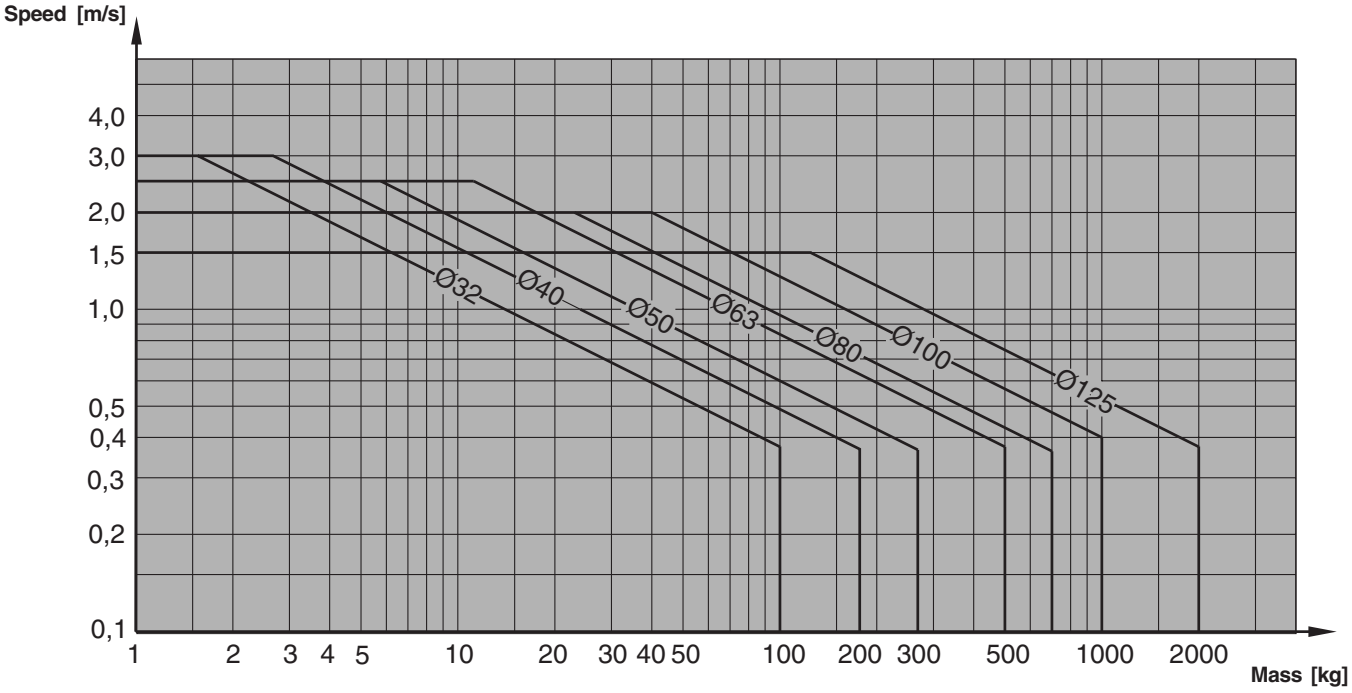
High temperature design	
Seals/scraper ring	Fluorocarbon rubber
Piston	Anodized aluminium
Piston/piston rod bearing	PTFE filled bronze
Low pressure hydraulics	
Seals/scraper ring	Nitrile rubber, NBR
Piston	Anodized aluminium
Piston/piston rod bearing	UHMWPE plastic
Option	
Piston rod material	Acid-proof steel
	Hard-chromium plated stainless steel

Cushioning characteristics

The diagram below is used for sizing 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.



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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.

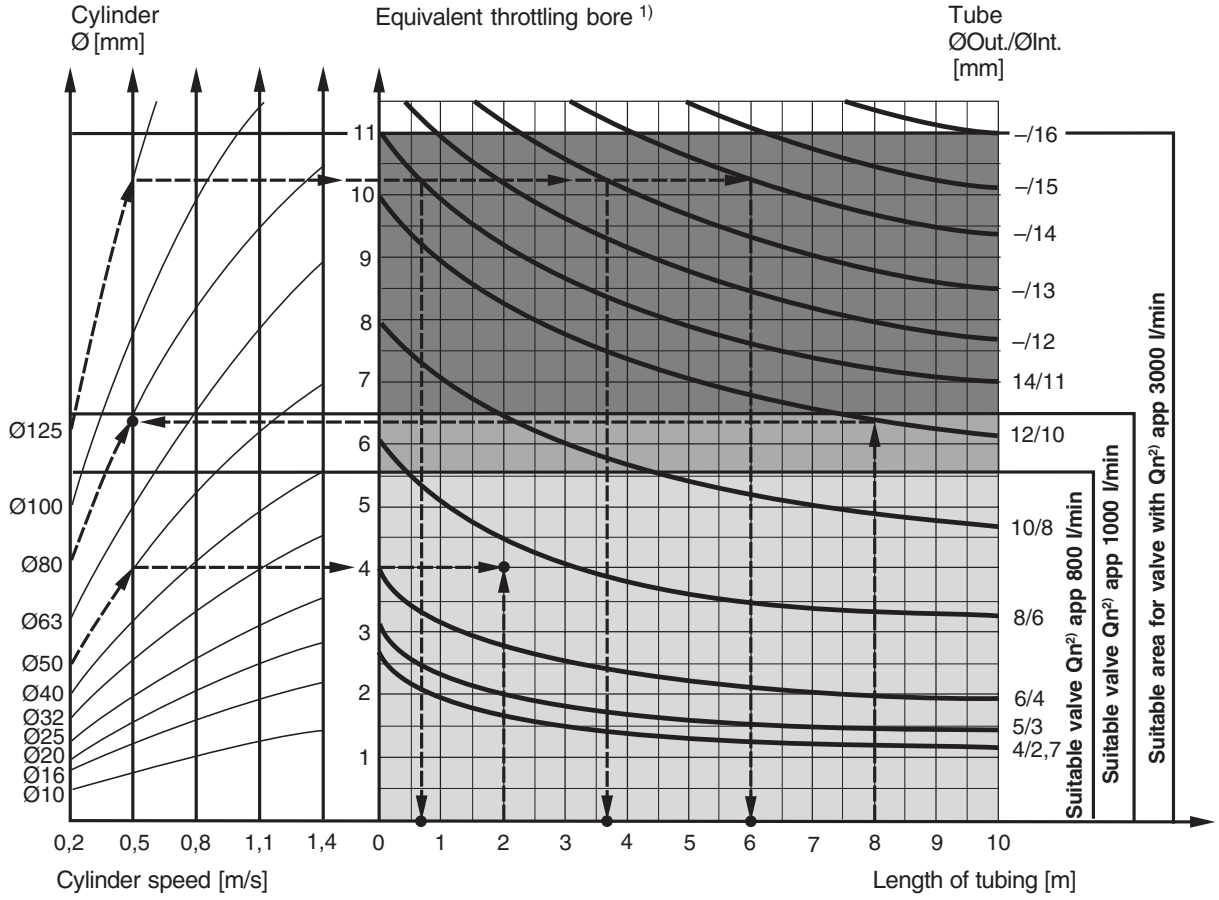
The following is the basic principle:

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 fillingtime.

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.

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P1 **D** **–** **S** **032** **M** **S** **–**

Piston Style		
Cushions	**Piston Material**	
	Plastic	**Aluminum**
None	M	X
Cush B/E	–*	4
Cush head	J	5
Cush cap	K	6

* The dash must be placed in model code.

Bore Size	
32mm-125mm	032

Version			
		Rod Lock	
	Cylinder Body Profile	**None**	**Fitted**
Die Cast End Caps	Standard	S	L
	Tie Rod	T	M
	Clean	C	D
Removable Gland	Standard	G	R
	Tie Rod	E	7
Special	Any Special	/	

Cylinder Ports	
Port Type	**Front & rear**
BSPP Ports (G threads)	–*
NPTF ports	E
BSPT Ports (RC threads)	Q

* The dash must be placed in model code.

Function				
Fastener Type	**Rod Wiper Style**	**Double Acting**	**Double Rod**	**Tandem**
Standard end cover screws	Std scraper	M	F	C
	Metal scraper*	Q	R	J
Stainless steel end cover screws	Std scraper	A	G	N/A
	Metal scraper*	S	T	N/A

*Available on the Removable Gland Version only.

Piston Rod & Seal Material			
Piston Rod Material	**Seal Material**		
	Standard	**Fluoro-carbon***	**Hydraulic****
Chromium plated carbon steel	C	G	J
Chromium plated stainless steel	R	D	Z
Acid resistant stainless steel	M	N	N/A

*If used for temperature above +80°C (+176°F), aluminum piston required.

**Hydraulic seal option valid for Removable Gland Version only. Adjustable cushions and rod lock options not available.

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0500	S	1	N	N

Stroke†	
in mm	0500

Rod Mountings & Plugs††		
Rod Mounting	**No plugs**	**With plugs**
Swivel rod eye	S	A
Swivel rod eye SS	T	1
Swivel rod eye with clevis bracket GA	V	E
Swivel rod eye SS with clevis bracket GA	W	2
Clevis	C	B
Clevis SS	D	3
Flexco coupling	F	G
One additional piston rod nut	X	P
Stainless steel piston rod nut	Y	4
Acid resistant nut	Z	5
None (piston rod nut only)	N	R

†When specifying a stop tube, place a "/" in the version field. Then specify the version, amount of stop tube, and amount of net stroke. The stroke used in the model code should be gross stroke (net stroke plus stop tube).

††Please review Piston Rod Selection Chart in the Engineering Section to check for a rod buckling condition.

Rod End	
Rod End Style	
Metric male	N
Metric female	6
Special*	3

* Please give desired dimensions for KK, AM and WH. If otherwise special, furnish dimensioned sketch.

Sensors*			
	Cable Location		
Factory-fitted sensors	**Front or left**	**Rear or right**	**Front & rear**
P1D Clean prepared for sensors	6	7	8
P1D (except PID Clean) prepared for sensors	N		

***Note:** For sensor part numbers and specifications, please refer to electronic sensors section.

Mounting Style		
	Standard	**Rotated 90°**
Flange MF1/MF2 in front end	1	3
Flange MF1/MF2 in rear end	B	4
Flange MF1/MF2 in both ends	2	K
Foot brackets MS1	F	R
Clevis bracket GA aluminum	C	U
Rear eye MP4 aluminum	E	V
Rear swivel eye aluminum	S	W
Clevis bracket MP2 aluminum	T	Y
Rear eye + clevis (MP4 + MP2) aluminum	L	Z
Clevis bracket MP2 + pivot hinge aluminum	X	5
Clevis bracket GA aluminum + steel swivel hinge	Q	0
Rear swivel eye + clevis bracket GA aluminum	M	A
Cylinder trunnion (XV dimension)*	G	7
Trunnion flange in front end	H	P
Trunnion flange in rear end	J	8
None	N	9

*Requires XV dimension and tie rod version.

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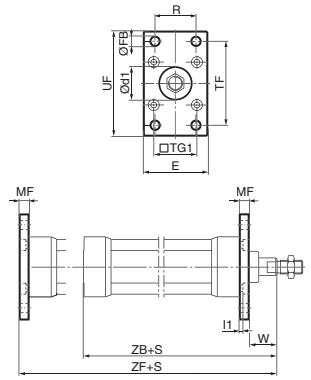
Cylinder mountings

Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Flange MF1/MF2	Intended for fixed mounting of cylinder. Flange can be fitted to front or rear end cover of cylinder. Materials Flange: Surface-treated aluminum, black (125mm bore flange steel, black) Mounting screws acc. to DIN 6912: Zinc-plated steel 8.8 Supplied complete with mounting screws for attachment to cylinder.	32	0,23	**P1C-4KMBA**
		40	0,28	**P1C-4LMBA**
		50	0,53	**P1C-4MMBA**
		63	0,71	**P1C-4NMBA**
		80	1,59	**P1C-4PMBA**
		100	2,19	**P1C-4QMBA**
		125	3,78	**P1C-4RMB**

According to ISO MF1/MF2, VDMA 24 562, AFNOR

Cyl.-bore mm	d1 H11 mm	FB H13 mm	TG1 mm	E mm	R JS14 mm	MF JS14 mm	TF JS14 mm	UF mm	l1 -0,5 mm	W mm	ZF mm	ZB mm
32	30	7	32,5	45	32	10	64	80	5,0	16	130	123,5
40	35	9	38,0	52	36	10	72	90	5,0	20	145	138,5
50	40	9	46,5	65	45	12	90	110	6,5	25	155	146,5
63	45	9	56,5	75	50	12	100	120	6,5	25	170	161,5
80	45	12	72,0	95	63	16	126	150	8,0	30	190	177,5
100	55	14	89,0	115	75	16	150	170	8,0	35	205	192,5
125	60	16	110,0	140	90	20	180	205	10,5	45	245	230,5

S = Stroke length



Foot bracket MS1

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, black
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
Supplied in pairs with mounting screws for attachment to cylinder.

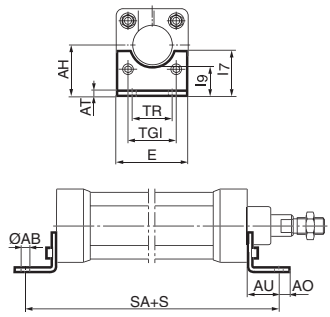
32	0,06*	**P1C-4KMF**
40	0,08*	**P1C-4LMF**
50	0,16*	**P1C-4MMF**
63	0,25*	**P1C-4NMF**
80	0,50*	**P1C-4PMF**
100	0,85*	**P1C-4QMF**
125	1,48*	**P1C-4RMF**

* Weight per item

According to ISO MS1, VDMA 24 562, AFNOR

Cyl.-bore mm	AB H14 mm	TG1 mm	E mm	TR JS14 mm	AO mm	AU mm	AH JS15 mm	l7 mm	AT mm	l9 JS14 mm	SA mm
32	7	32,5	45	32	10	24	32	30	4,5	17,0	142
40	9	38,0	52	36	8	28	36	30	4,5	18,5	161
50	9	46,5	65	45	13	32	45	36	5,5	25,0	170
63	9	56,5	75	50	13	32	50	35	5,5	27,5	185
80	12	72,0	95	63	14	41	63	49	6,5	40,5	210
100	14	89,0	115	75	15	41	71	54	6,5	43,5	220
125	16	110,0	140	90	22	45	90	71	8,0	60,0	250

S = Stroke length



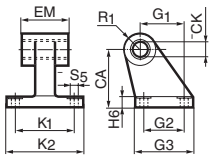
Pivot bracket with rigid bearing

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

32	0,06	**P1C-4KMD**
40	0,08	**P1C-4LMD**
50	0,15	**P1C-4MMD**
63	0,20	**P1C-4NMD**
80	0,33	**P1C-4PMD**
100	0,49	**P1C-4QMD**
125	1,02	**P1C-4RMD**

According to CETOP RP 107 P, VDMA 24 562, AFNOR

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
32	10	6,6	38	51	21	18	25,5	31	32	8	10,0
40	12	6,6	41	54	24	22	27,0	35	36	10	11,0
50	12	9,0	50	65	33	30	31,0	45	45	12	13,0
63	16	9,0	52	67	37	35	39,0	50	50	12	15,0
80	16	11,0	66	86	47	40	49,0	60	63	14	15,0
100	20	11,0	76	96	55	50	59,0	70	71	15	19,0
125	25	14,0	94	124	70	60	69,0	90	90	20	22,5



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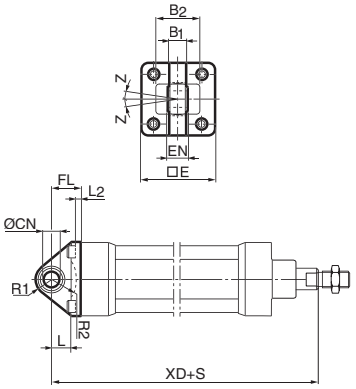
Cylinder mountings

Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Swivel eye bracket	Intended for use together with clevis bracket GA	32	0,08	**P1C-4KMSA**
		40	0,11	**P1C-4LMSA**
	Material	50	0,20	**P1C-4MMSA**
	Bracket: Surface-treated aluminium, black	63	0,27	**P1C-4NMSA**
	Swivel bearing acc. to DIN 648K: Hardened steel	80	0,52	**P1C-4PMSA**
		100	0,72	**P1C-4QMSA**
	Supplied complete with mounting screws for attachment to cylinder.	125	1,53	**P1C-4RMSA**

Now in aluminum!

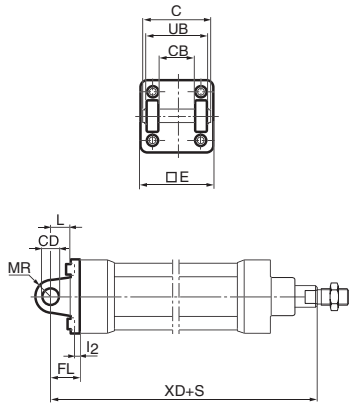


According to VDMA 24 562, AFNOR

Cyl.-bore mm	E mm	B1 mm	B2 mm	EN mm	R1 mm	R2 mm	FL mm	l2 mm	L mm	CN H7 mm	XD mm	Z
32	45	10,5	-	14	16	-	22	5,5	12	10	142	4°
40	52	12,0	-	16	18	-	25	5,5	15	12	160	4°
50	65	15,0	51	21	21	19	27	6,5	15	16	170	4°
63	75	15,0	-	21	23	-	32	6,5	20	16	190	4°
80	95	18,0	-	25	29	-	36	10,0	20	20	210	4°
100	115	18,0	-	25	31	-	41	10,0	25	20	230	4°
125	140	25,0	-	37	40	-	50	10,0	30	30	275	4°

S = Stroke length

Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Clevis bracket MP2	Intended for flexible mounting of cylinder. Clevis bracket MP2 can be combined with clevis bracket MP4.	32	0,08	**P1C-4KMT**
		40	0,11	**P1C-4LMT**
		50	0,14	**P1C-4MMT**
	Materials	63	0,29	**P1C-4NMT**
	Clevis bracket: Surface-treated aluminium, black	80	0,36	**P1C-4PMT**
	Pin: Surface hardened steel	100	0,64	**P1C-4QMT**
	Circlips according to DIN 471: Spring steel	125	1,17	**P1C-4RMT**
	Mounting screws acc. to DIN 912: Zinc-plated steel 8.8			
	Supplied complete with mounting screws for attachment to cylinder.			



According to ISO MP2, VDMA 24 562, AFNOR

Cyl.-bore mm	C mm	E mm	UB h14 mm	CB H14 mm	FL ±0,2 mm	L mm	l2 mm	CD H9 mm	MR mm	XD mm
32	53	45	45	26	22	13	5,5	10	10	142
40	60	52	52	28	25	16	5,5	12	12	160
50	68	65	60	32	27	16	6,5	12	12	170
63	78	75	70	40	32	21	6,5	16	16	190
80	98	95	90	50	36	22	10,0	16	16	210
100	118	115	110	60	41	27	10,0	20	20	230
125	139	140	130	70	50	30	10,0	25	25	275

S = Stroke length

Parker Hannifin Corporation
Actuator Division
Wadsworth, Ohio USA

Cylinder mountings

Clevis bracket MP4

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

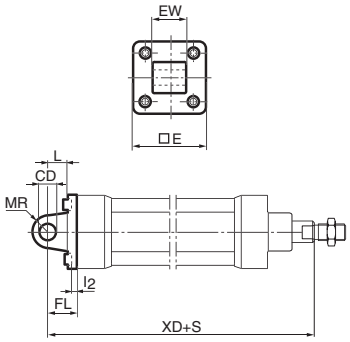
Supplied complete with mounting screws for attachment to cylinder.

Cyl. bore Ø mm	Weight kg	Order code
32	0,09	**P1C-4KME**
40	0,13	**P1C-4LME**
50	0,17	**P1C-4MME**
63	0,36	**P1C-4NME**
80	0,46	**P1C-4PME**
100	0,83	**P1C-4QME**
125	1,53	**P1C-4RME**

According to ISO MP4, VDMA 24 562, AFNOR

Cyl.-bore mm	E mm	EW mm	FL mm	L ±0,2 mm	l2 mm	CD mm	MR H9 mm	XD mm
32	45	26	22	13	5,5	10	10	142
40	52	28	25	16	5,5	12	12	160
50	65	32	27	16	6,5	12	12	170
63	75	40	32	21	6,5	16	16	190
80	95	50	36	22	10,0	16	16	210
100	115	60	41	27	10,0	20	20	230
125	140	70	50	30	10,0	25	25	275

S = Stroke length



Clevis bracket GA

Now in aluminium!

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

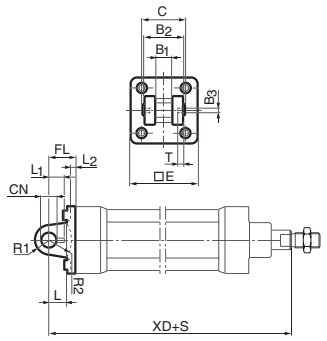
Supplied complete with mounting screws for attachment to cylinder.

Cyl.-bore mm	Weight kg	Order code
32	0,09	**P1C-4KMCA**
40	0,13	**P1C-4LMCA**
50	0,17	**P1C-4MMCA**
63	0,36	**P1C-4NMCA**
80	0,58	**P1C-4PMCA**
100	0,89	**P1C-4QMCA**
125	1,75	**P1C-4RMCA**

According to VDMA 24 562, AFNOR

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	l2 mm	L mm	CN F7 mm	R1 mm	XD mm
32	41	45	34	14	3	3,3	17	11,5	22	5,5	12	10	11	142
40	48	52	40	16	4	4,3	20	12,0	25	5,5	15	12	13	160
50	54	65	45	21	4	4,3	22	14,0	27	6,5	17	16	18	170
63	60	75	51	21	4	4,3	25	14,0	32	6,5	20	16	18	190
80	75	95	65	25	4	4,3	30	16,0	36	10,0	20	20	22	210
100	85	115	75	25	4	4,3	32	16,0	41	10,0	25	20	22	230
125	110	140	97	37	6	6,3	42	24,0	50	10,0	30	30	30	275

S = Stroke length



Stainless steel Pin Set GA
Materials
Pin: Stainless steel
Locking pin: Stainless steel
Circlips according to DIN 471: Stainless steel

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**

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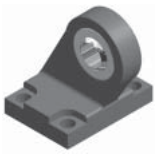
Wadsworth, Ohio USA

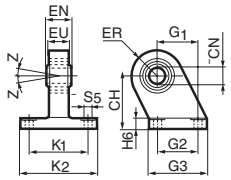
Cylinder mountings

Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Pivot bracket with swivel bearing	Intended for use together with clevis bracket GA.	32	0,18	**P1C-4KMA**
		40	0,25	**P1C-4LMA**
	Material	50	0,47	**P1C-4MMA**
	Pivot bracket: Surface-treated steel, black	63	0,57	**P1C-4NMA**
	Swivel bearing acc. to DIN 648K: Hardened steel	80	1,05	**P1C-4PMA**
		100	1,42	**P1C-4QMA**
		125	3,10	**P1C-4RMA**



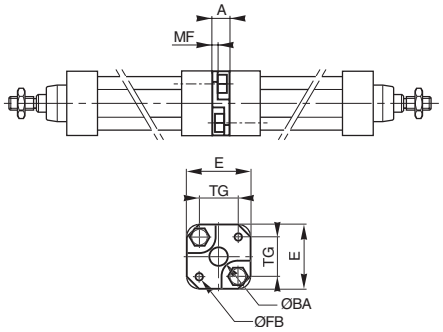
According to VDMA 24 562, AFNOR

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
32	10	6,6	38	51	10,5	21	18	14	31	32	10	16	4°
40	12	6,6	41	54	12,0	24	22	16	35	36	10	18	4°
50	16	9,0	50	65	15,0	33	30	21	45	45	12	21	4°
63	16	9,0	52	67	15,0	37	35	21	50	50	12	23	4°
80	20	11,0	66	86	18,0	47	40	25	60	63	14	28	4°
100	20	11,0	76	96	18,0	55	50	25	70	71	15	30	4°
125	30	14,0	94	124	25,0	70	60	37	90	90	20	40	4°

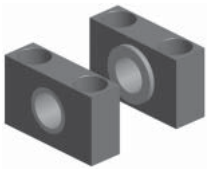


Mounting kit	Mounting kit for back to back mounted cylinders, 3 and 4 position cylinders.	32	0,060	**P1E-6KB0**
		40	0,078	**P1E-6LB0**
	Material:	50	0,162	**P1E-6MB0**
	Mounting: Aluminium	63	0,194	**P1E-6NB0**
	Mounting screws: Zinc-plated steel 8.8	80	0,450	**P1E-6PB0**
		100	0,672	**P1E-6QB0**

Cyl.-bore mm	E mm	TG mm	ØFB mm	MF mm	A mm	ØBA mm
32	50	32,5	6,5	5	16	30
40	60	38,0	6,5	5	16	35
50	66	46,5	8,5	6	20	40
63	80	56,5	8,5	6	20	45
80	100	72,0	10,5	8	25	45
100	118	89,0	10,5	8	25	55



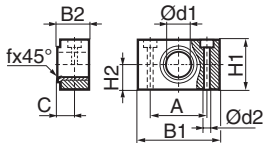
Pivot bracket for MT4	Intended for use together with central trunnion MT4.	32	0,04*	**9301054261**
		40	0,07*	**9301054262**
	Material	50	0,07*	**9301054262**
	Pivot bracket: Surface-treated aluminium	63	0,12*	**9301054264**
	Bearing acc. to DIN 1850 C: Sintered oil-bronze bushing	80	0,12*	**9301054264**
		100	0,21*	**9301054266**
	Supplied in pairs.	125	0,21*	**9301054266**



According to ISO, VDMA 24 562, AFNOR

* Weight per item.

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



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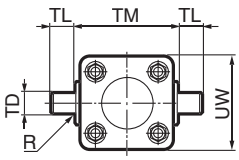
Wadsworth, Ohio USA

Cylinder mountings

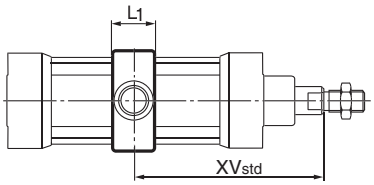
Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Center trunnion MT4 for P1D-T	Intended for articulated mounting of cylinder. This mounting is only available for the tie-rod design of P1D. The trunnion is factory-fitted in the centre of the cylinder or at an optional location specified by the XV-measure – see the order code key. Combined with pivot bracket for MT4. Material: Trunnion: zinc plated steel **Trunnion with optional location** Ordered by letter G in position 17 and desired XV-measure (3-digit measure in mm) must be supplied. See the order code key on pages 20-21.	32 40 50 63 80 100 125	0,13 0,31 0,37 0,69 0,89 1,58 2,60	**See order key on pages 20 and 21**

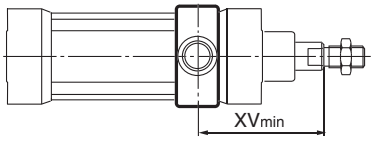


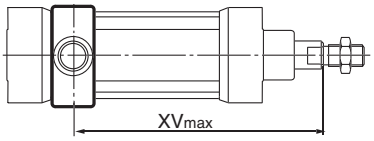
According to ISO MT4, VDMA 24 562, AFNOR

Cyl.-bore mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	X1 mm	XV_{min} mm	X2 mm
32	50	12	12	1,0	46	15	73,0	62,0	84,0
40	63	16	16	1,6	59	20	82,5	73,0	92,0
50	75	16	16	1,6	69	20	90,0	80,5	99,5
63	90	20	20	1,6	84	25	97,5	89,5	106,0
80	110	20	20	1,6	102	25	110,0	98,0	122,0
100	132	25	25	2,0	125	30	120,0	110,5	129,5
125	160	25	25	2,0	155	32	145,0	132,0	158,0

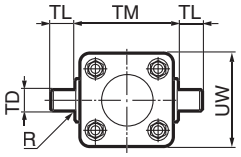
XVstd = X1 + Stroke length/2
XVmax = X2 + Stroke length







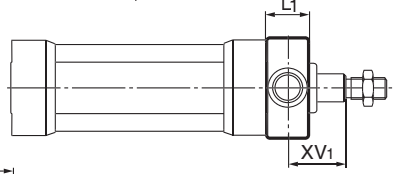
Flange mounted trunnion	Intended for articulated mounting of cylinder. This trunnion can be flange mounted on the front or rear end cover of all P1D cylinders. At your choice, you can order a complete cylinder with factory-fitted flange mounted trunnion – see the order code key on pages 20 and 21. Individual trunnions have order code as shown to the right. Material: Trunnion: zinc plated steel Screws: zinc plated steel, 8.8 Delivered complete with mounting screws for attachment to the cylinder	32 40 50 63 80 100	0,17 0,43 0,55 1,10 1,66 3,00	**P1D-4KMYF** **P1D-4LMYF** **P1D-4MMYF** **P1D-4NMYF** **P1D-4PMYF** **P1D-4QMYF**

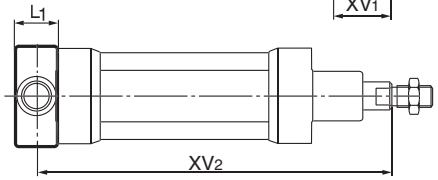


According to ISO MT4, VDMA 24 562, AFNOR

Cyl.-bore mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	XV_1 mm	X mm
32	50	12	12	1,0	46	14	19,0	127,0
40	63	16	16	1,6	59	19	20,5	144,5
50	75	16	16	1,6	69	19	27,5	152,5
63	90	20	20	1,6	84	24	25,0	170,0
80	110	20	20	1,6	102	24	34,0	186,0
100	132	25	25	2,0	155	29	36,5	203,5

XV_2 = X +Stroke length





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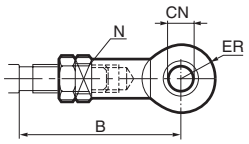
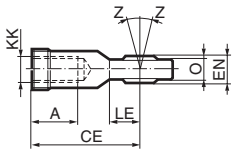
Wadsworth, Ohio USA

Piston rod mountings

Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Swivel rod eye 	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	32	0,08	**P1C-4KRS**
		40	0,12	**P1C-4LRS**
		50	0,25	**P1C-4MRS**
		63	0,25	**P1C-4MRS**
		80	0,46	**P1C-4PRS**
		100	0,46	**P1C-4PRS**
		125	1,28	**P1C-4RRS**
Stainless steel swivel rod eye 	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	32	0,08	**P1S-4JRT**
		40	0,12	**P1S-4LRT**
		50	0,25	**P1S-4MRT**
		63	0,25	**P1S-4MRT**
		80	0,46	**P1S-4PRT**
		100	0,46	**P1S-4PRT**
		125	1,28	**P1S-4RRT**

Use stainless steel nut (see page 45) with stainless steel swivel rod eye.
According to ISO 8139

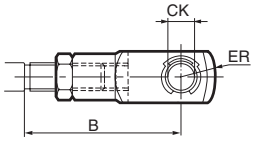


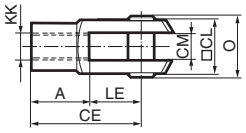


Cyl.-bore mm	A mm	B min mm	B max mm	CE mm	CN H9 mm	EN h12 mm	ER mm	KK	LE min mm	N mm	O mm	Z
32	20	48,0	55	43	10	14	14	M10x1,25	15	17	10,5	12°
40	22	56,0	62	50	12	16	16	M12x1,25	17	19	12,0	12°
50	28	72,0	80	64	16	21	21	M16x1,5	22	22	15,0	15°
63	28	72,0	80	64	16	21	21	M16x1,5	22	22	15,0	15°
80	33	87,0	97	77	20	25	25	M20x1,5	26	32	18,0	15°
100	33	87,0	97	77	20	25	25	M20x1,5	26	32	18,0	15°
125	51	123,5	137	110	30	37	35	M27x2	36	41	25,0	15°

Clevis 	Clevis for articulated mounting of cylinder. Material Clevis, clip: Galvanized steel Pin: Hardened steel	32	0,09	**P1C-4KRC**
		40	0,15	**P1C-4LRC**
		50	0,35	**P1C-4MRC**
		63	0,35	**P1C-4MRC**
		80	0,75	**P1C-4PRC**
		100	0,75	**P1C-4PRC**
		125	2,10	**P1C-4RRC**
Stainless steel clevis 	Stainless-steel clevis for articulated mounting of cylinder. Material Clevis: Stainless steel Pin: Stainless steel Circlips according to DIN 471: Stainless steel	32	0,09	**P1S-4JRD**
		40	0,15	**P1S-4LRD**
		50	0,35	**P1S-4MRD**
		63	0,35	**P1S-4MRD**
		80	0,75	**P1S-4PRD**
		100	0,75	**P1S-4PRD**
		125	2,10	**P1S-4RRD**

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
32	20	45,0	52	40	10	20	10	16	M10x1,25	20	28,0
40	24	54,0	60	48	12	24	12	19	M12x1,25	24	32,0
50	32	72,0	80	64	16	32	16	25	M16x1,5	32	41,5
63	32	72,0	80	64	16	32	16	25	M16x1,5	32	41,5
80	40	90,0	100	80	20	40	20	32	M20x1,5	40	50,0
100	40	90,0	100	80	20	40	20	32	M20x1,5	40	50,0
125	56	123,5	137	110	30	55	30	45	M27x2	54	72,0

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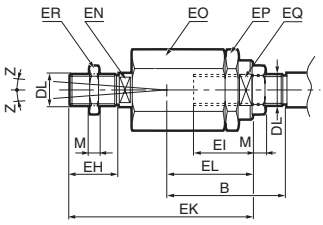
Piston rod mountings

Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Flexo coupling	Flexo coupling for articulated mounting of piston rod. Flexo fitting is intended to take up axial angle errors within a range of ±4°.	32	0,21	**P1C-4KRF**
		40	0,22	**P1C-4LRF**
		50	0,67	**P1C-4MRF**
		63	0,67	**P1C-4MRF**
	Material	80	0,72	**P1C-4PRF**
	Flexo coupling, nut: Zinc-plated steel	100	0,72	**P1C-4PRF**
	Socket: Hardened steel	125	1,80	**P1C-4RRF**
	Supplied complete with galvanized adjustment nut.			

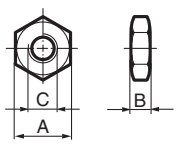
Cyl.-bore mm	B min mm	B max mm	DL	EH mm	EI mm	EK mm	EL mm	EN mm	EO mm	EP mm	EQ mm	ER mm	M mm	Z
32	36,0	43	M10x1,25	20	23	70	31	12	30	30	19	30	5,0	4°
40	37,0	43	M12x1,25	23	23	67	31	12	30	30	19	30	6,0	4°
50	53,0	61	M16x1,5	40	32	112	45	19	41	41	30	41	8,0	4°
63	53,0	61	M16x1,5	40	32	112	45	19	41	41	30	41	8,0	4°
80	57,0	67	M20x1,5	39	42	122	56	19	41	41	30	41	10,0	4°
100	57,0	67	M20x1,5	39	42	122	56	19	41	41	30	41	10,0	4°
125	75,5	89	M27x2	48	48	145	60	24	55	55	32	55	13,5	4°



Nut	Intended for fixed mounting of accessories to the piston rod.	32	0,007	**9128985601**
		40	0,010	**0261109910**
	Material: Zinc-plated steel	50	0,021	**9128985603**
		63	0,021	**9128985603**
	All P1D cylinders are delivred with a zinc-plated steel piston	80	0,040	**0261109911**
		100	0,040	**0261109911**
	rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.	125	0,100	**0261109912**
		32	0,007	**9126725404**
Stainless steel nut	Intended for fixed mounting of accessories to the piston rod.	40	0,010	**9126725405**
		50	0,021	**9126725406**
		63	0,021	**9126725406**
	Material: Stainless steel A2	80	0,040	**0261109921**
		100	0,040	**0261109921**
	All P1D cylinders are delivred with a zinc-plated steel piston	125	0,100	**0261109922**
	rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.	32	0,007	**0261109919**
		40	0,010	**0261109920**
Acid-proof nut	Intended for fixed mounting of accessories to the piston rod.	50	0,021	**0261109917**
		63	0,021	**0261109917**
		80	0,040	**0261109916**
	Material: Acid-proof steel A4	100	0,040	**0261109916**
		125	0,100	**0261109918**
	Cylinders with acid-proof piston rod are supplied with nut of acid-proof steel			

According to DIN 439 B

Cyl.-bore mm	A mm	B mm	C
32	17	5,0	M10x1,25
40	19	6,0	M12x1,25
50	24	8,0	M16x1,5
63	24	8,0	M16x1,5
80	30	10,0	M20x1,5
100	30	10,0	M20x1,5
125	41	13,5	M27x2



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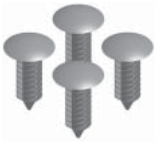
Accessories

Type	Description	Cyl. bore Ø mm	Weight kg	Order code
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 40 50 63 80 100 125	0,02 0,02 0,05 0,05 0,09 0,09 0,15	**9301054321** **9301054321** **9301054322** **9301054322** **9301054323** **9301054323** **9301054324**
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 40 50 63 80 100 125	0,02 0,02 0,04 0,04 0,07 0,07 0,12	**9301054331** **9301054331** **9301054332** **9301054332** **9301054333** **9301054333** **9301054334**
Sealing plugs 	Set of sealing plugs to be fitted in unused end covers. The plugs can be used for all P1D cylinders to avoid collecting dirt and fluids in the end cover screw recesses. Material: Polyamid PA 4 pcs per pack	32 40 50 63 80 100 125	0,01 0,01 0,02 0,02 0,02 0,02 0,03	**9121742201** **9121742201** **9121742202** **9121742202** **9121742203** **9121742203** **9121742204**

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3 and 4 position cylinders

This type of cylinder function consists of two cylinders installed back to back. Two cylinders with the same stroke give a 3 position cylinder with a symmetrical centre position, whereas different strokes give a 4 position cylinder where the two central positions can be calculated from the different stroke lengths.

3 and 4 position cylinders can be ordered in two ways.

Factory-fitted P1D-T

Tie-rod P1D cylinders are completed at the factory and are joined together as one unit by special tie-rods, see position 9 in the order key. See pages 20, 21.

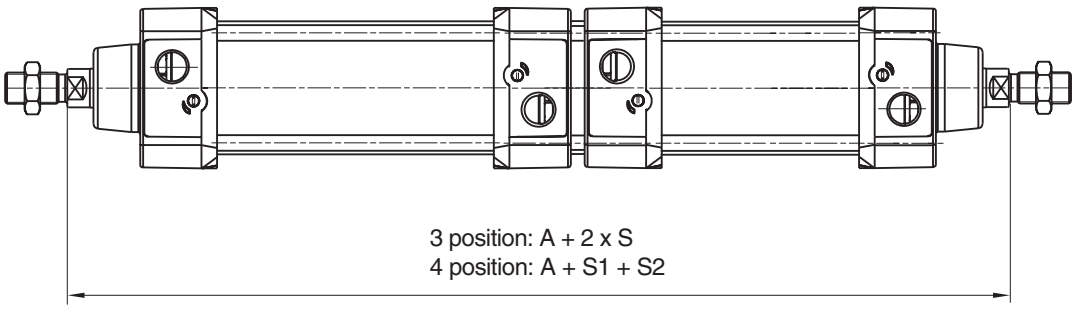
Installation kit for all designs

There is an installation kit for cylinder bores 32 – 100 mm which makes it possible to join any two P1D cylinders together at any time, to make a 3 or 4 position cylinder.

Please refer to cylinder mountings, page 25.

Cylinder bore. mm	A, P1D-T mm	A, P1D-S mm
32	247	256
40	277	286
50	293	306
63	323	336
80	355	373
100	385	403
125	461	–

S=Stroke



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