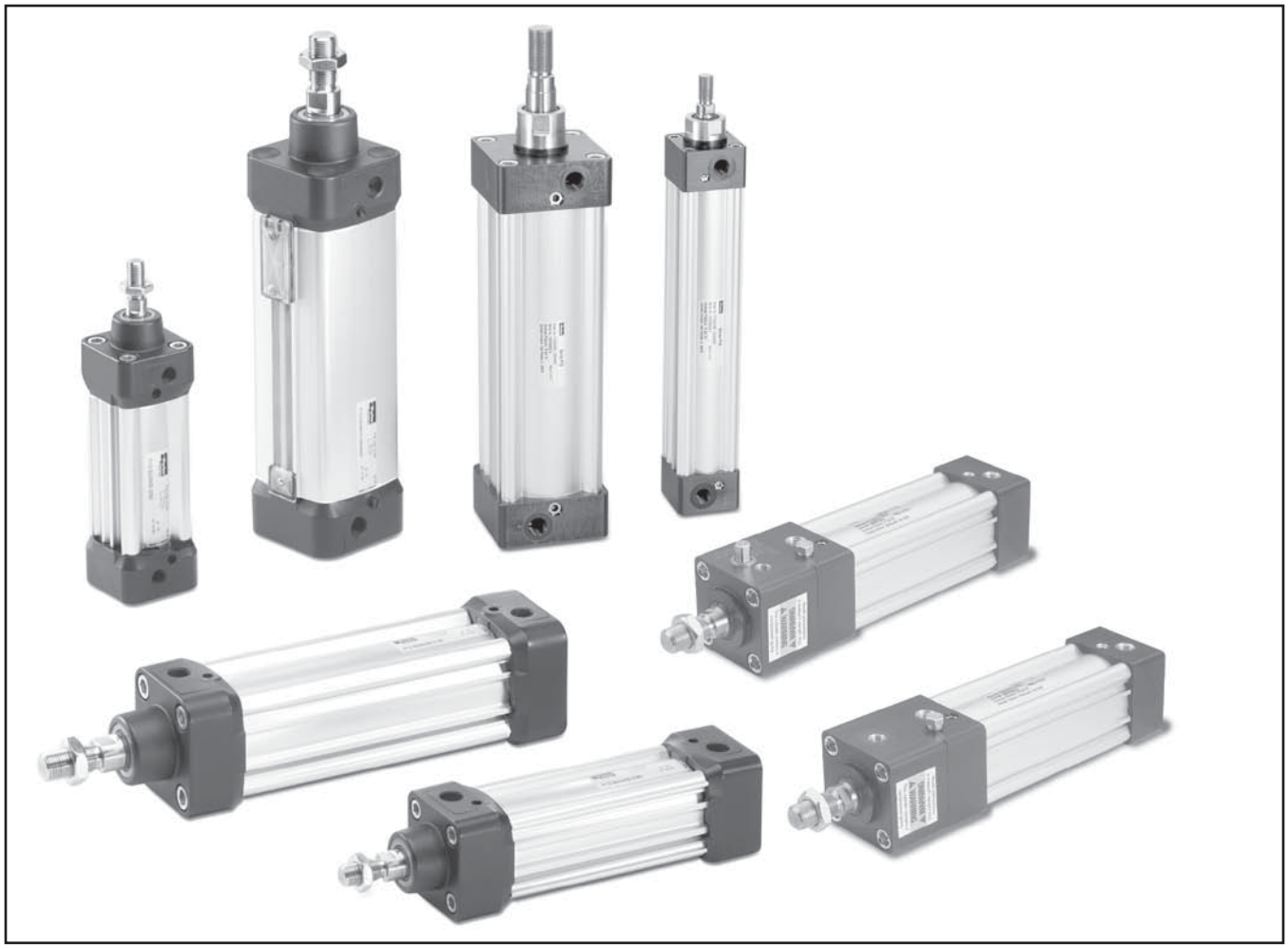
P1D Series

ISO 6431 / ISO 15552 / VDMA 24562
Pneumatic Cylinders



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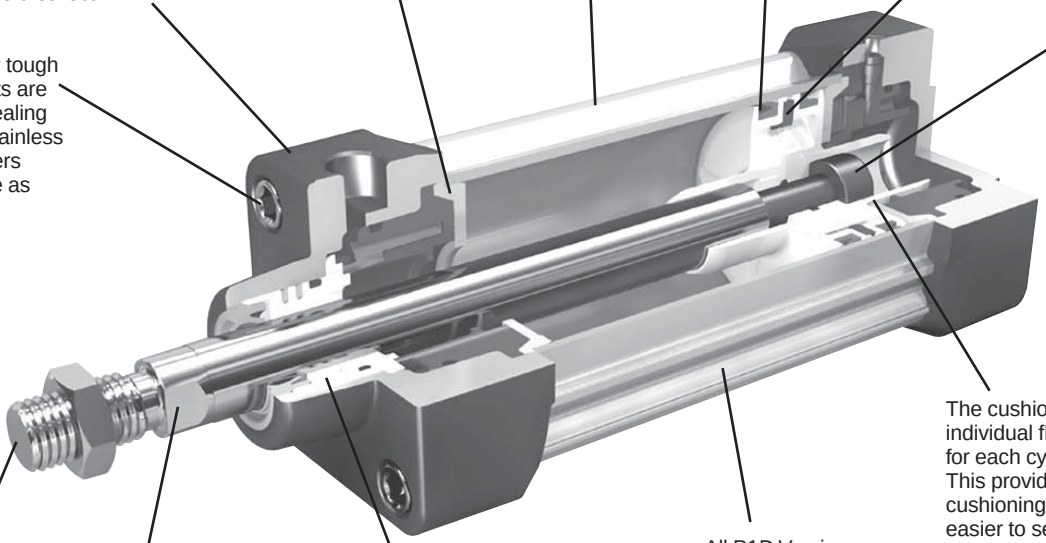
P1D Standard Version



P1D Standard Version

P1D Standard Version cylinders are available in 32-125mm bores and utilize internal composite technology to save weight, while assuring the high performance and functionality expected of ISO cylinders. Cushions and bumpers at both ends and a magnetic piston are included as standard. The Standard Version serves all markets where performance at an affordable price is desired.

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.

Mechanically protected sensor technology
The body extrusion has recessed sensor grooves on three sides of the cylinder. The new Global Sensors drop into the sensor groove quickly and easily. Both the cable and the sensor are protected. Choose a sensor in a variety of cable lengths and with flying leads, 8mm connector or 12mm 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.

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P1D Removable Gland Version

P1D Removable Gland Version cylinders are available in 32-200mm bores and utilize bar stock endcaps and a removable high-strength bronze bearing for traditional and custom applications. The bronze bearing assembly is externally removable for quick and easy maintenance. No other ISO cylinder manufacturer in the world produces a Removable Gland Version and meets these demands. This version covers all applications which require performance and customization at all bore sizes.

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 are made of precision lightweight aluminum. This allows for maximum flexibility and quick manufacturing 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 Series Rod Lock Cylinder

The P1D Series Rod Lock Cylinder incorporates a powerful piston rod locking device, which clamps the piston rod and locks it in position. The locking device is a spring lock with an air pressure release 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 at 4 Bar (58 psi), the locking device is released.

The P1D Series Rod Lock Cylinder is available for cylinder bores 32-125mm. The design provides 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 a contaminant free environment

P1D Series Rod Lock Cylinder with Manual Override

The P1D Series Rod Lock Cylinder with Manual Override is available for rod lock release during non-production activities. It incorporates the same features as the standard rod lock cylinder.

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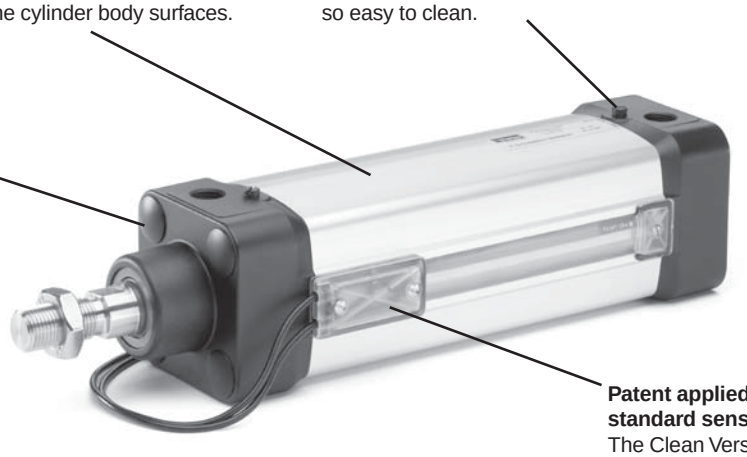
Convex shape for optimum hygiene
What makes the P1D Clean version unique is its convex body extrusion, which allows the cylinder to be kept clean. Regardless of orientation, fluids will run off the cylinder body surfaces.

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 installed in the end cover screws which are not used for the cylinder installation. To ensure the sealing function, the plugs cannot be re-used. When installed in the end cover screws, they are tapped lightly with a hammer for high axial force.



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.

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.

P1D Clean Version

The P1D Clean Version is completely designed for the food industry. The stringent requirements for hygiene regarding choice of material and corrosion resistance have guided the development of this cylinder version. Available with BSPP ports (ISO 1179-1 with ISO 228-1 threads).

All the main dimensions of the P1D Clean comply with ISO 6431, ISO/DIS 1555, VDMA 24562 and AFNOR standards except 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.

P1D Tie-Rod Version

The P1D Tie-Rod Version cylinders are based on the same high level technology as the Standard Version. They accept either Standard Version or Removable Gland Version heads and caps. This cylinder is the perfect choice wherever a true tie-rod cylinder is needed.

International standards
The P1D Tie-Rod Version complies with ISO 6431, ISO/DIS 15552, VDMA 24562 and AFNOR installation dimension standards, for customer reassurance world-wide.

“Drop-in” sensor
The P1D Tie-Rod Version utilizes the same drop-in Global Sensors as the other versions. An ingenious multi-jointed adapter clamps the sensors to the tie rod in any chosen position along the stroke.

Large Bore Sizes
The P1D Tie-Rod Version is now available in 160 and 200mm bore sizes.

32-125mm bores

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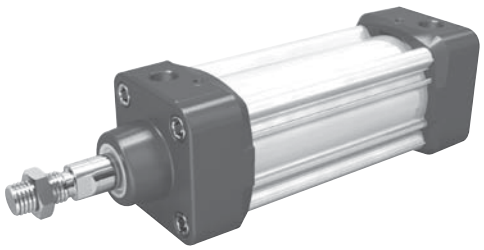
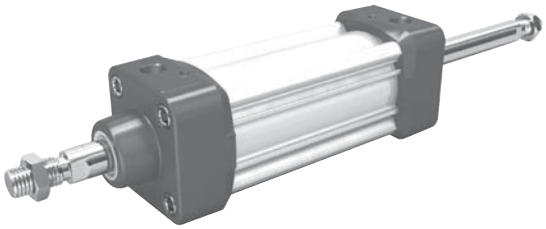
Using P1D cylinders as a platform, a number of different designs can be produced to suit differing requirements. Please refer to the Ordering Information page for the designation of each variant.

Alternative piston rod materials
All P1D cylinders in all bores, Ø32-200 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 bore sizes of all versions are available with a double 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.



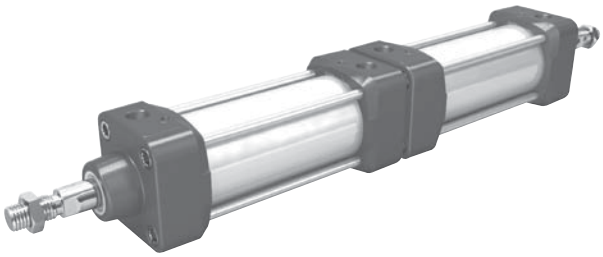
Double Rod

High ambient temperature
The Removable Gland Version 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

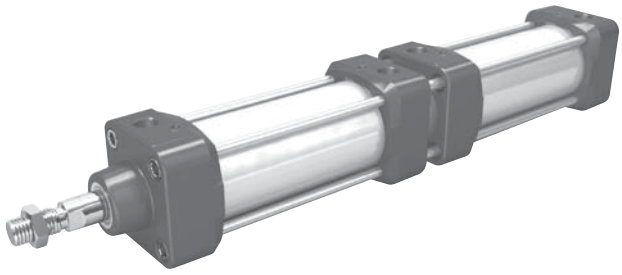
Low pressure hydraulics
All bore sizes of the Removable Gland Version can be supplied with special seals for operation with low pressure hydraulics up to 10 bar. Temperature range -20 °C to +80 °C (-4°F to +176°F).

Duplex cylinder – 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 bore sizes. Other P1D cylinders can be flange mounted back-to-back with a special mounting.



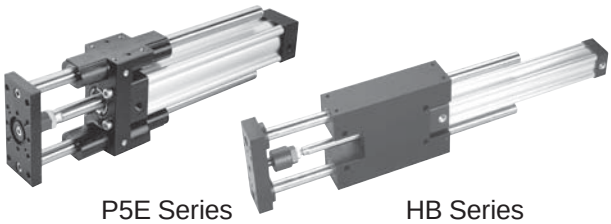
3 and 4 Position Cylinders

Tandem cylinder
The P1D Tie-Rod Version 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

Guided Cylinders
For guided versions of the P1D, see the P5E Series and HB Series in Section F.



P5E Series HB Series

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P1D – **S** **032** **M** **C** –

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Piston Style		
Cushions	**Piston Material**	
	Composite [1]	**Aluminum** [2]
None	**M**	**Y**
Cush B/E	**–** [3]	**4**
Cush head	**J**	**5**
Cush cap	**K**	**6**

1 Not available for 160-200mm bores.
2 Not available on Clean Version.
3 Must be placed in model code.

Bore Size	
032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm
125	125mm
160	160mm [8]
200	200mm [8]

8 Tie Rod Version E must be specified for these bores.

Version				
	Cylinder Body Profile	**Rod Lock**		
		None	**Fitted w/Std Rod Lock** [7]	**Fitted w/Manual Override Rod Lock** [7]
Die Cast End Caps [4]	Standard	**S**	**L**	N/A
	Tie Rod [14]	**T**	**M**	N/A
	Clean	**C**	**D**	N/A
Removable Gland [5] (Machined Endcaps)	Standard	**G**	**R**	**J**
	Tie Rod [14]	**E**	**7** [4]	Consult Factory
Special [6]	Any Special	**/**		

4 Not available for 160-200mm bores or with fluorocarbon seals.
5 When Removable Gland Version is fitted with rod lock, gland cannot be replaced without disassembling cylinder.
6 If special cylinder is ordered (other than rod end), End Cap Style, Cylinder Body Profile and Rod Lock option must be given in addition to the special request.
7 Cylinders fitted with rod locks must be cushioned on both ends.

Function				
Fastener Type	**Rod Wiper Style**	**Double Acting**	**Double Rod**	**Tandem** [14]
Standard end cover screws	Std scraper	**M**	**F**	**C**
	Metal scraper	**Q**	**R**	**J**
Stainless steel end cover screws [9]	Std scraper	**A**	**G**	N/A
	Metal scraper	**S**	**T**	N/A

Piston Rod & Seal Material			
Piston Rod Material	**Seal Material**		
	Standard	**Fluorocarbon** [10]	**Hydraulic** [11]
Chrome plated carbon steel [12]	**C**	**G**	**J**
Chrome plated stainless steel [12,15]	**R**	**D**	**Z**
316 Stainless steel [13]	**S**	N/A	N/A
Acid-resistant stainless steel	**M**	**N** [12]	N/A

Cylinder Ports Front & Rear	
–	BSPP Ports (G Threads)**
E	NPTF Ports*
Q	BSPT Ports (R_C Threads)*†

* Not available on Clean Versions.
† Not available on Die Cast Versions.
** ISO 1179-1 with ISO 228-1 threads.

9 Applies only to end cover screws for 32-125mm bores. For stainless steel tie rods and nuts (all bore sizes), change Version to special and request stainless steel tie rods and nuts.
10 If used for temperature above +80°C (+176°F), aluminum piston required. Not available with die cast end caps.
11 Hydraulic seal option valid for Removable Gland Version only. Adjustable cushion options and Rod Lock Versions not available.
12 Not available on Clean Version.
13 Only available on Clean Version.
14 Tie Rod Version is required for Tandem Function.
15 Consult factory for this option.

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0500	N	N	N	N	N

Stroke [1]
Specify whole mm using 4 digits, i.e. 0500

Rod Mountings & Plugs [2]		
Rod Mounting	**No Plugs** [3]	**With Plugs** [4]
Swivel rod eye	**S**	**A**
Swivel rod eye SS	**T**	**1**
Swivel rod eye with clevis bracket GA [7]	**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**

Rod End

N	Metric male
6	Metric female
3	Special*

* Please provide desired dimensions for KK, AM and WH or W. If otherwise, please provide dimensioned sketch.

Sensors [5]			
Prepared for Factory-fitted Sensors	**Cable Location**		
	Front or Left	**Rear or Right**	**Front & Rear**
P1D Clean Version	**6**	**7**	**8**
P1D all versions (except Clean) prepared for sensors or Clean Version without sensor capability [6]	**N**		

Mounting Style		
	Standard	**Rotated 90°**
Flange MF1 at head (front) end	**1**	**3**
Flange MF2 at cap (rear) end	**B**	**4**
Flanges MF1 and MF2 at both ends	**2**	**K**
Foot brackets MS1	**F**	**R**
Clevis bracket GA aluminum	**C**	**U**
Rear eye MP4 aluminum	**E**	**V**
Rear swivel eye MP6 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**
Intermediate trunnion MT4 (requires XV dimension)	**G**	**7**
Trunnion flange at head (front) end [4]	**H**	**P**
Trunnion flange at cap (rear) end [4]	**J**	**8**
None (MX0)	**N**	**9**

Notes:

1 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).

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

3 Clean Version comes standard with plugs. Use this column when ordering Clean Version.

4 Not available for 160-200mm bores.

5 For sensor part numbers and specifications, please refer to Electronic Sensors section.

6 P1D Clean Version ordered without sensors ***cannot*** be retrofitted with sensor capability.

7 Consult factory for this option.

Double Rod Cylinders

Double rod option is available with Mounting Styles MX0, MS1, MF1, MF2 and MT4.

For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of '3' and be sure to clearly state which rod end is to be assembled at which end.

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Specifications

- Bore sizes 32-200mm
- Max stroke 2800mm
- Min stroke 25mm
  (must specify Tie Rod Version for strokes <25mm)
- Rod Ends – 2 standard, specials to order
- Single rod end and double rod end styles
- Working pressure Max 10 Bar (145 PSI)
- 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 (non-lube), does not normally need additional lubrication. If air line lubrication is initiated, it must always be continued.
- Working medium Dry, filtered compressed air to ISO 8573-1 class 3. 4. 3. or better

P1D Clean Version

Min stroke	25mm
Protection class	Hose-proof in accordance with IP65
Chemical resistance	Tested for normally used industrial detergents, both acid and alkaline

P1D Rod Lock Version

- Fluid Medium: Dry, filtered, compressed air
- Maximum Cylinder Operating Pressure: 10 Bar (145 PSI)
- Required Pressure to Unlock[1]: 4 Bar (58 PSI)
- Minimum Torque Required for Manual Override Version:
  - 32mm Bore = 0.9 N-m / 8 in-lbs
  - 40mm Bore = 0.9 N-m / 8 in-lbs
  - 50mm Bore = 2.7 N-m / 24 in-lbs
  - 63mm Bore = 2.7 N-m / 24 in-lbs
  - 80mm Bore = 27.1 N-m / 240 in-lbs
  - 100mm Bore = 36.6 N-m / 324 in-lbs
  - 125mm Bore = 61.0 N-m / 540 in-lbs
- Maximum Operating Temperature: -10°C to +75°C, +14°F to +167°F
- Maximum Cylinder Operating Speed: 5 feet per second

[1]Signal pressure to port on locking device. Operation at pressures lower than 4 Bar (58 psi) may lead to inadvertent engagement of the rod lock device.

Quick Reference

Bore Size	Cylinder Area, cm²	Piston Rod			Cushioning Length mm	Air Consumption [1] litre	Connection Thread [4]	Theoretical Cylinder Forces at 6 Bar (N) [2]	
		Dia. mm	Area, cm²	Male Thread				Extend Stroke	Retract Stroke
32	8.0	12	1.1	M10x1.25	17	0.105	G1/8	482	414
40	12.6	16	2.0	M12x1.25	19	0.162	G1/4	754	633
50	19.6	20	3.1	M16x1.5	20	0.253	G1/4	1178	989
63	31.2	20	3.1	M16x1.5	23	0.414	G3/8	1870	1681
80	50.3	25	4.9	M20x1.5	23	0.669	G3/8	3016	2721
100	78.5	25	4.9	M20x1.5	27	1.043	G1/2	4712	4417
125	122.7	32	8.0	M27x2	30	1.662	G1/2	7363	6880
160	201.1	40	12.6	M36x2	38	2.724	G3/4	12.064	11,310
200	314.2	40	12.6	M36x2	38	4.256	G3/4	18.850	18,096

Cylinder Bore Size	Total Mass (kg)						Total Mass (kg) Moving Components	
	0mm Stroke [3]			Supplement per 10mm Stroke			at 0mm Stroke	Supplement per 10mm Stroke
	Standard	Tie-Rod	Clean	Standard	Tie-Rod	Clean	All Variants	All Variants
32	0.55	0.54	0.60	0.023	0.022	0.047	0.13	0.009
40	0.80	0.79	0.88	0.033	0.030	0.063	0.24	0.016
50	1.20	1.20	1.32	0.048	0.048	0.094	0.42	0.025
63	1.73	1.73	1.86	0.051	0.051	0.101	0.50	0.025
80	2.45	2.47	2.63	0.075	0.079	0.142	0.90	0.039
100	4.00	4.00	4.22	0.084	0.084	0.168	1.10	0.039
125	6.87	6.73	7.01	0.138	0.129	0.248	2.34	0.063
160	—	16.19	—	—	0.160	—	Consult Factory	Consult Factory
200	—	22.23	—	—	0.185	—	Consult Factory	Consult Factory

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

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

3 Total Mass for composite piston for 32-125mm bores and aluminum piston for 160-200mm bores.

4 ISO 1179-1 with ISO 228-1 threads

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Standard Version

Body extrusion	Clear anodized aluminium
End covers	Powder coated or black anodized aluminum
End cover inserts	POM
End cover nuts/screws	Zinc plated steel 8.8
Piston rod nut	Zinc plated steel
Piston rod	Chrome-plated steel (standard)
Rod wiperseal	PUR
Piston rod bearing	POM
Piston	POM
Piston bearing	POM
Magnetic ring	Plastic bound magnetic material
Piston fastener	Zinc plated steel (composite piston)
Piston seal	PUR
O-rings	Nitrile rubber, NBR
End-of-stroke bumpers and end seals	PUR
Cushioning seals	PUR
Cushioning screws	PA

Piston Rod Material Options

(or with equivalent properties):

Standard	Case-hardened, chrome plated carbon steel
Chrome plated stainless steel	17-4 PH, chrome plated stainless steel
Stainless steel	303 stainless steel
Acid-resistant stainless steel	316 stainless steel

Additional/Substitute Specifications

P1D Clean Version

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

P1D Tie-Rod Version

Tie-rods	Blackened steel

P1D Removable Gland Version

End covers	Black anodized aluminum
End cover screws	Zinc plated steel 8.8 (32-125mm bores)
Cylinder Body	Clear anodized aluminum
Rod gland	PTFE filled high strength bronze
Rod seal	Buna Nitrile for sealing action
Rod wiper	Buna Nitrile for wiping action
Piston rod	Case hardened chrome-plated steel
Piston rod nut	Zinc plated steel
Piston	POM (standard) Aluminum (optional)
Piston seals	PUR
Piston bearing	POM or Molyguard wear band for aluminum piston
Magnetic ring	Plastic bound magnetic material
Piston fastener	Zinc plated steel (composite piston)
O-rings	Buna Nitrile
Cushioning seals	PUR
Cushioning screws	Stainless steel (brass for 160 and 200mm bores)

Design Variants for Removable Gland Version

High temperature option includes:

All seals	Fluorocarbon
Piston	Aluminum (without magnetic ring)

Low pressure hydraulic option includes:

Rod seal	Buna Nitrile
Rod wiper	PUR
Piston seals	Buna Nitrile
Piston	Aluminum (non-cushioned)

Metallic Rod Scraper includes:

Rod wiper	Dual high strength bronze wipers with nitrile or fluorocarbon energizer

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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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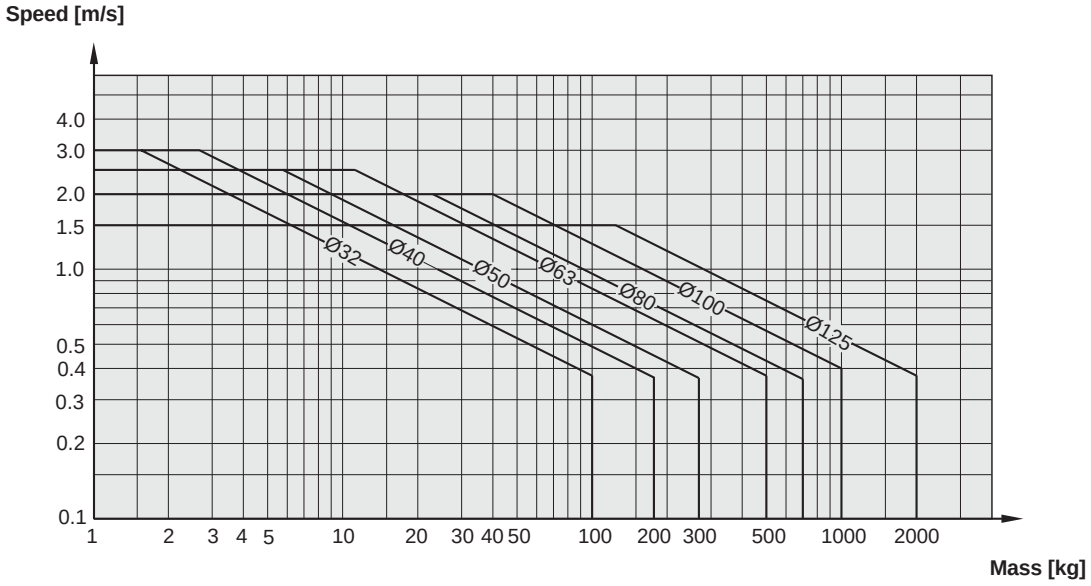

Recommended Air Quality for Cylinders

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/m³, which is what a standard compressor with a standard filter gives.

ISO 8573-1 Quality Classes

Quality Class	Polution		Water		Oil
	Particle Size (µm)	Max. Concentration (mg/m³)	Max Pressure Dew Point (°C)	Max Pressure Dew Point (°F)	Max. Concentration (mg/m³)
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	–

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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.

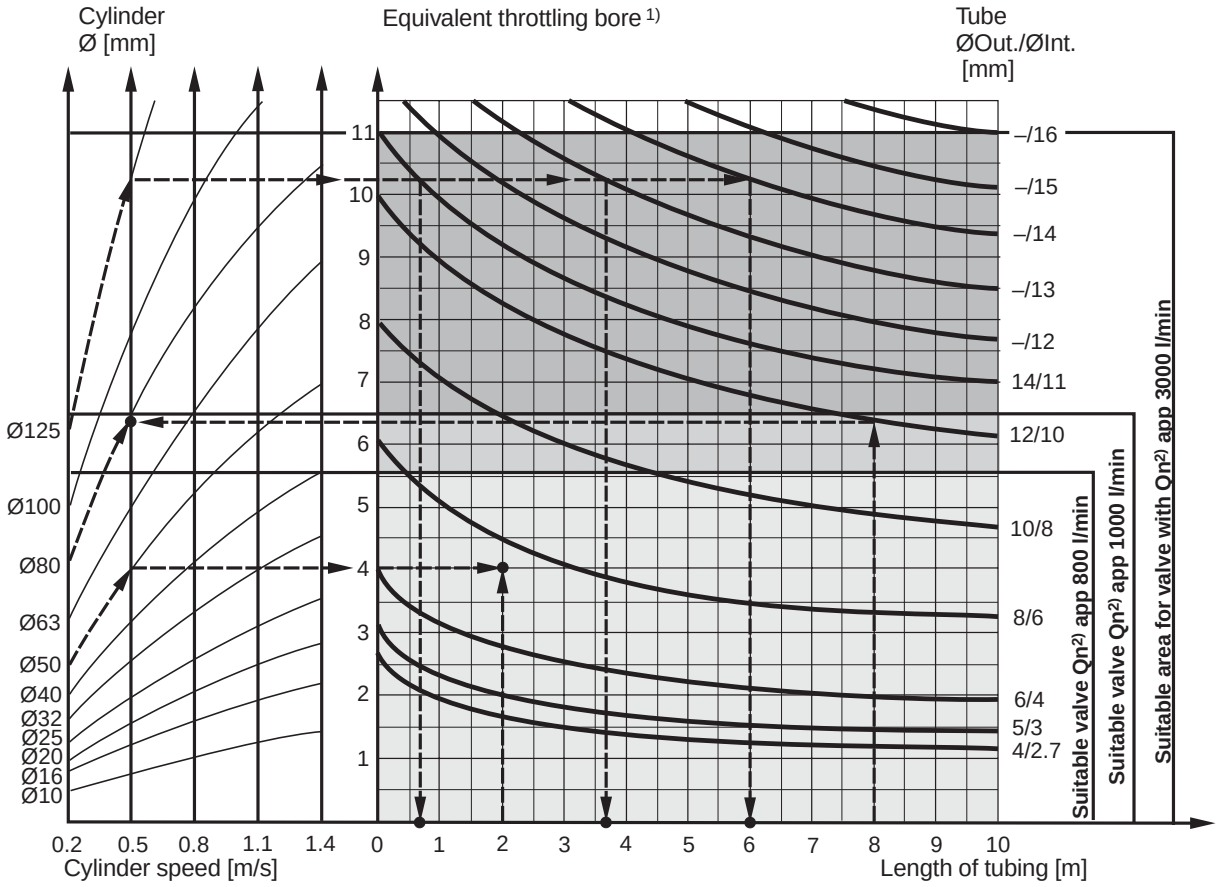
The following is the basic principle:

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 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 liter per minute (l/min) at 6 bar(e) supply pressure and 1 bar pressure drop across the valve.

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C086

P1D Rod Lock Version – Rod Lock Data

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.

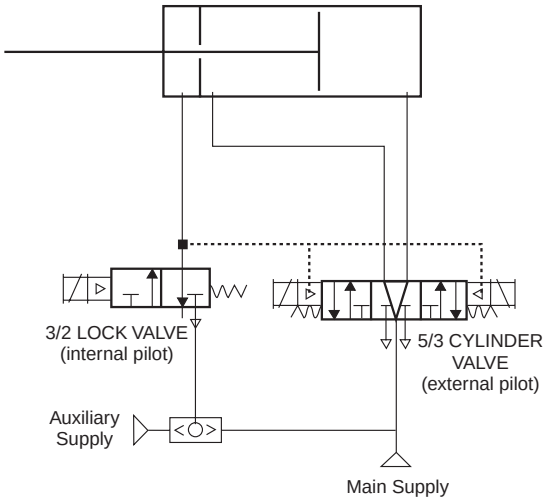
C

Holding Forces

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

NOTE: All P1D Rod Lock Versions are not intended for use in water service applications, or in environments that have high humidity levels and/or splashing fluids present.

Sample Pneumatic Circuit

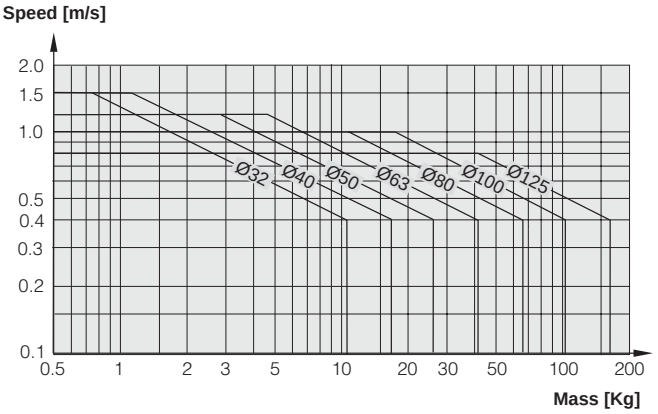


1. Lock valve must be maintained energized during cylinder motion, otherwise rod lock is engaged and cylinder valve shifts to mid position.
2. Cylinder valve must be maintained energized during extend or retract. Also keep energized at end of stroke until change of direction is desired.
3. Mid position 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.

Use as a Brake

The chart to the right shows the maximum values for speed and braking mass if the cylinder is used as a brake. The cylinder should not be exposed to additional compressive forces as this significantly reduces the external mass that can be braked.

We recommend systems in which the cylinder does not act as a motor during braking. Heat is generated if the brake is used frequently, and this must be taken into account to ensure that the maximum temperature is not exceeded.



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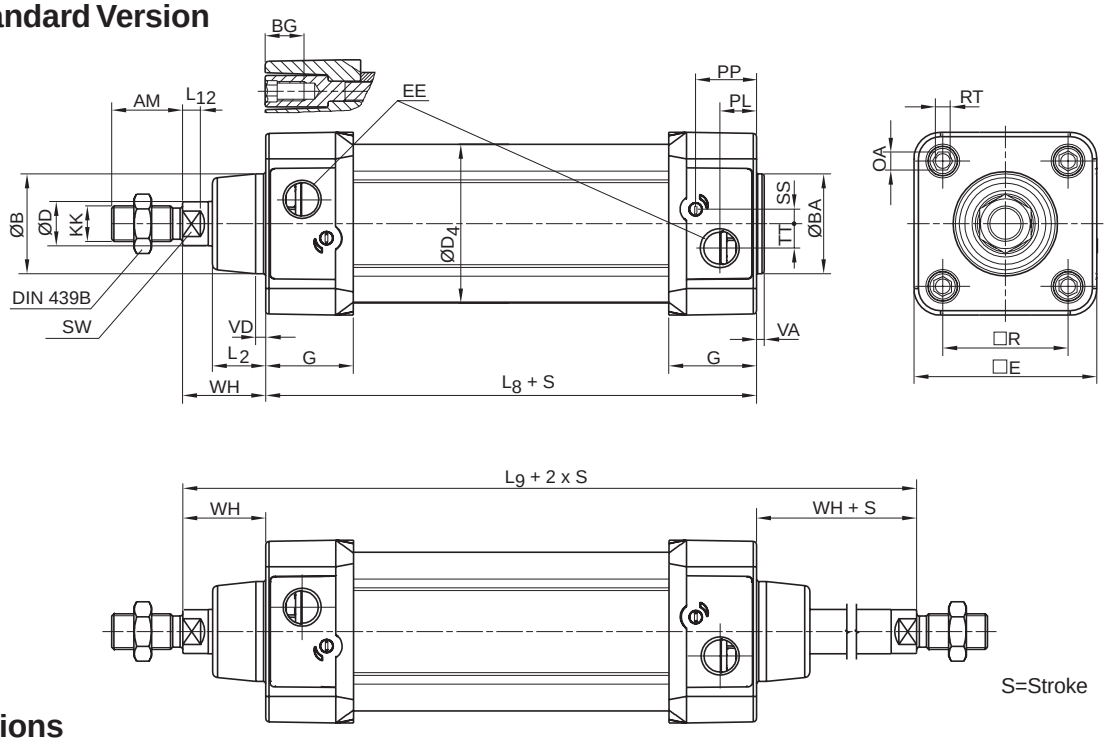
P1D Standard Version



S=Stroke

Dimensions

Cylinder Bore	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E	EE BSPP[1]	EE NPTF/ BSPT	G mm	KK	L2 mm	L8 mm	L9 mm	L12 mm
32	22	30	30	16	12	45.0	50.0	G1/8	1/8	28.5	M10x1.25	16.0	94	146	6.0
40	24	35	35	16	16	52.0	57.4	G1/4	1/4	33.0	M12x1.25	19.0	105	165	6.5
50	32	40	40	16	20	60.7	69.4	G1/4	1/4	33.5	M16x1.5	24.0	106	180	8.0
63	32	45	45	16	20	71.5	82.4	G3/8	3/8	39.5	M16x1.5	24.0	121	195	8.0
80	40	45	45	17	25	86.7	99.4	G3/8	3/8	39.5	M20x1.5	30.0	128	220	10.0
100	40	55	55	17	25	106.7	116.0	G1/2	1/2	44.5	M20x1.5	32.4	138	240	10.0
125	54	60	60	20	32	134.0	139.0	G1/2	1/2	51.0	M27x2	45.0	160	290	13.0

Cylinder Bore	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	3.5	6.5	65

1 ISO 1179-1 with ISO 228-1 threads

Tolerances

Cylinder Bore	B	BA mm	L8 mm	L9 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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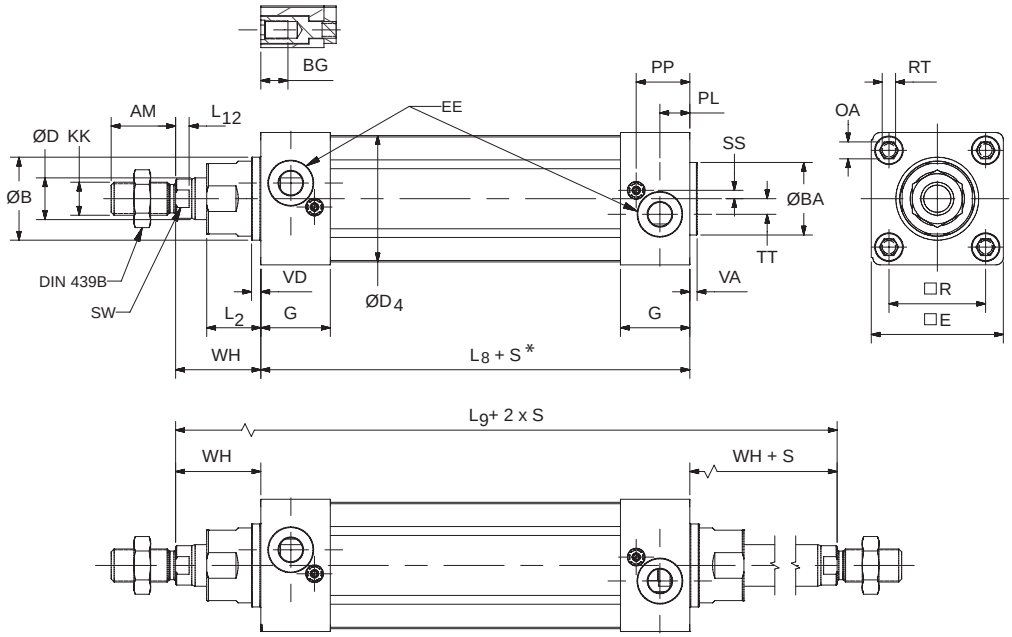
P1D Removable Gland Version



S=Stroke

Dimensions

Cylinder bore	AM mm	B mm	BA mm	BG mm	D mm	D_4 mm	E mm	EE BSPP [1]	EE NPTF/ BSPT	G mm	KK	L_2 mm	L_8 mm	L_9 mm	L_{12} mm
32	22	30	30	16	12	45.0	46.5	G1/8	1/8	28.5	M10x1.25	18	94	146	6.0
40	24	35	35	16	16	52.0	52.0	G1/4	1/4	33.0	M12x1.25	20	105	165	6.5
50	32	40	40	16	20	60.7	63.5	G1/4	1/4	33.5	M16x1.5	26	106	180	6.5
63	32	45	45	16	20	71.5	76.0	G3/8	3/8	39.5	M16x1.5	26	121	195	6.5
80	40	45	45	17	25	86.7	95.5	G3/8	3/8	39.5	M20x1.5	33	128	220	10.0
100	40	55	55	17	25	106.7	114.5	G1/2	1/2	44.5	M20x1.5	33	138	240	10.0
125	54	60	60	20	32	134.0	140.0	G1/2	1/2	51.0	M27x2	41	160	290	13.0

Cylinder bore	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

1 ISO 1179-1 with ISO 228-1 threads

Tolerances

Cylinder Bore	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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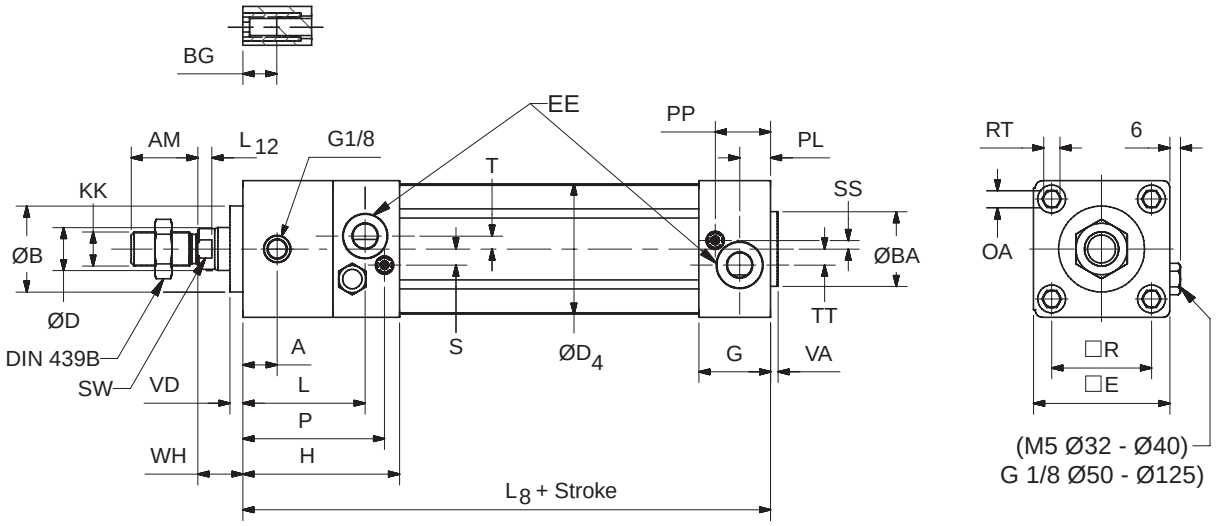
P1D Rod Lock Version
(Version R or L)



Dimensions

Cylinder Bore	A mm	AM mm	B mm	BA mm	BG mm	D mm	D_4 mm	E mm	EE [1]	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	OA mm	P mm	PL mm	PP mm	R mm	RT mm	S mm	SS mm	SW mm	T mm	TT mm	VA mm	VD mm	WH mm
32	6	64.8	13	21.8	32.5	M6	7	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	6	101.5	16	30.5	72.0	M10	9	0	22	5.0	15.0	3.5	4.0	20
100	6	123.5	18	35.8	89.0	M10	12	0	22	6.0	20.0	3.5	4.0	20
125	8	136.0	23	40.5	110.0	M12	12	0	27	6.0	17.5	5.5	6.0	27

1 ISO 1179-1 with ISO 228-1 threads

Tolerances

Cylinder Bore	B mm	R mm	L_8 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

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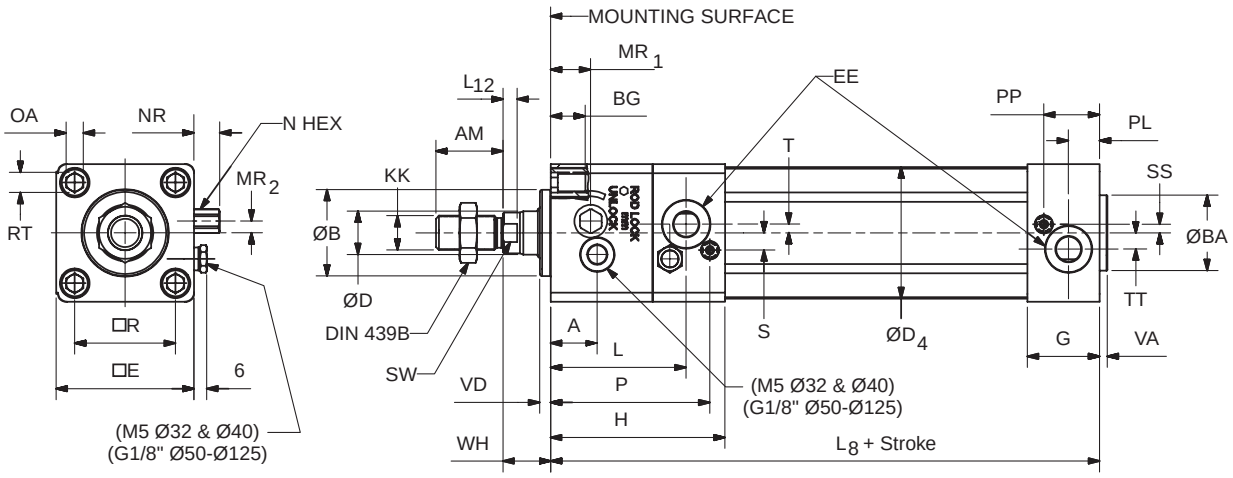
P1D Rod Lock Version with Manual Override
(Version J)



Dimensions

Cylinder Bore	A mm	AM mm	B mm	BA mm	BG mm	D mm	D_4 mm	E mm	EE [1]	G mm	H mm	KK	L mm	L_8 mm	L_{12} mm	MR_1 mm	MR_2 mm
32	27.0	22	30	30	16	12	45.0	46.5	G1/8	28.5	71.5	M10X1.25	56.0	137	6.0	16.0	3.0
40	27.0	24	35	35	16	16	52.0	52.0	G1/4	33.0	77.0	M12X1.25	56.0	149	6.5	16.0	3.0
50	21.5	32	40	40	16	20	60.7	63.5	G1/4	33.5	80.5	M16X1.5	62.5	153	6.5	18.5	5.5
63	39.0	32	45	45	16	20	71.5	76.0	G3/8	39.5	96.5	M16X1.5	74.5	178	6.5	22.0	4.0
80	38.5	40	45	45	17	25	86.7	95.5	G3/8	39.5	110.5	M20X1.5	87.0	209	10.0	15.0	19. 8
100	55.0	40	55	55	17	25	106.7	114.5	G1/2	44.5	132.5	M20X1.5	106.0	236	10.0	15.0	20.8
125	61.0	54	60	60	20	32	134.0	140.0	G1/2	51.0	145.0	M27X2	117.0	264	13.0	19.0	23.0

Cylinder Bore	N mm	NR 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	8	10.0	6	64.8	13	21.8	32.5	M6	7	6.5	10	2.5	4.5	3.5	4.5	15
40	8	10.0	6	68.0	14	21.9	38.0	M6	9	8.0	13	2.0	5.5	3.5	4.5	16
50	10	12.0	8	73.5	14	25.9	46.5	M8	8	4.0	17	4.0	7.5	3.5	5.0	17
63	10	12.0	8	89.5	16	27.4	56.5	M8	8	6.5	17	2.0	11.0	3.5	5.0	17
80	11	12.5	6	101.5	16	30.5	72.0	M10	9	0	22	5.0	15.0	3.5	14.0	30
100	11	12.5	6	123.5	18	35.8	89.0	M10	12	0	22	6.0	20.0	3.5	14.0	30
125	11	12.5	8	136.0	23	40.5	110.0	M12	12	0	27	6.0	17.5	5.5	16.0	37

1 ISO 1179-1 with ISO 228-1 threads

Tolerances

Cylinder Bore	B mm	R mm	L_8 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

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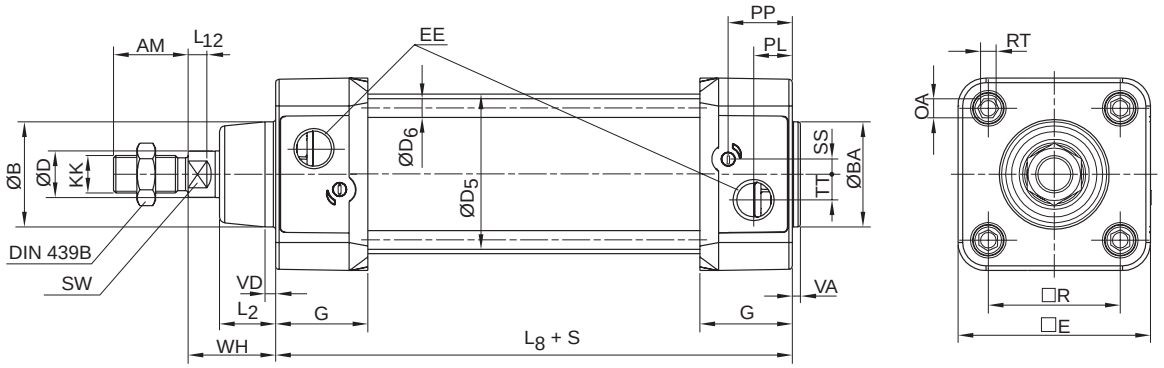
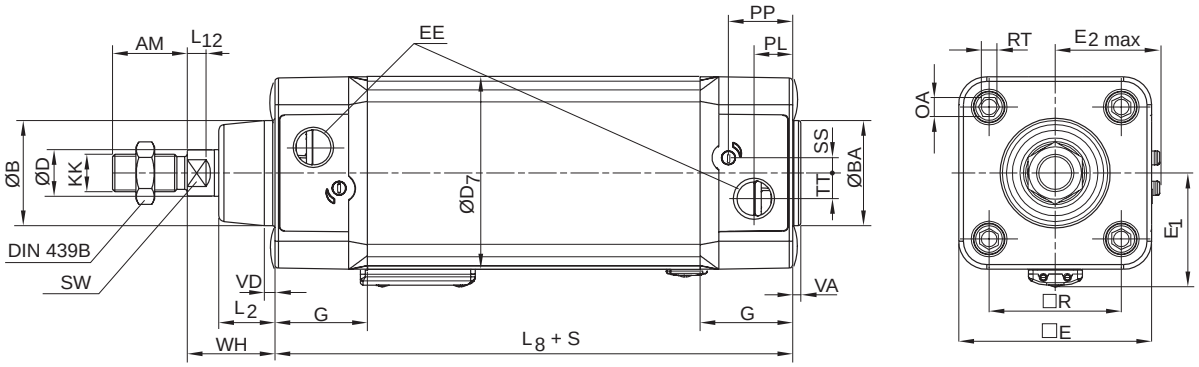
P1D Tie-Rod Version (32-125mm)



P1D Clean Version



Dimensions

Cylinder Bore	D_5 mm	D_6 mm	D_7 mm	E_1 mm	E_2 max 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 C15.

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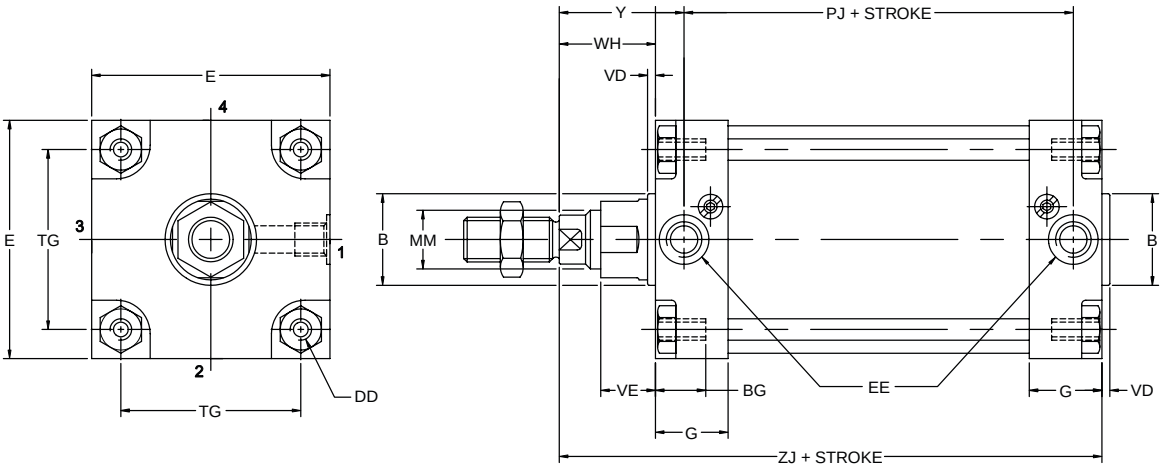
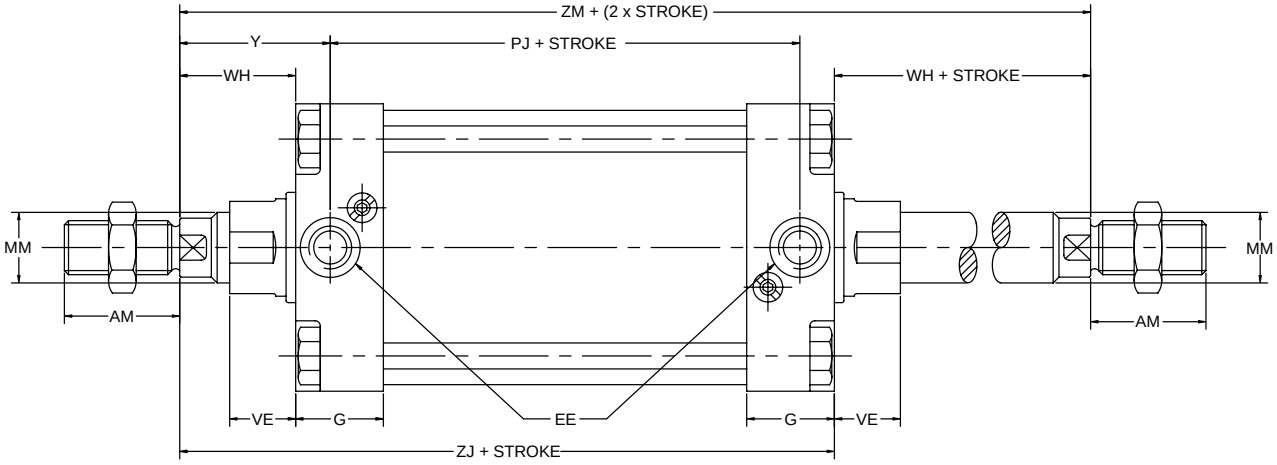
P1D Tie-Rod Version (160-200mm)





Rod End #1

Rod End #2

Dimensions

Cylinder Bore	AM mm	B d11 mm	BG mm	DD	E mm	EE		G mm	MM mm	TG mm	VD mm	VE mm	WH mm	Y mm	PJ [1] mm	ZJ [1] mm	ZM [2] mm
						BSPP [3]	NPTF/ BSPT										
160	72	65	24	M16	177	G3/4	3/4	54	40	140	6	56	80	105	130	260	340
200	72	75	24	M16	214	G3/4	3/4	54	40	175	6	56	95	120	130	275	370

1 Add stroke

2 Add 2× stroke

3 ISO 1179-1 with ISO 228-1 threads

Double Rod Cylinders

Double rod option is available on Mounting Styles MX0, MS1, MF1, MF2 and MT4.

For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of '3' and be sure to clearly state which rod end is to be assembled at which end.

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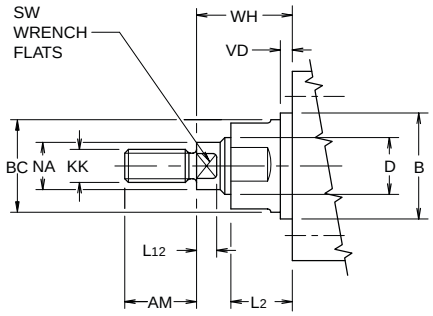
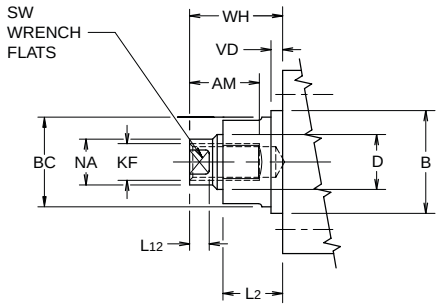
All Mountings Except MF1

Thread Style N



Thread Style 6



"Special Thread" Style 3

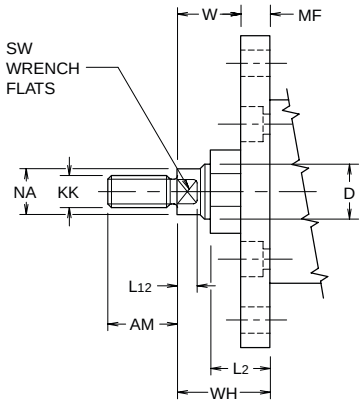
Special thread, extension, rod eye, blank, etc are also available. To order, specify "Style 3" and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

Bore	D	KK	KF	AM	B d11	BC	SW across flats	L_{12}	NA	VD	L_2	WH*
32	12	M10x1.25	M8x1	22	30	27	10	6	11	4.5	18	26
40	16	M12x1.25	M10x1.25	24	35	32	13	6.5	15	4.5	20	30
50	20	M16x1.5	M14x1.5	32	40	36	17	6.5	19	4.5	26	37
63	20	M16x1.5	M14x1.5	32	45	36	17	6.5	19	4.5	26	37
80	25	M20x1.5	M18x1.5	40	45	41	22	10	24	4.5	33	46
100	25	M20x1.5	M18x1.5	40	55	41	22	10	24	4.5	33	51
125	32	M27x2	M24x2	54	60	50	27	13	31	6.5	41	65
160	40	M36x2	M30x2	72	65	60	36	16	39	6	56	80
200	40	M36x2	M30x2	72	75	60	36	16	39	6	56	95

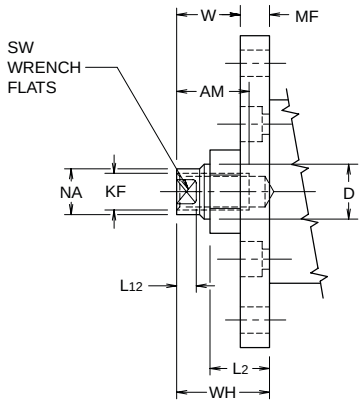
***NOTE:** Dimensions do not apply to Rod Lock Versions.

With MF1 Mounting

Thread Style N



Thread Style 6



"Special Thread" Style 3

Special thread, extension, rod eye, blank, etc are also available. To order, specify "Style 3" and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

Bore	D	KK	KF	AM	SW across flats	L_{12}	MF	NA	L_2	W†	WH†
32	12	M10x1.25	M8x1	22	10	6	10	11	18	16	26
40	16	M12x1.25	M10x1.25	24	13	6.5	10	15	20	20	30
50	20	M16x1.5	M14x1.5	32	17	6.5	12	19	26	25	37
63	20	M16x1.5	M14x1.5	32	17	6.5	12	19	26	25	37
80	25	M20x1.5	M18x1.5	40	22	10	16	24	33	30	46
100	25	M20x1.5	M18x1.5	40	22	10	16	24	33	35	51
125	32	M27x2	M24x2	54	27	13	20	31	41	45	65
160	40	M36x2	M30x2	72	36	16	20	39	56	60	80
200	40	M36x2	M30x2	72	36	16	25	39	56	70	95

†**NOTE:** Dimensions do not apply to Rod Lock Versions.

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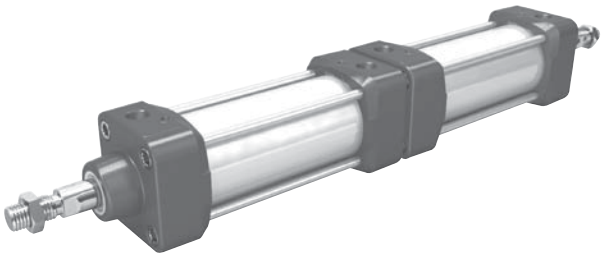


3 and 4-Position Duplex Cylinders

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

A 3-position duplex cylinder can also be obtained by mounting two cylinders of different strokes, in series, but not connecting the piston rods together. This concept is illustrated in a guided cylinder application shown on page F162 of the HB series.

These 3 and 4-position cylinders can be ordered in two ways as follows.

Factory-fitted P1D Duplex Cylinders

P1D tie-rod version duplex cylinders are completed at the factory and are joined together as one unit by special tie-rods. This version needs to be ordered as a special (/). Please consult factory for assistance.

Customer-Installed Mounting Kit

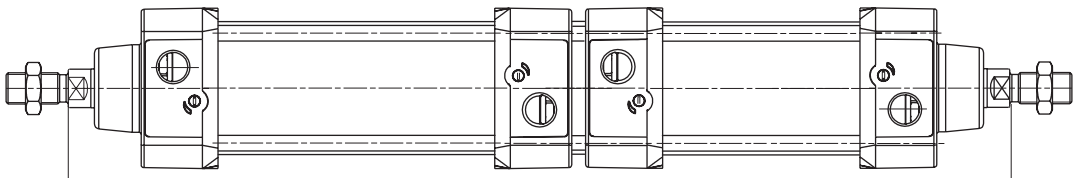
There is an installation mounting kit available for cylinder bores 32-100mm which makes it possible to join any two P1D cylinders, of the same bore, together at any time to make a 3 or 4-position cylinder. Please refer to the cylinder mountings on top of page C28.

Tandem Cylinders

In addition to the duplex cylinder options above, the P1D tie-rod version is also available as a tandem cylinder. By ordering two cylinders of equal strokes, mounted in series, and connecting the piston rods together, you achieve almost twice the output force, at the same pressure, as a standard cylinder. This is a great advantage when restricted mounting space prevents the use of a larger bore cylinder. Please review version and function options in the model code on page C8.

Cylinder Bore	A (mm)	
	P1D-T	P1D-S
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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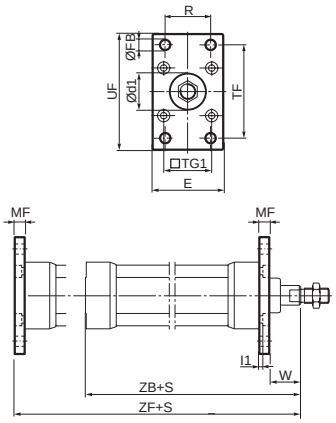
Flange MF1
Flange MF2

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

Materials
32-100mm bore flange: Surface-treated aluminum, black
125-200mm bore flange: Steel, black
Mounting screws acc. to DIN 6912: Zinc-plated steel 8.8
Supplied complete with mounting screws for attachment to cylinder.



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

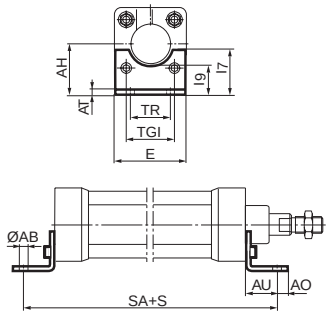
Bore mm	d1 H11 mm	FB H13 mm	TG1 mm	E mm	R JS14 mm	MF JS14 mm	TF JS14 mm	UF	I1 -0.5 mm	W mm	ZF mm	ZB mm	Weight kg	Part Number
32	30	7	32.5	45	32	10	64	80	5.0	16	130	123.5	0.23	**P1C-4KMBA**
40	35	9	38.0	52	36	10	72	90	5.0	20	145	138.5	0.28	**P1C-4LMBA**
50	40	9	46.5	65	45	12	90	110	6.5	25	155	146.5	0.53	**P1C-4MMBA**
63	45	9	56.5	75	50	12	100	120	6.5	25	170	161.5	0.71	**P1C-4NMBA**
80	45	12	72.0	95	63	16	126	150	8.0	30	190	177.5	1.59	**P1C-4PMBA**
100	55	14	89.0	112	75	16	150	185	8.0	35	205	192.5	2.19	**P1C-4QMBA**
125	60	16	110.0	140	90	20	180	220	10.5	45	245	230.5	3.78	**P1C-4RMB**
160	65	18	140.0	180	115	20	230	260	9.5	60	280	266	C.F.	**L075370160**
200	75	22	175.0	220	135	25	270	300	12.5	70	300	281	C.F.	**L075370200**

S = Stroke length C.F. = Consult Factory

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.



According to ISO MS1, VDMA 24 562, AFNOR

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	Part Number
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**
160	18	140.0	180	115	15	60	115	100	9.0	63.5	300	C.F.	**L075380160**
200	22	175.0	220	135	30	70	135	100	12.0	65.0	320	C.F.	**L075380200**

S = Stroke length C.F. = Consult Factory *Weight per item

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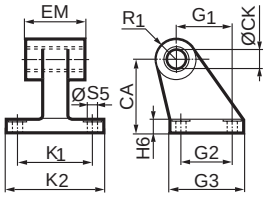
Pivot Bracket with Rigid Bearing

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



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

Bore mm	CK H9 mm	S5 H13 mm	K1 JS14 mm	K2	G1 JS14 mm	G2 JS14 mm	EM mm	G3 mm	CA JS15 mm	H6 mm	R1 mm	Weight kg	Part Number
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**
160	30	14.0	118	156	97	89	88.5	126	115	25	31.0	C.F.	**L075480160**
200	30	16.0	122	162	105	89	88.5	130	135	30	31.0	C.F.	**L075480200**

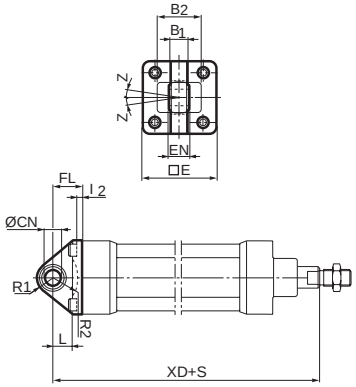
C.F. = Consult Factory

Swivel Eye Bracket (MP6)

Intended for use together with clevis bracket GA

Material
Bracket: Surface-treated aluminium, black
(Cast iron for 160-200mm bores)
Swivel bearing acc. to DIN 648K: Hardened steel

Supplied complete with mounting screws
for attachment to cylinder.



According to VDMA 24 562, AFNOR

Bore mm	E mm	B1 mm	B2 mm	EN mm	R1 mm	R2 mm	FL mm	I2 mm	L mm	CN H7 mm	XD mm	Z	Weight kg	Part Number
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**
160	177	30.0	–	43	44	41	55	4.0	41	35	315	16°	C.F.	**L075420160**
200	214	30.0	–	43	48	42	60	8.0	42	35	335	16°	C.F.	**L075420200**

S = Stroke length C.F. = Consult Factory

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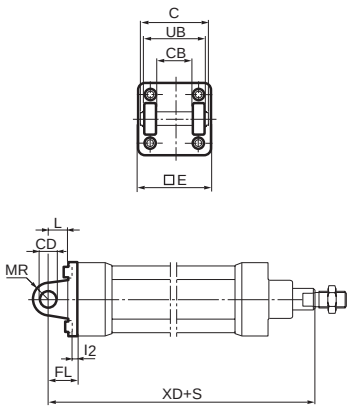
Clevis bracket MP2

Now in aluminum!

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

Materials
Clevis bracket: Surface-treated aluminium, black for 32-160mm bores; Cast iron for 200mm bore
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.

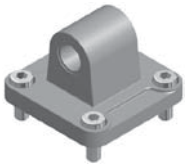


According to ISO MP2, VDMA 24 562, AFNOR

Bore mm	C mm	E mm	UB h14 mm	CB H14 mm	FL ±0.2 mm	L mm	I2 mm	CD H9 mm	MR mm	XD mm	Weight kg	Part Number
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**
160	178	180	170	90	55	35	10.0	30	25	315	C.F.	**L075390160**
200	178	200	170	90	60	35	14.0	30	25	335	C.F.	**L075390200**

S = Stroke length C.F. = Consult Factory

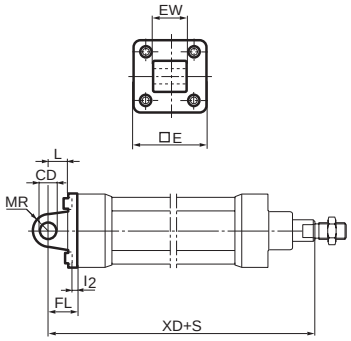
Clevis Bracket MP4



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

Materials
Clevis bracket: Surface-treated aluminium, black for 32-125mm bores; Cast iron for 160-200mm bores
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP4, VDMA 24 562, AFNOR

Bore mm	E mm	EW mm	FL mm	L ±0.2 mm	I2 mm	CD mm	MR H9 mm	XD mm	Weight kg	Part Number
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**
160	180	90	55	35	10.0	30	25	315	C.F.	**L075410160**
200	220	90	60	35	14.0	30	25	335	C.F.	**L075410200**

S = Stroke length C.F. = Consult Factory

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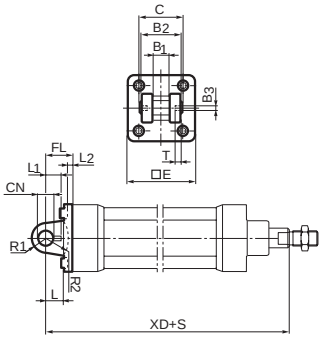
Clevis Bracket GA

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.



C

According to VDMA 24 562, AFNOR

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	Part Number
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**
160	140	178	122	43	6	6.3	46	26.5	55	10.0	37	35 h9	36	C.F.	C.F.	**L075510160**
200	175	218	122	43	6	6.3	49	26.5	60	11.5	40	35 h9	38	C.F.	C.F.	**L075510200**

S = Stroke length C.F. = Consult Factory

Stainless Steel Pin Set GA

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

Bore mm	Weight kg	Part Number
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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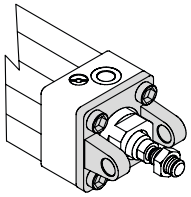
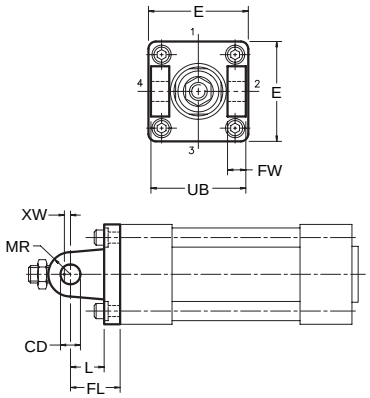
Head Detachable Clevis MP7



Intended for flexible mounting of cylinder

Materials
Clevis bracket: Cast iron for 32-63mm bores;
Surface treated aluminum, black for 80-200mm bores
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

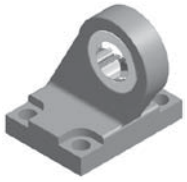
Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP7, VDMA 24 562, AFNOR

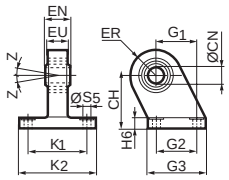
Bore	CD mm	E mm	FL mm	FW mm	L mm	MR mm	UB mm	XW mm	Part Number
32	10	46.5	22	8	12	10	45	4	**L075400032**
40	12	52	25	9	15	12	52	5	**L075400040**
50	12	63.5	27	10	15	13	60	10	**L075400050**
63	16	76	32	15	20	16	70	5	**L075400063**
80	16	95.5	36	20	20	17	90	10	**L075400080**
100	20	114.5	41	25	25	21	110	10	**L075400100**
125	25	140	50	30	35	25	130	15	**L075400125**
160	30	177	55	40	36	30	170	25	**L075400160**
200	30	214	60	40	41	30	170	35	**L075400200**

Pivot Bracket with Swivel Bearing



Intended for use together with clevis bracket GA.

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



According to VDMA 24 562, AFNOR

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	Weight kg	Part Number
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**

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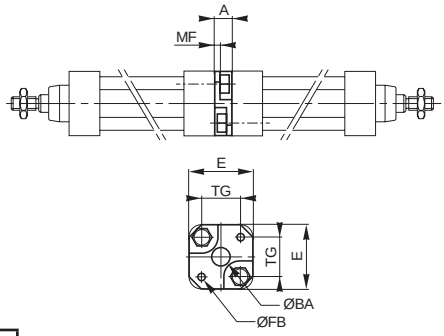
C086

Mounting Kit

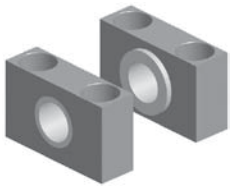
Mounting kit for back to back mounted cylinders, 3 and 4 position duplex cylinders.

Material
Mounting: Aluminium
Mounting screws: Zinc-plated steel 8.8



Bore mm	E mm	TG mm	ØFB mm	MF mm	A mm	ØBA mm	Weight kg	Part Number
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**

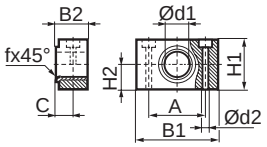
Pivot Bracket for MT4



Intended for use together with central trunnion MT4.

Material
Pivot bracket: Surface-treated aluminium
Bearing acc. to DIN 1850 C: Sintered oil-bronze bushing

Supplied in pairs.



According to ISO, VDMA 24 562, AFNOR

Bore mm	B1 mm	B2 mm	A mm	C mm	d1 mm	d2 H13 mm	H1 mm	H2 mm	fx45° min mm	Weight* kg	Part Number
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	
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	
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	

*Weight per item

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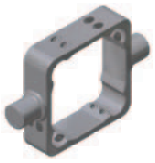
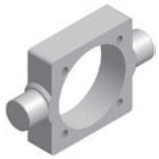
Intermediate Trunnion MT4



Standard*

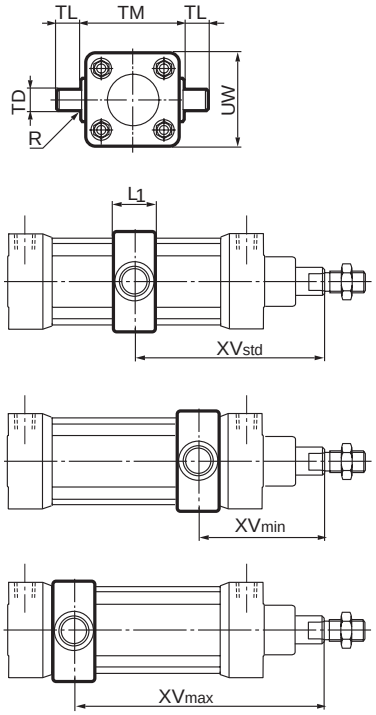


Tie Rod Version

Intended for articulated mounting of cylinder. The trunnion is factory-fitted at an optional location. Order by specifying Mounting Style G or 7 and providing the desired XV dimension (3-digit measure in mm). ***See page C9 for Ordering Information.*** Combined with pivot bracket for MT4 for 32-125mm bores.

Material:
Trunnion: Zinc plated steel (Cast iron for 160-200mm bores)

*Standard mounting is for the Standard cylinder body and is permanently affixed by the factory.

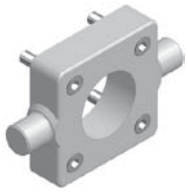


According to ISO MT4, VDMA 24 562, AFNOR

Bore mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	X1 mm	XV_{min} mm	X2 mm	Weight kg
32	50	12	12	1.0	46	15	73.0	62.0	84.0	0.13
40	63	16	16	1.6	59	20	82.5	73.0	92.0	0.31
50	75	16	16	1.6	69	20	90.0	80.5	99.5	0.37
63	90	20	20	1.6	84	25	97.5	89.5	106.0	0.69
80	110	20	20	1.6	102	25	110.0	98.0	122.0	0.89
100	132	25	25	2.0	125	30	120.0	110.5	129.5	1.58
125	160	25	25	2.0	155	32	145.0	132.0	158.0	2.60
160	200	32	32	2.5	190	70	C.F.	169	C.F.	C.F.
200	250	32	32	2.5	242	70	C.F.	184	C.F.	C.F.

XVstd = X1 + Stroke length/2 XVmax = X2 + Stroke length C.F. = Consult Factory

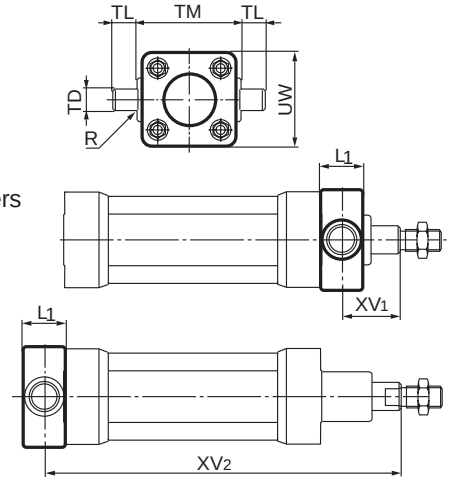
Flange Mounted Trunnion



Intended for articulated mounting of cylinder. This trunnion can be flange mounted on the front or rear end cover of all P1D cylinders. If you choose, you can order a complete cylinder with factory-fitted flange mounted trunnion – see the ordering information on pages C8 and C9. Individual trunnions have part numbers as shown below.

Material
Trunnion: zinc plated steel
Screws: zinc plated steel, 8.8

Delivered complete with mounting screws for attachment to the cylinder



According to ISO MT4, VDMA 24 562, AFNOR

Bore mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	XV_1 mm	X mm	Weight kg	Part Number
32	50	12	12	1.0	46	14	19.0	127.0	0.17	**P1D-4KMYF**
40	63	16	16	1.6	59	19	20.5	144.5	0.43	**P1D-4LMYF**
50	75	16	16	1.6	69	19	27.5	152.5	0.55	**P1D-4MMYF**
63	90	20	20	1.6	84	24	25.0	170.0	1.10	**P1D-4NMYF**
80	110	20	20	1.6	102	24	34.0	186.0	1.66	**P1D-4PMYF**
100	132	25	25	2.0	155	29	36.5	203.5	3.00	**P1D-4QMYF**

XV_2 = X + Stroke length

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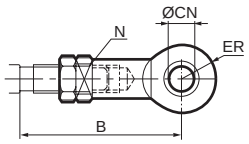
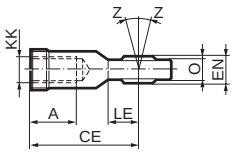
C086

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





Stainless Steel Swivel Rod Eye

Materials
Swivel rod eye: Stainless steel
Swivel bearing according to DIN 648K: Stainless steel

Use stainless steel nut (see page C31) with stainless steel swivel rod eye.

According to ISO 8139

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	Part Number	Stainless Steel Part Number
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		
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		
125	51	123.5	137	110	30	37	35	M27x2	36	41	25.0	15°	1.28	**P1C-4RRS**	**P1S-4RRT**
160/200	56	C.F.	C.F.	125	35*	43	40	M36x2	40	50	28.0	15°	C.F.	**L075470036**	**C.F.**

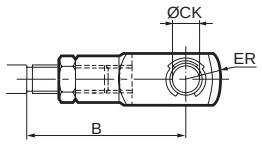
*H7

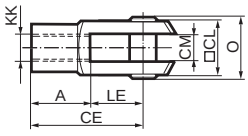
C.F. = Consult Factory

Clevis

Clevis for articulated mounting of cylinder.

Material
Clevis, clip: Galvanized steel
Pin: Hardened steel





Stainless Steel Clevis

Material
Clevis: Stainless steel
Pin: Stainless steel
Circlips according to DIN 471: Stainless steel

According to ISO 8140

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	Part Number	Stainless Steel Part Number
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		
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		
125	56	123.5	137	110	30	55	30	45	M27x2	54	72.0	2.10	**P1C-4RRC**	**P1S-4RRD**
160/200	71	C.F.	C.F.	144	35	70	35	57	M36x2	72	95	C.F.	**L075490036**	**C.F.**

C.F. = Consult Factory

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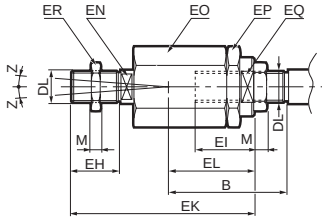
C086

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°.

Material
Flexo coupling, nut: Zinc-plated steel
Socket: Hardened steel

Supplied complete with galvanized adjustment nut.



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	Weight kg	Part Number
32	36.0	43	M10x1.25	20	23	70	31	12	30	30	19	30	5.0	4°	0.21	**P1C-4KRF**
40	37.0	43	M12x1.25	23	23	67	31	12	30	30	19	30	6.0	4°	0.22	**P1C-4LRF**
50	53.0	61	M16x1.5	40	32	112	45	19	41	41	30	41	8.0	4°	0.67	**P1C-4MRF**
63	53.0	61	M16x1.5	40	32	112	45	19	41	41	30	41	8.0	4°	0.67	
80	57.0	67	M20x1.5	39	42	122	56	19	41	41	30	41	10.0	4°	0.72	**P1C-4PRF**
100	57.0	67	M20x1.5	39	42	122	56	19	41	41	30	41	10.0	4°	0.72	
125	75.5	89	M27x2	48	48	145	60	24	55	55	32	55	13.5	4°	1.80	**P1C-4RRF**
160/200	C.F.	C.F.	M36x2	72	78	251	C.F.	36	75	75	50	55	18.0	4°	C.F.	**L075530036**

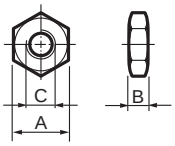
C.F. = Consult Factory

Nuts

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 Clean, which is delivered with a stainless steel piston rod nut instead.



Stainless Steel Nut

Material: Stainless steel A2

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

Acid-proof nut

Material: Acid-proof steel A4

Cylinders with acid-proof piston rod are supplied with nut of acid-proof steel

According to DIN 439 B

Bore mm	A mm	B mm	C	Weight kg	Part Numbers		
					Steel	Stainless Steel	Acid-Proof
32	17	5.0	M10x1.25	0.007	**9128985601**	**9126725404**	**0261109919**
40	19	6.0	M12x1.25	0.010	**0261109910**	**9126725405**	**0261109920**
50	24	8.0	M16x1.5	0.021	**9128985603**	**9126725406**	**0261109917**
63	24	8.0	M16x1.5	0.021			
80	30	10.0	M20x1.5	0.040	**0261109911**	**0261109921**	**0261109916**
100	30	10.0	M20x1.5	0.040			
125	41	13.5	M27x2	0.100	**0261109912**	**0261109922**	**0261109918**
160/200	55	18.0	M36x2	C.F.	**L075540036**	**C.F.**	**C.F.**

C.F. = Consult Factory

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C086

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.

Bore mm	Weight kg	Part Number
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**

Screw set for MF1/MF2

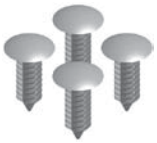
Set of stainless steel screws for fitting flanges MF1/MF2 onto the cylinder. The screws have an internal hexagonal head and are used in special environments, e.g. the food industry, or where there are extra demands for protection against corrosion.

Material:
According to DIN 6912, Stainless steel, A2

4 pcs per pack

Bore mm	Weight kg	Part Number
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



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.

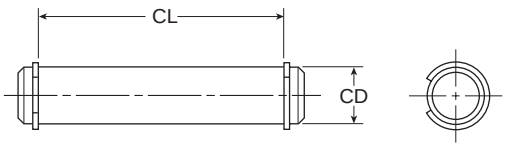
Material:
Polyamid PA

4 pcs per pack

Bore mm	Weight kg	Part Number
32	0.01	**9121742201**
40	0.01	**9121742201**
50	0.02	**9121742202**
63	0.02	**9121742202**
80	0.02	**9121742203**
100	0.02	**9121742203**
125	0.03	**9121742204**

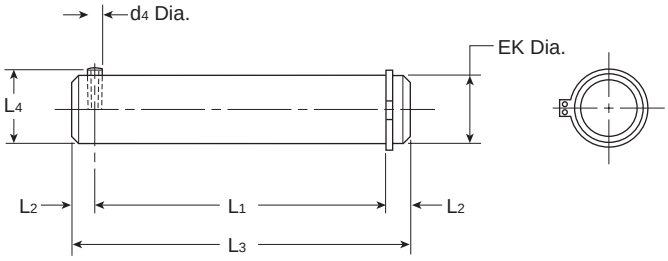
Pivot Pin Sets for 160-200mm Bore Cylinder Accessories

For Clevis Bracket MP2



Bore	CD	CL	Part Number
160/200	30	170.50	L075500160

For Rear Swivel Eye MP6



Bore	EK	d_4	L_1	L_2	L_3	L_4	Part Number
160/200	35	6	119	7	131	41	L075520160

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Seal Kits

Cyl. Bore	P1D Cylinder Version
mm	**Standard** P1D-S, P1D-T, P1D-C, P1D-F
32	SK032P1D01
40	SK040P1D01
50	SK050P1D01
63	SK063P1D01
80	SK080P1D01
100	SK100P1D01
125	SK125P1D01

Grease for P1D

Standard 30g **9127394541**

Gland Seal Kits

Bore Size	Rod Dia.	Rod No.	RG-Rod Gland Cartridge Kit		RK-Rod Seal Kit	
			Nitrile Seals	Fluorocarbon Seals	Nitrile Seals	Fluorocarbon Seals
			Consisting of: 1 each items #14, 41, 45 & 104	Consisting of: 1 each items #14, 41, 45 & 104	Consisting of: 1 each items #41, 45 & 104	Consisting of: 1 each items #41, 45 & 104
mm	mm		Part No.	Part No.	Part No.	Part No.
32	12	1	RG0P1D0121	RG0P1D0125	RK0P1D0121	RK0P1D0125
40	16	1	RG0P1D0161	RG0P1D0165	RK0P1D0161	RK0P1D0165
50 & 63	20	1	RG0P1D0201	RG0P1D0205	RK0P1D0201	RK0P1D0205
80 & 100	25	1	RG0P1D0251	RG0P1D0255	RK0P1D0251	RK0P1D0255
125	32	1	RG0P1D0321	RG0P1D0325	RK0P1D0321	RK0P1D0325

Piston & End Seal Kits

Bore Size	PK – Piston Seal Kit		CB – Cylinder Body End Seal Kit	
	Consisting of: 2 each items # 42 & 47 plus 1 each items 121 and #159. NOTE: (Fluorocarbon seals do not include magnetic ring symbol #159.)		Consisting of: 2 each item #47	
	Nitrile Seals	Fluorocarbon Seals	Nitrile Seals	Fluorocarbon Seals
mm	Part No.	Part No.	Part No.	Part No.
32	PK032P1D01	PK032P1D05	CB032P1D01	CB032P1D05
40	PK040P1D01	PK040P1D05	CB040P1D01	CB040P1D05
50	PK050P1D01	PK050P1D05	CB050P1D01	CB050P1D05
63	PK063P1D01	PK063P1D05	CB063P1D01	CB063P1D05
80	PK080P1D01	PK080P1D05	CB080P1D01	CB080P1D05
100	PK100P1D01	PK100P1D05	CB100P1D01	CB100P1D05
125	PK125P1D01	PK125P1D05	CB125P1D01	CB125P1D05

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