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Pneumatic ISO Cylinders

Series P1D-B
According to ISO 15552

PDE2659TCUK September 2012




ENGINEERING YOUR SUCCESS.

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PNEUMATIK

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Important

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



Note

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



WARNING

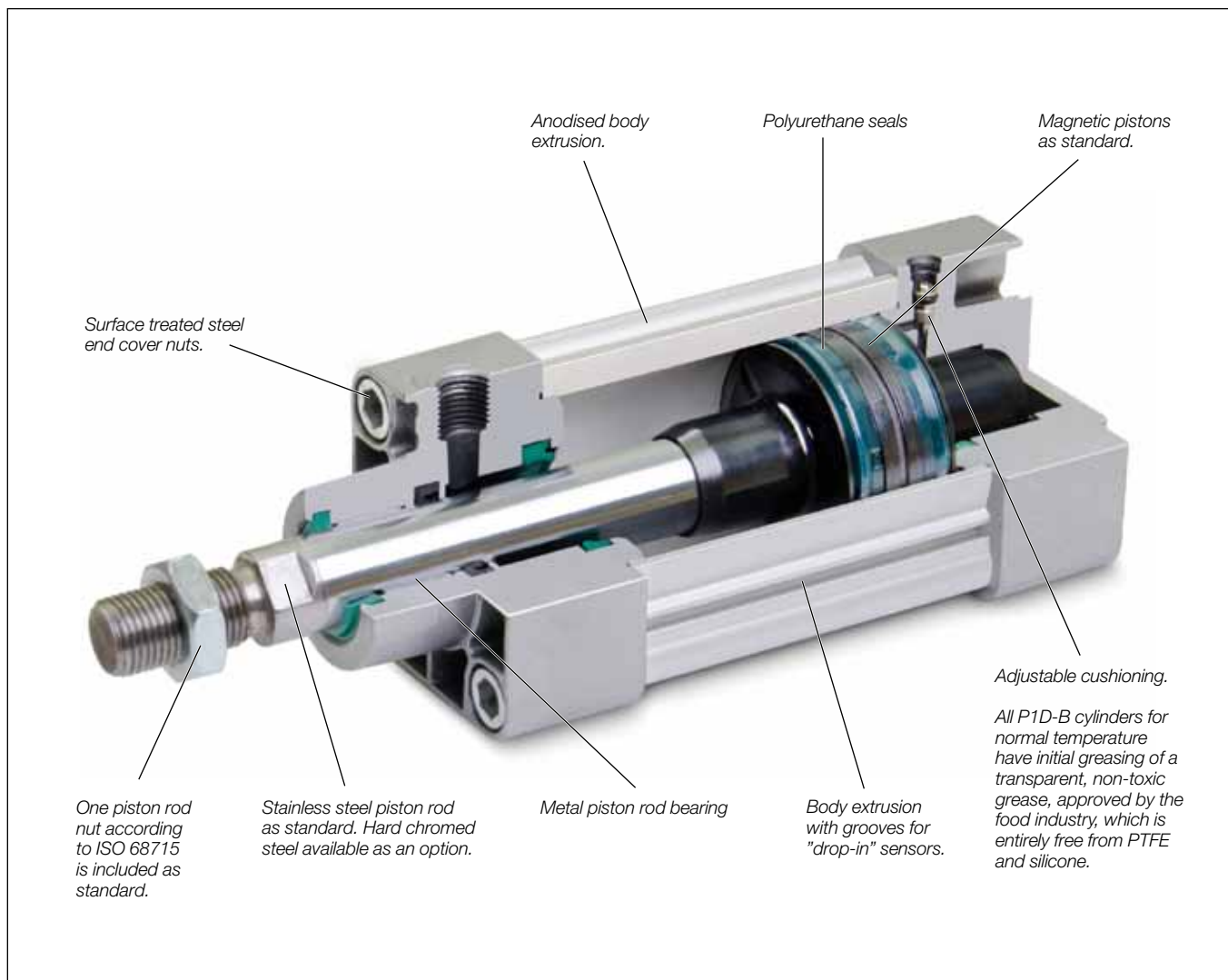
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P1D-B Pneumatic ISO Cylinders



Standard cylinders P1D-B, ISO 15552

Global product range

The P1D-B Series meets the specifications in the ISO 15552 standard. This means full interchangeability to any ISO 15552 cylinder anywhere around the globe. P1D-B will be available throughout the extensive worldwide Parker Hannifin organization – for the benefit to you and your customers.

Features

- ISO 15552 conformity.
- Bore sizes 32-125 mm.
- Corrosion resistant design with barrel in anodized aluminium and stainless steel piston rod.
- Polyurethane seal technology.
- Adjustable air cushioning.
- Range of mountings available.
- Drop in global P8S-G sensors.
- Metal piston rod bearing.

P1D-B Pneumatic ISO Cylinders

Cylinder forces, double acting variants

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

+ = Outward stroke
- = Return stroke

Note!

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

Main data: P1D-B

| Cylinder designation | Cylinder | | Piston rod | | Piston rod thread | Cushioning length | Connection | |
|------------------------------|----------|-----------------|------------|-----------------|----------------------|----------------------|-----------------------------|--------|
| | bore | area | dia. | area | | | sump- tion ²⁾ | thread |
| | mm | cm ² | mm | cm ² | | mm | litre | |
| P1D-B032••XXXX ¹⁾ | 32 | 8,0 | 12 | 1,1 | M10x1,25 | 17 | 0,105 | G1/8 |
| P1D-B040••XXXX ¹⁾ | 40 | 12,6 | 16 | 2,0 | M12x1,25 | 19 | 0,162 | G1/4 |
| P1D-B050••XXXX ¹⁾ | 50 | 19,6 | 20 | 3,1 | M16x1,5 | 20 | 0,253 | G1/4 |
| P1D-B063••XXXX ¹⁾ | 63 | 31,2 | 20 | 3,1 | M16x1,5 | 23 | 0,414 | G3/8 |
| P1D-B080••XXXX ¹⁾ | 80 | 50,3 | 25 | 4,9 | M20x1,5 | 23 | 0,669 | G3/8 |
| P1D-B100••XXXX ¹⁾ | 100 | 78,5 | 25 | 4,9 | M20x1,5 | 27 | 1,043 | G1/2 |
| P1D-B125••XXXX ¹⁾ | 125 | 122,7 | 32 | 8,0 | M27x2 | 30 | 1,662 | G1/2 |

Total mass including moving parts

| Cylinder designation | Total mass (kg) | |
|------------------------------|-----------------|-----------------------------|
| | at 0 mm stroke | Supplement per 10 mm stroke |
| P1D-B032••XXXX ¹⁾ | 0,55 | 0,023 |
| P1D-B040••XXXX ¹⁾ | 0,80 | 0,033 |
| P1D-B050••XXXX ¹⁾ | 1,20 | 0,048 |
| P1D-B063••XXXX ¹⁾ | 1,73 | 0,051 |
| P1D-B080••XXXX ¹⁾ | 2,45 | 0,075 |
| P1D-B100••XXXX ¹⁾ | 4,00 | 0,084 |
| P1D-B125••XXXX ¹⁾ | 6,87 | 0,138 |

Mass moving parts only (for cushioning calculation)

| Cylinder designation | Mass moving parts (kg) | |
|------------------------------|------------------------|-----------------------------|
| | at 0 mm stroke | Supplement per 10 mm stroke |
| P1D-B032••XXXX ¹⁾ | 0,13 | 0,009 |
| P1D-B040••XXXX ¹⁾ | 0,24 | 0,016 |
| P1D-B050••XXXX ¹⁾ | 0,42 | 0,025 |
| P1D-B063••XXXX ¹⁾ | 0,50 | 0,025 |
| P1D-B080••XXXX ¹⁾ | 0,90 | 0,039 |
| P1D-B100••XXXX ¹⁾ | 1,10 | 0,039 |
| P1D-B125••XXXX ¹⁾ | 2,34 | 0,063 |

1) XXXX = stroke

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

P1D-B Pneumatic ISO Cylinders

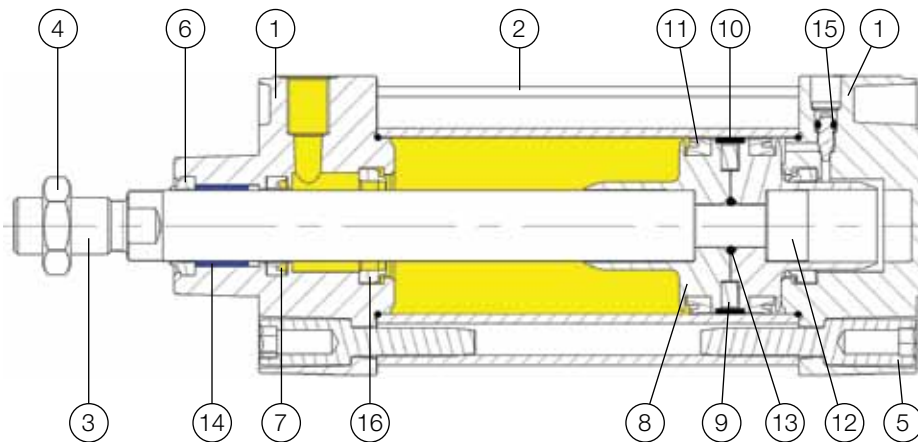
General technical data

| | | |
|-------------------|--|---------------|
| Product type | Standard cylinder according to ISO 15552 | |
| Bore size | 32 - 125 mm | |
| Stroke length | 5-2800 mm | |
| Versions | P1D-B...MS | Double acting |
| Cushioning | Adjustable air cushioning | |
| Position sensing | Proximity sensor | |
| Installation | P1D cylinder and piston rod mountings | |
| Mounting position | Any | |

Operating and environmental data

| | |
|----------------------|---|
| Operating medium | For best possible service life and trouble-free operation dry, filtered compressed air to ISO 8573-1:2010 quality class 3.4.3 should be used. This specifies a dew point of +3°C for indoor operation (a lower dew point should be selected for outdoor operation) and is in line with the air quality from most standard compressors with a standard filter. |
| Operating pressure | 0,5 bar to 10 bar |
| Ambient temperature | |
| Standard version | -20°C to +80°C |
| Pre-lubricated | Further lubrication is normally not necessary. If additional lubrication is introduced it must be continued. |
| Corrosion resistance | Resistance to corrosion and chemicals. |

Material specification



| Pos | Part | Specification | |
|-----|--------------------|---------------------------------------|--------------------------------------|
| 1 | End covers | Aluminium | |
| 2 | Cylinder barrel | Anodised aluminium | |
| 3 | Piston rod | Standard | Stainless steel, DIN X 10 CrNiS 18 9 |
| | | Option | Hard chromium plated Fe 490-2 FN |
| 4 | Piston rod nut | Zinc plated steel | |
| 5 | End cover screws | Zinc plated steel | |
| 6 | Scraper ring | Polyurethane | |
| 7 | Piston rod seal | Polyurethane | |
| 8 | Piston | POM high tech polymer | |
| 9 | Magnet | Plastic coated magnetic material | |
| 10 | Piston bearing | POM high tech polymer | |
| 11 | Piston seals | Polyurethane | |
| 12 | Piston bolt | Zinc plated steel | |
| 13 | O-rings | Nitrile rubber | |
| 14 | Piston rod bearing | Multilayer PTFE/steel | |
| 15 | Cushioning screws | Stainless steel, DIN X 10 CrNiS 18 n9 | |
| 16 | Cushioning seals | | Polyurethane |
| | | Note on materials | RoHS compliant |

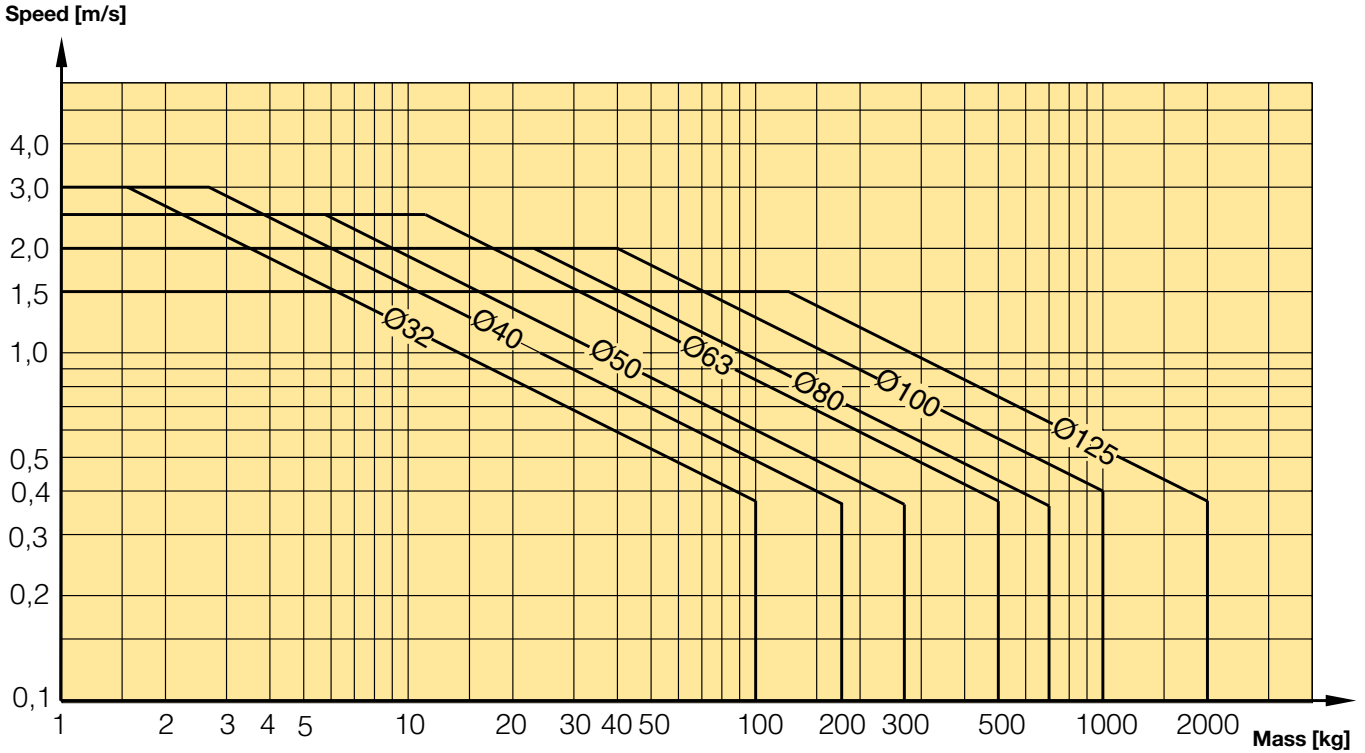
P1D-B Pneumatic ISO Cylinders

Cushioning characteristics

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

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

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



P1D-B Pneumatic ISO Cylinders

Guide for selecting suitable tubing

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

The following is the basic principle:

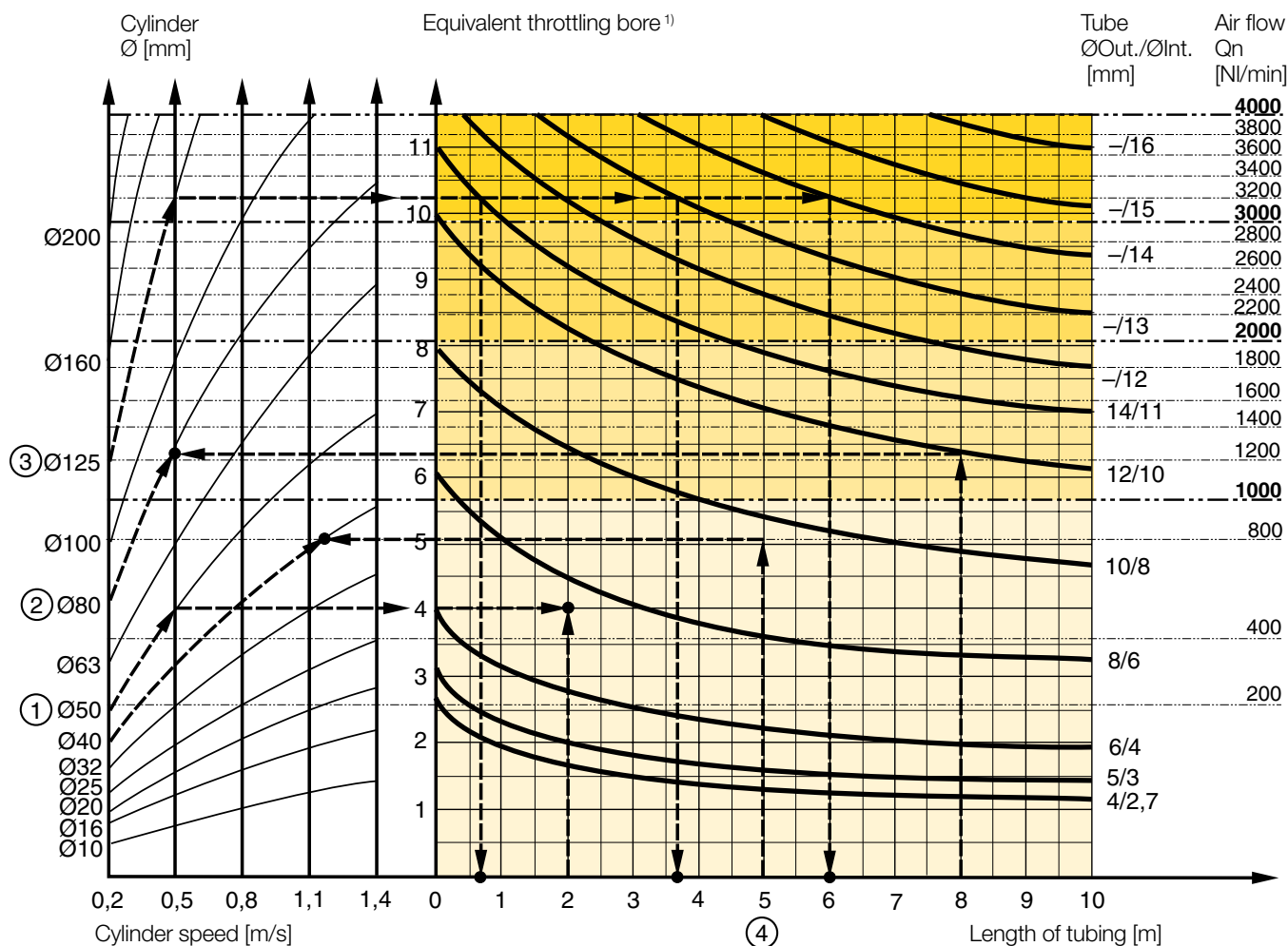
1. The primary line to the working valve could be over sized (this does not cause any extra air consumption and consequently does not create any extra costs in operation).
2. The tubes between the valve and the cylinder should, however, be optimized according to the principle that an insufficient bore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

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

The following prerequisites apply:

The cylinder load should be about 50% of the theoretical force (= normal load). A lower load gives a higher velocity and vice versa. The tube size is selected as a function of the cylinder bore, the desired cylinder velocity and the tube length between the valve and the cylinder.

If you want to use the capacity of the valve to its maximum, and obtain maximum speed, the tubing should be chosen so that they at least correspond with the equivalent restriction diameter (see description below), so that the tubing does not restrict the total flow. This means that a short tubing must have at least the equivalent restriction diameter. If the tubing is longer, choose it from the table below. Straight fittings should be chosen for highest flow rates. (Elbow and banjo fittings cause restriction.)



- 1) The "equivalent throttling bore" is a long throttle (for example a tube) or a series of throttles (for example, through a valve) converted to a short throttle which gives a corresponding flow rate. This should not be confused with the "orifice" which is sometimes specified for valves. The value for the orifice does not normally take account of the fact that the valve contains a number of throttles.
- 2) Qn is a measure of the valve flow capacity, with flow measured in litre per minute (l/min) at 6 bar(e) supply pressure and 1 bar pressure drop across the valve.

P1D-B Pneumatic ISO Cylinders

Example ① : Which tube diameter should be used?

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

Example ② : What cylinder velocity will be obtained?

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

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

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

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

For example:

Intersection one: When a tube (14/11) will be used, the maximum length of tube is 0.7 meter.

Intersection two: When a tube (—/13) will be used, the maximum length of tube is 3.7 meter.

Intersection three: When a tube (—/14) will be used, the maximum length of tube is 6 meter.

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

For an application using a 40 mm bore cylinder with a valve with Qn=800 NI/min. The distance between the cylinder and valve has been set to 5 m.

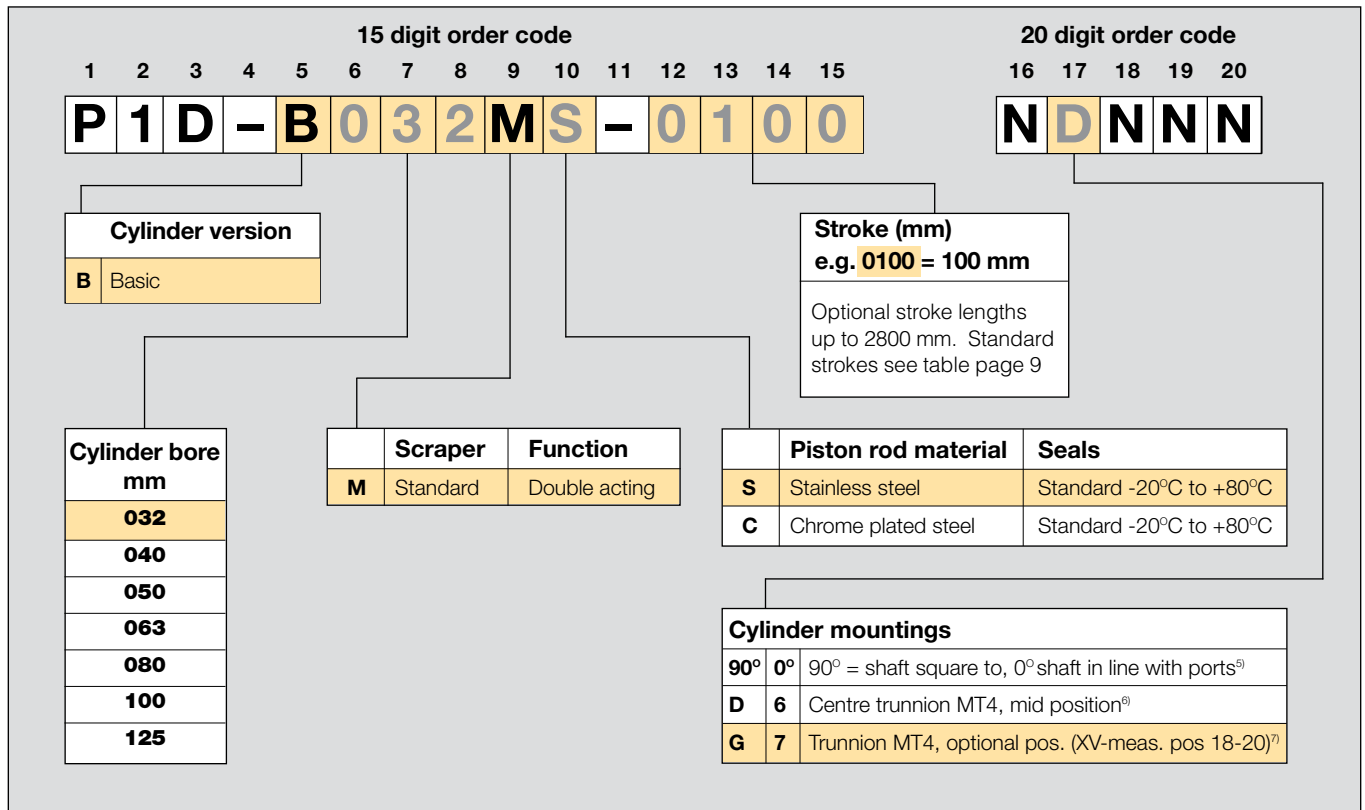
Tube dimension: What tube bore should be selected to obtain the maximum cylinder velocity? Start at pipe length 5 m, follow the line up to the intersection with 800 NI/min. Select the next largest tube diameter, in this case Ø10/8 mm.

Cylinder velocity: What maximum cylinder velocity will be obtained? Follow the line for 800 NI/min to the left until it intersects with the line for the Ø40 mm cylinder. In this example, the speed is just above 1.1 m/s.

Valve series with respective flows in NI/minute

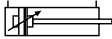
| Valve series | Qn in NI/Min |
|--|--------------|
| Interface PS1 | 120 |
| Moduflex Size 1 - Double 4/2 single solenoid | 165 |
| Adex A05 | 173 |
| Isys Micro - Single 5/3 APB | 228 |
| Moduflex Size 1 - Single or Double 3/2 | 235 |
| Isys Micro - Double 3/2 | 276 |
| Isys Micro - Single 5/2 | 282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

Order Key Code



Standard strokes

Standard strokes for all P1D-B cylinders comply with ISO 4393 (with the exception of stroke 40 mm).
 Special strokes up to 2800 mm.

| Order no | Cylinder bore (mm) | ● = Standard stroke (mm) | ■ = Stroke to special order |
|------------------------|---|--|-----------------------------|
| XXXX = Stroke | | 25 40 50 80 100 125 160 200 250 320 400 500 600 700 800 2800 | |
| P1D-B |  | | |
| P1D-B032MS-XXXX | 32 | ● | ■ |
| P1D-B040MS-XXXX | 40 | ● | ■ |
| P1D-B050MS-XXXX | 50 | ● | ■ |
| P1D-B063MS-XXXX | 63 | ● | ■ |
| P1D-B080MS-XXXX | 80 | ● | ■ |
| P1D-B100MS-XXXX | 100 | ● | ■ |
| P1D-B125MS-XXXX | 125 | ● | ■ |

P1D-B Pneumatic ISO Cylinders

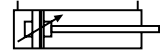
Double acting with stainless steel piston rod

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



P1D-B

Double-acting

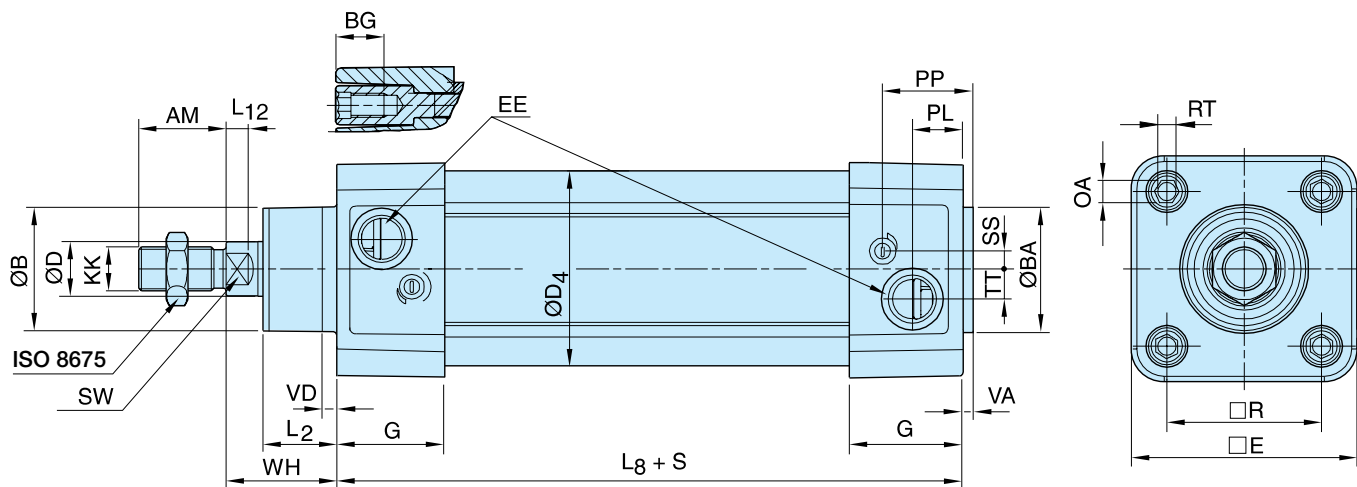


| Cyl. bore mm | Stroke mm | Order code |
|-------------------------|--------------|-----------------|
| 32 Conn. G1/8 | 25 | P1D-B032MS-0025 |
| | 40 | P1D-B032MS-0040 |
| | 50 | P1D-B032MS-0050 |
| | 80 | P1D-B032MS-0080 |
| | 100 | P1D-B032MS-0100 |
| | 125 | P1D-B032MS-0125 |
| | 160 | P1D-B032MS-0160 |
| | 200 | P1D-B032MS-0200 |
| | 250 | P1D-B032MS-0250 |
| | 320 | P1D-B032MS-0320 |
| 40 Conn. G1/4 | 25 | P1D-B040MS-0025 |
| | 40 | P1D-B040MS-0040 |
| | 50 | P1D-B040MS-0050 |
| | 80 | P1D-B040MS-0080 |
| | 100 | P1D-B040MS-0100 |
| | 125 | P1D-B040MS-0125 |
| | 160 | P1D-B040MS-0160 |
| | 200 | P1D-B040MS-0200 |
| | 250 | P1D-B040MS-0250 |
| | 320 | P1D-B040MS-0320 |
| 50 Conn. G1/4 | 25 | P1D-B050MS-0025 |
| | 40 | P1D-B050MS-0040 |
| | 50 | P1D-B050MS-0050 |
| | 80 | P1D-B050MS-0080 |
| | 100 | P1D-B050MS-0100 |
| | 125 | P1D-B050MS-0125 |
| | 160 | P1D-B050MS-0160 |
| | 200 | P1D-B050MS-0200 |
| | 250 | P1D-B050MS-0250 |
| | 320 | P1D-B050MS-0320 |
| 63 Conn. G3/8 | 25 | P1D-B063MS-0025 |
| | 40 | P1D-B063MS-0040 |
| | 50 | P1D-B063MS-0050 |
| | 80 | P1D-B063MS-0080 |
| | 100 | P1D-B063MS-0100 |
| | 125 | P1D-B063MS-0125 |
| | 160 | P1D-B063MS-0160 |
| | 200 | P1D-B063MS-0200 |
| | 250 | P1D-B063MS-0250 |
| | 320 | P1D-B063MS-0320 |

| Cyl. bore mm | Stroke mm | Order code |
|--------------------------|--------------|-----------------|
| 80 Conn. G3/8 | 25 | P1D-B080MS-0025 |
| | 40 | P1D-B080MS-0040 |
| | 50 | P1D-B080MS-0050 |
| | 80 | P1D-B080MS-0080 |
| | 100 | P1D-B080MS-0100 |
| | 125 | P1D-B080MS-0125 |
| | 160 | P1D-B080MS-0160 |
| | 200 | P1D-B080MS-0200 |
| | 250 | P1D-B080MS-0250 |
| | 320 | P1D-B080MS-0320 |
| 100 Conn. G1/2 | 25 | P1D-B100MS-0025 |
| | 40 | P1D-B100MS-0040 |
| | 50 | P1D-B100MS-0050 |
| | 80 | P1D-B100MS-0080 |
| | 100 | P1D-B100MS-0100 |
| | 125 | P1D-B100MS-0125 |
| | 160 | P1D-B100MS-0160 |
| | 200 | P1D-B100MS-0200 |
| | 250 | P1D-B100MS-0250 |
| | 320 | P1D-B100MS-0320 |
| 125 Conn. G1/2 | 25 | P1D-B125MS-0025 |
| | 40 | P1D-B125MS-0040 |
| | 50 | P1D-B125MS-0050 |
| | 80 | P1D-B125MS-0080 |
| | 100 | P1D-B125MS-0100 |
| | 125 | P1D-B125MS-0125 |
| | 160 | P1D-B125MS-0160 |
| | 200 | P1D-B125MS-0200 |
| | 250 | P1D-B125MS-0250 |
| | 320 | P1D-B125MS-0320 |

P1D-B Pneumatic ISO Cylinders

P1D-B Basic



Dimensions

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

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

S=Stroke

Tolerances

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

Cylinder mountings

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 steel
Mounting screws acc. to DIN 6912: Zinc-plated steel 8.8

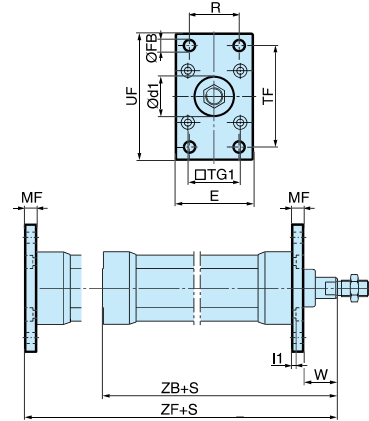
Supplied complete with mounting screws for attachment to cylinder.

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

| Cyl. bore mm | d1 mm | FB mm | TG1 mm | E mm | R mm | MF mm | TF mm | UF mm | I1 mm | W mm | ZF mm | ZB mm |
|--------------|-------|-------|--------|------|------|-------|-------|-------|-------|------|-------|-------|
| | H11 | H13 | | | JS14 | JS14 | JS14 | | -0,5 | | | |
| 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

| Cyl. bore Ø mm | Weight kg | Order code |
|----------------|-----------|-----------------|
| 32 | 0,23 | P1C-4KMB |
| 40 | 0,28 | P1C-4LMB |
| 50 | 0,53 | P1C-4MMB |
| 63 | 0,71 | P1C-4NMB |
| 80 | 1,59 | P1C-4PMB |
| 100 | 2,19 | P1C-4QMB |
| 125 | 3,78 | P1C-4RMB |



Foot bracket MS1



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

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

Supplied in pairs with mounting screws for attachment to cylinder.

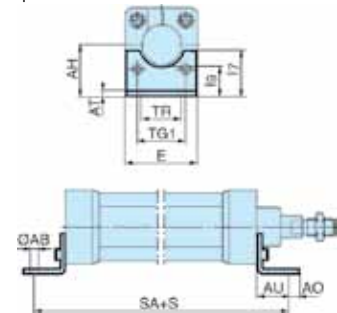
According to ISO MS1, VDMA 24 562, AFNOR

| Cyl. bore mm | AB mm | TG1 mm | E mm | TR mm | AO mm | AU mm | AH mm | I7 mm | AT mm | I9 mm | SA mm |
|--------------|-------|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| | H14 | | | JS14 | | | JS15 | | | JS14 | |
| 32 | 7 | 32,5 | 47 | 32 | 8 | 24 | 32 | 30 | 4,5 | 17,0 | 142 |
| 40 | 9 | 38,0 | 53 | 36 | 10 | 28 | 36 | 30 | 4,5 | 18,5 | 161 |
| 50 | 9 | 46,5 | 65 | 45 | 10 | 32 | 45 | 36 | 5,5 | 25,0 | 170 |
| 63 | 9 | 56,5 | 75 | 50 | 10 | 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 | 20 | 45 | 90 | 71 | 8,0 | 60,0 | 250 |

S = Stroke length

| Cyl. bore Ø mm | Weight kg | Order code |
|----------------|-----------|-----------------|
| 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



Pivot bracket with rigid bearing



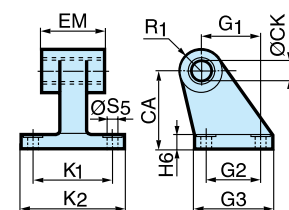
Intended for flexible mounting of cylinder. The pivot bracket can be combined with clevis bracket MP2.

Material:
Pivot bracket: Aluminium
Bearing: Sintered oil-bronze bushing

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

| Cyl. bore mm | CK mm | S5 mm | K1 mm | K2 mm | G1 mm | G2 mm | EM mm | G3 mm | CA mm | H6 mm | R1 mm |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | H9 | H13 | JS14 | | JS14 | JS14 | | | JS15 | | |
| 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 |

| Cyl. bore Ø mm | Weight kg | Order code |
|----------------|-----------|------------------|
| 32 | 0,06 | P1C-4KMDB |
| 40 | 0,08 | P1C-4LMDB |
| 50 | 0,15 | P1C-4MMDB |
| 63 | 0,20 | P1C-4NMDB |
| 80 | 0,33 | P1C-4PMDB |
| 100 | 0,49 | P1C-4QMDB |
| 125 | 1,02 | P1C-4RMDB |



Cylinder mountings

Swivel eye bracket

Intended for use together with clevis bracket GA

Material:
Bracket: Aluminium
Swivel bearing acc. to DIN 648K: Hardened steel

Supplied complete with mounting screws for attachment to cylinder.

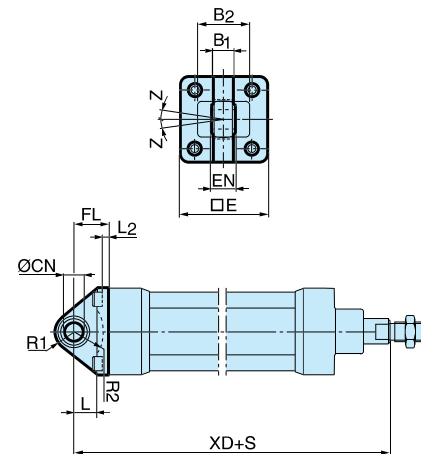


| Cyl. bore Ø mm | Weight kg | Order code |
|-------------------|--------------|----------------|
| 32 | 0,08 | PD23843 |
| 40 | 0,11 | PD23844 |
| 50 | 0,20 | PD23845 |
| 63 | 0,27 | PD23846 |
| 80 | 0,52 | PD23847 |
| 100 | 0,72 | PD23848 |
| 125 | 1,53 | PD23849 |

According to VDMA 24 562, AFNOR

| Cyl. 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 ° |
|-----------------|---------|----------|----------|----------|----------|----------|----------|----------|---------|----------------|----------|--------|
| 32 | 47 | 10,5 | - | 14 | 16 | 12 | 22 | 6.0 | 12 | 10 | 142 | 4° |
| 40 | 55 | 12,0 | - | 16 | 21 | 14 | 25 | 6.0 | 15 | 12 | 160 | 4° |
| 50 | 65 | 12,0 | 51 | 16 | 23 | 16 | 27 | 7.0 | 15 | 12 | 170 | 4° |
| 63 | 78 | 15,0 | - | 21 | 27 | 19 | 32 | 7.0 | 20 | 16 | 190 | 4° |
| 80 | 95 | 15,0 | - | 21 | 29 | 21 | 36 | 10.0 | 20 | 16 | 210 | 4° |
| 100 | 115 | 18,0 | - | 25 | 34 | 24 | 41 | 10.0 | 25 | 20 | 230 | 4° |
| 125 | 140 | 22,0 | - | 31 | 40 | 30 | 50 | 10.5 | 30 | 25 | 275 | 4° |

S = Stroke length



Clevis bracket MP2

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

Material:
Clevis bracket: Aluminium
Pin: Surface hardened steel
Circlips according to DIN 471: Spring steel
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.

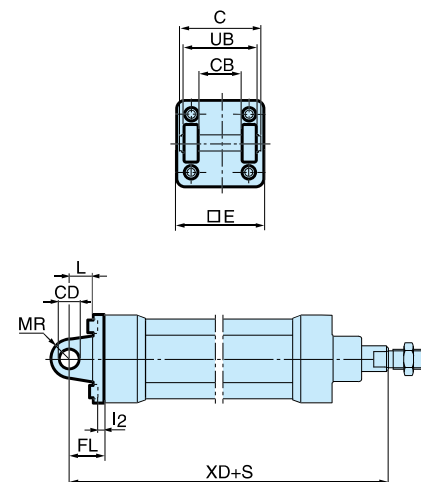


| Cyl. bore Ø mm | Weight kg | Order code |
|-------------------|--------------|------------------|
| 32 | 0,08 | P1C-4KMTB |
| 40 | 0,11 | P1C-4LMTB |
| 50 | 0,14 | P1C-4MMTB |
| 63 | 0,29 | P1C-4NMTB |
| 80 | 0,36 | P1C-4PMTB |
| 100 | 0,64 | P1C-4QMTB |
| 125 | 1,17 | P1C-4RMTB |

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 | I2 mm | CD H9 mm | MR mm | XD mm |
|-----------------|---------|---------|-----------------|-----------------|------------------|---------|----------|----------------|----------|----------|
| 32 | 53 | 47 | 45 | 26 | 22 | 13 | 6,0 | 10 | 10 | 142 |
| 40 | 60 | 55 | 52 | 28 | 25 | 16 | 6,0 | 12 | 12 | 160 |
| 50 | 68 | 65 | 60 | 32 | 27 | 16 | 7,0 | 12 | 12 | 170 |
| 63 | 78 | 78 | 70 | 40 | 32 | 21 | 7,0 | 16 | 16 | 190 |
| 80 | 98 | 95 | 90 | 50 | 36 | 22 | 10,0 | 16 | 16 | 210 |
| 100 | 118 | 115 | 110 | 60 | 41 | 27 | 10,5 | 20 | 20 | 230 |
| 125 | 139 | 140 | 130 | 70 | 50 | 30 | 10,5 | 25 | 25 | 275 |

S = Stroke length



Cylinder mountings

Clevis bracket MP4



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

Material:
 Clevis bracket: Aluminium
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

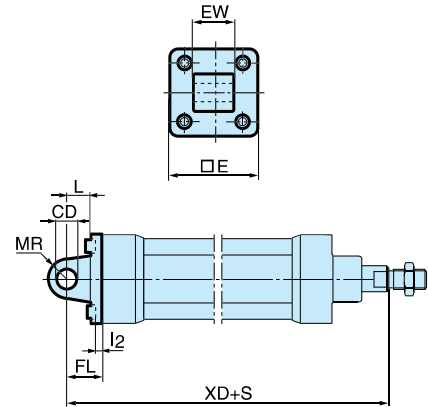
Supplied complete with mounting screws for attachment to cylinder.

| Cyl. bore Ø mm | Weight kg | Order code |
|-------------------|--------------|----------------|
| 32 | 0,09 | PD23412 |
| 40 | 0,13 | PD23413 |
| 50 | 0,17 | PD23414 |
| 63 | 0,36 | PD23415 |
| 80 | 0,46 | PD23416 |
| 100 | 0,83 | PD23417 |
| 125 | 1,53 | PD23418 |

According to ISO MP4, VDMA 24 562, AFNOR

| Cyl. bore mm | E mm | EW mm | FL mm | L ±0,2 mm | I2 mm | CD mm | MR H9 mm | XD mm |
|-----------------|---------|----------|----------|-----------------|----------|----------|----------------|----------|
| 32 | 47 | 26 | 22 | 13 | 6,0 | 10 | 10 | 142 |
| 40 | 55 | 28 | 25 | 16 | 6,0 | 12 | 12 | 160 |
| 50 | 65 | 32 | 27 | 16 | 7,0 | 12 | 12 | 170 |
| 63 | 78 | 40 | 32 | 21 | 7,0 | 16 | 16 | 190 |
| 80 | 95 | 50 | 36 | 22 | 10,0 | 16 | 16 | 210 |
| 100 | 115 | 60 | 41 | 27 | 10,5 | 20 | 20 | 230 |
| 125 | 140 | 70 | 50 | 30 | 10,5 | 25 | 25 | 275 |

S = Stroke length



Clevis bracket GA



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.

Material:
 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

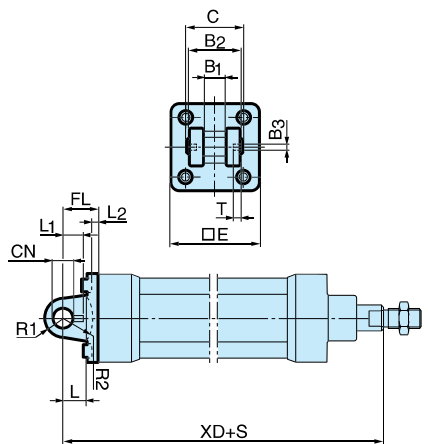
Supplied complete with mounting screws for attachment to cylinder.

| Cyl. bore Ø mm | Weight kg | Order code |
|-------------------|--------------|------------------|
| 32 | 0,09 | P1C-4KMCB |
| 40 | 0,13 | P1C-4LMCB |
| 50 | 0,17 | P1C-4MMCB |
| 63 | 0,36 | P1C-4NMCB |
| 80 | 0,58 | P1C-4PMCB |
| 100 | 0,89 | P1C-4QMCB |
| 125 | 1,75 | P1C-4RMCB |

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 | I2 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 | 55 | 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



Cylinder mountings

Pivot bracket with swivel bearing

Intended for use together with clevis bracket GA.

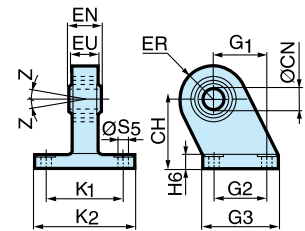
Material:
Pivot bracket: Surface-treated steel
Swivel bearing acc. to DIN 648K: Hardened steel



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° |

| Cyl. bore Ø mm | Weight kg | Order code |
|----------------|-----------|---------------|
| 32 | 0,18 | KC5130 |
| 40 | 0,25 | KC5131 |
| 50 | 0,47 | KC5132 |
| 63 | 0,57 | KC5133 |
| 80 | 1,05 | KC5134 |
| 100 | 1,42 | KC5135 |
| 125 | 3,10 | KC5136 |



Mounting kit

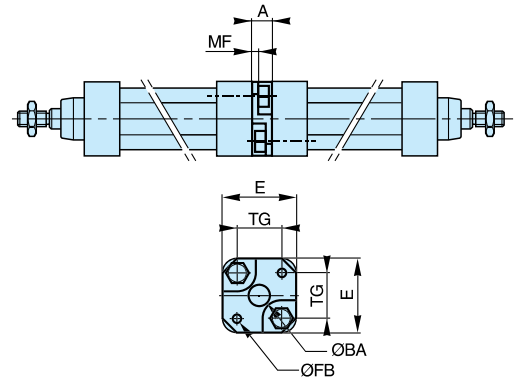
Mounting kit for back to back mounted cylinders, 3 and 4 position cylinders.

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



| Cyl. bore mm | E mm | TG mm | ØFB mm | MF mm | A mm | ØBA mm |
|--------------|------|-------|--------|-------|------|--------|
| 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 |

| Cyl. bore Ø mm | Weight kg | Order code |
|----------------|-----------|-----------------|
| 32 | 0,09 | P1E-6KB0 |
| 40 | 0,13 | P1E-6LB0 |
| 50 | 0,17 | P1E-6MB0 |
| 63 | 0,36 | P1E-6NB0 |
| 80 | 0,46 | P1E-6PB0 |
| 100 | 0,83 | P1E-6QB0 |



Pivot bracket for MT4

Intended for use together with centre trunnion MT4.

Material:
Pivot bracket: Aluminium
Bearing: Composite

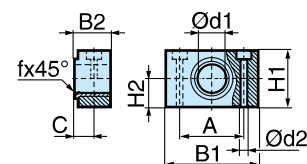
Supplied in pairs.



According to ISO, VDMA 24 562, AFNOR

| Cyl. bore mm | B1 mm | B2 mm | A mm | C mm | d1 mm | d2 H13 mm | H1 mm | H2 mm | fx45° min mm |
|--------------|-------|-------|------|------|-------|-----------|-------|-------|--------------|
| 32 | 55 | 20 | 36 | 10,5 | 12 | 8,4 | 26 | 13 | 1,0 |
| 40 | 55 | 20 | 36 | 12,0 | 16 | 8,4 | 26 | 13 | 1,6 |
| 50 | 55 | 20 | 36 | 12,0 | 16 | 8,4 | 26 | 13 | 1,6 |
| 63 | 65 | 25 | 42 | 13,0 | 20 | 10,5 | 30 | 15 | 1,6 |
| 80 | 65 | 25 | 42 | 13,0 | 20 | 10,5 | 30 | 15 | 1,6 |
| 100 | 75 | 28 | 50 | 16,0 | 25 | 13,0 | 40 | 20 | 2,0 |
| 125 | 75 | 28 | 50 | 16,0 | 25 | 13,0 | 40 | 20 | 2,0 |

| Cyl. bore Ø mm | Weight kg | Order code |
|----------------|-----------|----------------|
| 32 | 0,06 | PD23381 |
| 40 | 0,06 | PD23382 |
| 50 | 0,06 | PD23382 |
| 63 | 0,10 | PD23383 |
| 80 | 0,10 | PD23383 |
| 100 | 0,175 | PD23384 |
| 125 | 0,175 | PD23384 |



Centre trunnion MT4



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

Material:

Trunnion: Zinc plated steel

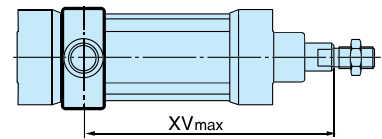
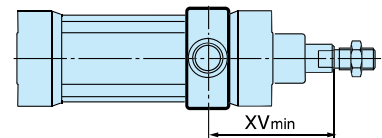
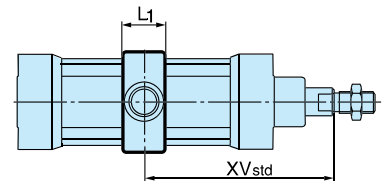
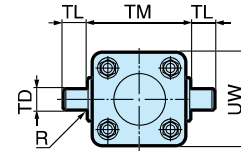
Trunnion centred

The central trunnion for the P1D-B is ordered with letter D in position 17 (no dimension specified in positions 18-20). e.g. P1D-B100MS-0500NDNNN

Trunnion with optional location

The central trunnion for the P1D-B is ordered with letter G in position 17 and desired XV-measure (3-digit measure in mm) in positions 18-20. e.g. P1D-B100MS-0500NG300
Material: nodular graphite cast iron, passivated steel

| Cyl. bore Ø mm | Weight kg | Order code |
|-------------------|--------------|--------------------------------|
| 32 | 0,13 | See order key on page 9 |
| 40 | 0,31 | |
| 50 | 0,37 | |
| 63 | 0,69 | |
| 80 | 0,89 | |
| 100 | 1,58 | |
| 125 | 2,60 | |



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 | 52 | 18 | 73,0 | 89 | 57 |
| 40 | 63 | 16 | 16 | 1,6 | 59 | 20 | 82,5 | 95 | 70 |
| 50 | 75 | 16 | 16 | 1,6 | 71 | 20 | 90,0 | 113 | 67 |
| 63 | 90 | 20 | 20 | 1,6 | 84 | 26 | 97,5 | 118 | 78 |
| 80 | 110 | 20 | 20 | 1,6 | 105 | 26 | 110,0 | 132 | 88 |
| 100 | 132 | 25 | 25 | 2,0 | 129 | 32 | 120,0 | 140 | 100 |
| 125 | 160 | 25 | 25 | 2,0 | 159 | 33 | 145,0 | 168 | 122 |

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

Cylinder mountings

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. Individual trunnions have order code as shown to the right.

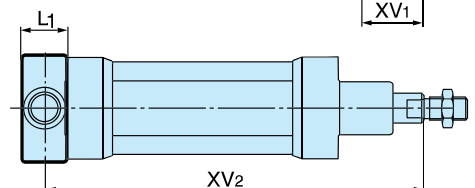
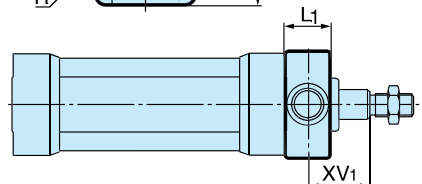
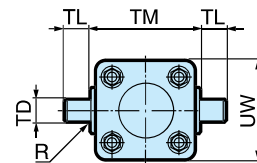
Material:

Trunnion: zinc plated steel

Screws: zinc plated steel, 8.8

Delivered complete with mounting screws for attachment to the cylinder

| Cyl. bore Ø mm | Weight kg | Order code |
|-------------------|--------------|------------------|
| 32 | 0,17 | P1D-4KMYF |
| 40 | 0,43 | P1D-4LMYF |
| 50 | 0,55 | P1D-4MMYF |
| 63 | 1,10 | P1D-4NMYF |
| 80 | 1,66 | P1D-4PMYF |
| 100 | 3,00 | 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 | Y mm |
|-----------------|-----------------|-----------------|----------------|---------|----------|----------|-----------------------|---------|---------|
| 32 | 50 | 12 | 12 | 1,0 | 46 | 14 | 19,5 | 126,5 | 11 |
| 40 | 63 | 16 | 16 | 1,6 | 59 | 19 | 21,0 | 144,0 | 14 |
| 50 | 75 | 16 | 16 | 1,6 | 69 | 19 | 28,0 | 152,0 | 20 |
| 63 | 90 | 20 | 20 | 1,6 | 84 | 24 | 25,5 | 169,5 | 20 |
| 80 | 110 | 20 | 20 | 1,6 | 102 | 24 | 34,5 | 185,5 | 26 |
| 100 | 132 | 25 | 25 | 2,0 | 125 | 29 | 37,0 | 203,0 | 31 |

Piston rod mountings

Swivel rod eye

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

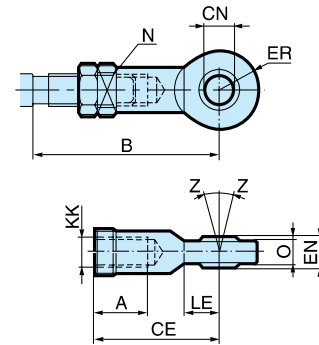
Material:
Swivel rod eye: Zinc-plated steel
Swivel bearing according to DIN 648K: Hardened steel



| Cyl. bore Ø mm | Weight kg | Order code |
|-------------------|--------------|-----------------|
| 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 |

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 mm | 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.

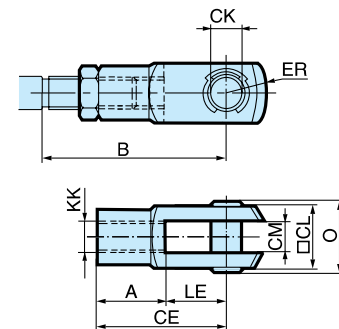
Material:
Clevis, clip: Galvanized steel
Pin: Hardened steel



| Cyl. bore Ø mm | Weight kg | Order code |
|-------------------|--------------|-----------------|
| 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 |

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 mm | 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 |



Piston rod mountings

Flexo coupling



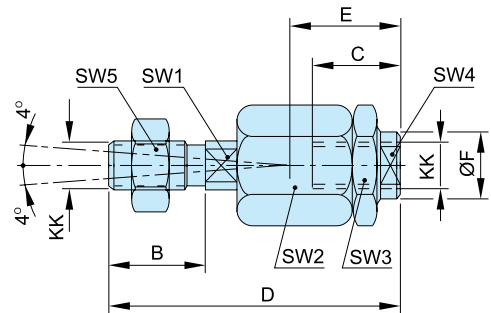
Flexo coupling for articulated mounting of piston rod. Flexo fitting is intended to take up axial angle errors within a range of $\pm 4^\circ$.

Material
Flexo coupling, nut: Zinc-plated steel

Supplied complete with galvanized adjustment nut.

| Cyl. bore Ø mm | Weight kg | Order code |
|-------------------|--------------|---------------|
| 32 | 0,23 | KY1129 |
| 40 | 0,23 | KY1131 |
| 50 | 0,65 | KY1133 |
| 63 | 0,65 | KY1133 |
| 80 | 0,71 | KY1134 |
| 100 | 0,71 | KY1134 |
| 125 | 1,60 | KC5036 |

| Cyl. bore mm | KK mm | B mm | C mm | D mm | E mm | OF mm | SW1 mm | SW2 mm | SW3 mm | SW4 mm | SW5 mm |
|-----------------|----------|---------|---------|---------|---------|----------|-----------|-----------|-----------|-----------|-----------|
| 32 | M10x1.25 | 20 | 23 | 73 | 31 | 21 | 12 | 30 | 30 | 19 | 17 |
| 40 | M12x1.25 | 24 | 23 | 77 | 31 | 21 | 12 | 30 | 30 | 19 | 19 |
| 50 | M16x1.5 | 32 | 32 | 108 | 45 | 33,5 | 19 | 41 | 41 | 30 | 24 |
| 63 | M16x1.5 | 32 | 32 | 108 | 45 | 33,5 | 19 | 41 | 41 | 30 | 24 |
| 80 | M20x1.5 | 40 | 42 | 122 | 56 | 33,5 | 19 | 41 | 41 | 30 | 30 |
| 100 | M20x1.5 | 40 | 42 | 122 | 56 | 33,5 | 19 | 41 | 41 | 30 | 30 |
| 125 | M27x2 | 54 | 48 | 147 | 51 | 39 | 24 | 55 | 55 | 32 | 41 |



Nut



Intended for fixed mounting of accessories to the piston rod.
Material: Zinc-plated steel
Supplied as pack of 10 off

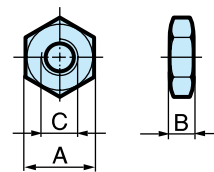
All P1D cylinders are delivered with a zinc-plated steel piston rod nut.

| Cyl. bore Ø mm | Weight* kg | Order code |
|-------------------|---------------|------------------|
| 32 | 0,007 | P14-4KRPZ |
| 40 | 0,010 | P14-4LRPZ |
| 50 | 0,021 | P14-4MRPZ |
| 63 | 0,021 | P14-4MRPZ |
| 80 | 0,040 | P14-4PRPZ |
| 100 | 0,040 | P14-4PRPZ |
| 125 | 0,100 | P14-4RRPZ |

* Weight per item

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 |



New drop-in sensors

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



Electronic sensors

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

Technical data

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

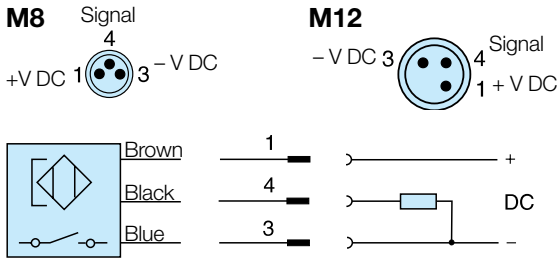
Reed sensors

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

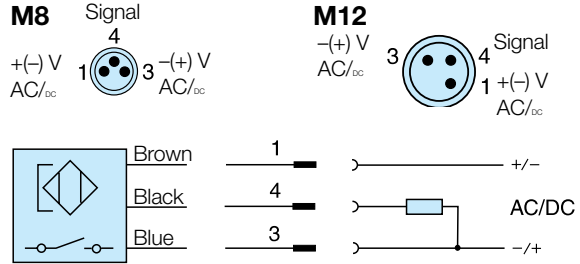
Technical data

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

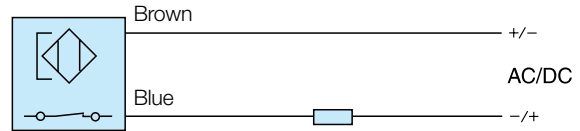
Electronic sensors



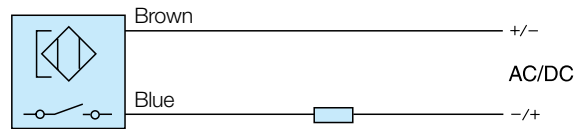
Reed sensors



P8S-GCFPX

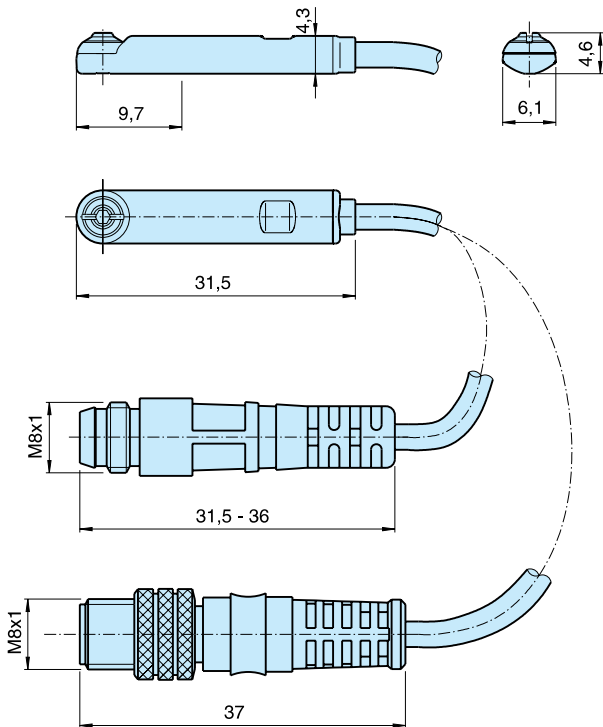


P8S-GRFLX / P8S-GRFLX2

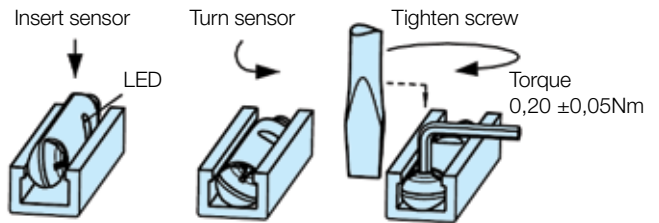


Dimensions

Sensors



Sensor Installation



Ordering data

| Output/function | Cable/connector | Weight kg | Order code |
|--|--|--------------|-------------------|
| Electronic sensors , 10-30 V DC | | | |
| PNP type, normally open | 0,27 m PUR-cable and 8 mm snap-in male connector | 0,007 | P8S-GPSHX |
| PNP type, normally open | 0,27 m PUR-cable and M12 screw male connector | 0,015 | P8S-GPMHX |
| PNP type, normally open | 3 m PVC-cable without connector | 0,030 | P8S-GPFLX |
| PNP type, normally open | 10 m PVC-cable without connector | 0,110 | P8S-GPFTX |
| Reed sensors , 10-30 V AC/DC | | | |
| Normally open | 0,27 m PUR-cable and 8 mm snap-in male connector | 0,007 | P8S-GSSHX |
| Normally open | 0,27 m PUR-cable and M12 screw male connector | 0,015 | P8S-GSMHX |
| Normally open | 3 m PVC-cable without connector | 0,030 | P8S-GSFLX |
| Normally open | 10 m PVC-cable without connector | 0,110 | P8S-GSFTX |
| Normally closed | 5m PVC-cable without connector ⁽¹⁾ | 0,050 | P8S-GCFPX |
| Reed sensors, 10-120 V AC/DC | | | |
| Normally open | 3 m PVC-cable without connector | 0,030 | P8S-GRFLX |
| Reed sensorer, 24-230 V AC/DC | | | |
| Normally open | 3 m PVC-cable without connector | 0,030 | P8S-GRFLX2 |

1) Without LED

Connecting cables with one connector

The cables have an integral snap-in female connector.



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

Male connectors for connecting cables

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



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

P1D-B Pneumatic ISO Cylinders

P1D-B Seal kits

Complete seal kits consisting of:

- Piston seals
- Cushioning seals
- Piston rod seal
- O-rings
- Scraper ring

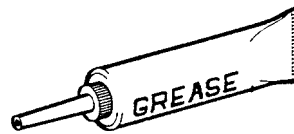
Material specification, see page 5



Order codes

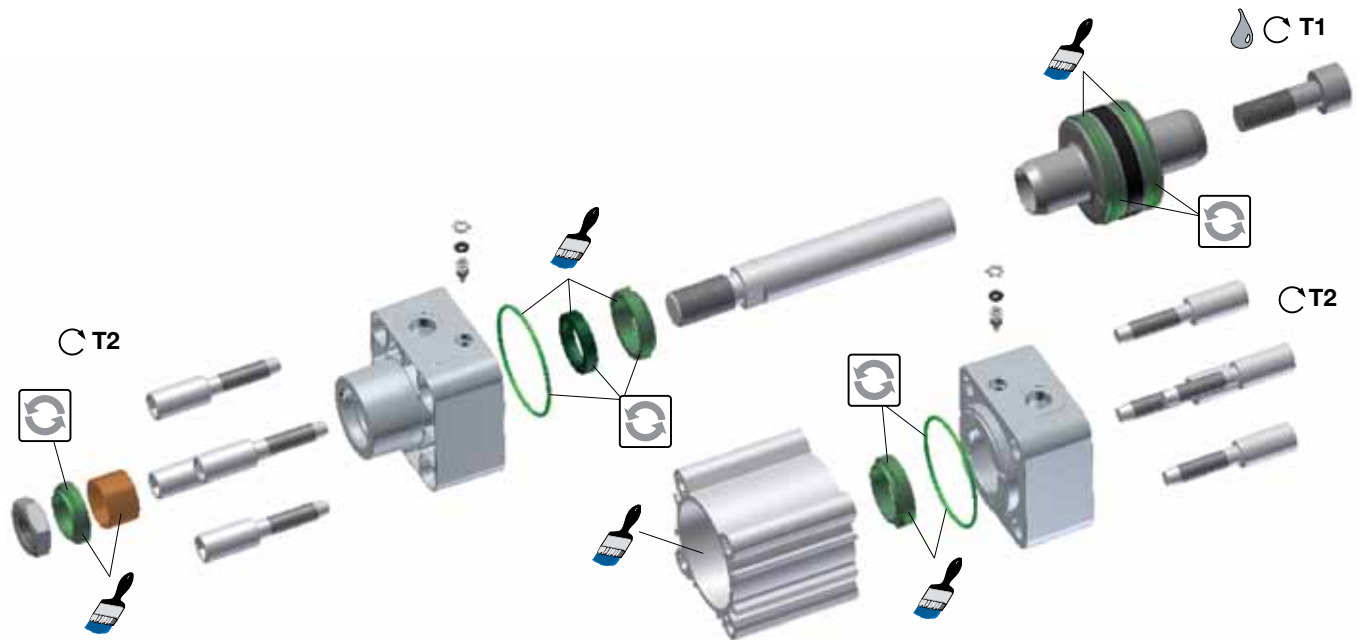
| Cyl.bore mm | P1D cylinder version | |
|----------------|----------------------|------------------|
| | Standard | P1D-B |
| 32 | | P1D-6KRNB |
| 40 | | P1D-6LRNB |
| 50 | | P1D-6MRNB |
| 63 | | P1D-6NRNB |
| 80 | | P1D-6PRNB |
| 100 | | P1D-6QRNB |
| 125 | | P1D-6RRNB |

Order codes



| | | |
|----------|-----|-------------------|
| Standard | 30g | 9127394541 |
|----------|-----|-------------------|

Seal kit



= Included in seal kit

= Lubricated with grease

= Socket head

= Locking fluid

= Tightening torque

Loctite 270 or Loctite 2701 locking fluid must be used

| Cyl.-dia mm | Plastic piston T1 Nm | NV mm | T2 Nm | NV mm |
|----------------|----------------------------|----------|----------|----------|
| 32 | 4,5 | 6 | 8 | 6 |
| 40 | 11 | 8 | 8 | 6 |
| 50 | 20 | 10 | 20 | 8 |
| 63 | 20 | 10 | 20 | 8 |
| 80 | 40 | 14 | 20 | 6 |
| 100 | 120 | 14 | 20 | 6 |
| 125 | 120 | 14 | 70 | 8 |

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

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

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

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

Specifying air purity in accordance with ISO8573-1:2010

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

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

ISO 8573-1:2010 Class 1.2.1

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

Class 1 - Particulate

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

Class 2 - Water

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

Class 1 - Oil

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

ISO8573-1:2010 Class zero

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

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