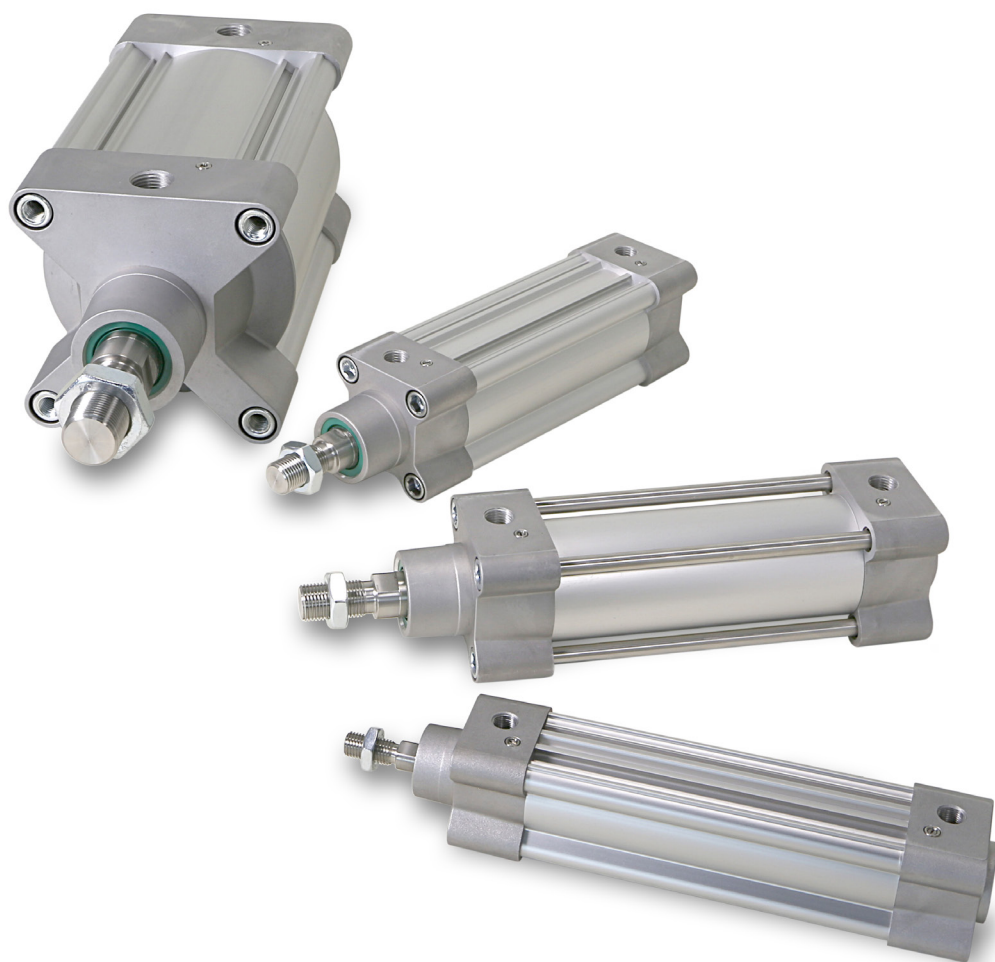
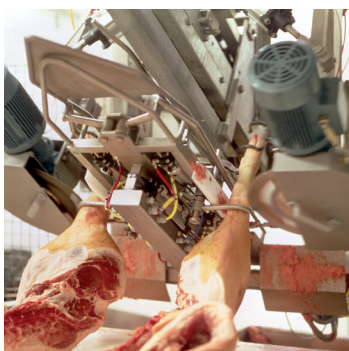




aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
**pneumatics**  
process control  
sealing & shielding



# Pneumatic Cylinders

Ø32 to Ø125 mm P1F Series

According to ISO 15552

Catalogue PDE3570TCEN



ENGINEERING YOUR SUCCESS.



**Important**

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



**Note**

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



**WARNING**

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

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## Standard Cylinders ISO 15552

### Global product range

The P1F Series meets the specifications of the ISO 15552 standard. This means full interchangeability to any cylinder anywhere around the globe.

The P1F will be available throughout the extensive worldwide Parker Hannifin organisation – for the benefit to you and your customers.



### Features

- Smooth profile or Tie-Rods design.
- Bore sizes 32 - 125 mm.
- Stroke up to 2500 mm.
- Corrosion resistant design.
- Stainless steel piston rod.
- Polyurethane seal technology.
- Stainless steel cushioning screws on same side.
- New adjustable pneumatic and mechanical cushioning system reduces noise.
- Full range of mountings.
- Full range of drop-in' sensors.

## Design Variants

### Smooth profile - P1F-S, P1F-K

The P1F in bore sizes Ø32 to Ø125 mm is a smooth profile designed cylinder with a magnetic piston used for standard temperature range from -20°C to +80°C. Utilising internal composite technology to save weight and reduce impact kinetic energy, while assuring the high performance and functionality expected for an ISO cylinder. Aluminium end covers, stainless steel piston rod guided with a PTFE coated steel bearing, pneumatic cushioning and polyurethane (PUR) seals as standard, this is our smooth profile industrial ISO cylinder.



### Smooth profile - P1F-A

Similar to the smooth profile version but in an ATEX variant and a restricted temperature range from -20°C to +60°C. Average speed up to 0.5 m/s and max. frequency 1Hz.

CE Ex II 2GD Ex h IIC T4 T=120°C GDb -20°C ≤ Ta ≤ +60°C

### Twin Rods smooth profile - P1F-R, P1F-Q

Similar to the smooth profile version but with Twin Rods for non-rotating applications like handling and packaging.



### Tie-Rods round profile - P1F-T, P1F-N

Similar to the smooth profile version but in a Tie-Rods design for heavy duty applications. Round tube is made in anodised aluminium; Tie-Rods in stainless steel as a standard.

Bore sizes Ø32 to Ø125 mm.

Large bore sizes Ø160 to Ø320 mm, see catalogue PDE2667TCEN.



### **Smooth profile with rod locks - P1F-L, P1F-H**

With an air/spring rod lock allowing the piston rod to be braked or locked in any position. Incorporating a powerful piston rod locking device, which clamps the piston rod and locks it in position in static, H version or in dynamic, L version. In the absence of an air signal pressure, full holding force is applied to the piston rod. Fully integrated in the front end cap for the L version, added as an accessories for the H version.

### **Air Reservoirs - P1F-P**

The air reservoirs are produced by a cylinder tube and two standard rear end plates and used, e.g. together with throttle valves to achieve a timer function in a pneumatic system. The delay of time will be varied by changing the throttle valve and by the size of the air reservoir. With a well functioning throttle valve and a suitable air reservoir it would be possible to achieve an accuracy of  $\pm 5\%$ . The reservoir is also used to equal pressure variants into system and to handling short extreme air consumptions without functional disorders. The air reservoirs could also be used together with check valves in order to retain a pressure which is essential for safety reasons.



## **Options**

### **High temperature**

All seals in the high temperature version of P1F are developed and validated for continuous operation up to  $+150^{\circ}\text{C}$ . The combination of the seal geometry and the FKM (fluoro elastomers) material ensures reliable and long service life. High temperature cylinders have no magnetic piston and cannot be fitted with sensors (the magnetic field strength in high temperatures is too low to ensure correct reliable sensor function).

### **Chemical resistance scraper**

For use in applications where chemicals may affect the scraper in the front end cover, an option with a scraper in FKM (fluoro elastomers) for better chemical resistance must be used. This sealing option is combined with both end covers having a specific anodisation to a better corrosion resistance and with stainless steel screws and piston rod nut.

### **Metallic scraper**

In environments where the piston rod may be coated with resin, ice, cement, sugar crystals, dough, etc., primarily in timber handling, refrigerated/chilled transport, cement industry, chemicals and food and drinks a metal scraper in combination with a hard-chromium plated piston rod is the right solution. Available for low temperature range applications from  $-30^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$ .

### **Low temperature**

All seals in the low temperature version of P1F are developed and validated for continuous operation down to  $-40^{\circ}\text{C}$ . Ultrathin polyurethane TPU-PUR seal technology and specifically formulated grease support performance and reliability for low temperature applications. As standard supplied with a magnetic ring in the piston for proximity sensing.

### **Dry running scraper**

In many applications, primarily in the foodstuffs industry, the cylinders are cleaned frequently. This means that the film of grease on the piston rod is washed off, which puts special demands on the material with an FDA conformity and on the design of the piston wiper / rod itself. This sealing option is combined with both end covers having a specific anodisation to a better corrosion resistance and with the stainless steel screws and piston rod nut. Suitable for non food area EN1672-2.

### **Stainless steel screws and anodised end caps**

Piston rod nut and end covers fixing screws are made in stainless steel, piston rod bushing in a high polymer and end covers are anodised for a better corrosion resistance and use for applications where humidity is constant and when cylinders are frequently cleaned by chemical agents. Only available for chemical resistance and dry running scraper options.

## Technical Data

### Cylinder forces

| Bore/piston rod [mm] | Stroke | Surface area [cm <sup>2</sup> ] | Max theoretical force in N in relation to applied pressure in bar |      |      |      |      |             |      |      |       |       |
|----------------------|--------|---------------------------------|---|------|------|------|------|-------------|------|------|-------|-------|
|                      |        |                                 | 1   | 2    | 3    | 4    | 5    | 6           | 7    | 8    | 9     | 10    |
| 32/12                | +      | 8.0                             | 80  | 161  | 241  | 322  | 402  | <b>483</b>  | 563  | 643  | 724   | 804   |
|                      | -      | 6.9                             | 69  | 138  | 207  | 276  | 346  | <b>415</b>  | 484  | 553  | 622   | 691   |
| 40/16                | +      | 12.6                            | 126   | 251  | 377  | 503  | 628  | <b>754</b>  | 880  | 1005 | 1131  | 1257  |
|                      | -      | 10.6                            | 106   | 211  | 317  | 422  | 528  | <b>633</b>  | 739  | 844  | 950   | 1056  |
| 50/20                | +      | 19.6                            | 196   | 393  | 589  | 785  | 982  | <b>1178</b> | 1374 | 1571 | 1767  | 1964  |
|                      | -      | 16.5                            | 165   | 330  | 495  | 660  | 825  | <b>990</b>  | 1155 | 1319 | 1484  | 1649  |
| 63/20                | +      | 31.2                            | 312   | 623  | 935  | 1247 | 1559 | <b>1870</b> | 2182 | 2494 | 2806  | 3117  |
|                      | -      | 28.0                            | 280   | 561  | 841  | 1121 | 1402 | <b>1682</b> | 1962 | 2242 | 2523  | 2803  |
| 80/25                | +      | 50.3                            | 503   | 1005 | 1508 | 2011 | 2513 | <b>3016</b> | 3519 | 4021 | 4524  | 5027  |
|                      | -      | 45.4                            | 454   | 907  | 1361 | 1814 | 2268 | <b>2721</b> | 3175 | 3629 | 4082  | 4536  |
| 100/25               | +      | 78.5                            | 785   | 1571 | 2356 | 3142 | 3927 | <b>4712</b> | 5498 | 6283 | 7069  | 7854  |
|                      | -      | 73.6                            | 736   | 1473 | 2209 | 2945 | 3682 | <b>4418</b> | 5154 | 5891 | 6627  | 7363  |
| 125/32               | +      | 122.7                           | 1227  | 2454 | 3682 | 4909 | 6136 | <b>7363</b> | 8590 | 9818 | 11045 | 12272 |
|                      | -      | 114.7                           | 1147  | 2294 | 3440 | 4587 | 5734 | <b>6881</b> | 8027 | 9174 | 10321 | 11468 |

+ = outward stroke  
- = return stroke

### Cylinder air consumption

| Bore/piston rod [mm] | Stroke | Surface area [cm <sup>2</sup> ] | Air consumption in l/mm in relation to applied pressure in bar |       |       |       |       |              |       |       |       |       |
|----------------------|--------|---------------------------------|--|-------|-------|-------|-------|--------------|-------|-------|-------|-------|
|                      |        |                                 | 1  | 2     | 3     | 4     | 5     | 6            | 7     | 8     | 9     | 10    |
| 32/12<br>(G1/8)      | +      | 8.0                             | 0.016  | 0.024 | 0.032 | 0.040 | 0.048 | <b>0.056</b> | 0.064 | 0.072 | 0.079 | 0.087 |
|                      | -      | 6.9                             | 0.014  | 0.021 | 0.027 | 0.034 | 0.041 | <b>0.048</b> | 0.055 | 0.061 | 0.068 | 0.075 |
| 40/16<br>(G1/4)      | +      | 12.6                            | 0.025  | 0.037 | 0.050 | 0.062 | 0.075 | <b>0.087</b> | 0.099 | 0.112 | 0.124 | 0.137 |
|                      | -      | 10.6                            | 0.021  | 0.031 | 0.042 | 0.052 | 0.063 | <b>0.073</b> | 0.083 | 0.094 | 0.104 | 0.115 |
| 50/20<br>(G1/4)      | +      | 19.6                            | 0.039  | 0.058 | 0.078 | 0.097 | 0.117 | <b>0.136</b> | 0.155 | 0.175 | 0.194 | 0.213 |
|                      | -      | 16.5                            | 0.033  | 0.049 | 0.065 | 0.082 | 0.098 | <b>0.114</b> | 0.130 | 0.147 | 0.163 | 0.179 |
| 63/20<br>(G3/8)      | +      | 31.2                            | 0.062  | 0.093 | 0.123 | 0.154 | 0.185 | <b>0.216</b> | 0.247 | 0.277 | 0.308 | 0.339 |
|                      | -      | 28.0                            | 0.056  | 0.083 | 0.111 | 0.139 | 0.166 | <b>0.194</b> | 0.222 | 0.249 | 0.277 | 0.305 |
| 80/25<br>(G3/8)      | +      | 50.3                            | 0.100  | 0.150 | 0.199 | 0.249 | 0.298 | <b>0.348</b> | 0.398 | 0.447 | 0.497 | 0.546 |
|                      | -      | 45.4                            | 0.090  | 0.135 | 0.180 | 0.224 | 0.269 | <b>0.314</b> | 0.359 | 0.404 | 0.448 | 0.493 |
| 100/25<br>(G1/2)     | +      | 78.5                            | 0.156  | 0.234 | 0.311 | 0.389 | 0.466 | <b>0.544</b> | 0.621 | 0.699 | 0.776 | 0.854 |
|                      | -      | 73.6                            | 0.146  | 0.219 | 0.292 | 0.364 | 0.437 | <b>0.510</b> | 0.582 | 0.655 | 0.728 | 0.800 |
| 125/32<br>(G1/2)     | +      | 122.7                           | 0.244  | 0.365 | 0.486 | 0.607 | 0.728 | <b>0.850</b> | 0.971 | 1.092 | 1.213 | 1.334 |
|                      | -      | 114.7                           | 0.228  | 0.341 | 0.454 | 0.567 | 0.681 | <b>0.794</b> | 0.907 | 1.020 | 1.134 | 1.247 |

free air consumption for 1 cycle, 10 mm inward and 10 mm outward

+ = outward stroke  
- = return stroke

### Weight

| Cyl.-bore [mm] | P1F-S/A/L/H    |                 | P1F-T          |                 | Moving parts   |                 | Adder for rod lock |            |
|----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|--------------------|------------|
|                | Base 0 mm [kg] | per 100 mm [kg] | Base 0 mm [kg] | per 100 mm [kg] | Base 0 mm [kg] | per 100 mm [kg] | P1F-H [kg]         | P1F-L [kg] |
| Ø32            | 0.54           | 0.23            | 0.49           | 0.27            | 0.10           | 0.09            | 0.6                | 0.41       |
| Ø40            | 0.74           | 0.32            | 0.73           | 0.31            | 0.19           | 0.16            | 0.8                | 0.44       |
| Ø50            | 1.22           | 0.47            | 1.19           | 0.52            | 0.34           | 0.25            | 1.0                | 0.61       |
| Ø63            | 1.69           | 0.49            | 1.68           | 0.54            | 0.40           | 0.24            | 1.2                | 1.25       |
| Ø80            | 2.50           | 0.73            | 2.48           | 0.84            | 0.73           | 0.39            | 1.4                | 2.45       |
| Ø100           | 3.65           | 0.80            | 3.66           | 0.88            | 1.02           | 0.38            | 1.6                | 3.72       |
| Ø125           | 6.41           | 1.37            | 6.30           | 1.32            | 2.01           | 0.63            | 1.8                | 6.07       |

**PDE3570TCEN**  
**Pneumatic Cylinders ISO 15552**

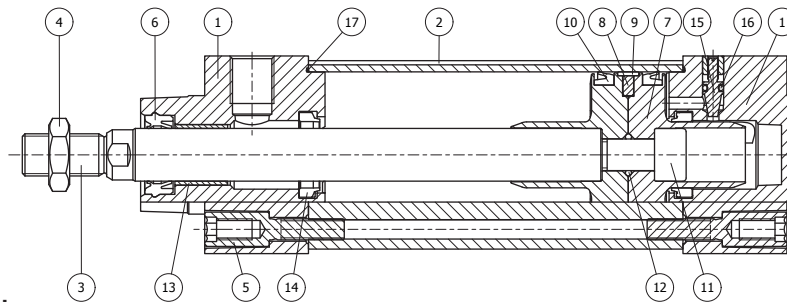
**Technical Data**

|                  |  |
|------------------|--|
| Product type     | Standard cylinder according to ISO 15552 |
| Bore size        | 32 - 125 mm                              |
| Stroke length    | 5 - 2500 mm                              |
| Versions         | Double acting                            |
| Cushioning       | Adjustable air cushioning                |
| Position sensing | Proximity sensor                         |
| Installation     | ISO cylinder and piston rod mountings    |



**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 3.4.3 should be used. This specifies a dew point of + 3°C for indoor operation (a lower dew point should be selected for minus temperature operation and we recommend the use of an inline dryer) and is in line with the air quality for most standard compressors with a standard filter. |                 |                                  |                |
| Operating pressure   | 1 to 10 bar  |                 |                                  |                |
| Ambient temperature  | Standard temperature (option M):   | -20°C to +80°C  | Metal scraper (option Q):        | -30°C to +80°C |
|                      | High temperature (option F):   | -10°C to +150°C | FKM wiper rod seal (option V):   | -10°C to +80°C |
|                      | Low temperature (option L):  | -40°C to + 80°C | POLON wiper rod seal (option D): | -20°C to +80°C |
| Pre-lubricated       | Further lubrication is normally not necessary. If additional lubrication is introduced it must be continued. Hydraulic oil type HLP (DIN 51524, ISO 11158). Viscosity by 40°C: 32 mm2/s (cst). Example: Shell Tellus 32 or equal.  |                 |                                  |                |
| Corrosion resistance | Material and surface treatment selected for typical industrial applications with resistance to corrosion and chemicals.  |                 |                                  |                |



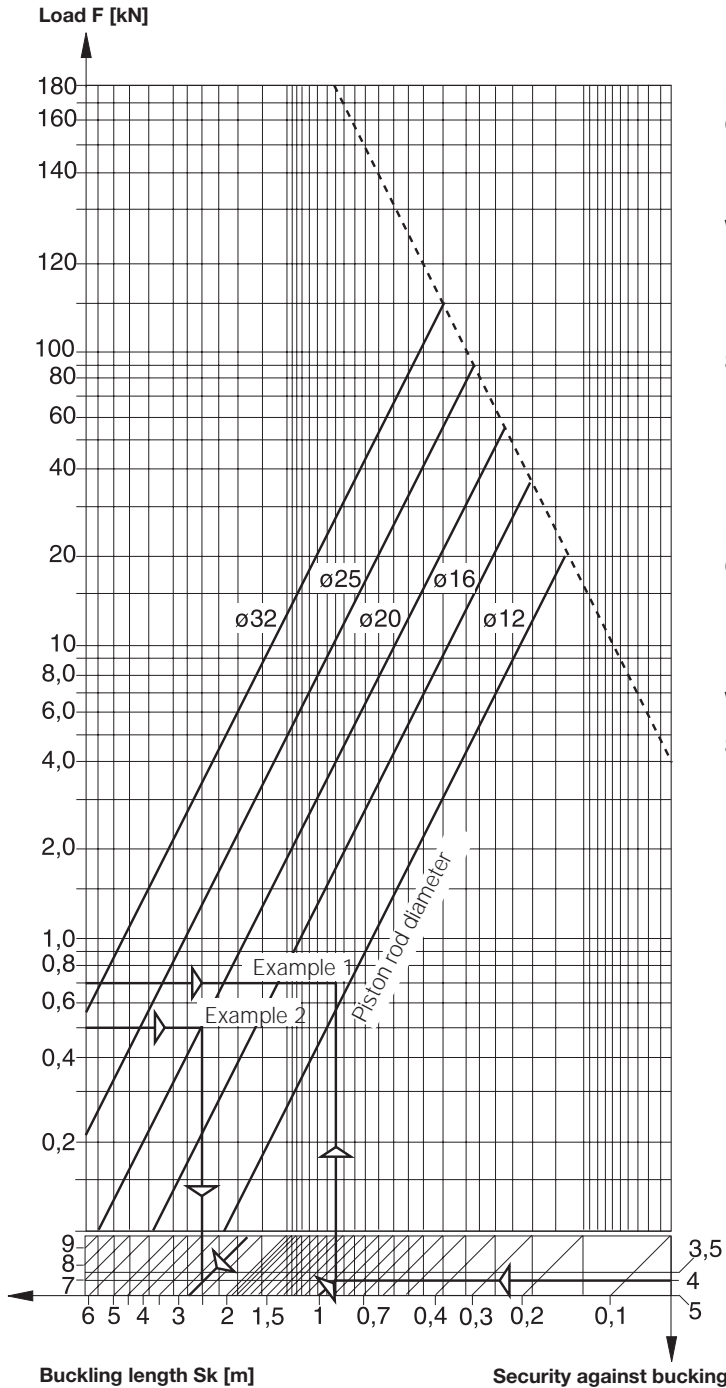
**Material specification**

| Pos | Part                    | Specification   |   |
|-----|-------------------------|---|---|
| 1   | End covers              | Aluminium / Optional black anodised (options V & D only)            |   |
| 2   | Cylinder barrel         | Anodised aluminium (profile or round tube)                          |   |
| 3   | Piston rod              | Standard  | Austenitic stainless steel, DIN X8 CrNiS 18-9   |
|     |                         | Optional  | Chromium plated steel DIN C45E  |
|     |                         | Optional  | Chromium plated stainless steel DIN X2 CrNiMoN 17-12-2, Acid proof  |
| 4   | Piston rod nut          | Zinc plated steel / Stainless steel (option V & D only)             |   |
| 5   | End cover screws        | Zinc plated steel / Stainless steel (option V & D only)             |   |
| 6   | Piston rod seal         | Standard  | Polyurethane (PUR)  |
|     |                         | Optional  | Fluoro elastomer (FKM) / Ultrathane polyurethane (TPU-PUR) / Metallic scraper (Brass) nitrile (NBR) / Polon / UHMW-PE |
| 7   | Piston                  | Standard  | Poloxymethylene (POM)   |
|     |                         | Optional  | Aluminium   |
| 8   | Magnet                  | Plastic coated magnetic material                                    |   |
| 9   | Piston bearing          | Standard  | Poloxymethylene (POM)   |
|     |                         | Optional  | Polytetrafluoroethylene (PTFE), for aluminium piston  |
| 10  | Piston seals            | Standard  | Polyurethane (PUR)  |
|     |                         | Optional  | Fluoro elastomer (FKM) / Ultrathane polyurethane (TPU-PUR)  |
| 11  | Piston bolt             | Zinc plated steel   |   |
| 12  | O-ring piston bolt      | Standard  | Nitrile rubber (NBR)  |
|     |                         | Optional  | Fluoro elastomer (FKM)  |
| 13  | Piston rod bearing      | Multilayer Steel / PTFE / Optional high polymer (option V & D only) |   |
| 14  | Cushioning seals        | Standard  | Polyurethane (PUR)  |
|     |                         | Optional  | Fluoro elastomer (FKM) / Ultrathane polyurethane (TPU-PUR)  |
| 15  | Cushioning screw        | Stainless steel DIN X8 CrNiS 18-9                                   |   |
| 16  | O-ring cushioning screw | Standard  | Nitrile rubber (NBR)  |
|     |                         | Optional  | Fluoro elastomer (FKM)  |
| 17  | O-ring end cover        | Standard  | Nitrile rubber (NBR)  |
|     |                         | Optional  | Fluoro elastomer (FKM)  |
|     | Tie-Rods                | Austenitic stainless steel, DIN X8 CrNiS 18-9                       |   |
|     | Tie-Rods nut            | Zinc plated steel   |   |

**Piston rod load diagram**

The piston rod diameter has to be determined to prevent the rod from buckling. Always take the maximum piston thrust force achievable at the specified operating pressure with the cylinder in question.

Loads resulting from longer strokes (as indicated in the diagram) on request. In case of special mounting conditions and transverse forces please consult. Recommended security factor against buckling: 3,5 to 5.



**Example 1:**

Given Piston thrust: 0.7 kN  
 Stroke length: 1000 mm  
 Operating pressure: approx. 6 bar

Wanted Piston rod diameter with 4-fold security against buckling;  
 Check the piston thrust of the cylinder diameter resulting from the piston rod diameter.

Solution see example 1 in piston rod load diagram.  
 The piston rod diameter lies between 12 and 16 mm - a cylinder with a piston rod of 16 mm diameter therefore has to be chosen.

**Example 2:**

Given Cylinder:  $\phi 50$  mm  
 Piston rod:  $\phi 20$  mm  
 Stroke length: 1000 mm  
 Piston thrust: 0.5 kN at 6 bar

Wanted max. stroke with 4-fold security against buckling

Solution see example 2 in piston rod load diagram.  
 $Sk = 2900$  mm  
 max. stroke = 1450 mm

**Buckling Possibilities of Piston Rods**





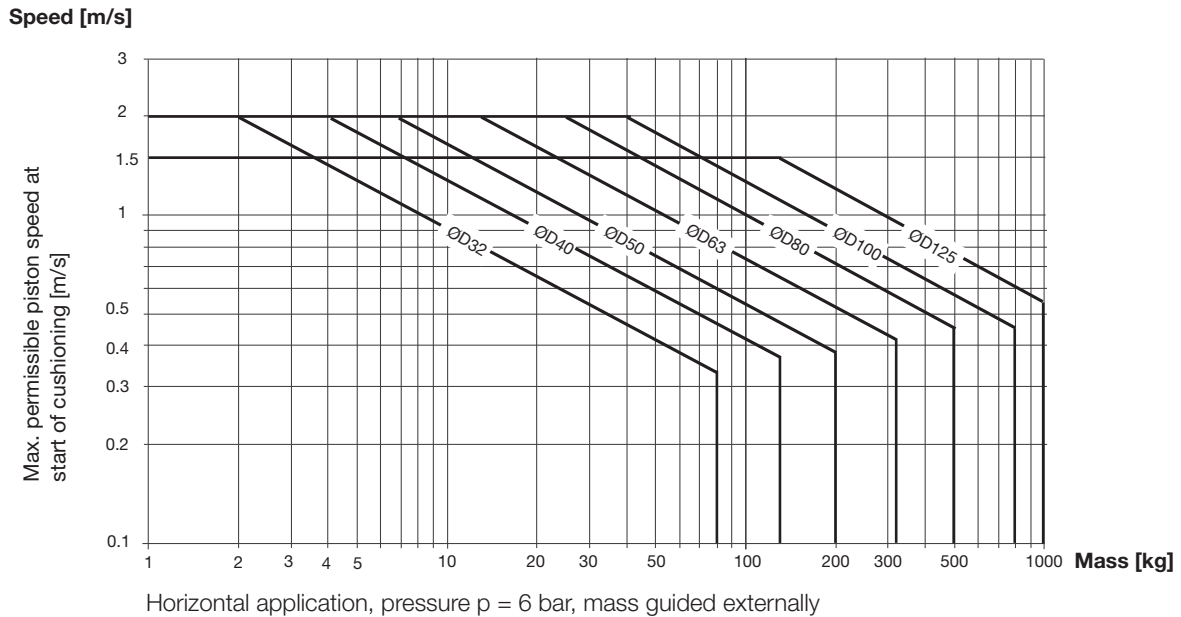
**Cushioning Characteristics**

Air cushion is used to absorb kinetic energy due to load and speed at both end of stroke. This typically consists of a threaded needle screw that adjusts into an orifice in the cylinder end plate. By adjusting the screw further into the orifice you lessen the amount of air that can escape in a given time. Slowing the exhaust of air creates back pressure which slows the piston as it enters into the end cushioning seal.

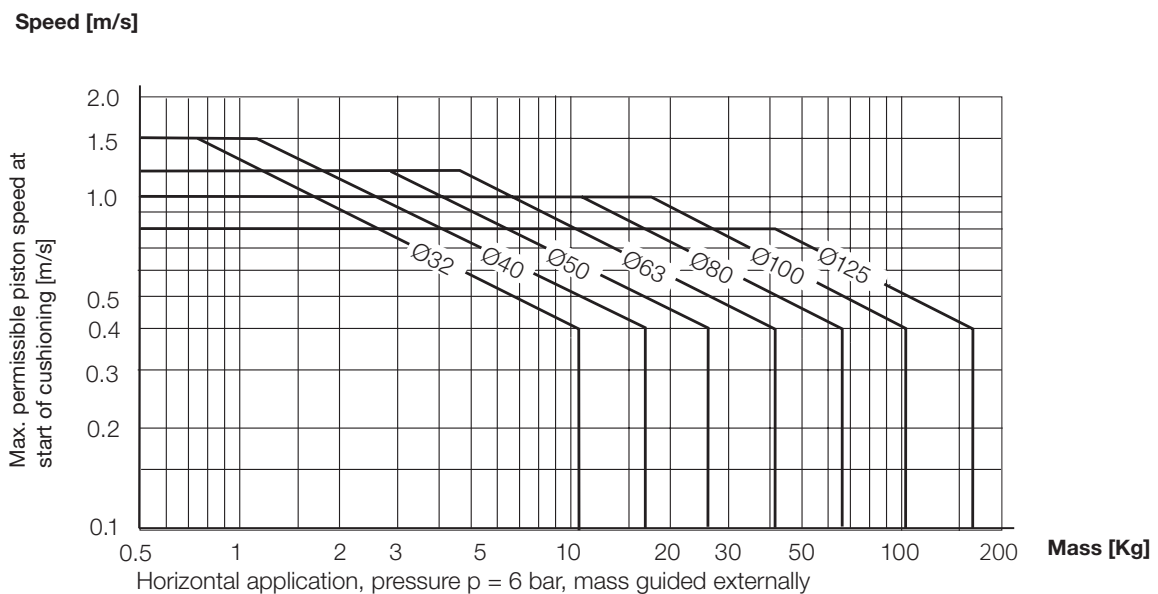
**Cushioning Diagram**

Work out your expected moving mass and read off the maximum permissible speed at start of cushioning. Alternatively, take your desired speed and expected mass and find the cylinder size required. Please note that piston speed at start of cushioning is typically approx. 50 % higher than the average speed, and that it is this higher speed which determines the choice of cylinder.

The mass is the sum of internal and external friction, plus any gravitational forces.



**Cushioning Diagram for Cylinders with rod locks**



## Rod Locks

**Function on pressure loss** | The piston rod lock can be used in all material handling systems where controlled fastening or positioning is required. Additional measures are required for use in safety-related applications (refer to EC Machinery Directive).

The piston rod cylinder with brakes is suitable for use in safety-related sections of control systems. The piston rod lock is also suitable for use as a pressure-loss brake for cylinders with suspended loads. Piston rod can be held in position for long periods even with alternating loads, fluctuating operating pressure or leaks in the system. The signal air to the lock unit can be connected directly to the air system or to the supply air for the valve controlling the cylinder. For controlled on/off operation of the rod lock unit, a separate valve, with large exhaust flow capacity, must be used.

**Clean and compact design** | The front end piece and rod lock unit for the P1F-L variant form an integrated block, keeping the length of the cylinder as short as possible. The design is easy to clean, sealed and waterproof. The exhaust air from the

lock unit can be removed by replacing the filter unit with a fitting and hose. This is an advantage in terms of cleaning or when environmental factors are important.

**Use as a brake** | The graph on page 9 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.

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 too. The static locking force corresponds to 7 bar pressure. Under certain circumstances, the rod lock can also be used as a brake for positioning or similar applications. The maximum values set out in the cushioning graph must not be exceeded.

### Static lock forces

| Cylinder bore [mm] | [N] P1F-L | [N] P1F-H |
|--------------------|-----------|-----------|
| Ø32                | 550       | 600       |
| Ø40                | 860       | 1000      |
| Ø50                | 1345      | 1500      |
| Ø63                | 2140      | 2200      |
| Ø80                | 3450      | 3000      |
| Ø100               | 5390      | 5000      |
| Ø125               | 8425      | 7500      |

### Technical data

|                                  |                             |                             |
|----------------------------------|-----------------------------|-----------------------------|
| Working pressure:                | Max 10 bar                  | Max 10 bar                  |
| Working media:                   | Dry filtered compressed air | Dry filtered compressed air |
| Working temperature:             | -20 to +80°C                | -20 to +80°C                |
| Release pressure <sup>1)</sup> : | Min 4 bar +/- 10%           | > 4 bar                     |

<sup>1)</sup> Signal pressure to inlet port of lock unit

### Material specification, piston rod locking

|                      | P1F-L                   | P1F-H              |
|----------------------|-------------------------|--------------------|
| Housing              | Anodised aluminium      | Anodised aluminium |
| Carriage             | -                       | Anodised aluminium |
| Lock collars         | Hardened steel          | Brass              |
| Springs              | Stainless steel         | Stainless steel    |
| Rod seal Ø 32-40 mm  | UHMWPE plastic          | -                  |
| Rod seal Ø 50-125 mm | Polyurethane PUR        | -                  |
| O Rings              | Nitrile rubber NBR      | -                  |
| Scraper ring         | Polyurethane PUR        | Polyurethane PUR   |
| Air filter           | Brass / Sintered bronze | -                  |

#### Note!

If a rod guidance module is to be fitted to the brake and the cylinder, as the piston rod extension (WH dimension) for P1F-L is not in accordance with the ISO standard, the piston rod must be extended to provide the same WH dimension as for the cylinder itself. Cylinder piston rod material must be made in chromium plated steel.

**Separate Rod Locking Device**

The cylinder needs to have an extended piston rod.  
 Cylinder piston rod material must be made in chromium plated steel.

| Cyl.-bore<br>[mm] | Rod<br>[mm] | Rod extension<br>[mm] | Weight<br>[kg] | Order Code    |
|-------------------|-------------|-----------------------|----------------|---------------|
| Ø32               | 12          | 48                    | 0.60           | <b>KC8227</b> |
| Ø40               | 16          | 55                    | 0.80           | <b>KC8228</b> |
| Ø50               | 20          | 70                    | 1.00           | <b>KC8229</b> |
| Ø63               | 20          | 70                    | 1.20           | <b>KC8230</b> |
| Ø80               | 25          | 90                    | 1.40           | <b>KC8231</b> |
| Ø100              | 25          | 92                    | 1.60           | <b>KC8232</b> |
| Ø125              | 32          | 122                   | 1.80           | <b>KC8233</b> |



**Functioning:**

The holding force relates to a static load. If this load is exceeded, slippage can occur. Any dynamic forces occurring in operation must not exceed the static holding force. In clamped operating mode, if the load is fluctuating, the clamping unit is not free from play. The cylinder is not suitable for positioning tasks.

**Important:**

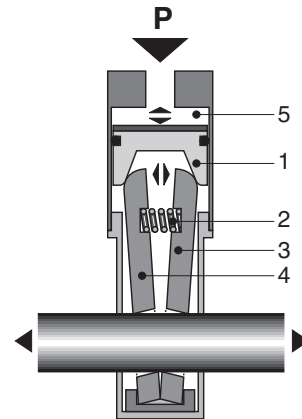
- The locking unit can only be mounted on the cylinder if it is held in its unlocked position either by air pressure or by a suitable screw.
- When the cylinder piston rod is locked it must not be rotated or subjected to external force.

**Actuation:**

The clamping unit must only be released when both cylinder chambers are pressurised, otherwise there is danger of an accident from the irregular movement of the piston rod. Shutting off the compressed air supply at both ends with a 5/3 ways valve provides adequate safety only for a short time.

**Pneumatic circuit:**

The design of safe pneumatic circuits begins with a careful risk assessment. The process involves designers of all systems within a machine and/or process from mechanical to electrical. The first step is to look at the project and identify any potential hazards and risks for injury. The next step is to do a risk estimate and evaluation of each hazard. The designers can then develop the appropriate preventive measures to minimize the risk to acceptable levels. The standard developed within ISO 13849 outlines the process by which machine builders can develop their own standard for meeting the guidelines with the goal of making machines as safe as possible. The standard addresses the control of a machine and not the actual moving components (i.e. cylinders, actuators). Pneumatic circuits are usually only one part of a machine that could pose potential hazards.



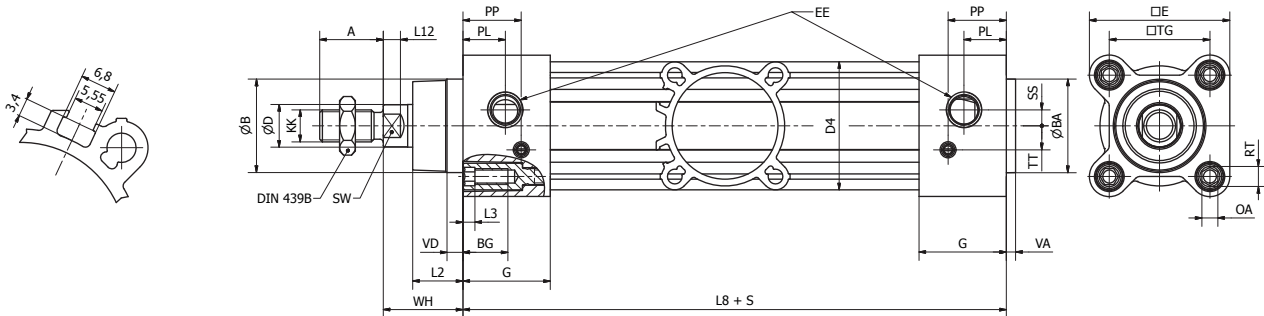
**Function:**

If the pressure drops the piston rod is locked by two tilting plates. When the piston (1) is put under pressure it is pushed downwards, pressing the two tilting plates (3) and (4) together. The piston rod is then free to move. If the pressure drops in piston chamber (5), a spring pushes the two plates (3) and (4) apart, so that the wedge effect pushes the piston (1) upwards and the tilting plates lock the piston rod.

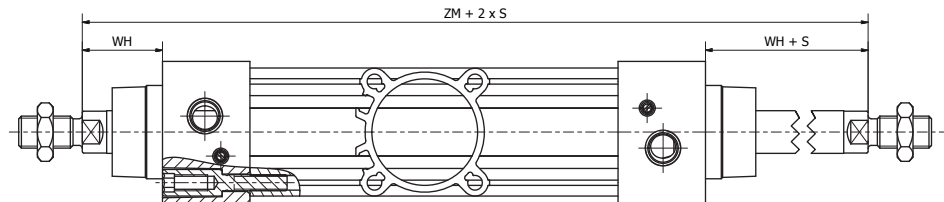
Dimensions

Smooth profile design

P1F-S / P1F-A

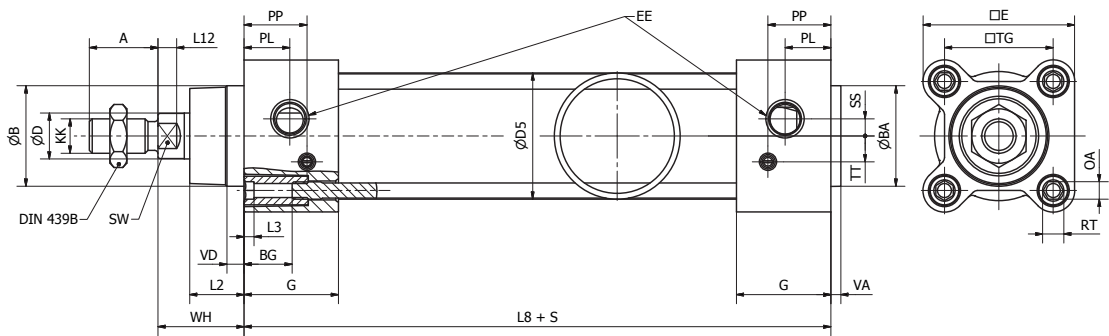


P1F-K

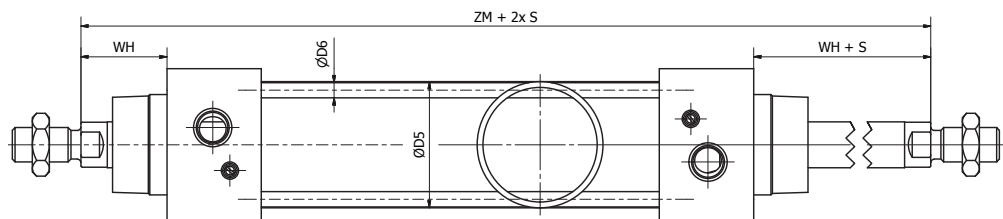


Tie-Rods with round profile design

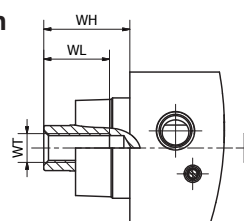
P1F-T



P1F-N



Female piston rod option



## Dimensions

### Dimensions [mm]

| Cyl.-bore<br>[mm] | A  | ØB<br>d11 | ØBA<br>d11 | BG   | ØD | D4   | ØD5 | ØD6  | E    | EE   | G    | KK       | L2   | L3  | L8  |
|-------------------|----|-----------|------------|------|----|------|-----|------|------|------|------|----------|------|-----|-----|
| Ø32               | 22 | 30        | 30         | 17   | 12 | 42.5 | 35  | 5.3  | 47   | G1/8 | 28.4 | M10x1.25 | 16.8 | 4.5 | 94  |
| Ø40               | 24 | 35        | 35         | 17   | 16 | 48   | 43  | 5.3  | 53   | G1/4 | 33   | M12x1.25 | 19   | 4.5 | 105 |
| Ø50               | 32 | 40        | 40         | 18   | 20 | 59.5 | 54  | 7.1  | 64.5 | G1/4 | 33.4 | M16x1.5  | 27.6 | 4.5 | 106 |
| Ø63               | 32 | 45        | 45         | 18   | 20 | 69.5 | 67  | 7.1  | 75   | G3/8 | 39.4 | M16x1.5  | 24.3 | 4.5 | 121 |
| Ø80               | 40 | 45        | 45         | 19.5 | 25 | 86   | 85  | 8.9  | 94   | G3/8 | 39.4 | M20x1.5  | 30.1 | 5.5 | 128 |
| Ø100              | 40 | 55        | 55         | 19.5 | 25 | 103  | 105 | 8.9  | 111  | G1/2 | 44.3 | M20x1.5  | 34   | 5.5 | 138 |
| Ø125              | 54 | 60        | 60         | 20   | 32 | 130  | 130 | 10.8 | 136  | G1/2 | 50.8 | M27x2    | 45   | 0   | 160 |

| Cyl.-bore<br>[mm] | L12 | OA | PL   | PP   | RT  | SS   | SW | TG   | TT  | VA  | VD | WH | WL | WT       | ZM  |
|-------------------|-----|----|------|------|-----|------|----|------|-----|-----|----|----|----|----------|-----|
| Ø32               | 6   | 6  | 14   | 20   | M6  | 5    | 10 | 32.5 | 6.5 | 3.6 | 6  | 26 | 21 | M8x1     | 146 |
| Ø40               | 6.5 | 6  | 16   | 22   | M6  | 6    | 13 | 38   | 9   | 3.5 | 6  | 30 | 23 | M10x1.25 | 165 |
| Ø50               | 8   | 8  | 15.5 | 21.5 | M8  | 6    | 17 | 46.5 | 9   | 3.6 | 6  | 37 | 31 | M14x1.5  | 180 |
| Ø63               | 8   | 8  | 18   | 28   | M8  | 10   | 17 | 56.5 | 11  | 3.5 | 6  | 37 | 31 | M14x1.5  | 195 |
| Ø80               | 10  | 10 | 20   | 30   | M10 | 11.5 | 22 | 72   | 14  | 3.5 | 6  | 46 | 39 | M18x1.5  | 220 |
| Ø100              | 10  | 10 | 18   | 33   | M10 | 11.5 | 22 | 89   | 14  | 3.5 | 6  | 51 | 39 | M18x1.5  | 240 |
| Ø125              | 13  | 8  | 20   | 40   | M12 | 0    | 27 | 110  | 22  | 5.5 | 9  | 65 | 53 | M24x2    | 290 |

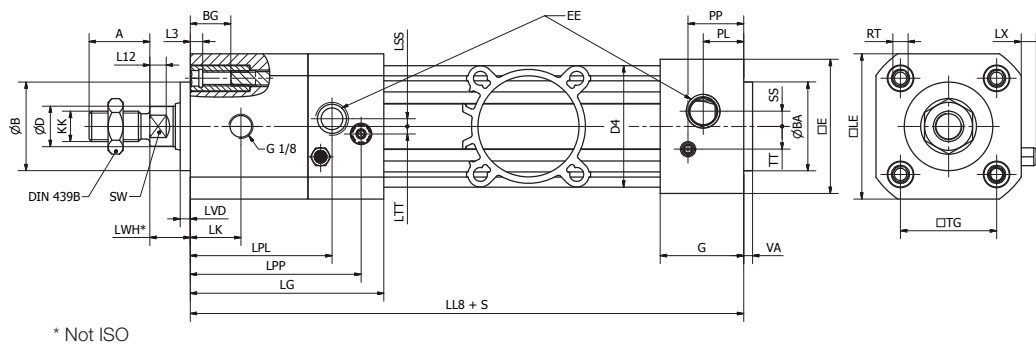
### Tolerances [mm]

| Cyl.-bore<br>[mm] | A         | L8            | TG    | ZM           | stroke tolerance |                     |            |
|-------------------|-----------|---------------|-------|--------------|------------------|---------------------|------------|
|                   |           |               |       |              | s ≤ 350 mm       | 350 mm < s ≤ 600 mm | s > 600 mm |
| Ø32               | 0 / - 0.5 | ± 0.3         | ± 0.4 | -0.4 / + 2.2 | + 1.7            | + 1.9               | + 2.3      |
| Ø40               | 0 / - 0.5 | ± 0.3         | ± 0.4 | -0.4 / + 2.2 | + 1.7            | + 1.9               | + 2.3      |
| Ø50               | 0 / - 0.5 | ± 0.4         | ± 0.4 | -0.4 / + 2.2 | + 1.8            | + 2                 | + 2.4      |
| Ø63               | 0 / - 0.5 | - 0.5 / + 0.3 | ± 0.4 | -0.4 / + 2.2 | + 1.9            | + 2.1               | + 2.5      |
| Ø80               | 0 / - 0.5 | ± 0.4         | ± 0.4 | -0.4 / + 2.2 | + 1.9            | + 2.1               | + 2.5      |
| Ø100              | 0 / - 0.5 | ± 0.5         | ± 0.4 | -0 / + 2.5   | + 2.0            | + 2.2               | + 2.6      |
| Ø125              | 0 / - 1.0 | ± 0.5         | ± 0.4 | -0 / + 2.6   | + 2.1            | + 2.3               | + 2.7      |

## Dimensions

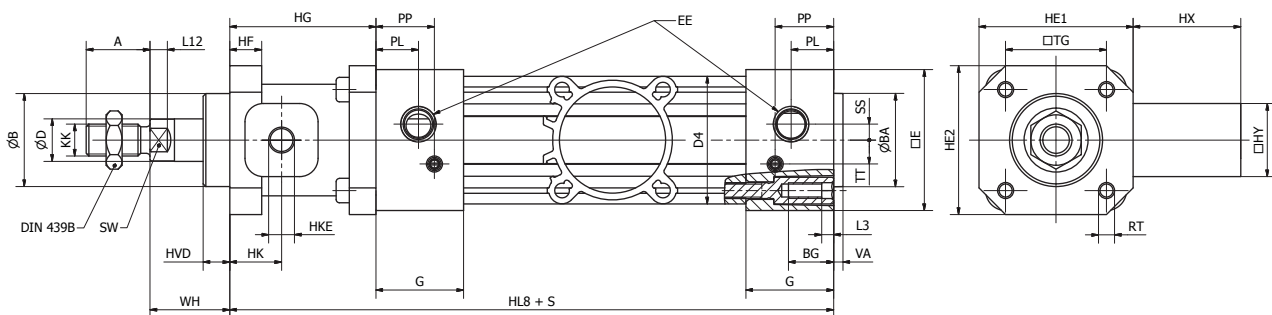
### Dynamic rod lock with smooth profile design

#### P1F-L



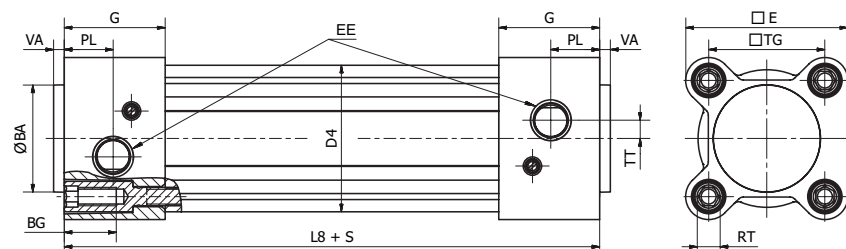
### Static rod lock with smooth profile design

#### P1F-H



### Air reservoir with smooth profile design

#### P1F-P



#### Important

Pressure Equipment Directive. According (PED) to the directive 2014/68/EU, for uncertified pressure vessels:

**Max Working pressure x Volume maximized to 50 Bar x litre, i.e. max 10 bar and 5 liter volume.**

In accordance we therefore maximised the volume to max 5 litre cylinder.

## Dimensions

### Dimensions [mm]

| Cyl.-bore<br>[mm] | A  | ØB<br>e11 | ØBA<br>d11 | BG   | ØD | D4   | ØD5 | ØD6  | E    | EE   | G    | KK       | L2   | L3  | L8  |
|-------------------|----|-----------|------------|------|----|------|-----|------|------|------|------|----------|------|-----|-----|
| Ø32               | 22 | 30        | 30         | 17   | 12 | 42.5 | 35  | 5.3  | 47   | G1/8 | 28.4 | M10x1.25 | 16.8 | 4.5 | 94  |
| Ø40               | 24 | 35        | 35         | 17   | 16 | 48   | 43  | 5.3  | 53   | G1/4 | 33   | M12x1.25 | 19   | 4.5 | 105 |
| Ø50               | 32 | 40        | 40         | 18   | 20 | 59.5 | 54  | 7.1  | 64.5 | G1/4 | 33.4 | M16x1.5  | 27.6 | 4.5 | 106 |
| Ø63               | 32 | 45        | 45         | 18   | 20 | 69.5 | 67  | 7.1  | 75   | G3/8 | 39.4 | M16x1.5  | 24.3 | 4.5 | 121 |
| Ø80               | 40 | 45        | 45         | 19.5 | 25 | 86   | 85  | 8.9  | 94   | G3/8 | 39.4 | M20x1.5  | 30.1 | 5.5 | 128 |
| Ø100              | 40 | 55        | 55         | 19.5 | 25 | 103  | 105 | 8.9  | 111  | G1/2 | 44.3 | M20x1.5  | 34   | 5.5 | 138 |
| Ø125              | 54 | 60        | 60         | 20   | 32 | 130  | 130 | 10.8 | 136  | G1/2 | 50.8 | M27x2    | 45   | 0   | 160 |

| Cyl.-bore<br>[mm] | L12 | OA | PL   | PP   | RT  | SS   | SW | TG   | TT  | VA  | VD | WH | WL | WT       | ZM  |
|-------------------|-----|----|------|------|-----|------|----|------|-----|-----|----|----|----|----------|-----|
| Ø32               | 6   | 6  | 14   | 20   | M6  | 5    | 10 | 32.5 | 6.5 | 3.6 | 6  | 26 | 21 | M8x1     | 146 |
| Ø40               | 6.5 | 6  | 16   | 22   | M6  | 6    | 13 | 38   | 9   | 3.5 | 6  | 30 | 23 | M10x1.25 | 165 |
| Ø50               | 8   | 8  | 15.5 | 21.5 | M8  | 6    | 17 | 46.5 | 9   | 3.6 | 6  | 37 | 31 | M14x1.5  | 180 |
| Ø63               | 8   | 8  | 18   | 28   | M8  | 10   | 17 | 56.5 | 11  | 3.5 | 6  | 37 | 31 | M14x1.5  | 195 |
| Ø80               | 10  | 10 | 20   | 30   | M10 | 11.5 | 22 | 72   | 14  | 3.5 | 6  | 46 | 39 | M18x1.5  | 220 |
| Ø100              | 10  | 10 | 18   | 33   | M10 | 11.5 | 22 | 89   | 14  | 3.5 | 6  | 51 | 39 | M18x1.5  | 240 |
| Ø125              | 13  | 8  | 20   | 40   | M12 | 0    | 27 | 110  | 22  | 5.5 | 9  | 65 | 53 | M24x2    | 290 |

| Cyl.-bore<br>[mm] | LE   | LG    | LK   | LL8 | LPL   | LPP   | LSS | LTT | LVD | LWH | LX |
|-------------------|------|-------|------|-----|-------|-------|-----|-----|-----|-----|----|
| Ø32               | 50   | 71    | 18.5 | 137 | 53    | 63    | 4.5 | 3   | 4   | 15  | 6  |
| Ø40               | 57.4 | 76.5  | 20   | 149 | 56    | 67.5  | 3   | 3   | 4   | 16  | 6  |
| Ø50               | 70   | 80    | 21   | 153 | 65    | 71    | 5.5 | 8   | 4   | 17  | 7  |
| Ø63               | 82.4 | 96    | 30   | 178 | 76.5  | 87    | 3   | 8.5 | 4   | 17  | 7  |
| Ø80               | 100  | 110   | 35   | 199 | 89    | 101   | 6   | 9   | 4   | 20  | 7  |
| Ø100              | 116  | 132   | 54   | 226 | 112   | 122   | 6   | 12  | 4   | 20  | 7  |
| Ø125              | 139  | 144.5 | 65.5 | 254 | 124.5 | 134.5 | 6   | 14  | 6   | 27  | 7  |

| Cyl.-bore<br>[mm] | HE1 | HE2 | HF | HG  | HK   | HKE  | HL8 | HVD | HX   | HY   |
|-------------------|-----|-----|----|-----|------|------|-----|-----|------|------|
| Ø32               | 50  | 48  | 12 | 48  | 16   | G1/8 | 142 | 10  | 40   | 25   |
| Ø40               | 58  | 56  | 12 | 55  | 19.5 | G1/8 | 160 | 10  | 40.5 | 27.5 |
| Ø50               | 70  | 68  | 16 | 70  | 21   | G1/8 | 176 | 12  | 48.5 | 32.5 |
| Ø63               | 85  | 82  | 15 | 70  | 21   | G1/8 | 191 | 12  | 49   | 41   |
| Ø80               | 105 | 100 | 16 | 90  | 28   | G1/8 | 218 | 20  | 65.5 | 49   |
| Ø100              | 130 | 120 | 18 | 92  | 27   | G1/8 | 230 | 23  | 59.5 | 53   |
| Ø125              | 150 | 140 | 27 | 122 | 37   | G1/8 | 282 | 32  | 69.5 | 65   |

### Tolerances [mm]

| Cyl.-bore<br>[mm] | A      | L8            | TG   | ZM        | stroke tolerance |          |            | P1F-P             |   |  |
|-------------------|--------|---------------|------|-----------|------------------|----------|------------|-------------------|---|--|
|                   |        |               |      |           | 350 mm < s       |          |            | Cyl.-bore<br>[mm] | Air volume<br>base 0 mm<br>[cm <sup>3</sup> ] | Air volume per<br>stroke of<br>[cm <sup>3</sup> /100 mm] |
|                   |        |               |      |           | s ≤ 350 mm       | ≤ 600 mm | s > 600 mm |                   |   |  |
| Ø32               | 0/-0.5 | ± 0.3         | ±0.4 | -0.4/+2.2 | + 1.7            | + 1.9    | + 2.3      | Ø32               | 40  | 80   |
| Ø40               | 0/-0.5 | ± 0.3         | ±0.4 | -0.4/+2.2 | + 1.7            | + 1.9    | + 2.3      | Ø40               | 68  | 126  |
| Ø50               | 0/-0.5 | - 0.3 / + 0.5 | ±0.4 | -0.4/+2.2 | + 1.8            | + 2      | + 2.4      | Ø50               | 91  | 196  |
| Ø63               | 0/-0.5 | - 0.6 / + 0.2 | ±0.4 | -0.4/+2.2 | + 1.9            | + 2.1    | + 2.5      | Ø63               | 137   | 312  |
| Ø80               | 0/-0.5 | ± 0.4         | ±0.4 | -0.4/+2.2 | + 1.9            | + 2.1    | + 2.5      | Ø80               | 289   | 503  |
| Ø100              | 0/-0.5 | ± 0.5         | ±0.4 | -0/+2.5   | + 2.0            | + 2.2    | + 2.6      | Ø100              | 417   | 785  |
| Ø125              | 0/-1.0 | ± 0.5         | ±0.4 | -0/+2.6   | + 2.1            | + 2.3    | + 2.7      | Ø125              | 809   | 1227   |





## Mountings

Flange MF1 / MF2 ①



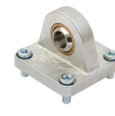
Foot brackets MS1 ②



Pivot bracket with rigid bearing AB7 ③



Swivel eye bracket MP6 ④



Clevis bracket MP2 ⑤



|      |          |          |           |           |           |
|------|----------|----------|-----------|-----------|-----------|
| Ø32  | P1C-4KMB | P1C-4KMF | P1C-4KMDB | P1C-4KMSB | P1C-4KMTB |
| Ø40  | P1C-4LMB | P1C-4LMF | P1C-4LMDB | P1C-4LMSB | P1C-4LMTB |
| Ø50  | P1C-4MMB | P1C-4MMF | P1C-4MMDB | P1C-4MMSB | P1C-4MMTB |
| Ø63  | P1C-4NMB | P1C-4NMF | P1C-4NMDB | P1C-4NMSB | P1C-4NMTB |
| Ø80  | P1C-4PMB | P1C-4PMF | P1C-4PMDB | P1C-4PMSB | P1C-4PMTB |
| Ø100 | P1C-4QMB | P1C-4QMF | P1C-4QMDB | P1C-4QMSB | P1C-4QMTB |
| Ø125 | P1C-4RMB | P1C-4RMF | P1C-4RMDB | P1C-4RMSB | P1C-4RMTB |

Clevis bracket MP4 ⑥



Clevis bracket AB6 ⑦



Pivot bracket with swivel bearing CS7 ⑧



3 and 4 position flange JP1 ⑨



Pivot brackets AT4 ⑩



|      |           |            |           |          |            |
|------|-----------|------------|-----------|----------|------------|
| Ø32  | P1C-4KMEB | P1C-4KMCEB | P1C-4KMAF | P1E-6KB0 | 9301054261 |
| Ø40  | P1C-4LMEB | P1C-4LMCEB | P1C-4LMAF | P1E-6LB0 | 9301054262 |
| Ø50  | P1C-4MMEB | P1C-4MCEB  | P1C-4MMAF | P1E-6MB0 | 9301054262 |
| Ø63  | P1C-4NMEB | P1C-4NCEB  | P1C-4NMAF | P1E-6NB0 | 9301054264 |
| Ø80  | P1C-4PMEB | P1C-4PCEB  | P1C-4PMAF | P1E-6PB0 | 9301054264 |
| Ø100 | P1C-4QMEB | P1C-4QCEB  | P1C-4QMAF | P1E-6QB0 | 9301054266 |
| Ø125 | P1C-4RMEB | P1C-4RCEB  | P1C-4RMAF |          | 9301054266 |

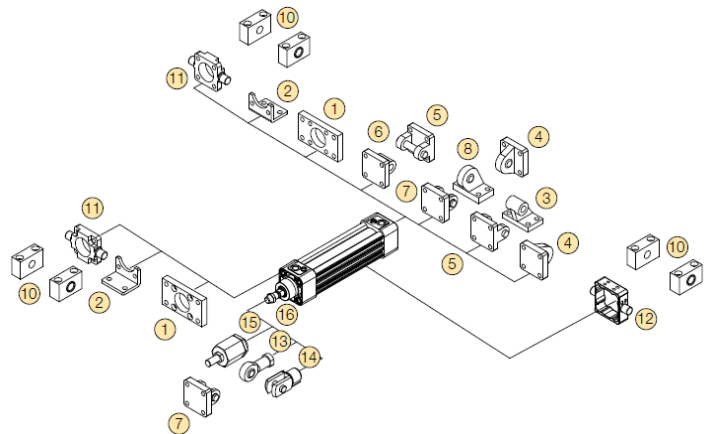
Flange trunnion MT5/MT6 ⑪



Intermediate trunnion MT4 ⑫



|      |           |                  |
|------|-----------|------------------|
| Ø32  | P1D-4KMYF | refer to page 34 |
| Ø40  | P1D-4LMYF | refer to page 34 |
| Ø50  | P1D-4MMYF | refer to page 34 |
| Ø63  | P1D-4NMYF | refer to page 34 |
| Ø80  | P1D-4PMYF | refer to page 34 |
| Ø100 | P1D-4QMYF | refer to page 34 |
| Ø125 |           | refer to page 34 |



Nut MR9 (pack of 10) ⑬

Zinc plated steel



Stainless steel



Swivel rod eye AP6 ⑬



Clevis AP2 ⑭



Flexo coupling PM5 ⑮




|      |           |           |          |          |          |
|------|-----------|-----------|----------|----------|----------|
| Ø32  | P14-4KRPZ | P14-4KRPS | P1C-4KRS | P1C-4KRC | P1C-4KRF |
| Ø40  | P14-4LRPZ | P14-4LRPS | P1C-4LRS | P1C-4LRC | P1C-4LRF |
| Ø50  | P14-4MRPZ | P14-4MRPS | P1C-4MRS | P1C-4MRC | P1C-4MRF |
| Ø63  | P14-4MRPZ | P14-4MRPS | P1C-4MRS | P1C-4MRC | P1C-4MRF |
| Ø80  | P14-4PRPZ | P14-4PRPS | P1C-4PRS | P1C-4PRC | P1C-4PRF |
| Ø100 | P14-4PRPZ | P14-4PRPS | P1C-4PRS | P1C-4PRC | P1C-4PRF |
| Ø125 | P14-4RRPZ | P14-4RRPS | P1C-4RRS | P1C-4RRC | P1C-4RRF |

## Seal Kits

### Complete seal kits consisting of:

- 2 piston seals.
- 2 cushioning seals.
- 1 wiper / piston rod seal.
- 2 O-Rings.

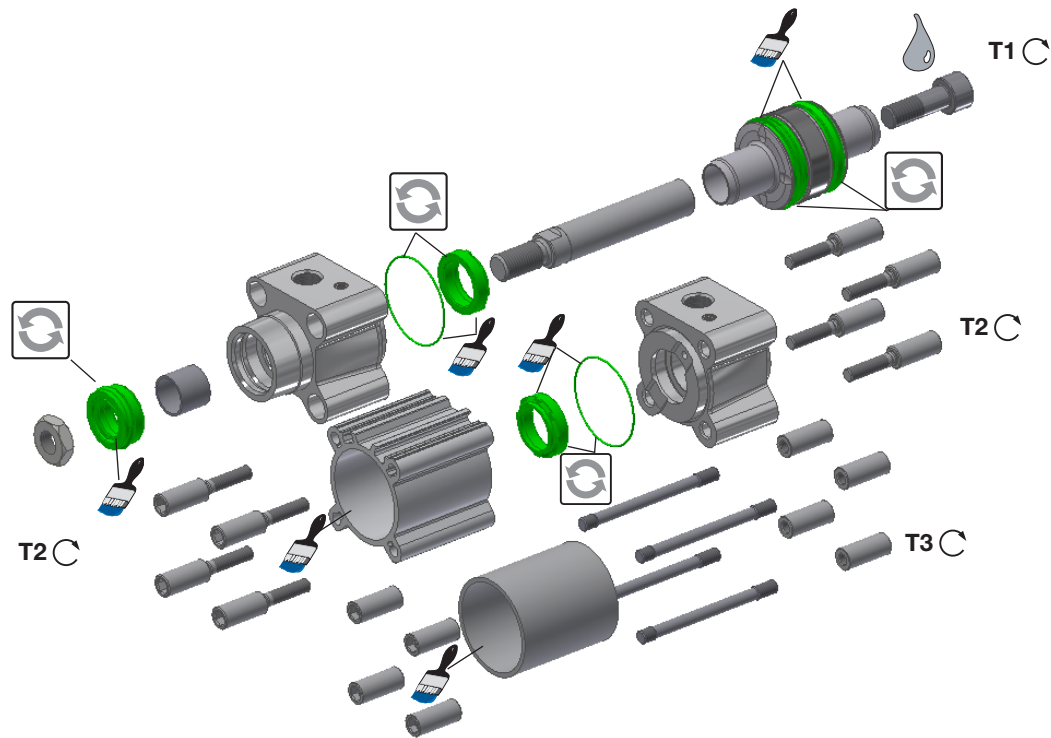
### Greases

|  |                              |      |            |
|--|------------------------------|------|------------|
|  | Standard and low temperature | 30 g | 9127394541 |
|  | High temperature             | 30 g | 9127394521 |

| Cyl.-bore [mm] | Standard temperature <sup>1)</sup> | High temperature <sup>1)</sup> | Low temperature <sup>1)</sup> | Metallic scraper <sup>1) 2)</sup> | FKM Wiper seal <sup>1)</sup> | With dyn. rod lock <sup>1)</sup> | With static rod lock <sup>1)</sup> | Polon/UHMW-PE |
|----------------|------------------------------------|--------------------------------|-------------------------------|-----------------------------------|------------------------------|----------------------------------|------------------------------------|---------------|
| Ø32            | P1F-6032RN                         | P1F-6032RF                     | P1F-6032RL                    | P1F-6032RQ                        | P1F-6032RV                   | P1F-6032RNL                      | P1F-6032RNH                        | P1F-6032RD    |
| Ø40            | P1F-6040RN                         | P1F-6040RF                     | P1F-6040RL                    | P1F-6040RQ                        | P1F-6040RV                   | P1F-6040RNL                      | P1F-6040RNH                        | P1F-6040RD    |
| Ø50            | P1F-6050RN                         | P1F-6050RF                     | P1F-6050RL                    | P1F-6050RQ                        | P1F-6050RV                   | P1F-6050RNL                      | P1F-6050RNH                        | P1F-6050RD    |
| Ø63            | P1F-6063RN                         | P1F-6063RF                     | P1F-6063RL                    | P1F-6063RQ                        | P1F-6063RV                   | P1F-6063RNL                      | P1F-6063RNH                        | P1F-6050RD    |
| Ø80            | P1F-6080RN                         | P1F-6080RF                     | P1F-6080RL                    | P1F-6080RQ                        | P1F-6080RV                   | P1F-6080RNL                      | P1F-6080RNH                        | P1F-6080RD    |
| Ø100           | P1F-6100RN                         | P1F-6100RF                     | P1F-6100RL                    | P1F-6100RQ                        | P1F-6100RV                   | P1F-6100RNL                      | P1F-6100RNH                        | P1F-6100RD    |
| Ø125           | P1F-6125RN                         | P1F-6125RF                     | P1F-6125RL                    | P1F-6125RQ                        | P1F-6125RV                   | P1F-6125RNL                      | P1F-6125RNH                        | P1F-6125RD    |

<sup>1)</sup> for through piston rod, add K at the end, ie P1F-6032RNK

<sup>2)</sup> -30 to +80°C



| Cyl.-bore [mm] | AF [mm] | Plastic piston T1 [Nm] | Alu Piston T1 [Nm] | AF [mm] | T2 [Nm] | AF [mm] | T3 [Nm] |
|----------------|---------|------------------------|--------------------|---------|---------|---------|---------|
| Ø32            | 6       | 4.5                    | 15                 | 6       | 11      | 6       | 4.5     |
| Ø40            | 8       | 11                     | 30                 | 8       | 11      | 6       | 4.5     |
| Ø50            | 10      | 20                     | 40                 | 10      | 18      | 8       | 9.5     |
| Ø63            | 10      | 20                     | 40                 | 10      | 18      | 8       | 9.5     |
| Ø80            | 14      | 40                     | 120                | 14      | 29      | 6       | 19      |
| Ø100           | 14      | 120                    | 120                | 14      | 29      | 6       | 19      |
| Ø125           | 14      | 120                    | 120                | 14      | 70      | 8       | 40      |



= Included in seal kit



= Socket head across flats



= Tightening torque



Lubricated with grease



Locking fluid  
Loctite 270 or Loctite 2701 locking fluid must be used

## **Contents**

### **Twin-Rods Bores 32 to 100 mm**

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## Technical Data

### Cylinder forces

| Bore/piston rod [mm] | Stroke | Surface area [cm <sup>2</sup> ] | Max theoretical force in N (under different pressure bar) |      |      |      |      |             |      |      |      |      |
|----------------------|--------|---------------------------------|---|------|------|------|------|-------------|------|------|------|------|
|                      |        |                                 | 1   | 2    | 3    | 4    | 5    | 6           | 7    | 8    | 9    | 10   |
| 32/2x8               | +      | 8.0                             | 80  | 161  | 241  | 322  | 402  | <b>483</b>  | 563  | 643  | 724  | 804  |
|                      | -      | 7.0                             | 70  | 141  | 211  | 281  | 352  | <b>422</b>  | 493  | 563  | 633  | 704  |
| 40/2x10              | +      | 12.6                            | 126   | 251  | 377  | 503  | 628  | <b>754</b>  | 880  | 1005 | 1131 | 1257 |
|                      | -      | 11.0                            | 110   | 220  | 330  | 440  | 550  | <b>660</b>  | 770  | 880  | 990  | 1100 |
| 50/2x12              | +      | 19.6                            | 196   | 393  | 589  | 785  | 982  | <b>1178</b> | 1374 | 1571 | 1767 | 1964 |
|                      | -      | 17.4                            | 174   | 347  | 521  | 695  | 869  | <b>1042</b> | 1216 | 1390 | 1564 | 1737 |
| 63/2x16              | +      | 31.2                            | 312   | 623  | 935  | 1247 | 1559 | <b>1870</b> | 2182 | 2494 | 2806 | 3117 |
|                      | -      | 27.2                            | 272   | 543  | 815  | 1086 | 1358 | <b>1629</b> | 1901 | 2172 | 2444 | 2715 |
| 80/2x20              | +      | 50.3                            | 503   | 1005 | 1508 | 2011 | 2513 | <b>3016</b> | 3519 | 4021 | 4524 | 5027 |
|                      | -      | 44.0                            | 440   | 880  | 1319 | 1759 | 2199 | <b>2639</b> | 3079 | 3519 | 3958 | 4398 |
| 100/2x20             | +      | 78.5                            | 785   | 1571 | 2356 | 3142 | 3927 | <b>4712</b> | 5498 | 6283 | 7069 | 7854 |
|                      | -      | 72.3                            | 723   | 1445 | 2168 | 2890 | 3613 | <b>4335</b> | 5058 | 5781 | 6503 | 7226 |

+ = outward stroke  
- = return stroke

### Cylinder air consumption

| Bore/piston rod [mm] | Stroke | Surface area [cm <sup>2</sup> ] | Air consumption in l/mm in relation to applied pressure in bar |       |       |       |       |              |       |       |       |       |
|----------------------|--------|---------------------------------|--|-------|-------|-------|-------|--------------|-------|-------|-------|-------|
|                      |        |                                 | 1  | 2     | 3     | 4     | 5     | 6            | 7     | 8     | 9     | 10    |
| 32/2x8               | +      | 8.0                             | 0.016  | 0.024 | 0.032 | 0.040 | 0.048 | <b>0.056</b> | 0.064 | 0.072 | 0.079 | 0.087 |
|                      | -      | 7.0                             | 0.014  | 0.021 | 0.028 | 0.035 | 0.042 | <b>0.049</b> | 0.056 | 0.063 | 0.070 | 0.077 |
| 40/2x10              | +      | 12.6                            | 0.025  | 0.037 | 0.050 | 0.062 | 0.075 | <b>0.087</b> | 0.099 | 0.112 | 0.124 | 0.137 |
|                      | -      | 11.0                            | 0.022  | 0.033 | 0.044 | 0.054 | 0.065 | <b>0.076</b> | 0.087 | 0.098 | 0.109 | 0.120 |
| 50/2x12              | +      | 19.6                            | 0.039  | 0.058 | 0.078 | 0.097 | 0.117 | <b>0.136</b> | 0.155 | 0.175 | 0.194 | 0.213 |
|                      | -      | 17.4                            | 0.035  | 0.052 | 0.069 | 0.086 | 0.103 | <b>0.120</b> | 0.137 | 0.155 | 0.172 | 0.189 |
| 63/2x16              | +      | 31.2                            | 0.062  | 0.093 | 0.123 | 0.154 | 0.185 | <b>0.216</b> | 0.247 | 0.277 | 0.308 | 0.339 |
|                      | -      | 27.2                            | 0.054  | 0.081 | 0.108 | 0.134 | 0.161 | <b>0.188</b> | 0.215 | 0.242 | 0.268 | 0.295 |
| 80/2x20              | +      | 50.3                            | 0.100  | 0.150 | 0.199 | 0.249 | 0.298 | <b>0.348</b> | 0.398 | 0.447 | 0.497 | 0.546 |
|                      | -      | 44.0                            | 0.087  | 0.131 | 0.174 | 0.218 | 0.261 | <b>0.304</b> | 0.348 | 0.391 | 0.435 | 0.478 |
| 100/2x20             | +      | 78.5                            | 0.156  | 0.234 | 0.311 | 0.389 | 0.466 | <b>0.544</b> | 0.621 | 0.699 | 0.776 | 0.854 |
|                      | -      | 72.3                            | 0.144  | 0.215 | 0.286 | 0.358 | 0.429 | <b>0.500</b> | 0.572 | 0.643 | 0.714 | 0.786 |

free air consumption for 1 cycle, 10 mm inward and 10 mm outward

+ = outward stroke  
- = return stroke

### Weight

| Cyl.-bore [mm] | P1F-R          |                 | P1F-Q          |                 | Moving parts   |                 |
|----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
|                | Base 0 mm [kg] | per 100 mm [kg] | Base 0 mm [kg] | per 100 mm [kg] | Base 0 mm [kg] | per 100 mm [kg] |
| Ø32            | 0.8            | 0.25            | 1.0            | 0.3             | 0.08           | 0.08            |
| Ø40            | 1.0            | 0.35            | 1.4            | 0.4             | 0.17           | 0.15            |
| Ø50            | 1.7            | 0.50            | 2.3            | 0.6             | 0.32           | 0.24            |
| Ø63            | 2.6            | 0.60            | 3.2            | 0.9             | 0.38           | 0.23            |
| Ø80            | 4.2            | 0.90            | 5.6            | 1.4             | 0.71           | 0.38            |
| Ø100           | 6.2            | 1.00            | 7.4            | 1.5             | 1.00           | 0.37            |

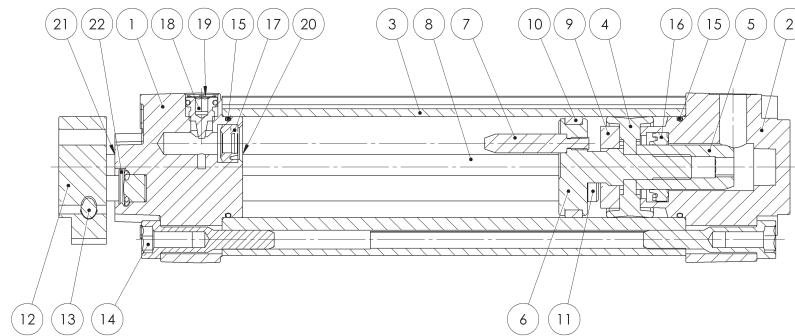


**Technical Data**

|                  |                                   |
|------------------|-----------------------------------|
| Product type     | Cylinder with Twin Rods (not ISO) |
| Bore size        | 32 - 100 mm                       |
| Stroke length    | 5 - 2000 mm                       |
| Versions         | Double acting                     |
| Cushioning       | Adjustable air cushioning         |
| Position sensing | Proximity sensor                  |
| Installation     | ISO mountings                     |

**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 3.4.3 should be used. This specifies a dew point of + 3°C for indoor operation (a lower dew point should be selected for minus temperature operation and we recommend the use of an inline dryer) and is in line with the air quality from most standard compressors with a standard filter. |
| Operating pressure   | 1 to 10 bar   |
| Ambient temperature  | Standard temperature (option M): -20°C to +80°C<br>High temperature (option F): -10°C to +150°C   |
| Pre-lubricated       | Further lubrication is normally not necessary. If additional lubrication is introduced it must be continued. Hydraulic oil type HLP (DIN 51524, ISO 11158). Viscosity by 40°C: 32 mm2/s (cst). Example: Shell Tellus 32 or equal.   |
| Corrosion resistance | Material and surface treatment selected for typical industrial applications with resistance to corrosion and chemicals.   |

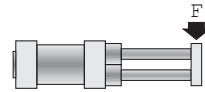


**Material specification**

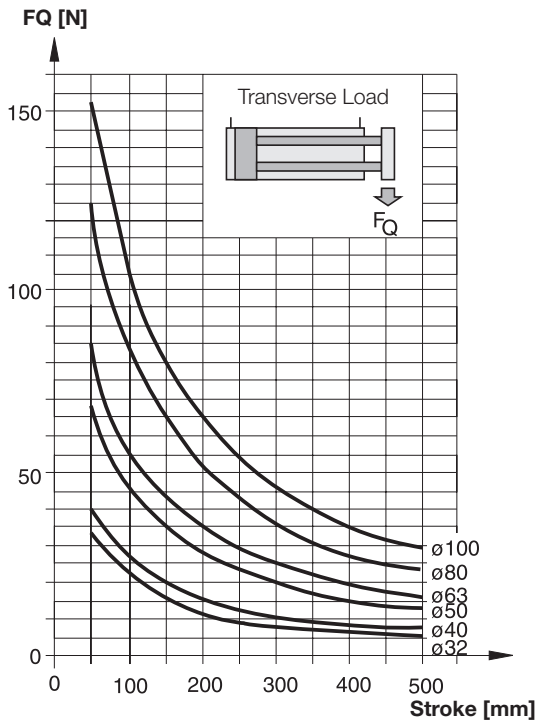
| Pos    | Part                     |          | Specification                                 |
|--------|--------------------------|----------|---|
| 1, 2   | End cover                |          | Aluminium                                     |
| 3      | Cylinder barrel          |          | Anodised aluminium profile                    |
| 4      | Piston                   | Standard | Nitrile rubber (NBR)                          |
|        |                          | Optional | Flioro elastomer (FKM)                        |
| 5      | Sleeve                   |          | Brass   |
| 6      | Support                  |          | Aluminium                                     |
| 7      | Sleeve                   |          | Braas   |
| 8      | Piston rod               |          | Austenitic stainless steel, DIN X8 CrNiS 18-9 |
| 9      | Magnet                   |          | Plastic coated magnetic material              |
| 10     | Piston bearing           |          | Polyetrafluoroethylene (PTFE)                 |
| 11     | Screw                    |          | Zinc plated steel                             |
| 12     | Front plate              |          | Steel   |
| 13     | Screw                    |          | Zinc plated steel                             |
| 14     | End covers screws        |          | Zinc plated steel                             |
|        |                          |          |   |
| 15     | O-ring end cover         | Standard | Nitrile rubber (NBR)                          |
|        |                          | Optional | Flioro elastomer (FKM)                        |
| 16, 17 | Cushioning seal          | Standard | Nitrile rubber (NBR)                          |
|        |                          | Optional | Flioro elastomer (FKM)                        |
| 18     | Cushioning screw         |          | Brass   |
| 19     | Cushioning retainer      |          | Steel   |
|        |                          |          |   |
|        | O-ring cushioning screws | Standard | Nitrile rubber (NBR)                          |
|        |                          | Optional | Flioro elastomer (FKM)                        |
| 20     | Piston rods bearing      |          | Multilayer Steel                              |
| 21     | Retainer                 |          | Spring Steel                                  |
| 22     | Piston rod seal          | Standard | Nitrile rubber (NBR)                          |
|        |                          | Optional | Flioro elastomer (FKM)                        |

**Installation Instructions for Twin Rods Cylinders**

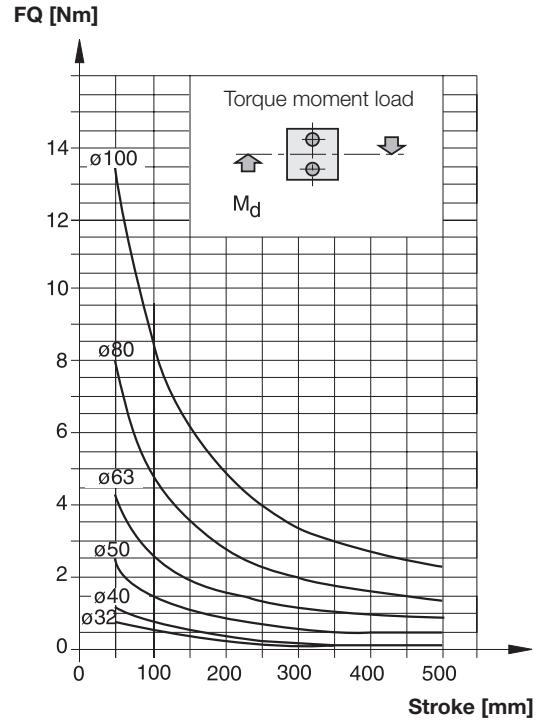
For maximum reliability and service life, transverse loads should be applied as shown.



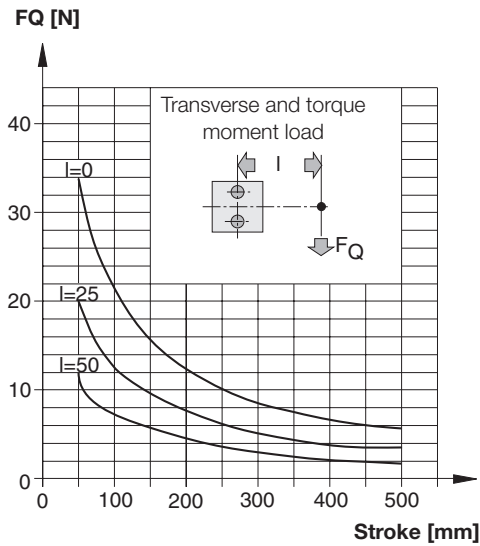
**Transverse Load - Ø 32 - 100 mm**



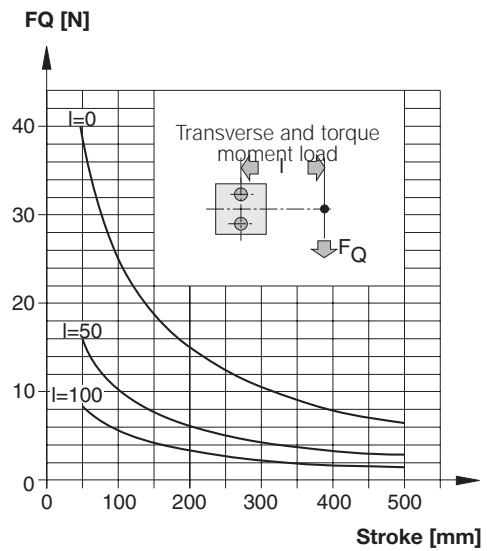
**Torque moment load - Ø 32 - 100 mm**



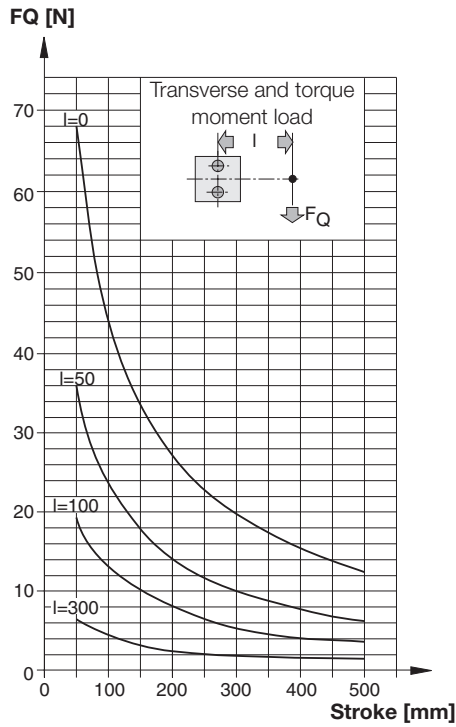
**Transverse and Torque Moment Load - Ø 32 mm**



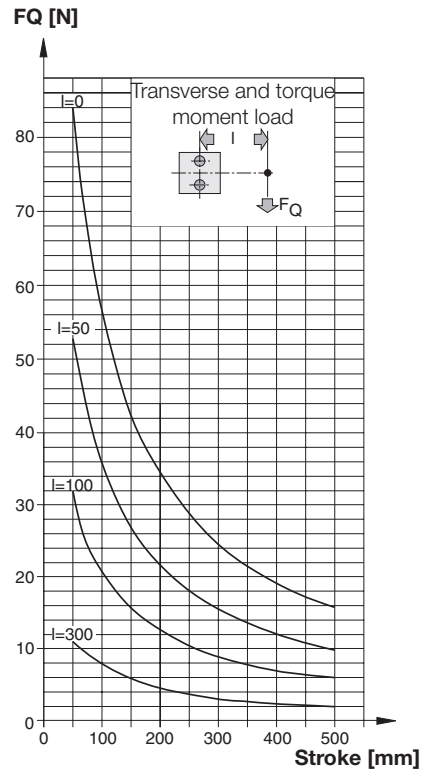
**Transverse and Torque Moment Load - Ø 40 mm**



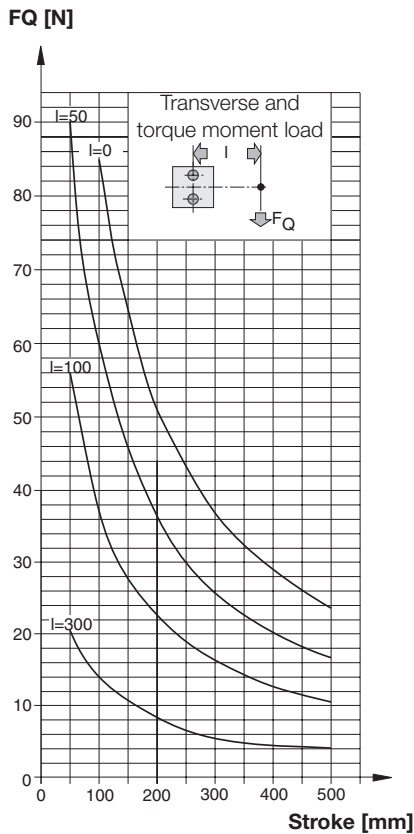
Transverse and Torque Moment Load - Ø 50 mm



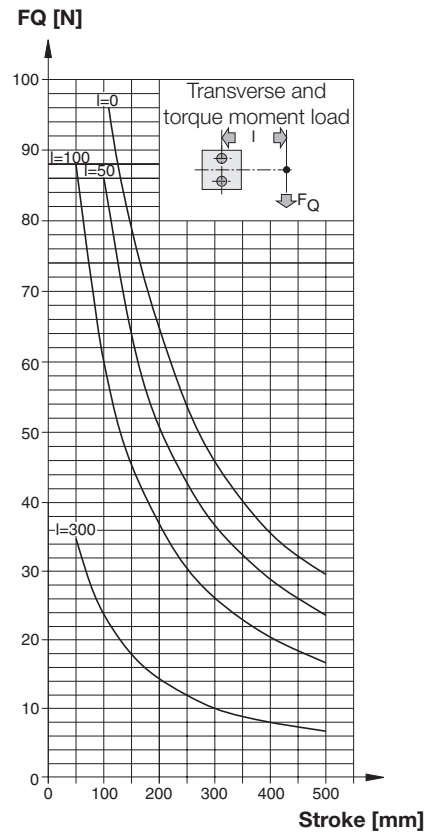
Transverse and Torque Moment Load - Ø 63 mm



Transverse and Torque Moment Load - Ø 80 mm



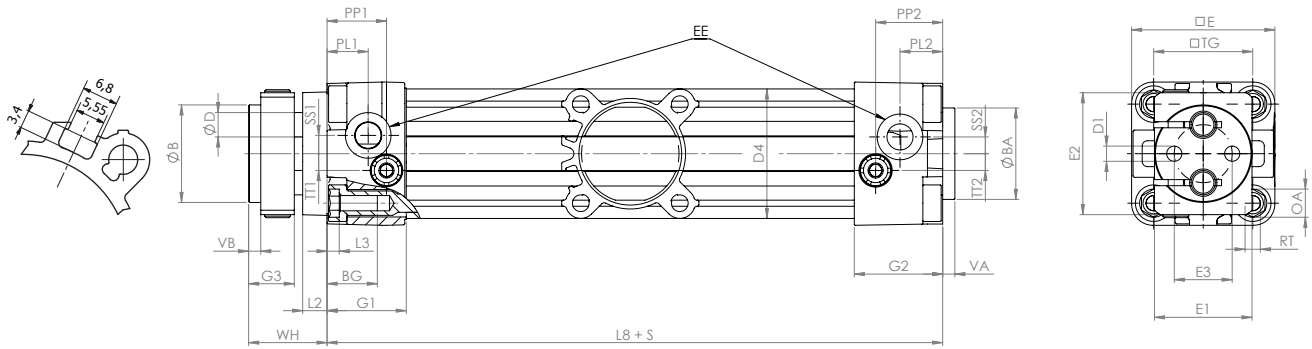
Transverse and Torque Moment Load - Ø 100 mm



Dimensions

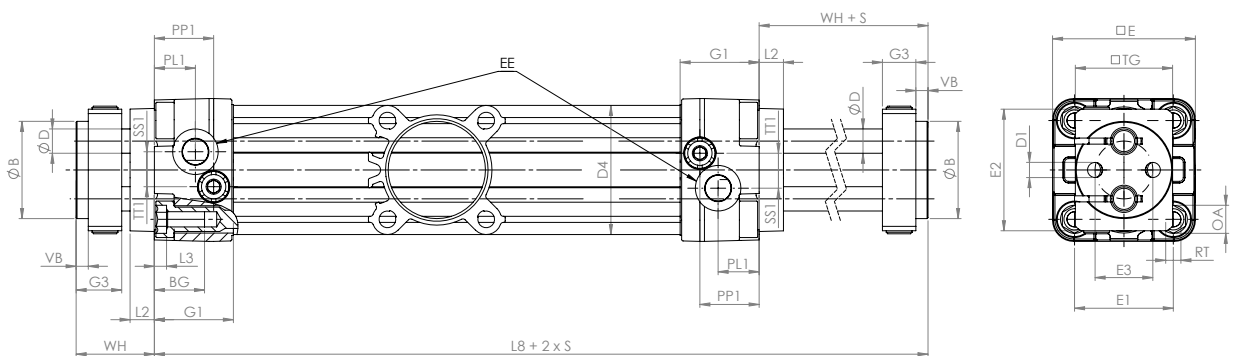
Twin-Rods smooth profile design

P1F-R



Through Twin-Rods smooth profile design

P1F-Q





## Dimensions

### Dimensions [mm]

| Cyl.-bore<br>[mm] | E3   | ØB<br>h9 | ØBA*<br>-0,1 | BG | ØD | D1  | D4  | E1  | E2  | EE*  | G1 | G2 | G3 | VA* | VB |
|-------------------|------|----------|--------------|----|----|-----|-----|-----|-----|------|----|----|----|-----|----|
| Ø32               | 19   | 32       | 30           | 16 | 8  | M6  | 32  | 32  | 40  | G1/8 | 26 | 29 | 15 | 4   | 4  |
| Ø40               | 22.5 | 40       | 35           | 16 | 10 | M8  | 40  | 40  | 45  | G1/4 | 30 | 27 | 15 | 4   | 4  |
| Ø50               | 30   | 50       | 40           | 16 | 12 | M8  | 50  | 50  | 55  | G1/4 | 34 | 29 | 18 | 5   | 4  |
| Ø63               | 38   | 63       | 45           | 16 | 16 | M10 | 63  | 63  | 70  | G3/8 | 34 | 30 | 22 | 5   | 4  |
| Ø80               | 50   | 80       | 45           | 16 | 20 | M12 | 80  | 80  | 95  | G3/8 | 39 | 34 | 22 | 5   | 4  |
| Ø100              | 70   | 100      | 55           | 16 | 20 | M12 | 100 | 100 | 115 | G1/2 | 40 | 35 | 22 | 5   | 4  |

\*Dimensions in accordance with ISO

| Cyl.-bore<br>[mm] | L3  | L8* | OA | PL1  | PP1  | PL2  | PP2 | RT  | SS1 | TT1 | SS2 | TT2 | TG*  | E*  | L2 | WH |
|-------------------|-----|-----|----|------|------|------|-----|-----|-----|-----|-----|-----|------|-----|----|----|
| Ø32               | 4.5 | 94  | 6  | 13.5 | 19.5 | 14.5 | 22  | M6  | 6   | 5.5 | 5.5 | 5.5 | 32.5 | 47  | 8  | 26 |
| Ø40               | 4.5 | 105 | 6  | 18.5 | 21.5 | 16   | 20  | M6  | 7   | 8.5 | 6.5 | 8.5 | 38   | 53  | 12 | 30 |
| Ø50               | 4.5 | 106 | 8  | 22.5 | 27   | 22   | 22  | M8  | 9.5 | 6.5 | 8.5 | 8.5 | 46.5 | 65  | 13 | 34 |
| Ø63               | 4.5 | 121 | 8  | 17.5 | 28   | 17.5 | 28  | M8  | 10  | 11  | 10  | 11  | 56.5 | 75  | 11 | 36 |
| Ø80               | 5.5 | 128 | 10 | 20.5 | 30   | 20.5 | 30  | M10 | 9   | 11  | 9   | 11  | 72   | 95  | 13 | 38 |
| Ø100              | 5.5 | 138 | 10 | 19   | 33   | 19   | 33  | M10 | 13  | 14  | 13  | 14  | 89   | 115 | 13 | 38 |

\*Dimensions in accordance with ISO

### Tolerances [mm]

| Cyl.-bore<br>[mm] | WH        | L8            | TG    | stroke tolerance |                     |            |
|-------------------|-----------|---------------|-------|------------------|---------------------|------------|
|                   |           |               |       | s ≤ 350 mm       | 350 mm < s ≤ 600 mm | s > 600 mm |
| Ø32               | 0 / - 0.5 | ± 0.3         | ± 0.4 | + 1.7            | + 1.9               | + 2.3      |
| Ø40               | 0 / - 0.5 | ± 0.3         | ± 0.4 | + 1.7            | + 1.9               | + 2.3      |
| Ø50               | 0 / - 0.5 | ± 0.4         | ± 0.4 | + 1.8            | + 2                 | + 2.4      |
| Ø63               | 0 / - 0.5 | - 0.5 / + 0.3 | ± 0.4 | + 1.9            | + 2.1               | + 2.5      |
| Ø80               | 0 / - 0.5 | ± 0.4         | ± 0.4 | + 1.9            | + 2.1               | + 2.5      |
| Ø100              | 0 / - 0.5 | ± 0.5         | ± 0.4 | + 2.0            | + 2.2               | + 2.6      |

**Order code**

**Order Instructions**    **P 1 F - R 0 3 2 M S X 0 1 6 0 - 0 0 0 0**

| Profile/cylinder design |                          |
|-------------------------|--------------------------|
| <b>R</b>                | Smooth Twin-Rods         |
| <b>Q</b>                | Smooth Through Twin-Rods |

| Cylinder bore size |        |
|--------------------|--------|
| <b>032</b>         | 32 mm  |
| <b>040</b>         | 40 mm  |
| <b>050</b>         | 50 mm  |
| <b>063</b>         | 63 mm  |
| <b>080</b>         | 80 mm  |
| <b>100</b>         | 100 mm |

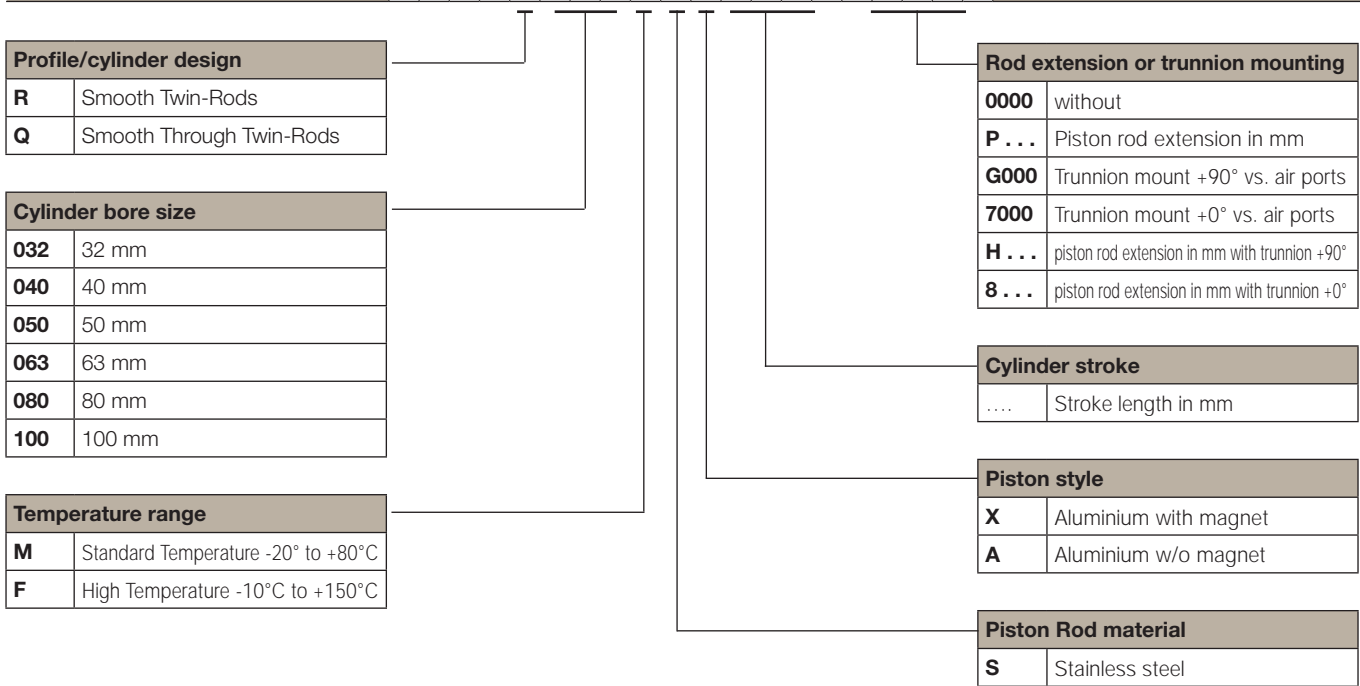
| Temperature range |                                    |
|-------------------|------------------------------------|
| <b>M</b>          | Standard Temperature -20° to +80°C |
| <b>F</b>          | High Temperature -10°C to +150°C   |

| Rod extension or trunnion mounting |   |
|------------------------------------|---|
| <b>0000</b>                        | without                                       |
| <b>P . . .</b>                     | Piston rod extension in mm                    |
| <b>G000</b>                        | Trunnion mount +90° vs. air ports             |
| <b>7000</b>                        | Trunnion mount +0° vs. air ports              |
| <b>H . . .</b>                     | piston rod extension in mm with trunnion +90° |
| <b>8 . . .</b>                     | piston rod extension in mm with trunnion +0°  |

| Cylinder stroke |                     |
|-----------------|---------------------|
| ....            | Stroke length in mm |

| Piston style |                       |
|--------------|-----------------------|
| <b>X</b>     | Aluminium with magnet |
| <b>A</b>     | Aluminium w/o magnet  |

| Piston Rod material |                 |
|---------------------|-----------------|
| <b>S</b>            | Stainless steel |



## Mountings

Flange MF1/MF2 \* ①



Foot brackets MS1\*\*②



Pivot bracket with rigid bearing AB7 ③



Swivel eye bracket MP6 ④



Clevis bracket MP2 ⑤



|      |          |           |           |           |           |
|------|----------|-----------|-----------|-----------|-----------|
| Ø32  | P1C-4KMB | P1F-4KMHF | P1C-4KMDB | P1C-4KMSB | P1C-4KMTB |
| Ø40  | P1C-4LMB | P1F-4LMHF | P1C-4LMDB | P1C-4LMSB | P1C-4LMTB |
| Ø50  | P1C-4MMB | P1F-4MMHF | P1C-4MMDB | P1C-4MMSB | P1C-4MMTB |
| Ø63  | P1C-4NMB | P1F-4NMHF | P1C-4NMDB | P1C-4NMSB | P1C-4NMTB |
| Ø80  | P1C-4PMB | P1F-4PMHF | P1C-4PMDB | P1C-4PMSB | P1C-4PMTB |
| Ø100 | P1C-4QMB | P1F-4QMHF | P1C-4QMDB | P1C-4QMSB | P1C-4QMTB |

Clevis bracket MP4 ⑥



Clevis bracket AB6 ⑦



Pivot bracket with swivel bearing CS7 ⑧



3 and 4 position flange JP1 ⑨



Pivot brackets AT4 ⑩



|      |           |           |           |          |            |
|------|-----------|-----------|-----------|----------|------------|
| Ø32  | P1C-4KMEB | P1C-4KMCB | P1C-4KMAF | P1E-6KB0 | 9301054261 |
| Ø40  | P1C-4LMEB | P1C-4LMCB | P1C-4LMAF | P1E-6LB0 | 9301054262 |
| Ø50  | P1C-4MMEB | P1C-4MMCB | P1C-4MMAF | P1E-6MB0 | 9301054262 |
| Ø63  | P1C-4NMEB | P1C-4NMCB | P1C-4NMAF | P1E-6NB0 | 9301054264 |
| Ø80  | P1C-4PMEB | P1C-4PMCB | P1C-4PMAF | P1E-6PB0 | 9301054264 |
| Ø100 | P1C-4QMEB | P1C-4QMCB | P1C-4QMAF | P1E-6QB0 | 9301054266 |

Flange trunnion ⑪  
MT5/MT6 \*



Intermediate trunnion ⑫  
MT4



|      |           |                  |
|------|-----------|------------------|
| Ø32  | P1D-4KMYF | refer to page 34 |
| Ø40  | P1D-4LMYF | refer to page 34 |
| Ø50  | P1D-4MMYF | refer to page 34 |
| Ø63  | P1D-4NMYF | refer to page 34 |
| Ø80  | P1D-4PMYF | refer to page 34 |
| Ø100 | P1D-4QMYF | refer to page 34 |

\* only on rear end cap, \*\* specific to Twin Rods cylinders

**Seal Kits**

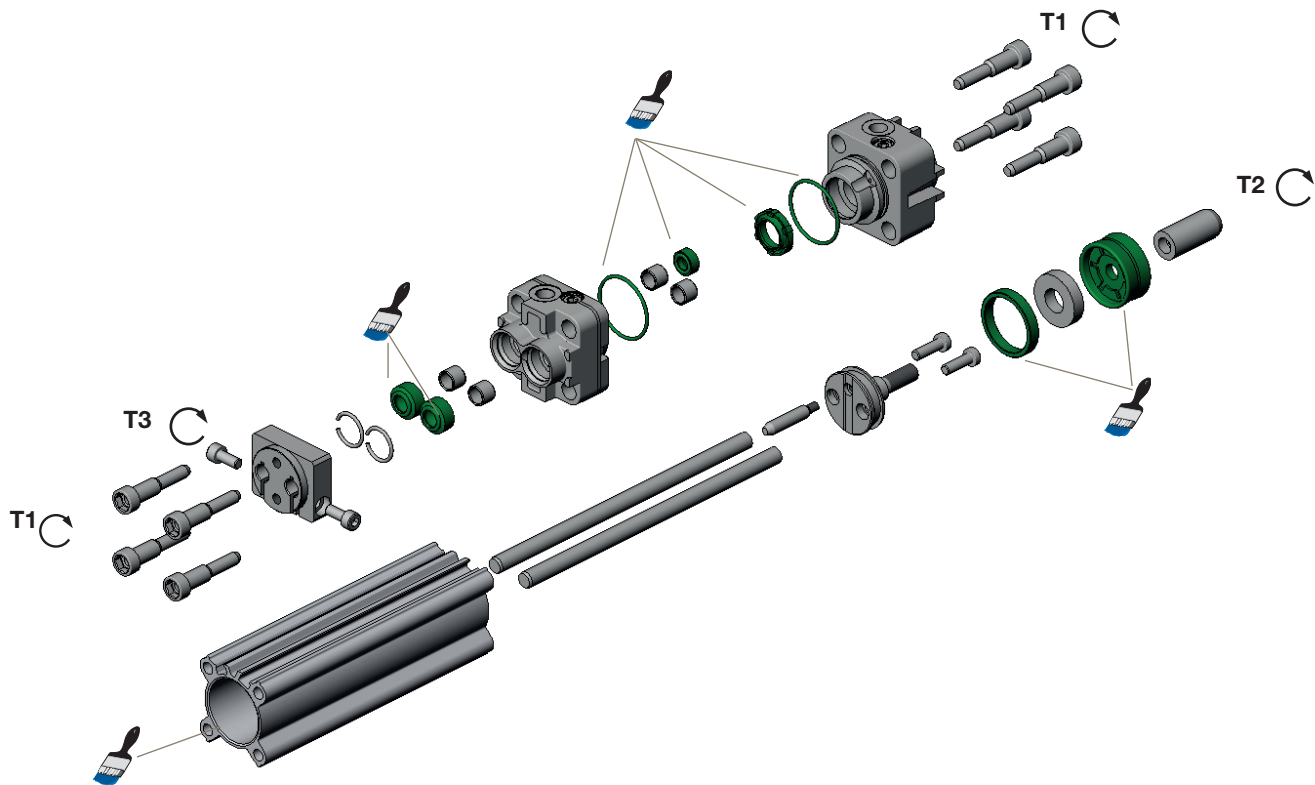
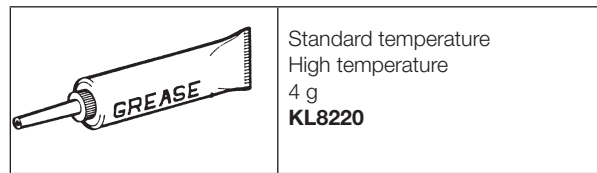
**Complete seal kits consisting of:**

- 1 piston seal.
- 2 cushioning seals.
- 2 wiper / piston rod seals.
- 2 O-Rings.
- 1 piston bearing ring.

| Cyl.-bore [mm] | Standard temperature <sup>1)</sup> | High temperature <sup>1)</sup> |
|----------------|------------------------------------|--------------------------------|
| Ø32            | <b>P1F-6032RNR</b>                 | <b>P1F-6032RFR</b>             |
| Ø40            | <b>P1F-6040RNR</b>                 | <b>P1F-6040RFR</b>             |
| Ø50            | <b>P1F-6050RNR</b>                 | <b>P1F-6050RFR</b>             |
| Ø63            | <b>P1F-6063RNR</b>                 | <b>P1F-6063RFR</b>             |
| Ø80            | <b>P1F-6080RNR</b>                 | <b>P1F-6080RFR</b>             |
| Ø100           | <b>P1F-6100RNR</b>                 | <b>P1F-6100RFR</b>             |

<sup>1)</sup> for through piston Twin Rods, add K at the end, ie P1F-6032RNRK

**Grease**



| Cyl.-bore [mm] | Piston T1 [Nm] | AF [mm] | T2 [Nm] | AF [mm] | T3 [Nm]   | AF [mm] |
|----------------|----------------|---------|---------|---------|-----------|---------|
| Ø32            | 10 - 12        | 8       | 5-6     | 5       | 5.5 ± 0.8 | 4       |
| Ø40            | 10 - 12        | 8       | 12-14   | 6       | 5.5 ± 0.8 | 4       |
| Ø50            | 16 - 20        | 10      | 16-18   | 10      | 10 ± 1.5  | 5       |
| Ø63            | 16 - 20        | 10      | 16-18   | 10      | 20 ± 3    | 6       |
| Ø80            | 26 - 32        | 12      | 20-23   | 12      | 20 ± 3    | 6       |
| Ø100           | 26 - 32        | 12      | 20-23   | 12      | 20 ± 3    | 6       |



= Included in seal kit



= Socket head across flats



= Tightening torque



Lubricated with grease



Locking fluid  
 Loctite 638 locking fluid must be used

## **Contents**

### **Mountings**

|                            |       |
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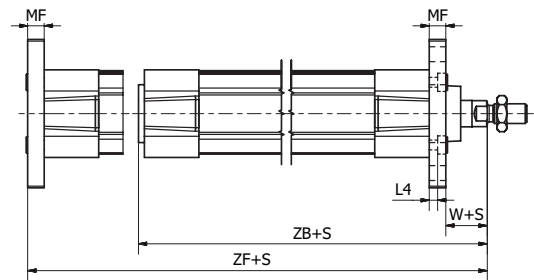
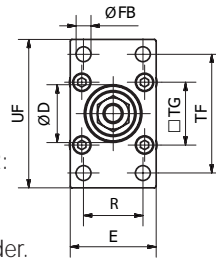
## Flange - MF1 / MF2\*\*



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 the cylinder.



### According to ISO 15552

| Cyl.-bore | D <sub>(H11)</sub> | E    | ØFB <sub>(H13)</sub> | L4   | MF   | R    | TF   | TG    | UF   | W*   | ZB*   | ZF*  | Weight | Order code      |
|-----------|--------------------|------|----------------------|------|------|------|------|-------|------|------|-------|------|--------|-----------------|
| [mm]      | [mm]               | [mm] | [mm]                 | [mm] | [mm] | [mm] | [mm] | [mm]  | [mm] | [mm] | [mm]  | [mm] | [kg]   |                 |
| Ø32       | 30                 | 45   | 7                    | 5.0  | 10   | 32   | 64   | 32.5  | 80   | 16   | 123.5 | 130  | 0.21   | <b>P1C-4KMB</b> |
| Ø40       | 35                 | 52   | 9                    | 5.0  | 10   | 36   | 72   | 38.0  | 90   | 20   | 138.5 | 145  | 0.27   | <b>P1C-4LMB</b> |
| Ø50       | 40                 | 65   | 9                    | 6.5  | 12   | 45   | 90   | 46.5  | 110  | 25   | 146.5 | 155  | 0.53   | <b>P1C-4MMB</b> |
| Ø63       | 45                 | 75   | 9                    | 6.5  | 12   | 50   | 100  | 56.5  | 120  | 25   | 161.5 | 170  | 0.66   | <b>P1C-4NMB</b> |
| Ø80       | 45                 | 95   | 12                   | 9.0  | 16   | 63   | 126  | 72.0  | 150  | 30   | 177.5 | 190  | 1.45   | <b>P1C-4PMB</b> |
| Ø100      | 55                 | 115  | 14                   | 9.0  | 16   | 75   | 150  | 89.0  | 170  | 35   | 192.5 | 205  | 1.60   | <b>P1C-4QMB</b> |
| Ø125      | 60                 | 140  | 16                   | 10.5 | 20   | 90   | 180  | 110.0 | 205  | 45   | 230.5 | 245  | 3.34   | <b>P1C-4RMB</b> |

\*Does not apply to cylinders with piston rod extension, lock units and Twin Rods, see page 38.

\*\* only on rear end cap Twin Rods cylinders.

## Foot Bracket - MS1

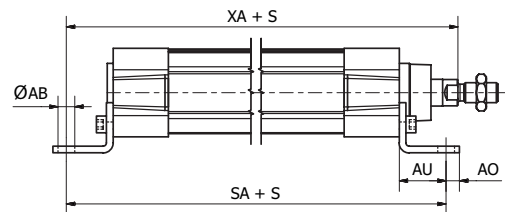
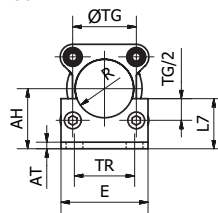


Intended for fixed mounting of cylinder.  
Foot bracket can be fitted to front or rear end cover of the cylinder.

### Materials:

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

Supplied complete with mounting screws for attachment to the cylinder.



### According to ISO 15552

| Cyl.-bore | ØAB <sub>(H14)</sub> | AH <sub>(JS15)</sub> | AO    | AT   | AU   | E     | L7    | R    | SA*  | TG <sub>(JS14)</sub> | TR   | XA*     | Weight ** | Order code                |
|-----------|----------------------|----------------------|-------|------|------|-------|-------|------|------|----------------------|------|---------|-----------|---------------------------|
| [mm]      | [mm]                 | [mm]                 | [mm]  | [mm] | [mm] | [mm]  | [mm]  | [mm] | [mm] | [mm]                 | [mm] | [mm]    | [kg]      | <b>P1F-R/Q</b>            |
| Ø32       | 7                    | 32                   | 11/8  | 4    | 24   | 45/47 | 30/27 | 15   | 142  | 32.5                 | 32   | 144     | 0.077     | <b>P1C-4KMF P1F-4KMHF</b> |
| Ø40       | 10                   | 36                   | 8/10  | 4    | 28   | 52/53 | 30    | 17.5 | 161  | 38.0                 | 36   | 163     | 0.084     | <b>P1C-4LMF P1F-4LMHF</b> |
| Ø50       | 10                   | 45                   | 15/10 | 5    | 32   | 65    | 36/38 | 20   | 170  | 46.5                 | 45   | 175/172 | 0.181     | <b>P1C-4MMF P1F-4MMHF</b> |
| Ø63       | 10                   | 50                   | 13/10 | 5    | 32   | 75    | 35/40 | 22.5 | 185  | 56.5                 | 50   | 190/189 | 0.204     | <b>P1C-4NMF P1F-4NMHF</b> |
| Ø80       | 12                   | 63                   | 14/10 | 6    | 41   | 95    | 47/51 | 22.5 | 210  | 72.0                 | 63   | 215/207 | 0.400     | <b>P1C-4PMF P1F-4PMHF</b> |
| Ø100      | 14.5                 | 71                   | 16/15 | 6    | 41   | 115   | 53/51 | 27.5 | 220  | 89.0                 | 75   | 230/217 | 0.539     | <b>P1C-4QMF P1F-4QMHF</b> |
| Ø125      | 16.5                 | 90                   | 25    | 8    | 45   | 140   | 70    | 30   | 250  | 110.0                | 90   | 270     | 1.103     | <b>P1C-4RMF -</b>         |

\*Does not apply to cylinders with piston rod extension, lock units and Twin Rods, see page 38.

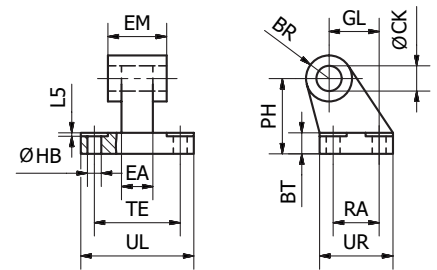
\*\* per bracket

### Pivot Bracket with Rigid Bearing - AB7



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

**Materials:**  
 Pivot bracket: Aluminium (no surface treatment)  
 Bush: Steel and PTFE



#### According to ISO 15552

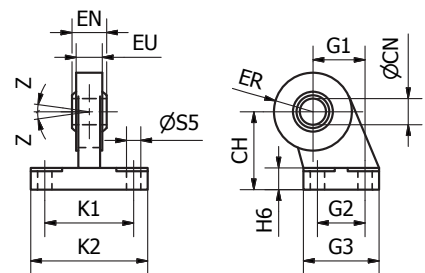
| Cyl.-bore | CK   | HB   | L5   | TE   | UL   | GL   | RA   | EA   | EM   | UR   | PH   | BT   | BR   | Weight | Order code       |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|------------------|
| [mm]      | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg]   |                  |
| Ø32       | 10   | 6.6  | 1.6  | 38   | 51   | 21   | 18   | 10   | 26   | 31   | 32   | 8    | 10.0 | 0.05   | <b>P1C-4KMDB</b> |
| Ø40       | 12   | 6.6  | 1.6  | 41   | 54   | 24   | 22   | 15   | 28   | 35   | 36   | 10   | 11.0 | 0.09   | <b>P1C-4LMDB</b> |
| Ø50       | 12   | 9.0  | 1.6  | 50   | 65   | 33   | 30   | 16   | 32   | 45   | 45   | 12   | 13.0 | 0.16   | <b>P1C-4MMDB</b> |
| Ø63       | 16   | 9.0  | 1.6  | 52   | 67   | 37   | 35   | 16   | 40   | 50   | 50   | 14   | 15.0 | 0.20   | <b>P1C-4NMDB</b> |
| Ø80       | 16   | 11.0 | 2.5  | 66   | 86   | 47   | 40   | 20   | 50   | 60   | 63   | 14   | 15.0 | 0.32   | <b>P1C-4PMDB</b> |
| Ø100      | 20   | 11.0 | 2.5  | 76   | 96   | 55   | 50   | 20   | 60   | 70   | 71   | 17   | 19.0 | 0.53   | <b>P1C-4QMDB</b> |
| Ø125      | 25   | 14.0 | 3.2  | 94   | 124  | 70   | 60   | 30   | 70   | 90   | 90   | 20   | 22.5 | 1.01   | <b>P1C-4RMDB</b> |

### Pivot Bracket with Swivel Bearing - CS7



Intended for use together with clevis bracket AB6.

**Materials:**  
 Pivot bracket: Aluminium (no surface treatment)  
 Swivel bearing acc. to DIN 648K:  
 Hardened steel



#### According to ISO 15552

| Cyl.-bore | CN   | S5   | K1   | K2   | EU   | G1   | G2   | EN   | G3   | CH   | H6   | ER   | Z    | Weight | Order code       |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|------------------|
| [mm]      | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg]   |                  |
| Ø32       | 10   | 6.6  | 38   | 51   | 10.5 | 21   | 18   | 14   | 31   | 32   | 10   | 15   | 4°   | 0.18   | <b>P1C-4KMAF</b> |
| Ø40       | 12   | 6.6  | 41   | 54   | 12.0 | 24   | 22   | 16   | 35   | 36   | 10   | 18   | 4°   | 0.27   | <b>P1C-4LMAF</b> |
| Ø50       | 16   | 9.0  | 50   | 65   | 15.0 | 33   | 30   | 21   | 45   | 45   | 12   | 20   | 4°   | 0.46   | <b>P1C-4MMAF</b> |
| Ø63       | 16   | 9.0  | 52   | 67   | 15.0 | 37   | 35   | 21   | 50   | 50   | 12   | 23   | 4°   | 0.55   | <b>P1C-4NMAF</b> |
| Ø80       | 20   | 11.0 | 66   | 86   | 18.0 | 47   | 40   | 25   | 60   | 63   | 14   | 27   | 4°   | 0.97   | <b>P1C-4PMAF</b> |
| Ø100      | 20   | 11.0 | 76   | 96   | 18.0 | 55   | 50   | 25   | 70   | 71   | 15   | 30   | 4°   | 1.33   | <b>P1C-4QMAF</b> |
| Ø125      | 30   | 13.5 | 94   | 124  | 25.0 | 70   | 60   | 37   | 90   | 90   | 20   | 40   | 4°   | 3.00   | <b>P1C-4RMAF</b> |

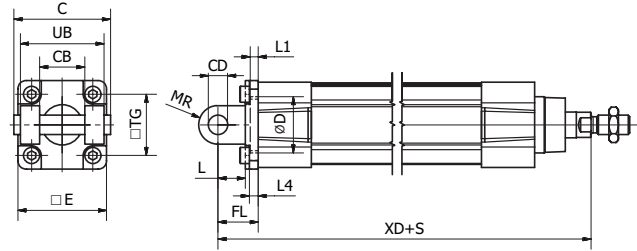
### Clevis Bracket - MP2



Intended for flexible mounting of cylinder.  
Can be combined with clevis bracket MP4 and pivot bracket with rigid bearing AB7.

**Materials:**

Clevis bracket: Aluminium (no surface treatment)  
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 the cylinder.

**According to ISO 15552**

| Cyl.-bore | C    | E    | UB   | CB   | TG   | FL   | L1   | L    | L4   | D    | CD   | MR   | XD*  | Weight | Order code       |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|------------------|
| [mm]      | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg]   |                  |
| Ø32       | 53   | 45   | 45   | 26   | 32.5 | 22   | 5    | 13   | 5.5  | 30   | 10   | 10   | 142  | 0.08   | <b>P1C-4KMTB</b> |
| Ø40       | 60   | 52   | 52   | 28   | 38   | 25   | 5    | 16   | 5.5  | 35   | 12   | 12   | 160  | 0.10   | <b>P1C-4LMTB</b> |
| Ø50       | 68   | 65   | 60   | 32   | 46.5 | 27   | 5    | 16   | 6.5  | 40   | 12   | 12   | 170  | 0.18   | <b>P1C-4MMTB</b> |
| Ø63       | 78   | 75   | 70   | 40   | 56.5 | 32   | 5    | 21   | 6.5  | 45   | 16   | 16   | 190  | 0.24   | <b>P1C-4NMTB</b> |
| Ø80       | 98   | 95   | 90   | 50   | 72   | 36   | 5    | 22   | 10   | 45   | 16   | 16   | 210  | 0.49   | <b>P1C-4PMTB</b> |
| Ø100      | 118  | 115  | 110  | 60   | 89   | 41   | 5    | 27   | 10   | 55   | 20   | 20   | 230  | 0.73   | <b>P1C-4QMTB</b> |
| Ø125      | 139  | 140  | 130  | 70   | 110  | 50   | 7    | 30   | 10   | 60   | 25   | 25   | 275  | 1.37   | <b>P1C-4RMTB</b> |

\*Does not apply to cylinders with piston rod extension, lock units and Twin Rods, see page 38.

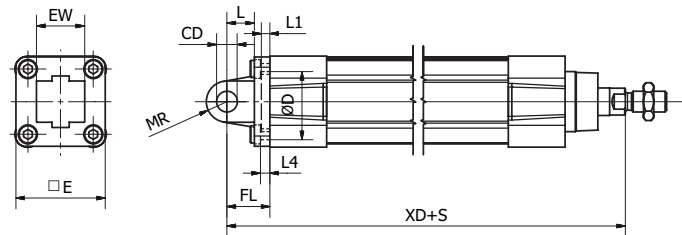
### Clevis Bracket - MP4



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

**Materials:**

Clevis bracket: Aluminium (no surface treatment)  
Bush: Steel and PTFE  
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8



Supplied complete with mounting screws for attachment to the cylinder.

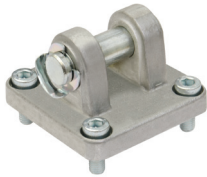
**According to ISO 15552**

| Cyl.-bore | CD   | D    | E    | EW   | FL   | L    | L1   | L4   | MR   | TG   | XD*  | Weight | Order code       |
|-----------|------|------|------|------|------|------|------|------|------|------|------|--------|------------------|
| [mm]      | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg]   |                  |
| Ø32       | 10   | 30   | 47   | 26   | 22   | 12   | 6.5  | 6    | 10.5 | 32.5 | 142  | 0.08   | <b>P1C-4KMEB</b> |
| Ø40       | 12   | 35   | 52   | 28   | 25   | 16   | 5    | 5.5  | 12   | 38   | 160  | 0.11   | <b>P1C-4LMEB</b> |
| Ø50       | 12   | 40   | 65   | 32   | 27   | 16   | 5    | 6.5  | 12   | 46.5 | 170  | 0.18   | <b>P1C-4MMEB</b> |
| Ø63       | 16   | 45   | 78   | 40   | 32   | 21   | 5    | 6.5  | 16   | 56.5 | 190  | 0.28   | <b>P1C-4NMEB</b> |
| Ø80       | 16   | 45   | 95   | 50   | 36   | 22   | 5    | 10   | 16   | 72   | 210  | 0.52   | <b>P1C-4PMEB</b> |
| Ø100      | 20   | 55   | 115  | 60   | 41   | 27   | 5    | 10   | 20   | 89   | 230  | 0.79   | <b>P1C-4QMEB</b> |
| Ø125      | 25   | 60   | 140  | 70   | 50   | 30   | 7    | 10   | 25   | 110  | 275  | 1.46   | <b>P1C-4RMEB</b> |

\*Does not apply to cylinders with piston rod extension, lock units and Twin Rods, see page 38.



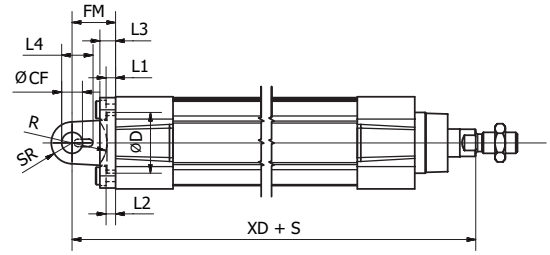
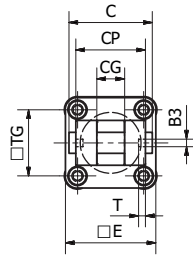
### Clevis Bracket - AB6



Intended for flexible mounting of cylinder. Clevis bracket AB6 can be combined with pivot brackets MP6 and CS7 or swivel rod eye AP6.

**Materials:**

- Clevis bracket: Aluminium (no surface treatment)
- 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 the cylinder.

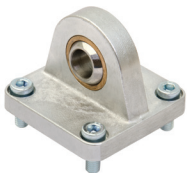


**According to ISO 15552**

| Cyl-bore | B3   | C    | CF   | CG   | CP   | D    | E    | FM   | I2   | T    | R    | L1   | L4   | L3   | SR   | TG   | XD*  | Weight | Order code       |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|------------------|
| [mm]     | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg]   |                  |
| Ø32      | 3.3  | 41   | 10   | 14   | 34   | 30   | 45   | 22   | 5.5  | 3    | 17   | 5    | 16.5 | 9    | 10   | 32.5 | 142  | 0.04   | <b>P1C-4KMCB</b> |
| Ø40      | 4.3  | 48   | 12   | 16   | 40   | 35   | 52   | 25   | 5.5  | 4    | 20   | 5    | 18   | 9    | 12   | 38   | 160  | 0.07   | <b>P1C-4LMCB</b> |
| Ø50      | 4.3  | 54   | 16   | 21   | 45   | 40   | 65   | 27   | 6.5  | 4    | 22   | 5    | 22   | 11   | 14   | 46.5 | 170  | 0.11   | <b>P1C-4MNCB</b> |
| Ø63      | 4.3  | 60   | 16   | 21   | 51   | 45   | 75   | 32   | 6.5  | 4    | 25   | 5    | 22   | 11   | 18   | 56.5 | 190  | 0.19   | <b>P1C-4NMCB</b> |
| Ø80      | 4.3  | 75   | 20   | 25   | 65   | 45   | 95   | 36   | 10.0 | 4    | 30   | 5    | 26   | 14   | 20   | 72   | 210  | 0.38   | <b>P1C-4PMC</b>  |
| Ø100     | 6.3  | 85   | 20   | 25   | 75   | 55   | 115  | 41   | 10.0 | 4    | 32   | 5    | 26   | 14   | 22   | 89   | 230  | 0.61   | <b>P1C-4QMCB</b> |
| Ø125     | 6.3  | 110  | 30   | 37   | 97   | 60   | 140  | 50   | 10.0 | 6    | 42   | 7    | 39   | 20   | 25   | 110  | 275  | 1.10   | <b>P1C-4RMCB</b> |

\*Does not apply to cylinders with piston rod extension, lock units and Twin Rods, see page 38.

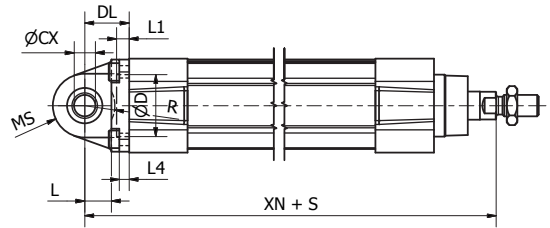
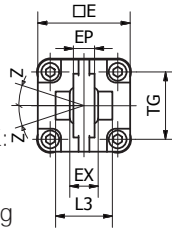
### Swivel Eye Bracket - MP6



Intended for use together with clevis bracket AB6.

**Materials:**

- Bracket: Aluminium (no surface treatment)
- Swivel bearing acc. to DIN 648K: Hardened steel
- Supplied complete with mounting screws for attachment to cylinder.

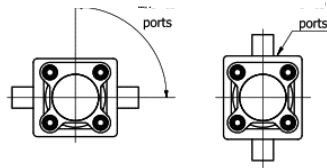
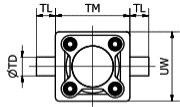


**According to ISO 15552**

| Cyl.-bore | CX   | D    | DL   | E    | EP   | EX   | L    | L1   | L3   | L4   | MS   | R    | TG   | XN*  | Z  | Weight | Order code       |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|--------|------------------|
| [mm]      | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |    | [kg]   |                  |
| Ø32       | 10   | 30   | 22   | 45   | 10.5 | 14   | 12   | 7    | -    | 5.5  | 16   | -    | 32.5 | 142  | 4° | 0.09   | <b>P1C-4KMSB</b> |
| Ø40       | 12   | 35   | 25   | 52   | 12   | 16   | 15   | 7    | -    | 5.5  | 18   | -    | 38   | 160  | 4° | 0.13   | <b>P1C-4LMSB</b> |
| Ø50       | 16   | 40   | 27   | 65   | 15   | 21   | 15   | 7    | 51   | 6.5  | 21   | 19   | 46.5 | 170  | 4° | 0.24   | <b>P1C-4MMSB</b> |
| Ø63       | 16   | 45   | 32   | 75   | 15   | 21   | 20   | 7    | -    | 6.5  | 23   | -    | 56.5 | 190  | 4° | 0.29   | <b>P1C-4NMSB</b> |
| Ø80       | 20   | 45   | 36   | 95   | 18   | 25   | 20   | 9    | 74   | 10   | 28   | 24   | 72   | 210  | 4° | 0.59   | <b>P1C-4PMSB</b> |
| Ø100      | 20   | 55   | 41   | 115  | 18   | 25   | 25   | 9    | 140  | 10   | 30   | 32   | 89   | 230  | 4° | 0.78   | <b>P1C-4QMSB</b> |
| Ø125      | 30   | 60   | 50   | 140  | 25   | 37   | 30   | 9    | -    | 10   | 40   | -    | 110  | 275  | 4° | 1.38   | <b>P1C-4RMSB</b> |

\*Does not apply to cylinders with piston rod extension, lock units and Twin Rods, see page 38.

### Intermediate Trunnion - MT4

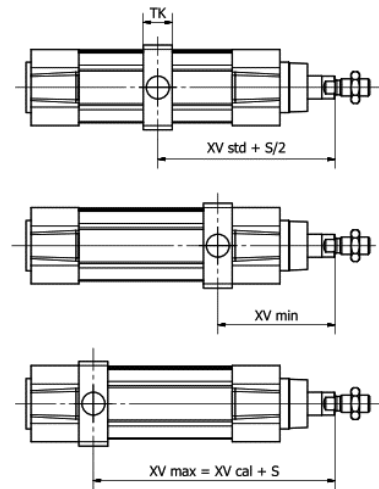


Available for P1F Profile and Tie-Rods versions the MT4 centre trunnion when combined with AT4 pivot brackets is intended for articulated mounting of the cylinder. The trunnion is free so that it can be fixed afterward when the cylinder is at the right place on the machine.

**Material:** Zinc plated steel

Refer to the model code page 16 for ordering cylinder with trunnion.

**Important note:** the rear end cylinder cover needs to be removed for adding the trunnion when ordered as a single kit.



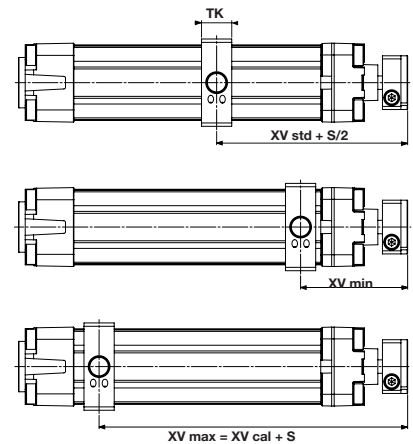
| According to ISO 15552 |                   |                   |                   |                    | P1F-S/K |      |                    |                    | P1F-T/N |      |                    |                    | P1F-L       | P1F-H | Order Code     |           |
|------------------------|-------------------|-------------------|-------------------|--------------------|---------|------|--------------------|--------------------|---------|------|--------------------|--------------------|-------------|-------|----------------|-----------|
| Cyl.- bore             | TL <sub>h14</sub> | TM <sub>h14</sub> | ØTD <sub>e9</sub> | XV* <sub>std</sub> | TK      | UW   | XV* <sub>min</sub> | XV* <sub>cal</sub> | TK      | UW   | XV* <sub>min</sub> | XV* <sub>cal</sub> | Adder to XV |       | Smooth Profile | Tie-Rods  |
| [mm]                   | [mm]              | [mm]              | [mm]              | [mm]               | [mm]    | [mm] | [mm]               | [mm]               | [mm]    | [mm] | [mm]               | [mm]               | [mm]        | [mm]  |                |           |
| Ø32                    | 12                | 50                | 12                | 73                 | 18      | 52   | 65                 | 81                 | 15      | 46   | 63                 | 83                 | 32          | 48    | P1F-4KMY       | P1F-4KMYT |
| Ø40                    | 16                | 63                | 16                | 83                 | 20      | 60   | 74                 | 91                 | 20      | 59   | 74                 | 91                 | 30          | 55    | P1F-4LMY       | P1F-4LMYT |
| Ø50                    | 16                | 75                | 16                | 90                 | 20      | 71   | 82                 | 98                 | 20      | 69   | 82                 | 98                 | 29          | 70    | P1F-4MMY       | P1F-4MMYT |
| Ø63                    | 20                | 90                | 20                | 98                 | 26      | 84   | 91                 | 104                | 25      | 84   | 90                 | 105                | 39          | 70    | P1F-4NMY       | P1F-4NMYT |
| Ø80                    | 20                | 110               | 20                | 110                | 26      | 105  | 100                | 120                | 25      | 102  | 99                 | 121                | 45          | 90    | P1F-4PMY       | P1F-4PMYT |
| Ø100                   | 25                | 132               | 25                | 120                | 32      | 129  | 113                | 127                | 30      | 125  | 112                | 128                | 57          | 92    | P1F-4QMY       | P1F-4QMYT |
| Ø125                   | 25                | 160               | 25                | 145                | 33      | 154  | 134                | 156                | 33      | 155  | 134                | 156                | 56          | 122   | P1F-4RMY       | P1F-4RMYT |

\*Does not apply to cylinders with piston rod extension, lock units and Twin Rods.  
Add to XV<sub>std</sub>, XV<sub>min</sub>, XV<sub>cal</sub> the „adder to XV“.

### Twin Rods Cylinders

| According to ISO 15552 |                   |                   |                   |                    | P1F-R/Q |      |                    |                    | Order Code     |
|------------------------|-------------------|-------------------|-------------------|--------------------|---------|------|--------------------|--------------------|----------------|
| Cyl.- bore             | TL <sub>h14</sub> | TM <sub>h14</sub> | ØTD <sub>e9</sub> | XV* <sub>std</sub> | TK      | UW   | XV* <sub>min</sub> | XV* <sub>cal</sub> | Smooth Profile |
| [mm]                   | [mm]              | [mm]              | [mm]              | [mm]               | [mm]    | [mm] | [mm]               | [mm]               |                |
| Ø32                    | 12                | 50                | 12                | 73                 | 18      | 52   | 62                 | 81                 | P1F-4KMY       |
| Ø40                    | 16                | 63                | 16                | 83                 | 20      | 60   | 71                 | 97                 | P1F-4LMY       |
| Ø50                    | 16                | 75                | 16                | 87                 | 20      | 71   | 79                 | 100                | P1F-4MMY       |
| Ø63                    | 20                | 90                | 20                | 97                 | 26      | 84   | 84                 | 113                | P1F-4NMY       |
| Ø80                    | 20                | 110               | 20                | 102                | 26      | 105  | 91                 | 118                | P1F-4PMY       |
| Ø100                   | 25                | 132               | 25                | 107                | 32      | 129  | 95                 | 124                | P1F-4QMY       |

\*Does not apply to cylinders with piston rod extension.



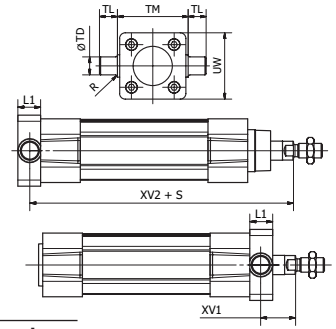
**Flange Trunnion - MT5 / MT6\*\***



Intended for articulated mounting of cylinder. This trunnion can be flange mounted on the front or rear end cover of the cylinder.

**Materials:**

Trunnion: Zinc-plated steel  
 Screws: Zinc-plated steel 8.8  
 Delivered complete with mounting screws for attachment to the cylinder.



**According to ISO 15552**

| Cyl.-bore | L1   | R    | TD <sub>(e9)</sub> | TL <sub>(h14)</sub> | TM <sub>(h14)</sub> | UW   | XV1* | XV2*  | Weight | Order code       |
|-----------|------|------|--------------------|---------------------|---------------------|------|------|-------|--------|------------------|
| [mm]      | [mm] | [mm] | [mm]               | [mm]                | [mm]                | [mm] | [mm] | [mm]  | [kg]   |                  |
| Ø32       | 14   | 1.0  | 12                 | 12                  | 50                  | 46   | 19.5 | 127.0 | 0.14   | <b>P1D-4KMYF</b> |
| Ø40       | 19   | 1.6  | 16                 | 16                  | 63                  | 59   | 21.0 | 144.5 | 0.39   | <b>P1D-4LMYF</b> |
| Ø50       | 19   | 1.6  | 16                 | 16                  | 75                  | 69   | 28.0 | 152.5 | 0.51   | <b>P1D-4MMYF</b> |
| Ø63       | 24   | 1.6  | 20                 | 20                  | 90                  | 84   | 25.5 | 170.0 | 1.04   | <b>P1D-4NMYF</b> |
| Ø80       | 24   | 1.6  | 20                 | 20                  | 110                 | 102  | 34.5 | 186.0 | 1.57   | <b>P1D-4PMYF</b> |
| Ø100      | 29   | 2.0  | 25                 | 25                  | 132                 | 125  | 37.0 | 203.5 | 3.00   | <b>P1D-4QMYF</b> |

\*Does not apply to cylinders with piston rod extension, lock units and Twin Rods.  
 To fit a flange mounted trunnion at the front end cover of a cylinder with lock unit, the piston rod must be extended by L1 length. This is in order to provide the same WH dimensions as for the P1F base cylinder.  
 \*\*only on rear end cap for Twin Rods cylinders.

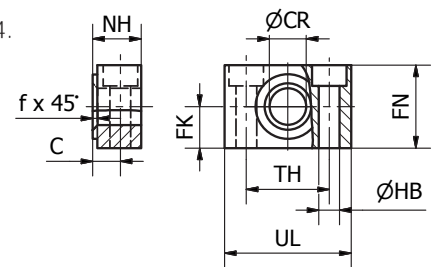
**Pivot Brackets for MT Trunnion - AT4**



Intended for use together with trunnion MT4.

**Materials:**

Pivot bracket: Surface-treated aluminium  
 Bush: Bronze  
 Supplied in pairs



**According to ISO 15552**

| Cyl.-bore | UL   | NH   | TH   | C    | CR   | HB   | FN   | FK   | fx45° | Weight | Order code        |
|-----------|------|------|------|------|------|------|------|------|-------|--------|-------------------|
| [mm]      | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm]  | [kg]   |                   |
| Ø32       | 46   | 18   | 32   | 10.5 | 12   | 6.6  | 30   | 15   | 1.0   | 0.08   | <b>9301054261</b> |
| Ø40       | 55   | 21   | 36   | 12.0 | 16   | 9    | 36   | 18   | 1.6   | 0.14   | <b>9301054262</b> |
| Ø50       | 55   | 21   | 36   | 12.0 | 16   | 9    | 36   | 18   | 1.6   | 0.14   | <b>9301054262</b> |
| Ø63       | 65   | 23   | 42   | 13.0 | 20   | 11   | 40   | 20   | 1.6   | 0.21   | <b>9301054264</b> |
| Ø80       | 65   | 23   | 42   | 13.0 | 20   | 11   | 40   | 20   | 1.6   | 0.21   | <b>9301054264</b> |
| Ø100      | 75   | 28.5 | 50   | 16.0 | 25   | 14   | 50   | 25   | 2.0   | 0.36   | <b>9301054266</b> |
| Ø125      | 75   | 28.5 | 50   | 16.0 | 25   | 14   | 50   | 25   | 2.0   | 0.36   | <b>9301054266</b> |

### 3 and 4 Position Flange - JP1

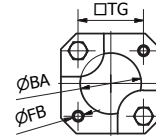
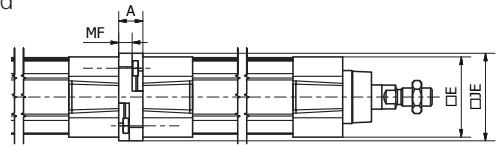


Mounting kit for back to back mounted cylinders, 3 and 4 position cylinders.

**Materials:**

Mounting: Aluminium  
 (no surface treatment)

Mounting screws: Zinc-plated steel 8.8



| Cyl.-bore | A    | ØBA  | E    | ØFB  | JE   | MF   | TG   | Weight | Order code      |
|-----------|------|------|------|------|------|------|------|--------|-----------------|
| [mm]      | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg]   |                 |
| Ø32       | 16   | 30   | 47   | 6.5  | 50   | 9    | 32.5 | 0.04   | <b>P1E-6KB0</b> |
| Ø40       | 16   | 35.5 | 53   | 6.5  | 58   | 9    | 38.0 | 0.07   | <b>P1E-6LB0</b> |
| Ø50       | 20   | 40.5 | 64.5 | 8.5  | 66   | 6    | 46.5 | 0.08   | <b>P1E-6MB0</b> |
| Ø63       | 20   | 45.5 | 75   | 8.5  | 80   | 6    | 56.5 | 0.16   | <b>P1E-6NB0</b> |
| Ø80       | 25   | 45.5 | 94   | 10.5 | 99   | 8    | 72.0 | 0.30   | <b>P1E-6PB0</b> |
| Ø100      | 25   | 55.5 | 111  | 10.5 | 118  | 8    | 89.0 | 0.54   | <b>P1E-6QB0</b> |

### Flexo Coupling - PM5

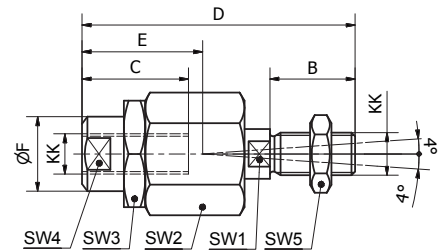


Flexo coupling for articulated mounting of piston rod. Flexo fitting is intended to take up axial angle errors within a range of  $\pm 4^\circ$ .

**Materials:**

Flexo coupling, nut: Zinc-plated steel

Supplied complete with galvanized adjustment nut.



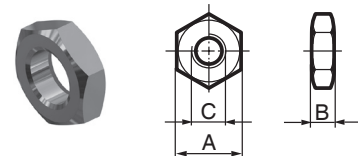
| Cyl. bore | KK       | B    | C    | D    | E    | ØF   | SW1  | SW2  | SW3  | SW4  | SW5  | Weight | Order code      |
|-----------|----------|------|------|------|------|------|------|------|------|------|------|--------|-----------------|
| [mm]      |          | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [kg]   |                 |
| Ø32       | M10x1.25 | 20   | 23   | 70   | 31   | 21   | 12   | 30   | 30   | 19   | 17   | 0.23   | <b>P1C-4KRF</b> |
| Ø40       | M12x1.25 | 24   | 30   | 77   | 31   | 21   | 12   | 30   | 30   | 19   | 19   | 0.23   | <b>P1C-4LRF</b> |
| Ø50       | M16x1.5  | 32   | 32   | 108  | 45   | 33.5 | 19   | 41   | 41   | 30   | 24   | 0.65   | <b>P1C-4MRF</b> |
| Ø63       | M16x1.5  | 32   | 32   | 108  | 45   | 33.5 | 19   | 41   | 41   | 30   | 24   | 0.65   | <b>P1C-4MRF</b> |
| Ø80       | M20x1.5  | 40   | 42   | 122  | 56   | 33.5 | 19   | 41   | 41   | 30   | 30   | 0.71   | <b>P1C-4PRF</b> |
| Ø100      | M20x1.5  | 40   | 42   | 122  | 56   | 33.5 | 19   | 41   | 41   | 30   | 30   | 0.71   | <b>P1C-4PRF</b> |
| Ø125      | M27x2    | 54   | 48   | 147  | 51   | 39   | 24   | 55   | 55   | 32   | 41   | 1.60   | <b>P1C-4RRF</b> |

### Piston Rod Nuts - MR9

P1F cylinders are delivered with a zinc plated steel piston rod nut, in stainless steel for options V & D only.

**According to DIN 439 B**

| Cyl.-bore | A    | B    | C          | Weight | Order code        |                  |
|-----------|------|------|------------|--------|-------------------|------------------|
|           |      |      |            |        | Zinc plated steel | Stainless steel  |
| [mm]      | [mm] | [mm] | [mm]       | [kg]   |                   |                  |
| Ø32       | 17   | 5.0  | M10 x 1.25 | 0.007  | <b>P14-4KRPZ</b>  | <b>P14-4KRPS</b> |
| Ø40       | 19   | 6.0  | M12 x 1.25 | 0.010  | <b>P14-4LRPZ</b>  | <b>P14-4LRPS</b> |
| Ø50       | 24   | 8.0  | M16 x 1.5  | 0.021  | <b>P14-4MRPZ</b>  | <b>P14-4MRPS</b> |
| Ø63       | 24   | 8.0  | M16 x 1.5  | 0.021  | <b>P14-4MRPZ</b>  | <b>P14-4MRPS</b> |
| Ø80       | 30   | 10.0 | M20 x 1.5  | 0.040  | <b>P14-4PRPZ</b>  | <b>P14-4PRPS</b> |
| Ø100      | 30   | 10.0 | M20 x 1.5  | 0.040  | <b>P14-4PRPZ</b>  | <b>P14-4PRPS</b> |
| Ø125      | 41   | 13.5 | M27 x 2.0  | 0.100  | <b>P14-4RRPZ</b>  | <b>P14-4RRPS</b> |



**Material:** Zinc-plated steel

**Material:** Stainless steel A2

\*Weight per item

### Swivel Rod Eye - AP6

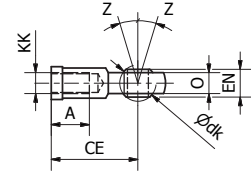
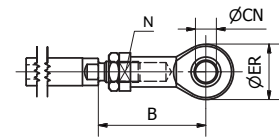


Swivel rod eye for articulated mounting of the cylinder. Swivel rod eye can be combined with clevis bracket AB6.

**Materials:**

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

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



**According to DIN ISO 8139**

| Cyl.-bore<br>[mm] | A<br>[mm] | B <sub>min</sub><br>[mm] | B <sub>max</sub><br>[mm] | CE<br>[mm] | CN<br>[mm] | EN<br>[mm] | ER<br>[mm] | KK       | LE dk | N<br>[mm] | O<br>[mm] | Z   | Weight | Order Code       |                 |
|-------------------|-----------|--------------------------|--------------------------|------------|------------|------------|------------|----------|-------|-----------|-----------|-----|--------|------------------|-----------------|
|                   |           |                          |                          |            |            |            |            |          |       |           |           |     |        | Galvanised steel | Stainless steel |
| Ø32               | 15        | 48.0                     | 55                       | 43         | 10         | 14         | 29         | M10x1.25 | 19.0  | 17        | 10.5      | 13° | 0.07   | <b>P1C-4KRS</b>  | <b>P1S-4JRT</b> |
| Ø40               | 18        | 56.0                     | 62                       | 50         | 12         | 16         | 33         | M12x1.25 | 22.2  | 19        | 12.0      | 13° | 0.11   | <b>P1C-4LRS</b>  | <b>P1S-4LRT</b> |
| Ø50               | 24        | 72.0                     | 80                       | 64         | 16         | 21         | 43         | M16x1.5  | 28.5  | 22        | 15.0      | 15° | 0.21   | <b>P1C-4MRS</b>  | <b>P1S-4MRT</b> |
| Ø63               | 24        | 72.0                     | 80                       | 64         | 16         | 21         | 43         | M16x1.5  | 28.5  | 22        | 15.0      | 15° | 0.21   | <b>P1C-4MRS</b>  | <b>P1S-4MRT</b> |
| Ø80               | 30        | 87.0                     | 97                       | 77         | 20         | 25         | 51         | M20x1.5  | 34.9  | 30        | 18.0      | 15° | 0.38   | <b>P1C-4PRS</b>  | <b>P1S-4PRT</b> |
| Ø100              | 30        | 87.0                     | 97                       | 77         | 20         | 25         | 51         | M20x1.5  | 34.9  | 30        | 18.0      | 15° | 0.38   | <b>P1C-4PRS</b>  | <b>P1S-4PRT</b> |
| Ø125              | 45        | 123.5                    | 137                      | 110        | 30         | 37         | 70         | M27x2    | 50.8  | 41        | 25.0      | 15° | 1.15   | <b>P1C-4RRS</b>  | <b>P1S-4RRT</b> |

### Clevis - AP2

**Galvanised Steel**



**Stainless Steel**

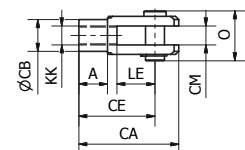
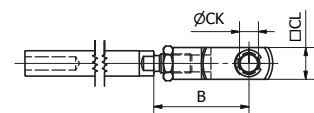


Clevis for articulated mounting of the cylinder.

**Materials:**

Clevis, clip: Zinc-plated steel  
Pin: Hardened steel

Clevis, clip: Stainless steel  
Pin: Stainless steel



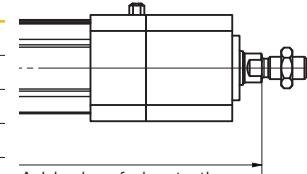
**According to DIN ISO 8140**

| Cyl.-bore<br>[mm] | A<br>[mm] | B <sub>min</sub><br>[mm] | B <sub>max</sub><br>[mm] | CA<br>[mm] | CB<br>[mm] | CE<br>[mm] | CK<br>[mm] | CL<br>[mm] | CM<br>[mm] | KK       | LE<br>[mm] | O<br>[mm] | Weight<br>[kg] | Order code       |                 |
|-------------------|-----------|--------------------------|--------------------------|------------|------------|------------|------------|------------|------------|----------|------------|-----------|----------------|------------------|-----------------|
|                   |           |                          |                          |            |            |            |            |            |            |          |            |           |                | Galvanised steel | Stainless steel |
| Ø32               | 15        | 45                       | 52                       | 52         | 18         | 40         | 10         | 20         | 10         | M10x1.25 | 20         | 25        | 0.09           | <b>P1C-4KRC</b>  | <b>P1S-4JRD</b> |
| Ø40               | 18        | 54                       | 60                       | 62         | 20         | 48         | 12         | 24         | 12         | M12x1.25 | 24         | 31        | 0.15           | <b>P1C-4LRC</b>  | <b>P1S-4LRD</b> |
| Ø50               | 24        | 72                       | 80                       | 83         | 26         | 64         | 16         | 32         | 16         | M16x1.5  | 32         | 40        | 0.34           | <b>P1C-4MRC</b>  | <b>P1S-4MRD</b> |
| Ø63               | 24        | 72                       | 80                       | 83         | 26         | 64         | 16         | 32         | 16         | M16x1.5  | 32         | 40        | 0.34           | <b>P1C-4MRC</b>  | <b>P1S-4MRD</b> |
| Ø80               | 30        | 90                       | 100                      | 105        | 34         | 80         | 20         | 40         | 20         | M20x1.5  | 40         | 50        | 0.67           | <b>P1C-4PRC</b>  | <b>P1S-4PRD</b> |
| Ø100              | 30        | 90                       | 100                      | 105        | 34         | 80         | 20         | 40         | 20         | M20x1.5  | 40         | 50        | 0.67           | <b>P1C-4PRC</b>  | <b>P1S-4PRD</b> |
| Ø125              | 40        | 123.5                    | 137                      | 148        | 48         | 110        | 30         | 55         | 30         | M27x2.0  | 54         | 65        | 1.80           | <b>P1C-4RRC</b>  | <b>P1S-4RRD</b> |

For some versions of P1F cylinders mounting dimensions previously shown and marked \* require adjustment. P1F cylinders with rod locks have extended piston rods so some mounting dimensions will differ from those for standard product. For rod lock versions then an additional length shown in the tables below should be added.

**Adder to the dimension for P1F-L with rod lock**

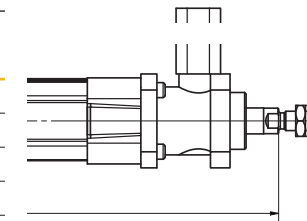
| Cyl.-bore<br>[mm] | MF1/MF2<br>ZB ZF |  | Mounting type |           |           |           |           | MT5/MT6<br>XV1 XV2 |  |
|-------------------|------------------|--|---------------|-----------|-----------|-----------|-----------|--------------------|--|
|                   |                  |  | MS1<br>SA XA  | MP6<br>XN | MP2<br>XD | MP4<br>XD | AB6<br>XD |                    |  |
| Ø32               |                  |  |               | +32 [mm]  |           |           |           |                    |  |
| Ø40               |                  |  |               | +30 [mm]  |           |           |           |                    |  |
| Ø50               |                  |  |               | +29 [mm]  |           |           |           |                    |  |
| Ø63               |                  |  |               | +39 [mm]  |           |           |           |                    |  |
| Ø80               |                  |  |               | +45 [mm]  |           |           |           |                    |  |
| Ø100              |                  |  |               | +57 [mm]  |           |           |           |                    |  |
| Ø125              |                  |  |               | +56 [mm]  |           |           |           |                    |  |



Adder is referring to the piston rod flat

**Adder to the dimension for P1F-H with rod lock**

| Cyl.-bore<br>[mm] | MF1/MF2<br>ZB ZF |  | Mounting type |           |           |           |           | MT5/MT6<br>XV1 XV2 |  |
|-------------------|------------------|--|---------------|-----------|-----------|-----------|-----------|--------------------|--|
|                   |                  |  | MS1<br>SA XA  | MP6<br>XN | MP2<br>XD | MP4<br>XD | AB6<br>XD |                    |  |
| Ø32               |                  |  |               | +48 [mm]  |           |           |           |                    |  |
| Ø40               |                  |  |               | +55 [mm]  |           |           |           |                    |  |
| Ø50               |                  |  |               | +70 [mm]  |           |           |           |                    |  |
| Ø63               |                  |  |               | +70 [mm]  |           |           |           |                    |  |
| Ø80               |                  |  |               | +90 [mm]  |           |           |           |                    |  |
| Ø100              |                  |  |               | +92 [mm]  |           |           |           |                    |  |
| Ø125              |                  |  |               | +122 [mm] |           |           |           |                    |  |

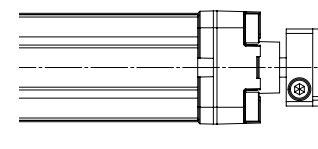


Adder is referring to the piston rod flat

For P1F cylinders with a piston rod extension then an addition length equal to the piston rod extension should be added. P1F cylinders with twin rods also have some mounting dimensions that differ from those for standard product. For these versions on bores 50 – 100mm then the length shown in the table below should be subtracted.

**Adder to the dimension for P1F-R with twin-rods**

| Cyl.-bore<br>[mm] | MF1/MF2<br>ZB ZF |  | Mounting type |           |           |           |           | MT5/ MT6<br>XV1 XV2 |  |
|-------------------|------------------|--|---------------|-----------|-----------|-----------|-----------|---------------------|--|
|                   |                  |  | MS1<br>SA XA  | MP6<br>XN | MP2<br>XD | MP4<br>XD | AB6<br>XD |                     |  |
| Ø32               |                  |  |               | +0 [mm]   |           |           |           |                     |  |
| Ø40               |                  |  |               | +0 [mm]   |           |           |           |                     |  |
| Ø50               |                  |  |               | -3 [mm]   |           |           |           |                     |  |
| Ø63               |                  |  |               | -1 [mm]   |           |           |           |                     |  |
| Ø80               |                  |  |               | -8 [mm]   |           |           |           |                     |  |
| Ø100              |                  |  |               | -13 [mm]  |           |           |           |                     |  |



Adder is referring to the front face of the flange

### Drop-in sensors

The P8S 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.



### Electronic sensors

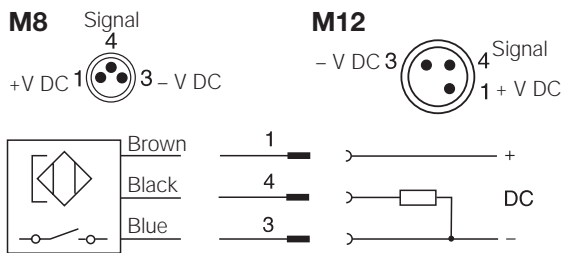
The electronic sensors are "Solid State", i.e. they have no moving parts at all. They are provided with short-circuit protection and transient protection as standard. The built-in electronics make the sensors suitable for applications with high on and off switching frequency, and where very long service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

### Reed sensors

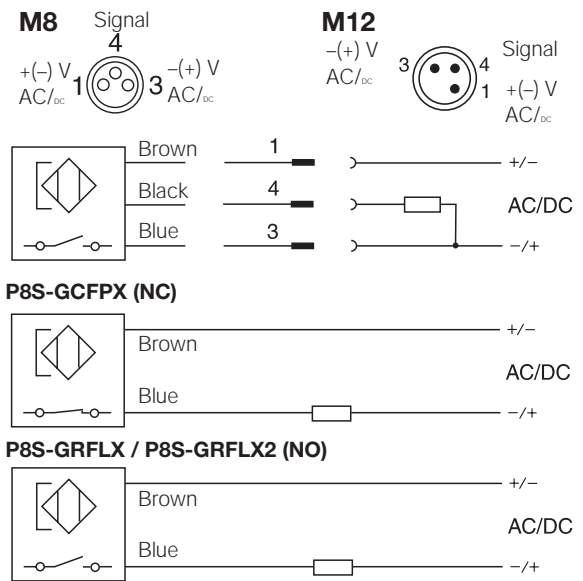
The sensors are based on proven reed switches, which offer reliable function in many applications. Simple installation, a protected position on the cylinder and clear LED indication.

|   | Electronic  | Reed  |
|---|---|---|
| Cylinder type:                          | Profile with T-slot   |   |
| Cylinder type with adaptor:             | Profile with S-slot (dovetail)   Tie rods   Round cylinders                 |   |
| Installation:                           | Drop-in. Fixed by 1.5 mm stainless steel allen key or flathead screwdriver. |   |
| Housing length:                         | 34.7 mm   31.5 mm (ATEX)  |   |
| Output Type / Function:                 | PNP, Normally Open (NO)   NPN, Normally Closed (NC)                         | Normally Open (NO)   Normally Closed (NC)                                     |
| Switching (on/off) switching frequency: | ≤1000 Hz  | ± 400 Hz  |
| Degree of Protection (IP):              | IP67  |   |
| Power consumption:                      | ≤ 10 mA   | -   |
| Input Supply Voltage Range:             | 10 to 30 V DC   18 to 30 V DC (ATEX)  | 10 to 30   10 to 120   10 to 230 V AC/DC (2-wire)   10 to 30 V AC/DC (3-wire) |
| Voltage Drop:                           | ≤ 2,2 V   | ≤ 3,5 V (2-wire NO)   ≤ 0,1 V (3-wire)   ≤ 0,1 V (2-wire NC)                  |
| Continuous output current:              | ≤ 100 mA   ≤ 70 mA (ATEX)   | ≤ 100 mA (2-wire NO)   ≤ 500 mA (3-wire)   ≤ 500 mA (2-wire NC)               |
| Switching capacity:                     | -   | ≤ 10 W  |
| Hazardous area category:                | 3G / 3D (ATEX)  | -   |
| Protection Class:                       | III   | II (2-wire)   III (3-wire)  |
| Response Sensitivity:                   | 2.65.. 2.95 mT  | 2.1.. 3.4 mT  |
| Overrun Distance:                       | 3 mm  | 9 mm  |
| Histeresis:                             | ≤ 0.5 mT  | ≤ 0.2 mT  |
| Repeatability:                          | ≤ 0.1 mT  | -   |
| Reverse Polarity Protection:            | Yes   | -   |
| Short-circuit Protection:               | Yes   | -   |
| Power-up Pulse Protection:              | Yes   | -   |
| Ambiant Operating Temperature Range:    | -25 to +75 °C (PUR cable)   -20 to +70°C (PVC cable)   -20 to +45°C (ATEX)  |   |
| Shock and Vibration resistance:         | 30 g 11 ms / 10 ... 55 Hz, 1 mm   |   |
| EMC:                                    | According to EN 60947-5-2   |   |
| Industry Standard:                      | CE   C UL US   RoHs   Ex  | CE   C UL US   RoHs   |
| UL Certification:                       | On request  |   |
| Housing Material:                       | Plastic polyamid PA12 (ATEX)   PA66   | Plastic polyamid PA12 (2-wire 240V)   PA66                                    |
| Cable Specification:                    | PUR (Polyurethane)   PVC (Polyvinyl Chloride)                               |   |
| Conductor Cross-Section:                | 0.14 mm <sup>2</sup> (3 wire)   | 0.14 mm <sup>2</sup> (3-wire)   0.12 mm <sup>2</sup> (2-wire)                 |
| Colour of LED:                          | Yellow  |   |
| Connection Style:                       | M8 snap-in   M8R (knurled nuts)   M12 (knurled nuts)   None (Flying lead)   |   |

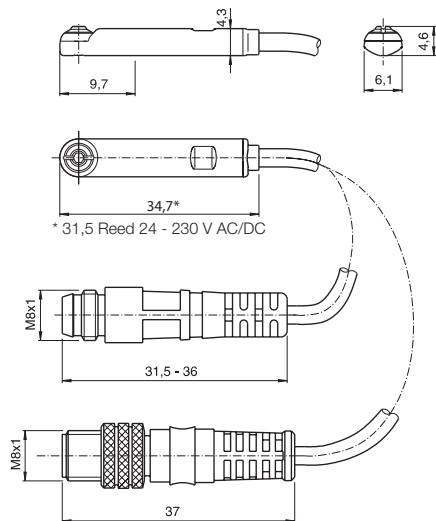
**Electronic sensors**



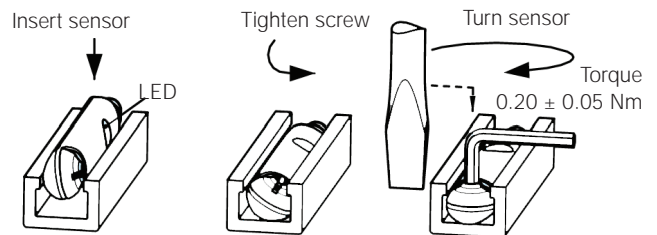
**Reed sensors**



**Dimensions [mm]**



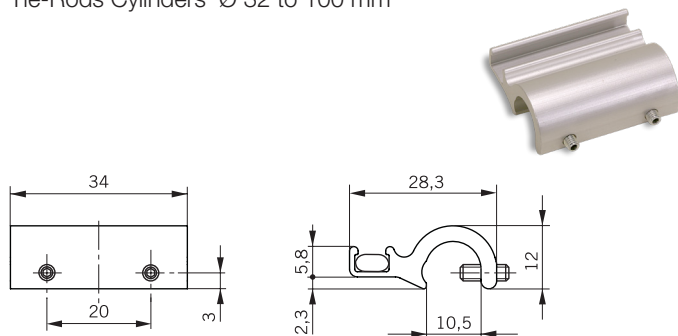
**Sensor Installation**



**Brackets for sensors for Tie-Rods version**

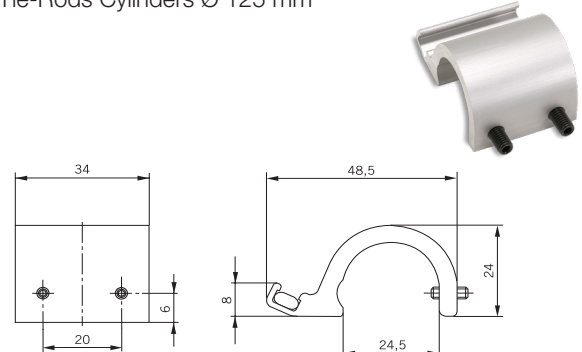
**P8S-TMA07**

(anodised aluminium, zinc plated screws)  
 Tie-Rods Cylinders Ø 32 to 100 mm



**P8S-TMA08**

(anodised aluminium, zinc plated screws)  
 Tie-Rods Cylinders Ø 125 mm





**PDE3570TCEN**  
**Pneumatic Cylinders ISO 15552**

**Sensors**

| Output/function                       | Cable/connector                                  | Weight [kg] | Order code        |
|---------------------------------------|--|-------------|-------------------|
| <b>Electronic sensors, 10-30 V DC</b> |  |             |                   |
| PNP type, normally open               | 0.27 m PUR cable and 8 mm snap-in male connector | 0.007       | <b>P8S-GPSHX</b>  |
| PNP type, normally open               | 0.27 m PUR cable and M12 screw male connector    | 0.015       | <b>P8S-GPMHX</b>  |
| PNP type, normally open               | 3 m PVC cable without connector                  | 0.030       | <b>P8S-GPFLX</b>  |
| PNP type, normally open               | 10 m PVC cable without connector                 | 0.110       | <b>P8S-GPFTX</b>  |
| <b>Reed sensors, 10-30 V AC/DC</b>    |  |             |                   |
| Normally open                         | 0.27 m PUR cable and 8 mm snap-in male connector | 0.007       | <b>P8S-GSSHX</b>  |
| Normally open                         | 0.27 m PUR cable and M12 screw male connector    | 0.015       | <b>P8S-GSMHX</b>  |
| Normally open                         | 3 m PVC cable without connector                  | 0.030       | <b>P8S-GSFLX</b>  |
| Normally open                         | 10 m PVC cable without connector                 | 0.110       | <b>P8S-GSFTX</b>  |
| Normally closed                       | 5 m PVC cable without connector without LED      | 0.050       | <b>P8S-GCFPX</b>  |
| <b>Reed sensors, 10-120 V AC/DC</b>   |  |             |                   |
| Normally open                         | 3 m PVC cable without connector                  | 0.030       | <b>P8S-GRFLX</b>  |
| <b>Reed sensors, 24-230 V AC/DC</b>   |  |             |                   |
| Normally open                         | 3 m PVC cable without connector                  | 0.030       | <b>P8S-GRFLX2</b> |

**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 screw connectors and meet protection class IP 65.



**Technical data**

Operating voltage: max. 32V AC/DC  
 Operating current per contact: max. 4 A  
 Connection cross section: 0.25.... 0.5 mm<sup>2</sup> (conductor diameter min 0.1)  
 Protection class: IP65 And IP 67 when plugged and screwed down (EN 60529)  
 Temperature range: - 25... +85°C

| Connector           | Weight [kg] | Order Code       |
|---------------------|-------------|------------------|
| M8 screw connector  | 0.018       | <b>P8CS0803J</b> |
| M12 screw connector | 0.022       | <b>P8CS1204J</b> |

**Connecting cables**

| Description  | Weight [g] | For Product Series          | Order Code        |
|--|------------|-----------------------------|-------------------|
| Cable flex PVC 3 meter with 8mm snap-in connector / flying leads   | 70         | P8S Sensors with M8         | <b>9126344341</b> |
| Cable flex PVC 10 meter with 8mm snap-in connector / flying leads  | 210        | P8S Sensors with M8         | <b>9126344342</b> |
| Cable PUR 3 meter with 8mm snap-in female connector / flying leads | 70         | P8S Sensors with M8         | <b>9126344345</b> |
| Cable flex PUR 10 meter with 8mm snap-in connector / flying leads  | 210        | P8S Sensors with M8         | <b>9126344346</b> |
| Cable PVC 2.5 meter with M8 screw connector / flying leads         | 60         | P8S Sensors with knurled M8 | <b>KC3102</b>     |
| Cable PVC 5 meter with M8 screw female connector / flying leads    | 120        | P8S Sensors with knurled M8 | <b>KC3104</b>     |

## Continuous Position Sensing

Analogue signal or IO-Link communication for linear cylinders many applications require more than just end of stroke sensing of an actuator, but traditional methods of continuous sensing are expensive and difficult to implement. Parker's CPS series of the P8S sensor family enables quick, easy, precise, and contactless position sensing of a piston. This can be installed on a standard linear actuator and offers an outstanding price to performance ratio.

### Product Features:

- Continuous position sensing
- IO-Link communication with M12 connector
- No modification to the actuator
- Analogue version with M8 connector
- 5 sizes with sensing ranges from 32 mm to 256 mm
- IP67 design suitable for any industrial application
- Yellow teach button for easy set-up

### Technical specification:

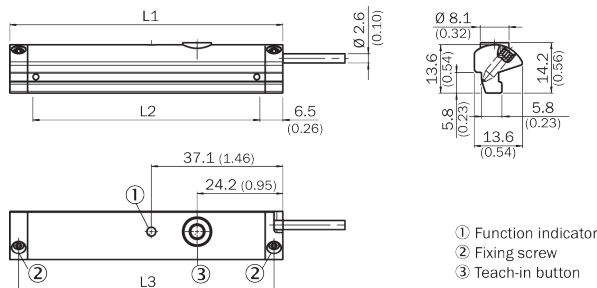
- 1 ms sampling rate
- 0.03% full scale resolution
- 0.06% full scale repeatability
- 0.3 mm Linearity error

### How it installs:

The Parker CPS requires the use of a magnetic piston. The product will fit T-slot cylinders without any additional mounting hardware.

1. Pivot the sensor into the slot
2. Teach the CPS unit the desired measuring range
3. Tighten set screws

### Dimensions in mm (inch)

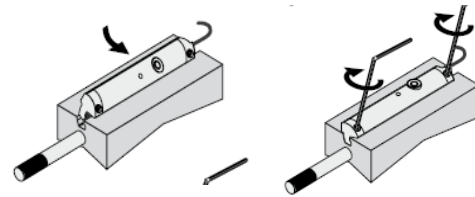


### How it connects:

Analogue version has a M8 connector and a voltage output of 0-10V as well as a current output of 4-20mA. IO-Link version has a M12 connector and transmits position via 2 bytes of process input data and also allows for parameter control of measuring range and locking of the teach button. It can be controlled by Class A or Class B IO-Link Masters.

### How it works:

The CPS product detects the position of an actuator via the magnet on the piston. The sensor settings can easily be adjusted during installation using the yellow teach button or during operation over the IO-Link communication. This upgrades the functionality of the pneumatic actuator by making it more intelligent and versatile in support of the Industry 4.0 initiative.



| Order Code |      |     |                  |                  |
|------------|------|-----|------------------|------------------|
| L1         | L2 * | L3  | Analogue         | IO-Link          |
| 45         | 32   | 40  | <b>P8SAGACHA</b> | <b>P8SAGHMHA</b> |
| 77         | 64   | 72  | <b>P8SAGACHB</b> | <b>P8SAGHMHB</b> |
| 141        | 128  | 136 | <b>P8SAGACHD</b> | <b>P8SAGHMHD</b> |
| 205        | 192  | 200 | <b>P8SAGACHF</b> | <b>P8SAGMHMF</b> |
| 269        | 256  | 264 | <b>P8SAGACHH</b> | <b>P8SAGMHMH</b> |

\*L2 equal to the measuring range

## CPS Sensors

### Drop in T-slot, Turn, Screw, it's done

| Output   | Measuring length | Configuration Option              | Order Code       | Weight [g] | For product series   |
|----------|------------------|-----------------------------------|------------------|------------|----------------------|
| Analogue | 32 mm            | Teach Button                      | <b>P8SAGACHA</b> | 16         | With T-slot groove * |
|          | 64 mm            |                                   | <b>P8SAGACHB</b> | 26         |                      |
|          | 128 mm           |                                   | <b>P8SAGACHD</b> | 46         |                      |
|          | 192 mm           |                                   | <b>P8SAGACHF</b> | 66         |                      |
|          | 256 mm           |                                   | <b>P8SAGACHH</b> | 86         |                      |
| IO-Link  | 32 mm            | Teach Button or IO-Link parameter | <b>P8SAGHMHA</b> | 20         | With T-slot groove * |
|          | 64 mm            |                                   | <b>P8SAGHMHB</b> | 30         |                      |
|          | 128 mm           |                                   | <b>P8SAGHMHD</b> | 50         |                      |
|          | 192 mm           |                                   | <b>P8SAGMHMF</b> | 70         |                      |
|          | 256 mm           |                                   | <b>P8SAGMHMH</b> | 90         |                      |

\* Required magnetic field sensitivity: 3mT / -2 mT (Analogue) / 3mT (IO-Link)

**Note:** PUR cable with M12 (IO-Link) or M8 (Analogue) male connector knurled nut, 4-pin, 0,3 meter length. Please consult for measuring range 96, 160 & 224 mm.

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