



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



Pneumatic cylinders

Series P1E

According to ISO and VDMA

Cylinder diameters 160 and 200 mm


Catalogue PDE2580TCUK-ul. May 2009




ENGINEERING YOUR SUCCESS.

| Features | Air cylinder | Hydraulic cylinder | Electro mechanical actuators |
|---|--------------|--------------------|------------------------------|
| Overload safe | *** | *** | * |
| Easy to limit force | *** | *** | * |
| Easy to vary speed | *** | *** | * |
| Speed | *** | ** | ** |
| Reliability | *** | *** | *** |
| Robustness | *** | *** | * |
| Installation cost | *** | * | ** |
| Ease of service | *** | ** | * |
| Safety in damp environments | *** | *** | * |
| Safety in explosive atmospheres | *** | *** | * |
| Safety risk with electrical installations | *** | *** | * |
| Risk of oil leak | *** | * | *** |
| Clean, hygienic | *** | ** | * |
| Standardised measurements | *** | *** | * |
| Service life | *** | *** | * |
| Hydraulic system required | *** | * | *** |
| Weight | ** | ** | ** |
| Purchase price | *** | ** | * |
| Power density | ** | *** | * |
| Noise level during operation | ** | *** | ** |
| High force for size | ** | *** | * |
| Positioning possibilities | * | *** | *** |
| Total energy consumption | * | ** | *** |
| Service interval | * | ** | *** |
| Compressor capacity required | * | *** | *** |


* = good, **=average, ***=excellent



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



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



WARNING

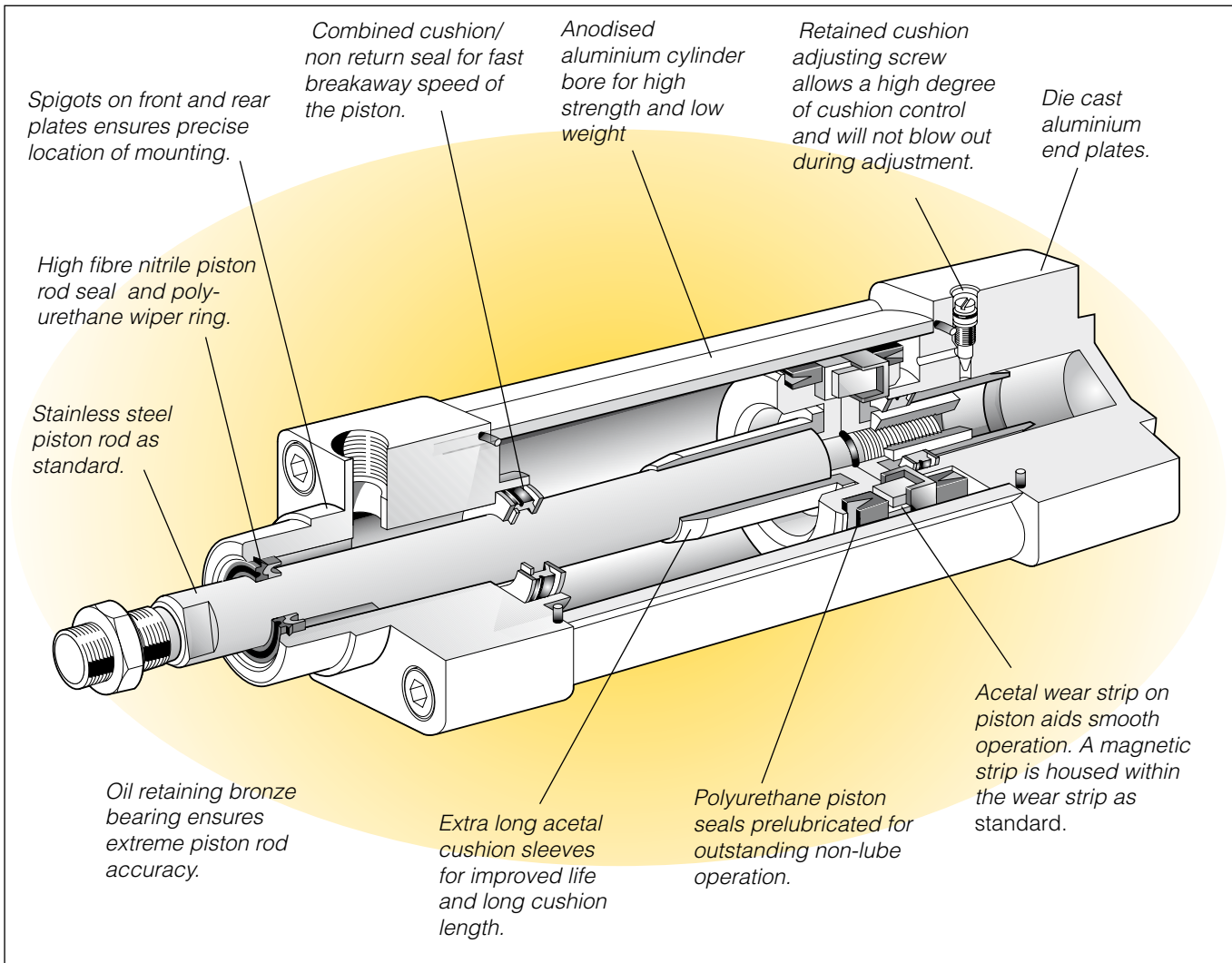
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ISO Cylinders – P1E

The P1E Series of I.S.O. cylinders are precision made to the most exacting standards to provide the finest pneumatic cylinders available with the widest choice of options.

Installation dimensions according to international ISO/VDMA standards

The new P1E complies with the current ISO 6431, ISO 15552, VDMA 24562 and AFNOR installation dimension standards. For customer reassurance world-wide.

High quality

As with our other products, the P1E has been developed with quality in all aspects – specification, design, planning, purchasing, production, distribution and service. We have been certified under the ISO 9001 QA standard since 1992. Quality in all our products and services is our prime aim.

Adaptability for use with electronics

P1E Cylinders are equipped as standard with magnetic pistons for position sensing. A full range of sensors enables the cylinders to be integrated into the most advanced automation systems. The sensors can be fitted at any position along the cylinder stroke.

Design

In the development of P1E cylinders, great emphasis was placed on the importance of long service life, and operation with unlubricated air, characteristics essential for applications in demanding environments.

Long service life

Proven sealing systems and pre-lubricated bearings, together with surface smoothness and precise tolerances in all constituent parts, provide long, safe and reliable service life.

Effective cushioning

A long cushioning zone and simple, adjustable cushion screw facilitates fine adjustment and permits a large mass, high velocity and short cycle time.

Anodised cylinder barrel

The basic P1E Series cylinder features anodised cylinder tubes as standard and are pre lubricated on assembly. The cylinder bore finish and seal quality are such that in most applications they can operate without lubrication for the normal service life of a pneumatic cylinder.

High temperature cylinders

For high temperature applications, we can offer cylinders with high quality fluorocarbon rubber seals and P.T.F.E. wear strips.

Magnetic cylinders

Available for use with electronic or reed sensors, the magnetic versions feature an encapsulated polymer magnet. This protects the magnet from wear and maintains low friction.

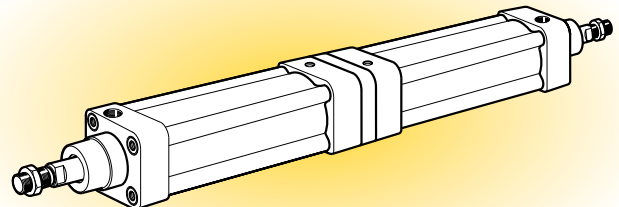
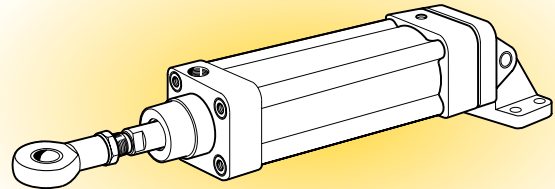
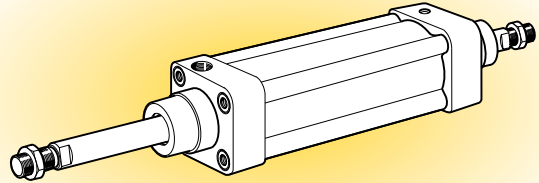
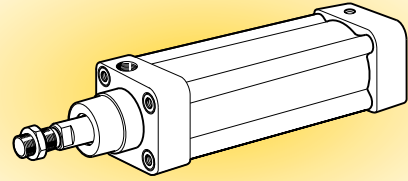
Variants

In addition to the basic versions, a number of special variants of the Parker P1E cylinders are available. The special variants are designed to meet the most exacting demands. The available options include:

- Non-standard stroke lengths
- Choice of two different piston-rod materials
- Extended piston rods
- Through piston rod
- High temperature cylinder versions for use in ambient temperatures up to +180 °C
- Factory fitted mountings

Complete range of mountings

A complete range of surface-treated mountings according to ISO, VDMA and AFNOR are available as accessories.



Cylinder forces, double acting variants

| Cyl. bore/ pist. rod mm | Stroke | Piston area | | Max theoretical force in N (bar) | | | | | | | | |
|----------------------------|--------|-----------------|------|----------------------------------|------|-------|-------|--------------|-------|-------|-------|-------|
| | | cm ² | | 1,0 | 2,0 | 3,0 | 4,0 | 5,0 | 6,0 | 7,0 | 8,0 | 9,0 |
| 160/40 | + | 201,1 | 2011 | 4021 | 6032 | 8042 | 10053 | 12064 | 14074 | 16085 | 18096 | 20106 |
| | - | 188,5 | 1885 | 3770 | 5655 | 5740 | 9425 | 11310 | 13195 | 15080 | 16965 | 18850 |
| 200/40 | + | 314,2 | 3142 | 6283 | 9425 | 12566 | 15708 | 18850 | 21991 | 25133 | 28274 | 31416 |
| | - | 301,6 | 3016 | 6032 | 9048 | 12064 | 15080 | 18096 | 21112 | 24127 | 27043 | 30159 |

+ = Outward stroke
- = Return stroke

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

Main data: P1E

| Cylinder beteckning | Cylinder bore area | | Piston rod dia. area | | Piston rod thread | Total mass at 0 mm stroke | | Mass moving parts at 0 mm stroke | | Air con- sump- tion | Conn. thread |
|------------------------|-----------------------|-----------------|-------------------------|-----------------|----------------------|---------------------------------|---|--|---|---------------------------|-----------------|
| | mm | cm ² | mm | cm ² | | kg | Supplement per 10 mm stroke kg | kg | Supplement per 10 mm stroke kg | | |
| P1E-T160 | 160 | 201,1 | 40 | 12,6 | M36x2 | 11,71 | 0,228 | 11,71 | 0,228 | 2,814 ¹⁾ | G3/4 |
| P1E-T200 | 200 | 314,2 | 40 | 12,6 | M36x2 | 15,45 | 0,252 | 15,45 | 0,252 | 4,396 ¹⁾ | G3/4 |

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

Material specification

| | |
|--------------------|----------------------------------|
| Piston rod | Stainless steel, X 10 CrNiS 18 9 |
| Piston rod seal | Polyurethane |
| Piston rod bearing | Oil Retaining Bronze |
| End cover | Black anodised aluminium |
| Tie Rods | Zinc Plated Steel |
| Tie Rod Nuts | Zinc Plated Steel |
| O-ring, internal | Nitrile rubber, NBR |
| Cylinder barrel | Hard anodised aluminium |
| Piston | Aluminium |
| Piston seal | Polyurethane |
| Piston bearing | Polyurethane |
| Magnetic ring | Plastic bound magnetic material |

Variants:

High-temperature version, type F:

| | |
|-----------------|--------------------------|
| Piston rod seal | Fluorocarbon rubber, FPM |
| Piston seal | Fluorocarbon rubber, FPM |
| O-rings | Fluorocarbon rubber, FPM |

Operation data

| | |
|---------------------|--------------------------|
| Working pressure | Max 10 bar |
| Working temperature | max +70 °C min -10 °C |
| High temp version | max +180 °C min 0 °C |

Greased for life, does not normally need additional lubrication. If extra lubrication is given, this must always be continued.

Working medium, air quality

Working medium Dry, filtered compressed air to ISO 8573-1 class 3.4.3.

Recommended air quality for cylinders

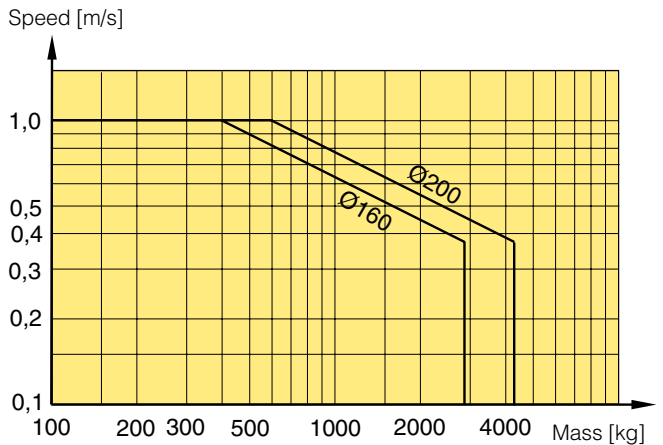
For best possible service life and trouble-free operation, ISO 8573-1 quality class 3.4.3 should be used. This means 5 µm filter (standard filter) dew point +3 °C for indoor operation (a lower dew point should be selected for outdoor operation) and oil concentration 1.0 mg oil/m³, which is what a standard compressor with a standard filter gives.

Cushioning characteristics

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

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



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



ISO 8573-1 quality classes

| Quality class | Pollution particle size (µm) | max concentration (mg/m ³) | Water max. press. dew point (°C) | Oil max concentration (mg/m ³) |
|---------------|------------------------------|--|----------------------------------|--|
| 1 | 0,1 | 0,1 | -70 | 0,01 |
| 2 | 1 | 1 | -40 | 0,1 |
| 3 | 5 | 5 | -20 | 1,0 |
| 4 | 15 | 8 | +3 | 5,0 |
| 5 | 40 | 10 | +7 | 25 |
| 6 | - | - | +10 | - |

Order key

| | | | | | | |
|-------------------------------|--|-------------------------|--|-------------------------|---|-------------------------------------|
| P1E-T | | 160 | | M | S - 0250 | |
| Cylinder version | | Cylinder bore mm | | Sealing material | | Stroke length |
| T | Tie rod | 160 | | S | Standard seals, magnetic piston | 0025 |
| D | Centre trunnion, tie rod | 200 | | A | Standard seals, non magnetic piston | 0050 |
| Cylinder type/function | | | | F | High temperature seals, non magnetic piston | 0080 |
| M |  Double acting cushioned | | | | | 0100 |
| F |  Double acting, through rod cushioned | | | | | 0125 |
| | | | | | | 0160 |
| | | | | | | 0200 |
| | | | | | | 0250 |
| | | | | | | 0320 |
| | | | | | | Standard stroke length in mm |

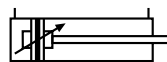
Stroke length

Standard stroke lengths in mm according to ISO 4393. Special stroke lengths up to 2700 mm

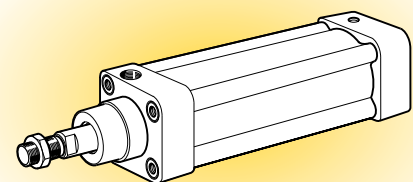
| Cylinder designation | Cylinder bore | ● Standard stroke length in mm | | | | | | | | Non standard stroke length |
|----------------------|---------------|--------------------------------|----|----|-----|-----|-----|-----|-----|----------------------------|
| | | 25 | 50 | 80 | 100 | 125 | 160 | 200 | 250 | |
| Double acting | | | | | | | | | | |
| P1E-T160MS-xxxx | 160 | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| P1E-T200MS-xxxx | 200 | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Double-acting P1E-T

Piston rod Ø40 mm, thread M36x2



| Cyl. bore mm | Stroke mm | Weight kg | Order code |
|--------------------------|-----------|-----------|------------------------|
| 160 Conn. G3/4 | 25 | 12,28 | P1E-T160MS-0025 |
| | 50 | 12,85 | P1E-T160MS-0050 |
| | 80 | 13,53 | P1E-T160MS-0080 |
| | 100 | 13,99 | P1E-T160MS-0100 |
| | 125 | 14,56 | P1E-T160MS-0125 |
| | 160 | 15,36 | P1E-T160MS-0160 |
| | 200 | 16,27 | P1E-T160MS-0200 |
| | 250 | 17,41 | P1E-T160MS-0250 |
| | 320 | 19,01 | P1E-T160MS-0320 |
| 200 Conn. G3/4 | 25 | 16,08 | P1E-T200MS-0025 |
| | 50 | 16,71 | P1E-T200MS-0050 |
| | 80 | 17,47 | P1E-T200MS-0080 |
| | 100 | 17,97 | P1E-T200MS-0100 |
| | 125 | 18,60 | P1E-T200MS-0125 |
| | 160 | 19,48 | P1E-T200MS-0160 |
| | 200 | 20,49 | P1E-T200MS-0200 |
| | 250 | 21,75 | P1E-T200MS-0250 |
| | 320 | 23,51 | P1E-T200MS-0320 |



Non-standard stroke lengths on request

Guide for selecting suitable tubing

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

The following is the basic principle:

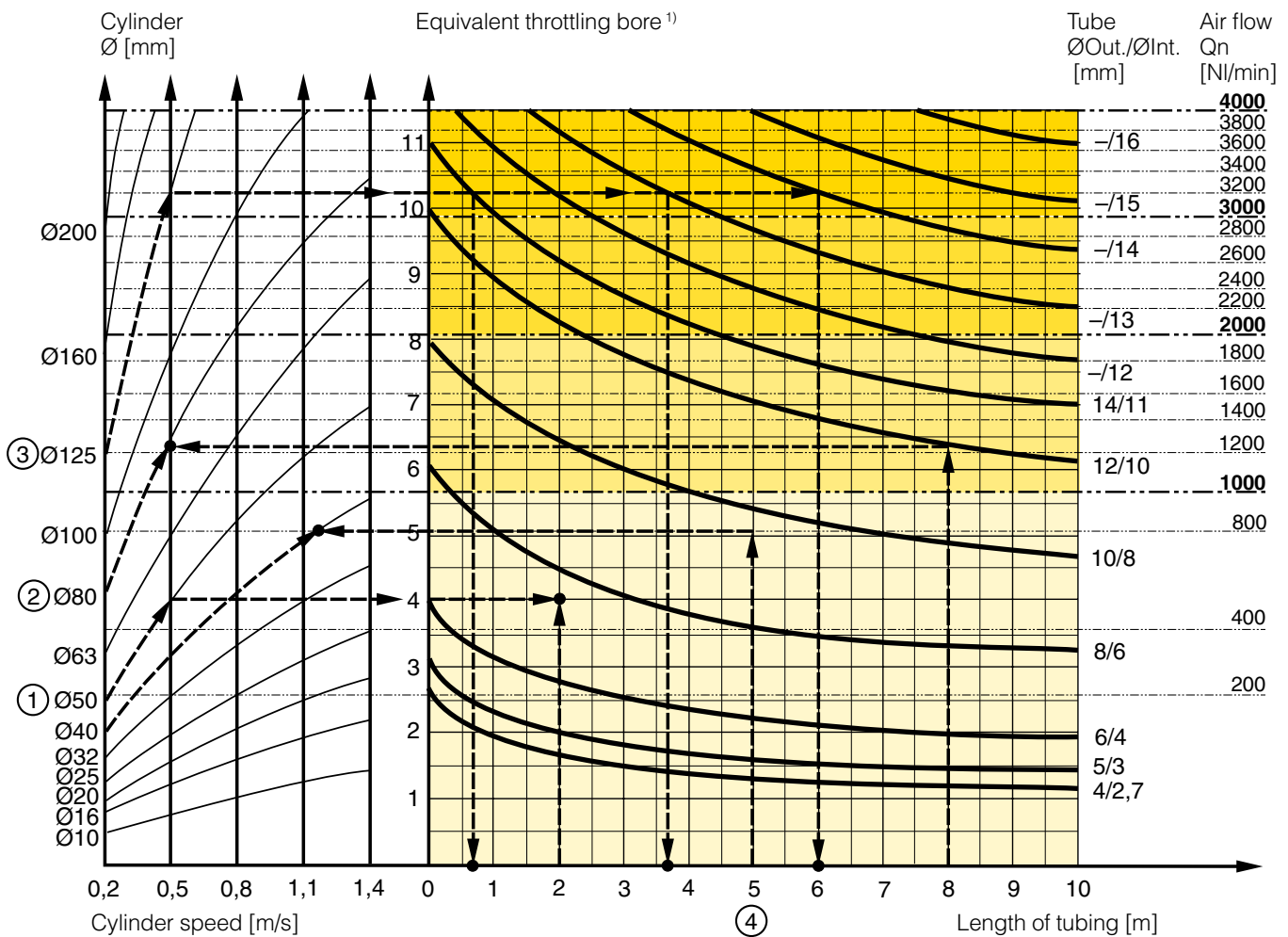
1. The primary line to the working valve could be over sized (this does not cause any extra air consumption and consequently does not create any extra costs in operation).
2. The tubes between the valve and the cylinder should, however, be optimized according to the principle that an insufficient bore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

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

The following prerequisites apply:

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

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



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

Example ①: Which tube diameter should be used?

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

Example ②: What cylinder velocity will be obtained?

A 80 mm bore cylinder will be used, connected by 8 m 12/10 tube to a P2L-B valve. What cylinder velocity will we get? We refer to the diagram and follow the line from 8 mm tube length up to the curve for 12/10 tube. From there, we go horizontally to the curve for the Ø80 cylinder. We find that the velocity will be about 0.5 m/s.

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

For an application a 125 mm bore cylinder will be used. Maximum velocity of piston rod is 0.5 m/s. The cylinder will be controlled by a P2L-D valve. What diameter of tube can be used and what is maximum length of tube.

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

For example:

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

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

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

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

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

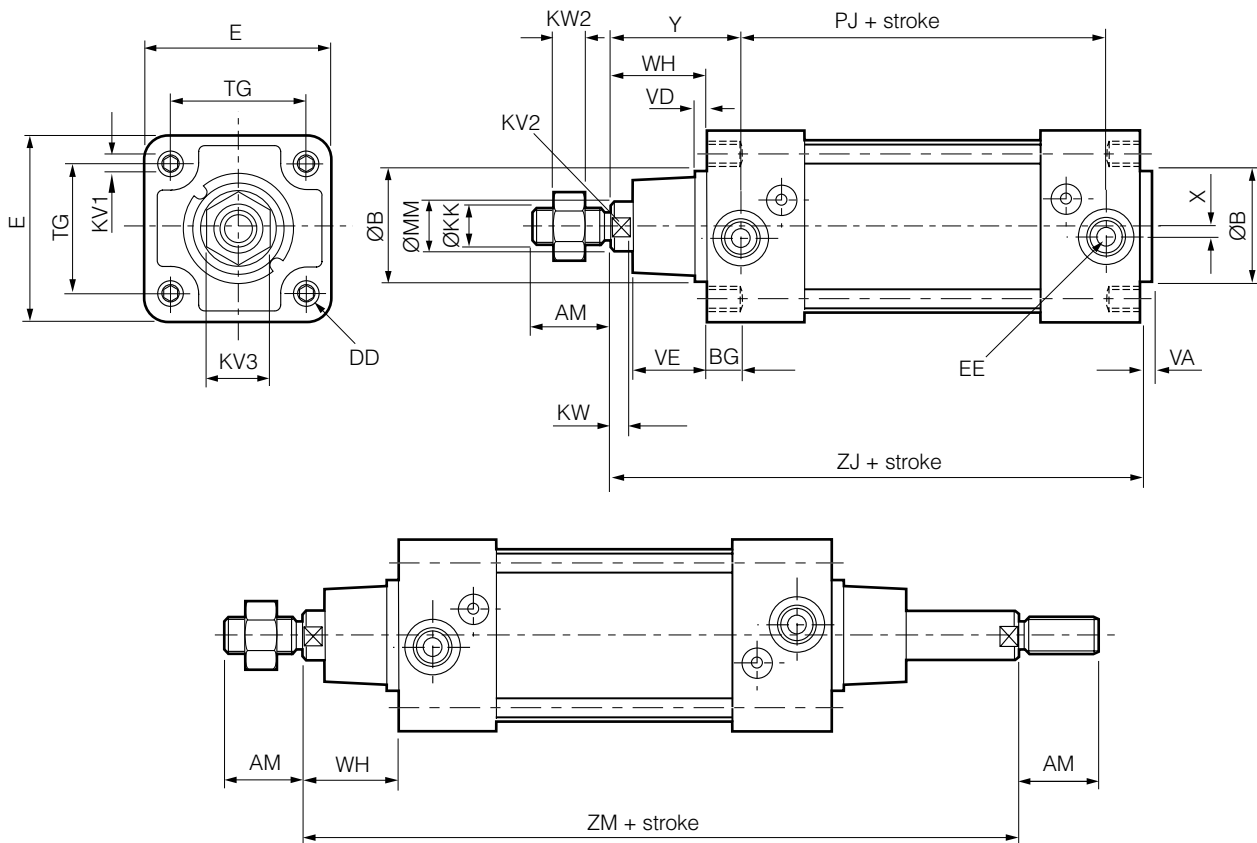
Tube dimension: What tube bore should be selected to obtain the maximum cylinder velocity? Start at pipe length 5 m, follow the line up to the intersection with 800 NI/min. Select the next largest tube diameter, in this case Ø10/8 mm.

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

Valve series with respective flows in NI/minute

| Valve series | Qn in NI/Min |
|---|--------------|
| Valvetronic Solstar | 33 |
| Interface PS1 | 100 |
| Adex A05 | 173 |
| Moduflex size 1, (2 x 3/2) | 220 |
| Valvetronic PVL-B 5/3 closed centre, 6 mm push in | 290 |
| Moduflex size 1, (4/2) | 320 |
| B43 Manual and mechanical | 340 |
| Valvetronic PVL-B 2 x 2/3, 6 mm push in | 350 |
| Valvetronic PVL-B 5/3 closed centre, G1/8 | 370 |
| Compact Isomax DX02 | 385 |
| Valvetronic PVL-B 2 x 3/2 G1/8 | 440 |
| Valvetronic PVL-B 5/2, 6 mm push in | 450 |
| Valvetronic PVL-B 5/3 vented centre, 6 mm push in | 450 |
| Moduflex size 2, (2 x 3/2) | 450 |
| Flowstar P2V-A | 520 |
| Valvetronic PVL-B 5/3 vented centre, G1/8 | 540 |
| Valvetronic PVL-B 5/2, G1/8 | 540 |
| Valvetronic PVL-C 2 x 3/2, 8 mm push in | 540 |
| Adex A12 | 560 |
| Valvetronic PVL-C 2 x 3/2 G1/8 | 570 |
| Compact Isomax DX01 | 585 |
| VIKING Xtreme P2LAX | 660 |
| Valvetronic PVL-C 5/3 closed centre, 8 mm push in | 700 |
| Valvetronic PVL-C 5/3 vented centre, G1/4 | 700 |
| B3-Series | 780 |
| Valvetronic PVL-C 5/3 closed centre, G1/4 | 780 |
| Moduflex size 2, (4/2) | 800 |
| Valvetronic PVL-C 5/2, 8 mm push in | 840 |
| Valvetronic PVL-C 5/3 vented centre, 8 mm push in | 840 |
| Valvetronic PVL-C 5/2, G1/4 | 840 |
| Flowstar P2V-B | 1090 |
| ISOMAX DX1 | 1150 |
| B53 Manual and mechanical | 1160 |
| B4-Series | 1170 |
| VIKING Xtreme P2LBX | 1290 |
| B5-Series, G1/4 | 1440 |
| Airline Isolator Valve VE22/23 | 1470 |
| ISOMAX DX2 | 2330 |
| VIKING Xtreme P2LCX, G3/8 | 2460 |
| VIKING Xtreme P2LDX, G1/2 | 2660 |
| ISOMAX DX3 | 4050 |
| Airline Isolator Valve VE42/43 | 5520 |
| Airline Isolator Valve VE82/83 | 13680 |

Dimensions



| Cyl. bore Ø mm | MM | KK* Ø | AM* | ØB +0/-2 | WH e11 | VD | VE | ZJ | VA | PJ | X | Y | KV3 | KW2 A/F |
|-------------------|----|----------|-----|-------------|-----------|----|----|-----|----|-----|---|-----|-----|------------|
| 160 | 40 | M36x2 | 72 | 65 | 80 | 7 | 52 | 260 | 5 | 132 | 0 | 104 | 55 | 18 |
| 200 | 40 | M36x2 | 72 | 75 | 95 | 7 | 60 | 275 | 5 | 132 | 0 | 119 | 55 | 18 |

| Cyl. bore Ø mm | EE | DD | KV1 | BG A/F | KV2 min | KW A/F | E | TG | ZM |
|-------------------|-------------------------------|-----|-----|-----------|------------|-----------|-----|-----|-----|
| 160 | G ³ / ₄ | M16 | 30 | 24 | 36 | 16 | 179 | 140 | 340 |
| 200 | G ³ / ₄ | M16 | 30 | 24 | 36 | 16 | 216 | 175 | 370 |

* According to ISO 6431

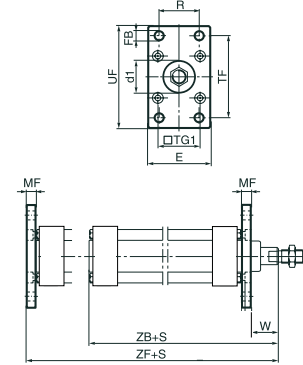
Cylinder mountings

| Type | Description | Cyl. bore Ø mm | Weight kg | Order code |
|-----------------------|---|-------------------|--------------|------------------------------------|
| Flange MF1/MF2 | Intended for fixed mounting of cylinder. Flange can be fitted to front or rear end cover of cylinder. | 160 200 | 6,00 8,00 | P1C-4SMB P1C-4TMB |



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

Supplied complete with mounting screws for attachment to cylinder.



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

| Cyl. bore mm | d1 mm | FB mm | TG1 mm | E mm | R mm | MF mm | TF mm | UF mm | W mm | ZF mm |
|-----------------|----------|----------|-----------|---------|---------|----------|----------|----------|---------|----------|
| 160 | 65 | 18 | 140 | 190 | 115 | 20 | 230 | 275 | 60 | 280 |
| 200 | 75 | 22 | 175 | 225 | 135 | 25 | 270 | 318 | 70 | 300 |

S=Stroke length

Foot bracket MS1

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

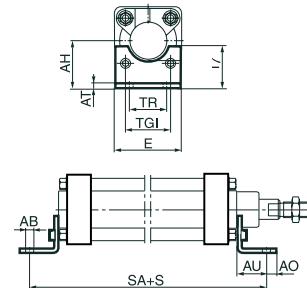
160
200
** Weight per item

P1C-4SMF
P1C-4TMF



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

Supplied in pairs with mounting screws for attachment to cylinder.



According to ISO MS1, VDMA 24 562, AFNOR

| Cyl. bore mm | AB mm | TG ₁ mm | E mm | TR mm | AO mm | AU mm | AH mm | l ₁ mm | AT mm | SA mm |
|-----------------|----------|-----------------------|---------|----------|----------|----------|----------|----------------------|----------|----------|
| 160 | 18 | 140 | 177 | 115 | 24 | 60 | 115 | - | 4,75 | 300 |
| 200 | 22 | 175 | 214 | 135 | 30 | 70 | 135 | - | 8 | 320 |

S=Stroke length

Clevis bracket MP2

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

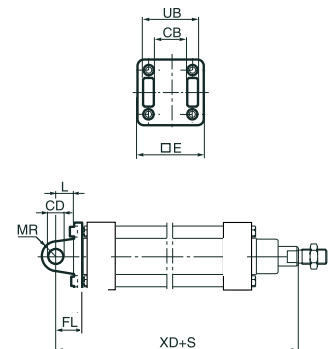
160
200

P1C-4SMT
P1C-4TMT



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

Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP2, VDMA 24 562, AFNOR

| Cyl. bore mm | E mm | UB mm | CB mm | FL mm | L mm | CD mm | MR mm | XD mm |
|-----------------|---------|----------|----------|----------|---------|----------|----------|----------|
| 160 | 177 | 170 | 90 | 55 | 35 | 30 | 30 | 315 |
| 200 | 214 | 170 | 90 | 60 | 36 | 30 | 30 | 335 |

S=Stroke length

Cylinder mountings

| Type | Description | Cyl. bore Ø mm | Weight kg | Order code |
|---------------------------|---|-------------------|--------------|------------------------------------|
| Clevis bracket MP4 | Intended for flexible mounting of cylinder. Clevis bracket MP4 can be combined with clevis bracket MP2. | 160 | 3,00 | P1C-4SME P1C-4TME |
| | | 200 | 6,20 | |



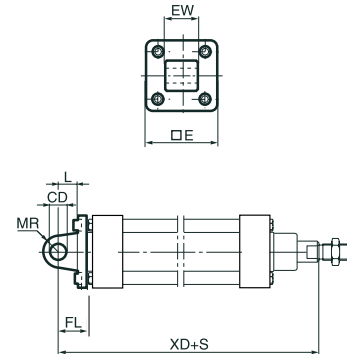
Materials
Clevis bracket: Surface-treated aluminium, black
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.

According to ISO MP4, VDMA 24 562, AFNOR

| Cyl. bore mm | E | EW | FL ±0,2 | L | CD | MR | XD |
|-----------------|-----|----|------------|----|----|----|-----|
| 160 | 177 | 90 | 55 | 35 | 30 | 30 | 315 |
| 200 | 214 | 90 | 60 | 35 | 30 | 30 | 335 |

S=Stroke length



| | | | | |
|------------------------------|--|-----|------|--|
| Pivot bracket for MT4 | Intended for use together with central trunnion MT4. | 160 | 6,46 | 9301054268 9301054268 |
| | | 200 | 9,20 | |

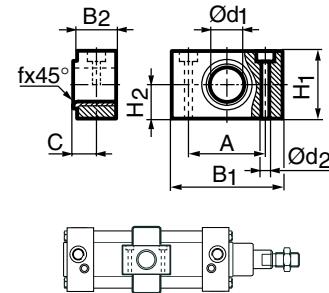


Material
Pivot bracket: Surface-treated aluminium
Bearing acc. to DIN 1850 C: Sintered oil-bronze bushing

Supplied in pairs.

According to ISO, VDMA 24 562, AFNOR

| Cyl. bore mm | B ₁ | B ₂ | A | C | d ₁ | d ₂ H13 | H ₁ | H ₂ | fx45° min |
|-----------------|----------------|----------------|----|------|----------------|-----------------------|----------------|----------------|--------------|
| 160 | 92 | 40 | 60 | 22,5 | 32 | 18,0 | 60 | 30 | 2,5 |
| 200 | 92 | 40 | 60 | 22,5 | 32 | 18,0 | 60 | 30 | 2,5 |



| | | | | |
|----------------------------|---|-----|----|--------------------------------|
| Centre trunnion MT4 | Intended for articulated mounting of cylinder. The trunnion is factory-fitted in the centre of the cylinder or at an optional location specified by the XV-measure – see the order code key on page 7. Combined with pivot bracket for MT4. | 160 | XX | See order key on page 7 |
| | | 200 | XX | |



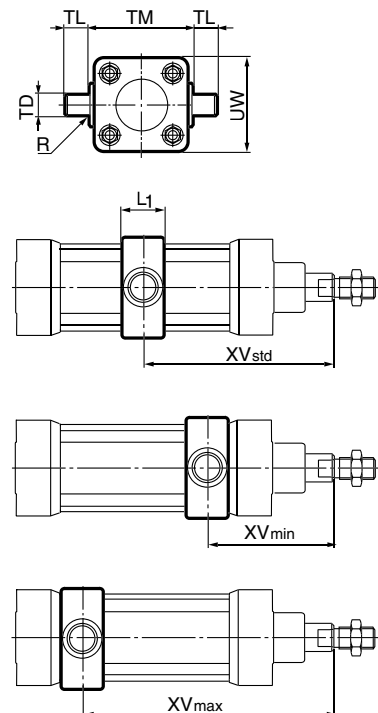
Material:
Trunnion: zinc plated steel

Trunnion centred

The central trunnion is ordered with letter D in position. See the order code key at pages 7.

Trunnion with optional location

Please contact customer service for other XV dimensions



According to ISO MT4, VDMA 24 562, AFNOR

| Cyl. bore mm | TM | TL | TD | R | UW | L1 | X1* | XV* min | X2* |
|-----------------|-----|----|----|-----|-----|----|-----|------------|-----|
| 160 | 200 | 32 | 32 | 2,5 | 190 | 70 | 170 | 169 | 170 |
| 200 | 250 | 32 | 32 | 2,5 | 242 | 70 | 185 | 184 | 186 |

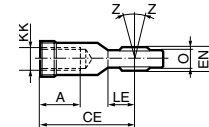
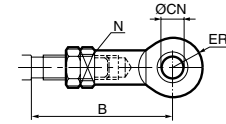
XVstd = X1 + Stroke length/2, XVmax = X2 + Stroke length

Cylinder mountings

| Type | Description | Cyl. bore Ø mm | Weight kg | Order code |
|-----------------------|---|-------------------|--------------|------------------------------------|
| Swivel rod eye | Swivel rod eye for articulated mounting of cylinder. Swivel rod eye can be combined with clevis bracket GA. Maintenance-free. | 160 | 2,00 | P1C-4SRS P1C-4SRS |
| | | 200 | 2,00 | |



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



According to ISO 8139

| Cyl. bore mm | A mm | B min mm | B max mm | CE mm | CN H9 mm | EN h12 mm | ER mm | KK M36x2 | LE min mm | N mm | O mm | Z mm |
|-----------------|---------|----------------|----------------|----------|----------------|-----------------|----------|-------------|-----------------|---------|---------|---------|
| 160 | 56 | 139 | 161 | 125 | 35 | 43 | 40 | M36x2 | 41 | 14 | 28 | 15° |
| 200 | 56 | 139 | 161 | 125 | 35 | 43 | 40 | M36x2 | 41 | 14 | 28 | 15° |

Clevis

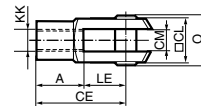
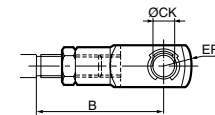
Clevis for articulated mounting of cylinder.

160 4,30
200 4,30

P1C-4SRC
P1C-4SRC



Material
Clevis, clip: Galvanized steel
Pin: Hardened steel



According to ISO 8140

| Cyl. bore mm | A mm | B min mm | B max mm | CE mm | CK h11/E9 mm | CL mm | CM mm | ER mm | KK M36x2 | LE mm | O mm |
|-----------------|---------|----------------|----------------|----------|--------------------|----------|----------|----------|-------------|----------|---------|
| 160 | 72 | 158 | 180 | 144 | 35 | 70 | 35 | 50 | M36x2 | 72 | 83 |
| 200 | 72 | 158 | 180 | 144 | 35 | 70 | 35 | 50 | M36x2 | 72 | 83 |

Nut

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

160 0,110
200 0,110

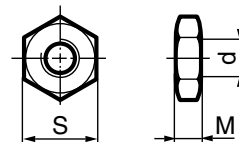
9128985606
9128985606



The cylinders are delivered with a zinc-plated steel piston rod nut

According to DIN 439 B

| Cyl. bore mm | d mm | M mm | S mm |
|-----------------|---------|---------|---------|
| 160 | M36x2 | 18 | 55 |
| 200 | M36x2 | 18 | 55 |



New drop-in sensors

The completely new "drop-in" 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. There is a double jointed adapter for the tie-rod version, which offers simple and flexible use of standard sensors.



Electronic sensors

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

Technical data

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

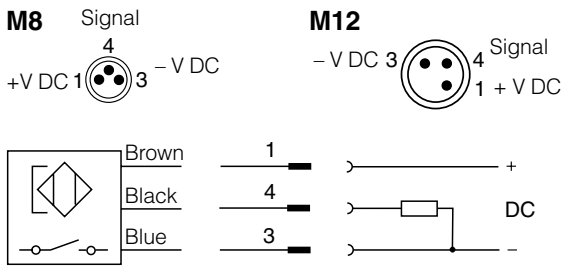
Reed sensors

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

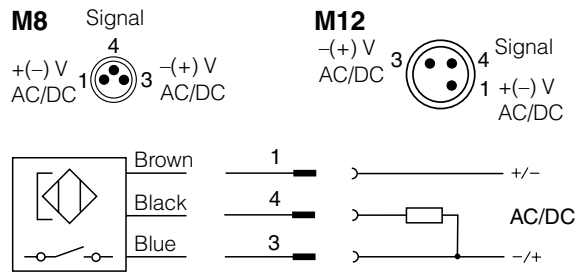
Technical data

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

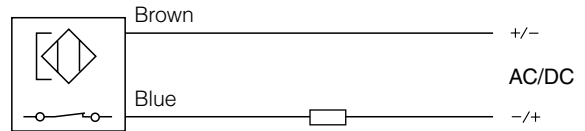
Electronic sensors



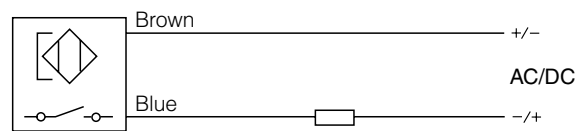
Reed sensors



P8S-GCFPX

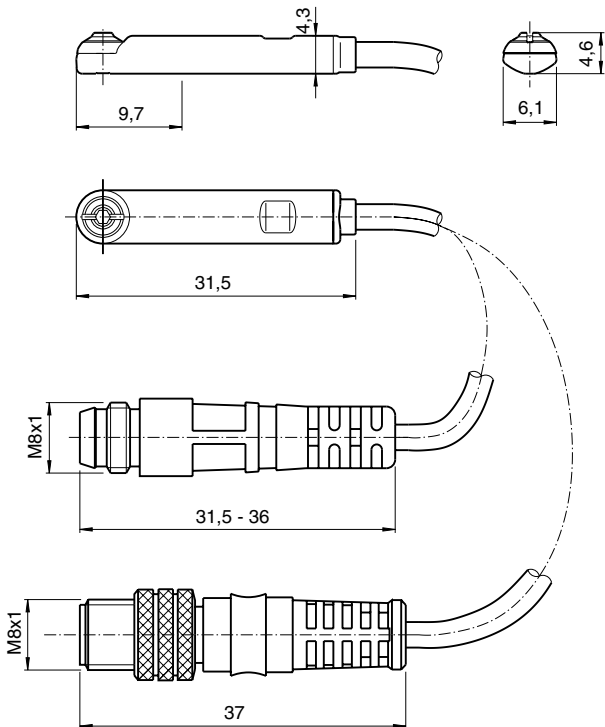


P8S-GRFLX / P8S-GRFLX2

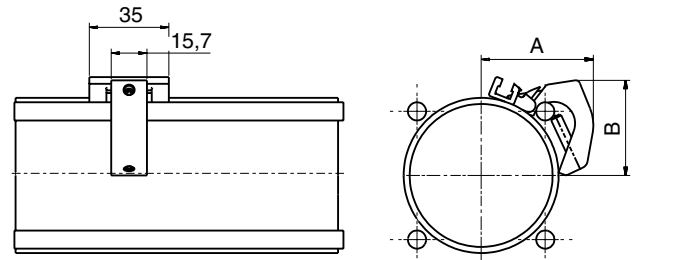


Dimensions

Sensors




Adapter



| Cyl. bore mm | A mm | B mm |
|-----------------|---------|---------|
| 160 | 95 | 90 |
| 200 | 112 | 107 |

Ordering data

| Output/function | Cable/connector | Weight kg | Order code |
|--|--|--|---------------------|
| Electronic sensors , 10-30 V DC | | | |
| PNP type, normally open | 0,27 m PUR-cable and 8 mm snap-in male connector | 0,007 | P8S-GPSHX |
| PNP type, normally open | 1,0 m PUR-cable and 8 mm snap-in male connector | 0,013 | P8S-GPSCX |
| PNP type, normally open | 1,0 m PUR-cable and M8 screw male connector | 0,013 | P8S-GPCCX |
| PNP type, normally open | 0,27 m PUR-cable and M12 screw male connector | 0,015 | P8S-GPMHX |
| PNP type, normally open | 3 m PVC-cable without connector | 0,030 | P8S-GPFLX |
| PNP type, normally open | 10 m PVC-cable without connector | 0,110 | P8S-GPFTX |
| Electronic sensor 18-30 V DC | | | |
| ATEX-certified | | | |
|  II3G EEx nA II T4X II3D 135 °C IP67 | | See ATEX information in P1D catalogue | |
| Type PNP , normally open | 3 m PVC-cable without connector | 0,030 | P8S-GPFLX/EX |
| Reed sensors , 10-30 V AC/DC | | | |
| Normally open | 0,27 m PUR-cable and 8 mm snap-in male connector | 0,007 | P8S-GSSHX |
| Normally open | 1,0 m PUR-cable and 8 mm snap-in male connector | 0,013 | P8S-GSSCX |
| Normally open | 1,0 m PUR-cable and M8 male connector | 0,013 | P8S-GSCCX |
| Normally open | 0,27 m PUR-cable and M12 screw male connector | 0,015 | P8S-GSMHX |
| Normally open | 1,0 m PUR-cable and M12 screw male connector | 0,023 | P8S-GSMCX |
| Normally open | 3 m PVC-cable without connector | 0,030 | P8S-GSFLX |
| Normally open | 10 m PVC-cable without connector | 0,110 | P8S-GSFTX |
| Normally closed | 5m PVC-cable without connector ¹⁾ | 0,050 | P8S-GCFPX |
| Reed sensors, 10-120 V AC/DC | | | |
| Normally open | 3 m PVC-cable without connector | 0,030 | P8S-GRFLX |
| Reed sensorer, 24-230 V AC/DC | | | |
| Normally open | 3 m PVC-cable without connector | 0,030 | P8S-GRFLX2 |

1) Without LED

Adapter for tie-rod design

| Description | Weight kg | Order code |
|------------------------|--------------|------------------|
| Double jointed adapter | 0,07 | P8S-TMA0X |



Connecting cables with one connector

The cables have an integral snap-in female connector.



| Type of cable | Cable/connector | Weight kg | Order code |
|---|------------------------------|-----------|-------------------|
| Cables for sensors, complete with one female connector | | | |
| Cable, Flex PVC | 3 m, 8 mm Snap-in connector | 0,07 | 9126344341 |
| Cable, Flex PVC | 10 m, 8 mm Snap-in connector | 0,21 | 9126344342 |
| Cable, Super Flex PVC | 3 m, 8 mm Snap-in connector | 0,07 | 9126344343 |
| Cable, Super Flex PVC | 10 m, 8 mm Snap-in connector | 0,21 | 9126344344 |
| Cable, Polyurethane | 3 m, 8 mm Snap-in connector | 0,01 | 9126344345 |
| Cable, Polyurethane | 10 m, 8 mm Snap-in connector | 0,20 | 9126344346 |
| Cable, Polyurethane | 5 m, M12 screw connector | 0,07 | 9126344348 |
| Cable, Polyurethane | 10 m, M12 screw connector | 0,20 | 9126344349 |

Male connectors for connecting cables

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



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

Ready to use connecting cables with connectors at each end

As accessories the system comprises a large number of different cables in order to meet all requirements that may arise and to make the installation simple, fast and reliable. Cables with moulded 8 mm snap-in round contacts in both ends. The cables are available in two types, one with a straight male and female connectors respectively, and one with a straight 3-pole male connector in one end and an angled 3-pole female connector in the other end.



Technical data

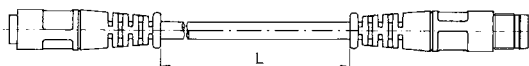
Contacts

Moulded 8 mm snap-in male/female contacts.
Enclosure IP67

Cable

Conductor 3x0,25 mm² (32x0,10 mm²)
Sheath PVC/PUR
Colour Black

Cables with straight 3-pole male and female connectors respectively.



Cables with a straight 3-pole male connector in one end and an angled 3-pole female connector in the other end.



| Designation | Weight kg | Order code |
|-------------------------------------|-----------|-------------------|
| Cable with straight contacts, 0,2 m | 0,02 | 9121717014 |
| Cable with straight contacts, 0,3 m | 0,02 | 9121717015 |
| Cable with straight contacts, 0,5 m | 0,03 | 9121717016 |
| Cable with straight contacts, 1,0 m | 0,03 | 9121717017 |
| Cable with straight contacts, 2,0 m | 0,05 | 9121717018 |
| Cable with straight contacts, 3,0 m | 0,07 | 9121717019 |
| Cable with straight contacts, 5,0 m | 0,12 | 9121717020 |
| Cable with straight contacts, 10 m | 0,23 | 9121717021 |

| Designation | Weight kg | Order code |
|--|-----------|-------------------|
| Cable with straight and angled connectors, 0,2 m | 0,02 | 9121717022 |
| Cable with straight and angled connectors, 0,3 m | 0,02 | 9121717023 |
| Cable with straight and angled connectors, 0,5 m | 0,03 | 9121717024 |
| Cable with straight and angled connectors, 1,0 m | 0,03 | 9121717025 |
| Cable with straight and angled connectors, 2,0 m | 0,05 | 9121717026 |
| Cable with straight and angled connectors, 3,0 m | 0,07 | 9121717027 |
| Cable with straight and angled connectors, 5,0 m | 0,12 | 9121717028 |
| Cable with straight and angled connectors, 10 m | 0,23 | 9121717029 |

Connection block Valvetronic 110

The Valvetronic 110 is a connection block that can be used for collecting signals from sensors at various points on a machine and connecting them to the control system via a multicore cable. Valvetronic 110 can also be used for central connection of the multi-core cable to the outputs of a control system, and can be laid to a machine where the output signals can be connected. The connection block has ten 8 mm snap-in circular connectors and a multi-core cable which is available in lengths of 3 or 10 m. The connections on the block are numbered from 1 to 10. Blanking plugs are available for unused connections, as labels for marking the connections of each block.



Technical data

Connections:

Ten 3-pole numbered 8 mm round snap-in female contacts
Input block



- Pin 1 Common, +24 VDC
- Pin 2 Input signal
- Pin 3 Common, 0V

Output block



- Pin 1 Common, GND
- Pin 2 Output signal
- Pin 3 Common, 0V

Electrical data:

Voltage 24 VDC (max. 60 V AC/75 V DC)
Insulation group according to DIN 0110 class C
Load max. 1 A per connection
total max. 3 A

Cable:

Length 3 m or 10 m
Type of cable LifYY11Y
Conductor 12
Area 0.34 mm²
Colour marking According to DIN 47 100

Mechanical data

Enclosure IP 67, DIN 40050 with fitted contacts and/or blanking plugs.

Temperature -20 °C to +70 °C





Material

Body PA 6,6 VD according to UL 94
Contact holder PBTP
Snap-in ring LDPE
Moulding mass Epoxy
Seal NBR
Screws Plated steel

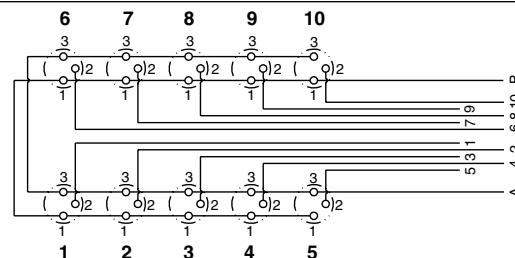
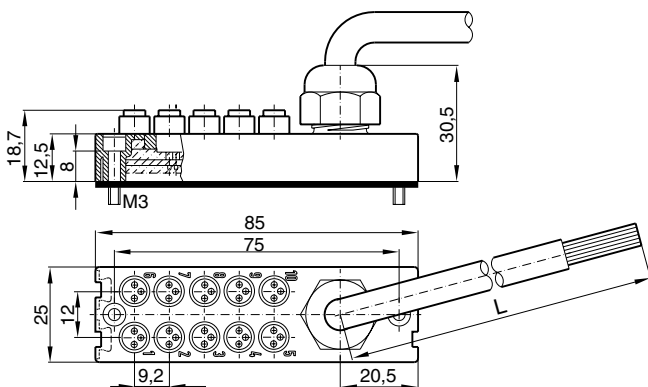
Industrial durability

Good chemical and oil resistance. Tests should be performed in aggressive environments.

Ordering data




| Designation | Weight kg | Order code |
|--|-----------|-------------------|
|  Connection block Valvetronic 110 with 3 m cable | 0,32 | 9121719001 |
|  Connection block Valvetronic 110 with 10 m cable | 0,95 | 9121719002 |
|  Blanking plugs (pack of 10) Use blanking plugs to close unused connections. | 0,02 | 9121719003 |
|  Labels (pack of 10) White labels to insert in grooves on the side of the connection | 0,02 | 9121719004 |

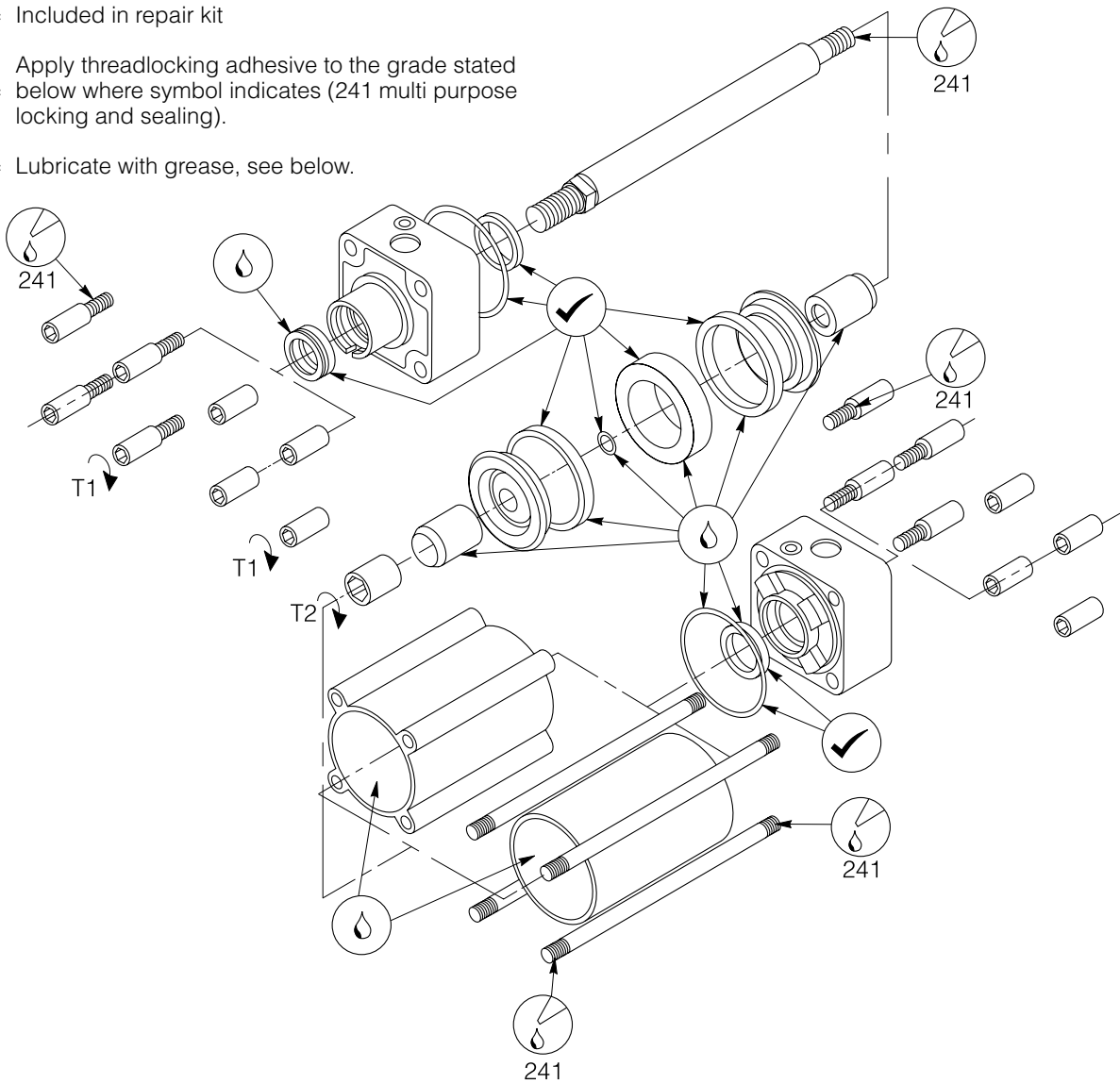
Dimensions and wiring diagrams



| Conductor | Colour | Input | Output |
|-----------|-----------|-----------|-----------|
| 1 | Pink | Signal 1 | Signal 1 |
| 2 | Grey | Signal 2 | Signal 2 |
| 3 | Yellow | Signal 3 | Signal 3 |
| 4 | Green | Signal 4 | Signal 4 |
| 5 | White | Signal 5 | Signal 5 |
| 6 | Red | Signal 6 | Signal 6 |
| 7 | Black | Signal 7 | Signal 7 |
| 8 | Violet | Signal 8 | Signal 8 |
| 9 | Grey-Pink | Signal 9 | Signal 9 |
| 10 | Red-Blue | Signal 10 | Signal 10 |
| A | Blue | 0 V | 0 V |
| B | Brown | +24 V | PE |

Repair kits

-  = Included in repair kit
-  = Apply threadlocking adhesive to the grade stated below where symbol indicates (241 multi purpose locking and sealing).
-  = Lubricate with grease, see below.



| Ø | T1 Nm | NV | T2 Nm | NV |
|-----|-------|----|---------|----|
| 32 | 4-5 | 6 | 9-10 | 5 |
| 40 | 4-5 | 6 | 9-10 | 6 |
| 50 | 9-10 | 8 | 28-30 | 12 |
| 63 | 9-10 | 8 | 28-30 | 12 |
| 80 | 18-20 | 10 | 80-85 | 12 |
| 100 | 18-20 | 10 | 80-85 | 12 |
| 125 | 24-26 | 24 | 115-125 | 30 |
| 160 | 36-38 | 30 | 163-177 | 22 |
| 200 | 36-38 | 30 | 163-177 | 22 |

| Ø | Repair kits | |
|-----|-----------------|------------------|
| | Standard | High temperature |
| 32 | P1E-6KRM | P1E-6KRV |
| 40 | P1E-6LRM | P1E-6LRV |
| 50 | P1E-6MRM | P1E-6MRV |
| 63 | P1E-6NRM | P1E-6NRV |
| 80 | P1E-6PRM | P1E-6PRV |
| 100 | P1E-6QRM | P1E-6QRV |
| 125 | P1E-6RRM | P1E-6RRV |
| 160 | P1E-6SRM | P1E-6SRV |
| 200 | P1E-6TRM | P1E-6TRV |

Grease for P1E



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

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