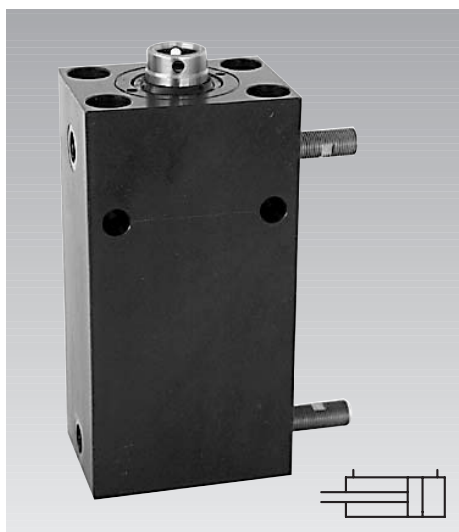
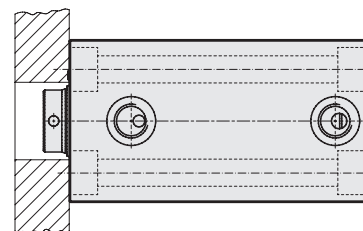
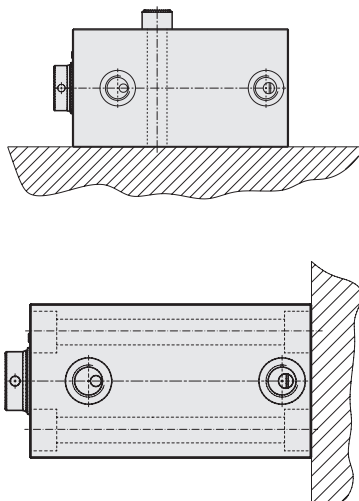




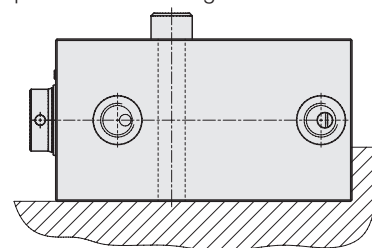
Block Cylinder for stroke end control max. operating pressure 500 bar



Fixing possibilities



Cylinders must be backed up for operating pressures exceeding 160 bar



Application

Double-acting block cylinders with stroke end control are particularly suitable for automated installations, time and cycle-dependent clamping and unclamping.

Description

The stroke end control supplies the required information about the position of the piston. Control is made by pressure-proof sensors, which are fixed at the corresponding stroke end of the cylinder piston in the body.

Advantages

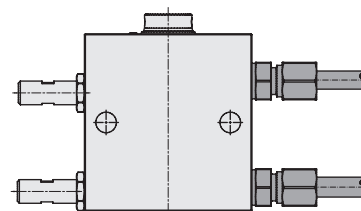
- Compact design
- Same dimensions as the block cylinders as per data sheet B 1.509, except for total length
- Diverse mounting possibilities
- 3 standard stroke lengths
- Sensors can be mounted at the right or left-hand side
- Switching point of the sensors adjustable up to 5 mm before the final position
- All standard versions are equipped with VITON® seals

Important notes

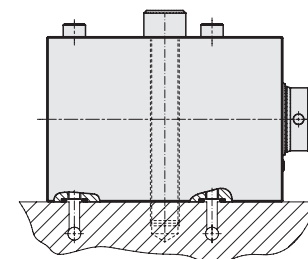
The high-pressure resistant sensors are delivered separately for mounting at place of installation in order to avoid transport damage. Please refer to the installation instructions on page 4.

Maximum environmental temperature according to the sensor $-25...+80\text{ °C}$ or $+120\text{ °C}$.

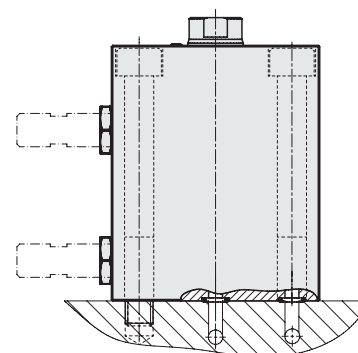
Version with connecting thread



Version for manifold mounting with O-ring sealing



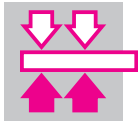
Version for manifold mounting with O-ring sealing Bottom side



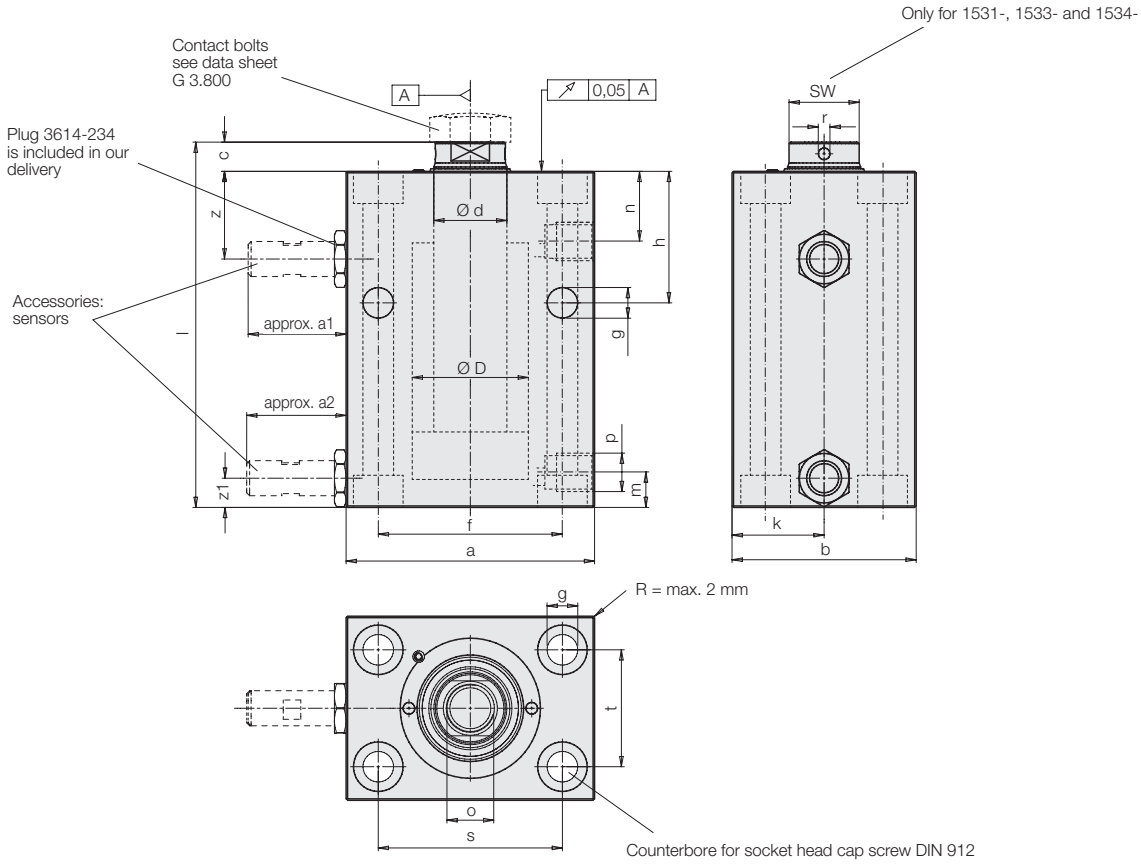
Application example

Application for pressing in of piston rods into the pistons.

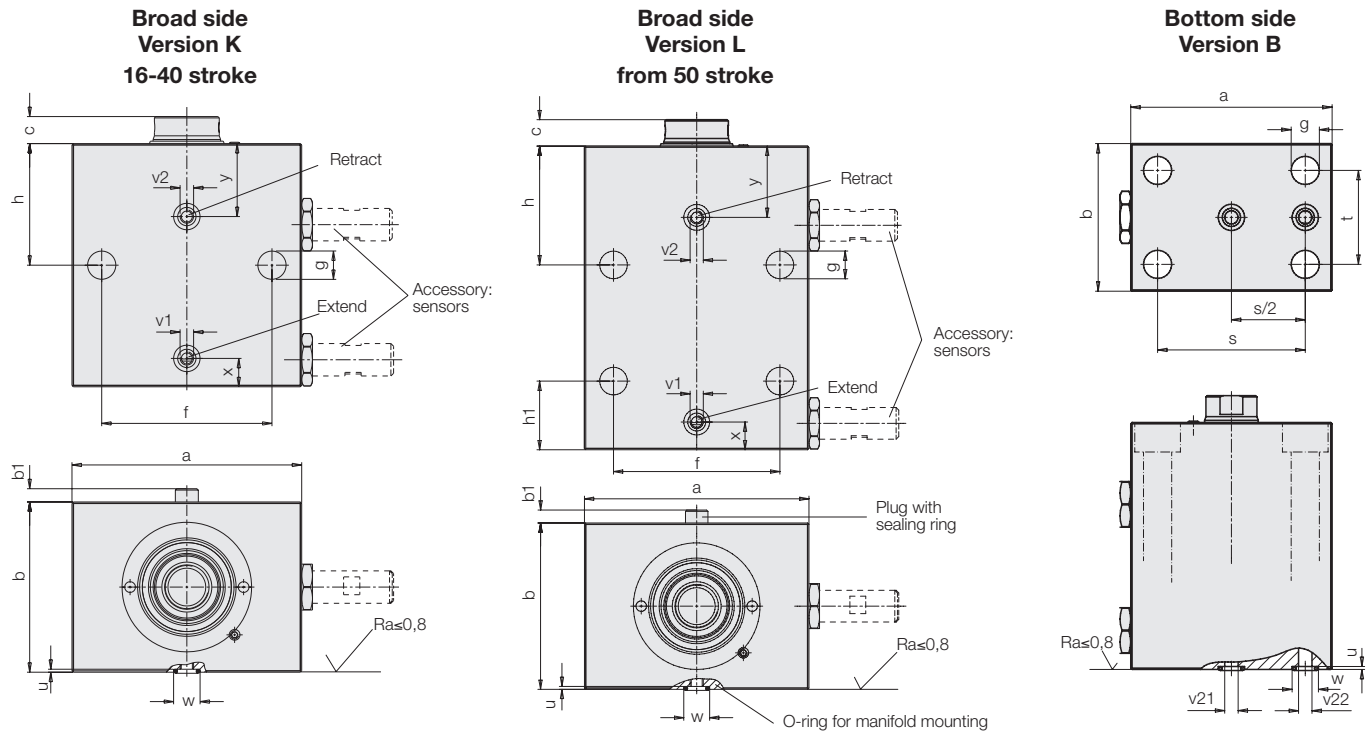
To monitor the press-in depth of the piston rods, the stroke ends of the block cylinder is controlled.



Dimensions – Version with connecting thread



Oil supply and O-ring sealing at:



For use of the sensors at the left side, the cylinder will be rotated by 180° and the plug with sealing ring and the O-ring for manifold mounting are exchanged.



| | | | | | | | | | |
|--------------------------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Piston Ø D | [mm] | 16 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| Stangen-Ø d | [mm] | 10 | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
| Force to push at | 100 bar [kN] | 2 | 4.9 | 8 | 12.6 | 19.5 | 31.2 | 50.4 | 78.4 |
| Force to pull at | 500 bar [kN] | 10 | 24.5 | 40.2 | 62.8 | 98.5 | 156 | 252 | 392 |
| Force to push at | 100 bar [kN] | 1.2 | 2.9 | 4.9 | 7.7 | 11.6 | 18.6 | 30.6 | 47.4 |
| Force to pull at | 500 bar [kN] | 6.1 | 14.5 | 24.5 | 38.3 | 57.9 | 93 | 153.2 | 236.8 |
| Oil volume/ stroke to extend | [cm³] | 2.01 | 4.91 | 8.05 | 12.56 | 19.63 | 31.17 | 50.26 | 78.54 |
| 10 mm stroke stroke to retract | [cm³] | 1.2 | 2.9 | 4.9 | 7.7 | 11.6 | 18.6 | 30.6 | 47.4 |
| a | [mm] | 60 | 65 | 75 | 85 | 100 | 125 | 160 | 200 |
| a1 | [mm] | 35 | 34.5 | 33.5 | 33.5 | 30 | 47 | 37 | 42 |
| a2 | [mm] | 35 | 34.5 | 33.5 | 34 | 32 | 47 | 39 | 44 |
| b | [mm] | 35 | 45 | 55 | 63 | 75 | 95 | 120 | 150 |
| b1 | [mm] | 4 | 5 | 5 | 5 | 6 | 5.5 | 7.5 | 7.5 |
| c | [mm] | 6 | 7 | 10 | 10 | 10 | 14 | 14 | 15 |
| f | [mm] | 30 | 50 | 55 | 63 | 76 | 95 | 120 | 158 |
| g | [mm] | 6.5 | 8.5 | 10.5 | 10.5 | 13 | 17 | 21 | 25 |
| h | [mm] | 40 | 38 | 45 | 45 | 49 | 52 | 62 | 64 |
| h1 | [mm] | 24 | 38 | 29 | 26 | 33 | 37 | 47 | 52 |
| k | [mm] | 17.5 | 22.5 | 27.5 | 31.5 | 37.5 | 47.5 | 60 | 75 |
| m | [mm] | 11 | 16 | 13 | 12 | 13 | 20.5 | 20 | 24 |
| n | [mm] | 16.5 | 18 | 24 | 24 | 27 | 26 | 34 | 35 |
| o x depth of thread | [mm] | M6x12 | M10x15 | M12x15 | M16x25 | M20x30 | M27x40 | M30x40 | M42x60 |
| p | | G1/4 | G1/4 | G1/4 | G1/4 | G1/4 | G1/2 | G1/2 | G1/2 |
| r | [mm] | - | - | - | 4 | 4 | 4 | 5 | 6 |
| s | [mm] | 40 | 50 | 55 | 63 | 76 | 95 | 120 | 158 |
| t | [mm] | 22 | 30 | 35 | 40 | 45 | 65 | 80 | 108 |
| u ± 0.05 | [mm] | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.5 | 1.5 | 1.5 |
| v1 extend | [mm] | M4 | M5 | M5 | M5 | M6 | M6 | M8 | M8 |
| v2 retract | [mm] | M4 | M5 | M5 | M5 | M6 | M6 | M8 | M8 |
| v21 extend | [mm] | 3.5 | 4 | 5 | 6 | 6 | 8 | 8 | 8 |
| v22 retract | [mm] | 3.5 | 4 | 5 | 6 | 6 | 8 | 8 | 8 |
| w +0.2 | [mm] | 9.8 | 9.8 | 9.8 | 9.8 | 10.8 | 13.8 | 13.8 | 13.8 |
| x | [mm] | 9 | 16 | 13 | 10.5 | 13 | 18 | 22.5 | 24 |
| y | [mm] | 20.5 | 21 | 27 | 27 | 29.5 | 31.5 | 39 | 40 |
| z | [mm] | 28 | 24.5 | 30.5 | 30 | 33 | 34.5 | 41.5 | 42.5 |
| z1 | [mm] | 11 | 12.7 | 14.5 | 13 | 17.5 | 21 | 26 | 30 |
| R | [mm] | - | - | - | 2 | 2 | 2 | 2 | - |
| SW | [mm] | 8 | 13 | 17 | - | - | - | - | - |
| Dimensions O-ring | | 7x1.5 | 7x1.5 | 7x1.5 | 7x1.5 | 8x1.5 | 10x2 | 10x2 | 10x2 |
| Part-no. O-ring | | 3001-077 | 3001-077 | 3001-077 | 3001-077 | 3000-275 | 3001-078 | 3001-078 | 3001-078 |

| | | | | | | | | | |
|--------------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Stroke ±1 | [mm] | 16 | 20 | 25 | 25 | 25 | 30 | 32 | 40 |
| Total length l ± 1 | [mm] | 81 | 88 | 102 | 104 | 109 | 126 | 141 | 156 |
| Weight | [kg] | 1 | 1.6 | 2.7 | 3.4 | 5.1 | 8.9 | 16.3 | 28.2 |

With connecting thread

| | | | | | | | | |
|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Part-no. | 1531-136 | 1533-136 | 1534-136 | 1535-136 | 1536-136 | 1537-146 | 1538-146 | 1539-156 |
|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|

For manifold mounting with O-ring sealing

| | | | | | | | | |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Part-no. Version K | 1531-130K | 1533-130K | 1534-130K | 1535-130K | 1536-130K | 1537-140K | 1538-140K | 1539-150K |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|

| | | | | | | | | |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Part-no. Version B | 1531-136B | 1533-136B | 1534-136B | 1535-136B | 1536-136B | 1537-146B | 1538-146B | 1539-156B |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|

| | | | | | | | | |
|--------------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Stroke ±1 | [mm] | 50 | 50 | 50 | 50 | 50 | 63 | 80 |
| Total length l ± 1 | [mm] | 115 | 118 | 127 | 129 | 134 | 159 | 189 |
| Weight | [kg] | 1.7 | 2.3 | 3 | 4.2 | 6.2 | 11.1 | 21.7 |

With connecting thread

| | | | | | | | |
|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Part-no. | 1531-166 | 1533-166 | 1534-166 | 1535-166 | 1536-166 | 1537-176 | 1538-186 |
|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|

For manifold mounting with O-ring sealing

| | | | | | | | |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Part-no. Version L | 1531-160L | 1533-160L | 1534-160L | 1535-160L | 1536-160L | 1537-170L | 1538-180L |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|

| | | | | | | | |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Part-no. Version B | 1531-166B | 1533-166B | 1534-166B | 1535-166B | 1536-166B | 1537-176B | 1538-186B |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|

| | | | | | | | | |
|--------------------|-------------|------------|------------|------------|------------|------------|------------|------------|
| Stroke ±1 | [mm] | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Total length l ± 1 | [mm] | 165 | 168 | 177 | 179 | 184 | 196 | 209 |
| Weight | [kg] | 2.5 | 3.3 | 4.8 | 6 | 8.6 | 14 | 24.2 |

With connecting thread

| | | | | | | | | |
|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Part-no. | 1531-196 | 1533-196 | 1534-196 | 1535-196 | 1536-196 | 1537-196 | 1538-196 | 1539-196 |
|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|

For manifold mounting with O-ring sealing

| | | | | | | | | |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Part-no. Version L | 1531-190L | 1533-190L | 1534-190L | 1535-190L | 1536-190L | 1537-190L | 1538-190L | 1539-190L |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|

| | | | | | | | | |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Part-no. Version B | 1531-196B | 1533-196B | 1534-196B | 1535-196B | 1536-196B | 1537-196B | 1538-196B | 1539-196B |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|

Accessory sensor

| | | | | | | | | |
|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Part-no. | 3829-180 | 3829-180 | 3829-180 | 3829-180 | 3829-180 | 3829-030 | 3829-030 | 3829-204 |
|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|

Accessory pull-type connector pnp

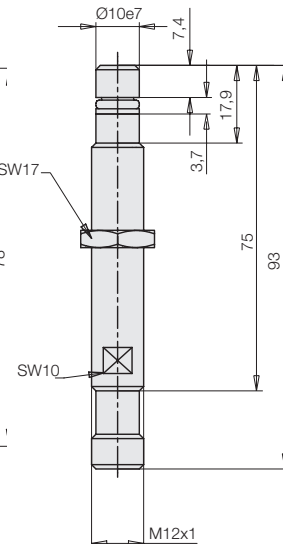
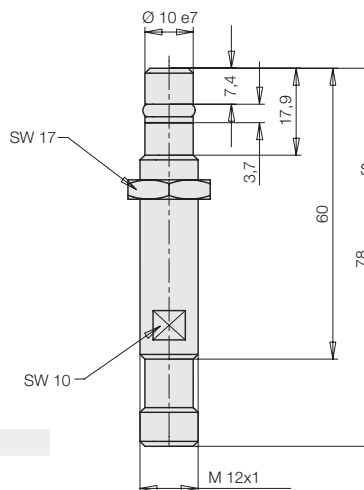
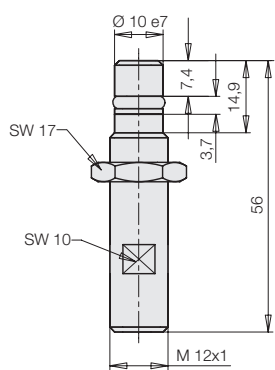
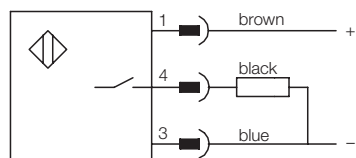
| | | | | | | | | |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| M12x1 knee-type | | | | | | | | |
| Part-no. | 3829-049 | 3829-049 | 3829-049 | 3829-049 | 3829-049 | 3829-049 | 3829-049 | 3829-049 |

| | | | | | | | | |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| M12x1 straight | | | | | | | | |
| Part-no. | 3829-078 | 3829-078 | 3829-078 | 3829-078 | 3829-078 | 3829-078 | 3829-078 | 3829-078 |

| | | | | | | | | |
|--------------------------------------|--|--|--|--|--|--|--|--|
| Technical characteristics see page 4 | | | | | | | | |
|--------------------------------------|--|--|--|--|--|--|--|--|



| For block cylinders: | 1531-XXX 1533-XXX 1534-XXX 1535-XXX 1536-XXX | | 1537-XXX 1538-XXX | | 1539-XXX | |
|---|--|------------------|----------------------|------------------|-----------------|------------------|
| General and technical characteristics | | | | | | |
| Environmental temperature | °C | -25...+80 | -25...+120 | -25...+80 | -25...+120 | -25...+80 |
| Rated operating distance S _n | mm | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| Assured operating distance S _a | mm | 0...1.2 | 0...2 | 0...1.2 | 0...2 | 0...1.2 |
| Repeatability | % | ≤ 5 | ≤ 5 | ≤ 5 | ≤ 5 | ≤ 5 |
| Hysteresis | % | ≤ 15 | ≤ 15 | ≤ 15 | ≤ 15 | ≤ 15 |
| Dimension D x T | mm | M12x1 x 56 | M12x1 x 56 | M12x1x78 | M12x1 x 78 | M12x1 x 93 |
| Material of the body | | 1.4104 | 1.4104 | 1.4104 | 1.4104 | 1.4104 |
| Material of sensing face | | EP (duroplastic) | ceramics | EP (duroplastic) | ceramics | EP (duroplastic) |
| Code class | IP | 68 | 68 | 68 | 68 | 68 |
| Type of connection | | Connector S4 | Connector S4 | Connector S4 | Connector S4 | Connector S4 |
| Electrical characteristics | | | | | | |
| Voltage | | DC | DC | DC | DC | DC |
| Wiring | | 3 wires | 3 wires | 3 wires | 3 wires | 3 wires |
| Switching function | | interlock | interlock | interlock | interlock | interlock |
| Output signal | | pnp | pnp | pnp | pnp | pnp |
| Rated operating voltage | V | 24 DC | 24 DC | 24 DC | 24 DC | 24 DC |
| Rated operating current | mA | 200 | 200 | 200 | 200 | 200 |
| Voltage | V | 10...30 DC | 10...30 DC | 10...30 DC | 10...30 DC | 10...30 DC |
| Residual ripple | % | ≤ 15 | ≤ 15 | ≤ 15 | ≤ 15 | ≤ 15 |
| Switching frequency | Hz | 1000 | 2000 | 1000 | 2000 | 1000 |
| No-load current | mA | ≤ 10/≤ 2 | ≤ 8 | ≤ 10/≤ 1 | ≤ 8 | ≤ 10/≤ 1 |
| Voltage drop | V | ≤ 1.5/- | ≤ 2.5 | ≤ 1.5/- | ≤ 2.5 | ≤ 1.5/- |
| Protection against short circuit | | yes | yes | yes | yes | yes |
| Protection against reverse battery | | yes | yes | yes | yes | yes |
| Part-no. sensor | | 3829-180 | 3829-228 | 3829-030 | 3829-227 | 3829-204 |
| Part-no. O-ring (included in the delivery) | | 3001-550 | 3001-550 | 3001-551 | 3001-551 | 3001-550 |
| Part-no. Back-up ring (included in the delivery) | | 3001-552 | 3001-552 | 3001-552 | 3001-552 | 3001-552 |

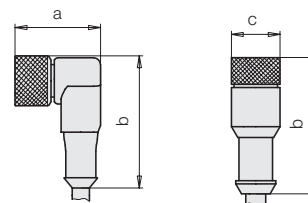
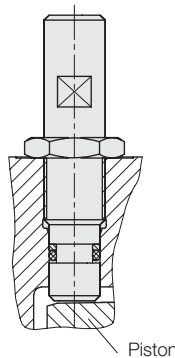


Mounting and adjustment of sensors

Front sensor:

- Extend piston rod completely
- Carefully, screw the sensors in to the stop at the piston
Turn back the sensor:

| Rotation | Switching point before the final position |
|----------|---|
| 1/4 | approx. 4 mm |
| 1 1/4 | approx. 1 mm |
- Lock the sensor in this position by means of a nut
- Wire the switch electrically and check the function



LED: Voltage (green)
Function display (yellow)

Rear sensor:

- Retract completely the piston rod
(Further steps see front sensor)

| Accessories for sensors | a | b | c | Code class | Environmental temperature | LED | Part-no. |
|--|------|------|------|------------|---------------------------|-----|-----------------|
| Plug-type connector pnp M12, knee-type | 25 | 39 | - | IP68 | -25...+70°C | yes | 3829-049 |
| Plug-type connector pnp M12, straight | - | 41 | 14.5 | IP68 | -25...+70°C | no | 3829-078 |
| Plug-type connector pnp M12, knee-type | 31.5 | 38 | - | IP67 | -40...+105°C | no | 3829-230 |
| Plug-type connector pnp M12, straight | - | 35.5 | 14.5 | IP67 | -40...+105°C | no | 3829-229 |

All plug-type connectors with 3 meters cable