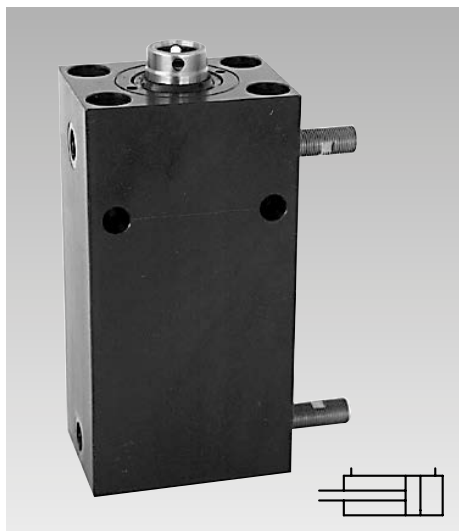




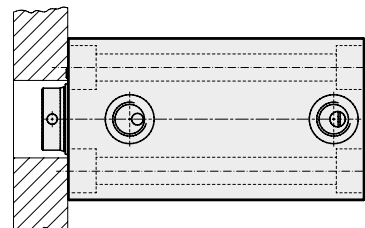
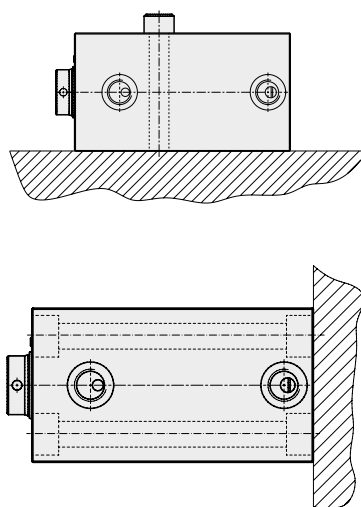
## Block Cylinders

for stroke end control

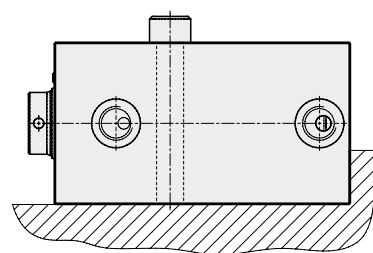
double acting, max. operating pressure 500 bar



### Fixing possibilities



Cylinders must be backed up for operating pressures exceeding 100 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.

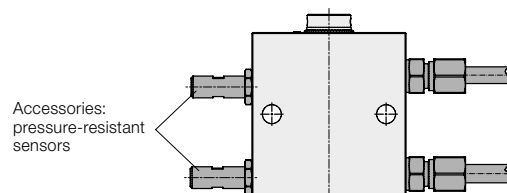
### Advantages

- Compact design
- Same dimensions as the block cylinders as per data sheet B 1.5094, 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 4 mm before the final position
- All versions are equipped by default with FKM seals

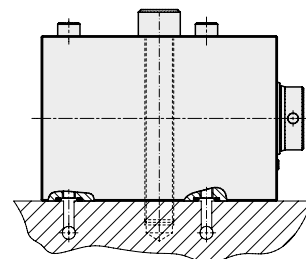
### Important notes!

The high-pressure resistant sensors are installed on customer site, in order to avoid transport damages. Please refer to the installation instructions on page 4.  
Maximum environmental temperature according to the sensor -25...+80°C or 120°C.

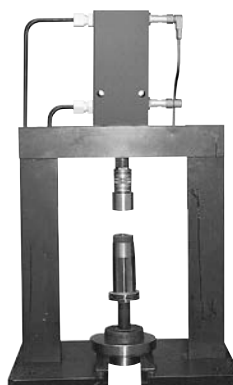
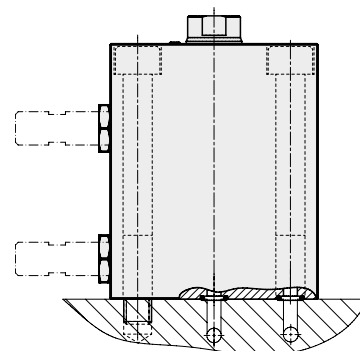
### Version with pipe thread



### Version for manifold mounting with O-ring sealing



### Version for manifold mounting with O-ring sealing bottom side

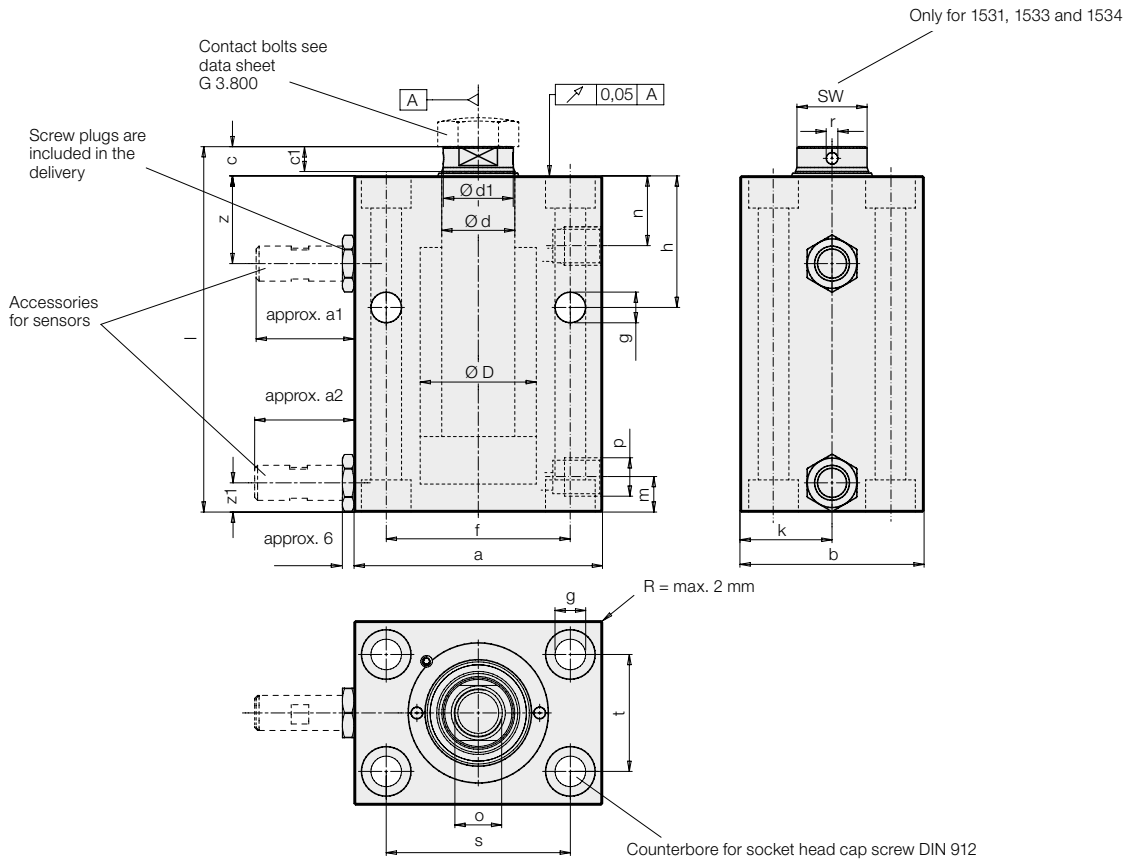


### Application example

Application for pressing in of piston rods into the pistons.

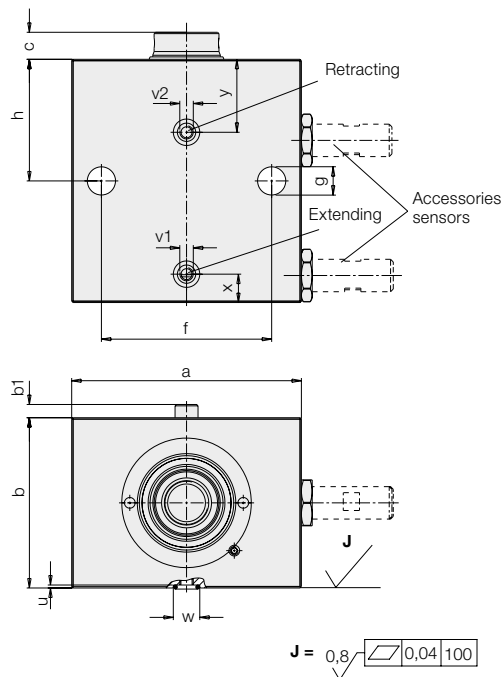
To monitor the press-in depth of the piston rods, the stroke ends of the block cylinder are controlled.

## Dimensions – Versions with pipe thread

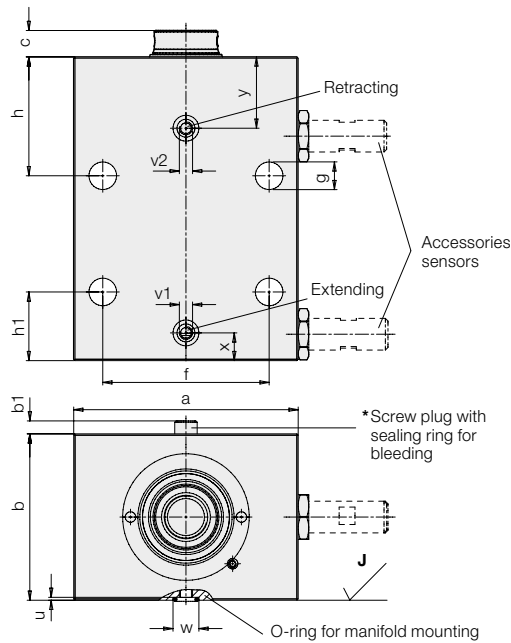


## Oil supply and O-ring sealing at:

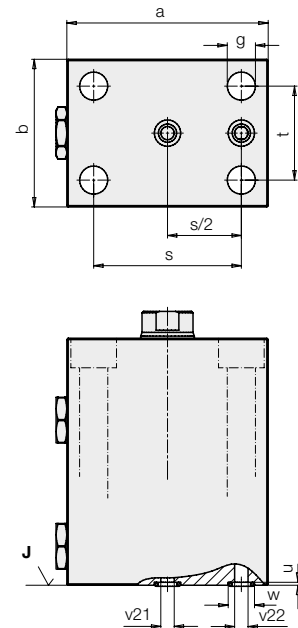
### Broad side Version K 16 - 40 stroke



### Broad side Version K from 50 stroke



### Bottom side Version B



\* 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.

## Dimensions

| <b>Piston Ø D</b>           |                   | <b>[mm]</b> | <b>16</b> | <b>25</b> | <b>32</b> | <b>40</b> | <b>50</b> | <b>63</b> | <b>80</b> | <b>100</b> |
|-----------------------------|-------------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| <b>Rod Ø d</b>              |                   | <b>[mm]</b> | <b>10</b> | <b>16</b> | <b>20</b> | <b>25</b> | <b>32</b> | <b>40</b> | <b>50</b> | <b>63</b>  |
| Push force at               | 100 bar           | [kN]        | 2         | 4.9       | 8         | 12.6      | 19.5      | 31.2      | 50.4      | 78.4       |
|                             | 500 bar           | [kN]        | 10        | 24.5      | 40.2      | 62.8      | 98.5      | 156       | 252       | 392        |
| Pull force at               | 100 bar           | [kN]        | 1.2       | 2.9       | 4.9       | 7.7       | 11.6      | 18.6      | 30.6      | 47.4       |
|                             | 500 bar           | [kN]        | 6.1       | 14.5      | 24.5      | 38.3      | 57.9      | 93        | 153.2     | 236.8      |
| Oil volume/<br>10 mm stroke | Stroke to extend  | [cm³]       | 2.01      | 4.91      | 8.05      | 12.56     | 19.63     | 31.17     | 50.26     | 78.54      |
|                             | Stroke to retract |             | 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         |
| Ø d1 x c1                   |                   | [mm]        | 9,2x3.7   | 15x5      | 19x7.8    | 24x7.1    | 30,5x6.4  | 38,7x9.2  | 48x9.2    | 61x10.7    |
| 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                           |                   |             | G 1/4     | G 1/4     | G 1/4     | G 1/4     | G 1/4     | G 1/2     | G 1/2     | G 1/2      |
| 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   |

|                         |             |                 |                 |                 |                 |                 |                 |                 |                 |
|-------------------------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>Stroke ±1</b>        | <b>[mm]</b> | <b>16</b>       | <b>20</b>       | <b>25</b>       | <b>25</b>       | <b>25</b>       | <b>30</b>       | <b>32</b>       | <b>40</b>       |
| 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            |
| <b>With pipe thread</b> |             |                 |                 |                 |                 |                 |                 |                 |                 |
| <b>Part no.</b>         |             | <b>1531 136</b> | <b>1533 136</b> | <b>1534 136</b> | <b>1535 136</b> | <b>1536 136</b> | <b>1537 146</b> | <b>1538 146</b> | <b>1539 156</b> |

|                                                  |  |                  |                  |                  |                  |                  |                  |                  |                  |
|--------------------------------------------------|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| <b>For manifold mounting with O-ring sealing</b> |  |                  |                  |                  |                  |                  |                  |                  |                  |
| <b>Part no. version K</b>                        |  | <b>1531 130K</b> | <b>1533 130K</b> | <b>1534 130K</b> | <b>1535 130K</b> | <b>1536 130K</b> | <b>1537 140K</b> | <b>1538 140K</b> | <b>1539 150K</b> |
| <b>Part no. version B</b>                        |  | <b>1531 136B</b> | <b>1533 136B</b> | <b>1534 136B</b> | <b>1535 136B</b> | <b>1536 136B</b> | <b>1537 146B</b> | <b>1538 146B</b> | <b>1539 156B</b> |

|                         |             |                 |                 |                 |                 |                 |                 |                 |  |
|-------------------------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--|
| <b>Stroke ±1</b>        | <b>[mm]</b> | <b>50</b>       | <b>50</b>       | <b>50</b>       | <b>50</b>       | <b>50</b>       | <b>63</b>       | <b>80</b>       |  |
| 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            |  |
| <b>With pipe thread</b> |             |                 |                 |                 |                 |                 |                 |                 |  |
| <b>Part no.</b>         |             | <b>1531 166</b> | <b>1533 166</b> | <b>1534 166</b> | <b>1535 166</b> | <b>1536 166</b> | <b>1537 176</b> | <b>1538 186</b> |  |

|                                                  |  |                  |                  |                  |                  |                  |                  |                  |  |
|--------------------------------------------------|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|
| <b>For manifold mounting with O-ring sealing</b> |  |                  |                  |                  |                  |                  |                  |                  |  |
| <b>Part no. version L</b>                        |  | <b>1531 160L</b> | <b>1533 160L</b> | <b>1534 160L</b> | <b>1535 160L</b> | <b>1536 160L</b> | <b>1537 170L</b> | <b>1538 180L</b> |  |
| <b>Part no. version B</b>                        |  | <b>1531 166B</b> | <b>1533 166B</b> | <b>1534 166B</b> | <b>1535 166B</b> | <b>1536 166B</b> | <b>1537 176B</b> | <b>1538 186B</b> |  |

|                         |             |                 |                 |                 |                 |                 |                 |                 |                 |
|-------------------------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>Stroke ±1</b>        | <b>[mm]</b> | <b>100</b>      | <b>100</b>      | <b>100</b>      | <b>100</b>      | <b>100</b>      | <b>100</b>      | <b>100</b>      | <b>100</b>      |
| Total length l ±1       | [mm]        | 165             | 168             | 177             | 179             | 184             | 196             | 209             | 216             |
| Weight                  | [kg]        | 2.5             | 3.3             | 4.8             | 6               | 8.6             | 14              | 24.2            | 39              |
| <b>With pipe thread</b> |             |                 |                 |                 |                 |                 |                 |                 |                 |
| <b>Part no.</b>         |             | <b>1531 196</b> | <b>1533 196</b> | <b>1534 196</b> | <b>1535 196</b> | <b>1536 196</b> | <b>1537 196</b> | <b>1538 196</b> | <b>1539 196</b> |

|                                                  |  |                  |                  |                  |                  |                  |                  |                  |                  |
|--------------------------------------------------|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| <b>For manifold mounting with O-ring sealing</b> |  |                  |                  |                  |                  |                  |                  |                  |                  |
| <b>Part no. version L</b>                        |  | <b>1531 190L</b> | <b>1533 190L</b> | <b>1534 190L</b> | <b>1535 190L</b> | <b>1536 190L</b> | <b>1537 190L</b> | <b>1538 190L</b> | <b>1539 190L</b> |
| <b>Part no. version B</b>                        |  | <b>1531 196B</b> | <b>1533 196B</b> | <b>1534 196B</b> | <b>1535 196B</b> | <b>1536 196B</b> | <b>1537 196B</b> | <b>1538 196B</b> | <b>1539 196B</b> |

|                         |  |                 |                 |                 |                 |                 |                 |                 |                 |
|-------------------------|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>Accessory sensor</b> |  |                 |                 |                 |                 |                 |                 |                 |                 |
| <b>Part no.</b>         |  | <b>3829 180</b> | <b>3829 180</b> | <b>3829 180</b> | <b>3829 180</b> | <b>3829 180</b> | <b>3829 030</b> | <b>3829 030</b> | <b>3829 204</b> |

|                                          |  |                 |                 |                 |                 |                 |                 |                 |                 |
|------------------------------------------|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>Accessory pull-type connector pnp</b> |  |                 |                 |                 |                 |                 |                 |                 |                 |
| M12x1 knee-type                          |  |                 |                 |                 |                 |                 |                 |                 |                 |
| <b>Part no.</b>                          |  | <b>3829 049</b> | <b>3829 049</b> | <b>3829 049</b> | <b>3829 049</b> | <b>3829 049</b> | <b>3829 049</b> | <b>3829 049</b> | <b>3829 049</b> |
| M12x1 straight                           |  |                 |                 |                 |                 |                 |                 |                 |                 |
| <b>Part no.</b>                          |  | <b>3829 078</b> | <b>3829 078</b> | <b>3829 078</b> | <b>3829 078</b> | <b>3829 078</b> | <b>3829 078</b> | <b>3829 078</b> | <b>3829 078</b> |

Technical characteristics see page 4

## High-pressure resistant sensors

### For block cylinders:

|  | 1531 XXX |  | 1537 XXX |  | 1539 XXX |
|--|----------|--|----------|--|----------|
|  | 1533 XXX |  | 1538 XXX |  |          |
|  | 1534 XXX |  |          |  |          |
|  | 1535 XXX |  |          |  |          |
|  | 1536 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            |
| Secured operating distance $S_a$ | mm   | 0...1.2        | 0...1.2    | 0...1.2        | 0...1.2    | 0...1.2        |
| Repeatability                    | %    | ≤ 5            | ≤ 5        | ≤ 5            | ≤ 5        | ≤ 5            |
| Hysteresis                       | %    | ≤ 15           | ≤ 15       | ≤ 15           | ≤ 15       | ≤ 15           |
| Dimensions 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 (Duroplast) | Ceramics   | EP (Duroplast) | Ceramics   | EP (Duroplast) |
| Code class                       | IP54 | 68             | 68         | 68             | 68         | 68             |
| Connection type                  |      | Plug S4        | Plug S4    | Plug S4        | Plug S4    | Plug S4        |

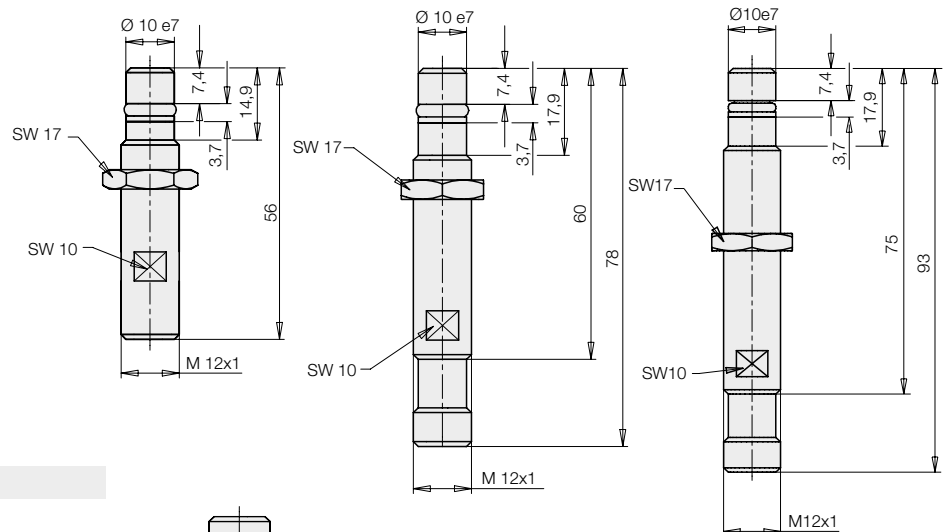
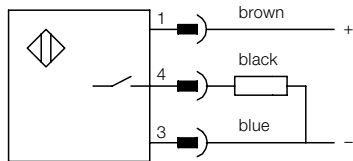
### Electrical characteristics

|                                    |    |            |            |            |            |            |
|------------------------------------|----|------------|------------|------------|------------|------------|
| 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                      |    | npn        | npn        | npn        | npn        | npn        |
| Rated operating voltage            | V  | 24 DC      | 24 DC      | 24 DC      | 24 DC      | 24 DC      |
| Rated operating current            | mA | 200        | 200        | 200        | 200        | 200        |
| Operating voltage                  | V  | 10...30 DC | 10...30 DC | 10...30 DC | 10...30 DC | 10...30 DC |
| Ripple                             | %  | ≤ 15       | ≤ 15       | ≤ 15       | ≤ 15       | ≤ 15       |
| Switching frequency                | Hz | 2000       | 400        | 1000       | 400        | 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 / -  |
| Short circuit protection           |    | yes        | yes        | yes        | yes        | yes        |
| Protection against reverse battery |    | yes        | yes        | yes        | yes        | yes        |

### Part no. sensor

(with mounted seals)

**3829 180      3829 228      3829 030      3829 227      3829 204**



### Mounting and setting of the sensors

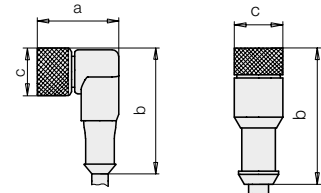
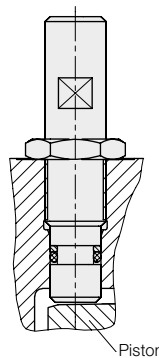
#### Front sensor:

- Extend piston rod completely
- Carefully screw in the sensor 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

#### Rear sensor:

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



LED: Operating voltage (green)  
Function display (yellow)

| Accessories for sensors                | a  | b  | c    | Cable length [m] | Code class | Environmental temperature | LED | Part no.       |
|----------------------------------------|----|----|------|------------------|------------|---------------------------|-----|----------------|
| Plug-type connector pnp M12, knee-type | 27 | 38 | 14.5 | 3                | IP68       | -25...+80 °C              | yes | <b>3829049</b> |
| Plug-type connector pnp M12, straight  | -  | 44 | 14.5 | 5                | IP68       | -40...+90 °C              | no  | <b>3829078</b> |
| Plug-type connector pnp M12, knee-type | 27 | 38 | 14.5 | 5                | IP68       | -20...+105 °C             | no  | <b>3829230</b> |
| Plug-type connector pnp M12, straight  | -  | 44 | 14.5 | 5                | IP68       | -40...+105 °C             | no  | <b>3829229</b> |