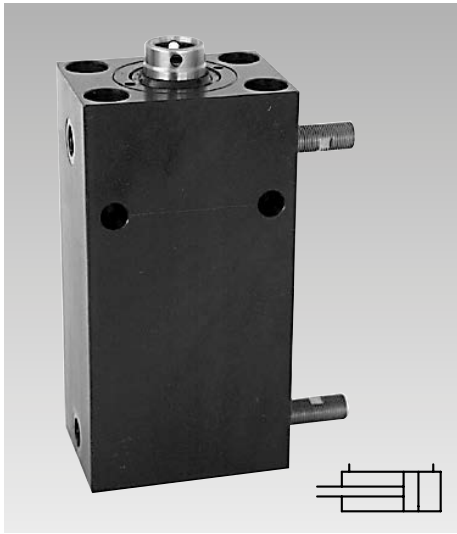


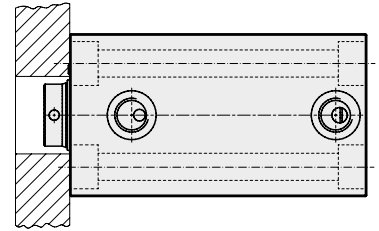
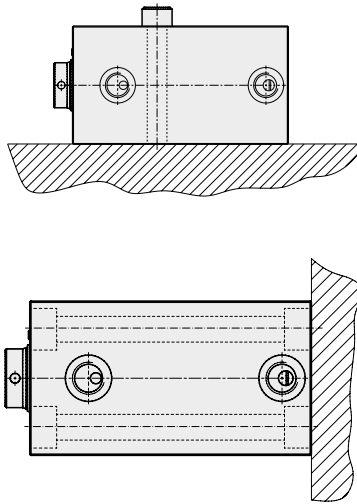


## Block Cylinders

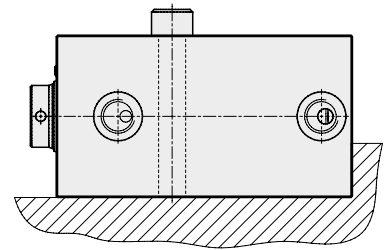
for stroke end control  
 double acting, max. operating pressure 500 bar



### 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.

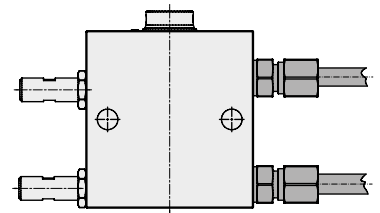
### Advantages

- Compact design
- Same dimensions as the block cylinders as per data sheet B 1.5094, 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

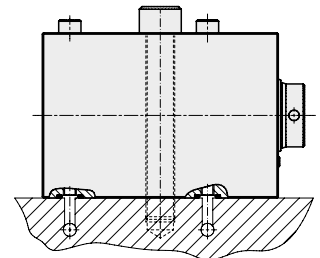
### Important notes!

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.

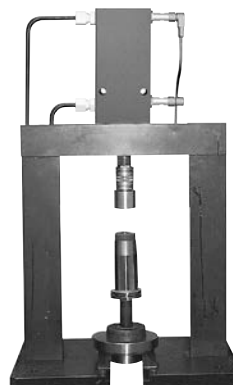
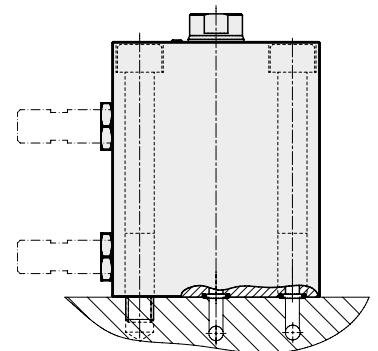
### Version with pipe thread



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



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

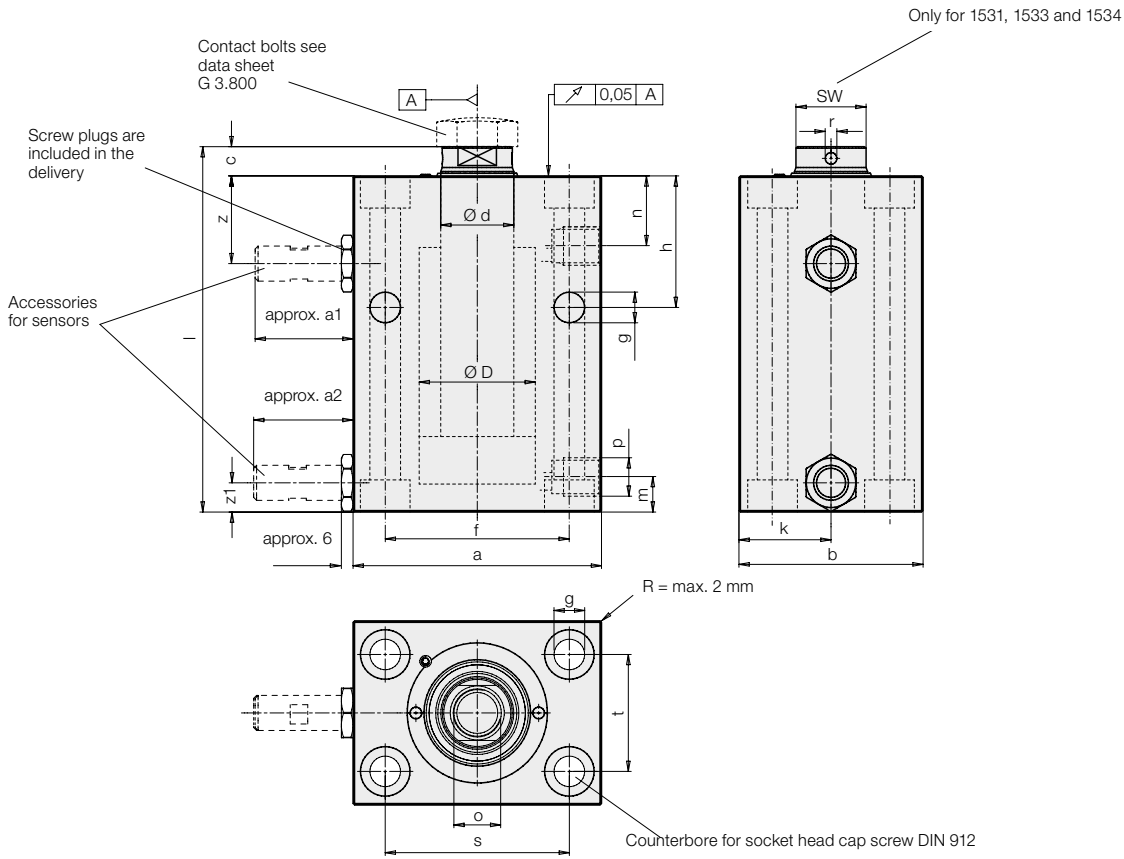


### Application example

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.

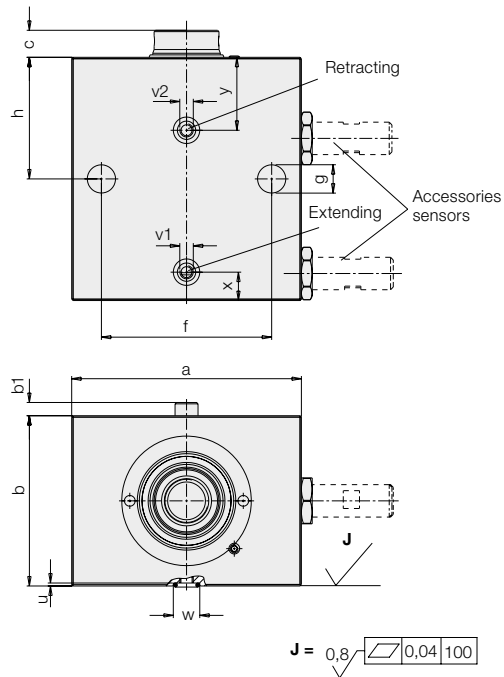
# Technical data

## Dimensions – Versions with pipe thread

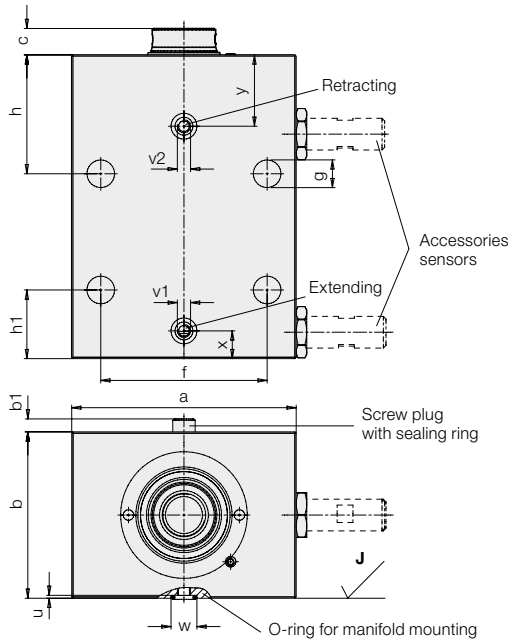


## Oil supply and O-ring sealing at:

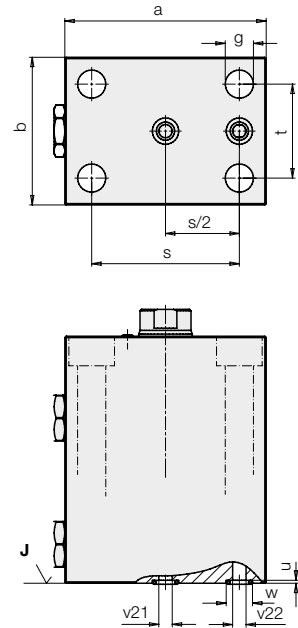
**Broad side  
Version K  
16 - 40 stroke**



**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

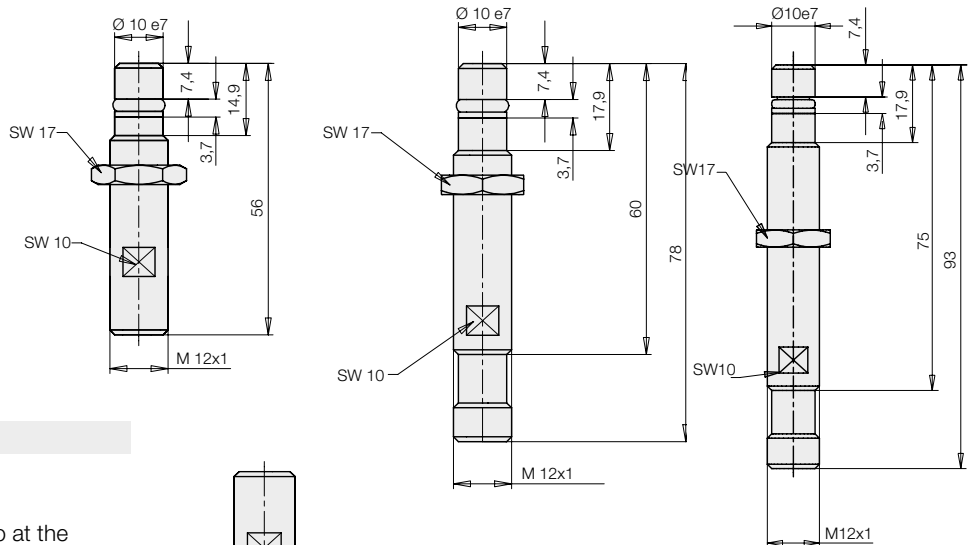
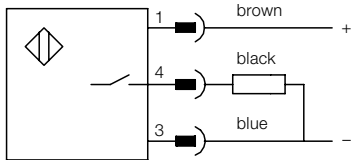
Piston Ø D	[mm]	16	25	32	40	50	63	80	100	
Rod Ø d	[mm]	10	16	20	25	32	40	50	63	
Push force at	100 bar	[kN]	2	4.9	8	12.6	19.5	31.2	50.4	78.4
	500 bar	[kN]	10	24.5	40.2	62.8	98.5	156	252	392
Pull force at	100 bar	[kN]	1.2	2.9	4.9	7.7	11.6	18.6	30.6	47.4
	500 bar	[kN]	6.1	14.5	24.5	38.3	57.9	93	153.2	236.8
Oil volume/ 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	[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		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		3001077	3001077	3001077	3001077	3000275	3001078	3001078	3001078	
<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>3829030</b>	<b>3829030</b>	<b>3829204</b>	
<b>Accessory pull-type connector pnp</b>										
M12x1 knee-type										
<b>Part no.</b>		<b>3829049</b>	<b>3829049</b>	<b>3829049</b>	<b>3829049</b>	<b>3829049</b>	<b>3829049</b>	<b>3829049</b>	<b>3829049</b>	
M12x1 straight										
<b>Part no.</b>		<b>3829078</b>	<b>3829078</b>	<b>3829078</b>	<b>3829078</b>	<b>3829078</b>	<b>3829078</b>	<b>3829078</b>	<b>3829078</b>	

Technical characteristics see page 4

# High-pressure resistant sensors

**For block cylinders:**

	1531 XXX 1533 XXX 1534 XXX 1535 XXX 1536 XXX		1537 XXX 1538 XXX		1539 XXX	
<b>General and technical characteristics</b>						
<b>Environmental temperature</b>	°C		-25...+80	-25...+120	-25...+80	
Rated operating distance S <sub>n</sub>	mm	1.5	1.5	1.5	1.5	
Secured operating distance S <sub>a</sub>	mm	0...1.2	0...1.2	0...1.2	0...1.2	
Repeatability	%	≤ 5	≤ 5	≤ 5	≤ 5	
Hysteresis	%	≤ 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
<b>Electrical characteristics</b>						
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
<b>Part no. sensor</b> (with mounted seals)		<b>3829 180</b>	<b>3829 228</b>	<b>3829 030</b>	<b>3829 227</b>	<b>3829 204</b>

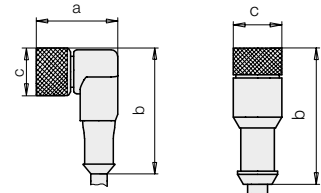
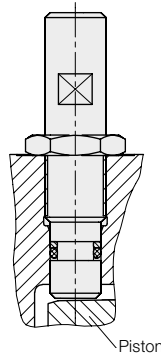


## Mounting and setting of the sensors

### 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



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

### Rear sensor:

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

## Accessories for sensors

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