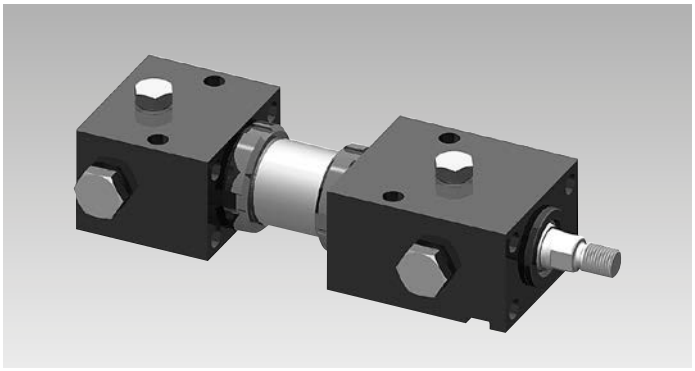
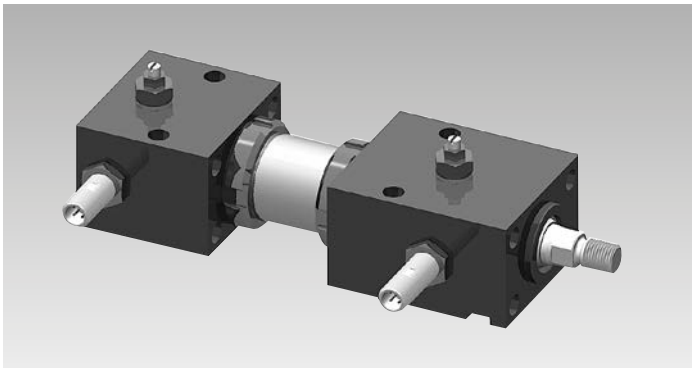
Hydraulic Block Cylinders

design with tube, optionally with stroke end cushioning and stroke end control, double acting, max operating pressure 250 bar

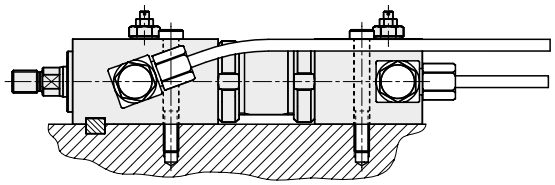


Hydraulic block cylinder in standard version

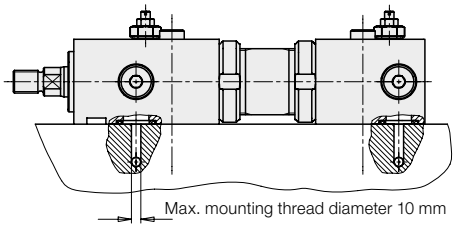


Hydraulic block cylinder with stroke end cushioning and control of the end positions

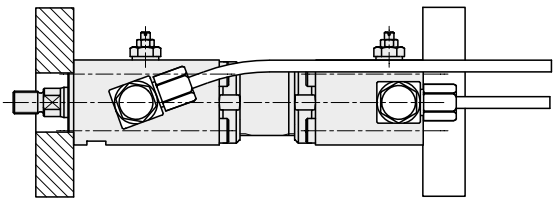
Connecting and fixing possibilities



Oil supply through high-pressure hoses or tubes



Oil supply through drilled channels



Fixing at the front or at the bottom with oil supply through high-pressure hoses or tubes

Application

Over years the ROEMHELD block cylinder has proved a building block in hydraulic systems. The hydraulic block cylinder completes this programme by the following characteristics:

- Piston stroke up to 1200 mm
- Installation possibility of high-pressure resistant sensors for the stroke end control
- Adjustable stroke end cushioning available

The application possibilities in machine and apparatus construction are considerably extended, especially in mould construction for operation of core-pullers and slides.

Description

The hydraulic block cylinder as linear drive combines the advantages of two series

- Hydraulic cylinders with long strokes and optional stroke end cushioning,
- Block cylinders with diverse fixing and oil supply possibilities and optional stroke end control.

The two cylinder heads in block form are connected by a HP tube, in which the piston is guided.
The HP tube and the chromium-plated piston rod material are cut goods, which allows manufacturing of any piston strokes in a very short time. The different connecting and fixing possibilities are shown in the above examples.
The hydraulic block cylinder can be delivered with and without adjustable stroke end cushioning.
High-pressure resistant sensors are available for the stroke end control, which are selected according to the cylinder size and temperature (see chart on page 4).

Important notes

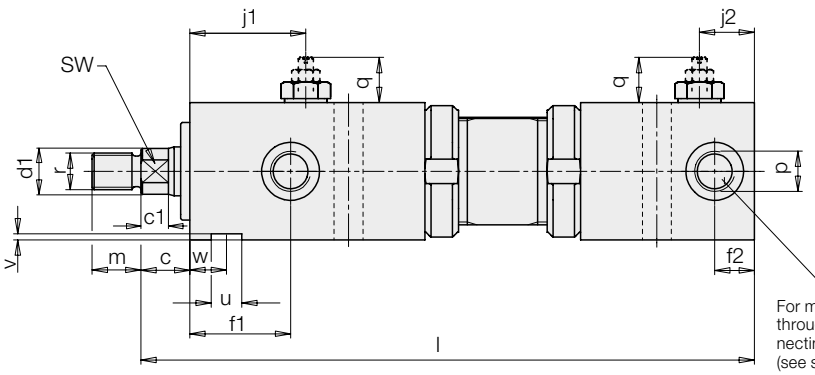
The high-pressure resistant sensors are delivered separately for mounting at place of installation in order to avoid transport damage. Please refer to the installation instructions on page 4.

Advantages

- Diverse fixing possibilities
- Tenon slot
- Oil supply through fittings or drilled channels with O-ring sealing
- Piston rod hardened and chromium-plated
- Piston rod sealing with minimum leakage
- Standard FKM seals
- Piston stroke up to 1200 mm
- Adjustable stroke end cushioning on request
- Stroke end control can be retrofitted with high-pressure resistant sensors

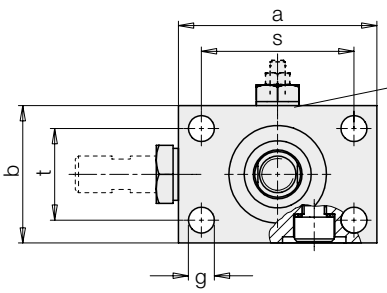
Dimensions of hydraulic block cylinders

Piston rod with external thread



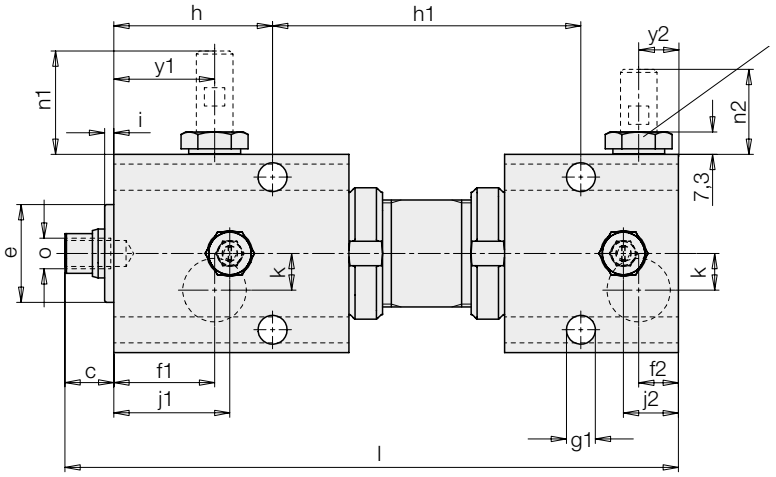
For manifold mounting "oil supply through drilled channels" the connecting threads have to be closed (see srew plug in chart 3)!

View for 1593 up to 1596



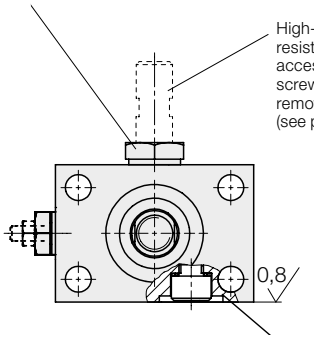
Flow control valves for stroke end cushioning or screw plug G 1/8

Piston rod with internal thread



Screw plug M12 x 1

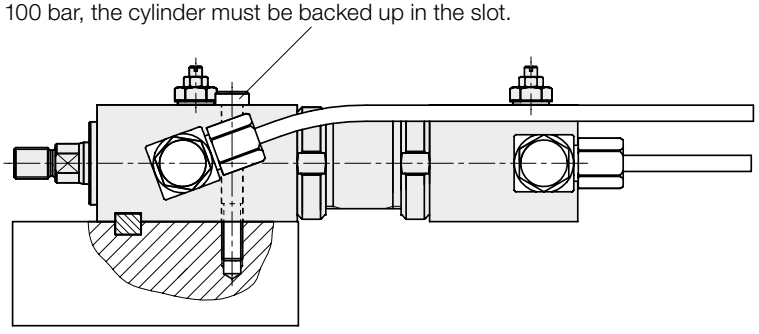
View for 1597 up to 1598



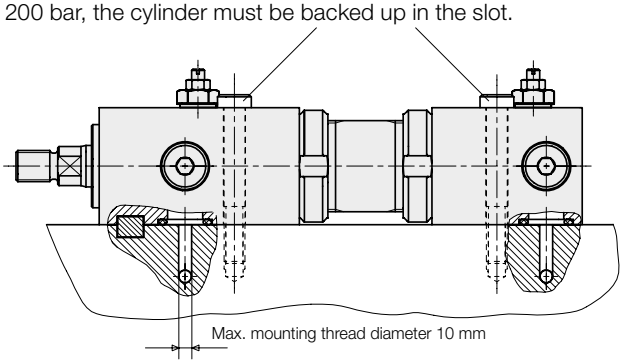
High-pressure resistant sensor (see accessories) can be screwed in after removal of the plug (see page 4 bottom)

For manifold mounting (see example left-hand side bottom) remove socket head cap screw with sealing and insert O-ring into the counterbore (see accessories)

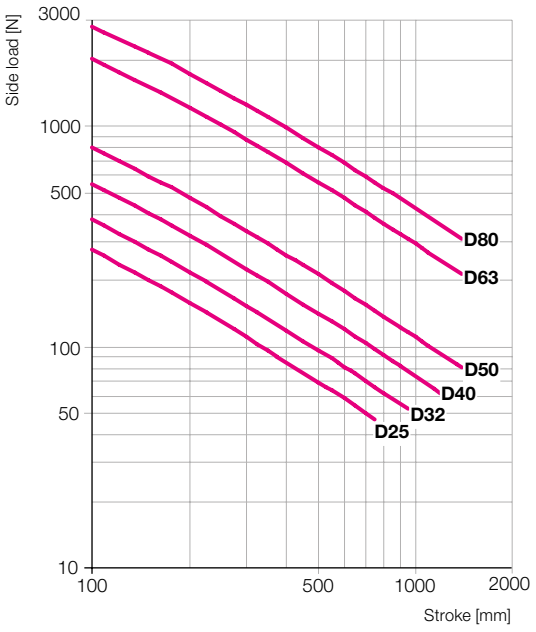
When fixing with 2 screws (property class 12.9) and a pressure exceeding 100 bar, the cylinder must be backed up in the slot.

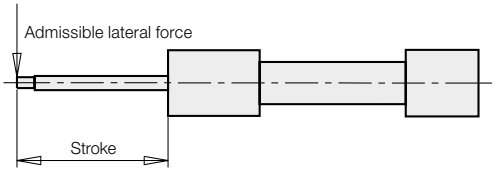


When fixing with 4 screws (property class 12.9) and a pressure exceeding 200 bar, the cylinder must be backed up in the slot.



Admissible transverse force with extended piston rod





Dimensions of hydraulic block cylinders

Hydraulic block cylinder (see code for part-nos.)			**1593**	**1594**	**1595**	**1596**	**1597**	**1598**
Piston Ø D		**[mm]**	**25**	**32**	**40**	**50**	**63**	**80**
Rod Ø d		**[mm]**	**16**	**20**	**25**	**32**	**40**	**50**
Nominal force at 250 bar	Extending stroke	[kN]	12.3	20.1	31.4	49.1	77.9	125.7
	Retracting stroke	[kN]	7.25	12.3	19.1	29	46.5	76.6
Piston area		[cm²]	4.9	8.04	12.56	19.63	31.17	50.26
Annulus area		[cm²]	2.89	4.9	7.65	11.59	18.6	30.6
Cushioning stroke		[mm]	16	16	20	25	32	40
L ± 0.75 = desired stroke +		[mm]	111	124	153	166	193	230
a		[mm]	65	75	85	100	125	160
b		[mm]	45	55	63	75	95	120
c		[mm]	16	16	16	18	20	22
Ø d1 x c1		[mm]	15x9	19x8	24x9	31x10	39x12	49x13
Ø e f7		[mm]	32	40	50	60	70	85
f1		[mm]	33	38.5	46	54	66	79
f2		[mm]	13	14	18	21	26	36
Ø g		[mm]	8.5	8.5	10.5	13	17	21
Ø g1 for (MXX)		[mm]	9.5 (M8)	11.5 (M10)	11.5 (M10)	14 (M12)	18 (M16)	22 (M20)
h		[mm]	52	56	64.5	74	94	105
h1 = desired stroke +		[mm]	11	21	38.5	33	23	42.5
i		[mm]	3	4	4	4	4	5
j1		[mm]	38	45	57	64	58	72
j2		[mm]	18	20	26.5	31	18	26
k		[mm]	12	14.5	16	20	30	32
m		[mm]	16	18	22	28	36	45
n1		[mm]	34	31	29	47	31	45
n2		[mm]	28	25	23	39.5	22	34.5
o x depth of thread (internal thread)		[mm]	M10x15	M12x15	M16x25	M20x30	M27x40	M30x40
p			G 1/4	G 1/4	G 1/4	G 1/4	G 1/2	G 1/2
q		[mm]	15	14	14	12.5	11	11
r (external thread)		[mm]	M12x1.25	M14x1.5	M16x1.5	M20x1.5	M27x2	M33x2
SW		[mm]	13	17	22	27	36	46
s		[mm]	50	58	66	80	99	124
t		[mm]	30	38	44	55	69	84
u H11		[mm]	10	12	12	14	20	22
v		[mm]	2	3	3	3	4	5
w		[mm]	12	16	24	32	35	50
y1		[mm]	33	38.5	46	50.5	60.5	69
y2		[mm]	13	14	18	16.5	20.5	21
minimum stroke* ± 1.5		[mm]	70	70	60	70	80	80
minimum stroke** ± 1.5		[mm]	130	140	150	170	190	210
maximum stroke ± 1.5		[mm]	750	950	1200	1200	1200	1200
Accessories								
Part no. high-pressure resistant sensor (s. page 4)			**3829180**	**3829180**	**3829180**	**3829030**	**3829180**	**3829030**
Dimensions of O-ring for manifold mounting		[mm]	15.54x2.62	15.54x2.62	15.54x2.62	15.54x2.62	18.72x2.62	18.72x2.62
Part no. O-ring (FKM)			**3000103**	**3000103**	**3000103**	**3000103**	**3001061**	**3001061**
Part no. Screw plug with hexagon socket			**3300821**	**3300821**	**3300821**	**3300821**	**3610045**	**3610045**

Code for part numbers

159X X X XXXX

- 0XXX = stroke in mm up to 999 mm
- 1XXX = stroke in 1000 mm and over

} min. and max. strokes see at the end of the chart

- 1 = without cushioning
- 3 = with cushioning

- 1 = piston rod with exterior thread
- 2 = piston rod with interior thread

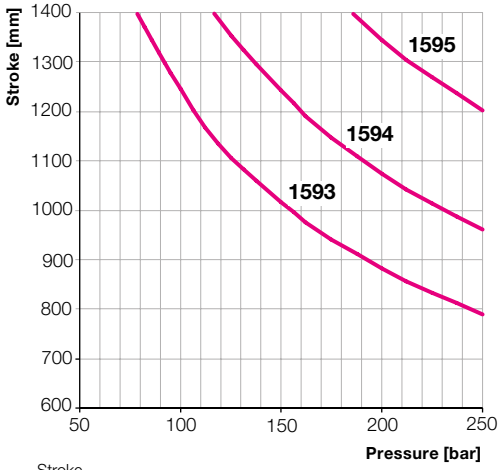
- 3 = piston-Ø D 25 mm
- 4 = piston-Ø D 32 mm
- 5 = piston-Ø D 40 mm
- 6 = piston-Ø D 50 mm
- 7 = piston-Ø D 63 mm
- 8 = piston-Ø D 80 mm

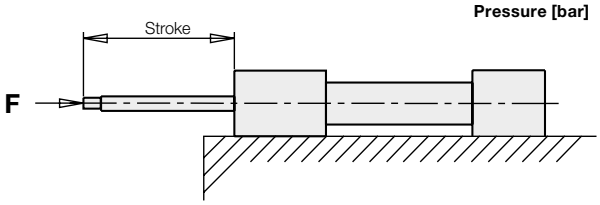
Order example:

1. Hydraulic block cylinder Ø 40 x 755 stroke without cushioning and piston rod with interior thread : **1595 21 0755**
2. Hydraulic block cylinder Ø 63 x 1015 stroke with cushioning and piston rod with exterior thread : **1597 13 1015**

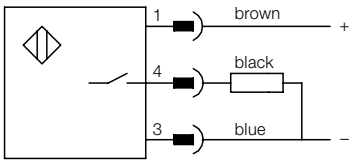
* minimum stroke with fixing at the broad side
** minimum stroke with fixing at the front by flange

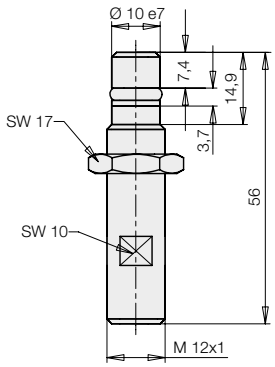
Limit values for stroke and operating pressures at buckling load (safety against buckling = 3.5)

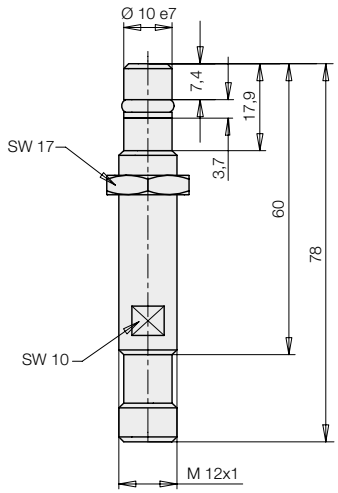




For cylinders:		1593XXX 1594XXX 1595XXX 1597XXX		1596XXX 1598XXX	
General and technical characteristics					
Environmental temperature	**°C**	**-25...+80**	**-25...+120**	**-25...+80**	**-25...+120**
Rated operating distance Sn	mm	1.5	1.5	1.5	1.5
Secured operating distance Sa	mm	0...1.2	0...1.2	0...1.2	0...1.2
Repeatability	%	≤ 5	≤ 5	≤ 5	≤ 5
Hysteresis	%	≤ 15	≤ 15	≤ 15	≤ 15
Dimensions DxT	mm	M12x1 x 56	M12x1 x 56	M12x1x78	M12x1 x 78
Material of the body		1.4104	1.4104	1.4104	1.4104
Material of sensing face		EP (Duroplast)	Ceramics	EP (Duroplast)	Ceramics
Code class	IP54	68	68	68	68
Connection type		Plug S4	Plug S4	Plug S4	Plug S4
Electrical characteristics					
Voltage		DC	DC	DC	DC
Wiring		3 wires	3 wires	3 wires	3 wires
Switching function		interlock	interlock	interlock	interlock
Output signal		pnp	pnp	pnp	pnp
Rated operating voltage	V	24 DC	24 DC	24 DC	24 DC
Rated operating current	mA	200	200	200	200
Operating voltage	V	10...30 DC	10...30 DC	10...30 DC	10...30 DC
Ripple	%	≤ 15	≤ 15	≤ 15	≤ 15
Switching frequency	Hz	2000	400	1000	400
No-load current	mA	≤ 10/≤ 2	≤ 8	≤ 10/≤ 1	≤ 8
Voltage drop	V	≤ 1.5/-	≤ 2.5	≤ 1.5/-	≤ 2.5
Short circuit protection		yes	yes	yes	yes
Protection against reverse battery		yes	yes	yes	yes
Part no. sensor (with mounted seals)		**3829180**	**3829228**	**3829030**	**3829227**







Mounting and setting of the sensors

Front sensor:

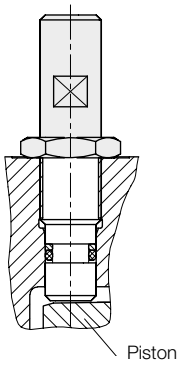
1. Extend piston rod completely
2. Carefully screw in the sensor to the stop at the piston. Turn back the sensor:

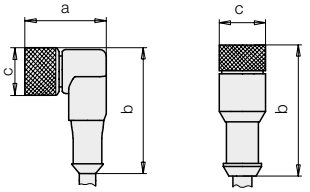
Rotation	Switching point before the final position
1/4	approx. 4 mm
1 1/4	approx. 1 mm

3. Lock the sensor in this position by means of a nut
4. Wire the switch electrically and check the function

Rear sensor:

1. 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	**3829049**
Plug-type connector pnp M12, straight	-	44	14.5	5	IP68	-40...+90 °C	no	**3829078**
Plug-type connector pnp M12, knee-type	27	38	14.5	5	IP68	-20...+105 °C	no	**3829230**
Plug-type connector pnp M12, straight	-	44	14.5	5	IP68	-40...+105 °C	no	**3829229**