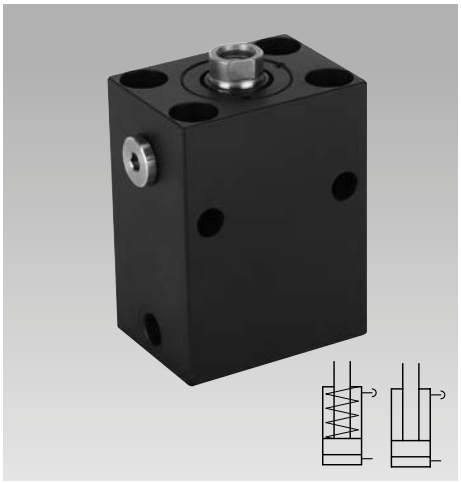
Block Cylinders
single acting, with and without spring return
max. operating pressure 500 bar



Application
Single-acting block cylinders can be used for all hydraulically-operated linear movements that do not require a retraction force or where the piston is retracted by an external force.

- Positioning
- Clamping
- Supporting
- Locking
- Riveting
- Moving
- Closing
- Locking
- Lifting
- Pushing

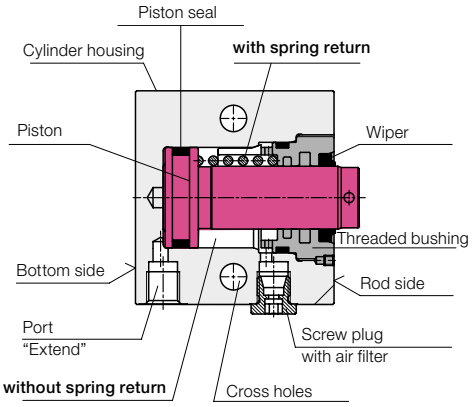
Function
With spring return
When pressurising the cylinder the piston extends. After pressure relief, the piston is retracted by spring force.
The pressure spring must not only overcome the friction forces, but must also supply the hydraulic oil back to the reservoir.

Without spring return
When pressurising the cylinder the piston extends. After pressure relief, the piston must be retracted by an external force. Since no pressure spring is installed, this single-acting block cylinder has the same stroke as the double-acting version with the same length.

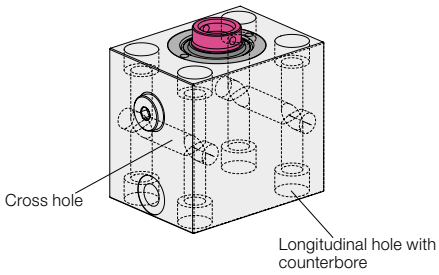
Material
Cylinder housing: high alloy steel, black oxide*
Kolben: case-hardening steel, hardened and ground
O-rings and wipers:
NBR = nitrile-butadiene rubber
Temperature range: –25 up to +100 °C
FKM = fluor caoutchouc
Temperature range: –15 up to +200 °C
Glydrings and back-up rings:
PTFE = polytetrafluor ethylene
Temperature range: –45 up to +200 °C
Hydraulic fluid: see data sheet A 0.100
Special versions for other hydraulic fluids and operating temperatures up to +250 °C are available on request. auf Anfrage lieferbar.

* Size 1519 black matt lacquered

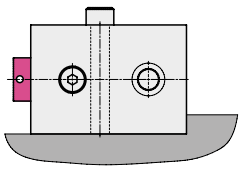
Advantages
- 8 sizes each with 2 stroke lengths available
- Large range of diameter
  Piston Ø 16 up to 100 mm
- Large range of stroke 8 up to 100 mm
- Large range of force
  2 kN for piston Ø 16 mm and 100 bar
  392 kN for piston Ø 100 mm and 500 bar
- Large retention force
- Compact block design
- Many fixing possibilities
- Many connecting possibilities
- Case-hardened piston rod
- Alternatively NBR or FKM seals and wiper
- Operating temperature up to 200 °C with FKM seals
- Minimum leakage
- Maintenance free

Design


Fixing possibilities
Possible mounting holes

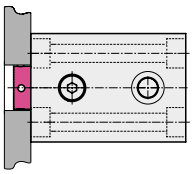


● Broad side



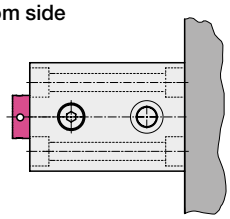
151XXX 0 1

● Rod side



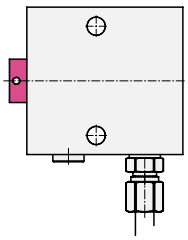
151XXX 5 6

● Bottom side



151XXX 5 6

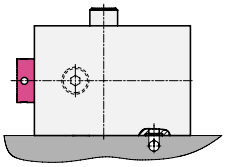
Hydraulic connecting possibilities
Pipe thread



151XXX 0 1 5 6

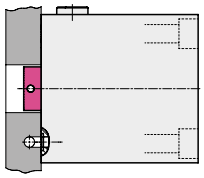
Flange with O-ring sealing

● Broad side



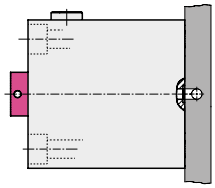
151XXXX K L

● Rod side



151XXXXS

● Bottom side



151XXXXB

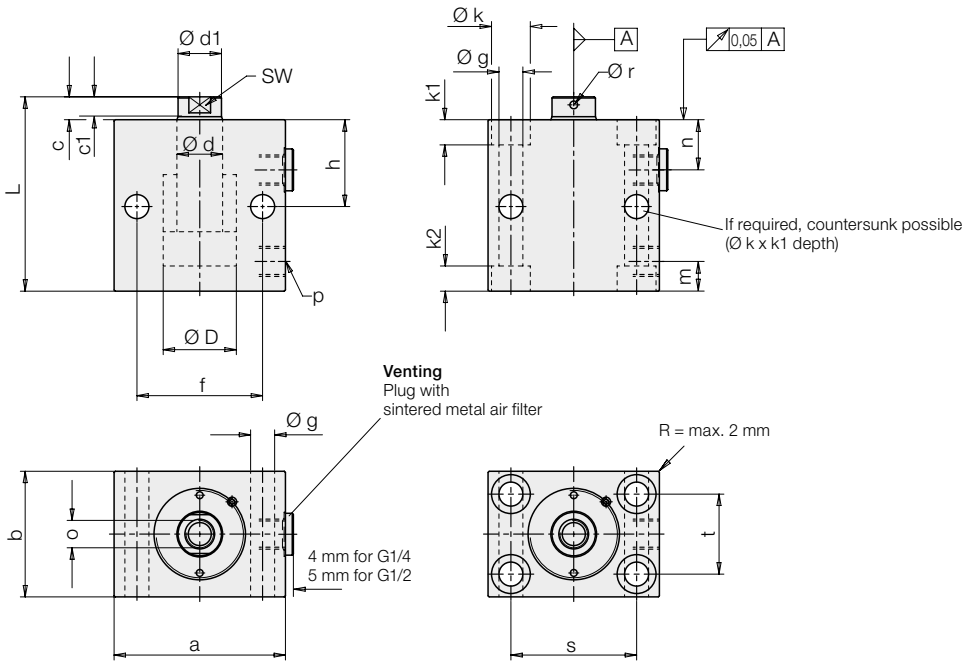
8 up to 100 mm stroke

2 cross holes

151XXX **0** (NBR) **1** (FKM)

2 cross holes and 4 longitudinal holes

151XXX **5** (NBR) **6** (FKM)



Piston Ø D	**[mm]**	**16**	**25**	**32**	**40**	**50**	**63**	**80**	**100**
Rod Ø d	**[mm]**	**10**	**16**	**20**	**25**	**32**	**40**	**50**	**63**

With spring return **8 up to 32 mm stroke** **X = identification code for bore holes and seals** ➔ see above

Stroke ±0.6	**[mm]**	**8**	**8**	**10**	**10**	**12**	**12**	**12**	**12**
Total length L ±0.5	[mm]	62	71	85	89	100	116	131	145
Min. spring return force	[N]	57	145	222	276	387	429	760	1200
Weight approx.	[kg]	0.8	1.2	2	2.76	4.5	8.2	15.4	24.8
Part no.		**151100X**	**151300X**	**151410X**	**151500X**	**151600X**	**151700X**	**151800X**	**151900X**

Stroke ±0.6	**[mm]**	**20**	**20**	**20**	**20**	**20**	**25**	**32**	**32**
Total length L ±0.5	[mm]	97	101	110	114	125	149	179	205
Min. spring return force	[N]	48	160	228	276	450	470	720	1230
Weight approx.	[kg]	1.4	2	2.8	3.6	6.1	10.3	20.3	39
Part no.		**151102X**	**151302X**	**151412X**	**151502X**	**151602X**	**151703X**	**151804X**	**151904X**

Without spring return **16 up to 100 mm stroke** **X = identification code for bore holes and seals** ➔ see above

Stroke ±0.6	**[mm]**	**16**	**20**	**25**	**25**	**25**	**30**	**32**	**40**
Total length L ±0.5	[mm]	62	71	85	89	100	116	131	145
Weight approx.	[kg]	0.8	1.2	1.9	2.7	4.4	8	15	24
Part no.		**151101X**	**151301X**	**151411X**	**151501X**	**151601X**	**151701X**	**151801X**	**151901X**

Stroke ±0.6	**[mm]**	**50**	**50**	**50**	**50**	**50**	**63**	**80**	**100**
Total length L ±0.5	[mm]	97	101	110	114	125	149	179	205
Weight approx.	[kg]	1.3	1.9	2.7	3.5	6	10	20	37
Part no.		**151106X**	**151306X**	**151416X**	**151506X**	**151606X**	**151707X**	**151808X**	**151909X**

Size		1511	1513	1514	1515	1516	1517	1518	1519
Piston Ø D	**[mm]**	**16**	**25**	**32**	**40**	**50**	**63**	**80**	**100**
Rod Ø d	**[mm]**	**10**	**16**	**20**	**25**	**32**	**40**	**50**	**63**
Force to push at	100 bar [kN]	2.0	4.9	8.0	12.6	19.5	31.2	50.4	78.4
	500 bar [kN]	10.0	24.5	40.2	62.8	98.5	156.0	252.0	392.0
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
a	[mm]	60	65	75	85	100	125	160	200
b	[mm]	35	45	55	63	75	95	120	150
c	[mm]	6 (7)*	7	10	10	10	14	14	15
Ø d1 x c1	[mm]	9.2x3.7	15x5	19x7.8	24x7.1	30.5x6.5	38.7x9.2	48x9.2	61x10.7
f	[mm]	30	50	55	63	76	95	120	158
Ø g	[mm]	6.5	8.5	10.5	10.5	13	17	21	25
h	[mm]	30	33	38	40	44	50	60	64
h1	[mm]	24.5	26	27	27	30	41	47	54
Ø k	[mm]	11	13.5	17	17	20	26	33	40
k1	[mm]	7	9	11	11	13	17	21.5	25.5
k2	[mm]	4	9	11	11	13	17	21.5	25.5
m	[mm]	11	11	11	11	13	17	21	25
n	[mm]	16.5	18	22	24	27	26	34	35
o x thread depth	[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
Ø 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
SW	[mm]	8	13	17	–	–	–	–	–
u ± 0.05	[mm]	1.1	1.1	1.1	1.1	1.1	1.5	1.5	1.5
Ø v1 extend	[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]	7	7.5	10	10	13	16	21	25

General tolerances as per DIN ISO 2768-mH
***** 7mm for 1511 02X and 1511 06X

Important notes

The block cylinders designed for industrial applications to transform hydraulic pressure to a linear movement and /or force. They can generate very high forces. The fixture or machine must be in the position to compensate the forces.

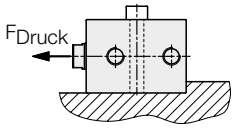
In the effective area of the clamping bolt there is the danger of crushing. The manufacturer of the fixture or the machine is obliged to provide effective protection devices.

Mounting

In principle, screws of tensile strength 8.8 can be used to secure the block cylinders.

Support

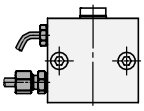
If block cylinders are fastened with screws across the cylinder axis, they must be supported for operating pressures of 100 bar and higher.



Support required, if p > 100 bar
(see also page 5 “Keyway”)

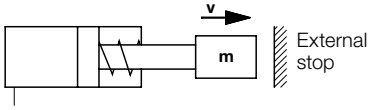
Venting of the spring area

If there is any danger that fluids penetrate through the sintered metal air filter into the spring area, a vent hose has to be connected and be placed in a protected position (see data sheet G 0.110).



Admissible dynamic load

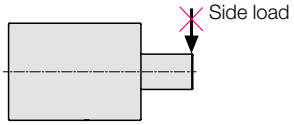
This block cylinder line is not equipped with stroke end cushioning, i.e. a weight **m** fixed to the piston will move with speed **v** against the internal stop without braking. Above all in extending direction, the threaded bushing is overloaded and the operating safety is-jeopardised.



At piston speeds higher than 0.05 m/s and a weight that exceeds the own weight of the block cylinder, a cylinder with stroke end cushioning has to be used or the cylinder movement must be effected against an external stop. This is also valid for punching applications

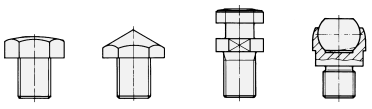
Side loads

Side loads cannot be compensated, since in the case of single-acting block cylinders the guide of the piston rod is not lubricated with hydraulic oil.



Accessory - Contact bolts

As accessory different contact bolts and coupling pins are available. See data sheet G 3.800



For further application instructions see data sheet A 0.100 and program summary “Block Cylinders”.

Flange with O-ring sealing

Broad side K

With spring return
8 up to 12 mm stroke
Without spring return
16 up to 40 mm stroke

2 cross holes
151X XX0K (NBR)
XX1K (FKM)

Broad side L

With spring return
20 up to 32 mm stroke
Without spring return
50 up to 32 mm stroke

4 cross holes
151X XX0L (NBR)
XX1L (FKM)

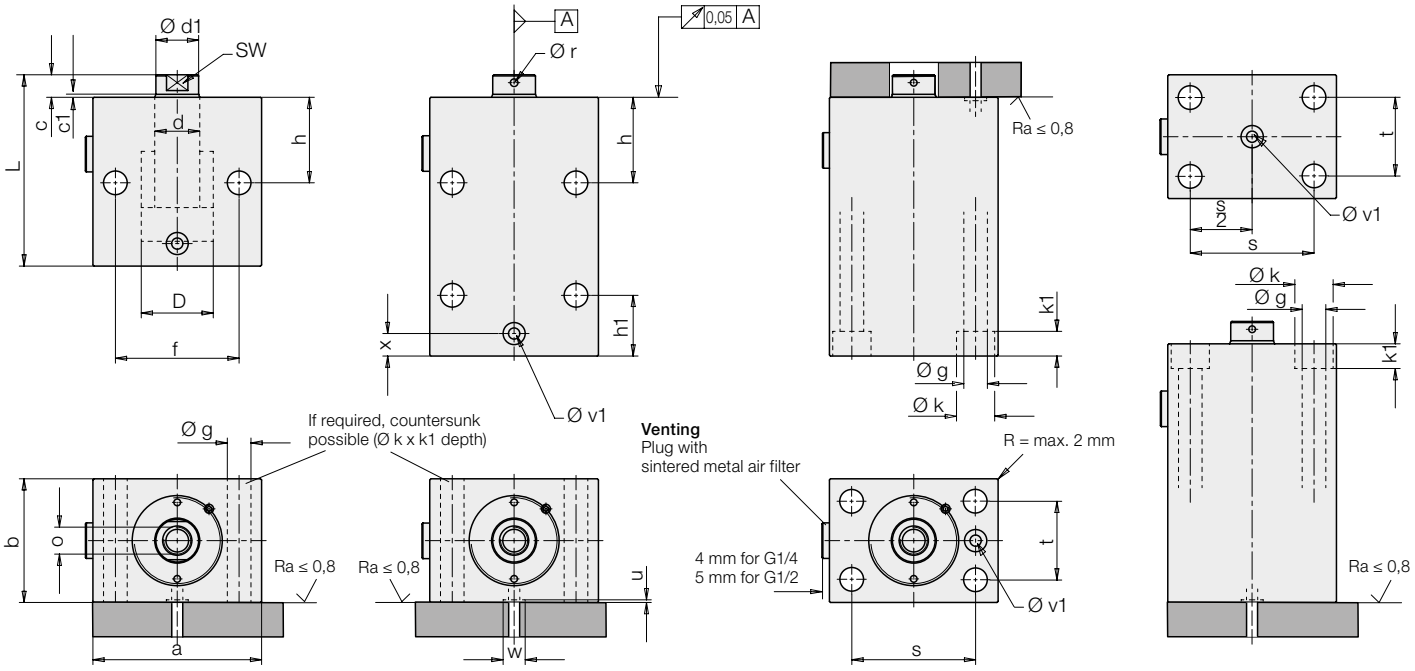
Rod side S

With spring return
8 up to 32 mm stroke
Without spring return
16 up to 100 mm stroke

4 longitudinal holes
151X XX5S (NBR)
XX6S (FKM)

Bottom side B

151X XX5B (NBR)
XX6B (FKM)



Piston Ø D	**[mm]**	**16**	**25**	**32**	**40**	**50**	**63**	**80**	**100**
Rod Ø d	**[mm]**	**10**	**16**	**20**	**25**	**32**	**40**	**50**	**63**

With spring return **8 up to 32 mm stroke** **XX = identification code for sealing material and manifold mounting area →** see above

Stroke ±0.6	**[mm]**	**8**	**8**	**10**	**10**	**12**	**12**	**12**	**12**
Total length L +0.5/-0.8	[mm]	62	71	85	89	100	116	131	145
Min. spring return force	[N]	57	145	222	276	387	429	760	1200
Weight approx.	[kg]	0.8	1.2	2	2.76	4.5	8.2	15.4	24.8
Part no.		**151100XX**	**151300XX**	**151410XX**	**151500XX**	**151600XX**	**151700XX**	**151800XX**	**151900XX**

Stroke ±0.6	**[mm]**	**20**	**20**	**20**	**20**	**20**	**25**	**32**	**32**
Total length L +0.5/-0.8	[mm]	97	101	110	114	125	149	179	205
Min. spring return force	[N]	48	160	228	276	450	470	720	1230
Weight approx.	[kg]	1.4	2	2.8	3.5	6.1	10.3	20.3	39
Part no.		**151102XX**	**151302XX**	**151412XX**	**151502XX**	**151602XX**	**151703XX**	**151804XX**	**151904XX**

Without spring return **6 up to 100 mm stroke** **XNNX = identification code for sealing material and manifold mounting area →** see above

Stroke ±0.6	**[mm]**	**16**	**20**	**25**	**25**	**25**	**30**	**32**	**40**
Total length L +0.5/-0.8	[mm]	62	71	85	89	100	116	131	145
Weight approx.	[kg]	0.8	1.2	1.9	2.7	4.4	8	15	24
Part no.		**151101XX**	**151301XX**	**151411XX**	**151501XX**	**151601XX**	**151701XX**	**151801XX**	**151901XX**

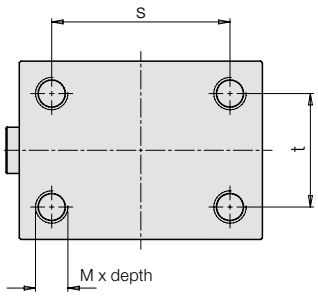
Stroke ±0.6	**[mm]**	**50**	**50**	**50**	**50**	**50**	**63**	**80**	**100**
Total length L +0.5/-0.8	[mm]	97	101	110	114	125	149	179	205
Weight approx.	[kg]	1.3	1.9	2.7	3.5	6	10	20	37
Part no.		**151106XX**	**151306XX**	**151416XX**	**151506XX**	**151606XX**	**151707XX**	**151808XX**	**151909XX**

O-rings for manifold-mounting area: (included in the delivery)

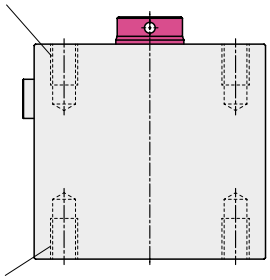
Dimensions	[mm]	7 x 1.5	7 x 1.5	7 x 1.5	7 x 1.5	8 x 1.5	10 x 2	10 x 2	10 x 2
Part no. NBR		**3000342**	**3000342**	**3000342**	**3000342**	**3000343**	**3000347**	**3000347**	**3000347**
Part no. FKM		**3001077**	**3001077**	**3001077**	**3001077**	**3000275**	**3001078**	**3001078**	**3001078**

4 threads at the front to fix the housing C, D

Instead of longitudinal holes and cross holes the block cylinders can be provided with 4 interior threads, alternatively at the rod side **C** or at the bottom side **D**.



Rod side: 151XXXXC



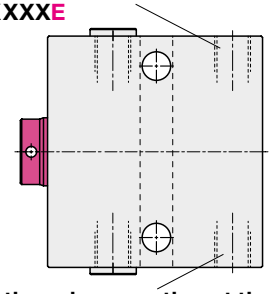
Bottom side: 151XXXXD

Keyway to support the housing E, F, Q

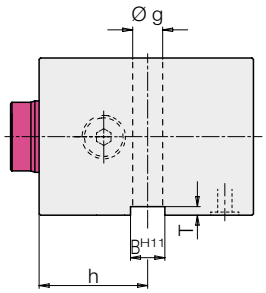
The block cylinders without longitudinal holes or interior thread can be equipped with a keyway for a key.

For pipe thread connection the position of the connecting threads have to be determined in advance (identification code **E** or **F**). For manifold-mounting connection (K or L) the identification code is **Q**.

Pipe thread connection at the right side: 151XXXXE



Pipe thread connection at the left side: 151XXXXF

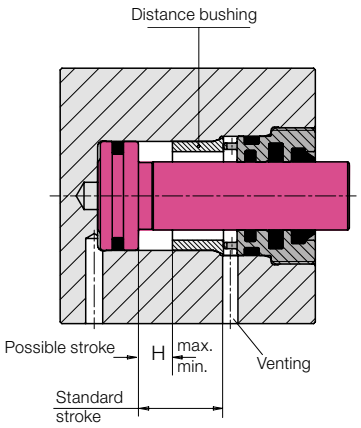


Manifold-mounting connection: 151XXXXXQ

Stroke limitation by distance bushing H

The extending piston stroke of block cylinders can be limited by installing a distance bushing. The minimum stroke should not be less than 1 mm. The maximum stroke possible based on the standard stroke is indicated in the below table.

Only without spring return!



Example: Possible stroke

Block cylinder 1515065
Standard stroke 50 mm

As per table:

Hmin. = 1 mm
Hmax. = 50 – 3 = 47 mm

Basic version	Dimensions								
	4 threads C, D			keyway E, F, Q				stroke limitation H	
Part no. (page 2 to 4)	M x depth	s	t	B^{H11}	T	Ø g	h	Hmin.	Hmax.
1511XXXX	M 6 x 9	40	22	8	2	6.5	30	1	standard stroke – 3
1513XXXX	M 8 x 12	50	30	10	2	8.5	33	1	standard stroke – 3
1514XXXX	M 10 x 15	55	35	12	3	10.5	38	1	standard stroke – 3
1515XXXX	M 10 x 15	63	40	12	3	10.5	40	1	standard stroke – 3
1516XXXX	M 12 x 18	76	45	15	5	13	44	1	standard stroke – 4
1517XXXX	M 16 x 24	95	65	20	5	17	50	1	standard stroke – 4
1518XXXX	M 20 x 30	120	80	24	7	21	60	1	standard stroke – 6
1519XXXX	M 24 x 36	158	108	28	7	25	64	1	standard stroke – 6

General tolerances as per DIN ISO 2768-mH

All dimensions in mm.

Examples for ordering:

4 threads

Block cylinder 1517005 (pipe thread connection) with 4 threads M16 at the bottom side
Part no. 1517005D

Block cylinder 1517005B (manifold-mounting connection) with 4 threads M16 at the bottom side
Part no. 1517005BD

Keyway

Block cylinder 1517000 (pipe thread connection) with keyway and connecting thread at the left side
Part no. 1517000F

Block cylinder 1517000K (manifold-mounting connection) with keyway
Part no.1517000KQ

Stroke limitation

Block cylinder 1517010 (pipe thread connection) with stroke limitation to 15 mm
Part no. 1517010H15

Block cylinder 1517010K (manifold-mounting connection) with keyway and stroke limitation to 15 mm
Part no. 1517010KQH15

Possible combinations of standard variants see page 6.

Code for part numbers of the basic versions*
(page 2 to 4)

1 5 X X X X X X

Piston diameter
11 = 16 mm
13 = 25 mm
14 = 32 mm
15 = 40 mm
16 = 50 mm
17 = 63 mm
18 = 80 mm
19 = 100 mm

Not applicable for pipe thread

Flange with O-ring sealing at the
K = broad side with 2 cross holes,
with spring return stroke 8 up to 12 mm
without spring return 16 up to 40 mm stroke
L = broad side with 4 cross holes,
with spring return 20 up to 32 mm stroke
without spring return 50 up to 100 mm stroke
S = rod side with 4 longitudinal holes
B = bottom side with 4 longitudinal holes

Sealings and holes in the housing
0 = NBR, 2 cross holes
1 = FKM, 2 cross holes
5 = NBR, 2 cross holes and 4 longitudinal holes
6 = FKM, 2 cross holes and 4 longitudinal holes

Piston stroke
0 = 8 up to 12 mm with spring return
1 = 16up to 40 mm without spring return
2 = 20 mm with spring return
3 = 25 mm with spring return
4 = 32 mm with spring return
6 = 50 mm without spring return
7 = 63 mm without spring return
8 = 80 mm without spring return
9 = 100 mm without spring return

Serial number
0 = Piston Ø 16, 25, 40, 50, 63, 80, 100 mm
1 = Piston Ø 32 mm

***) Important notes**
The code for part numbers allows the **determination of technical data of a known part number.**
The code for part numbers is not suitable for the selection of any variant. Only the versions as per the charts on page 2 or 4 are available as standard elements.
Special variants are available on request.

Code for part numbers of the standard variants and possible combinations
Explanation of the identification codes and order examples see page 5

1 5 X X X X X X X X

Basic version
(see above)

Pipe thread				**Optional stroke limitation only without spring return!**
	H			+ stroke limitation (e.g. H15)
4 interior threads rod side	**C**	**H**		+ stroke limitation
4 interior threads bottom side	**D**	**H**		+ stroke limitation
Keyway, connection at the right side	**E**	**H**		+ stroke limitation
Keyway, connection at the left side	**F**	**H**		+ stroke limitation
Flange with O-ring sealing				
Broad side: Strokes see page 4	**K**	**H**		+ stroke limitation
	L	**H**		+ stroke limitation
Rod side	**S**	**H**		+ stroke limitation
Bottom side	**B**	**H**		+ stroke limitation
Broad side: Strokes see page 4	**K**	**Q**	**H**	+ keyway + stroke limitation
	L	**Q**	**H**	+ keyway + stroke limitation
Rod side	**S**	**C**	**H**	+ 4 interior threads + stroke limitation
Bottom side	**B**	**D**	**H**	+ 4 interior threads + stroke limitation