

2-way cartridge valves, directional functions

Type LC (cartridge valves)
Type LFA (control cover)

RE 21010

Edition: 2017-05

Replaces: 2014-09



- ▶ Standard series
- ▶ Size 16 ... 160
- ▶ Component series 2X; 6X; 7X
- ▶ Maximum operating pressure 420 bar
- ▶ Maximum flow 25,000 l/min

Features

- ▶ Valve poppet with or without damping nose
- ▶ 2 area ratios
- ▶ 6 different cracking pressures
- ▶ 4 stroke limitations
- ▶ Control cover with integrated seat valve
- ▶ Control cover with integrated shuttle valve
- ▶ Control cover for set-up of directional spool valves with or without installed shuttle valve

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Function, sections, symbol

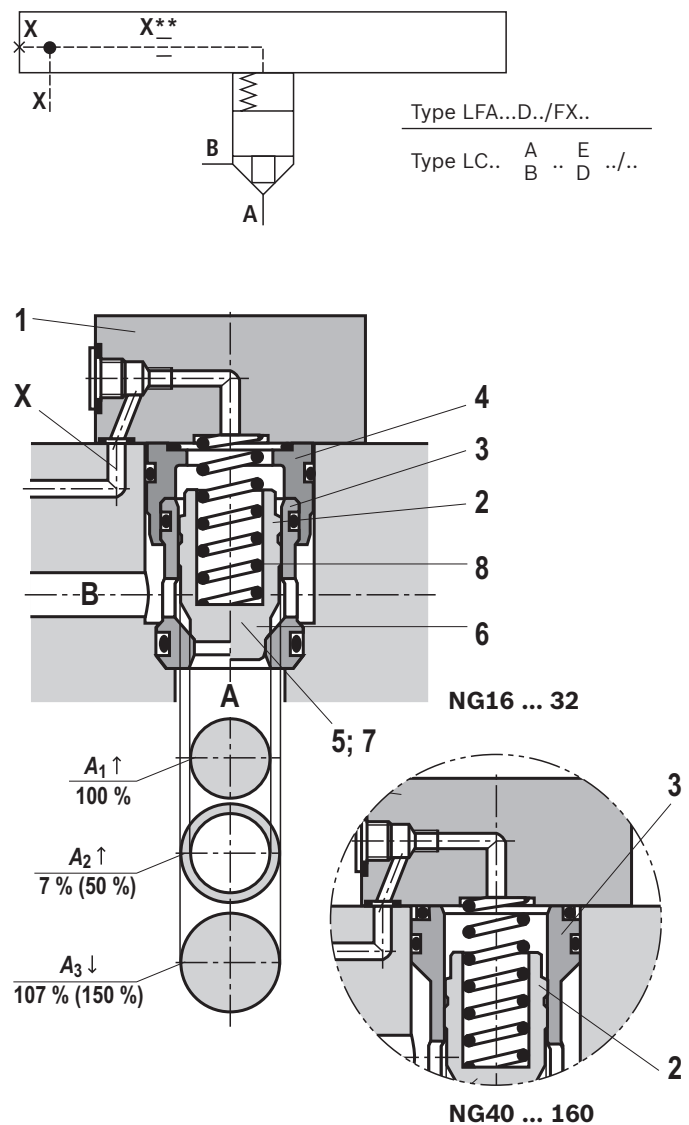
2-way cartridge valves are elements that have been designed for a compact block design. The power section with connections A and B is installed into the control block in a receiving hole standardized according to ISO 7368 and closed with a cover. In most cases, the cover is simultaneously the connection from the control side of the power section to the pilot control valves. By control with respective pilot control valves, the power section can be applied for pressure, directional and throttle functions or a combination of these functions. Particularly efficient solutions are realized by adjustment of the size to various flows of the individual ways of an actuator. The application of power sections of elements for multiple functions is very cost-effective.

2-way cartridge valves generally consist of control cover (1) and installation kit (2). The control cover contains the control bores and optionally a stroke limitation function, a hydraulically controlled directional seat valve or a shuttle valve according to the required overall function. Additionally, electrically operated directional spool or seat valves can be installed at a control cover. The installation kit consists of a bushing (3), ring (4) (only up to NG32), valve poppet (5), optionally with damping nose (6) or without damping nose (7) as well as closing spring (8). The function of 2-way cartridge valves is pressure-dependent. This way, three crucial pressurized areas A_1 , A_2 , A_3 are realized for the function. The area at the valve seat A_1 is considered as 100%. Depending on the version, the annulus area A_2 realized by grading is 7% or 50% of area A_1 . The area ratio $A_1 : A_2$ is respectively either 14.3 : 1 or 2 : 1. The area A_3 is identical to the sum of areas $A_1 + A_2$. Due to the different area ratios $A_1 : A_2$ and the resulting different annulus areas (A_2), the area A_3 is one time 107% and another time 150% of the area A_1 at the seat, which is observed as 100%.

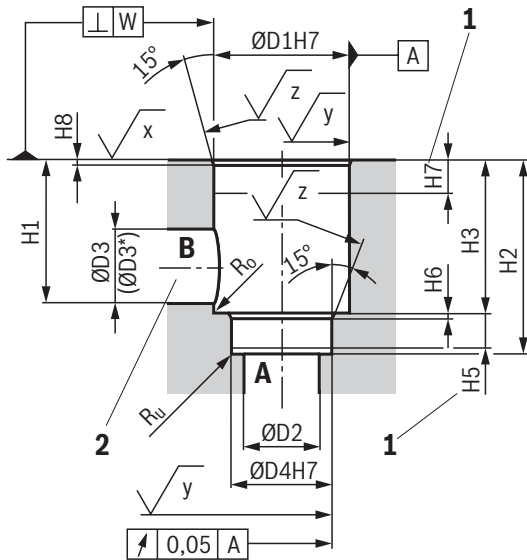
In general, the following applies:

The areas A_1 and A_2 are effective in opening direction. The area A_3 and the spring are effective in closing direction. The direction of action of the resulting force from the opening and closing forces determines the spool position of the 2-way cartridge valve.

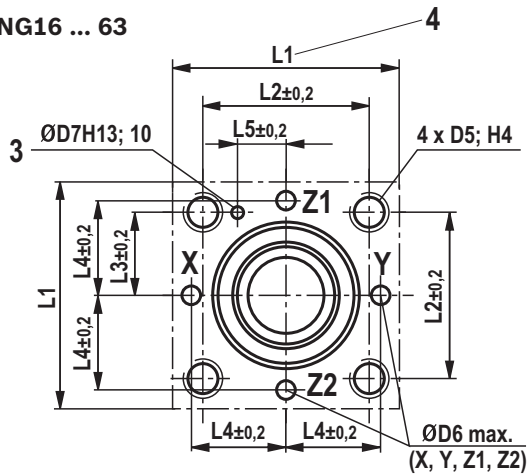
The 2-way cartridge valves can be passed from A to B or from B to A. Pressurization of area A_3 by pilot oil discharge from channel B or external pilot oil supply, channel A is blocked in a leakage-free manner.



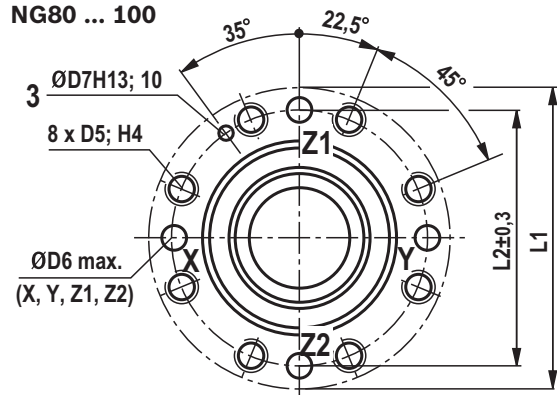
Installation bore and connection dimensions according to ISO 7368 (dimensions in mm)



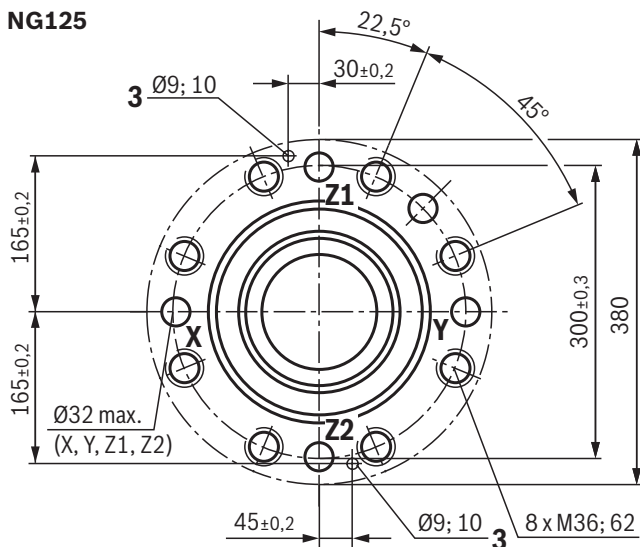
NG16 ... 63



NG80 ... 100



NG125



Size 160, dimensions and item explanations,
see page 5.

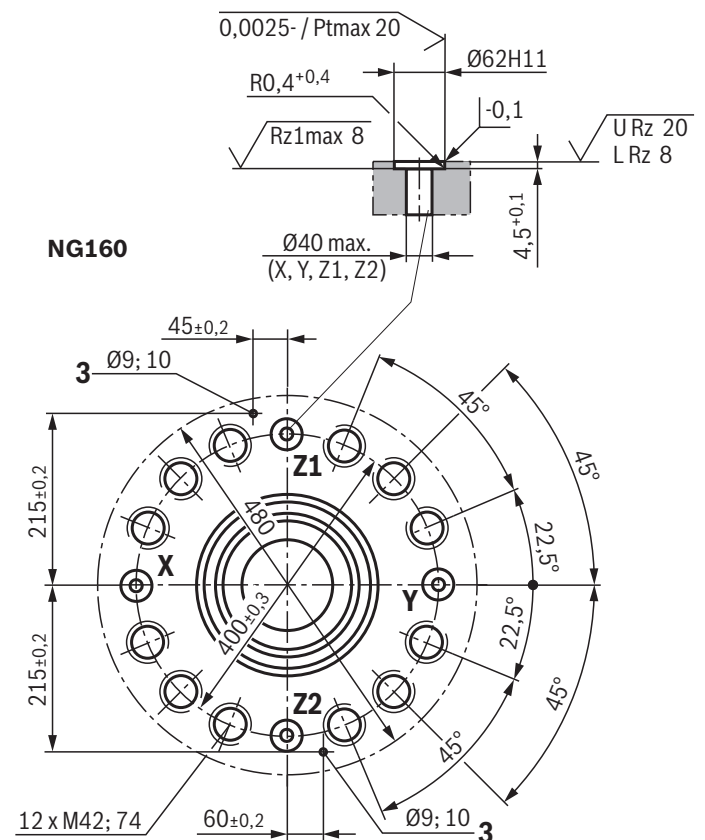
Installation bore and connection dimensions according to ISO 7368 (dimensions in mm)

NG	16	25	32	40	50	63	80	100	125	160
ØD1H7	32	45	60	75	90	120	145	180	225	300
ØD2	16	25	32	40	50	63	80	100	150 ²⁾	200 ²⁾
ØD3	16	25	32	40	50	63	80	100	125	160
(ØD3*) ¹⁾	25	32	40	50	63	80	100	125	160	250
ØD4H7	25	34	45	55	68	90	110	135	200	270
ØD5 ³⁾	M8	M12	M16	M20	M20	M30	M24	M30	–	–
ØD6	4	6	8	10	10	12	16	20	–	–
ØD7H13	4	6	6	6	8	8	10	10	–	–
H1	42.5	57	68.5	84.5	97.5	127	170.5	205.5	255	368
H2	56 ^{+0.1}	72 ^{+0.1}	85 ^{+0.1}	105 ^{+0.1}	122 ^{+0.1}	155 ^{+0.1}	205 ^{+0.1}	245 ^{+0.1}	300 ^{+0.15}	425 ^{+0.15}
H3	43 ^{+0.2}	58 ^{+0.2}	70 ^{+0.2}	87 ^{+0.3}	100 ^{+0.3}	130 ^{+0.3}	175 ^{+0.4}	210 ^{+0.4}	257 ^{+0.5}	370 ^{+0.5}
H4	20	25	35	45	45	65	50	63	–	–
H5	11	12	13	15	17	20	25	29	31	45
H6	2	2.5	2.5	3	3	4	5	5	7 ^{±0.5}	8 ^{±0.5}
H7	20	30	30	30	35	40	40	50	40	50
H8	2	2.5	2.5	3	4	4	5	5	5.5 ^{±0.2}	5.5 ^{±0.2}
H9	0.5	1	1.5	2.5	2.5	3	4.5	4.5	2	2
L1	65/80	85	102	125	140	180	250	300	–	–
L2	46	58	70	85	100	125	200	245	–	–
L3	23	29	35	42.5	50	62.5	–	–	–	–
L4	25	33	41	50	58	75	–	–	–	–
L5	10.5	16	17	23	30	38	–	–	–	–
W	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
R _o ²⁾	2	2	2	4	4	4	4	4	4	6.3
R _u ²⁾	1	1	1	1	1	1	1	1	1	1

1) Due to the use of a bore with ØD3*, port B protrudes over the upper limit of the area intended in ISO 7368. This is, however, possible due to the sealing concept and reduces the pressure loss during flow through the valve. Thus, we recommend a bore with ØD3*.

2) Maximum dimension

3) Mounting thread for version "/12" see data sheet 08936



- 1 Depth of fit
- 2 Port B can be positioned around the central axis of port A. However, it must be observed that the mounting bores and the control bores are not damaged.
- 3 Bore for locating pin
- 4 80 mm only with control cover for directional valve set-up NG16 (axis X–Y bores)

Technical data

(For applications outside these parameters, please consult us!)

general												
Size			16	25	32	40	50	63	80	100	125	160
Weight	► Type LC	kg	0.25	0.5	1.1	1.9	3.9	7.2	13.0	27.0	44.0	75.0
	► Type LFA	kg	1.2	2.3	4.0	7.4	10.5	21.0	27.0	42.0	80.0	150.0
Ambient temperature range			°C	-30 ... +60 (NBR seals) -20 ... +60 (FKM seals)								
MTTF _D values according to EN ISO 13849			Years	150 (for further details, see data sheet 08012)								

hydraulic			
Maximum operating pressure	► Without directional valve	bar	420
	► Port A, B, X, Z1, Z2	bar	315; 350; 420 (dependent on the attached directional valve)
	► Port Y	bar	Depending on the maximum tank pressure of the attached directional valve
Maximum flow		l/min	25000 (NG-dependent; see characteristic curves page 10 ... 13)
Hydraulic fluid			See table below
Hydraulic fluid temperature range		°C	-30 ... +80 (NBR seals) -20 ... +80 (FKM seals)
Viscosity range		mm ² /s	2.8 ... 500
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)			Class 20/18/15 ¹⁾

Hydraulic fluid	Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils	HL, HLP, HLPD, HVLP, HVLDPD	NBR, FKM	DIN 51524	90220
Bio-degradable ²⁾	► Insoluble in water	HETG	ISO 15380	90221
		HEES		
	► Soluble in water	HEPG	ISO 15380	
Flame-resistant	► Water-free	HFDU (glycol base)	ISO 12922	90222
		HFDU (ester base) ²⁾		
	► containing water ²⁾	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	ISO 12922	90223

**Important information on hydraulic fluids:**

- For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.
- There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).

► Flame-resistant – containing water:

- Life cycle as compared to operation with mineral oil HL, HLP 30 ... 100%
- Maximum hydraulic fluid temperature 60 °C

- **Bio-degradable and flame-resistant:** If this hydraulic fluid is used, small amounts of dissolved zinc may get into the hydraulic system.

¹⁾ The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components.

Available filters can be found at www.boschrexroth.com/filter.

²⁾ Not recommended for corrosion-protected version "J3" (contains zinc)

Ordering code: Cartridge valve (without control cover)

01	02	03	04	05	06	07
LC						/

01	Cartridge valve	LC
02	Size 16	16
	Size 25	25
	Size 32	32
	Size 40	40
	Size 50	50
	Size 63	63
	Size 80	80
	Size 100	100
	Size 125	125
	Size 160	160

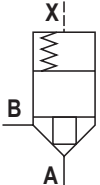
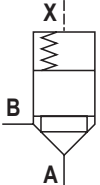
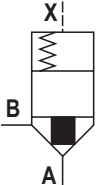
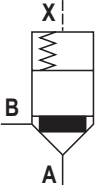
Spool design (for area ratio see section on page 3)

03	$A_1 : A_2 = 2 : 1$ ($A_2 = 50\%$)	A
	$A_1 : A_2 = 14.3 : 1$ ($A_2 = 7\%$)	B
04	Cracking pressure 0 bar (without spring)	00
	Cracking pressure ca. 0.5 bar	05
	Cracking pressure ca. 1 bar	10
	Cracking pressure ca. 2 bar	20
	Cracking pressure ca. 3 bar (only NG125)	30
	Cracking pressure ca. 4 bar (not NG125)	40
	For the exact values see page 8.	
05	Valve poppet without damping nose	E
	Valve poppet with damping nose	D
06	Component series 70 ... 79 (70 ... 79: unchanged installation and connection dimensions) (NG16 ... 63)	7X
	Component series 60 ... 69 (60 ... 69: unchanged installation and connection dimensions) (NG80 ... 100)	6X
	Component series 20 ... 29 (20 ... 29: unchanged installation and connection dimensions) (NG125 ... 160)	2X

Seal material

07	NBR seals	no code
	FKM seals	V
	Attention: Observe compatibility of seals with hydraulic fluid used. (Other seals upon request)	

Symbols

Version "E"		Version "D"	
 Area ratio $A_1 : A_2 = 2 : 1$ Version "...A.E..."	 Area ratio $A_1 : A_2 = 14.3 : 1$ Version "...B.E..."	 Area ratio $A_1 : A_2 = 2 : 1$ Version "...A.D..."	 Area ratio $A_1 : A_2 = 14.3 : 1$ Version "...B.D..."

Additional functions with special numbers see page 97.

Technical data: Cartridge valve (without control cover)
(For applications outside these parameters, please consult us!)

Size of the annulus area

Area in cm ²	Design	Size									
		16	25	32	40	50	63	80	100	125	160
A₁	LC..A..	1.89	4.26	6.79	11.1	19.63	30.2	37.9	63.6	95	160.6
	LC..B..	2.66	5.73	9.51	15.55	26.42	41.28	52.8	89.1	133.7	224.8
A₂	LC..A..	0.95	1.89	3.39	5.52	8.64	14.0	18.84	31.4	48	79.9
	LC..B..	0.18	0.43	0.67	1.07	1.85	2.90	3.94	5.9	9.3	15.7
A₃	LC..A..	2.84	6.16	10.18	16.62	28.27	44.2	56.74	95	143	240.5
	LC..B..	2.84	6.16	10.18	16.62	28.27	44.2	56.74	95	143	240.5

Spool form (damping nose)

		Design	Size									
			16	25	32	40	50	63	80	100	125	160
Stroke	cm	LC..E..	0.9	1.17	1.4	1.7	2.1	2.3	2.4	3.0	3.8	5.0
		LC..D..	0.9	1.17	1.4	1.9	2.3	2.8	3.0	3.8	4.8	6.5
Pilot volume	cm ³	LC..E..	2.56	7.21	14.3	28.3	59.4	102	136	285	544	1203
		LC..D..	2.56	7.21	14.3	31.6	65.0	124	170	361	687	1563
Theoretical pilot flow ¹⁾	l/min	LC..E..	15.4	43.3	86	170	356	612	816	1710	3264	7218
		LC..D..	15.4	43.3	86	190	390	744	1020	2166	4122	9378

Notice:

Spools with damping nose are mainly used in applications with stroke limitation and spool position monitoring. Due to the better flow values, we recommend the spool without damping nose by default.

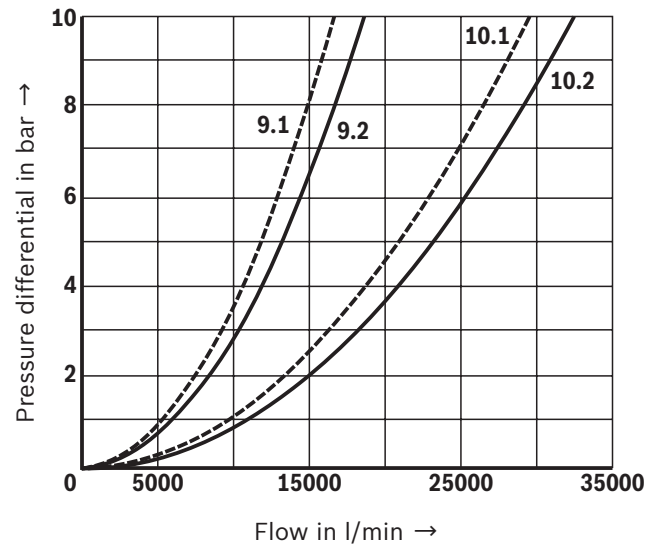
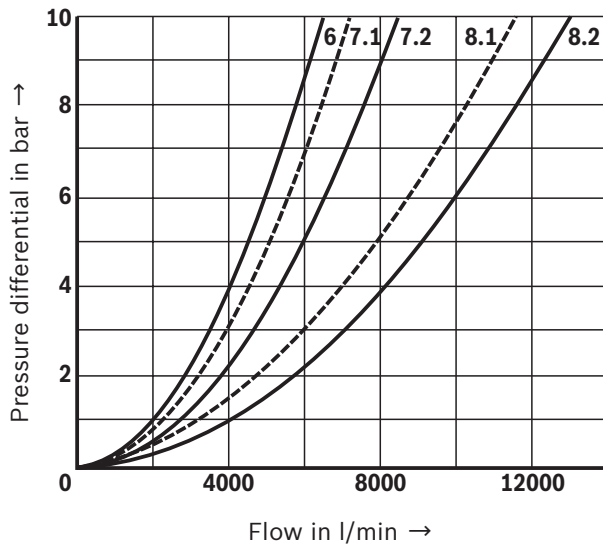
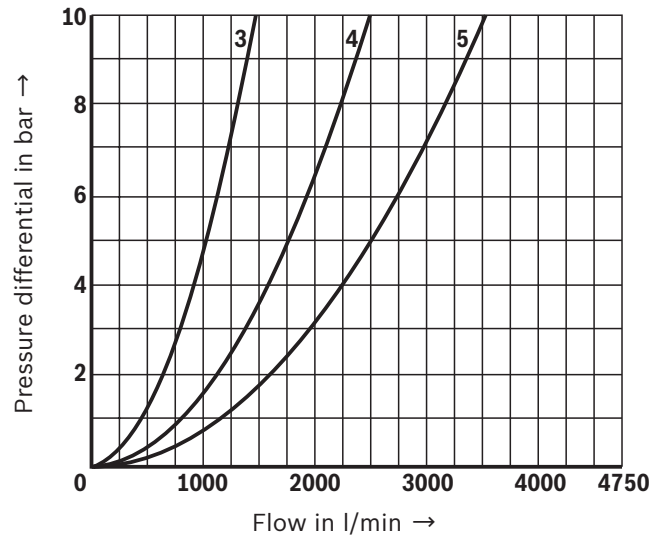
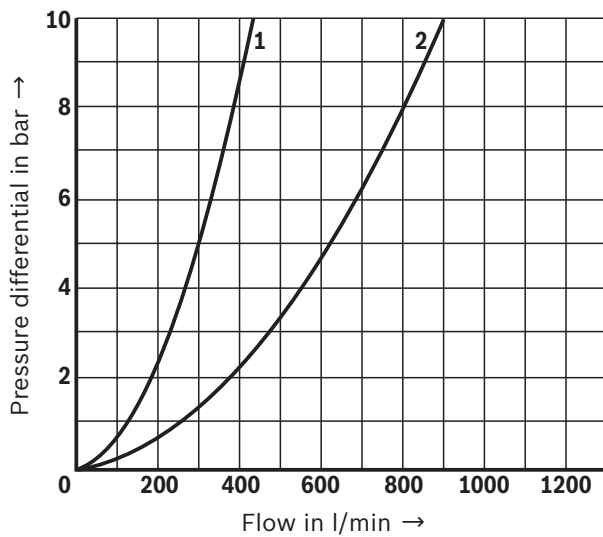
Technical data: Cartridge valve (without control cover)
(For applications outside these parameters, please consult us!)

Cracking pressure in bar

	Design	Size									
		16	25	32	40	50	63	80	100	125	160
Direction of flow A to B	LC..A 00..	0.02	0.025	0.05	0.05	0.05	0.07	0.07	0.1	0.15	0.15
	LC..A 05..	0.35	0.35	0.36	0.35	0.37	0.31	0.44	0.43	0.43	0.45
	LC..A 10..	0.70	0.68	0.72	0.71	0.67	0.64	0.88	0.88	0.88	–
	LC..A 20..	2.03	2.18	2.12	2.02	2.01	2.0	1.75	1.75	1.76	1.94
	LC..A 30..	–	–	–	–	–	–	–	–	2.05	–
	LC..A 40..	3.50	3.90	3.80	4.0	4.11	3.8	3.13	3.04	–	4.42
	LC..B 00..	0.014	0.02	0.035	0.035	0.035	0.05	0.05	0.07	0.1	0.1
	LC..B 05..	0.25	0.26	0.26	0.25	0.28	0.23	0.31	0.31	0.31	0.32
	LC..B 10..	0.49	0.50	0.51	0.51	0.48	0.47	0.63	0.63	0.62	–
	LC..B 20..	1.44	1.62	1.52	1.44	1.5	1.5	1.26	1.25	1.25	1.4
	LC..B 30..	–	–	–	–	–	–	–	–	1.45	–
	LC..B 40..	2.48	2.90	2.70	2.86	3.05	2.8	2.25	2.17	–	3.35
Direction of flow B to A	LC..A 00..	0.04	0.05	0.1	0.1	0.1	0.14	0.14	0.2	0.30	0.33
	LC..A 05..	0.69	0.78	0.72	0.7	0.84	0.68	0.88	0.88	0.86	0.91
	LC..A 10..	1.38	1.53	1.42	1.43	1.47	1.37	1.77	1.78	1.73	–
	LC..A 20..	4.05	4.91	4.25	4.06	4.57	4.33	3.53	3.54	3.50	3.9
	LC..A 30..	–	–	–	–	–	–	–	–	4.0	–
	LC..A 40..	6.96	8.74	7.6	8.05	9.34	8.15	6.3	6.2	–	8.76
	LC..B 00..	0.24	0.25	0.5	0.5	0.5	0.8	0.7	1.0	1.5	1.5
	LC..B 05..	3.69	3.40	3.64	3.64	3.95	3.27	4.2	4.6	4.4	4.6
	LC..B 10..	7.43	6.69	7.24	7.37	6.88	6.62	8.4	9.4	8.9	–
	LC..B 20..	21.3	21.5	21.6	20.9	21.4	20.9	16.9	18.7	17.9	20
	LC..B 30..	–	–	–	–	–	–	–	–	20.7	–
	LC..B 40..	36.6	38.3	38.6	41.5	43.6	39.4	30.2	32.5	–	44.7

¹⁾ Theoretical pilot flow for realization of a switching time of 10 ms

Characteristic curves: without damping nose "E", A → B
(simulated with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^{\circ}\text{C}$)

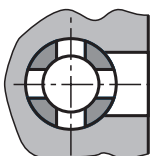


Notice:

The specified characteristic curves were simulated with 100% spool stroke and an aligned socket (see sketch below). The simulation results were validated by measurement results. The basis was an installation geometry with $\varnothing D3^*$ (see installation bore page 4) and a simulation model according to ISO 4411/2008-10-01.

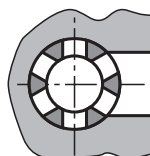
Recommended socket alignment:

NG16 ... 32



Bore on bore

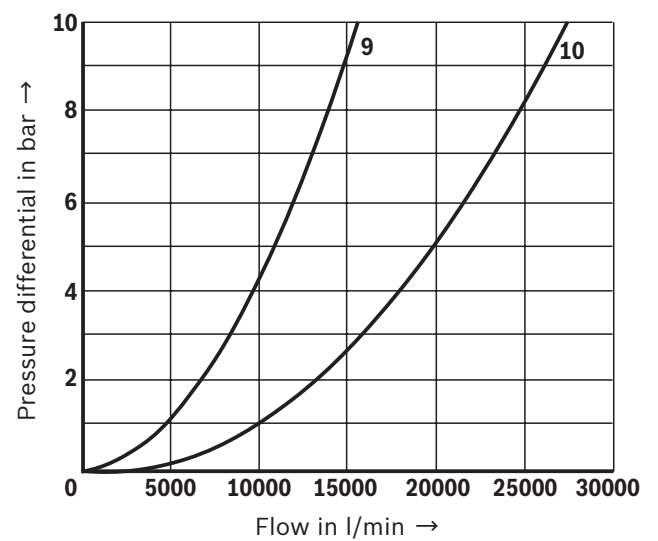
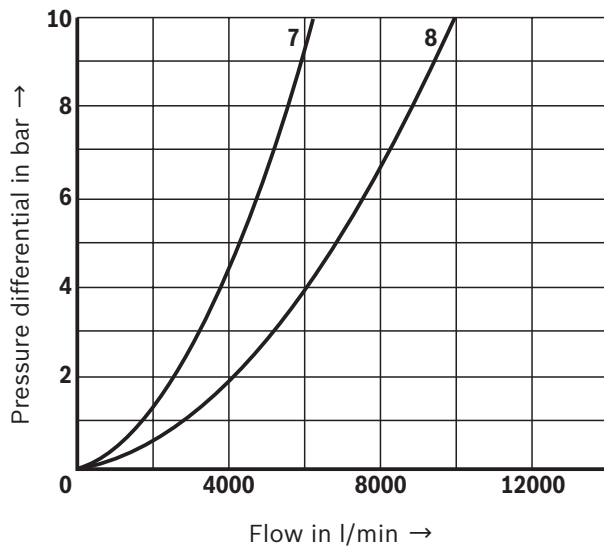
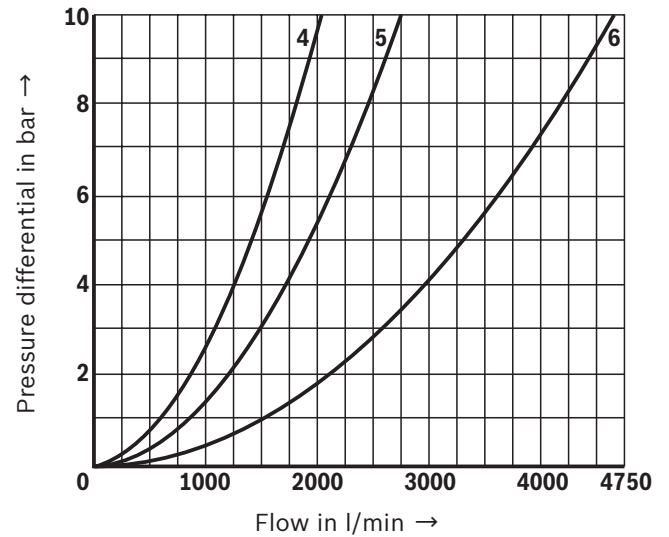
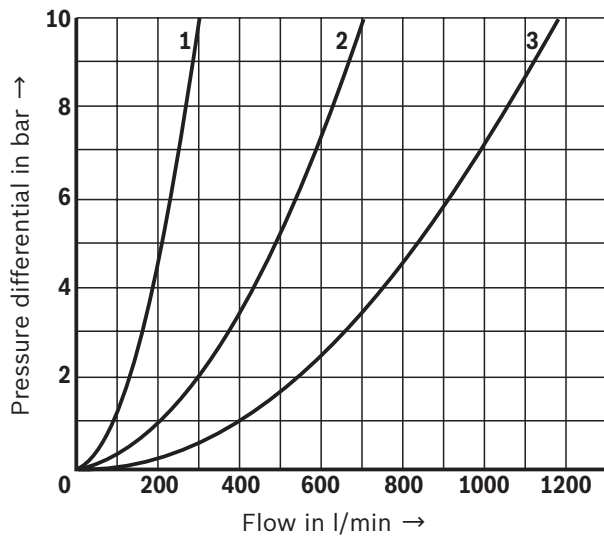
NG40 ... 125



Bar on bore

- 1 Size 16
- 2 Size 25
- 3 Size 32
- 4 Size 40
- 5 Size 50
- 6 Size 63
- 7.1 Size 80, spool design "A"
- 7.2 Size 80, spool design "B"
- 8.1 Size 100, spool design "A"
- 8.2 Size 100, spool design "B"
- 9.1 Size 125, spool design "A"
- 9.2 Size 125, spool design "B"
- 10.1 Size 160, spool design "A"
- 10.2 Size 160, spool design "B"

Characteristic curves: without damping nose "E", B → A
(simulated with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^{\circ}\text{C}$)

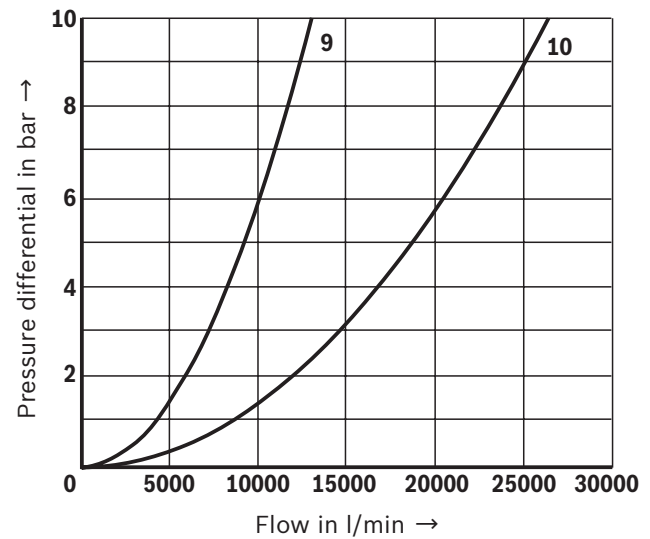
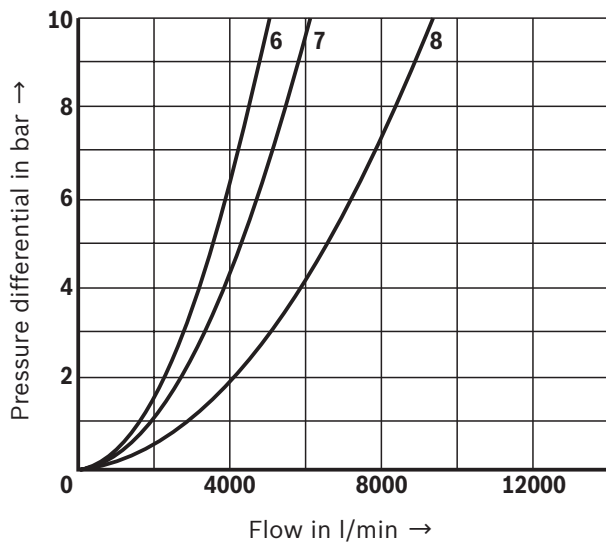
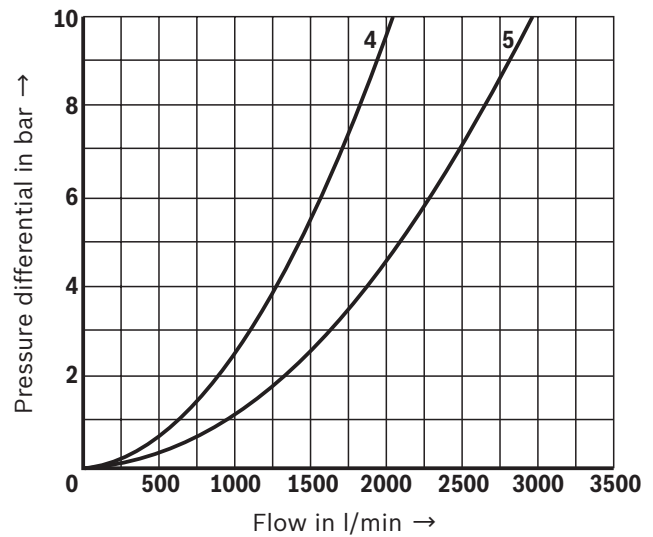
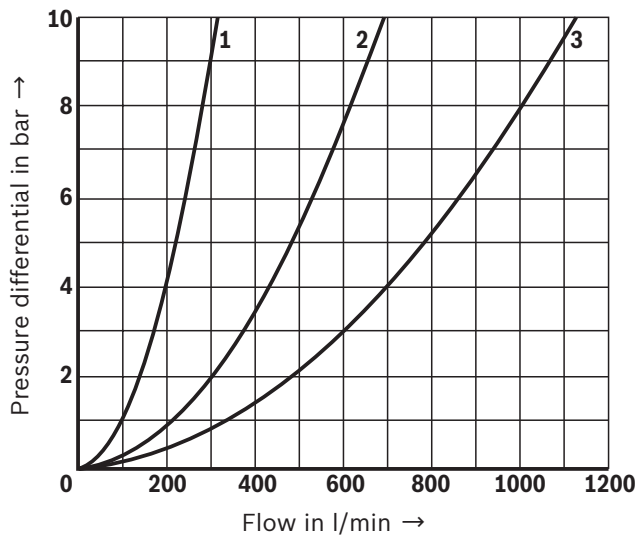


Notice:

The specified characteristic curves were simulated with 100% spool stroke and an aligned socket (see sketch on page 10). The simulation results were validated by measurement results. The basis was an installation geometry with $\varnothing D3^*$ (see installation bore page 4) and a simulation model according to ISO 4411/2008-10-01.

- 1 Size 16
- 2 Size 25
- 3 Size 32
- 4 Size 40
- 5 Size 50
- 6 Size 63
- 7 Size 80
- 8 Size 100
- 9 Size 125
- 10 Size 160

Characteristic curves: with damping nose "D", A → B
(simulated with HLP46, $\vartheta_{\text{Oil}} = 40 \pm 5 \text{ }^{\circ}\text{C}$)

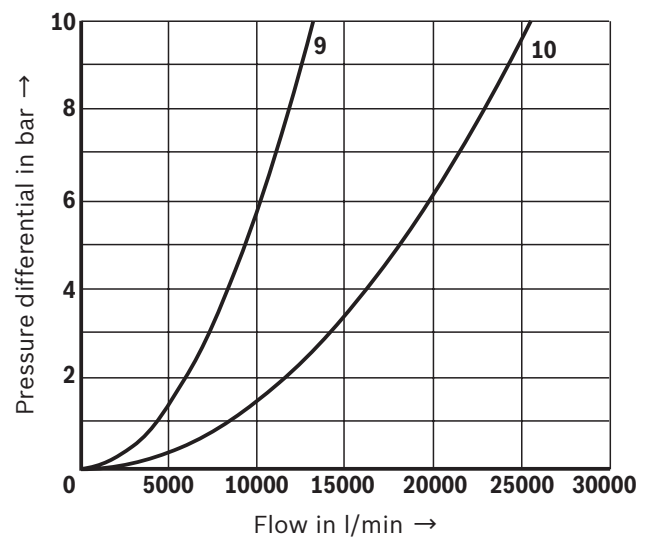
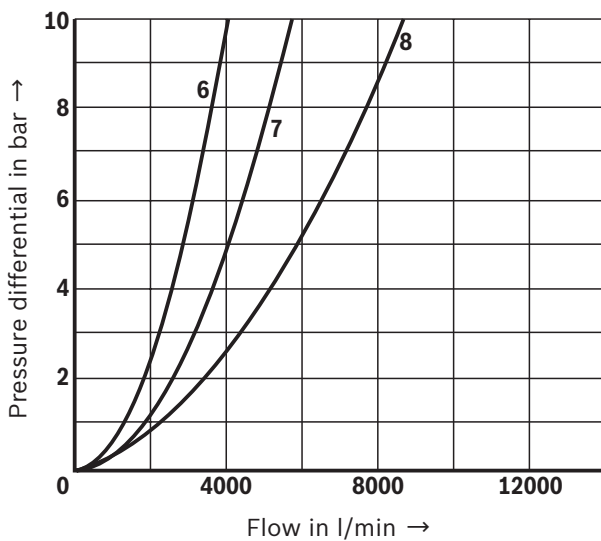
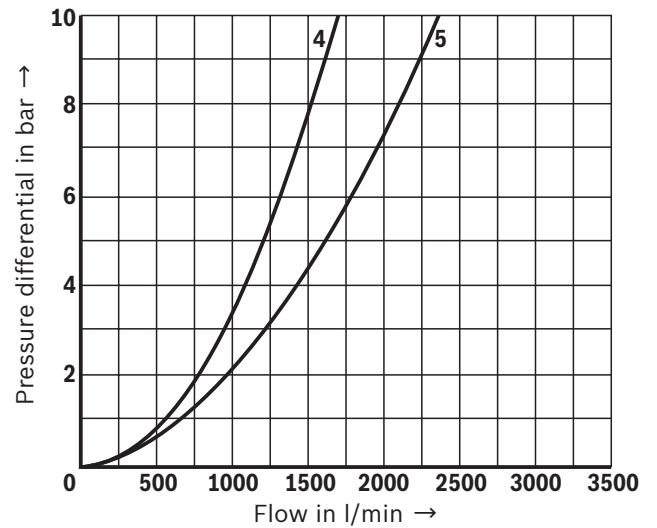
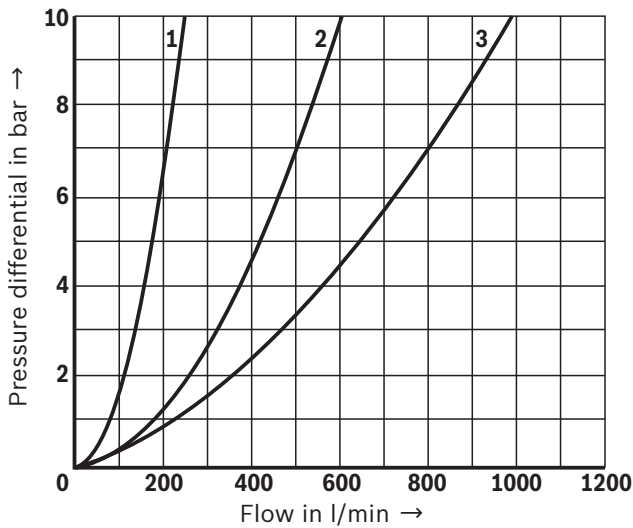


Notice:

The specified characteristic curves were simulated with 100% spool stroke and an aligned socket (see sketch on page 10). The simulation results were validated by measurement results. The basis was an installation geometry with $\varnothing D3^*$ (see installation bore page 4) and a simulation model according to ISO 4411/2008-10-01.

- 1 Size 16
- 2 Size 25
- 3 Size 32
- 4 Size 40
- 5 Size 50
- 6 Size 63
- 7 Size 80
- 8 Size 100
- 9 Size 125
- 10 Size 160

Characteristic curves: with damping nose "D", B → A
(simulated with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^{\circ}\text{C}$)

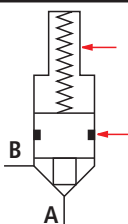
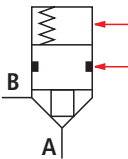
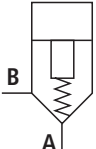
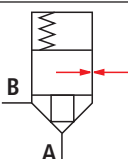
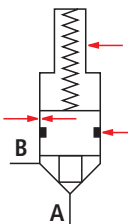
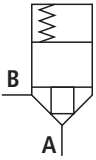
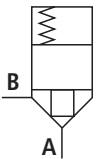


Notice:

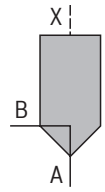
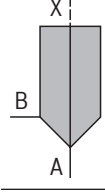
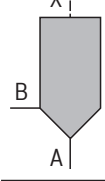
The specified characteristic curves were simulated with 100% spool stroke and an aligned socket (see sketch on page 10). The simulation results were validated by measurement results. The basis was an installation geometry with $\varnothing D3^*$ (see installation bore page 4) and a simulation model according to ISO 4411/2008-10-01.

- 1 Size 16
- 2 Size 25
- 3 Size 32
- 4 Size 40
- 5 Size 50
- 6 Size 63
- 7 Size 80
- 8 Size 100
- 9 Size 125
- 10 Size 160

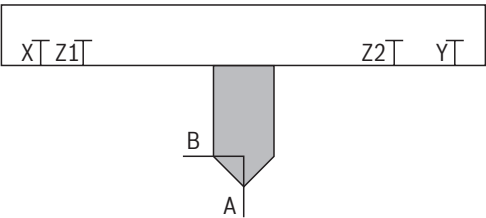
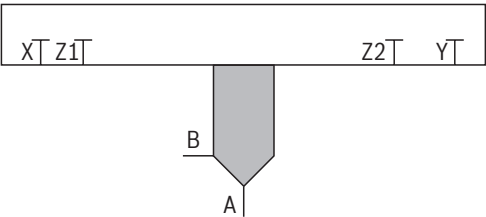
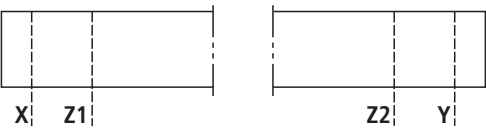
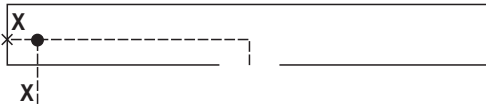
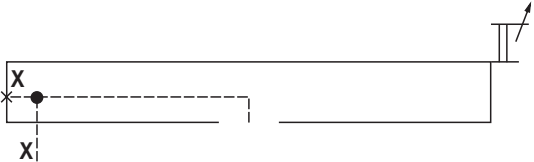
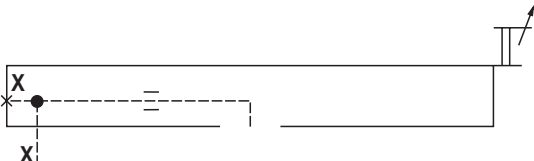
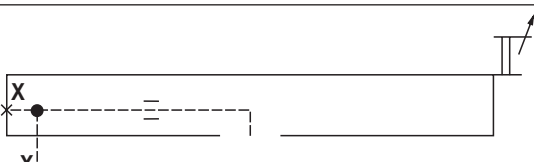
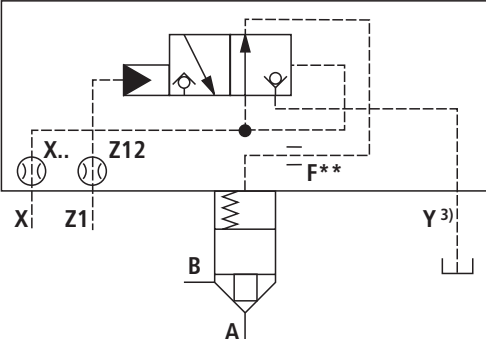
Additional functions with special numbers: Cartridge valve (upon request)

Symbol	Type (examples)	Size	Description/special characteristic
	LC . A..D7X/- 004 LC . A..E7X/- 004 LC . B..E7X/- 004	16 ... 50 16 ... 50 16 ... 63	▶ With spool sealing (leakage-free) ▶ Larger spring installation space ▶ Special cover or intermediate cover "D19" required ▶ NG16 ... 40: only with cracking pressure approx. 4 bar ▶ NG50 and 63: cracking pressure approx. 2 bar or higher; alternatively "without spring"
	LC . A..D6X/- 104 LC . A..E6X/- 104 LC . B..E6X/- 104 LC . A..D7X/- 104 LC . A..E7X/- 104 LC . A..E2X/- 104	80, 100 80, 100 80, 100 40 ... 63 40 ... 63 125, 160	▶ With spool sealing (leakage-free), ▶ as SO-004, however, no special cover required
	LC . A05D6X/- 054 LC . A20D6X/- 054 LC . A05E6X/- 054 LC . A..E6X/- 054 LC ./100 A20E6X/- 054 LC . B05E6X/- 054 LC . B20E6X/- 054 LC . A20D7X/- 054 LC . A40D7X/- 054 LC . A20E7X/- 054 LC . A..E7X/- 054	16 25 ... 32 16 25 ... 80 32, 100 12 25 50 63 50 63	▶ Pulling logic with open zero position ▶ Special cover (e.g. "D54") required
	LC ...7X/- 135	16 ... 40	▶ Larger spool clearance
	LC ...7X/- 146	16 ... 40	▶ Larger spool clearance ▶ With spool sealing (leakage-free) ▶ Larger spring installation space ▶ Special cover or intermediate cover "D19" required
	LC . A..D7X/- R10 LC . A20D7X/- R10 LC 1. A40E7X/- R10 LC . A..E7X/- R10 LC . A10E7X/- R10 LC . A05E7X/- R10 LC . B..D7X/- R10 LC . B10D7X/- R10 LC . B40E7X/- R10 LC . B..E7X/- R10	16 25 16, 32 25, 63 40 50 25 32 25, 40 50, 63	▶ As standard, however, outer bushing diameter D1 and D4 1 mm larger (repair kit).
	LC . A..D7X/- R20 LC . A20D7X/- R20 LC 1. A40E7X/- R20 LC . A..E7X/- R20 LC . A10E7X/- R20 LC . A05E7X/- R20 LC . B..D7X/- R20 LC . B10D7X/- R20 LC . B40E7X/- R20 LC . B..E7X/- R20	16 25 16, 32 25, 63 40 50 25 32 25, 40 50, 63	▶ As standard, however, outer bushing diameter D1 and D4 2 mm larger (repair kit).

Additional functions with special numbers: Cartridge valve (upon request)

Symbol	Type (examples)	Size	Description/special characteristic
	LC . XAB00E-7X/	16 ... 63	▶ Blind element without spool ▶ Channel A - B connected ▶ For use with available LFA cover, or in connection with a cover "LFA . D-7X/FX99"
	LC . XAF00E-7X/	16 ... 63	▶ Blind element without spool ▶ Channel A - F connected ▶ Channel B closed ▶ For use with available LFA cover, or in connection with a cover "LFA . D-7X/FX99"
	LC . X00E-7X/	16 ... 63	▶ Blind element without spool ▶ All channels blocked ▶ For use with available LFA cover, or in connection with a cover "LFA . D-7X/FX99"

Additional functions with special numbers: Control cover (upon request)

Symbol	Type	Size	Description/special characteristic
	LFA . D9 -7X/...	16 ... 63	► Cap, blind cover
	LFA . D10 -7X/...	16 ... 63	► Cap, blind cover
	LFA . D49 -7X/...	16 ... 40	► Spacer cover ► Suitable for producing a measuring plate
	LFA . D54 -6X/F LFA . D54 -7X/F	16 ... 50 50	► Cover for logic zero position open (pulling logic)
	LFA... H .../FDR...	40 ... 80	► Stroke limitation cover for pressure logics
	LFA . H2-14 -7X/F	16	► Cover for use with spool sealing (type LC.../-004, LC.../-146) ► Intermediate cover "D19" required
	LFA . H2-18 -7X/F	16 ... 63	► Stroke limitation with sealing
	LFA . R3 -7X/... LFA . RF3 -7X/...	25 ... 63	► Area ratio: $\frac{A_{Z1}}{A_X} = \frac{6}{1}$

Additional functions with special numbers:
Control cover (upon request)

Symbol	Type	Size	Description/special characteristic
	LFA . GWA11 -7X/...	16 ... 63	► Spring chamber additionally on "Z2"
	LFA . GWA21 -7X/... LFA . GWA21 -6X/...	32 ... 100	► 3 check valves
	LFA . WEA16 -7X/...	25, 30	► Additional external ports X and Y (G1/4)
	LFA . WEA54 -7X/... LFA . WEA54 -6X/... LFA . WEMA54 -6X/...	32, 50, 63 25 ... 50 25	► Cover for logic zero position open ► NG25: identical version with type WEA and WEMA
	LFA . KWA3 -7X/...	32 ... 63	

Additional functions with special numbers: Control cover (upon request)

Symbol	Type	Size	Description/special characteristic
	LFA . KWA7 -7X//...	40 ... 63	► As "KWA", spring chamber additionally on "Z2"

Further information

- | | |
|---|--|
| ► 2-way cartridge valve pressure functions | Data sheet 21050 |
| ► 2-way cartridge valves with spool position monitoring | Data sheet 21015 |
| ► 2-way cartridge valve, actively controllable, type LC2A | Data sheet 21040 |
| ► Directional spool valves type WE 6 | Data sheet 23178 |
| ► Directional spool valve type WE 10 | Data sheet 23340 |
| ► Directional spool valve type WEH | Data sheet 24751 |
| ► Directional seat valve type SEW 6 | Data sheet 22058 |
| ► Directional seat valve type SEW 10 | Data sheet 22075 |
| ► Directional seat valve type SED 6 | Data sheet 22049 |
| ► Directional seat valve type SED 10 | Data sheet 22045 |
| ► Cover plates type HSA | Data sheet 48042 |
| ► Sandwich plates type HSZ | Data sheet 48050 |
| ► Hydraulic fluids on mineral oil basis | Data sheet 90220 |
| ► Reliability characteristics according to EN ISO 13849 | Data sheet 08012 |
| ► Hexagon socket head cap screw, metric/UNC | Data sheet 09836 |
| ► Hydraulic valves for industrial applications | Data sheet 07600-B |
| ► Selection of the filters | www.boschrexroth.com/filter |