

Bosch Rexroth LC40A20D7X/ logic cartridge insert

Manufacturer: Bosch Rexroth

Manufacturer part number / published order designation: R900937999

Published model: LC40A20D7X/

About this compilation

Prepared by Hydmaster from selected manufacturer documentation. Original technical pages follow without cropped drawings, rewritten data or altered units. This cover and index are Hydmaster editorial material, not a manufacturer-issued exact-execution datasheet.

Coverage: selected pages relevant to the identified size and configuration. Other options or neighbouring models retained on an original page apply only where explicitly identified.

Execution notes and conditions

Current execution-specific pressure, flow, response time and thermal ratings are not established by a current article data table.

The reference areas and stroke are standard-series values in the March 2005 document, not an independently measured assembly.

Source-page index

Source page numbers below are physical pages of each complete original PDF. The original printed page labels and technical content remain unchanged. Compiled page numbers count this cover/index.

Source A: Bosch Rexroth Logic Cartridge Directional Re21010 2005

Original pages	Compiled pages	Relevant content
1	2	Original manufacturer series identity and component scope
3-9	3-9	Existing LC type key, nominal area ratio and spring/poppet options; ISO 7368 cavity dimensions; use the selected nominal-size column; Cavity installation, mounting interface and dimensional qualifications; Operating-fluid conditions and assembly-dependent pressure restrictions; Published preferred factory articles and literal model identities; Selected size and A-poppet reference areas, strokes and cracking-pressure data; A-poppet pressure/flow curves and test conditions; no response-time rating inferred

2-way cartridge valves

Directional functions

Cartridge valves and control covers

RE 21010/03.05
Replaces: 02.03

1/68

Types LC and LFA

Sizes 16 to 160
Component series 2X; 6X; 7X
Maximum operating pressure 420 bar
Maximum flow 25000 L/min



H5591

Control cover type LFA 25 WEA-7X/...
with directional valve type 4WE 6
D6X/EG24N9K4 and cable socket



H5455

Cartridge valve type LC 25 A40E7X/...

Table of contents

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see page 2

Features

- Valve poppet with or without damping nose
- 2 area ratios
- 4 different springs
- 4 stroke limiters
- Control cover with integrated poppet valve
- Control cover with integrated shuttle valve
- Control cover for mounting directional spool valves with or without integrated shuttle valve
- Control cover with or without limit switch monitoring
- Further information:

Pilot control valves	Size 6	Size 10
Directional spool valve type WE	RE 23178	RE 23327
Directional poppet valve type SEW	RE 22058	RE 22075
Directional poppet valve type SED	RE 22049	RE 22045

Function, sections, symbol

2-way cartridge valves are designed as elements for insertion into compact blocks. The power part with ports A and B is installed in a mounting cavity, which is standardised according to DIN ISO 7368, in the block and sealed by means of a cover. In most cases, the cover forms at the same time the connection between the control section of the power part and the pilot control valves. By controlling the power part with appropriate pilot control valves, it can perform pressure control, directional and throttling functions or a combination of these. Particularly economic solutions can be achieved by adapting the sizes to the different flows in the individual channels of an actuator. A very cost-efficient solution can be obtained, if several functions are assigned to the power part of an element.

Directional function

2-way cartridge valves mainly consist of a control cover (1) and a cartridge element (2). The control cover is provided with pilot bores and, depending on the required overall function, optionally a stroke limiter, a hydraulically controlled directional poppet valve or a shuttle valve. Moreover, electrically operated directional spool valves or directional poppet valves can be mounted onto the control cover. The cartridge consists of a bushing (3), a ring (4) (up to size 32 only), a valve poppet (5), optionally with damping nose (6) or without damping nose (7) and a closing spring (8).

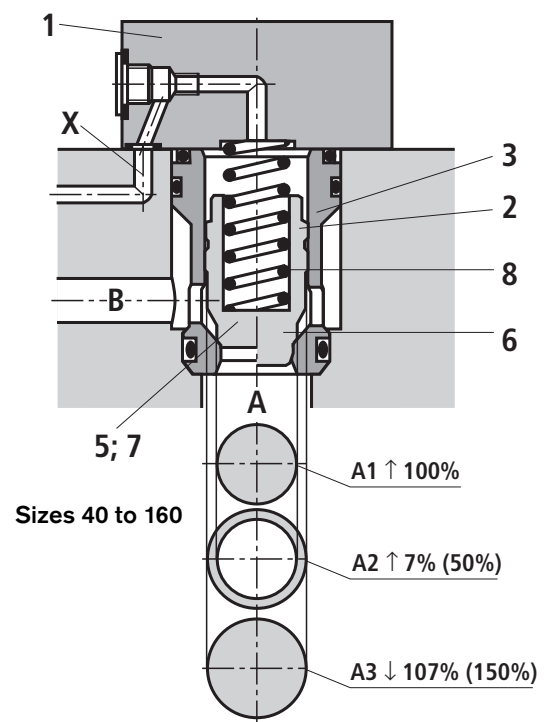
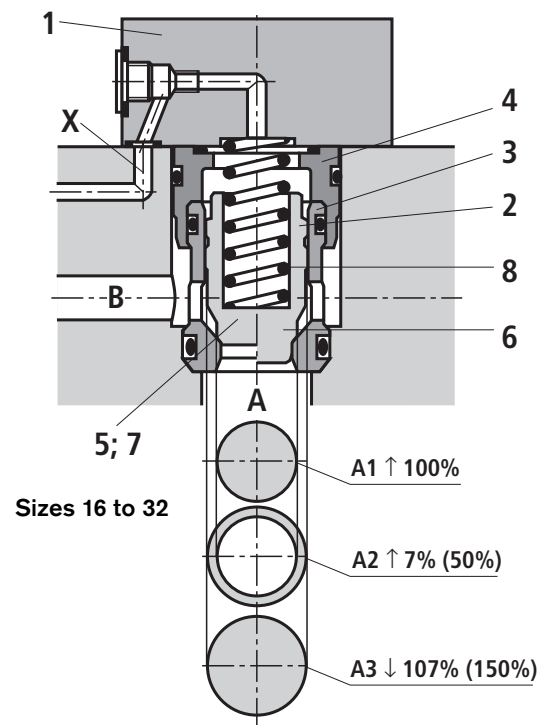
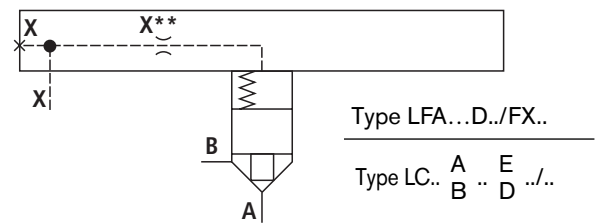
Function

2-way cartridge valve operate in dependence upon pressure. Three pressurised areas are essential for the function: A1, A2, A3. The area of the valve seat is always taken as 100%. As a result of the stepping, the annulus area A2 is 7% or 50% of area A2, depending on the version. Consequently, the area ratio A1: A2 is either 14.3:1 or 2:1. Area A3 is equal to the sum of areas A1 + A2. Due to the different area ratios A1: A2 and the resulting different annulus areas (A2), area A3 is either 107% or 150% of area A1 on the seat that is assumed to be 100%.

The following is generally valid:

Areas A1 and A2 act in the direction of opening. Area A3 and the spring act in the direction of closing. The effective direction of the force resulting from the opening and closing forces determines the spool position of the 2-way cartridge valve.

The medium can flow through 2-way cartridge valves from A to B or from B to A. When area A3 is pressurised due to the pilot oil flow from channel B or external pilot oil supply, channel A is leak-free closed.



Mounting cavity and connection dimensions to DIN ISO 7368 (except for sizes 125 and 160) (nominal dimensions in mm)

Size	16	25	32	40	50	63	80	100	125	160
ØD1	32	45	60	75	90	120	145	180	225	300
ØD2	16	25	32	40	50	63	80	100	150 ¹⁾	200 ¹⁾
ØD3	16	25	32	40	50	63	80	100	125	200
(ØD3*)	25	32	40	50	63	80	100	125	150	250 ¹⁾
ØD4	25	34	45	55	68	90	110	135	200	270
ØD5	M8	M12	M16	M20	M20	M30	M24	M30	–	–
ØD6 ¹⁾	4	6	8	10	10	12	16	20	–	–
ØD7	4	6	6	6	8	8	10	10	–	–
H1	34	44	52	64	72	95	130	155	192	268
(H1*)	29.5	40.5	48	59	65.5	86.5	120	142	180	243
H2	56	72	85	105	122	155	205	245	300 ^{+0.15}	425 ^{+0.15}
H3	43	58	70	87	100	130	175 ^{±0.2}	210 ^{±0.2}	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	0.2	0.2	0.2	0.2	0.2

¹⁾ Maximum dimension

- 1 Depth of fit
- 2 Reference dimension
- 3 For diameters other than ØD3 or (ØD3*) for port B, the distance from the cover support surface to the centre of the bore must be calculated.
- 4 Port B can be arranged around the central axis of port A. However, care must be taken to ensure that the mounting cavities and the pilot bores are not damaged.
- 5 Drilling for locating pin
- 6 Note on porting pattern for size 16: Length L1 (x–y axis of bores) for control cover with built-on directional valve is 80 mm.
- 7 For $\varnothing \leq 45$ mm → fit H8 permitted!

Technical data (for applications outside these parameters, please consult us!)

Ambient temperature range		°C	– 20 to + 70
Maximum operating pressure	– Without directional valve	bar	420
	– Ports A, B, X, Z1, Z2	bar	315; 350: 420 (according to the maximum operating pressure of built-on valves)
	– Port Y	bar	corresponds to maximum tank pressure of built-on valves
	– With monitored spool position	bar	400
Maximum flow		L/min	25000 (size-dependent; see characteristic curves on page 9)
Hydraulic fluid			Mineral oil (HL, HLP) to DIN 51524 ¹⁾ ; fast bio-degradable hydraulic fluids to VDMA 24568 (see also RE 90221); HETG (rape seed oil) ¹⁾ ; HEPG (polyglycols) ²⁾ ; HEES (synthetic esters) ²⁾ ; other hydraulic fluids on enquiry
Hydraulic fluid temperature range		°C	– 20 to + 80
Viscosity range		mm ² /s	2.8 to 500
Max. permissible degree of contamination of the hydraulic fluid - cleanliness class to ISO 4406 (c)			Class 20/18/15 ³⁾

¹⁾ Suitable for NBR and FKM seals

²⁾ Suitable for FKM seals only

³⁾ The cleanliness classes specified for components must be adhered to in hydraulic systems. Effective filtration prevents

malfunction and, at the same time, increases the service life of components.

For the selection of filters, see data sheets RE 50070, RE 50076, RE 50081, RE 50086 and RE 50088.

Ordering code: Cartridge valve (without control cover)

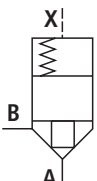
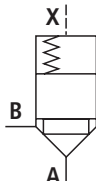
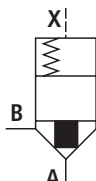
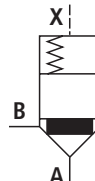
LC							
Size 16 (series 7X)	= 16					No code = NBR seals V = FKM seals (Other seals on enquiry) ⚠ Caution! Observe compatibility of seals with hydraulic fluid used!	
Size 25 (series 7X)	= 25						
Size 32 (series 7X)	= 32						
Size 40 (series 7X)	= 40						
Size 50 (series 7X)	= 50						
Size 63 (series 7X)	= 63						
Size 80 (series 6X)	= 80						
Size 100 (series 6X)	= 100						
Size 125 (series 2X)	= 125					7X = (Sizes 16 to 63) component series 70 to 79 (70 to 79: unchanged installation and connection dimensions) 6X = (Sizes 80 and 100) component series 60 to 69 (60 to 69: unchanged installation and connection dimensions) 2X = (Sizes 125 and 160) component series 20 to 29 (20 to 29: unchanged installation and connection dimensions)	
Size 160 (series 2X)	= 160						
Area ratio 2:1 (annulus area = 50%)	= A						
Area ratio 14x3:1 (annulus area = 7%)	= B						
Cracking pressure approx. 0 bar (without spring)	= 00					E = Valve poppet without damping nose D = Valve poppet with damping nose	
Cracking pressure approx. 0.5 bar	= 05						
Cracking pressure approx. 1.0 bar	= 10						
Cracking pressure approx. 2 bar	= 20						
Cracking pressure approx. 3 bar (size 125 only)	= 30						
Cracking pressure approx. 4 bar (not with sizes 125 and 160)	= 40						
For exact values, see page 8.							

Preferred types

Type LC (cartridge valve)	Material number	Type LC (cartridge valve)	Material number
LC 16 A20D7X/	R900912572	LC 40 A20D7X/	R900937999
LC 16 A20E7X/	R900910269	LC 40 A20E7X/	R900938000
LC 16 A40D7X/	R900912573	LC 40 A40D7X/	R900935732
LC 16 A40E7X/	R900912568	LC 40 A40E7X/	R900927973
LC 16 B20E7X/	R900912595	LC 40 B20E7X/	R900938007
LC 25 A20D7X/	R900912580	LC 50 A20D7X/	R900938026
LC 25 A20E7X/	R900910270	LC 50 A20E7X/	R900920273
LC 25 A40D7X/	R900912581	LC 50 A40D7X/	R900938027
LC 25 A40E7X/	R900912574	LC 50 A40E7X/	R900929935
LC 25 B20E7X/	R900912604	LC 50 B20E7X/	R900929665
LC 25 B40D7X/	R900912609	LC 63 A20D7X/	R900938058
LC 25 B40E7X/	R900912601	LC 63 A20E7X/	R900928826
LC 32 A20D7X/	R900912589	LC 63 A40D7X/	R900938059
LC 32 A20E7X/	R900906337	LC 63 A40E7X/	R900933230
LC 32 A40D7X/	R900909665	LC 63 B20E7X/	R900938064
LC 32 A40E7X/	R900909662		
LC 32 B20E7X/	R900912613		
LC 32 B40D7X/	R900912617		
LC 32 B40E7X/	R900912610		

Further preferred types and standard components can be found in the EPS (standard price list).

Symbols: Cartridge valve (for versions, see ordering code)

Without damping nose		With damping nose	
 Area ratio A1 : A2 = 2 : 1 Version ...A..E../...	 Area ratio A1 : A2 = 14.3 : 1 Version ...B..E../...	 Area ratio A1 : A2 = 2 : 1 Version ...A..D../...	 Area ratio A1 : A2 = 14.3 : 1 Version ...B..D../...

Technical data (for applications outside these parameters, please consult us!)**2-way cartridge valves for directional function**

		Size									
		16	25	32	40	50	63	80	100	125	160
Area A1 in cm ²	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
Area A2 in cm ²	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
Area A3 in cm ²	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
Stroke in 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 oil volume in 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 in L/min ¹⁾	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
Weight in kg	Cartridge valve	0.25	0.5	1.1	1.9	3.9	7.2	13.0	27.0	44.0	75.0
	Control cover	1.2	2.3	4.0	7.4	10.5	21.0	27.0	42.0	80.0	150.0
Cracking pressure in bar											
Direction of flow from 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	–	–
	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	–	–
Direction of flow from 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	–	–
	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	–	–

¹⁾ with a switching time of 10 ms

Characteristic curves (measured with HLP46, $\vartheta_{\text{oil}} = 40\text{ °C} \pm 5\text{ °C}$)
