

Bosch Rexroth LFA16H2-7X/F logic cartridge control cover

Manufacturer: Bosch Rexroth
Manufacturer part number / published order designation: R900912655
Published model: LFA16H2-7X/F

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

Supplied orifice, pilot setting and full assembled-system pressure/flow ratings are not established.

Supplied stroke-limiter setting is unknown; H5 is not promoted as an actual supplied stroke.

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 identity and separate insert/cover scope
3-6	3-6	LC interaction and nominal cavity scope; not a paired insert assignment; Applicable ISO 7368 cavity geometry; Cavity installation qualifications; Assembly-dependent pressure and fluid conditions
10-11	7-8	LFA control-cover type key and remote-port options; Exact preferred factory material-number/model rows
16	9	Control-cover mounting screws and assembly requirements
19	10	H2 control cover for sizes 16/25: adjustment head, common body dimensions and X thread; adjacent adjustment options do not apply

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).

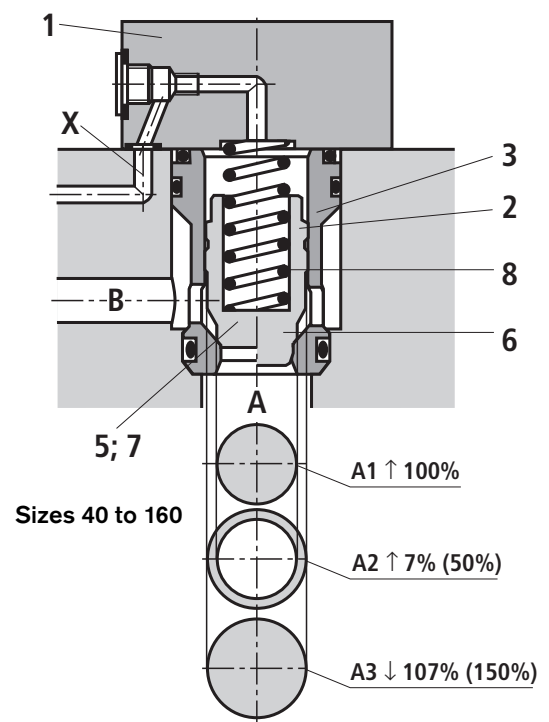
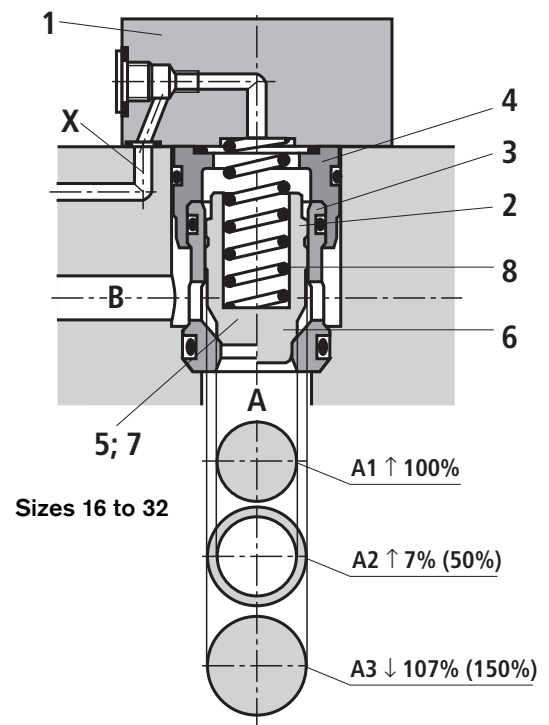
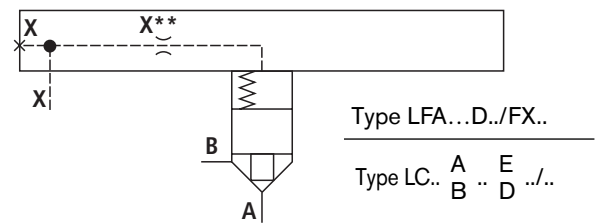
Function

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%.

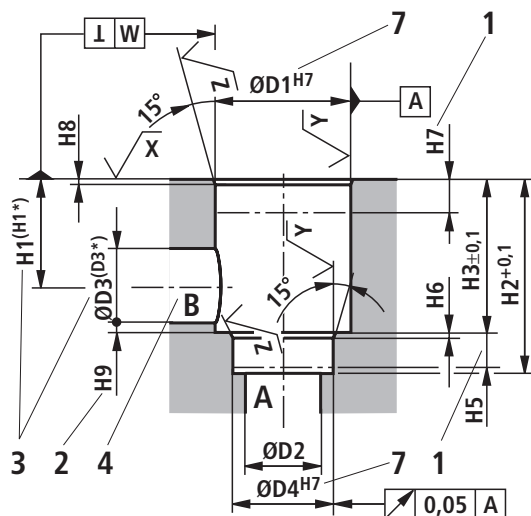
The following is generally valid:

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)



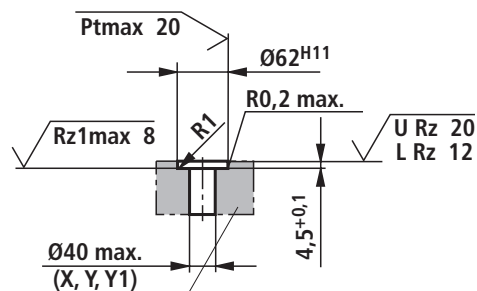
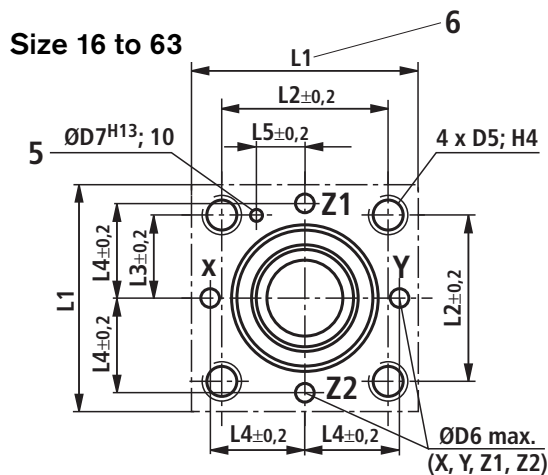
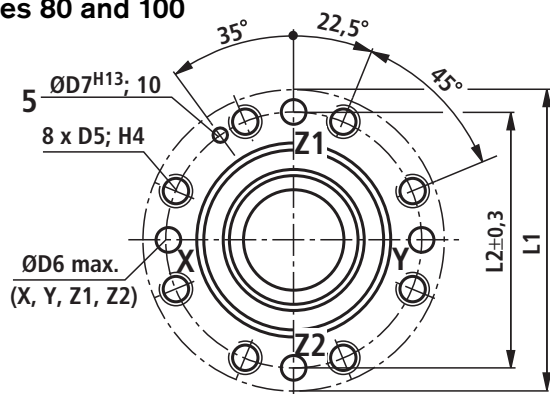
$$\sqrt{X} = \sqrt{Rz1_{\max} 4}$$

$$\sqrt{Y} = \sqrt{Rz1_{\max} 8}$$

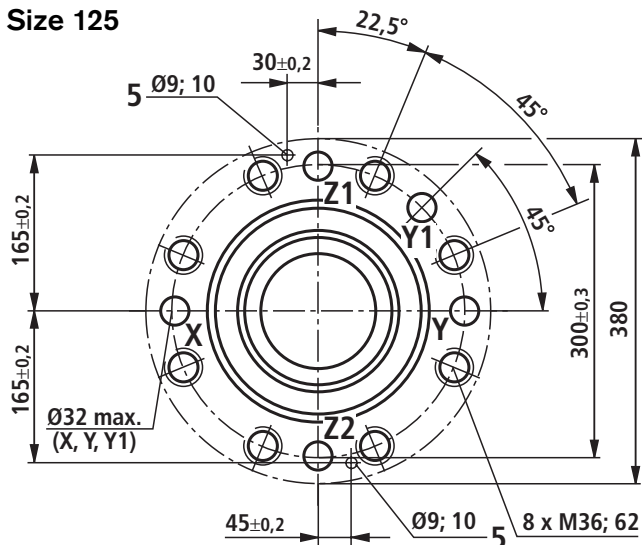
$$\sqrt{Z} = \sqrt{Rz1_{\max} 10}$$

For indication of dimensions and explanation of positions, see page 9!

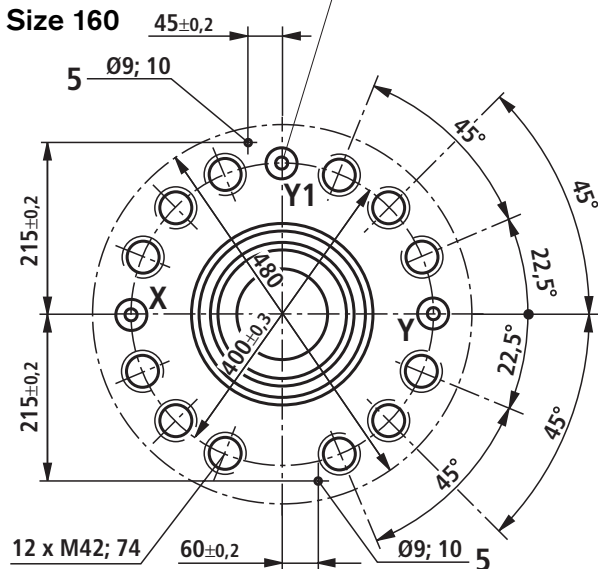
Sizes 80 and 100



Size 125



Size 160



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 $\varnothing \leq 45 \text{ mm} \rightarrow$ 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.

General notes on the ordering code for control covers

x = available

• = on enquiry

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
LFA			1) / 2)		3)	4)										

Size										Type	Component series	Area ratio	Cracking pressure	Damping	El. monitor for closed position	Remote control port	Nozzles in channel ⁵⁾							Seal material	
16	25	32	40	50	63	80	100	125	160								A	B	P	T	X	F	Z1		
x	x	x	x	x	x						7X														The ordering code can be found on the relevant pages of the individual control cover variants
						x	x				6X														
								x	x		2X														
x	x	x	x	x	x	x	x	x	x	D						F					x				
x	x	x	x							H1						F					x				
x	x	x	x	x	x	x	x	x	x	H2						F					x				
x	x	x	x							H3						F					x				
x	x	x	x	x	x	x	x	x		H4						F					x				
x	x	x	x	x	x	x	x			G											x		x		
	x	x	x	x	x	x	x			R												x			
	x	x	x	x	x					RF												x			
						x	x			R2												x			
x	x	x	x	x	x	x	x	•	•	WEA							x		x	x					
x	x	x	x	x	x	x	x	•	•	WEB								x	x	x					
x	x	x	x	x	x					WEMA									x	x		x			
						x	x			WEA8									x	x		x			
x	x	x	x	x	x					WEMB									x	x		x			
						x	x			WEB8									x	x		x			
x	x	x	x	x	x					WECA							x	x	x	x					
						x	x			WEA9							x	x	x	x					
x	x	x	x	x	x	x	x			GWA							x		x	x					
x	x	x	x	x	x	x	x			GWB								x	x	x					
x	x	x	x	x	x	x	x			KWA							x								
x	x	x	x	x	x	x	x			KWB								x							
x	x	x	x	x	x	•	•	•	•	E		x	x	D	QMG24	F					x				
x	x	x	x	x	x	•	•			EH2		x	x	D	QMG24	F					x				
x	x	x	x	x	x					EWA		x	x	D	QMG24		x		x	x					
x	x	x	x	x	x					EWB		x	x	D	QMG24			x	x	x					

1) 7X = component series 70 to 79,

6X = component series 60 to 69 and

2X = component series 20 to 29: (unchanged installation and connection dimensions)

2) CA = 2 : 1 (area ratio A1:A2)

CB = 14.3 : 1 (area ratio A1:A2)

CD = 0 %

For the control cover with electrical monitor of the closed position (including position switch), the type designation includes the version of the control cover and the cartridge valve).

3) 10 = 1.0 bar cracking pressure

20 = 2.0 bar cracking pressure

40 = 4.0 bar cracking pressure

4) D = valve poppet of the cartridge with damping nose

5) Order of nozzles for the purchase order and representation in symbols and circuit diagrams.

Further details can be found on the relevant pages of the individual control cover variants and on page 14 (nozzle characteristic curves).

Preferred types, see page 11,
are available at short notice!

General notes on the ordering code for control covers

Nozzle symbol		Symbol in the ordering code	
A**		A**	
This nozzle is designed as screw-in nozzle. If a nozzle is to be installed, the relevant code letter must be entered in the type designation together with the nozzle Ø in 1/10 mm. Example: A12 = nozzle with Ø1.2 mm in channel A.			

Nozzle symbol		Symbol in the ordering code	
Ø1,2			
This nozzle is designed as a drilling; no entries are required in the type designation. (Nozzle Ø in mm)			

Nozzle symbol		Symbol in the ordering code	
Z12			
This nozzle is designed as threaded nozzle. It is a standard nozzle, for which no entries are required in the type designation. (Nozzle Ø in 1/10 mm)			

For pilot control valves, see page 16!

Preferred types

Type LFA (control cover)	Material number
LFA 16 D-7X/F	R900912625
LFA 16 H2-7X/F	R900912655
LFA 16 WEA-7X/	R900910271
LFA 16 GWA-7X/	R900912636
LFA 16 E-7X/CA40DQMG24F	R900912619
LFA 25 D-7X/F	R900905302
LFA 25 H2-7X/F	R900912694
LFA 25 WEA-7X/	R900910273
LFA 25 GWA-7X/	R900912675
LFA 25 E-7X/CA40DQMG24F	R900912670
LFA 32 D-7X/F	R900905303
LFA 32 H2-7X/F	R900912728
LFA 32 WEA-7X/	R900912712
LFA 32 GWA-7X/	R900912708
LFA 32 E-7X/CA40DQMG24F	R900912703

Type LFA (control cover)	Material number
LFA 40 D-7X/F	R900938073
LFA 40 H2-7X/F	R900938122
LFA 40 WEA-7X/	R900931581
LFA 40 GWA-7X/	R900938114
LFA 40 E-7X/CA40DQMG24F	R900938107
LFA 50 D-7X/F	R900938150
LFA 50 H2-7X/F	R900938205
LFA 50 WEA-7X/	R900938215
LFA 50 GWA-7X/	R900938200
LFA 50 E-7X/CA40DQMG24F	R900938197
LFA 63 D-7X/F	R900938225
LFA 63 H2-7X/F	R900938250
LFA 63 WEA-7X/	R900938257
LFA 63 GWA-7X/	R900938245
LFA 63 E-7X/CA40DQMG24F	R900938242

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

General notes on the ordering code for control covers (pilot control valves)

Pilot control valve		Size	Data sheet no.	Control cover type	Size (control cover)
	Type				
Directional spool valve (wet pin)	4WE 6 D...6X/E	6	23178	WEA, WEB, GWA, GWB, KWA, KWB, EWA, EWB, WEMA, WEMB	16 to 50
	3WE 6 A...6X/E	6	23178	WECA	16 to 50
	4WE 10 D...3X/E	10	23327	WEA, WEB, GWA, KWA, KWB, EWA, EWB	63 to 100
	4WE 10 A...3X/E	10	23327	WEA 9, WECA	63 to 100
Diretional pop-pet valve	M-3SED 6 UK../350 M-3SED 6 CK../350	6	22049	WEMA, WEA, GWA, KWA	16 to 50
	M-3SEW 6 U../420 M-3SEW 6 C../420	6	22058	WEA, GWA, KWA, EWA, WEMA	16 to 50
	M-3SED 10 UK../350 M-3SED 10 CK../350	10	22045	WEA, GWA, KWA	63 to 100
	M-3SEW 10 U../420 M-3SEW 10 C../420	10	22075	WEA, GWA, KWA, EWA	63 to 100

Pilot control valves must be ordered separately.
For more details, see data sheet.

Valve fixing screws are included in the scope of supply of the control cover.

Note!

By combining a 2-way cartridge valve with a pilot control valve, various valve functions can be realised. In particular, the following components with porting pattern to ISO 4401-03-02-0-94 (up to size 50) and ISO 4401-05-04-0-94 (sizes 63 to 100) are suitable for this purpose.

Fixing screws ¹⁾ (included in the scope of supply)

Size	Control cover type	Qty	Dimensions	Tightening torque M_T in Nm ³⁾
16	WE., GW.	4	M8 x 45	32
	WEM.		M8 x 70	
	E		M8 x 60	
	EH2		M8 x 80	
	EW.		M8 x 85	
	²⁾		M8 x 40	
25	E	4	M12 x 60	110
	EH2, EW.		M12 x 90	
	²⁾		M12 x 50	
32	H1, H2, E	4	M16 x 80	270
	H3, H4		M16 x 70	
	EH2, EW.		M16 x 110	
	²⁾		M16 x 60	
40	E, EW.	4	M20 x 120	520
	EH2		M20 x 200	
	H1, H2		M20 x 110	
	²⁾		M20 x 70	

Size	Control cover type	Qty	Dimensions	Tightening torque M_T in Nm ³⁾
50	H2, H4	4	M20 x 120	520
	E, EW.		M20 x 130	
	EH2		M20 x 210	
	²⁾		M20 x 80	
63	H2, H4	4	M30 x 150	1800
	E, EW.		M30 x 180	
	EH2		M30 x 250	
	²⁾		M30 x 100	
80	H2, H4	8	M24 x 120	900
	²⁾		M24 x 100	
100	D, WE.	8	M30 x 120	1800
	²⁾		M30 x 140	
125	All control covers available	8	M36 x 160	3100
160	All control covers available	12	M42 x 220	5000

¹⁾ Hexagon socket head cap screws to ISO 4762 - 10.9

²⁾ Other available standard control covers

³⁾ Calculated with a total coefficient of friction $\mu = 0.14$; must be adjusted for other surfaces

Control cover with stroke limiter and remote control port: Type ..H... (nominal dimensions in mm)

Size 16 to 40

Size				Control	Remote control port	Nozzle in channel (Ø in 1/10 mm)
16	25	32	40			
x	x	x	x	H1	F	X**
x	x	x	x	H2	F	X**
x	x	x	x	H3	F	X**
x	x	x	x	H4	F	X**

No code =
V =

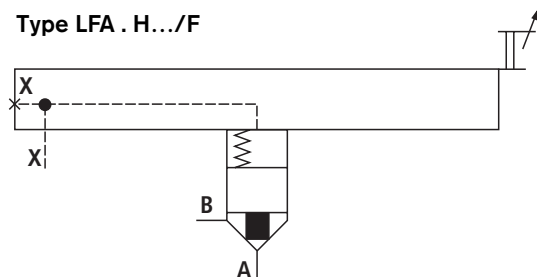
NBR seals
FKM seals
(Other seals on enquiry)

⚠ Caution!

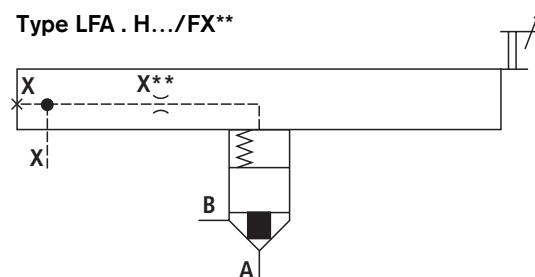
Observe compatibility of seals with
hydraulic fluid used!

△ Nozzle possible; indicate, if required

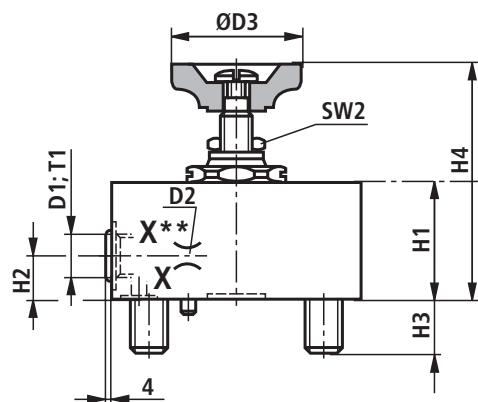
Type LFA . H.../F



Type LFA . H.../FX**

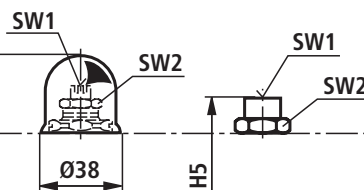


Control "H1"



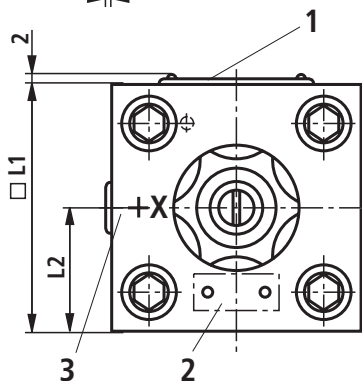
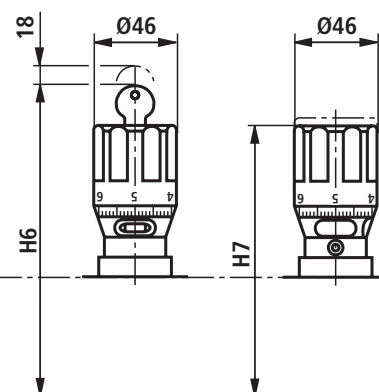
Control "H2"

Sizes 16 and 25 Sizes 32 and 40



Control
"H3"

Control
"H4"



1) For ordering codes
for nozzles, see
page 14 and 15.

2) Dimensions () valid
only for controls
"H3" and "H4"

3) Hexagon socket

1 Nameplate for sizes 16, 25, 32

2 Nameplate for size 40

3 Port X optionally as threaded connection

Size	16	25	32	40
D1	G1/8	G1/4	G1/4	G1/2
D2 ¹⁾	M6	M6	M6	M8 x 1
ØD3	52	80	80	100
H1	35	40	75 (60 ²⁾)	95 (100 ²⁾)
H2	12	16	16	30
H3	15	24	28	32
H4 max	90	95	120	160
H5 max	76	80	100	146
H6 max	155	160	180	234
H7 max	130	135	155	209
□ L1	65	85	100	125
L2	32.5	42.5	50	72
T1	8	12	12	14
A/F1 ³⁾	6	6	10	14
A/F2	21	22	27	46