5.1

2-way cartridge valves -directional function

Cartridge valves Type L-LC..

Control covers Type L-LFA...

Nominal sizes: 16 to 63
Series: 7X
Maximum operating pressure: 420 bar
Maximum flow-rate: 3000 L/min

Contents

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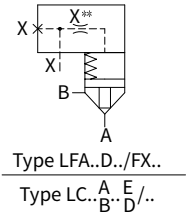
Function and configuration

2-way cartridge valves are designed as inserts for compact manifold control blocks. The installation hole dimension of the control block fitting the main valve component with ports A and B is in accord with ISO 7368 and sealed with a cover. In most cases, the cover also acts as a connection between the control side of the main component and the pilot valves. By controlling the main valve with suitable pilot valves, the main component can assume pressure, directional or throttling functions, or their combination.

Particularly economic designs can be achieved by matching the valve sizes to the individual actuator. When the element on the main valve is able to assume more than one function, a particularly economic design can be achieved.



Symbol

Directional function:

2-way cartridge valves basically comprise of control cover (1) and cartridge element (2). The control cover contains the control holes, and optional stroke limiter depending on the function, a hydraulically controlled directional poppet valve or a shuttle valve. In addition, directional spool valves or directional poppet valves may be mounted onto the control cover. The cartridge element basically comprises of a sleeve (3), an adjustment ring (4) (only up to NG32), valve poppet (5), optionally with damping nose (6), or without damping nose (7), and return spring (8).

05

Function:

Operation of 2-way cartridge valves depends on pressure. Hence for operation, there are three important pressure -bearing areas: A1, A2, A3. The area A1 on valve seat is taken as 100%. The annular area A2 is 7% or 50% of area A1 depending on the model. The area ratio A1:A2 is, therefore either 14.3:1 or 2:1. Area A3 is equal to sum of areas A1+A2. Due to the different area ratios A1:A2 and consequently the different annulus area (A2), area A3 may be either 107% or 150% of the 100% area at seat A1.

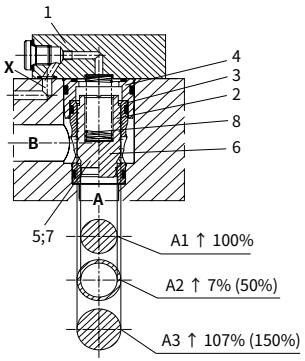
Basic application :

Areas A1 and A2 operate to open the valve. Area A3 and the spring operates to close the valve. The effective direction of the resultant force (of opening and closing forces) determines the switched position of the 2-way cartridge valve.

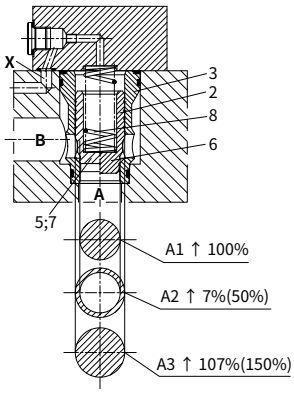
2-way cartridge valves may have flow passed from A to B or from B to A. When pilot oil acting on area A3 is from port B or supply from an external pilot oil, port A is closed, and leakage-free.

Function and configuration

Nominal sizes16, 25 and 32



Nominal sizes 40, 50 and 63



Technical data

Max. operating pressure	Without directional valve	bar	420
	- Port A, B, X, Z1, Z2	bar	315; 350; 420 (according to the maximum operating pressure of built-on valves)
	- Port Y	bar	Corresponds to the tank pressure of the built-on valve
Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 (NBR seal)
			-20 to +80 (FKM seal)
Viscosity range		mm^2/s	2.8 to 380
Degree of contamination			Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406 [1)]

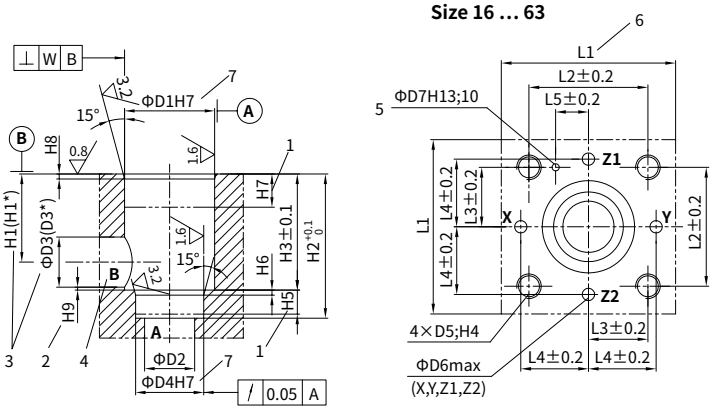
For applications outside these parameters, please consult us!

[1)] To prevent the problem caused by fluid contamination, fluid cleanliness mentioned above must be met.

Unit dimensions

(Dimensions in mm)

· Mounting cavity and connection dimensions to DIN ISO 7368



1 Depth of fit
2 Control dimension
3 If the diameter for port B is a different one than .D3 or (.D3*),
the distance from the cover contact surface to the center of the bore must be calculated.
4 Port B may be positioned around the central axis of port A.
However, it must be ensured that the mounting bores and the control bores are not damaged.
5 Bore for locating pin
6 80 mm only with control cover for directional valve set-up size 16 (axis X–Y bores)
7 For ΦD ⩽ 45mm → fit H8 is admissible

Unit dimensions

(Dimensions in mm)

· Installation bore and connection dimensions according to ISO 7368

通径	16	25	32	40	50	63
ΦD1	32	45	60	75	90	120
ΦD2	16	25	32	40	50	63
ΦD3	16	25	32	40	50	63
(ΦD3*)	25	32	40	50	63	80
ΦD4	25	34	45	55	68	90
ΦD5	M8	M12	M16	M20	M20	M30
ΦD6 [1)]	4	6	8	10	10	12
ΦD7	4	6	6	6	8	8
H1	34	44	52	64	72	95
(H1*)	29.5	40.5	48	59	65.5	86.5
H2	56	72	85	105	122	155
H3	43	58	70	87	100	130
H4	20	25	35	45	45	65
H5	11	12	13	15	17	20
H6	2	2.5	2.5	3	3	4
H7	20	30	30	30	35	40
H8	2	2.5	2.5	3	4	4
H9	0.5	1	1.5	2.5	2.5	3
L1	65/80	85	102	125	140	180
L2	46	58	70	85	100	125
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

Note: [1)] Maximum dimension

NO. HL-EN-L-LC.. 06/2024

2-way cartridge valves -directional function

5.1-1

Cartridge valves Type L-LC..

Ordering code

· Cartridge valves (without control cover)

L-LC | | | | – 7X / | ★

Cartridge valves

Nominal size 16 = 16
Nominal size 25 = 25
Nominal size 32 = 32
Nominal size 40 = 40
Nominal size 50 = 50
Nominal size 63 = 63

Area ratio 2:1 (annulus area = 50%) = A
Area ratio 14.3 :1 (annulus area = 7%) = B

Further details in clear text

No code = NBR seals
V = FKM seals

7X= Series 70 to 79
(70 to 79: unchanged installation and connection dimensions)

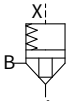
E = Valve poppet without damping nose
D = Valve poppet with damping nose

00 = Cracking pressure approx. 0bar (without spring)
05 = Cracking pressure approx. 0.5 bar
10 = Cracking pressure approx. 1 bar
20 = Cracking pressure approx. 2 bar
40 = Cracking pressure approx. 4bar (not size 125)

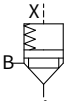
Symbols

· Cartridge valves (see Ordering datails)

Poppet without damping nose

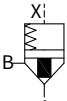


Area ratio
A1:A2 = 2:1
Type...A..E../...

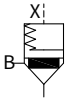


Area ratio
A1:A2 = 14.3:1
Type...B..E../...

Poppet with damping nose



Area ratio
A1:A2 = 2:1
Type...A..D../...



Area ratio
A1:A2 = 14.3:1
Type...B..D../...

Technical data

· 2-way cartridge valves directional

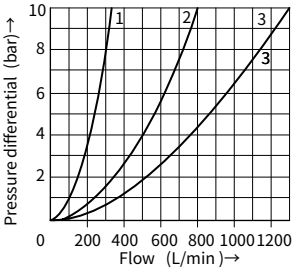
Area	Version	Size					
		16	25	32	40	50	63
A1 cm^2	LC..A..	1.89	4.26	6.79	11.1	19.63	30.2
	LC..B..	2.66	5.73	9.51	15.55	26.42	41.28
A2 cm^2	LC..A..	0.95	1.89	3.39	5.52	8.64	14
	LC..B..	0.18	0.43	0.67	1.07	1.85	2.90
A3 cm^2	LC..A..	2.84	6.16	10.18	16.62	28.27	44.2
	LC..B..	2.84	6.16	10.18	16.62	28.27	44.2
Stroke cm	LC..E..	0.9	1.17	1.4	1.7	2.1	2.3
	LC..D..	0.9	1.17	1.4	1.9	2.3	2.8
Pilot volume cm^3	LC..E..	2.56	7.21	14.3	28.3	59.4	102
	LC..D..	2.56	7.21	14.3	31.6	65.0	124
Theoretical [1] pilot fow (L/min)	LC..E..	15.4	43.3	86	170	356	612
	LC..D..	15.4	43.3	86	190	390	744
Weight kg	cartridge valves L-LC	0.25	0.5	1.1	1.9	3.9	7.2
Cracking pressure (bar) Direction of fow: A to B	LC..A 00..	0.02	0.02	0.05	0.05	0.05	0.07
	LC..A 05..	0.35	0.35	0.36	0.35	0.37	0.31
	LC..A 10..	0.70	0.68	0.72	0.71	0.67	0.64
	LC..A 20..	2.03	2.18	2.12	2.02	2.01	2
	LC..A 30..	–	–	–	–	–	–
	LC..A 40..	3.50	3.90	3.80	4.0	4.11	3.8
	LC..B 00..	0.01	0.02	0.04	0.04	0.04	0.05
	LC..B 05..	0.25	0.26	0.26	0.25	0.28	0.23
	LC..B 10..	0.49	0.50	0.51	0.51	0.48	0.47
	LC..B 20..	1.44	1.62	1.52	1.44	1.5	1.5
	LC..B 30..	–	–	–	–	–	–
	LC..B 40..	2.48	2.90	2.70	2.86	3.05	2.8
Cracking pressure (bar) Direction of fow: B to A	LC..A 00..	0.04	0.05	0.1	0.1	0.1	0.14
	LC..A 05..	0.69	0.78	0.72	0.7	0.84	0.68
	LC..A 10..	1.38	1.53	1.42	1.43	1.47	1.37
	LC..A 20..	4.05	4.91	4.25	4.06	4.57	4.33
	LC..A 30..	–	–	–	–	–	–
	LC..A 40..	6.96	8.74	7.6	8.05	9.34	8.15
	LC..B 00..	0.24	0.25	0.5	0.5	0.5	0.8
	LC..B 05..	3.69	3.4	3.64	3.64	3.95	3.27
	LC..B 10..	7.43	6.69	7.24	7.37	6.88	6.62
	LC..B 20..	21.3	21.5	21.6	20.9	21.4	20.9
	LC..B 30..	–	–	–	–	–	–
	LC..B 40..	36.6	38.3	38.6	41.5	43.6	39.4

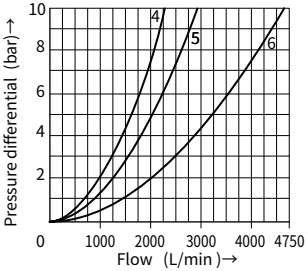
For applications outside these parameters, please consult us!

[1] Theoretical pilot flow to achieve a switching time of 10 ms .

Characteristic curves (Measured at ϑ_{oil}=40°C ±5°C , using HLP46)

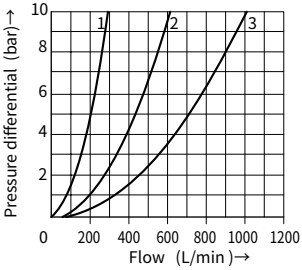
· Without damping nose

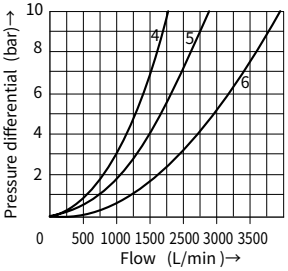




1 Size 16
2 Size 25
3 Size 32
4 Size 40
5 Size 50
6 Size 63

· With damping nose

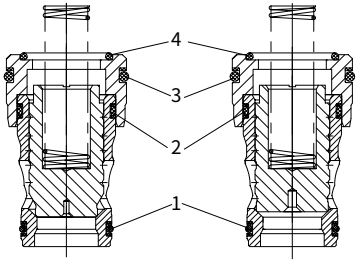




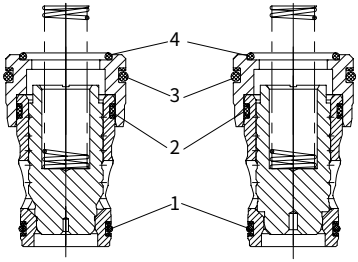
1 Size 16
2 Size 25
3 Size 32
4 Size 40
5 Size 50
6 Size 63

Dimension of O-rings for Cartridge valve type L-LC

· Sizes 16, 25 and 32



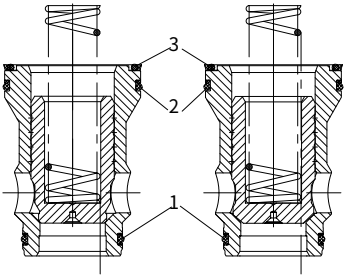
Type L-LC..A..E../... **Type L-LC..B..E../...**



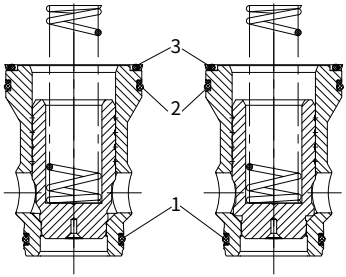
Type L-LC..A..D../... **Type L-LC..B..D../...**

	No.	Nominal size		
		16	25	32
O-rings	1	21.2×1.8	28×2.65	40×2.65
	2	22.4×2.65	32.5×2.65	43.7×3.55
	3	26.5×2.65	38.7×3.55	54.5×3.55
	4	20×2.65	30×2.65	37.5×3.55

· Size 40, 50, 63



Type L-LC..A..E../... **Type L-LC..B..E../...**



Type L-LC..A..D../... **Type L-LC..B..D../...**

	No.	Nominal size		
		40	50	63
O-rings	1	48.7×3.55	61.5×3.55	80×5.3
	2	69×3.55	80×5.3	109×5.3
	3	67×3.55	77.5×5.3	106×5.3

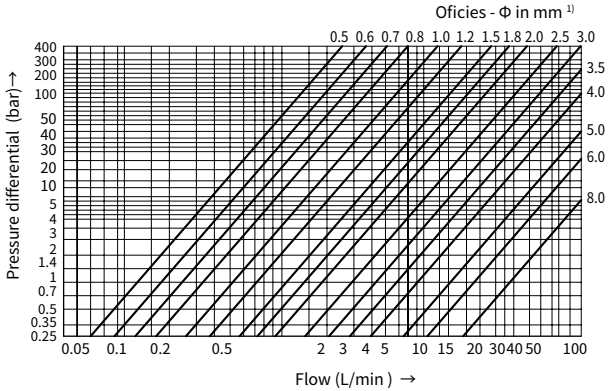
NO. HL-EN-L-LFA... 06/2024

2-way cartridge valves -directional function

5.1-2

Control covers Type L-LFA...

Characteristic curves for selection of orifices



1) Possible orifice - Φ in relation to the thread size

Thread	orifice - Φ (mm)
ZM6	0.5 to 3.0
ZM8	0.5 to 4.0
R3/8	0.8 to 6.0
R1/2	1.0 to 8.0

05

Ordering detail of orifice and plug

Nominal size	Thread / Orifice Φ mm	Ordering code			
		ZM6	ZM8	R3/8	R1/2
	0.5	ZM6-05	ZM8-05	-	-
	0.6	ZM6-06	ZM8-06	-	-
	0.7	ZM6-07	ZM8-07	-	-
16	0.8	ZM6-08	ZM8-08	R3/8-08	-
25	1	ZM6-10	ZM8-10	R3/8-10	R1/2-10
32	1.2	ZM6-12	ZM8-12	R3/8-12	R1/2-12
40	1.5	ZM6-15	ZM8-15	R3/8-15	R1/2-15
50	1.8	ZM6-18	ZM8-18	R3/8-18	R1/2-18
63	2	ZM6-20	ZM8-20	R3/8-20	R1/2-20
	2.5	ZM6-25	ZM8-25	R3/8-25	R1/2-25
	3	ZM6-30	ZM8-30	R3/8-30	R1/2-30
	3.5	-	ZM8-35	R3/8-35	R1/2-35
	4	-	ZM8-40	R3/8-40	R1/2-40
	5	-	-	R3/8-50	R1/2-50
	6	-	-	R3/8-60	R1/2-60
	8	-	-	-	R1/2-80
Plug		LT02.20.004	LT02.20.006	R3/8JB/ZQ4446	R1/2JB/ZQ4446

Fixing screws

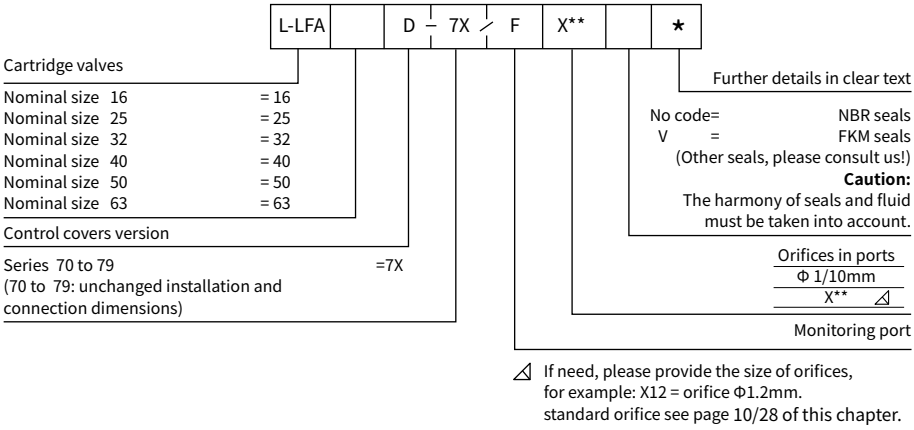
Internal hexagon according to GB/T 70.1-10.9 (Included in supply list)

Size	Type of control covers	Dimension	QTY	Tighting torque M_A (Nm)	Nominal size	Type of control covers	Dimension	QTY	Tighting torque M_A (Nm)
16	D	M8×40	4	32	40	D	M20×70	4	520
	G	M8×40				G	M20×70		
	GWA, GWB	M8×45				GWA, GWB	M20×70		
	H1, H2	M8×40				H1, H2	M20×110		
						R, RF	M20×70		
	KWA, KWB	M8×45				KWA, KWB	M20×70		
	WEA, WEB	M8×45				WEA, WEB	M20×70		
	WECA	M8×40				WECA	M20×70		
	WEMA, WEMB	M8×70				WEMA, WEMB	M20×70		
25	D	M12×50	4	110	50	D	M20×80	4	520
	G	M12×50				G	M20×80		
	GWA, GWB	M12×50				GWA, GWB	M20×80		
	H1, H2	M12×50				H2	M20×120		
	R, RF	M12×50				R, RF	M20×80		
	KWA, KWB	M12×50				KWA, KWB	M20×80		
	WEA, WEB	M12×50				WEA, WEB	M20×80		
	WECA	M12×50				WECA	M20×80		
	WEMA, WEMB	M12×50				WEMA, WEMB	M20×80		
32	D, G, R, RF GWA, GWB, KWA, KWB, WEA, WEB, WECA, WEMA, WEMB	M16×60	4	270	63	D, G, R, RF GWA, GWB, KWA, KWB, WEA, WEB, WECA, WEMA, WEMB	M30×100	4	1800
	H1, H2	M16×80				H2	M30×150		

Control covers with remote control

(Dimensions in mm)

·Type..D... (Nominal sizes 16 to 63)



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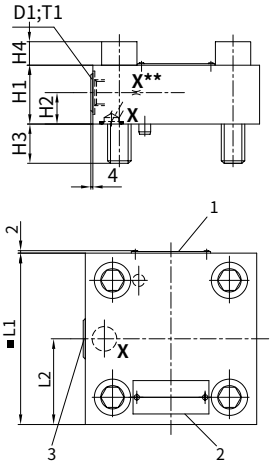
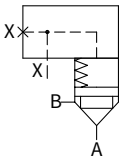
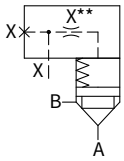


1 Nameplate used for sizes 16, 25 and 32
2 Nameplate used for sizes 40, 50 and 63
3 Optional port X used as threaded connection

L-LFA.D.../F



L-LFA.D.../FX**



Size	16	25	32	40	50	63
D1	G1/8	G1/4	G1/4	G1/2	G1/2	G3/4
X** 1)	ZM6	ZM6	ZM6	ZM8	ZM8	R3/8
H1	27	30	35	60	68	82
H2	12	16	16	30	32	40
H3	15	20	25	32	34	50
H4	6	12	16	-	-	-
L1	65	85	100	125	140	180
L2	32.5	42.5	50	72	80	90
T1	8	12	12	14	14	16
Weight kg	0.9	1.7	2.7	6.6	9.4	18.7

1) Ordering detail of orifice, see page 10/28 of this chapter.

Control covers with stroke limiter and remote control (Dimensions in mm)

· Type..H... (Nominal sizes 16 to 40)

L-LFA		H	–	7X	/	F	X**		★

Cartridge valves

Nominal size 16 = 16
Nominal size 25 = 25
Nominal size 32 = 32
Nominal size 40 = 40
Control covers version

Adjustment handle =1
Adjustment screw bolt =2

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

Further details in clear text

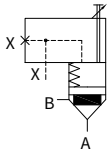
No code= NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

Orifices in ports
Φ 1/10mm
X** ◿

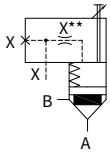
Monitoring port

◿ If need, please provide the size of orifices, for example: X12 = orifice Φ1.2mm.
standard orifice see page 10/28 of this chapter.

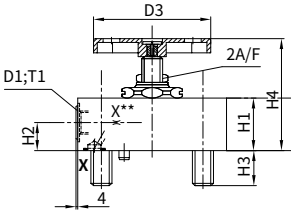
L-LFA.D.../F



L-LFA.D.../FX**

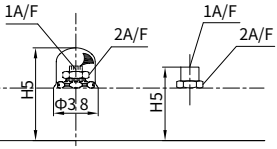


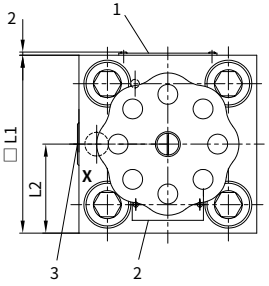
Adjustment unit '1'



Adjustment unit '2'

Sizes 16 and 25 Sizes 32 and 40





1 Nameplate used for sizes 16, 25 and 32
2 Nameplate used for sizes 40
3 Optional port X used as threaded connection

Size	16	25	32	40
D1	G1/8	G1/4	G1/4	G1/2
X** [1)]	ZM6	ZM6	ZM6	ZM8
D3	60	80	80	100
H1	35	40	75	95
H2	12	16	16	30
H3	15	24	28	32
H4max	90	95	120	160
H5max	76	80	100	146
□ L1	65	85	100	125
L2	32.5	42.5	50	72
T1	8	12	12	14
1A/F [2)]	6	6	10	14
2A/F	21	22	27	46
Weight kg	1.3	2.3	5.5	11.2

[1)] Ordering detail of orifice , see page 10/28 of this chapter
[2)] Internal hexagon

Control covers with stroke limiter and remote control (Dimensions in mm)

· Type..H... (Nominal sizes 50 to 63)

L-LFA		H	2	–	7X	/	F	X**		*

Control covers

Nominal size 50 = 50
Nominal size 63 = 63

Control covers version

Adjustment screw bolt

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

Further details in clear text

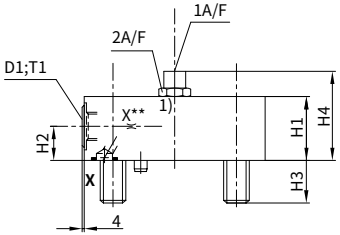
No code= NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

Orifices in ports
Φ 1/10mm
X** ⊿

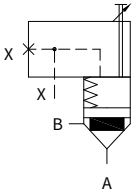
Monitoring port

⊿ If need, please provide the size of orifices, for example: X12 = orifice Φ1.2mm.
standard orifice see page 10/28 of this chapter.

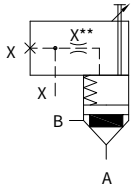
Adjustment unit '2'

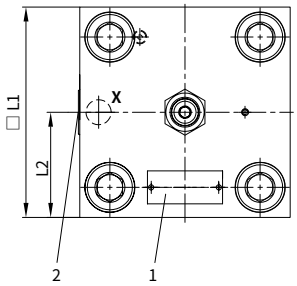


L-LFA.D.../F



L-LFA.D.../FX**





Size	50	63
D1	G1/2	G3/4
X**[1)]	ZM8	R3/8
H1	110	125
H2	32	40
H3	34	50
H4max	156	175
□ L1	140	180
L2	80	90
T1	14	16
1A/F2)	17	24
2A/F	55	65
Weight kg	15.8	30.2

1 Nameplate
2 Optional port X used as threaded connection

[1)] Ordering detail of orifice, see page 10/28 of this chapter
[2)] Internal hexagon

Control cover with built-in shuttle valve

(Dimensions in mm)

· Type..G... (Nominal sizes 16 to 63)

L-LFA | | G – 7X / | ★

Control covers

Nominal size 16 = 16
Nominal size 25 = 25
Nominal size 32 = 32
Nominal size 40 = 40
Nominal size 50 = 50
Nominal size 63 = 63

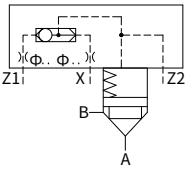
Control covers version

Further details in clear text

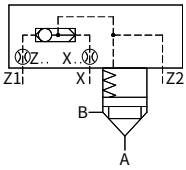
No code = NBR seals
V = FKM seals

7X= Series 70 to 79
(70 to 79: unchanged installation and connection dimensions)

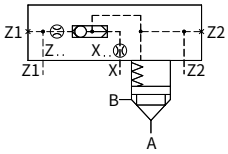
L-LFA.G...
Nominal sizes 16 to 32

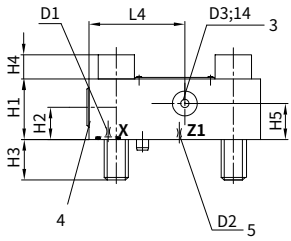


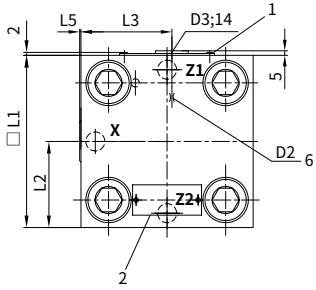
L-LFA.G...
Nominal sizes 40



L-LFA.G...
Nominal sizes 50 and 63







Size	16	25	32	40	50	63
D1 [2)]	Φ1.2	Φ1.5	Φ2.0	M6	M8×1	M8×1
D2 [2)]	Φ1.2	Φ1.5	Φ2.0	M6	M8×1	M8×1
D3	–	–	–	–	G1/2	G1/2
H1	35	30	35	60	68	82
H2	17	17	21.5	30	32	42
H3	15	24	28	32	34	50
H4	–	12	16	–	–	–
H5	–	–	–	–	32	40
L1	65	85	100	125	140	180
L2	36.5	45.5	50	62.5	70	90
L3	–	–	–	–	72	81
L4	–	–	–	–	72	90
L5	4.5	4	1	–	6	4

1 Nameplate used for sizes 16, 25, 32
2 Nameplate used for sizes 40, 50, 63
3 Optional port Z1 and Z2 used as threaded connection for sizes 25, 32, 50 and 63
4 Shuttle valve
5 D2 for nominal sizes 16 to 40
6 D2 for nominal sizes 50 and 63

Control cover with built-in directional poppet valve (Dimensions in mm)

· Types..R...;..RF... (Nominal sizes 25 to 63)

L-LFA | | – 7X / | F** | | | ★

Control covers

Nominal size 25 = 25
Nominal size 32 = 32
Nominal size 40 = 40
Nominal size 50 = 50
Nominal size 63 = 63

Control covers version
Directional valve without return spring =R
Directional valve with return spring = RF

Further details in clear text

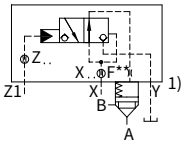
No code = NBR seals
V = FKM seals

Nozzle in channel (Φ in 1/10 mm)

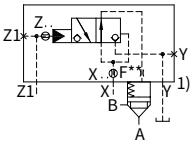
7X= Series 70 to 79
(70 to 79: unchanged installation and connection dimensions)

If need, please provide the size of orifices, for example: F12 = orifice Φ1.2mm.
standard orifice see page 10/28 of this chapter.

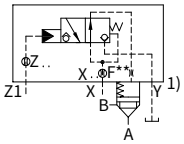
L-LFA.R... Nominal sizes 25 to 50



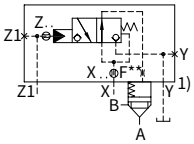
L-LFA.R... Nominal size 63



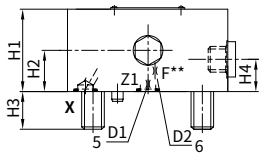
L-LFA.RF... Nominal sizes 25 to 50

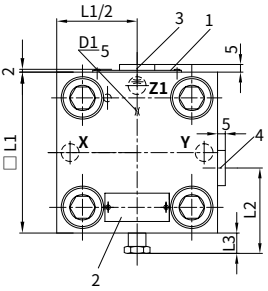


L-LFA.RF... Nominal sizes 63



Area ratio $\frac{A_{Z1}}{A_X} = \frac{3}{1}$





Size	Type	25	32	40	50	63
F** [2]		ZM6	ZM6	ZM8	ZM8	ZM8
H1		40	50	60	68	82
H2		20	26	30	34	40
H3		24	28	32	34	50
H4		15.5	26	30	34	40
□ L1		85	100	125	140	180
L2		50	50	65.7	70	78.5
L3	R	3	3	4	4	-
	RF	18	18	25	25	16
Weight	kg	2.1	3.6	6.7	9.5	18.3

[1] Max. pressure inPort Y: 5bar
[2] Ordering detail of orifice, see page 10/28 of this chapter.

1 Nameplate used for sizes 16, 25 and 32
2 Nameplate used for sizes 40, 50 and 63
3 Optional port Z1 used as threaded connection for size 63
4 Optional port Y used as threaded connection for size 63
5 D1 for nominal sizes 25 to 50
6 D1 for nominal size 63

Control cover for mounting directional spool or directional poppet valve (Dimensions in mm)

· Types ...WEA..., ..WEB.. (Nominal sizes 16 to 50)

L-LFA		– 7X / A**	B**	P**	T**		★

Control covers

Nominal size 16 = 16
Nominal size 25 = 25
Nominal size 32 = 32
Nominal size 40 = 40
Nominal size 50 = 50

Control covers version
Normally closed =WEA
Normally open =WEB

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

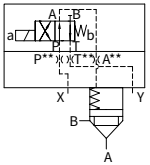
Further details in clear text

No code = NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

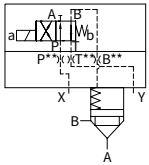
Control version	Orifices in ports (Φ 1/10 mm)			
WEA	A ** ◿		P ** ◿	T ** ◿
WEB		B ** ◿	P ** ◿	T ** ◿

◿ If need, please provide the size of orifices, for example: A12 = orifice Φ1.2mm. standard orifice see page 10/28 of this chapter.

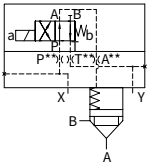
L-LFA.WEA...
Nominal sizes 16 to 32
Directional valve: 4WE6D



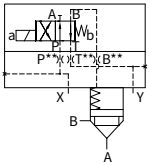
L-LFA.WEB...
Nominal sizes 16 to 32
Directional valve: 4WE6D

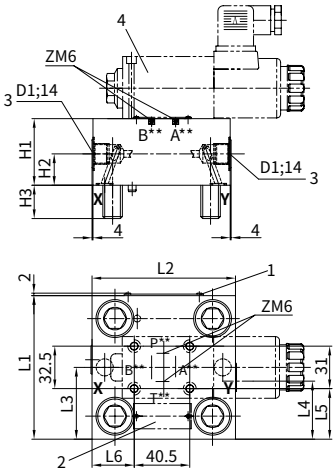


L-LFA.WEA...
Nominal sizes 40 to 50
Directional valve: 4WE6D



L-LFA.WEB...
Nominal sizes 40 to 50
Directional valve: 4WE6D





Size	16	25	32	40	50
D1	-	-	-	G1/2	G1/2
H1	40	40	50	60	68
H2	-	-	-	30	32
H3	15	24	28	32	34
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	-	-	-	72	80
L4	-	-	-	53	60
L5	17	27	34.5	47	54.5
L6	7	23.5	31	43.5	51
A**, B** T**, P** 1)	ZM6	ZM6	ZM6	ZM6	ZM6
Weight kg	1.5	2.1	3.6	6.6	9.3

[1] Ordering detail of orifice , see page 10/28 of this chapter.

1 Nameplate used for sizes 16, 25 and 32
2 Nameplate used for sizes 40 and 50
3 Optional port X and Y used as threaded connection for sizes 40 and 50.
4 Directional valve: 4WE6D...
Valve fixing screws: GB/T 70.1-M5×50-10.9, must be ordered separately.

Control cover for mounting directional spool or directional poppet valve (Dimensions in mm)

· Types ...WEA..., ..WEB.. (Nominal size 63)

L-LFA	63	–	7X /	A**	B**	P**	T**		★

Control covers

Nominal size

Control covers version
Normally closed =WEA
Normally open =WEB

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

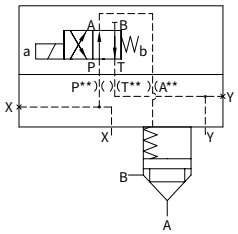
Further details in clear text

No code = NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

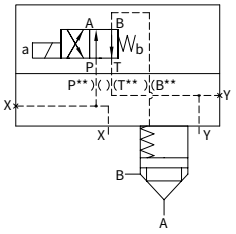
Control version	Orifices in ports (Φ 1/10 mm)			
WEA	A ** ◿		P ** ◿	T ** ◿
WEB		B ** ◿	P ** ◿	T ** ◿

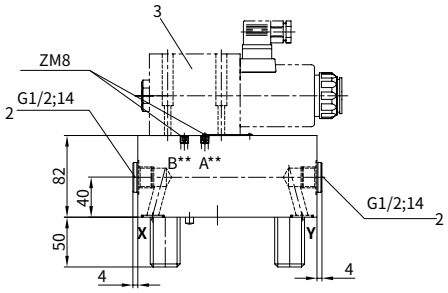
◿ If need, please provide the size of orifices, for example: A12 = orifice Φ1.2mm.
standard orifice see page 10/28 of this chapter.

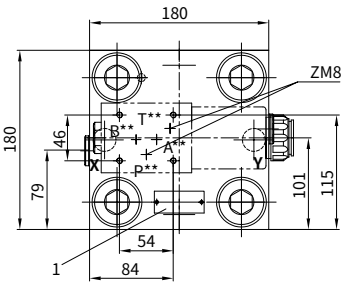
L-LFA.WEA...
Directional valve: 4WE10D



L-LFA.WEB...
Directional valve: 4WE10D







A **, B ** T **, P ** [1]	ZM8

[1] Ordering detail of orifice , see page 10/28 of this chapter.

1 Nameplate
2 Optional port X and Y used as threaded connection
3 Directional valve:4WE10D...
Valve fixing screws:
GB/T 70.1-M6×40-10.9,
must be ordered separately.
Weight (kg): 18.6

Control cover for mounting directional spool or directional poppet valve (Dimensions in mm)

· Types ...WEMA..., ..WEMB.. (Nominal sizes 16 to 50)

L-LFA		– 7X /	P**	T**	F**		*

Control covers

Nominal size 16 = 16
Nominal size 25 = 25
Nominal size 32 = 32
Nominal size 40 = 40
Nominal size 50 = 50

Control covers version
Normally closed =WEMA
Normally open =WEMB

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

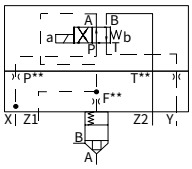
Further details in clear text

No code = NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

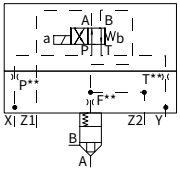
Orifices in ports (Φ 1/10 mm)
P ** T ** F **

If need, please provide the size of orifices, for example: P12 = orifice Φ1.2mm.
standard orifice see page 10/28 of this chapter.

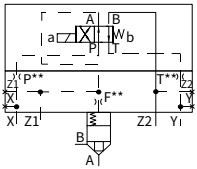
L-LFA.WEMA...
Nominal sizes 16 to 32
Directional valve: 4WE6D



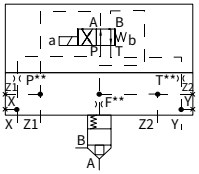
L-LFA..WEMB...
Nominal sizes 16 to 32
Directional valve: 4WE6D...

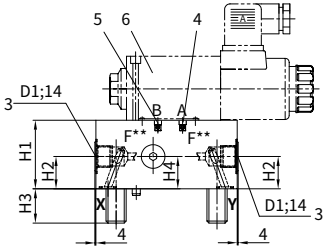


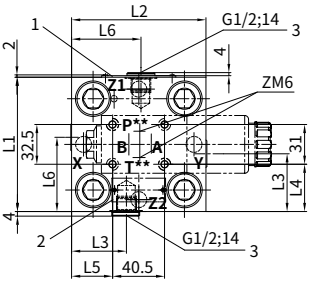
L-LFA.WEMA...
Nominal sizes 40 and 50
Directional valve: 4WE6D...



L-LFA.WEMB...
Nominal sizes 40 and 50
Directional valve: 4WE6D...







Size	16	25	32	40	50
D1	-	-	-	G1/2	G1/2
H1	65	40	50	60	68
H2	-	-	-	30	32
H3	15	24	28	32	34
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	-	-	-	53	60
L4	17	27	34.5	47	54.5
L5	7	23.5	31	43.5	51
L6	-	-	-	72	80
P**, T** F** [1)]	ZM6	ZM6	ZM6	ZM6	ZM6
F**	2.3	2.1	3.6	6.6	9.3

[1)] Ordering detail of orifice, see page 10/28 of this chapter

1 Nameplate used for sizes 16, 25 and 32
2 Nameplate used for sizes 40 and 50
3 Optional port X, Y, Z1 and Z2
used as threaded connection for sizes 40 and 50
4 Plug ZM6 used for: ...WEMB..
(Port B fixed with or without orifice F**, port A with plug)
5 Plug ZM6 used for: ...WEMA..
(Port A fixed with or without orifice F**, port B with plug)
6 Directional valve: 4WE6D...
Valve fixing screws: GB/T 70.1-M5×50-10.9,
must be ordered separately.

Control cover for mounting directional spool or directional poppet valve (Dimensions in mm)

· Types ...WEMA..., ..WEMB.. (Nominal size 63)

L-LFA	63	– 7X /	P**	T**	F**			★

Control covers

Nominal size

Control covers version
Normally closed =WEMA
Normally open =WEMB

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

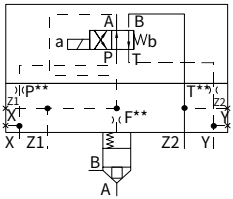
Further details in clear text

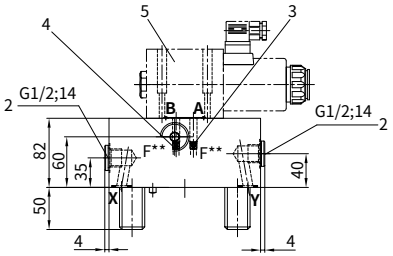
No code = NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

Orifices in ports (Φ 1/10 mm)		
P **	T **	F **

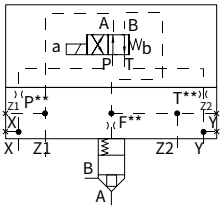
If need, please provide the size of orifices,
for example: P20 = orifice Φ2mm.
standard orifice see page 10/28 of this chapter.

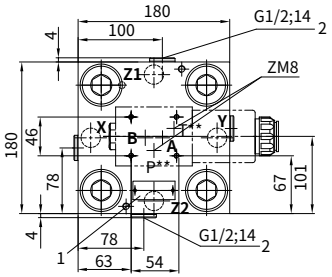
L-LFA.WEMA...
Directional valve: 4WE10D





L-LFA.WEMB...
Directional valve: 4WE10D





1 Nameplate
2 Optional port X, Y, Z1 and Z2 used as threaded connection
3 Plug ZM8 used for: ...WEMB..
(Port B fixed with or without orifice F**, port A with plug)
4 Plug ZM8 used for: ...WEMA..
(Port A fixed with or without orifice F**, port B with plug)
5 Directional valve: 4WE10D...
Valve fixing screws: GB/T 70.1-M6×40-10.9,
must be ordered separately.
Weight (kg): 18.6

P **, T **, F ** [1)]	ZM8

[1)] Ordering detail of orifice ,
see page 10/28 of this chapter.

Control cover for mounting directional spool valve (Dimensions in mm)

· Types ..WECA.. (Nominal sizes 16 to 50)

L-LFA		WECA – 7X / A**	B**	P**	T**		★

Control covers

Nominal size 16 = 16
Nominal size 25 = 25
Nominal size 32 = 32
Nominal size 40 = 40
Nominal size 50 = 50

Control covers version

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

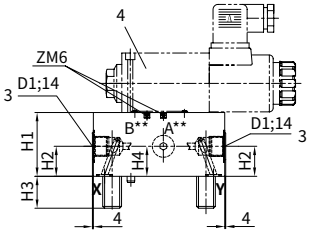
Further details in clear text

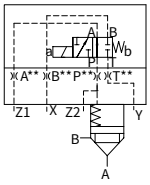
No code = NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

Orifices in ports (Φ 1/10 mm)

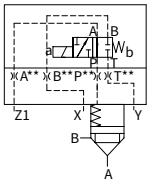
A **	B **	P **	T **

If need, please provide the size of orifices, for example: A12 = orifice Φ1.2mm.
standard orifice see page 10/28 of this chapter.

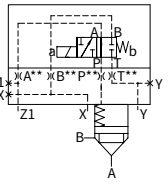




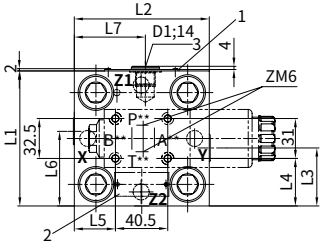
L-LFA16WECA...
Directional valve: 3WE6A



L-LFA...WECA...
Nominal sizes 25 and 32
Directional valve: 3WE6A



L-LFA...WECA...
Nominal sizes 40 and 50
Directional valve: 3WE6A



[1] Ordering detail of orifice, see page 10/28 of this chapter.

1 Nameplate used for sizes 16, 25 and 32
2 Nameplate used for sizes 40 and 50
3 Optional port X , Y and Z1 used as threaded connection for sizes 40 and 50
4 Directional valve: 3WE6A...
Valve fixing screws: GB/T 70.1-M5×50-10.9, must be ordered separately.

Size	16	25	32	40	50
D1	-	-	-	G1/2	G1/2
H1	40	40	50	60	68
H2	-	-	-	30	32
H3	15	24	28	32	34
H4	-	-	-	30	32
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	-	-	-	53	60
L4	17	27	34.5	47	54.5
L5	7	23.5	31	43.5	51
L6	-	-	-	62.5	70
L7	-	-	-	72	80
A**, B** P**, T** [1]	ZM6	ZM6	ZM6	ZM6	ZM6
Weight kg	1.5	2.1	3.6	6.6	9.3

Control cover for mounting directional spool valve

(Dimensions in mm)

· Types ..WECA.. (Nominal size 63)

L-LFA	63	WECA	–	7X	/	A**	B**	P**	T**		*

Control covers

Nominal size

Control covers version

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

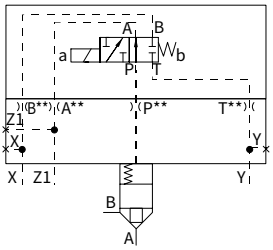
Further details in clear text

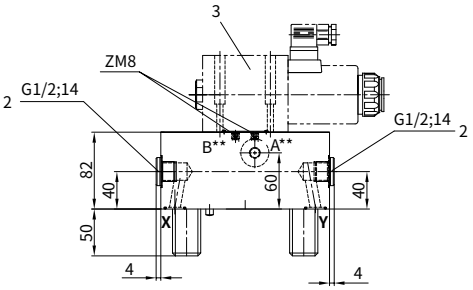
No code = NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

Orifices in ports (Φ 1/10 mm)			
A **	B **	P **	T **

If need, please provide the size of orifices, for example: A20= orifice Φ2mm, standard orifice see page 10/28 of this chapter.

L-LFA63WECA...
Directional valve: 3WE10A...

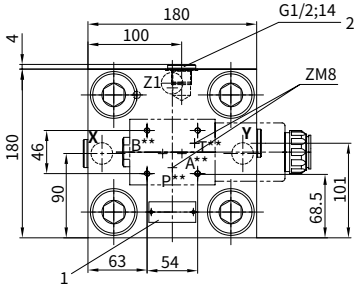




A **, B ** P **, T** 1)	ZM8

[1] Ordering detail of orifice, see page 10/28 of this chapter.

1 Nameplate
2 Optional port X , Y and Z1 used as threaded connection
3 Directional valve: 3WE10A...
Valve fixing screws: GB/T 70.1-M6×40-10.9 must be ordered separately
Weight (kg): 18.6



Control cover for mounting directional spool or poppet valve (Dimensions in mm)

· Types ..GWA, ..GWB.. (Nominal sizes 16 to 50)

L-LFA		– 7X /	A**	B**	P**	T**		★

Control covers

Nominal size 16 = 16
Nominal size 25 = 25
Nominal size 32 = 32
Nominal size 40 = 40
Nominal size 50 = 50

Control covers version
Normally closed =GWA
Normally open =GWB

Series 70 to 79 =7X
(70 to 79 unchanged installation and connection dimensions)

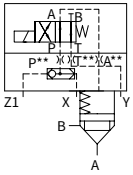
Further details in clear text

No code= NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

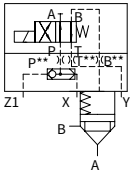
Control version	Orifices in ports (Φ1/10 mm)			
GWA	A **		P **	T **
GWB		B **	P **	T **

If need, please provide the size of orifices, for example: A12= orifice Φ1.2mm, standard orifice see page 10/28 of this chapter.

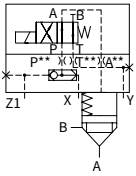
L-LFA.GWA...
Nominal sizes 16 to 32
Directional valve: 4WE6D



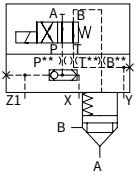
L-LFA..GWB...
Nominal sizes 16 to 32
Directional valve: 4WE6D

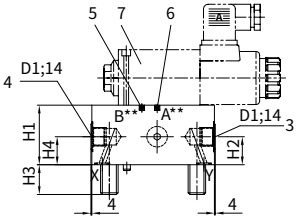


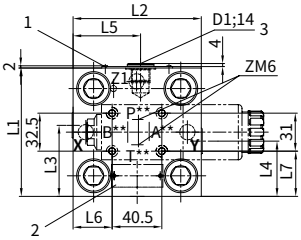
L-LFA.GWA...
Nominal sizes 40 and 50
Directional valve: 4WE6D



L-LFA.GWB...
Nominal sizes 40 and 50
Directional valve: 4WE6D







Size	16	25	32	40	50
D1	-	-	-	G1/2	G1/2
H1	40	40	50	60	68
H2	-	-	-	30	32
H3	15	24	28	32	34
H4	17	17	21.5	30	32
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	36.5	45.5	50	62.5	72
L4	-	-	-	53	60
L5	-	-	-	62.5	70
L6	7	23.5	31	43.5	51
L7	17	27	34.5	47	54.5
A**,B** P**,T** 1)	ZM6	ZM6	ZM6	ZM6	ZM6
Weight kg	1.5	2.1	3.6	6.6	9.3

1) Ordering detail of orifice, see page 10/28 of this chapter.

1 Nameplate used for sizes 16, 25 and 32
2 Nameplate used for sizes 40 and 50
3 Optional port Y and Z1 used as threaded connection for sizes 40 and 50
4 Shuttle valve
5 Plug ZM6 used for: ...GWA..(Port B fixed with plug, port A without plug)
6 Plug ZM6 used for: ...GWB..(Port A fixed with plug, port B without plug)
7 Directional valve: 4WE6D...Valve fixing screws: GB/T 70.1-M5×50-10.9, must be ordered separately

Control cover for mounting directional spool or poppet valve

(Dimensions in mm)

· Types ..GWA, ..GWB.. (Nominal size 63)

L-LFA	63	–	7X	A**	B**	P**	T**		★

Control covers

Nominal size

Control covers version
Normally closed =GWA
Normally open =GWB

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

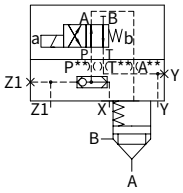
Further details in clear text

No code = NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

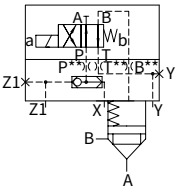
Orifices in ports (Φ 1/10 mm)			
A **	B **	P **	T **

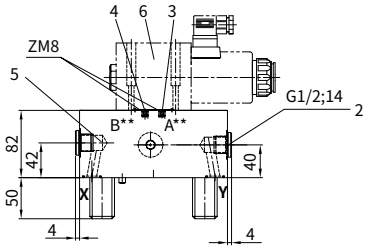
If need, please provide the size of orifices, for example: A20= orifice Φ2mm
standard orifice see page 10/28 of this chapter.

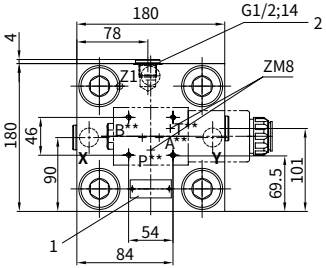
L-LFA63GWA...
Directional valve: 4WE10D



L-LFA63GWB...
Directional valve: 4WE10D







1 Nameplate
2 Optional port Y and Z1 used as threaded connection
3 Plug ZM8 used for: ...GWB..
(Port A fixed with plug, port B without plug)
4 Plug ZM8 used for: ...GWA..
(Port B fixed with plug, port A without plug)
5 Shuttle valve
6 Directional valve: 4WE10D...
Valve fixing screws: GB/T 70.1-M6×40-10.9, must be ordered separately
Weight (kg): 18.6

A **, B ** P **, T** 1)	ZM8

1) Ordering detail of orifice, see page 10/28 of this chapter

Control cover for mounting directional spool or poppet valve (Dimensions in mm)

· Types ..KWA, ..KWB.. (Nominal sizes 16 to 50)

L-LFA | – 7X / A** | B** | ★

Control covers

Nominal size 16 = 16
Nominal size 25 = 25
Nominal size 32 = 32
Nominal size 40 = 40
Nominal size 50 = 50

Control covers version
Normally closed =KWA
Normally open =KWB

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

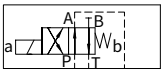
Further details in clear text

No code = NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

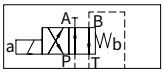
Control version	Orifices in ports (Φ 1/10 mm)	
KWA	A **	
KWB		B **

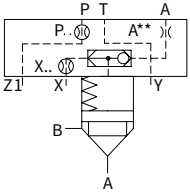
If need, please provide the size of orifices, for example: A12= orifice Φ1.2mm
standard orifice see page 10/28 of this chapter.

4WE6D
(Only for L-LFA.KWA...)

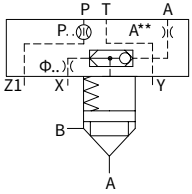


4WE6D
(Only for L-LFA.KWA...)

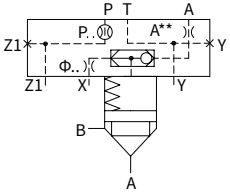




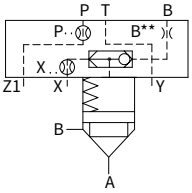
L-LFA16KWA...
(Directional valve see foregoing paragraphs)



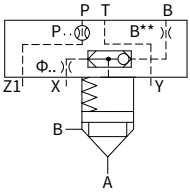
L-LFA .KWA...
Sizes 25 and 32
(Directional valve see foregoing paragraphs)



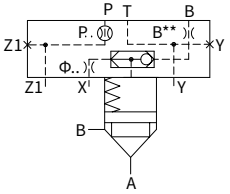
L-LFA .KWA...
Sizes 40 and 50
(Directional valve see foregoing paragraphs)



L-LFA16KWB...
(Directional valve see foregoing paragraphs)



L-LFA .KWB...
Sizes 25 and 32
(Directional valve see foregoing paragraphs)

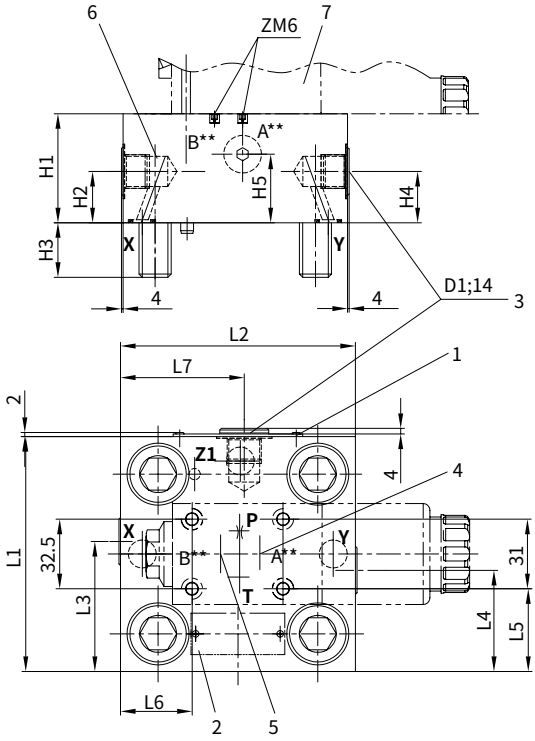


L-LFA .KWB...
Sizes 40 and 50
(Directional valve see foregoing paragraphs)

Control cover for mounting directional spool or poppet valve

(Dimensions in mm)

· Types ..KWA, ..KWB.. (Nominal sizes 16 to 50)



Size	16	25	32	40	50
D1	-	-	-	G1/2	G1/2
H1	40	40	50	60	68
H2	17	17	21.5	30	32
H3	15	24	28	32	34
H4	-	-	-	30	32
H5	-	-	-	30	50
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	36.5	45.5	50	62.5	72
L4	-	-	-	53	60
L5	17	27	34.5	47	54.5
L6	7	23.5	31	43.5	51
L7	-	-	-	62.5	70
A**,B** [1)]	ZM6	ZM6	ZM6	ZM6	ZM6
Weight kg	1.5	2.1	3.6	6.6	9.3

1 Nameplate for size 16, 25 and 32
2 Nameplate for size 40 and 50
3 Optional port Y and Z1 used as threaded connection for sizes 40 and 50.
4 Plug ZM6 used for: ...KWB.. (Port A fixed with plug, port B without plug)
5 Plug ZM6 used for: ...KWA.. (Port B fixed with plug, port A without plug)
6 Shuttle valve
Valve fixing screws: GB/T 70.1-M5×50-10.9 must be ordered separately

[1)] Orifice ordering code see page 10/28 of this chapter.

Control cover for mounting directional spool or poppet valve (Dimensions in mm)

· Types ..KWA,..KWB.. (Nominal size 63)

L-LFA	63	–	7X	A**	B**		★

Control covers

Nominal size

Control covers version
Normally closed =KWA
Normally open =KWB

Series 70 to 79 =7X
(70 to 79: unchanged installation and connection dimensions)

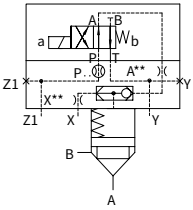
Further details in clear text

No code = NBR seals
V = FKM seals
(Other seals, please consult us!)
Caution:
The harmony of seals and fluid must be taken into account.

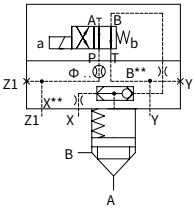
Control version	Orifices in ports (Φ 1/10 mm)	
KWA	A ** ◿	
KWB		B ** ◿

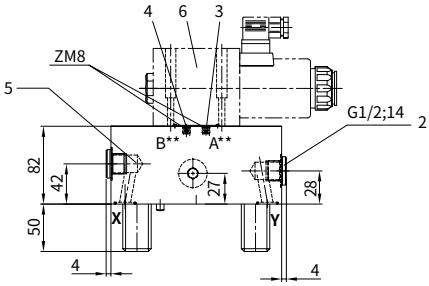
◿ If need, please provide the size of orifices, for example: A20= orifice Φ2mm standard orifice see page 10/28 of this chapter.

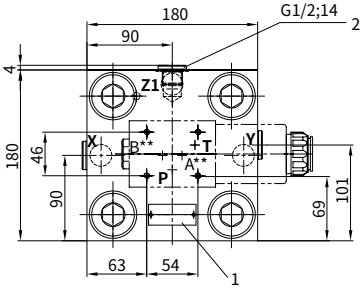
L-LFA63 KWA...
Directional valve: 4WE10D



L-LFA63 KWB...
Directional valve: 4WE10D







A **, B ** 1)	ZM8

1 Nameplate
2 Optional port Y and Z1 used as threaded connection
3 Plug used for: ...KWB..
4 Plug used for: ...KWA..
5 Shuttle valve
6 Directional valve:4WE10D...
Valve fixing screws: GB/T 70.1-M6×40-10.9 must be ordered separately
Weight (kg): 18.6

[1] Orifice ordering code see page 10/28 of this chapter. .