

2-way cartridge valves, directional functions

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

RE 21010

Edition: 2014-09

Replaces: 03.05



- ▶ 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
- ▶ 4 different springs
- ▶ 4 stroke limitations
- ▶ Control cover with installed seat valve
- ▶ Control cover with installed shuttle valve
- ▶ Control cover for mounting directional spool valves with or without installed shuttle valve
- ▶ Higher pressure ranges, upon request

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Function, sections, symbol

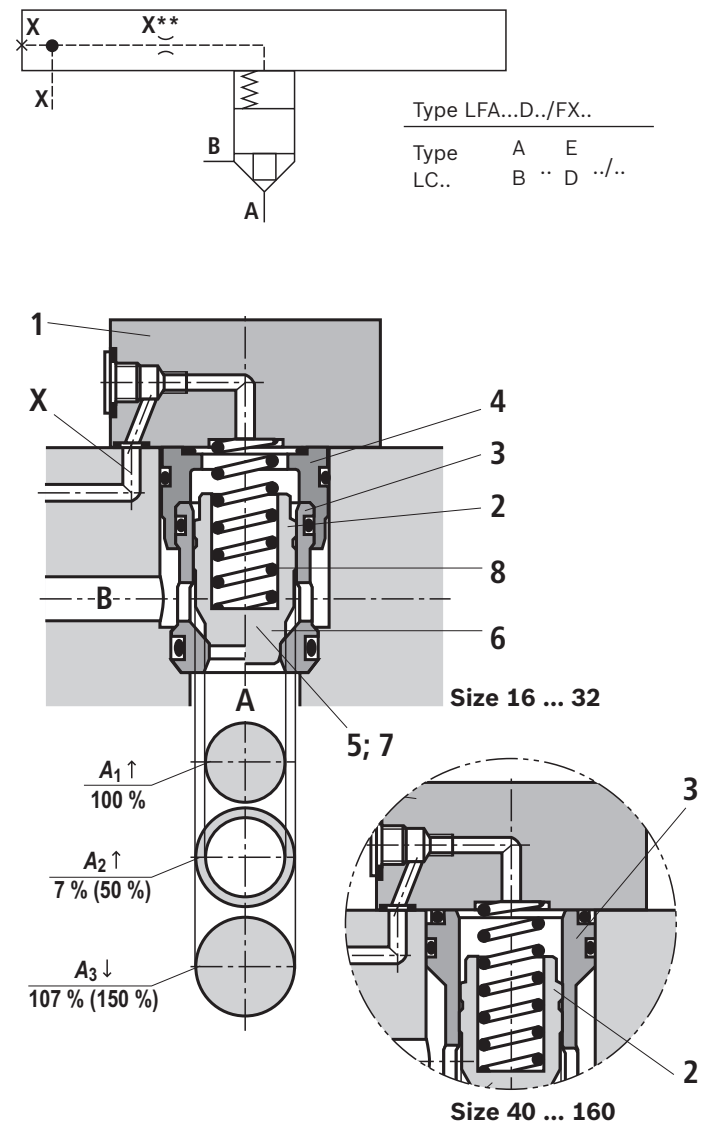
2-way cartridge valves are elements that have been designed for a compact block design. The power section with ports A and B is installed into the manifold in a receiving hole standardized according to ISO 7368 and closed with a cover. In most cases, the cover is simultaneously the connection from the control side of the power section to the pilot control valves. By controlling with the relevant pilot control valves, the power section can take over the pressure, directional and throttle function or a combination of these functions. Particularly economical solutions are achieved by adapting the nominal size to the different levels of flow of the individual ways of an actuator. One extremely economical method is to transfer multiple functions on the power section of an element.

2-way cartridge valves consist mainly of a control cover (1) and an installation kit (2). The control cover contains the control bores and stroke limitation, hydraulically controlled directional seat valve or a shuttle valve depending on the overall function required. Electrically operated directional spool valves or directional seat valves can also be mounted on the control cover. The installation kit consists of a socket (3), ring (4) (only up to size 32), valve poppet (5), optionally with damping nose (6) or without damping nose (7), and closing spring (8).

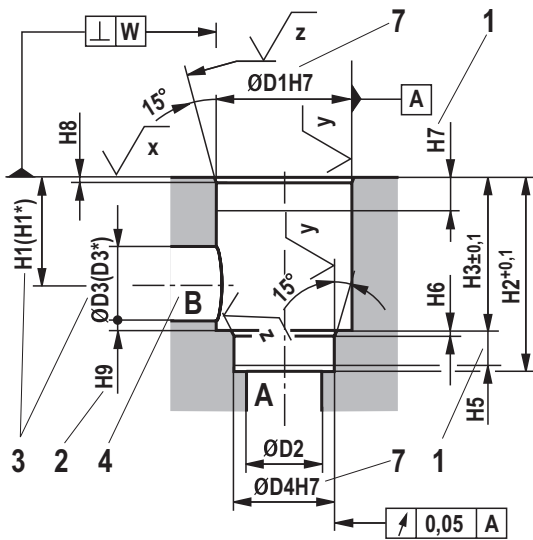
2-way cartridge valves work depending on the pressure. This results in three pressurized areas A_1 , A_2 , A_3 , which are important for the function. The area on the valve seat A_1 is regarded as 100%. The annulus area A_2 resulting from the gradation is 7% or 50% of the area A_1 depending on the version. The area ratio $A_1 : A_2$ is therefore either 14.3 : 1 or 2 : 1. The A_3 area is equal 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), area A_3 is 107% or 150% of area A_1 regarded as 100% on the seat.

The following applies:

Areas A_1 and A_2 act in the opening direction. Area A_3 and the spring act in closing direction. The direction of action of the resulting force from opening and closing forces determines the spool position of the 2-way cartridge valve. The 2-way cartridge valves can be flown through from A to B or from B to A. When the area A_3 is pressurized by removing pilot oil from channel B or external pilot oil supply, channel A is blocked leak-tight.

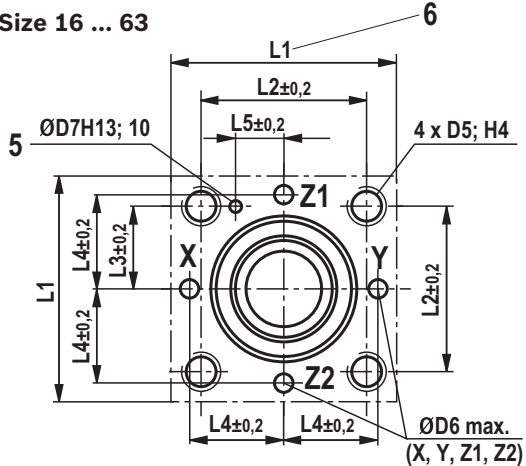


Installation bore and connection dimensions according to ISO 7368 1)
(dimensions in mm)

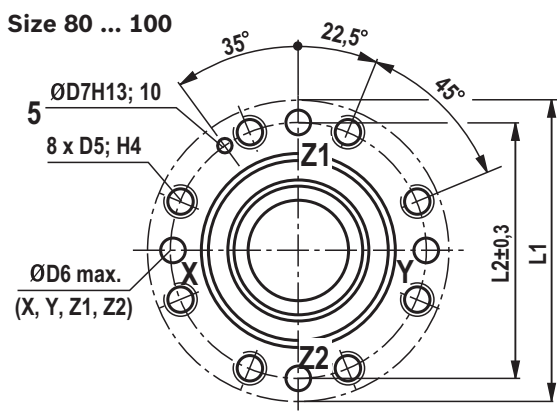


$\sqrt{x} = \sqrt{Rz1max\ 4}$
 $\sqrt{y} = \sqrt{Rz1max\ 8}$
 $\sqrt{z} = \sqrt{0,0025 - / Pt\ max\ 16}$

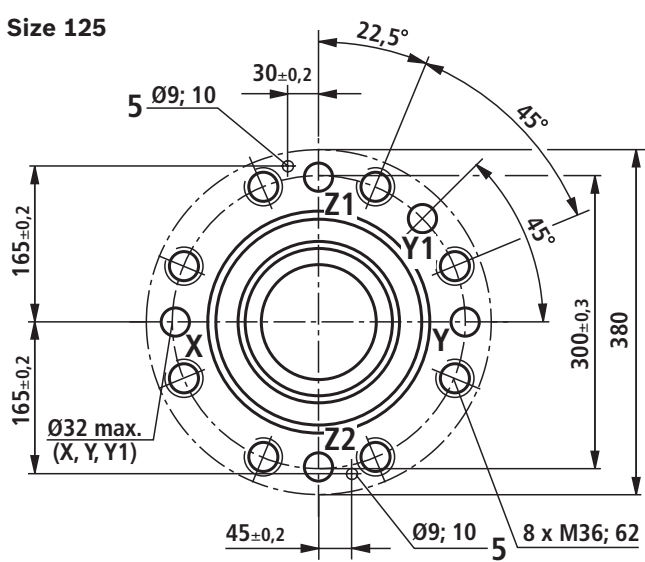
Size 16 ... 63



Size 80 ... 100



Size 125



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

1) Except for size 125 and 160

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 and 420 (depending on the mounted directional valve)
	▶ Port Y	bar	depending on the maximum tank pressure of the mounted directional valve
	▶ With monitored spool position	bar	400
Maximum flow		l/min	25,000 (size-dependent; see characteristic curves page 10 and 9)
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 permissible 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
Mineral oils	HL, HLP, HLPD, HVLP, HVLDP	NBR, FKM	DIN 51524
Bio-degradable	- insoluble in water	HETG	ISO 15380
		HEES	
	- soluble in water	HEPG	ISO 15380
	- water-free	HFDR, HFDR	ISO 12922
Flame-resistant	- containing water	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	ISO 12922

**Important Information on hydraulic fluids:**

- ▶ For more information and data on the use of other hydraulic fluids, please refer to data sheet 90220 or contact us!
- ▶ There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.)!
- ▶ The flash point of the hydraulic fluid used must be 40 K higher than the maximum solenoid surface temperature.

▶ Flame-resistant – contains water:

- Maximum pressure differential on the seat: 50 bar
- Pressure pre-loading at the tank port > 20% of the pressure differential, otherwise increased cavitation
- Life cycle as compared to operation with mineral oil HL, HLP 50 to 100%

¹⁾ The cleanliness classes stated for the components need to be maintained in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components.

For the selection of the filters see www.boschrexroth.com/filter.

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

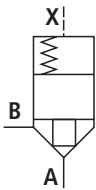
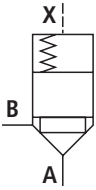
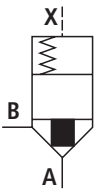
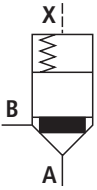
Spool design (for area ratio see section on page 3)

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 approx. 0.5 bar	05
	Cracking pressure approx. 1 bar	10
	Cracking pressure approx. 2 bar	20
	Cracking pressure approx. 3 bar (only size 125)	30
	Cracking pressure approx. 4 bar (not size 125 and 160)	40
	For exact values, see page 8.	
05	Valve poppet without damping nose	E
	Valve poppet with damping nose	D
06	Component series 70 to 79 (70 to 79: unchanged installation and connection dimensions) (size 16 ... 63)	7X
	Component series 60 to 69 (60 to 69: unchanged installation and connection dimensions) (size 80 ... 100)	6X
	Component series 20 to 29 (20 to 29: unchanged installation and connection dimensions) (size 125 ... 160)	2X

Seal material

07	NBR seals	no code
	FKM seals	V
	Attention, observe compatibility of seals with hydraulic fluid used. (Other seals on request)	

Symbols

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

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

Size of the annulus area

Area in cm ²	Version	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)

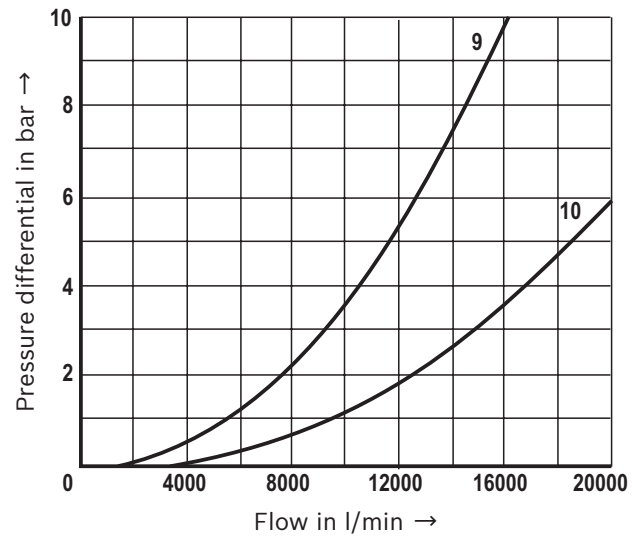
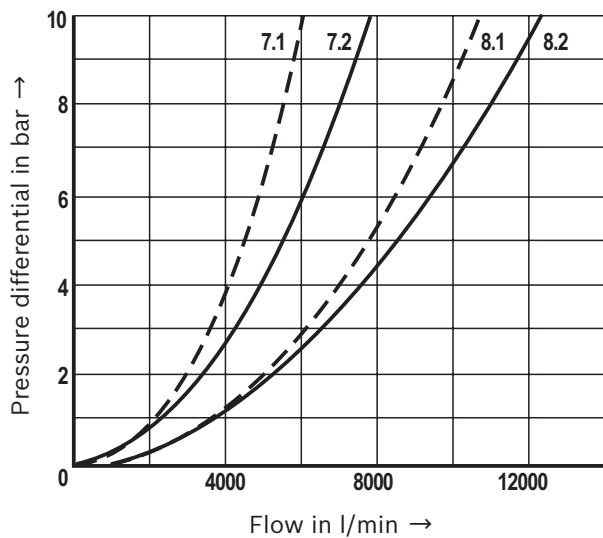
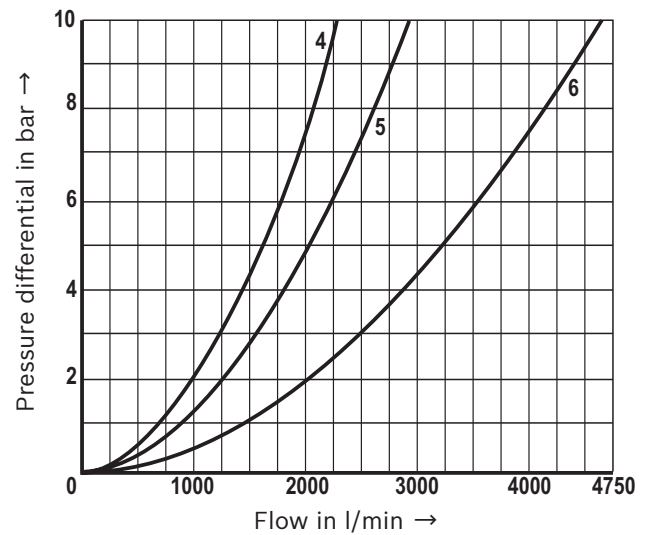
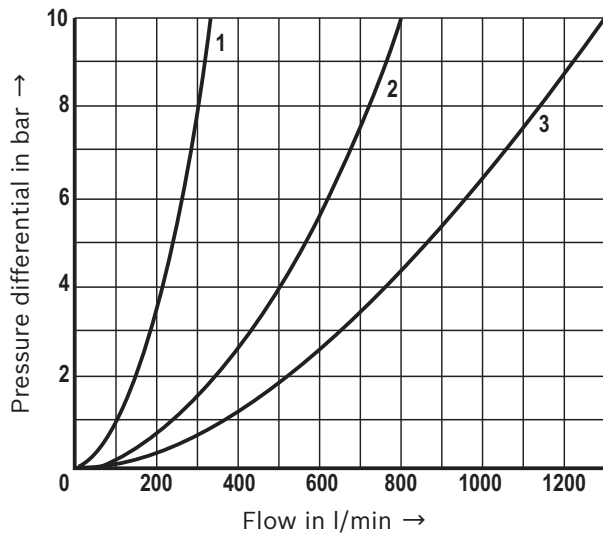
	Version	Size										
		16	25	32	40	50	63	80	100	125	160	
Stroke	cm	LC..E..	0.9	1.17	1.4	1.7	2.1	2.3	2.4	3.0	3.8	5.0
		LC..D..	0.9	1.17	1.4	1.9	2.3	2.8	3.0	3.8	4.8	6.5
Pilot volume	cm ³	LC..E..	2.56	7.21	14.3	28.3	59.4	102	136	285	544	1203
		LC..D..	2.56	7.21	14.3	31.6	65.0	124	170	361	687	1563
Theoretical 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

Cracking pressure in bar

	Version	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	-	-
	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 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⁾ Theoretical pilot flow to achieve a switching time of 10 ms

Characteristic curves: without damping nose
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

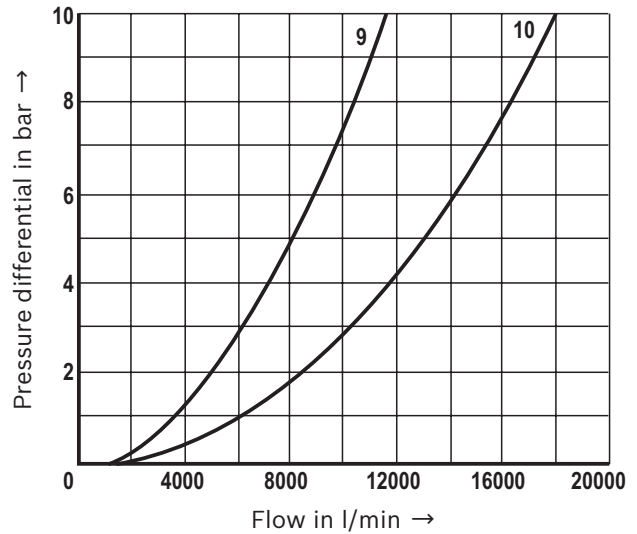
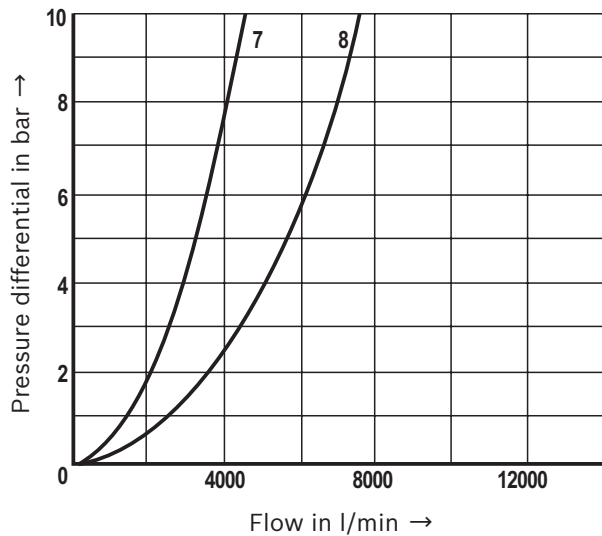
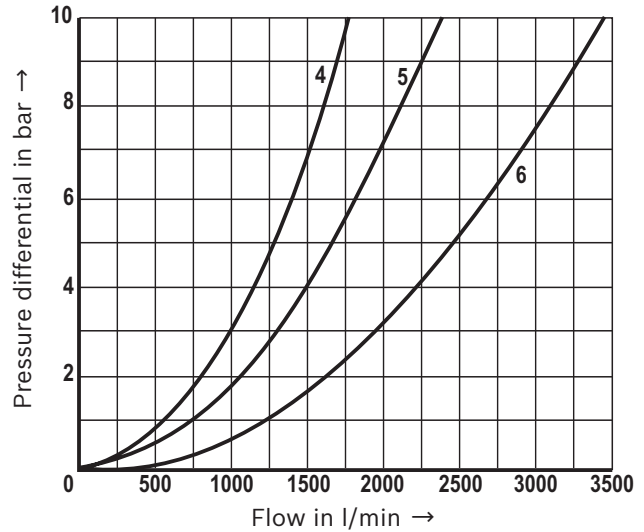
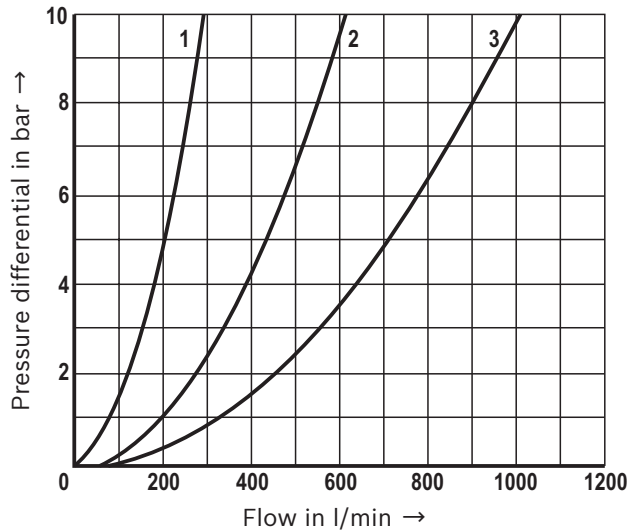


Notice:

The indicated characteristic curves have been determined without inserted springs and show average values with regard to the two possible directions of flow.

- 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 Size 125
- 10 Size 160

Characteristic curves: with damping nose
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ } ^\circ\text{C}$)









Notice:

The indicated characteristic curves have been determined without inserted springs and show average values with regard to the two possible directions of flow.


- 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

General notes on **ordering codes** for control cover type LFA...

Nozzle symbol		Symbol in ordering codes		
A**		A**		This nozzle is a screw-in nozzle. If a nozzle is to be installed, the relevant code letter with the nozzle Ø must be entered in the type designation in 1/10 mm. Example: A12 = nozzle with Ø1.2 mm in channel A.
Ø1.2				This nozzle is designed as a bore, no information is included in the type designation. (nozzle Ø in mm)
Z12				This nozzle is a screw-in nozzle. It is a standard nozzle, no information is included in the type designation. (nozzle Ø in 1/10 mm)

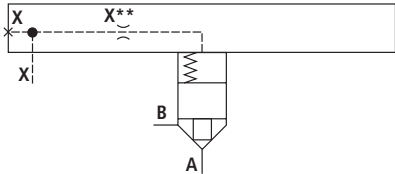
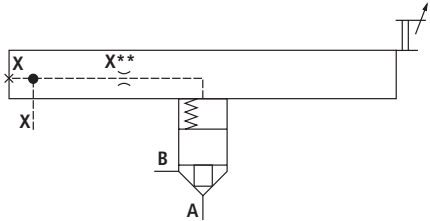
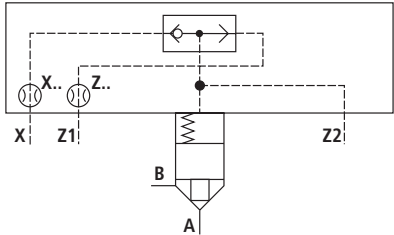
Pilot control valve (separate order)

Control cover		Pilot control valve	
Size	Version	Size	Description
16 ... 50	WE., WEM., WECA, GW., KW.	6	4/3, 4/2 and 3/2 directional spool valve, direct operated (subplate mounting)
63 ... 100	WE., WEM., WECA, GW., KW.	10	2/2, 3/2, 4/2 directional seat valve, direct operated (subplate mounting)
125	WE.	10	
160	WE.	25	

 **Notice:**

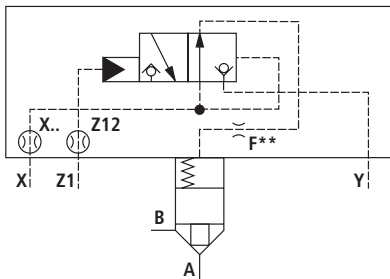
- ▶ Different valve functions can be achieved by combining a 2-way cartridge valve with a pilot control valve. For possible pilot control valves in accordance with ISO 4401, see selection table above.
- ▶ Mounting screws for pilot control valves are not included in the scope of supply.

Symbols

<p>Version "D" (size 16 ... 160) Control cover with remote control port</p>  <p>See page 14 and 15</p>	<p>Version "H" (size 16 ... 160) Control cover with stroke limitation and remote control port</p>  <p>See page 16 ... 19</p>	<p>Version "G" (size 16 ... 100) Control cover with installed shuttle valve</p>  <p>See page 22 ... 25</p>
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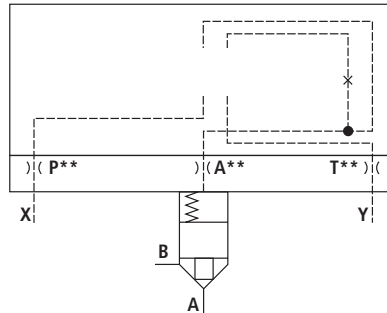
Symbols

Version "R" (size 25 ... 100)
Control cover with hydraulic pilot control valve (directional seat valve)



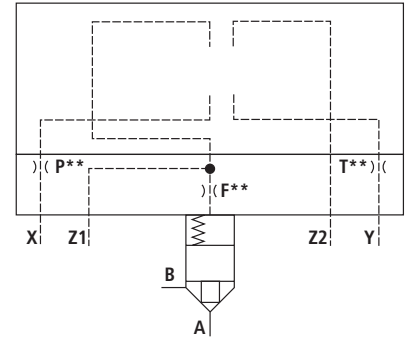
See page 26 ... 29

Version "WEA" (size 16 ... 160)
Control cover for mounting a directional spool valve or directional seat valve



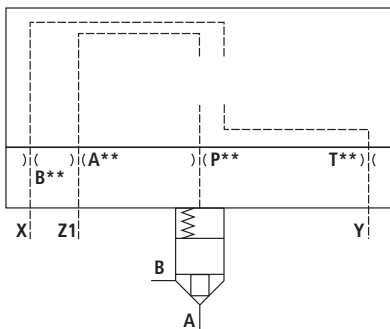
See page 30 ... 35

Version "WEMA" (size 16 ... 100)
Control cover for mounting a directional spool valve or directional seat valve with pilot port for switching a second valve



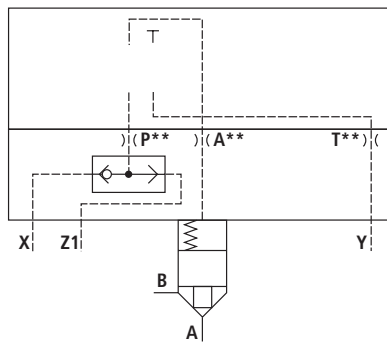
See page 38 ... 43

Version "WECA" (size 16 ... 100)
Control cover for mounting a directional spool valve as check valve switch



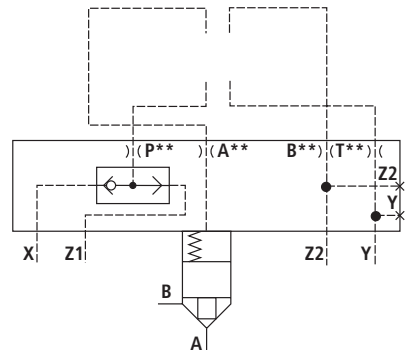
See page 44 ... 47

Version "GWA" (size 16 ... 100)
Control cover for mounting a directional spool valve or directional seat valve, with installed shuttle valve



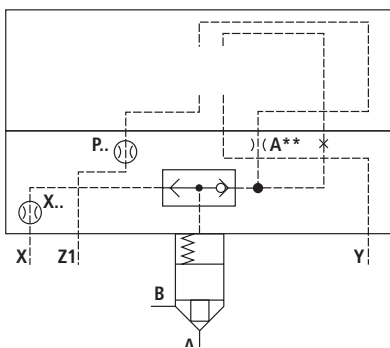
See page 50 ... 55

Version "GWMA" (size 16 ... 80)
Control cover for mounting a directional spool valve or directional seat valve, with installed shuttle valve as check valve switch



See page 56 ... 63

Version "KWA" (size 16 ... 100)
Control cover for mounting a directional spool valve or directional seat valve, with installed shuttle valve as check valve switch



See page 64 ... 69

Notice:

Basic symbols – compulsory symbols in the following type descriptions.

Control cover “D” with remote control port: Size 16 ... 63
(dimensions in mm)

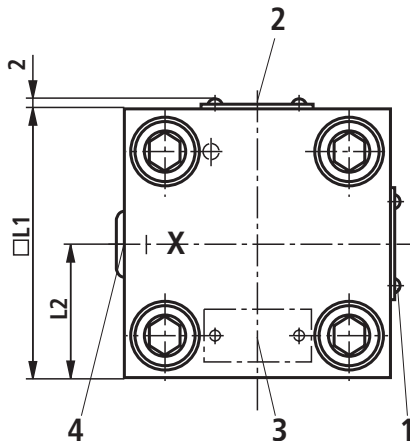
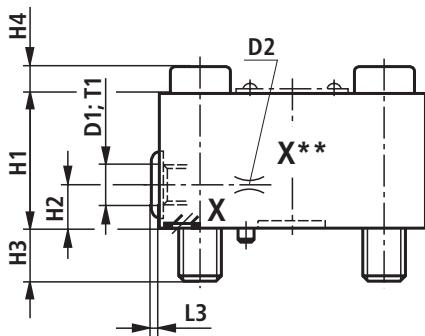
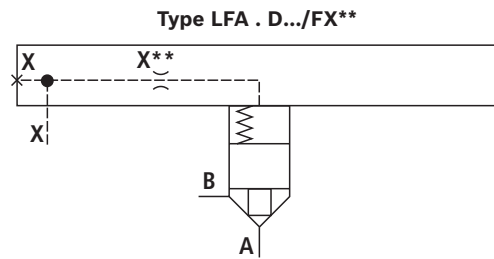
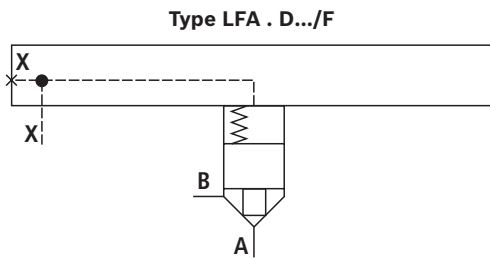
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		D	-	7X	/				F							1)

02						14					
Size						Nozzle in channel (∅ in 1/10 mm)					
16	25	32	40	50	63	X**					

09	With remote control port	F
----	--------------------------	----------

△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.



Size	16	25	32	40	50	63
D1	G1/8	G1/4	G1/4	G1/2	G1/2	G3/4
D2 2)	M6	M6	M6	M8 x 1	M8 x 1	G3/8
H1	27	30	35	60	68	82
H2	12	16	16	30	32	40
H3	15	24	28	32	34	50
H4	8	12	16	-	-	-
□ L1	65	85	100	125	140	180
L2	32.5	42.5	50	72	80	90
L3	4	5	5	5	5	5
T1	8	12	12	14	14	16

2) For nozzle ordering codes, see page 71.

Mounting screws included in the scope of delivery (see also page 71).

- 1 Name plate with size 16, 25
- 2 Nameplate with size 32
- 3 Name plate with size 40, 50, 63
- 4 Port X optionally as a threaded connection

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control cover “D” with remote control port: Size 80 ... 160
(dimensions in mm)

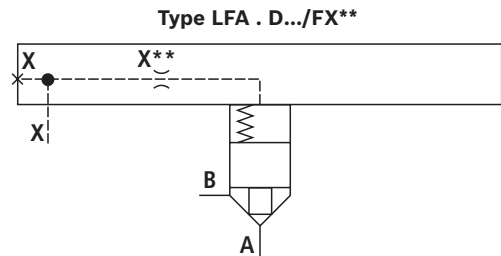
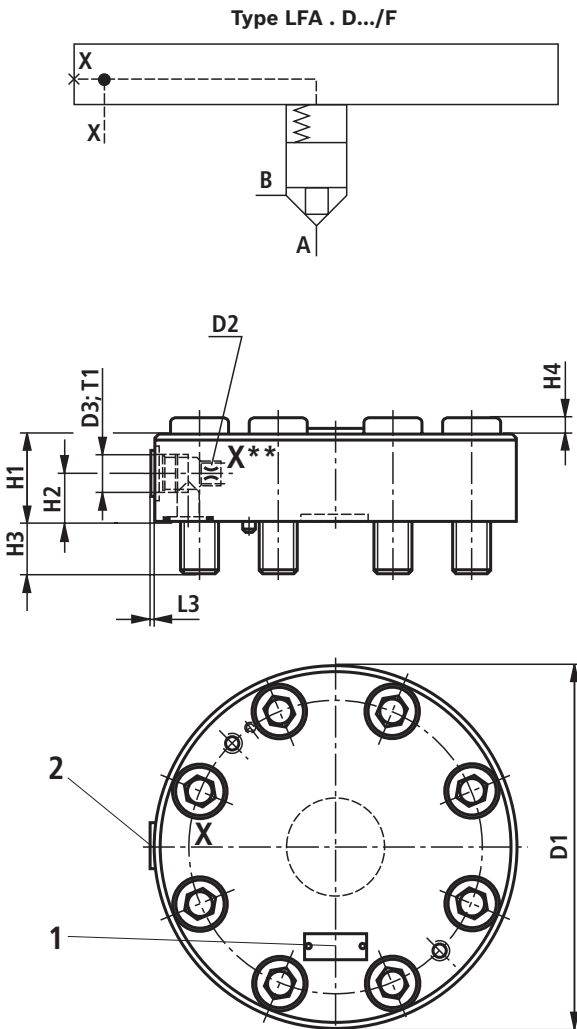
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		D	-	/				F								1)

02				14			
Size				Nozzle in channel (Ø in 1/10 mm)			
80	100	125	160	X**			

04	Component series 60 to 69 (60 to 69: unchanged installation and connection dimensions) (size 80 ... 100)	6X
	Component series 20 to 29 (20 to 29: unchanged installation and connection dimensions) (size 125 ... 160)	2X
09	With remote control port	F

⚠ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.



Size	80	100	125	160
D1	250	300	380	480
D2 ²⁾	G3/8	G1/2	G1	G1
D3	G3/4	G1	G1 1/4	G1 1/4
H1	70	75	105	147
H2	35	40	50	70
H3	45	52.5	61	74
H4	-	24	31	42
L3	3	3	4	4
T1	16	18	20	20

²⁾ For nozzle ordering codes, see page 71.

Mounting screws included in the scope of delivery (see also page 71).

- 1 Name plate
- 2 Port X optionally as a threaded connection

Notice:
The dimensions are nominal dimensions which are subject to tolerances.

Control cover “H.” with stroke limitation and remote control port: Size 16 ... 40

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/			F								1)

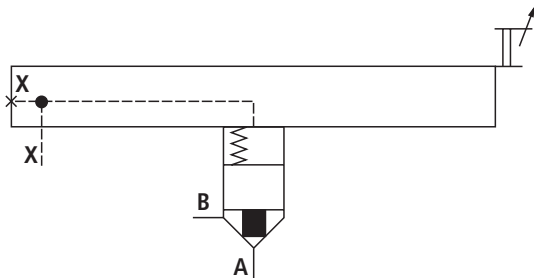
02				03		14	
Size				Type		Nozzle in channel (Ø in 1/10 mm)	
16	25	32	40	H1		X**	
				H2			
				H3			
				H4			

09	With remote control port	F
----	--------------------------	---

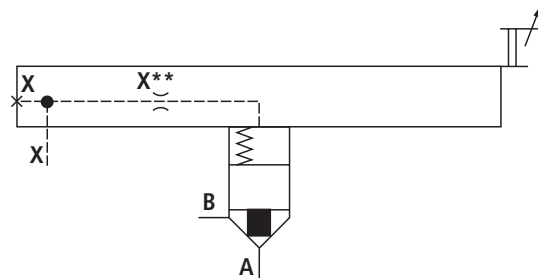
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

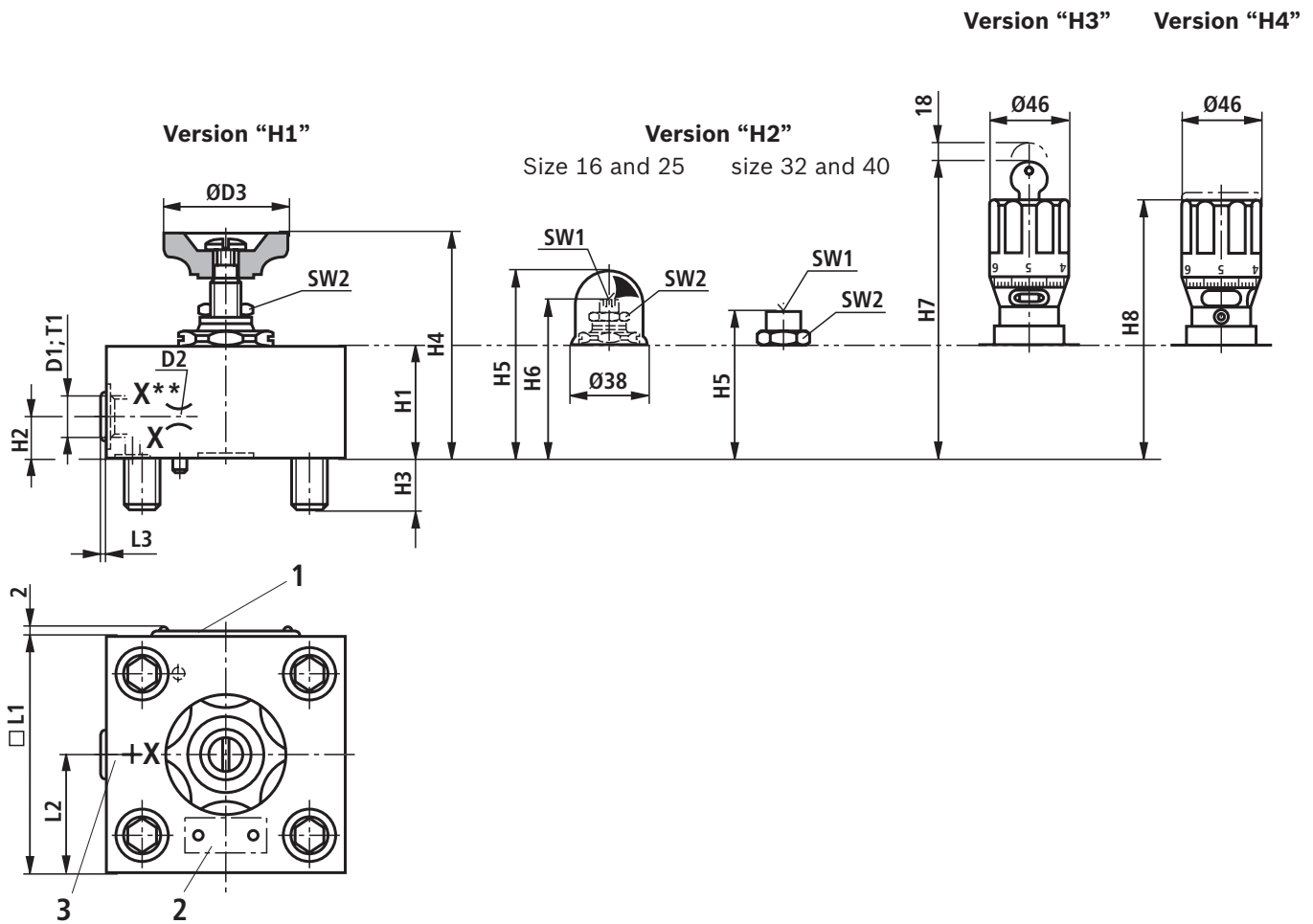
Type LFA . H.../F



Type LFA . H.../FX**



Control cover "H." with stroke limitation and remote control port: Size 16 ... 40 (dimensions in mm)



- 1 Name plate with size 16, 25, 32
- 2 Name plate with size 40
- 3 Port X optionally as a threaded connection

Size	16	25	32	40
D1	G1/8	G1/4	G1/4	G1/2
D2 ²⁾	M6	M6	M6	M8 x 1
ØD3	52	80	80	100
H1	35	40	75 (60 ⁴⁾)	95 (100 ⁴⁾)
H2	12	16	16	30
H3	15	24	28	32
H4 max	90	95	120	160
H5 max	76	80	100	146
H6 max	45	45	-	-
H7 max	155	160	180	234
H8 max	130	135	155	209
□ L1	65	85	100	125
L2	32.5	42.5	50	72
L3	4	5	5	5
T1	8	12	12	14
Wrench size 1mm ³⁾	6	6	10	17
Wrench size 2mm	21	22	27	46

Mounting screws included in the scope of delivery (see also page 71).

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

²⁾ For nozzle ordering codes, see page 71.

³⁾ Internal hexagon

⁴⁾ Dimensions () apply to version "H3" and "H4" only

Control cover “H.” with stroke limitation and remote control port: Size 50 and 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		-	7X	/				F								1)

02		03	14
Size		Type	Nozzle in channel (∅ in 1/10 mm)
50	63	H2	X**
		H4	

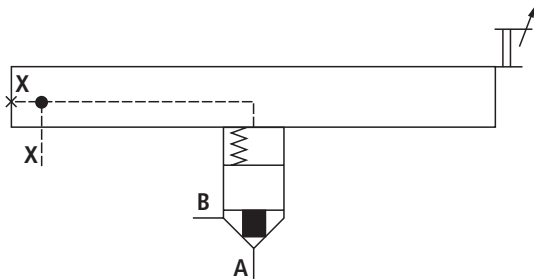
04	Component series 70 to 79 (70 to 79: unchanged installation and connection dimensions)	7X
----	--	----

09	With remote control port	F
----	--------------------------	---

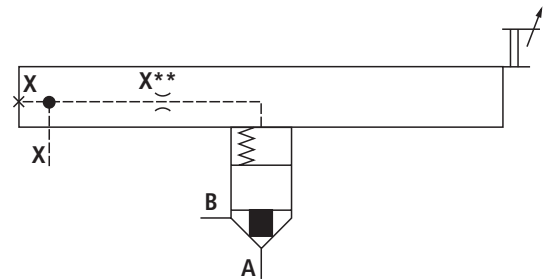
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

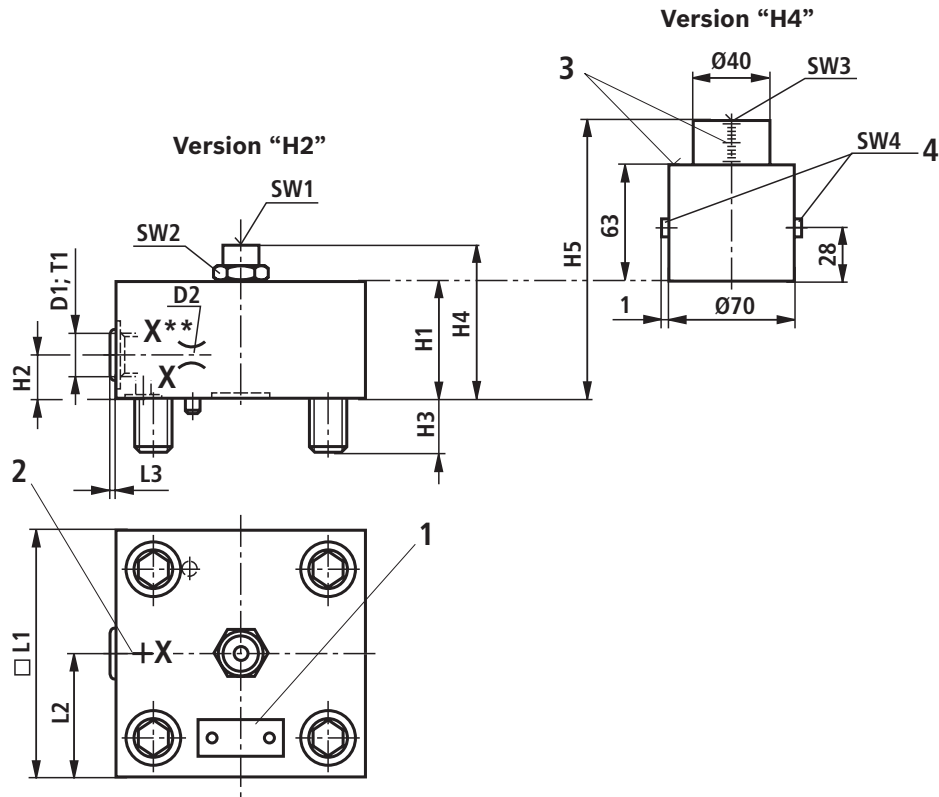
Type LFA . H.../F



Type LFA . H.../FX**



Control cover “H.” with stroke limitation and remote control port: Size 50 and 63
(dimensions in mm)



- 1 Name plate
- 2 Port X optionally as a threaded connection
- 3 Scale
- 4 bolted

Size	50	63
D1	G1/2	G3/4
D2 ²⁾	M8 x 1	G3/8
H1	110	125
H2	32	40
H3	34	50
H4 max	156	175
H5 max	200	220
□ L1	140	180
L2	80	90
L3	5	5
T1	14	16
Wrench size 1mm ³⁾	17	24
Wrench size 2mm	55	65
Wrench size 3mm ³⁾	19	19
Wrench size 4mm	5	5

²⁾ For nozzle ordering codes, see page 71.

³⁾ Internal hexagon

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Mounting screws included in the scope of delivery (see also page 71).

Control cover “H.” with stroke limitation and remote control port: Size 80 ... 160

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	/				F								1)

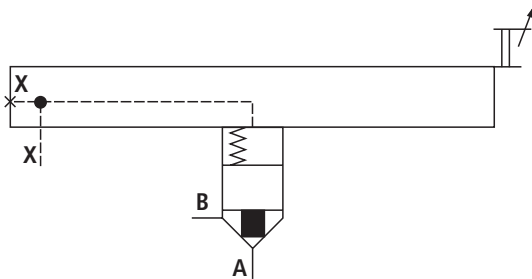
02				03		14	
				Type	Nozzle in channel (∅ in 1/10 mm)		
80	100	125	160	H2	X**		
				H4			

04	Component series 60 to 69 (60 to 69: unchanged installation and connection dimensions) (size 80 and 100)	6X
	Component series 20 to 29 (20 to 29: unchanged installation and connection dimensions) (size 125 and 160)	2X
09	With remote control port	F

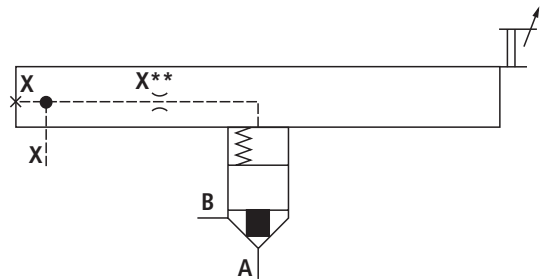
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

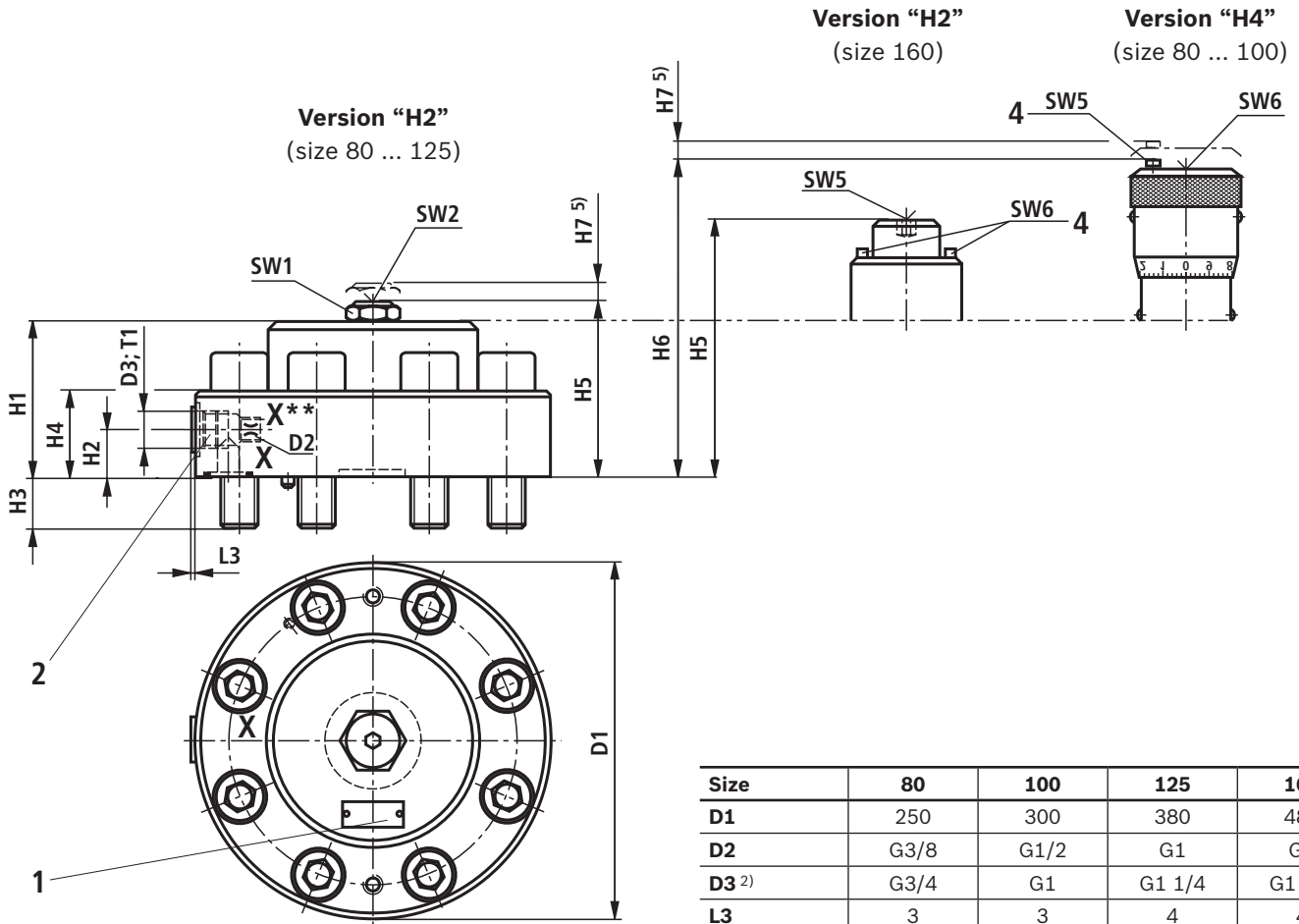
Type LFA . H.../F



Type LFA . H.../FX**



Control cover “H.” with stroke limitation and remote control port: Size 80 ... 160
(dimensions in mm)



- 1 Name plate
- 2 Port X optionally as a threaded connection
- 3 Scale
- 4 bolted

Size	80	100	125	160
D1	250	300	380	480
D2	G3/8	G1/2	G1	G1
D3 ²⁾	G3/4	G1	G1 1/4	G1 1/4
L3	3	3	4	4
H1	114	132	170	225
H2	35 (24 ⁴⁾)	35	50	70
H3	45	52.5	61	74
H4	76	88.5	100	147
H5	137	157	195	340
H6	229	247	–	–
H7	30	38	48	–
T1	16	18	20	20
Wrench size 1mm	75	75	95	–
Wrench size 2mm ³⁾	24	27	27	–
Wrench size 3mm ³⁾	–	–	–	32
Wrench size 4mm ³⁾	–	–	–	8
Wrench size 5mm ³⁾	5	5	–	–
Wrench size 6mm ³⁾	14	14	–	–

Mounting screws included in the scope of delivery (see also page 71).













Notice:


The dimensions are nominal dimensions which are subject to tolerances.


- 2) For nozzle ordering codes, see page 71.
- 3) Internal hexagon
- 4) Dimension () applies to version “H4” only
- 5) Maximum dimension

Control cover “G” with installed shuttle valve: Size 16 ... 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		G	-	7X	/											1)

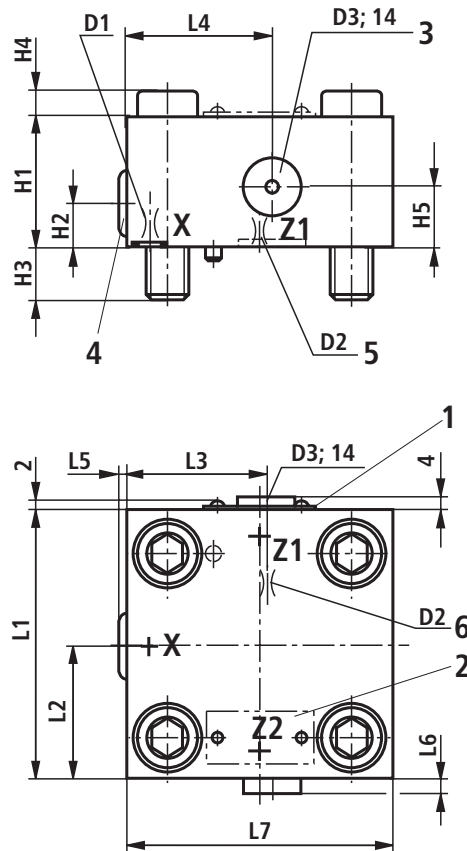
Size	Nozzle in channel	
	X	Z1
16	Ø1.2 	Ø1.2 
25	Ø1.5 	Ø1.5 
32	Ø2.0 	Ø2.0 
40	X15 	Z15 
50	X18 	Z18 
63	X20 	Z20 

 Nozzle drilled (Ø in mm) (does not appear in the type designation)

 Standard nozzle (Ø in 1/10 mm) (does not appear in the type designation)

¹⁾ See “General notes on ordering codes for control cover type LFA...” page 11.

Control cover "G" with installed shuttle valve: Size 16 ... 63 (dimensions in mm)



- 1 Name plate with size 16, 25, 32
- 2 Name plate with size 40, 50, 63
- 3 Port Z1 and Z2 optionally as a threaded connection with size 50 and 63
- 4 Shuttle valve
- 5 D2 with size 16 ... 40
- 6 D2 with size 50 and 63

Size	16	25	32	40	50	63
D1 ²⁾	Ø1.2	Ø1.5	Ø2.0	M6	M8 x 1	M8 x 1
D2 ²⁾	Ø1.2	Ø1.5	Ø2.0	M6	M8 x 1	M8 x 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	74	90
L3	-	-	-	-	72	81
L4	-	-	-	-	72	90
L5	4.5	4	1	-	6	4
L6	4	4	4	4	6	6
L7	65	85	100	125	140	180

²⁾ For nozzle ordering codes, see page 71.







Mounting screws included in the scope of delivery (see also page 71).


Notice:


The dimensions are nominal dimensions which are subject to tolerances.

Control cover “G” with installed shuttle valve: Size 80 ... 100

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		G	-	6X	/											1)

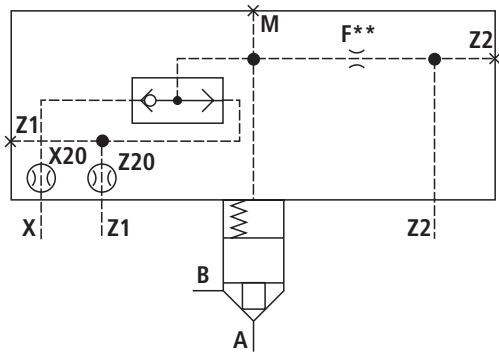
Size	Nozzle in channel (Ø in 1/10 mm)		
	X	F	Z1
80	X20 	F** 	Z20 
100	X20 	F** 	Z20 

 Nozzle possible, must be specified if required

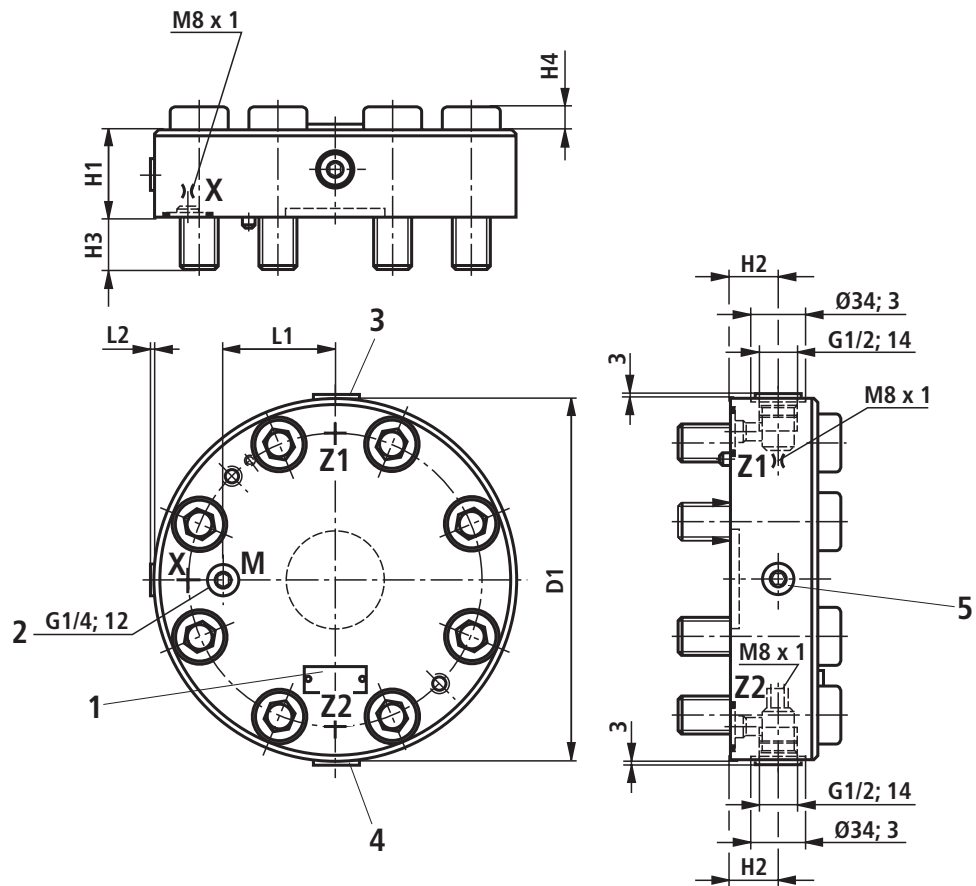
 Standard nozzle (does not appear in the type designation)

1) See “General notes on ordering codes for control cover type LFA...” page 11.
For nozzle ordering codes, see page 71.

Type LFA . G... (size 80 ... 100)



Control cover “G” with installed shuttle valve: Size 80 ... 100
(dimensions in mm)



- 1 Name plate
- 2 Measuring port
- 3 Port Z1 optionally as a threaded connection
- 4 Port Z2 optionally as a threaded connection
- 5 Shuttle valve

Size	80	100
D1	250	300
H1	80	75
H2	45	43
H3	45	52.5
H4	1	23.5
L1	73	96.5
L2	1	-

Mounting screws included in the scope of delivery (see also page 71).

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

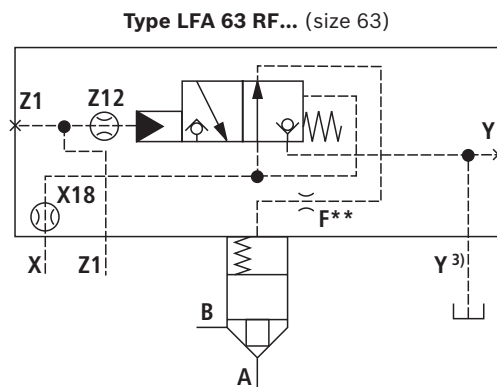
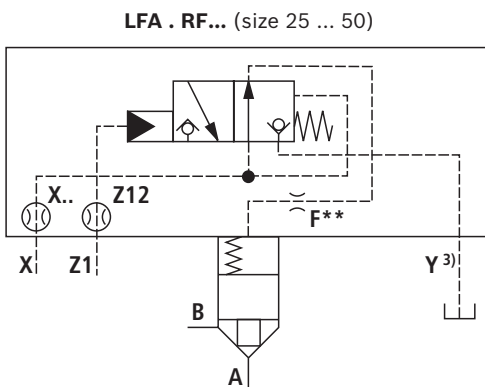
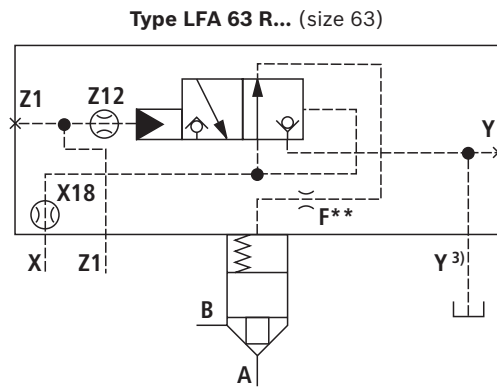
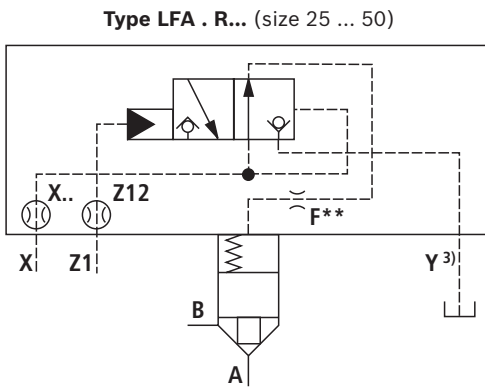
Control cover “R” and “RF” with installed directional seat valve: Size 25 ... 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		-	7X	/												1)

Size	Type	Nozzle in channel (∅ in 1/10 mm)		
		X	F	Z1
25	R, RF ^{2; 3)}	X10	F**	Z12
32		X12	F**	Z12
40		X15	F**	Z12
50		X15	F**	Z12
63		X18	F**	Z12

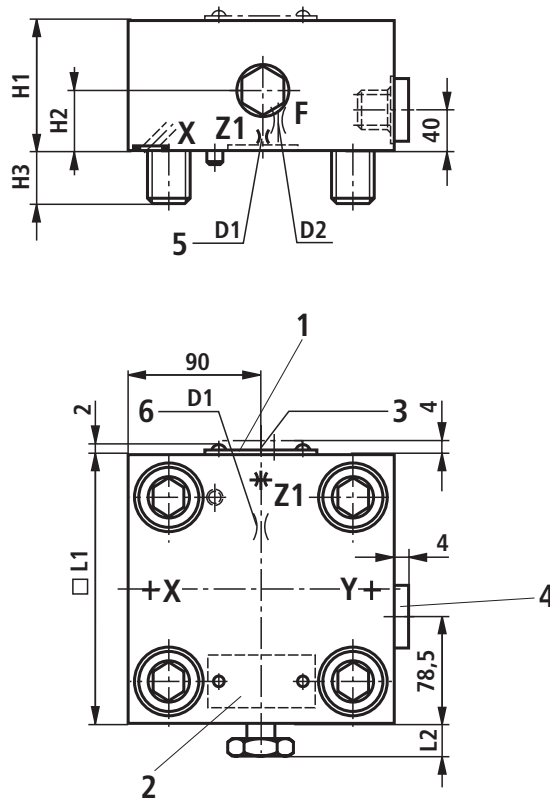
Area ratio: $\frac{A_{Z1}}{A_X} = \frac{3}{1}$

- △ Nozzle possible, must be specified if required
- △ Standard nozzle (does not appear in the type designation)
- 1) See “General notes on ordering codes for control cover type LFA...” page 11.
- 2) Directional seat valve with spring return
- 3) Special version “R3” and “RF3”, see page 73.



3) Pressure at port Y maximum 5 bar

Control cover “R” and “RF” with installed directional seat valve: Size 25 ... 63
(dimensions in mm)




- 1 Name plate with size 16, 25, 32
- 2 Name plate with size 40, 50, 63
- 3 Port Z1 optionally as a threaded connection with size 63 and (G1/4; 12)
- 4 Port Y optionally as a threaded connection with size 63 and (G1/2; 14)
- 5 D1 with size 16 ... 50
- 6 D1 with size 63

Size	Type	25	32	40	50	63
D1 ⁴⁾	R, RF	M6	M6	M8 x 1	M8 x 1	M8 x 1
D2 ⁴⁾		M6	M6	M8 x 1	M8 x 1	M8 x 1
H1		40	50	60	68	82
H2		20	26	33	32	40
H3		24	28	32	34	50
□ L1		85	100	125	140	180
L2	R	2	1	4	3	–
	RF	18,5	17,5	25	24	16

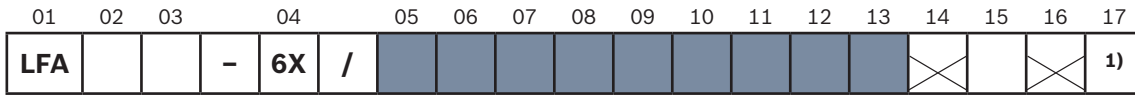
⁴⁾ For nozzle ordering codes, see page 71.

Mounting screws included in the scope of delivery (see also page 71).

 **Notice:**

The dimensions are nominal dimensions which are subject to tolerances.

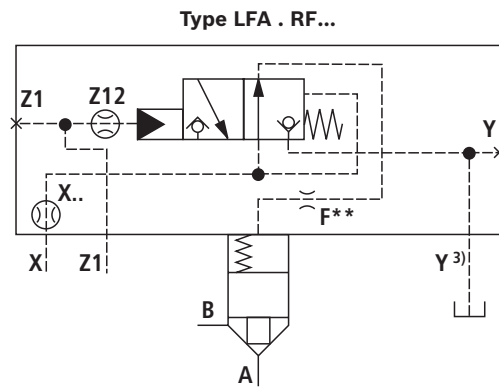
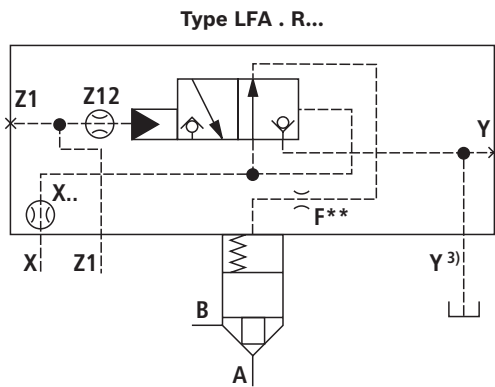
Control cover “R” and “RF” with installed directional seat valve: Size 80 ... 100



Size	Type	Nozzle in channel (∅ in 1/10 mm)		
		X	F	Z1
80	R, RF ²⁾	X20	F**	Z12
100		X25	F**	Z12

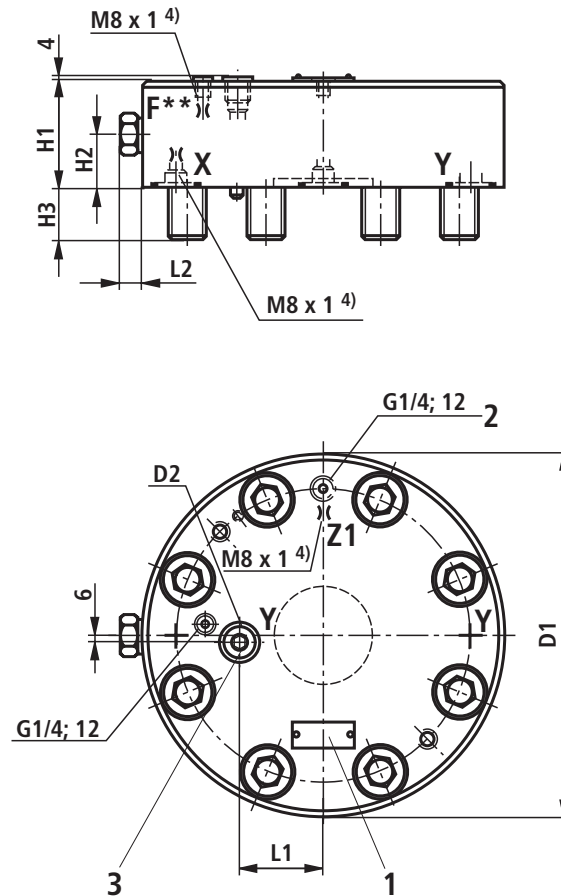
Area ratio: $\frac{A_{Z1}}{A_X} = \frac{3}{1}$

- △ Nozzle possible, must be specified if required
- △ Standard nozzle (does not appear in the type designation)
- 1) See “General notes on ordering codes for control cover type LFA...” page 11.
- 2) Directional seat valve with spring return



3) Pressure at port Y maximum 5 bar

Control cover “R” and “RF” with installed directional seat valve: Size 80 ... 100
(dimensions in mm)




- 1 Name plate
- 2 Port Z1 optionally as a threaded connection
- 3 Port Y optionally as a threaded connection

Size	80	100
D1	250	300
D2	G1/4; 12	G1/2; 14
H1	80	100
H2	36	45
H3	45	52
L1	52	74
L2	21	18
L3	6	5

⁴⁾ For nozzle ordering codes, see page 71.

Mounting screws included in the scope of delivery (see also page 71).

 **Notice:**

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “WEA” and “WEB” for mounting a directional spool valve or directional seat valve:
 Size 16 ... 50

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/											1)

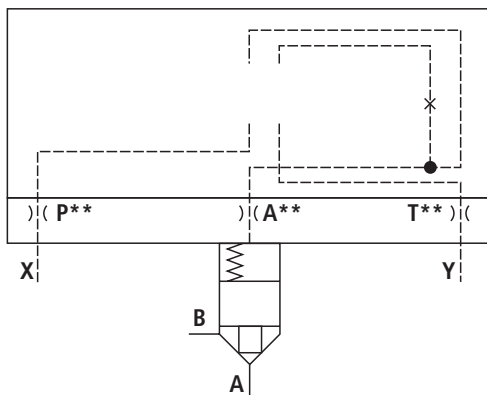
Size					Type	Nozzle in channel (Ø in 1/10 mm)			
						A	B	P	T
16	25	32	40	50	WEA	A**		P**	T**
					WEB		B**	P**	T**

△ Nozzle possible, must be specified if required

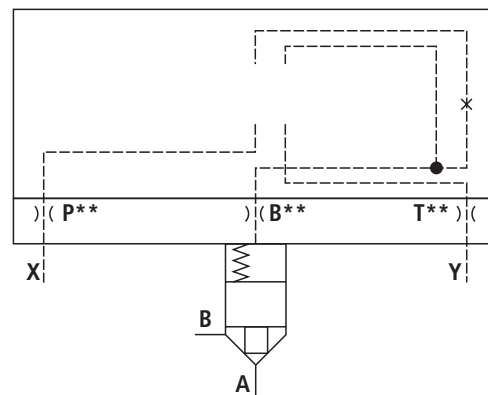
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

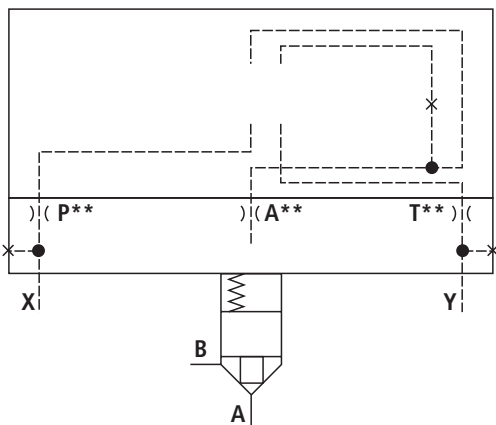
LFA . WEA... (size 16 ... 32)



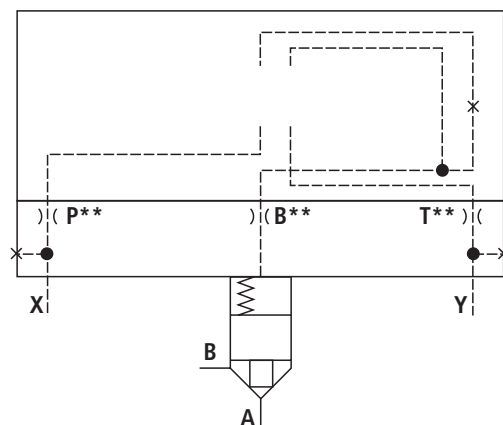
LFA . WEB... (size 16 ... 32)



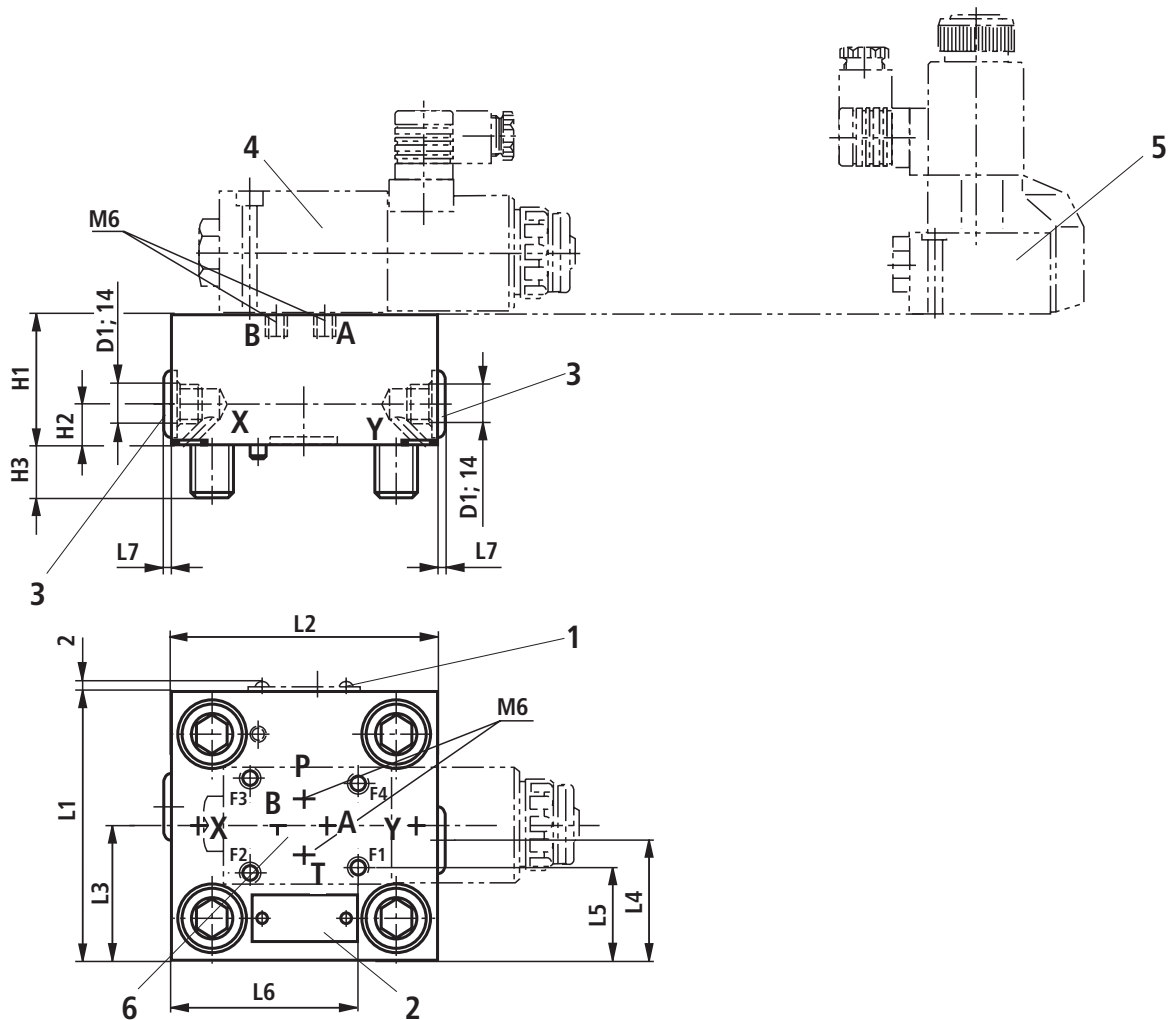
LFA . WEA... (size 40 and 50)



LFA . WEB... size 40 and 50



Control covers “WEA” and “WEB” for mounting a directional spool valve or directional seat valve:
Size 16 ... 50 (dimensions in mm)



- 1 Name plate with size 16, 25, 32
- 2 Name plate with size 40 and 50
- 3 Port X and Y optionally as a threaded connection with size 40 and 50
- 4 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 12
- 5 Directional seat valve type M-3SEW 6... (pilot control valve), separate order see page 12
- 6 Porting pattern according to ISO 4401-03-02-0-05

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	47.5	64	71.5	84	91.5
L7	4	4	4	6	6

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “WEA” and “WEB” for mounting a directional spool valve or directional seat valve:
Size 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	63	-	7X	/												1)

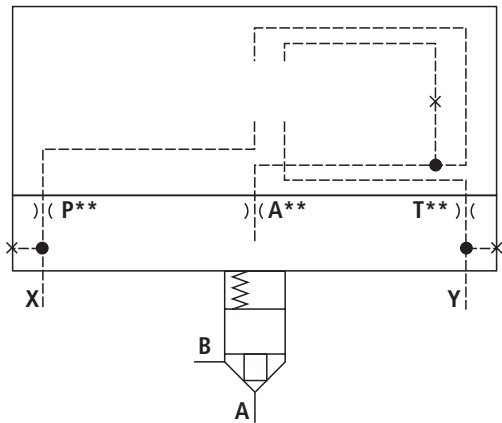
	03	10	11	12	13
Type	Nozzle in channel (Ø in 1/10 mm)				
	A	B	P	T	
WEA	A**		P**	T**	
WEB		B**	P**	T**	

△ Nozzle possible, must be specified if required

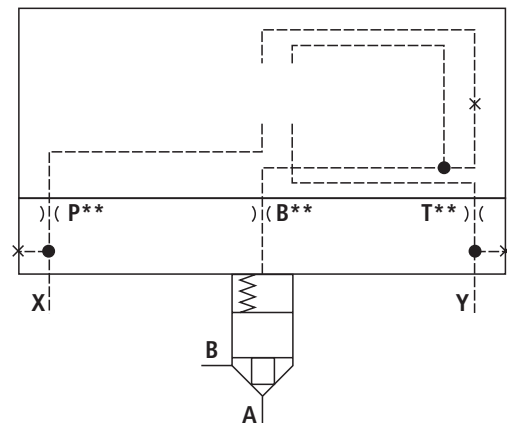
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

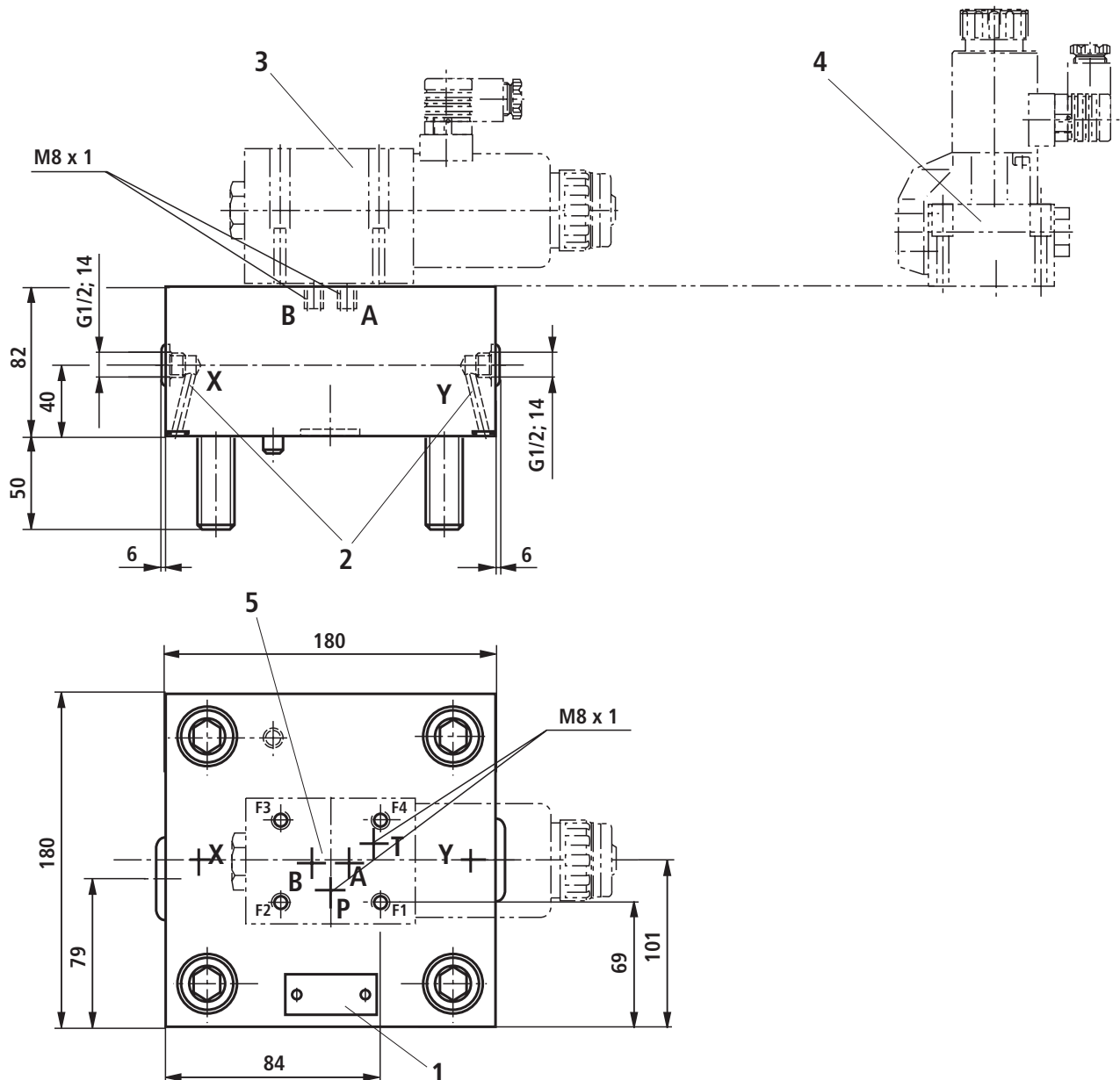
LFA 63 WEA...



LFA 63 WEB...



Control covers “WEA” and “WEB” for mounting a directional spool valve or directional seat valve:
size 63 (dimensions in mm)



- 1 Name plate
- 2 Ports X and Y optionally as threaded connection
- 3 Directional spool valve type 4WE 10 D... (pilot control valve), separate order see page 12
- 4 Directional seat valve type M-3SEW 10... (pilot control valve), separate order see page 12
- 5 Porting pattern according to ISO 4401-05-04-0-05



Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “WEA” and “WEB” for mounting a directional spool valve or directional seat valve:
 Size 80 ... 100

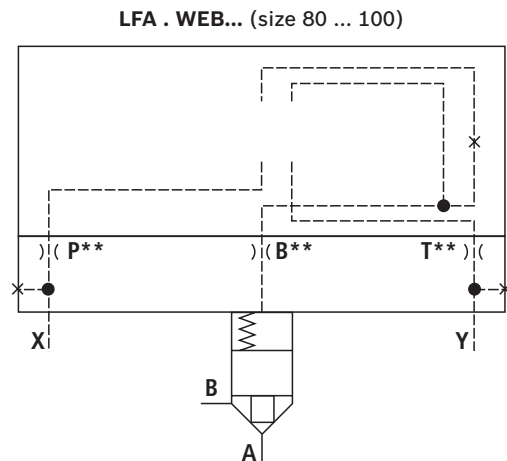
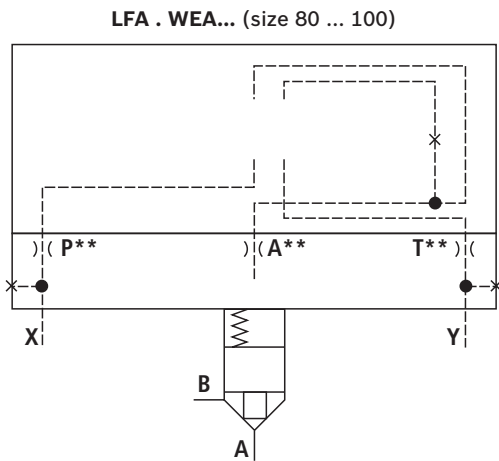
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		-	6X	/												1)

02		03		10		11		12		13	
Size		Type	Nozzle in channel (Ø in 1/10 mm)								
			A	B	P	T					
80	100	WEA	A**		P**	T**					
		WEB		B**	P**	T**					

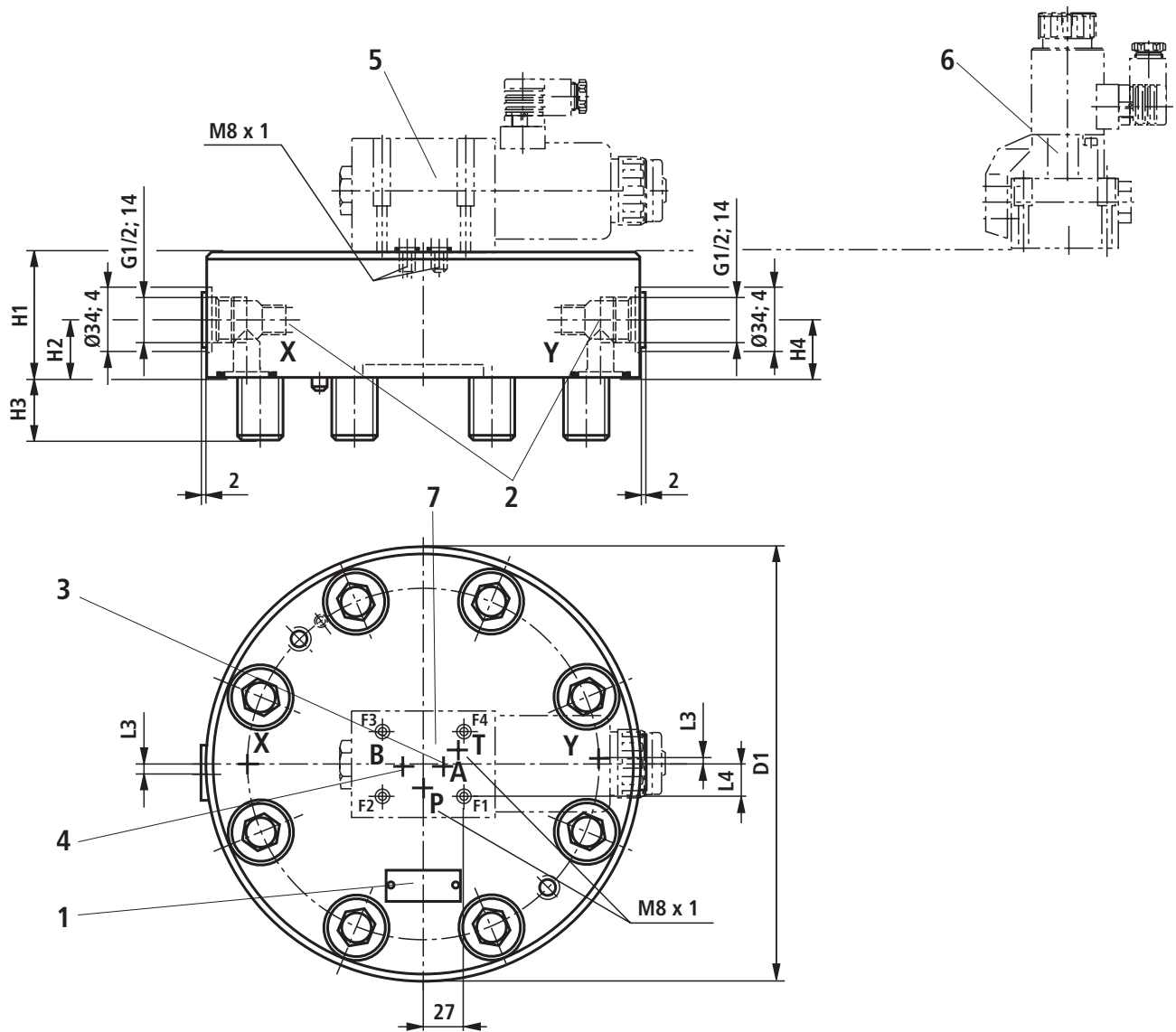
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.



Control covers “WEA” and “WEB” for mounting a directional spool valve or directional seat valve:
Size 80 ... 100 (dimensions in mm)



- 1 Name plate
- 2 Ports X and Y optionally as threaded connection
- 3 Plug screw with type WEB
- 4 Plug screw with type WEA
- 5 Directional spool valve type 4WE 10 D... (pilot control valve), separate order see page 12
- 6 Directional seat valve type M-3SEW 10... (pilot control valve), separate order see page 12
- 7 Porting pattern according to ISO 4401-05-04-0-05

Size	80	100
D1	250	300
H1	80	100
H2	30	24
H3	45	52.5
H4	45	55
L3	10	13
L4	16	18

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “WEA” and “WEB” for mounting a directional spool valve or directional seat valve:
 Size 125 ... 160

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		-	6X	/												1)

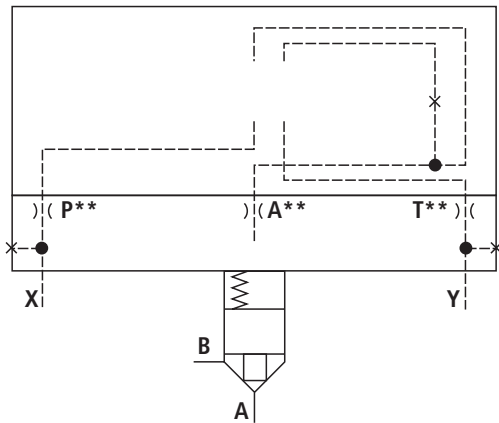
02		03		10		11		12		13	
Size		Type	Nozzle in channel (Ø in 1/10 mm)								
			A	B	P	T					
125	160	WEA	A**		P**	T**					
		WEB		B**	P**	T**					

△ Nozzle possible, must be specified if required

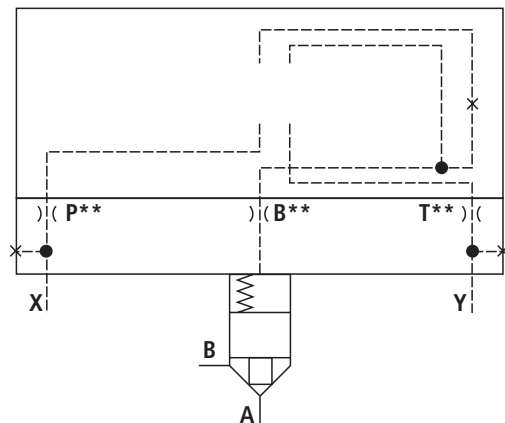
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

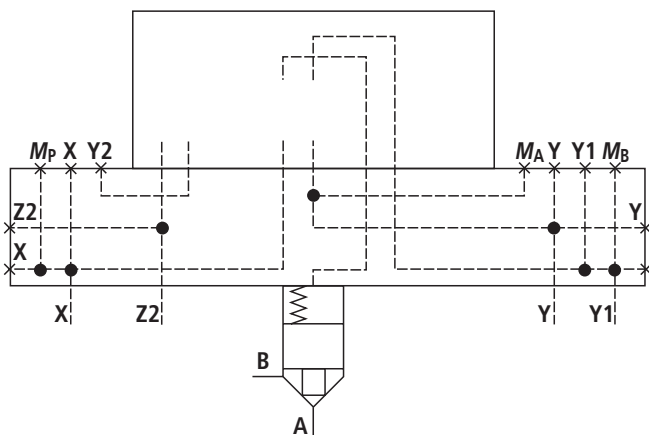
LFA . WEA... (size 125)



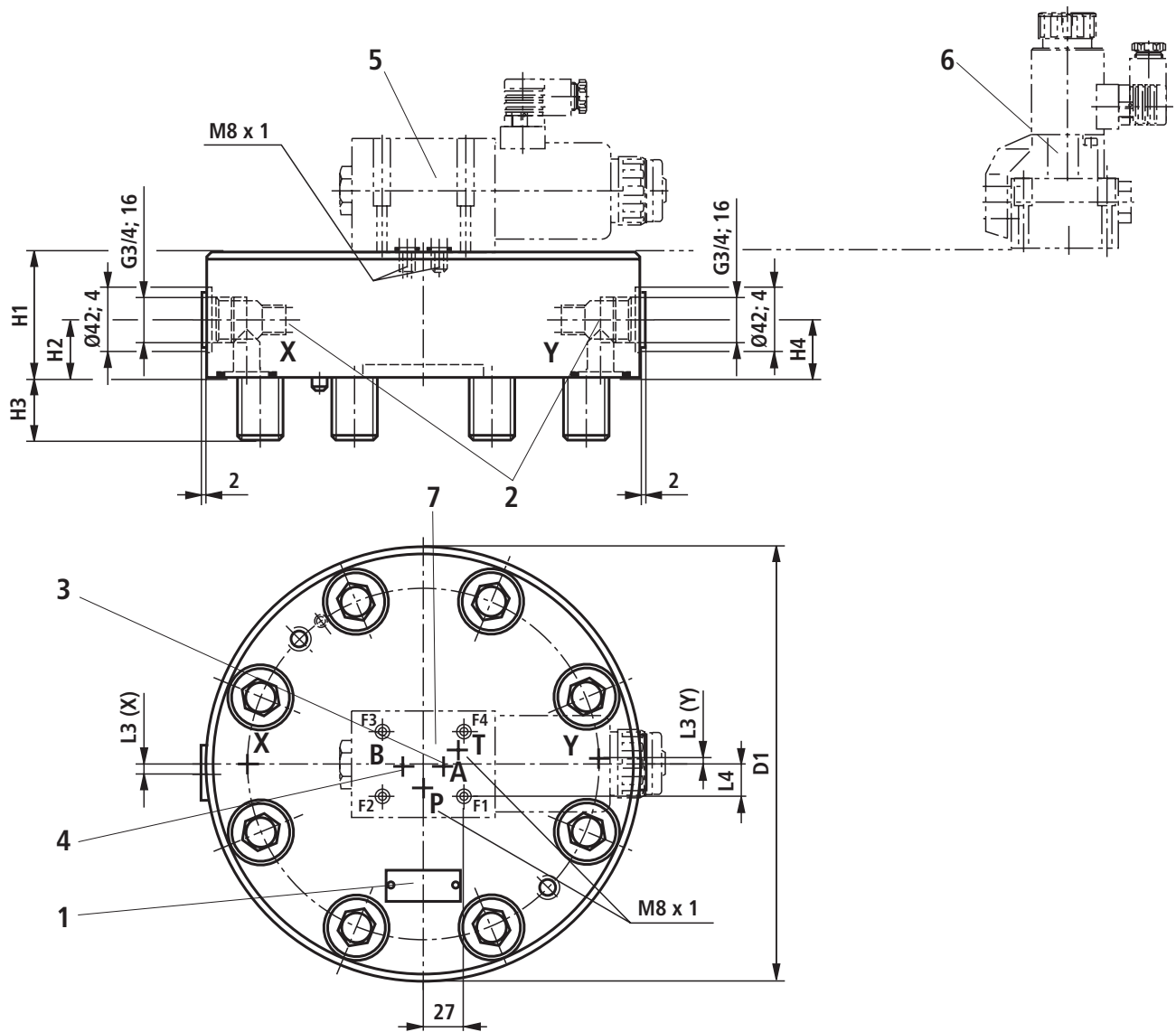
LFA . WEB... (size 125)



LFA . WEA... (160)



Control covers “WEA” and “WEB” for mounting a directional spool valve or directional seat valve:
Size 125 ... 160 (dimensions in mm)



- 1 Name plate
- 2 Ports X and Y optionally as threaded connection
- 3 Plug screw with type WEB
- 4 Plug screw with type WEA
- 5 Directional spool valve type 4WE 10 D... (size 125) or type WEH 25 ... (size 160) (pilot control valve), for separate order see page 12
- 6 Directional seat valve type M-3SEW 10... (pilot control valve), separate order see page 12
- 7 Porting pattern according to
 - ▶ Size 125: ISO 4401-05-04-0-05
 - ▶ Size 160: ISO 4401-08-08-0-05

Size	125	160
D1	380	480
H1	105	150
H2	51	80
H3	56	71
H4	51	80
L3-X	16	15
L3-Y	10	15
L4	23	46

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “WEMA” and “WEMB” for mounting a directional spool valve or directional seat valve: Size 16 ... 50

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/											1)

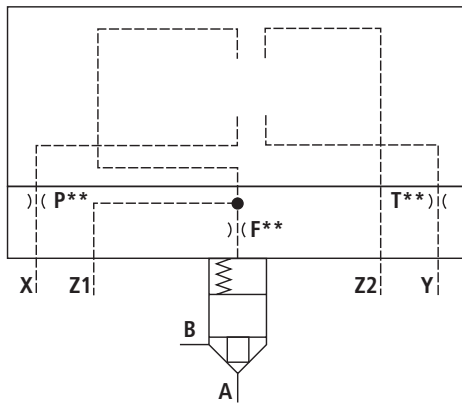
02					03					12			13			15		
Size					Type	Nozzle in channel (∅ in 1/10 mm)												
						P	T	F										
16	25	32	40	50	WEMA	P**	T**	F**										
					WEMB	P**	T**	F**										

△ Nozzle possible, must be specified if required

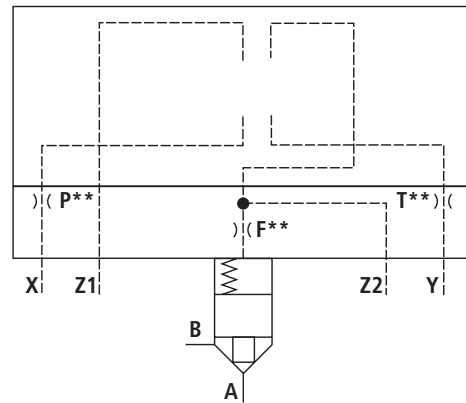
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

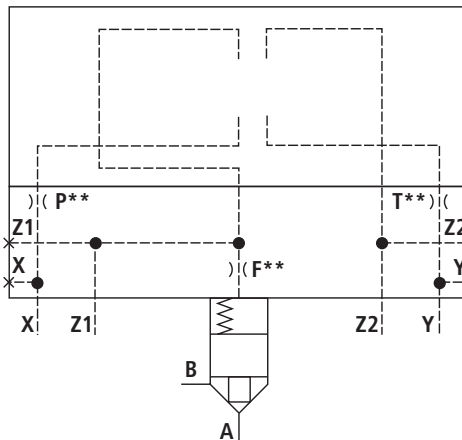
LFA . WEMA... (size 16 ... 32)



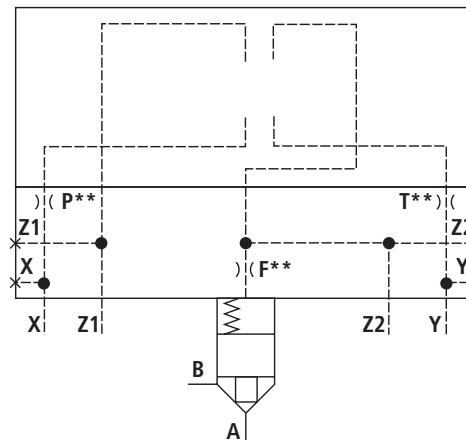
LFA . WEMB... (size 16 ... 32)



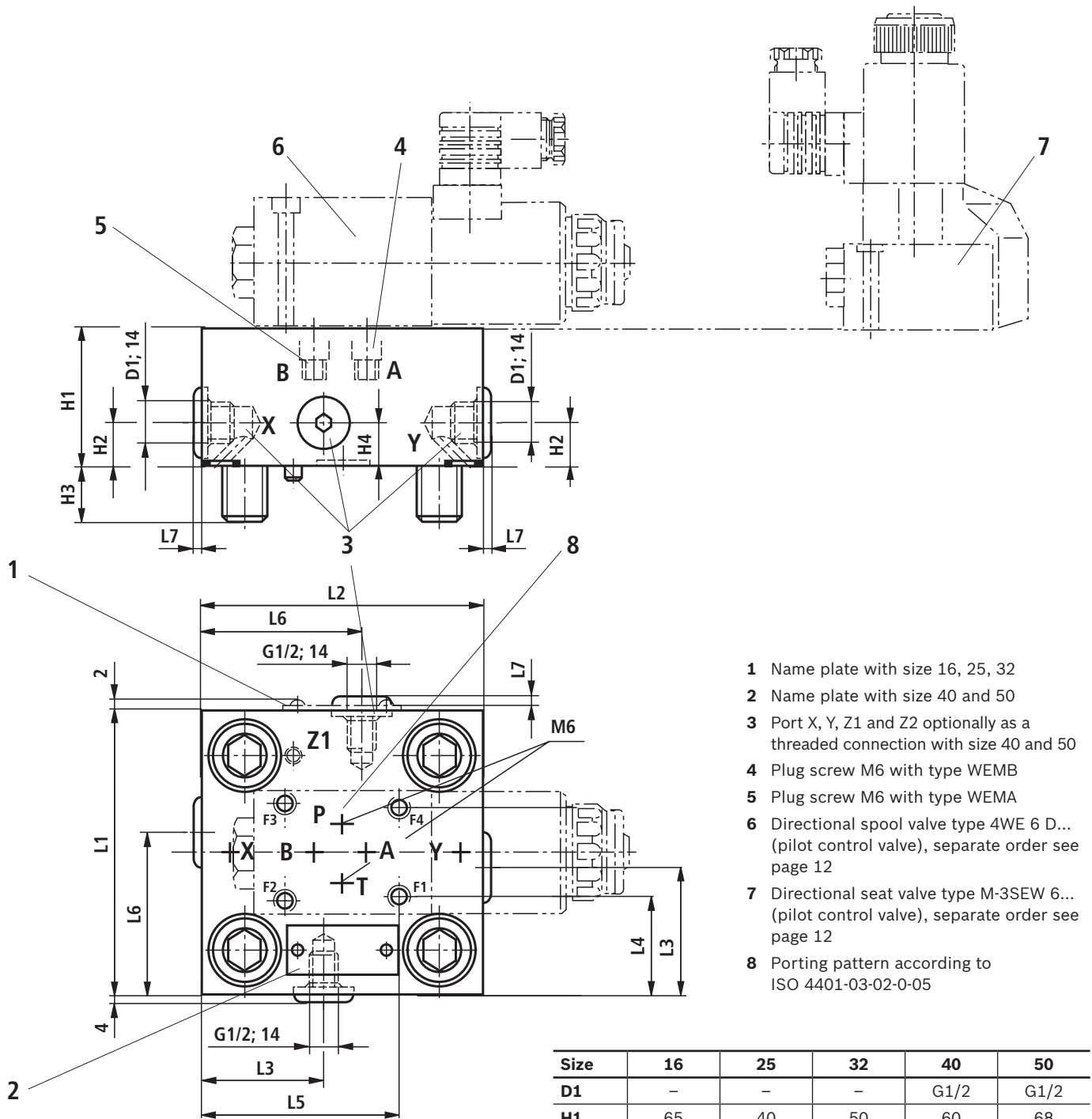
LFA . WEMA... (size 40 and 50)



LFA . WEMB... (size 40 and 50)



Control covers “WEMA” and “WEMB” for mounting a directional spool valve or directional seat valve: Size 16 ... 50 (dimensions in mm)



- 1 Name plate with size 16, 25, 32
- 2 Name plate with size 40 and 50
- 3 Port X, Y, Z1 and Z2 optionally as a threaded connection with size 40 and 50
- 4 Plug screw M6 with type WEMB
- 5 Plug screw M6 with type WEMA
- 6 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 12
- 7 Directional seat valve type M-3SEW 6... (pilot control valve), separate order see page 12
- 8 Porting pattern according to ISO 4401-03-02-0-05

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
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	47.5	64	71.5	84	91.5
L6	-	-	-	72	80
L7	4	4	4	6	6

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “WEMA” and “WEMB” for mounting a directional spool valve or directional seat valve: Size 63

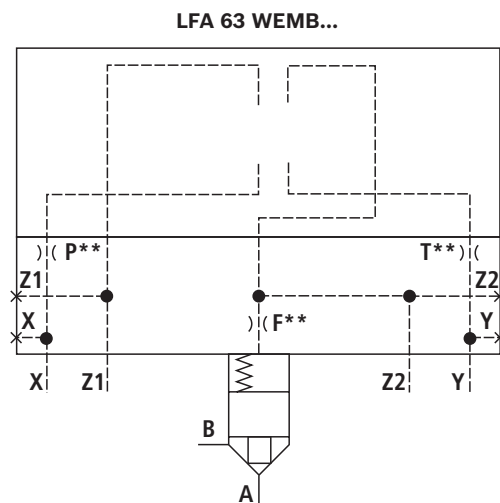
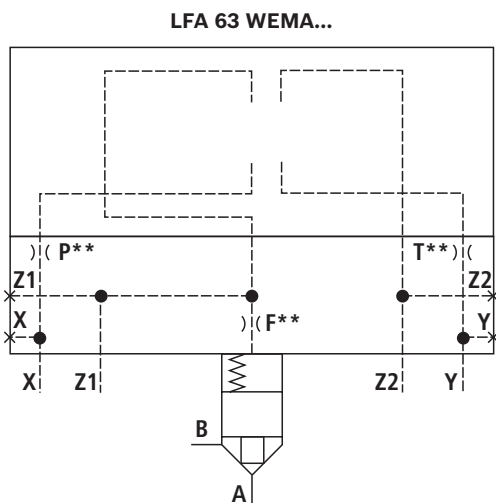
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	63		-	7X	/											1)

	03	12	13	15
Type	Nozzle in channel (∅ in 1/10 mm)			
	P	T	F	
WEMA	P**	T**	F**	
WEMB	P**	T**	F**	

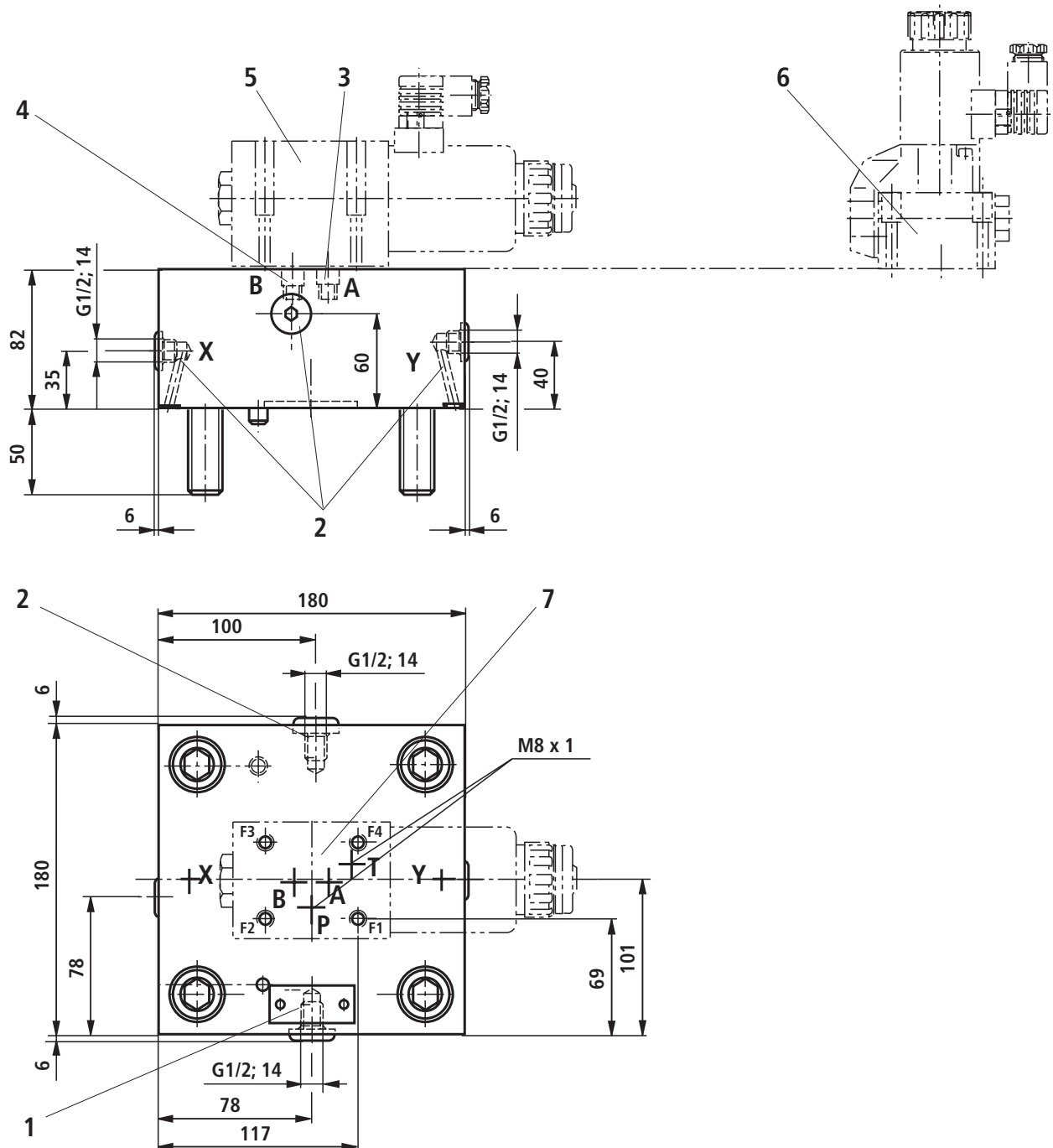
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.



Control covers “WEMA” and “WEMB” for mounting a directional spool valve or directional seat valve: size 63 (dimensions in mm)



- 1 Name plate
- 2 Ports X, Y, Z1 and Z2 optionally as threaded connection
- 3 Plug screw M8 x 1 with type WEMB
- 4 Plug screw M8 x 1 with type WEMA
- 5 Directional spool valve type 4WE 10 D... (pilot control valve), separate order see page 12
- 6 Directional seat valve type M-3SEW 10... (pilot control valve), separate order see page 12
- 7 Porting pattern according to ISO 4401-05-04-0-05



Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “WEMA” and “WEMB” for mounting a directional spool valve or directional seat valve: Size 80 ... 100

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	6X	/											1)

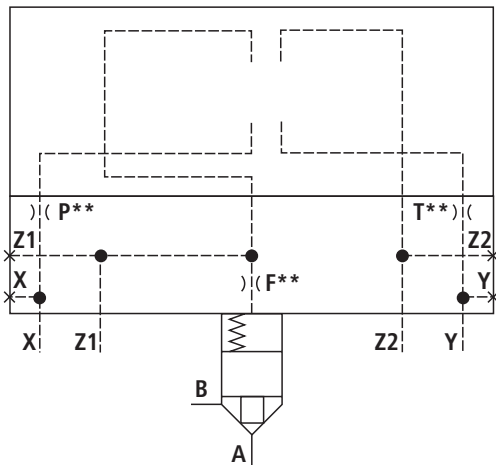
Size		Type	Nozzle in channel (∅ in 1/10 mm)		
			P	T	F
80	100	WEMA	P**	T**	F**
		WEMB	P**	T**	F**

△ Nozzle possible, must be specified if required

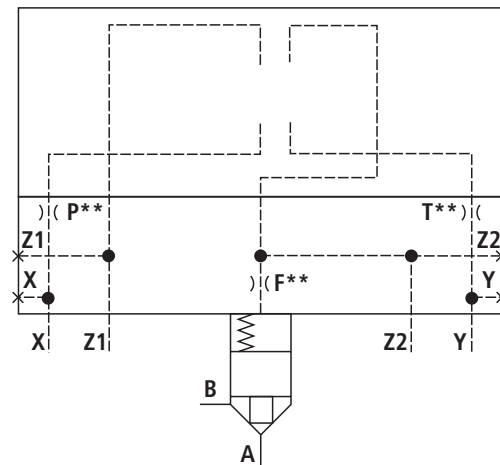
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

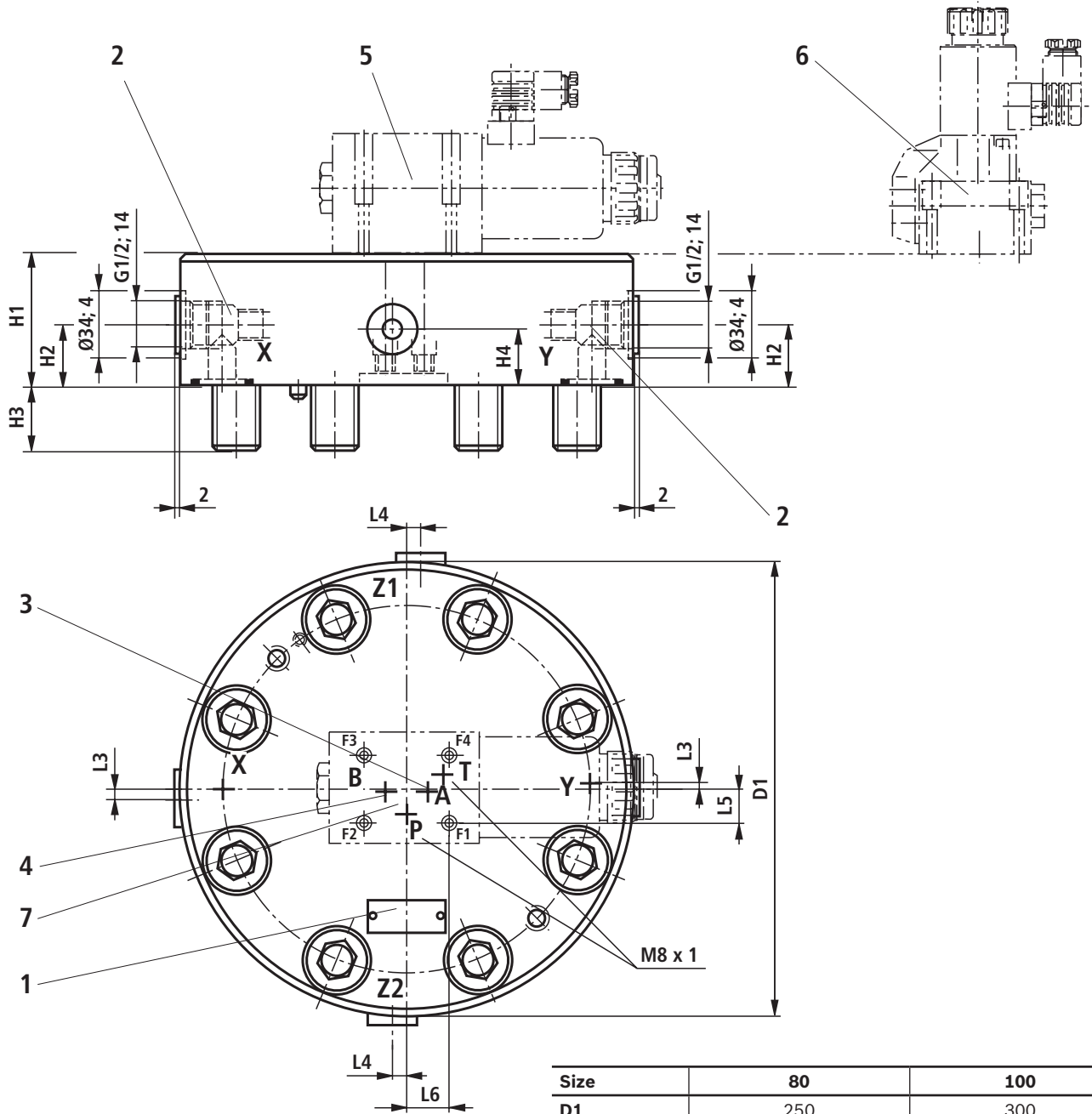
LFA . WEMA... (size 80 ... 100)



LFA . WEMB... (size 80 ... 100)



Control covers “WEMA” and “WEMB” for mounting a directional spool valve or directional seat valve: Size 80 ... 100 (dimensions in mm)



- 1 Name plate
- 2 Ports X, Y, Z1 and Z2 optionally as threaded connection
- 3 Plug screw M8 x 1 with type WEMB
- 4 Plug screw M8 x 1 with type WEMA
- 5 Directional spool valve type 4WE 10 D... (pilot control valve), separate order see page 12
- 6 Directional seat valve type M-3SEW 10... (pilot control valve), separate order see page 12
- 7 Porting pattern according to ISO 4401-05-04-0-05

Size	80	100
D1	250	300
H1	80	100
H2	42	55
H3	45	52.5
H4	26	35
L3	10	13
L4	10	9.5
L5	16	27
L6	27	26

Notice:
The dimensions are nominal dimensions which are subject to tolerances.

Control cover “WECA” for mounting a directional spool valve: Size 16 ... 50

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		WECA	-	7X	/											1)

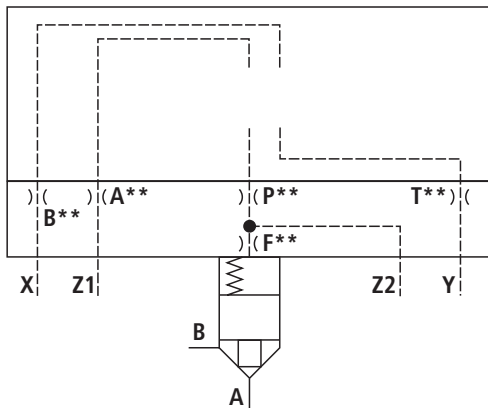
02	03	10	11	12	13	15
Size	Type	Nozzle in channel (Ø in 1/10 mm)				
		A	B	P	T	F
16	WECA	A**	B**	P**	T**	F**
25		A**	B**	P**	T**	
32		A**	B**	P**	T**	
40		A**	B**	P**	T**	
50		A**	B**	P**	T**	

△ Nozzle possible, must be specified if required

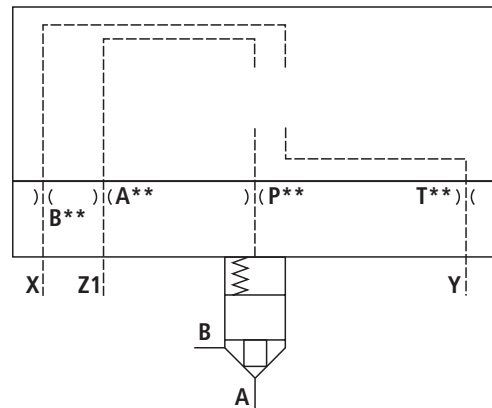
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

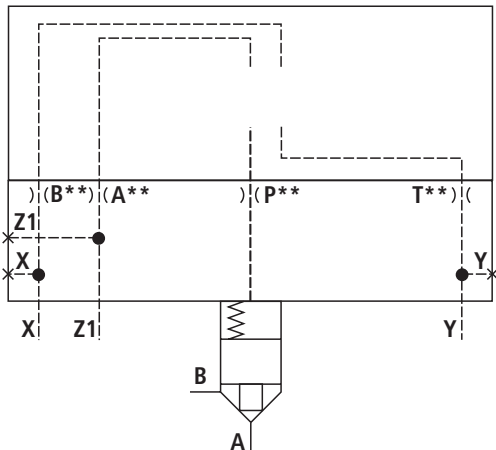
LFA . WECA... (size 16)



LFA . WECA... (size 25 and 32)



LFA . WECA... (size 40 and 50)



Control cover “WECA” for mounting a directional spool valve: Size 63

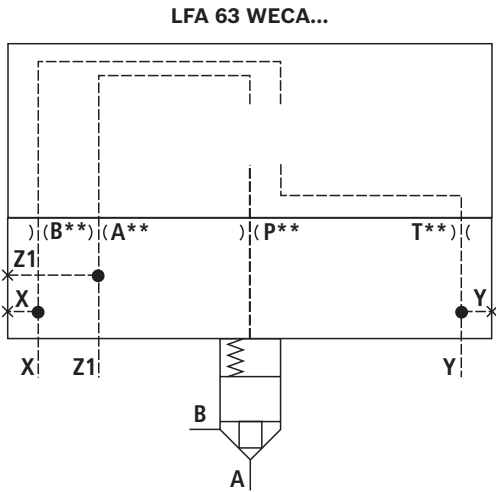
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	63	WECA	-	7X	/											1)

Nozzle in channel (Ø in 1/10 mm)			
A	B	P	T
A**	B**	P**	T**

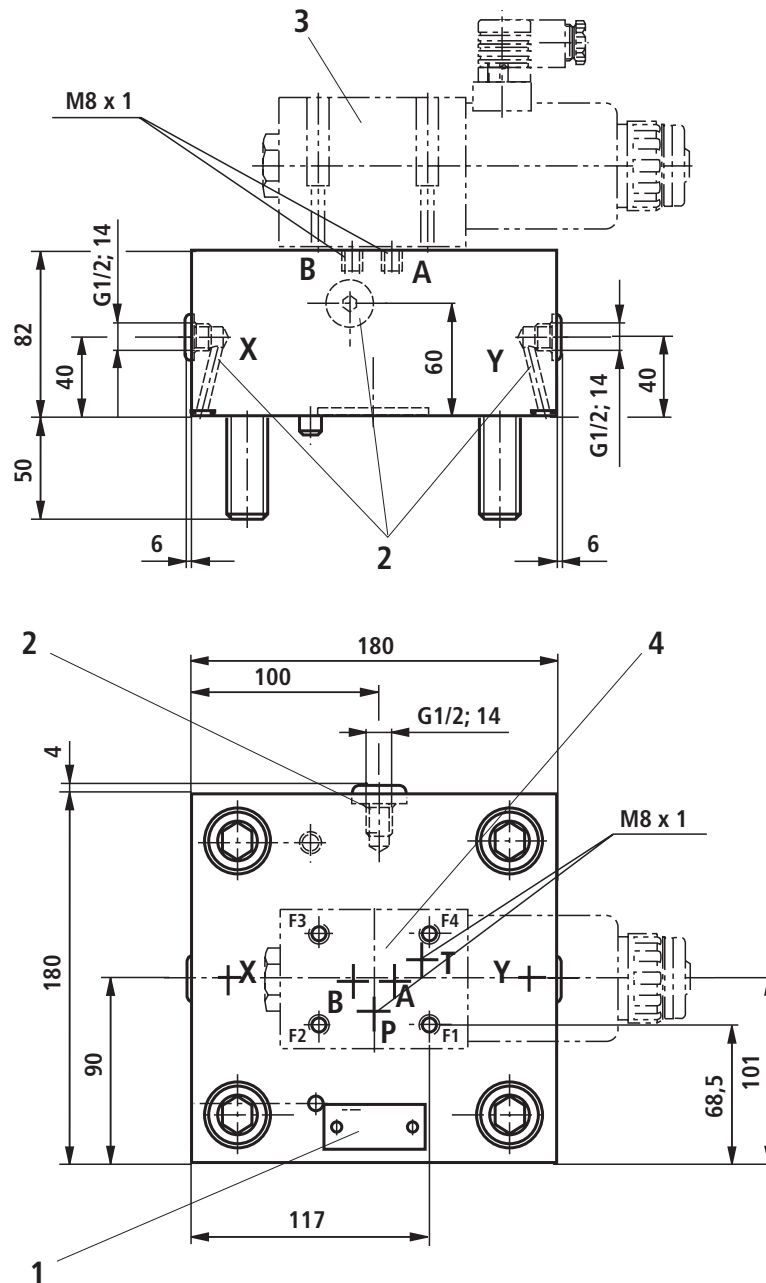
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.



Control cover "WECA" for mounting a directional spool valve: size 63 (dimensions in mm)



- 1 Name plate
- 2 Ports X, Y and Z1 optionally as threaded connection
- 3 Directional spool valve type 3WE 6 A... (pilot control valve), separate order see page 12
- 4 Porting pattern according to ISO 4401-05-04-0-05



Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control cover “WECA” for mounting a directional spool valve: Size 80 ... 100

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	
LFA		WECA	-	6X	/												1)

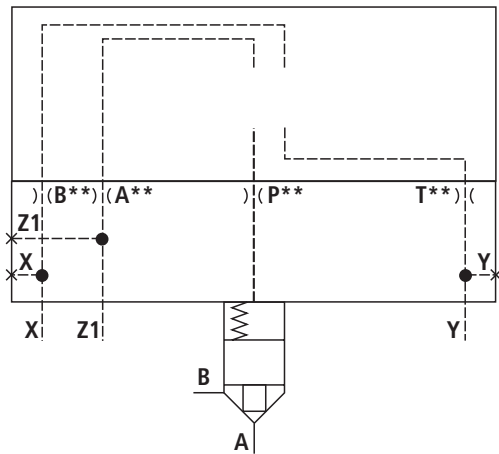
02		10		11		12		13	
Size		Nozzle in channel (∅ in 1/10 mm)							
		A	B	P	T				
80	100	A**	B**	P**	T**				

△ Nozzle possible, must be specified if required

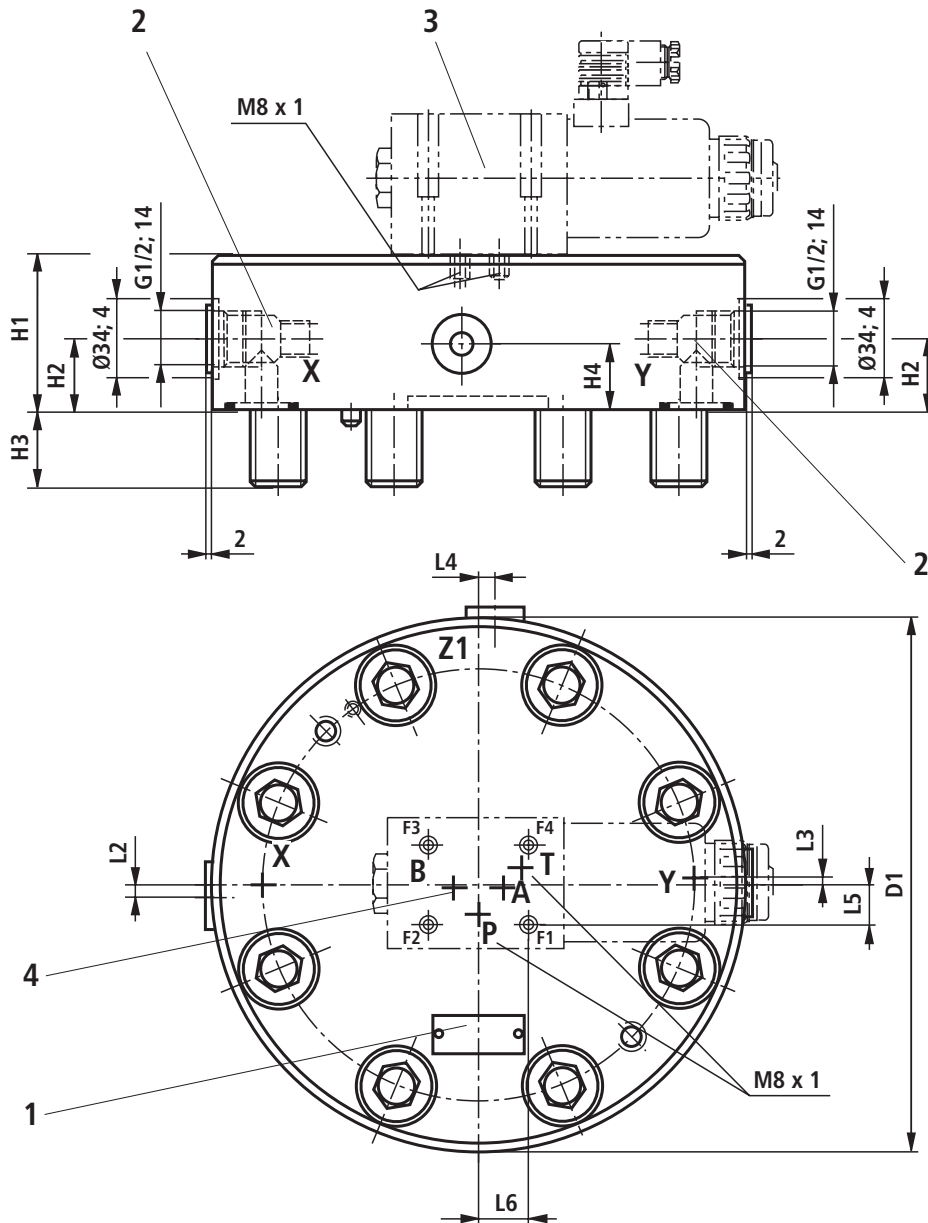
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

LFA . WECA... (size 80 ... 100)




Control cover "WECA" for mounting a directional spool valve: Size 80 ... 100 (dimensions in mm)



- 1 Name plate
- 2 Ports X, Y, Z1 and Z2 optionally as threaded connection
- 3 Directional spool valve type 3WE 10 A... (pilot control valve), separate order see page 12
- 4 Porting pattern according to ISO 4401-05-04-0-05

Size	80	100
D1	250	300
H1	80	100
H2	30	40
H3	45	52.5
H4	30	70
L2	0	6
L3	6	6
L4	6	6
L5	23	19
L6	27	26

 **Notice:**

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “GWA” and “GWB” for mounting a directional spool valve or directional seat valve:
 Size 16 ... 50

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		-	7X	/												1)

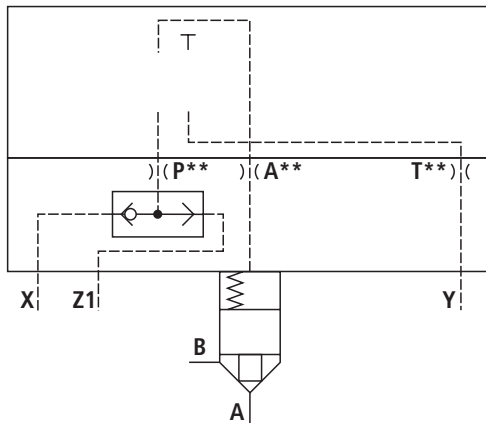
02					03					10					11					12					13				
Size					Type	Nozzle in channel (Ø in 1/10 mm)																							
						A	B						P	T															
16	25	32	40	50	GWA	A**							P**	T**															
					GWB		B**						P**	T**															

△ Nozzle possible, must be specified if required

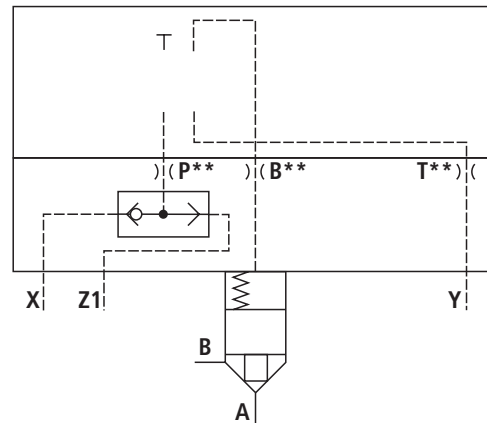
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

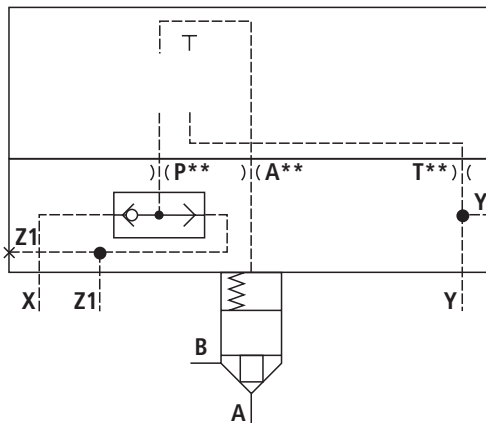
LFA . GWA... (size 16 ... 32)



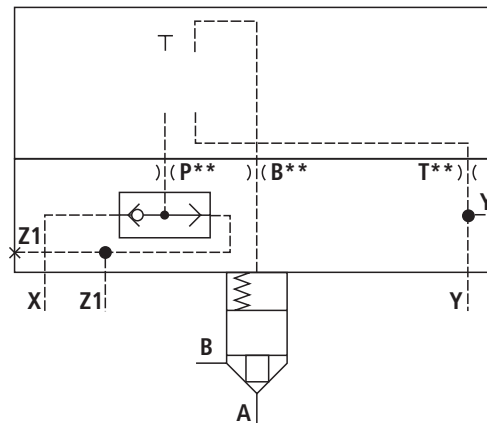
LFA . GWB... (size 16 ... 32)



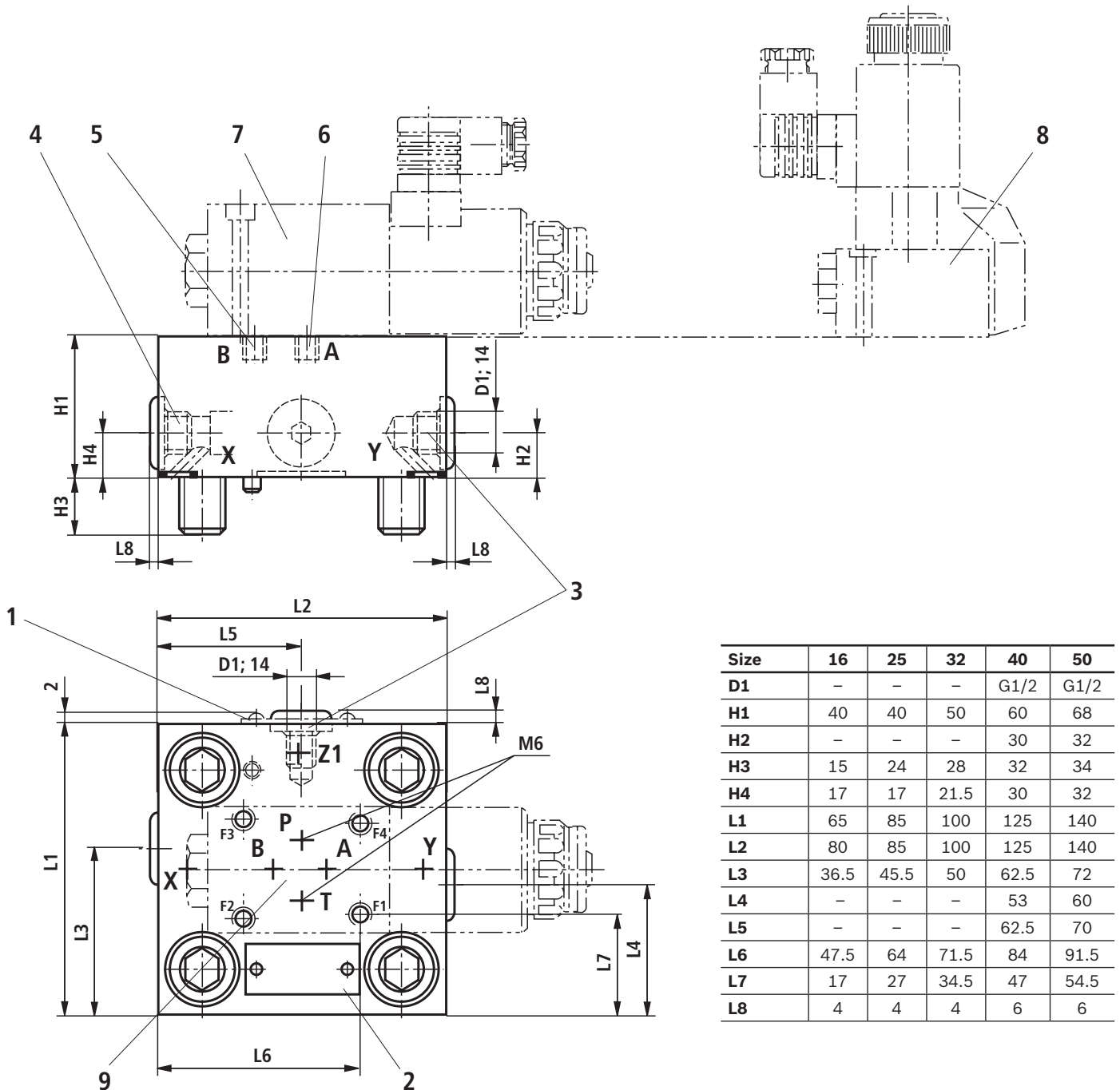
LFA . GWA... (size 40 and 50)



LFA . GWB... (size 40 and 50)



Control covers “GWA” and “GWB” for mounting a directional spool valve or directional seat valve:
Size 16 ... 50 (dimensions in mm)



- 1 Name plate with size 16, 25, 32
- 2 Name plate with size 40 and 50
- 3 Port Y and Z1 as a threaded connection with size 40 and size 50
- 4 Shuttle valve
- 5 Plug screw M6 with type GWA
- 6 Plug screw M6 with type GWB
- 7 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 12
- 8 Directional seat valve type M-3SEW 6... (pilot control valve), separate order see page 12

- 9 Porting pattern according to ISO 4401-03-02-0-05

**Notice:**

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “GWA” and “GWB” for mounting a directional spool valve or directional seat valve:
 Size 63

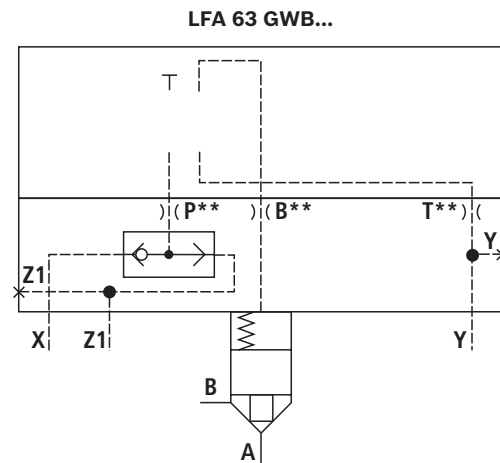
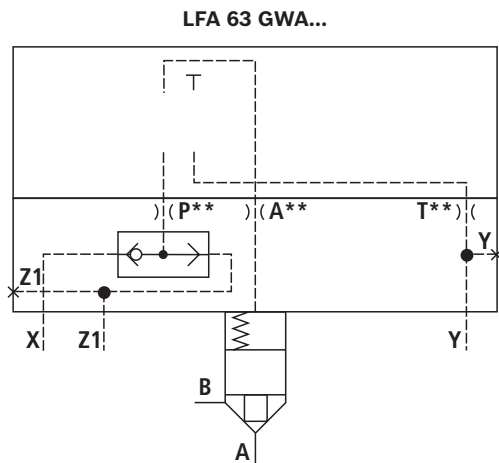
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	63	-	7X	/												1)

03	10	11	12	13
Type	Nozzle in channel (∅ in 1/10 mm)			
	A	B	P	T
GWA	A**		P**	T**
GWB		B**	P**	T**

△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.



Control covers “GWA” and “GWB” for mounting a directional spool valve or directional seat valve:
 Size 80 ... 100

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	
LFA			-	6X	/												1)

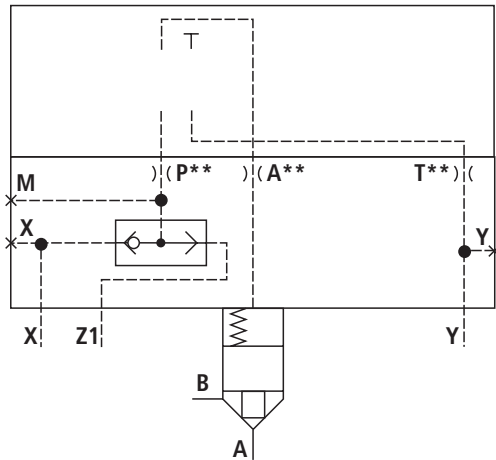
02		03		10		11		12		13	
Size		Type	Nozzle in channel (∅ in 1/10 mm)								
			A	B	P	T					
80	100	GWA	A**		P**	T**					
		GWB		B**	P**	T**					

△ Nozzle possible, must be specified if required

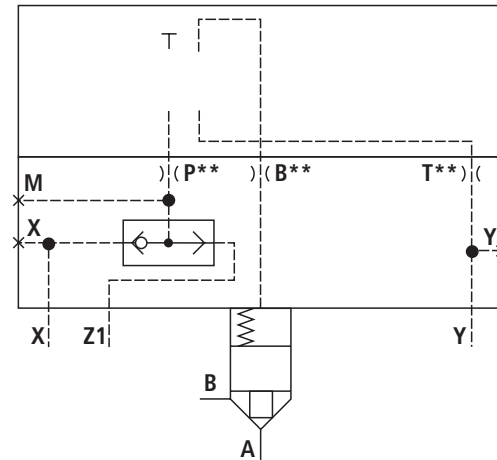
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

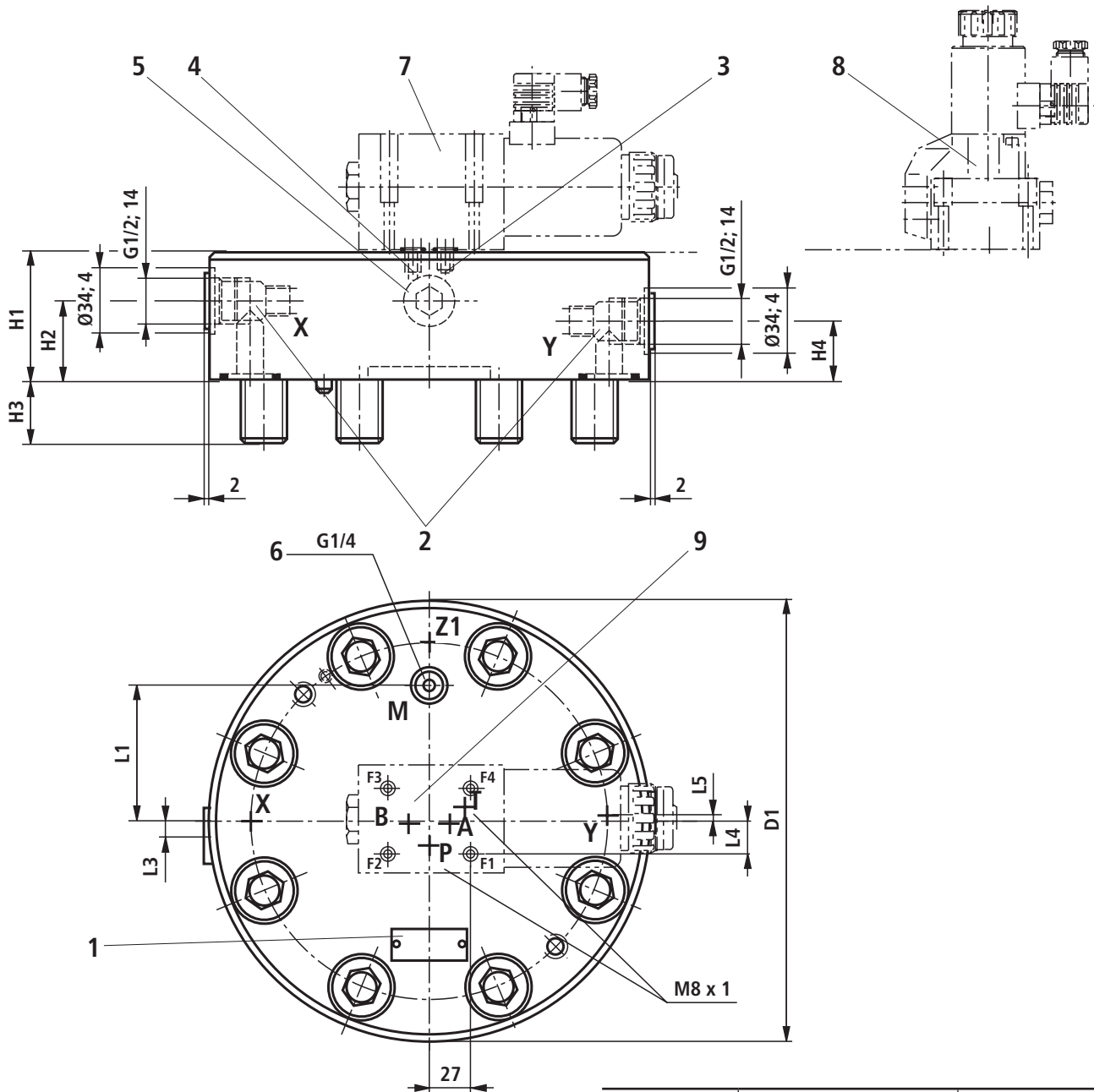
LFA . GWA... (size 80 ... 100)



LFA . GWB... (size 80 ... 100)



Control covers “GWA” and “GWB” for mounting a directional spool valve or directional seat valve:
Size 80 ... 100 (dimensions in mm)



- 1 Name plate
- 2 Ports X and Y optionally as threaded connection
- 3 Plug screw M8 x 1 with type GWB
- 4 Plug screw M8 x 1 with type GWA
- 5 Shuttle valve
- 6 Measuring port
- 7 Directional spool valve type 4WE 10 D... (pilot control valve), separate order see page 12
- 8 Directional seat valve type M-3SEW 10... (pilot control valve), separate order see page 12
- 9 Porting pattern according to ISO 4401-05-04-0-05

Size	80	100
D1	250	300
H1	80	100
H2	26	40
H3	45	52.5
H4	26	55
L1	74	96.5
L3	9.5	13
L4	17	18
L5	10.5	13

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “GWMA” for mounting a directional spool valve or directional seat valve:
Size 16 ... 32

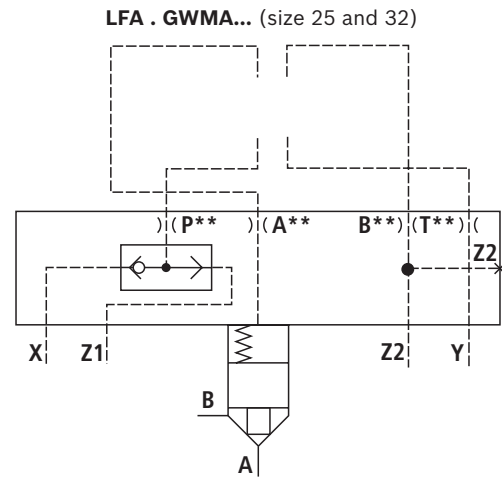
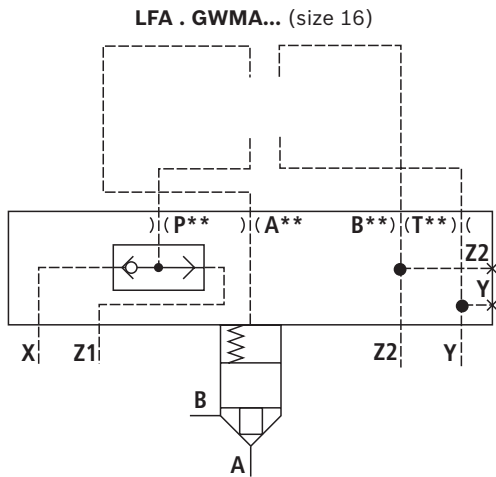
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		GWMA	-	7X	/											1)

02			10		11		12		13	
Size			Nozzle in channel (Ø in 1/10 mm)							
			A	B	P		T			
16	25	32	A**	B**	P**		T**			

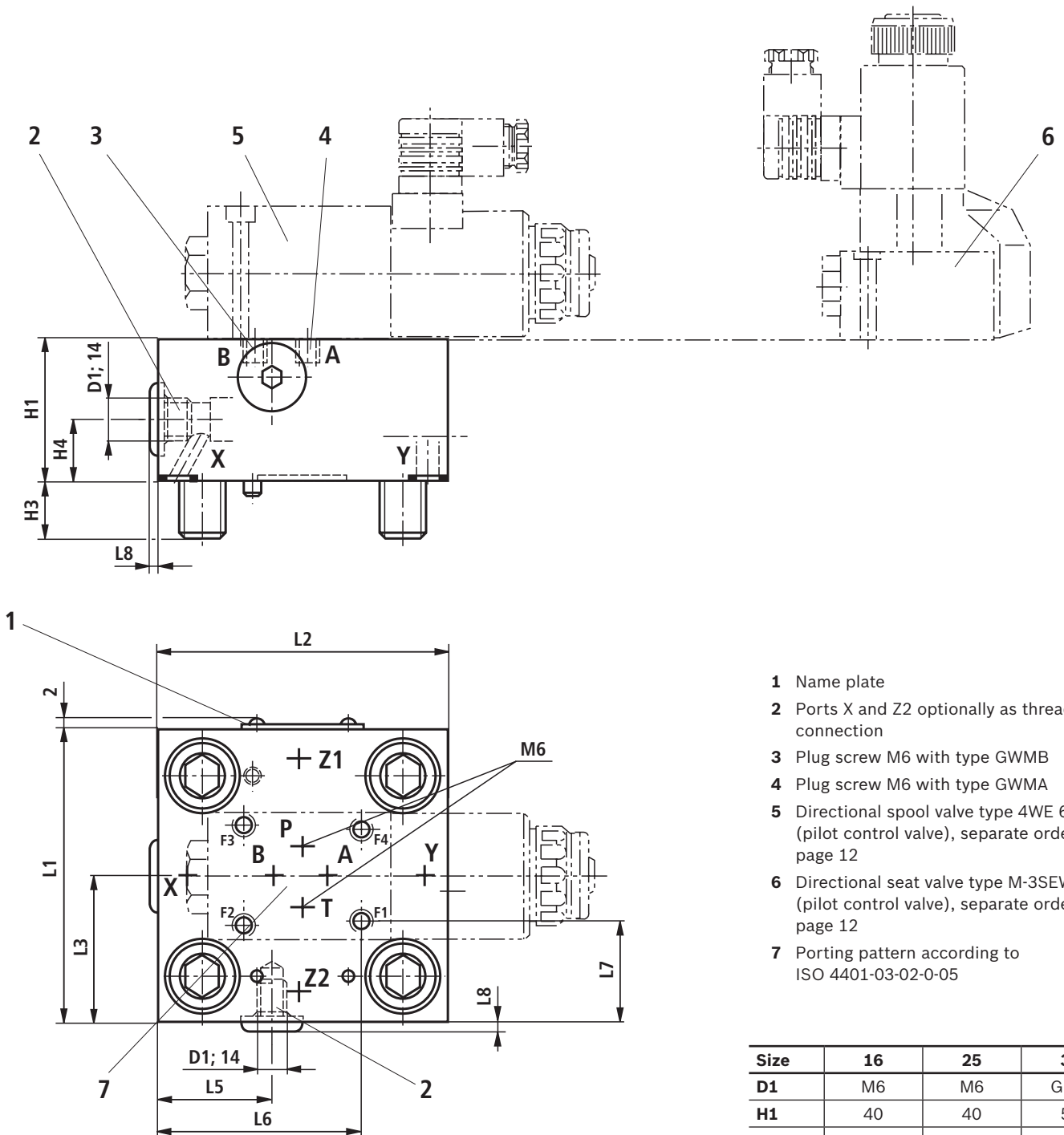
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.



Control covers “GWMA” for mounting a directional spool valve or directional seat valve:
Size 16 ... 32 (dimensions in mm)



- 1 Name plate
- 2 Ports X and Z2 optionally as threaded connection
- 3 Plug screw M6 with type GWMB
- 4 Plug screw M6 with type GWMA
- 5 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 12
- 6 Directional seat valve type M-3SEW 6... (pilot control valve), separate order see page 12
- 7 Porting pattern according to ISO 4401-03-02-0-05

Size	16	25	32
D1	M6	M6	G1/4
H1	40	40	50
H2	-	-	-
H3	15	24	28
H4	-	-	-
L1	65	85	100
L2	80	85	100
L3	39.5	45.5	50
L4	-	-	-
L5	30	34	44
L6	47.2	64	71.5
L7	17	27	34.55
L8	3	3	5

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “GWMA” for mounting a directional spool valve or directional seat valve:
Size 40 ... 50

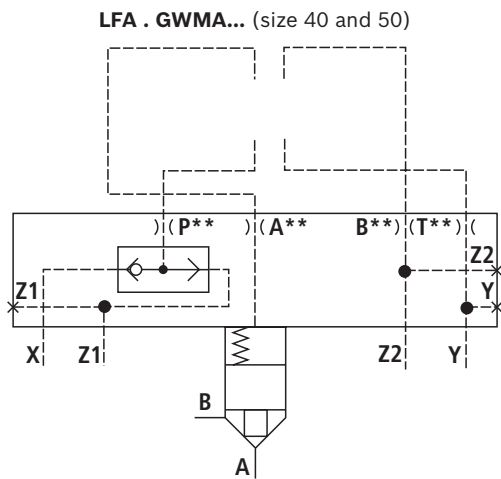
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		GWMA	-	7X	/											1)

02		10		11		12		13	
Size		Nozzle in channel (∅ in 1/10 mm)							
		A	B	P	T				
40	50	A**	B**	P**	T**				

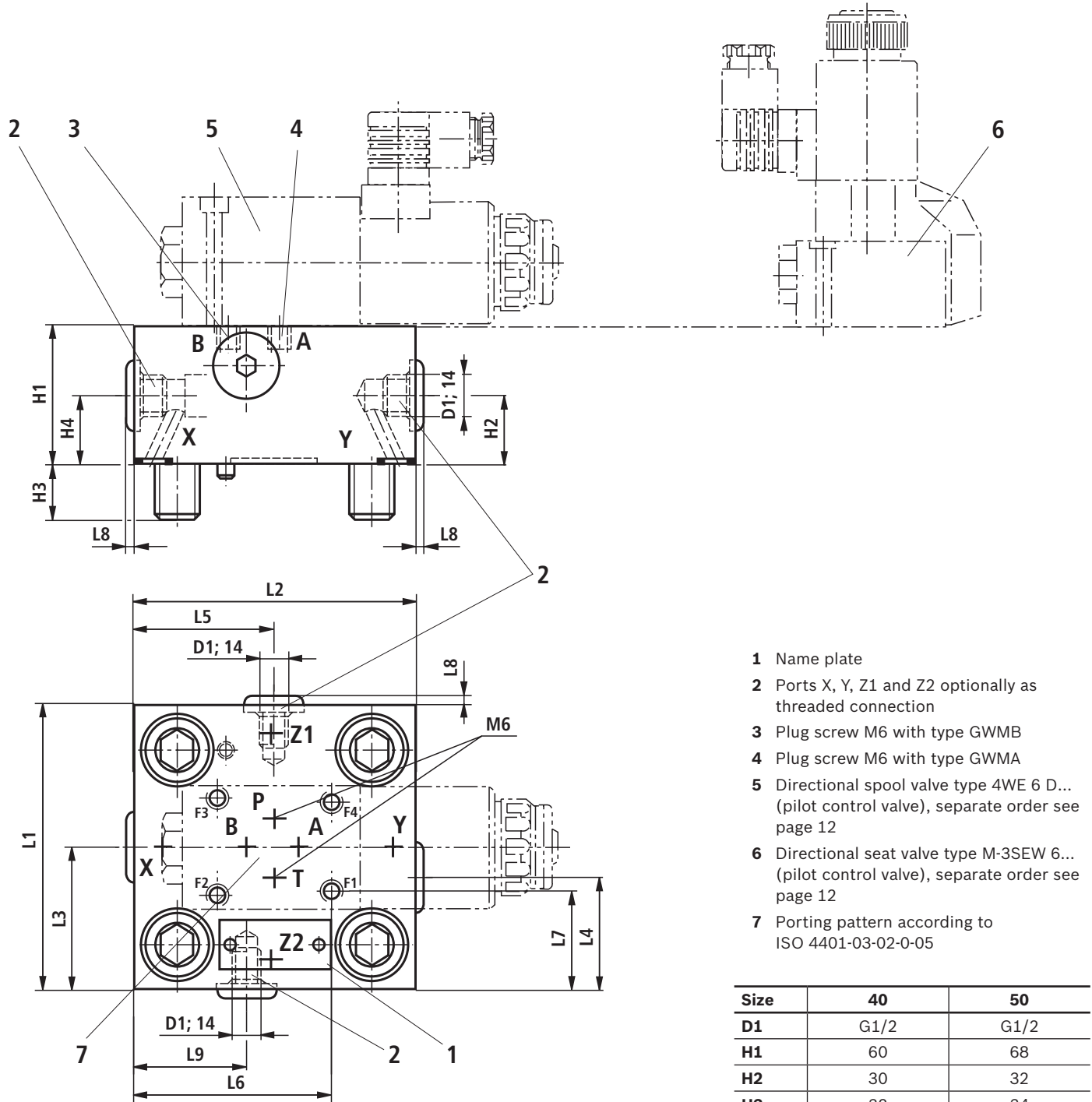
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.



Control covers “GWMA” for mounting a directional spool valve or directional seat valve:
 Size 40 ... 50 (dimensions in mm)



Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “GWMA” for mounting a directional spool valve or directional seat valve: Size 63

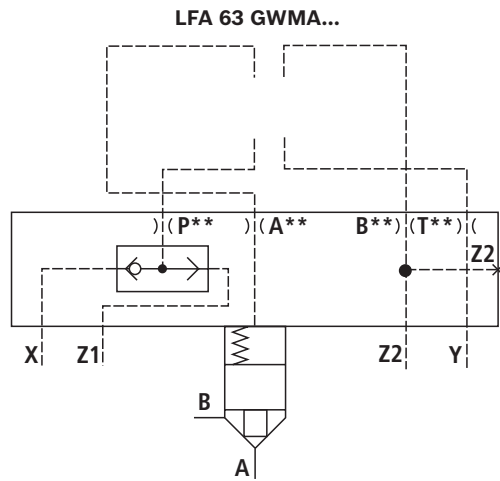
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	63	GWMA	-	7X	/											1)

10	11	12	13
Nozzle in channel (Ø in 1/10 mm)			
A	B	P	T
A**	B**	P**	T**

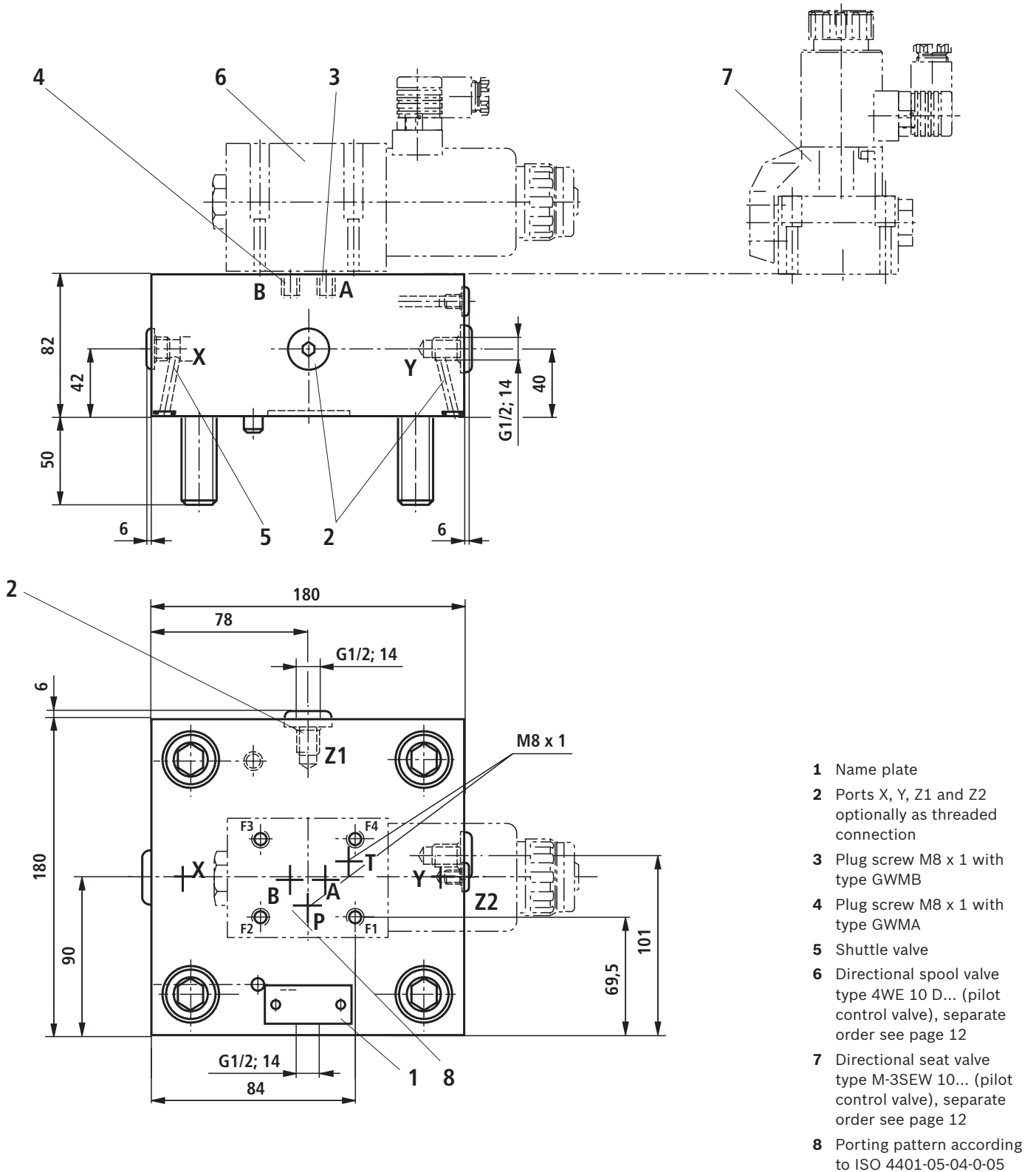
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.



Control covers “GWMA” for mounting a directional spool valve or directional seat valve: Size 63
(dimensions in mm)



Notice:
 The dimensions are nominal dimensions which are subject to tolerances.

Control covers “GWMA” for mounting a directional spool valve or directional seat valve: Size 80

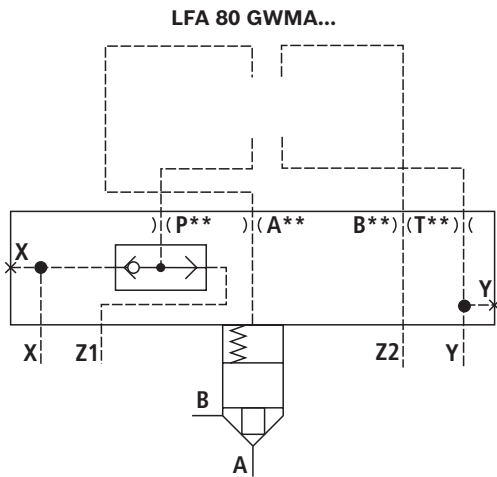
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	80	GWMA	-	7X	/											1)

10	11	12	13
Nozzle in channel (Ø in 1/10 mm)			
A	B	P	T
A**	B**	P**	T**

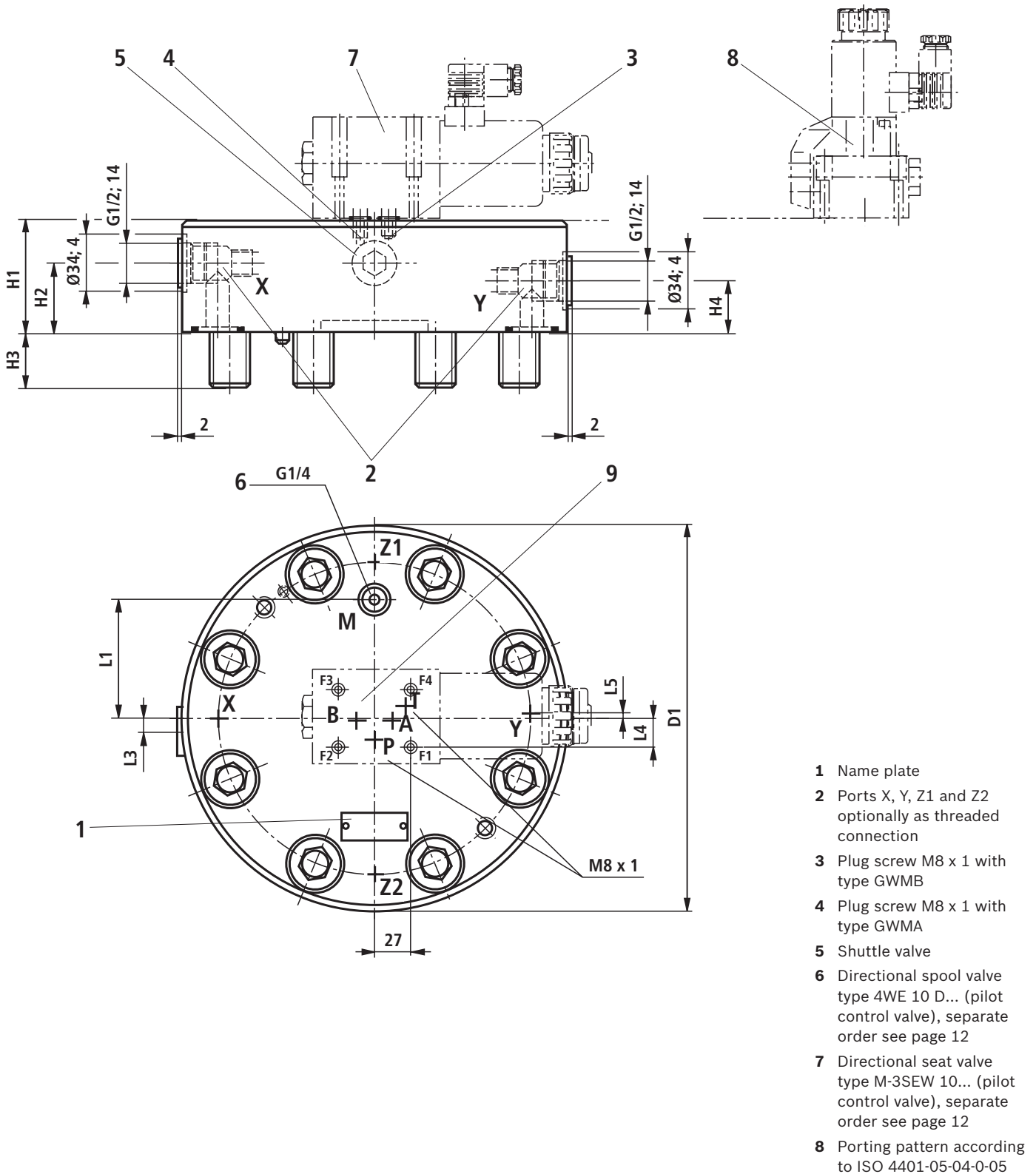
△ Nozzle possible, must be specified if required

1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.



Control covers "GWMA" for mounting a directional spool valve or directional seat valve: Size 80 (dimensions in mm)



Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “KWA” and “KWB” for mounting a directional spool valve or directional seat valve:
 Size 16 ... 50

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		-	7X	/												1)

Size	Type	Nozzle in channel (Ø in 1/10 mm)			
		A	B	P	X
16	KWA	A**		P15	X15
25		A**		P15	Ø2.0
32		A**		P20	Ø2.5
40		A**		P20	X30
50		A**		P20	X30
16	KWB		B**	P15	X15
25			B**	P15	Ø2.0
32			B**	P20	Ø2.5
40			B**	P20	X30
50			B**	P20	X30

△ Nozzle possible, must be specified if required

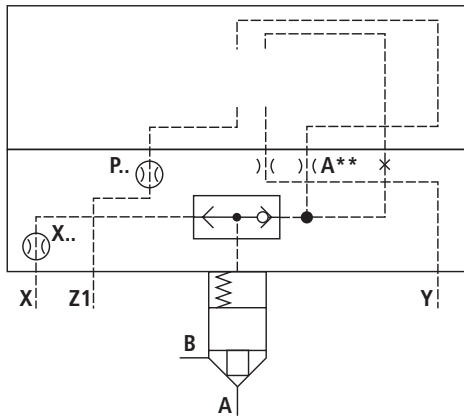
▲ Nozzle drilled (Ø in mm) (does not appear in the type designation)

△ Standard nozzle (Ø in 1/10 mm) (does not appear in the type designation)

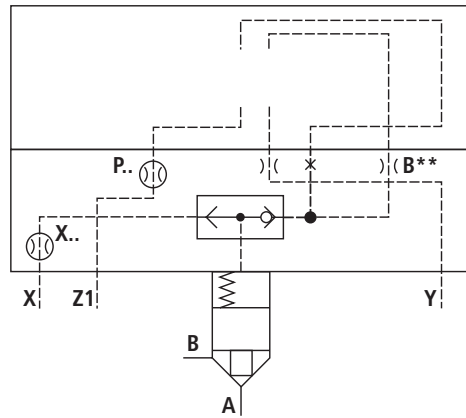
1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.

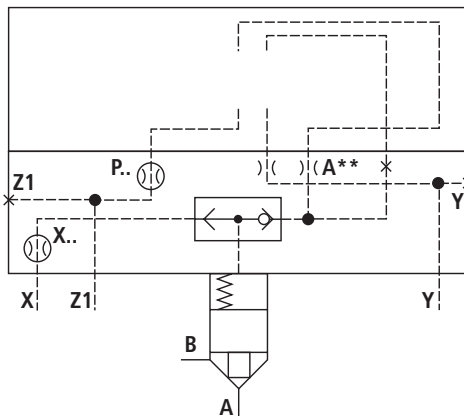
LFA . KWA... (size 16 ... 32)



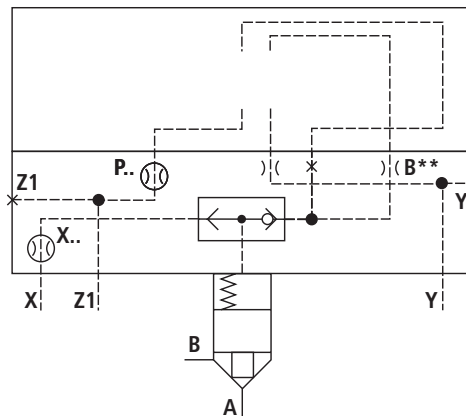
LFA . KWB... (size 16 ... 32)



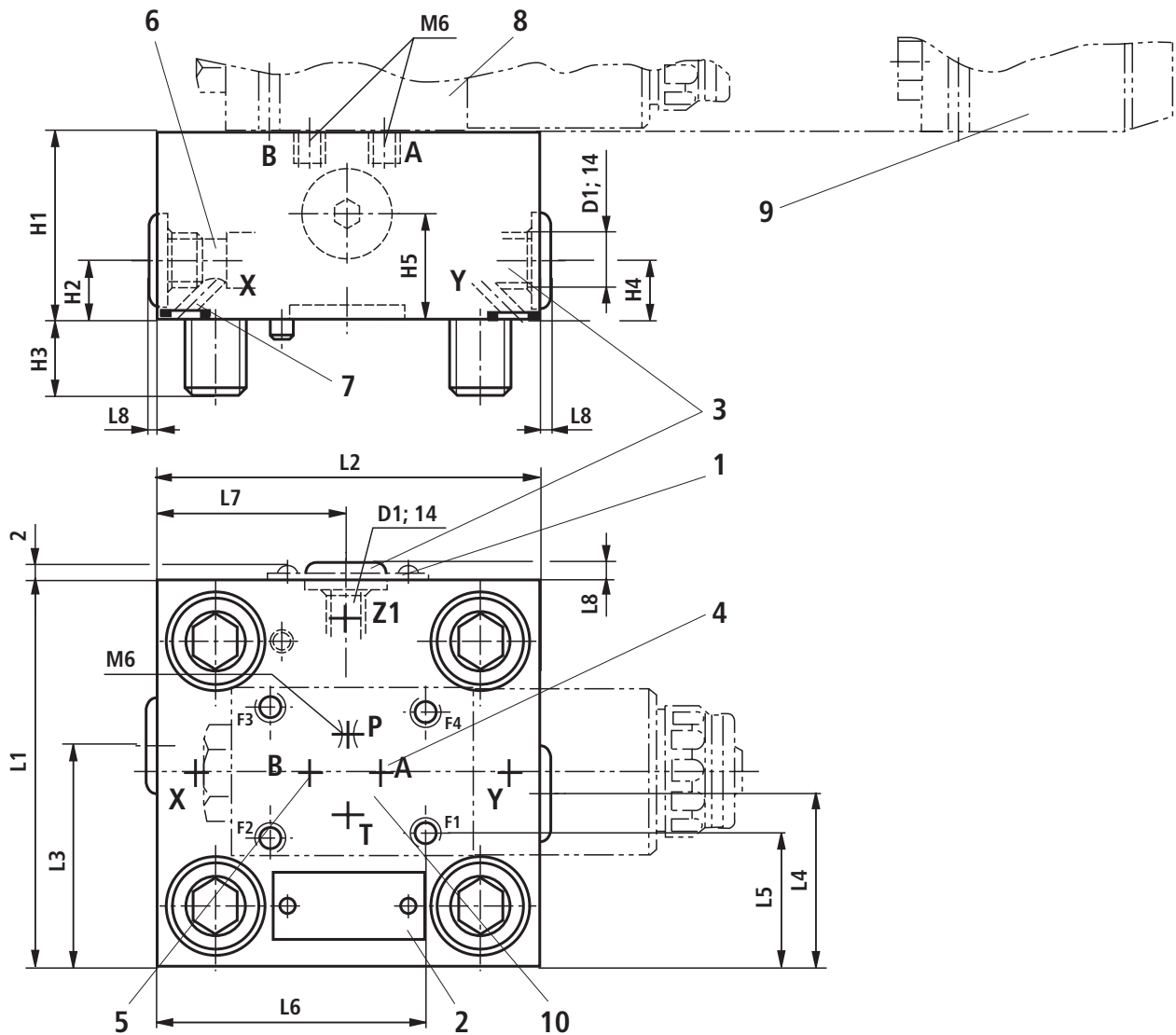
LFA . KWA... (size 40 and 50)



LFA . KWB... (size 40 and 50)



Control covers “KWA” and “KWB” for mounting a directional spool valve or directional seat valve:
Size 16 ... 50 (dimensions in mm)



- 1 Name plate with size 16, 25 and 32
- 2 Name plate with size 40 and 50
- 3 Port Y and Z1 optionally as a threaded connection with size 40 and 50
- 4 Plug screw type KWB
- 5 Plug screw type KWA
- 6 Shuttle valve
- 7 M6 with size 16 and 40, M8 x 1 with size 50
- 8 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 12
- 9 Directional seat valve type M-3SEW 6... (pilot control valve), separate order see page 12
- 10 Porting pattern according to ISO 4401-03-02-0-05

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	47.5	64	71.5	84	91.5
L7	-	-	-	62.5	70
L8	4	4	4	6	6

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “KWA” and “KWB” for mounting a directional spool valve or directional seat valve:
Size 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	63		-	7X	/											1)

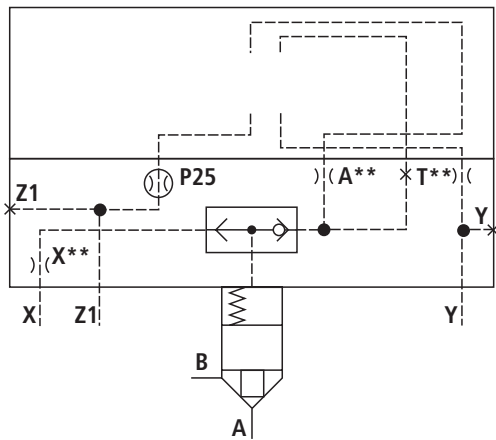
	03	10	11	12	13	14
Type	Nozzle in channel (∅ in 1/10 mm)					
	A	B	P	T	X	
KWA	A**		P25	T**	X**	
KWB		B**	P25		X**	

△ Nozzle possible, must be specified if required

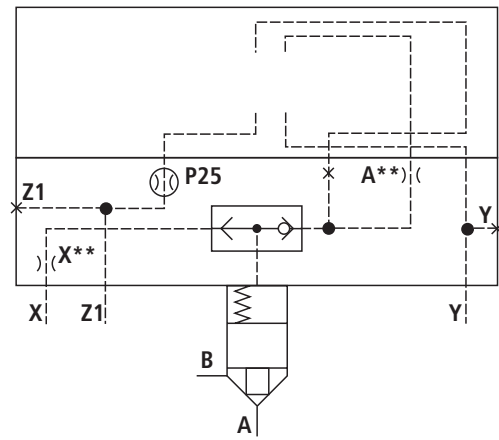
△ Standard nozzle (∅ in 1/10 mm) (does not appear in the type designation)

1) See “General notes on ordering codes for control cover type LFA...” page 11.
For nozzle ordering codes, see page 71.

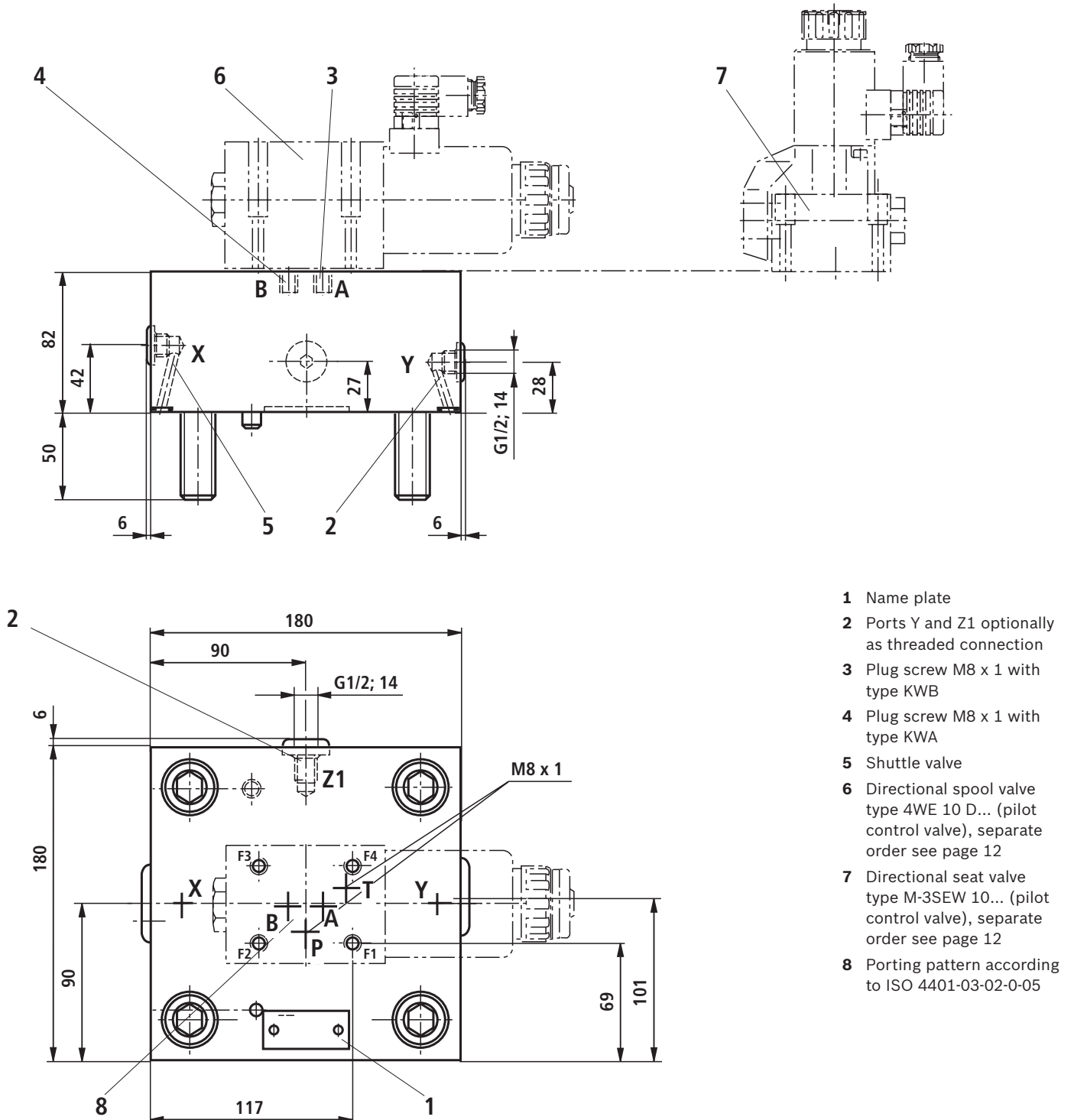
LFA 63 KWA...



LFA 63 KWB...



Control covers “KWA” and “KWB” for mounting a directional spool valve or directional seat valve:
size 63 (dimensions in mm)



Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Control covers “KWA” and “KWB” for mounting a directional spool valve or directional seat valve:
 Size 80 ... 100

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/											1)

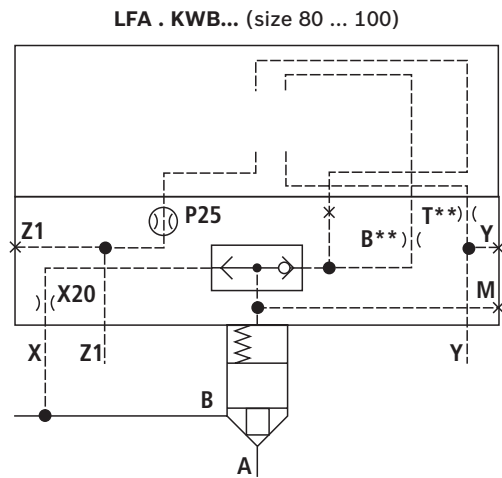
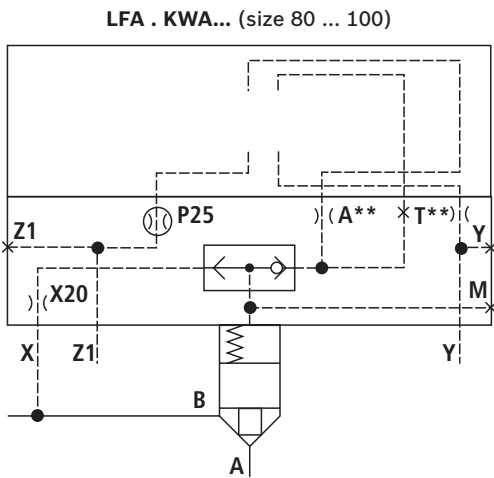
Size		Type	Nozzle in channel (∅ in 1/10 mm)				
			A	B	P	T	X
80	100	KWA	A**		P25	T**	X20
		KWB		B**	P25	T**	X20

△ Nozzle possible, must be specified if required

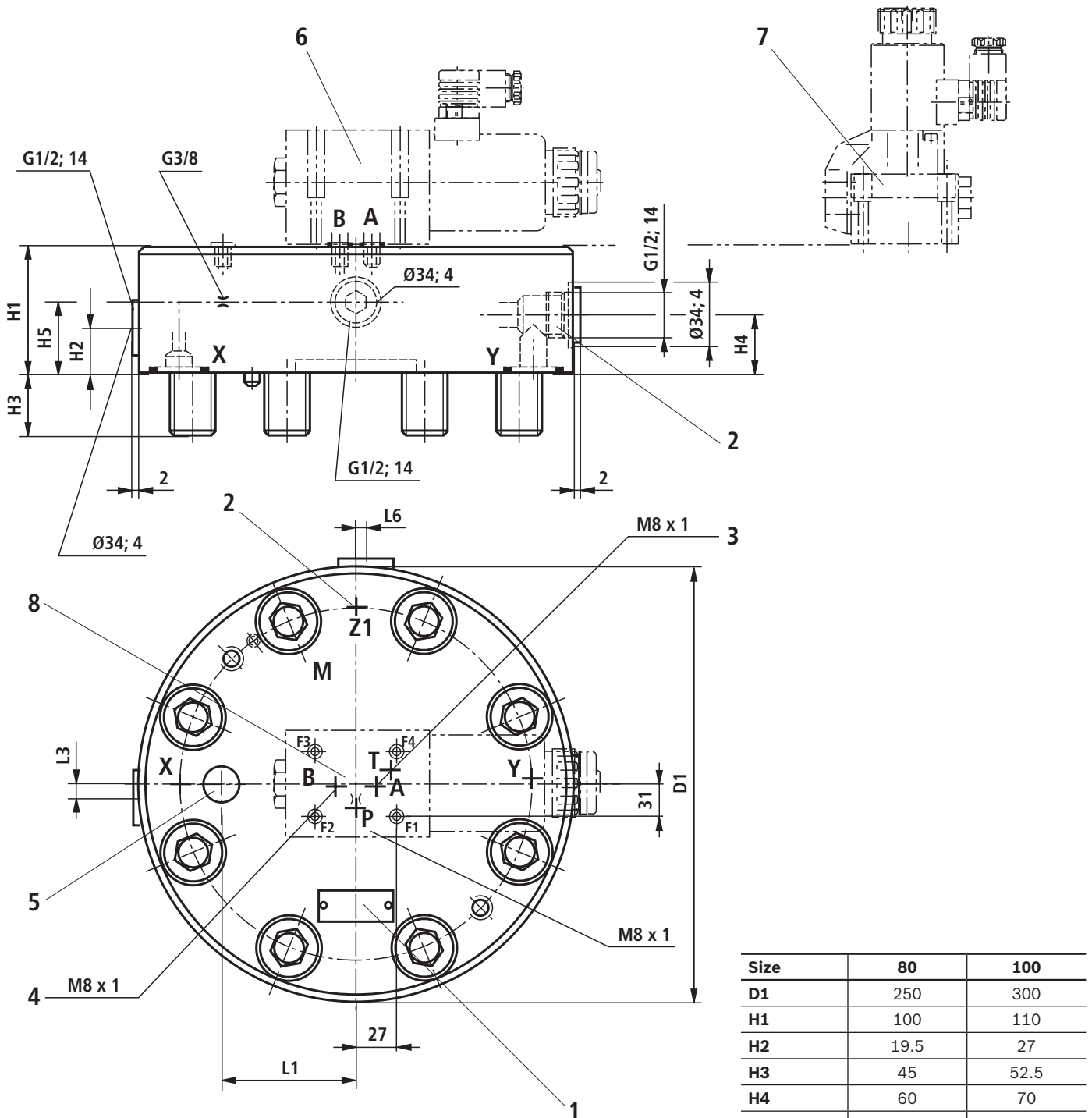
△ Standard nozzle (∅ in 1/10 mm) (does not appear in the type designation)

1) See “General notes on ordering codes for control cover type LFA...” page 11.

For nozzle ordering codes, see page 71.



Control covers “KWA” and “KWB” for mounting a directional spool valve or directional seat valve:
 Size 80 ... 100 (dimensions in mm)



- 1 Name plate
- 2 Ports Y and Z1 optionally as threaded connection
- 3 Plug screw for type KWB
- 4 Plug screw for type KWA
- 5 Shuttle valve
- 6 Directional spool valve type 4WE 10 D... (pilot control valve), separate order see page 12
- 7 Directional seat valve type M-3SEW 10... (pilot control valve), separate order see page 12
- 8 Porting pattern according to ISO 4401-05-04-0-05

Size	80	100
D1	250	300
H1	100	110
H2	19.5	27
H3	45	52.5
H4	60	70
H5	52	62
L1	55	62
L3	6.5	5
L6	6.5	2

Notice:
 The dimensions are nominal dimensions which are subject to tolerances.

Intermediate cover “D19” for installation kit with greater spring installation space and piston sealing (on request)

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		D19	-	7X	/											1)

02

Size					
16	25	32	40	50	63

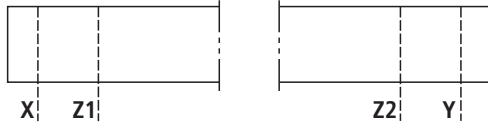
1) See “General notes on ordering codes for control cover type LFA...” page 11.



Notice:

Greater spring installation space (see type LC.../-004 and LC.../-146 page 72)

LFA . D19...



Mounting screws: Intermediate cover with control cover (separate order)

Size	Control cover type LFA	Quantity	Hexagon socket head cap screws ISO 4762 - 10.9-fIZn-240h-L		
			Dimensions	Material number	Tightening torque M_A in Nm \pm 10%
16	WE., GW.	4	M8 x 70	R913000149	30
	WEM., GWMA		M8 x 95	upon request	
	1)		M8 x 65	R913000368	
25	1)		M12 x 75	R913000467	100
32	H1, H2	4	M16 x 110	R913000079	240
	H3, H4		M16 x 100	R913000558	
	1)		M16 x 90	R913000554	
40	H1, H2	4	M20 x 140	R913000500	480
	1)		M20 x 100	R913000386	
50	H2, H4	4	M20 x 160	R913000318	480
	1)		M20 x 120	R913000582	
63	H2, H4	4	M30 x 210	R913000491	1600
	1)		M30 x 160	upon request	

1) More available series control covers

Mounting screws control cover LFA (included in the scope of delivery)

Hexagon socket head cap screws ISO 4762 - 10.9-f1Zn-240h-L ¹⁾

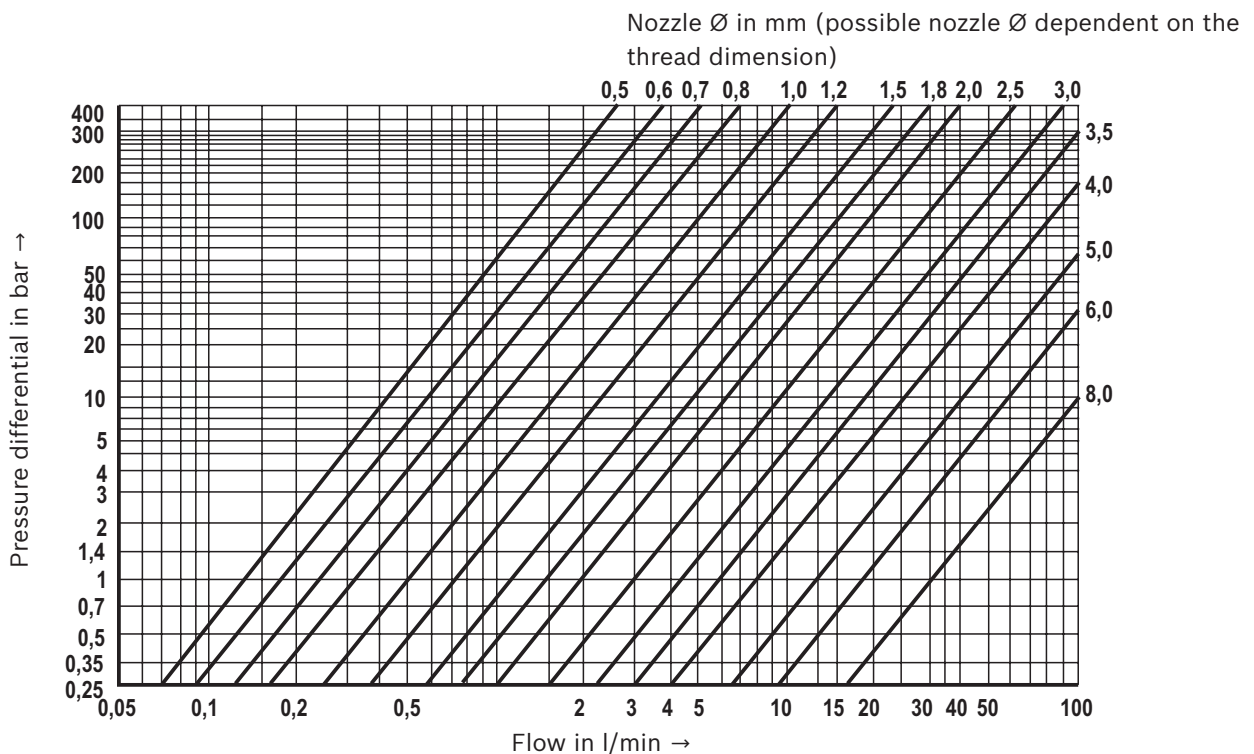
Size	Quantity	Tightening torque M_A in Nm
16	4	30
25	4	100
32	4	240
40	4	480
50	4	480
63	4	1,600
80	8	800
100	8	1,600
125	8	3,100
160	12	5,000

Notice:

- ▶ The tightening torques stated are guidelines when using screws with the specified friction coefficients and when using a manual torque wrench (tolerance $\pm 10\%$).
- ▶ The specified tightening torques were calculated with total friction coefficient $\mu = 0.14$; please adjust in case of modified surfaces.

¹⁾ Hexagon socket head cap screws UNC, see data sheet 08936

Characteristic curves for selecting nozzles; screw plug tightening torque



Nozzles

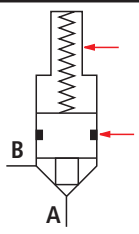
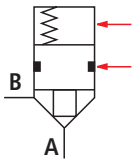
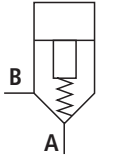
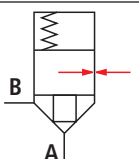
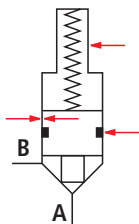
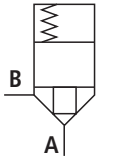
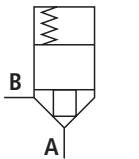
Thread	Nozzle \varnothing in mm
M6 conical	0.5 ... 3.0
M8 x 1 conical	0.5 ... 4.0
G3/8	0.8 ... 6.0
G1/2	1.0 ... 8.0

Other nozzles on request.

Plug screws

Thread	Tightening torque M_A in Nm
M6	–
M8 x 1	7
G3/8	55
G1/2	80
G3/4	135
G1	225
G1 1/4	360

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

Symbol	Type (examples)	Size	Description/particularity
	LC . A..D7X/- 004 LC . A..E7X/- 004 LC . B..E7X/- 004	16 ... 50 16 ... 50 16 ... 63	<ul style="list-style-type: none"> ▶ With piston sealing (leak tight) ▶ Greater spring installation space ▶ Special cover or intermediate cover "D19" are necessary
	LC . A..D6X/- 104 LC . A..E6X/- 104 LC . B..E6X/- 104 LC . A..D7X/- 104 LC . A..E7X/- 104	80, 100 80, 100 80, 100 63 63	<ul style="list-style-type: none"> ▶ With piston sealing (leak tight), ▶ as SO-004, but no special cover is necessary
	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	<ul style="list-style-type: none"> ▶ Pulling logic with open zero position ▶ Special cover (e.g. "D54") is necessary
	LC . A..D7X/- 135 LC . A40E7X/- 135 LC . A..E7X/- 135 LC . A..E7X/- 135 LC . B..E7X/- 135	16 ... 40 16 25 32 32	<ul style="list-style-type: none"> ▶ Greater piston clearance
	LC . A40E7X/- 146 LC . A..E7X/- 146 LC . B40E7X/- 146	25, 32 40 32	<ul style="list-style-type: none"> ▶ Greater piston clearance ▶ With piston sealing (leak tight) ▶ Greater spring installation space ▶ Special cover or intermediate cover "D19" are necessary
	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	<ul style="list-style-type: none"> ▶ As standard, but socket external diameters D1 and D4 1 mm are 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	<ul style="list-style-type: none"> ▶ As standard, but socket external diameters D1 and D4 2 mm are larger (repair kit).

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

Symbol	Type	Size	Description/particularity
	LFA . D54-6X/F LFA . D54-7X/F	16 ... 50 50	► Cover for logic zero position open (pulling logic)
	LFA . H2-14-7X/F	16	► Cover for use with piston sealing (type LC.../-004, LC.../-146) ► Intermediate cover "D19" required
	LFA . WEA54-7X/... LFA . WEA54-6X/... LFA . WEMA54-6X/...	32, 50, 63 25 ... 50 25	► Cover for logic zero position open ► Size 25: same version with type WEA and WEMA
	LFA . H2-18-7X/F	16 ... 63	► Stroke limitation with seal protection
	LFA . R3-7X/... LFA . RF3-7X/...	25 ... 63	► Area ratio: $\frac{A_{Z1}}{A_X} = \frac{6}{1}$

More information

▶ 2-way cartridge valves-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 valve 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
▶ Mineral-oil-based hydraulic fluids	Data sheet 90220
▶ Reliability characteristics according to EN ISO 13849	Data sheet 08012
▶ Hex socket head cap screws metric/UNC	Data sheet 09836
▶ Hydraulic valves for industrial applications	Data sheet 07600-B
▶ Filter range	www.boschrexroth.com/filter

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Notes

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Notes