

2-way cartridge valves with spool position monitoring

RE 21015

Edition: 2014-11

Replaces: 2014-08



- ▶ Size 16 ... 160
- ▶ Component series 2X; 6X; 7X
- ▶ Maximum operating pressure of 420 bar
- ▶ Maximum flow of 25.000 l/min

Features

- ▶ Functional product design
- ▶ Modular design (see data sheet 21010)
 - Cartridge valve with various options
 - Control covers in a wide range of versions for achieving selected functions
 - Electronic or hydraulic monitoring of the switch position
- ▶ Power and flow-optimized design
 - High flows
 - Low pressure drops
 - High switching speeds
 - Low leakage oil flows
- ▶ Robust design
 - High reliability
 - Long service life
- ▶ Other features
 - Small installation size, low weight
 - Easy to service

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General Information

Inductive position switch

Contactless position switches with integrated switching amplifiers switch shortly before the spool position to be monitored is reached. The spool position reached is displayed by a binary signal.

Advantages of the position switches:

- ▶ Short-circuit-proof
- ▶ Direct monitoring of the spool position at the control spool
- ▶ Long life cycle
- ▶ High reliability due to no use of dynamic seals
- ▶ Reaction time of the switch upon operation approx. 15 ms.

Notes:

Valves with inductive position switches and proximity sensors in safety-relevant controls may only be assembled and commissioned by hydraulically and electrically trained experts. Service work requires special tools and equipment. This work may only be performed by authorized specialists or in the factory!

Improper work at safety equipment leads to a risk of personal injury and damage to property!

- ▶ The valve components are coordinated with each other in the production plant and adjusted during assembly. They must not be interchanged. In case of valve or position switch defects, the entire valve must be exchanged!
- ▶ The factory setting of the position switch must not be changed. The position switch may only be set by Bosch Rexroth.
- ▶ The position switch must be automatically monitored by the machine control to prevent initiation of a new machine cycle even if the safety is called up on the position switch.

Components of the system

Cartridge element (seat valve design with damping noses)

Cartridge valves are hydraulically controlled seat or spool valves with two working ports A and B, as well as a control port X or two control ports X and Z for versions with differential spool. Y is usually the leakage oil connection. The valves are available in the sizes 16, 25, 32, 40, 50, 63, 80, 100, 125 and 160.

The main criteria for determining the size are the flow to be controlled, as well as the flow resistances of the cartridge valves and their area ratios.

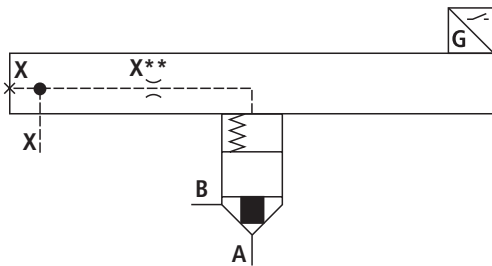
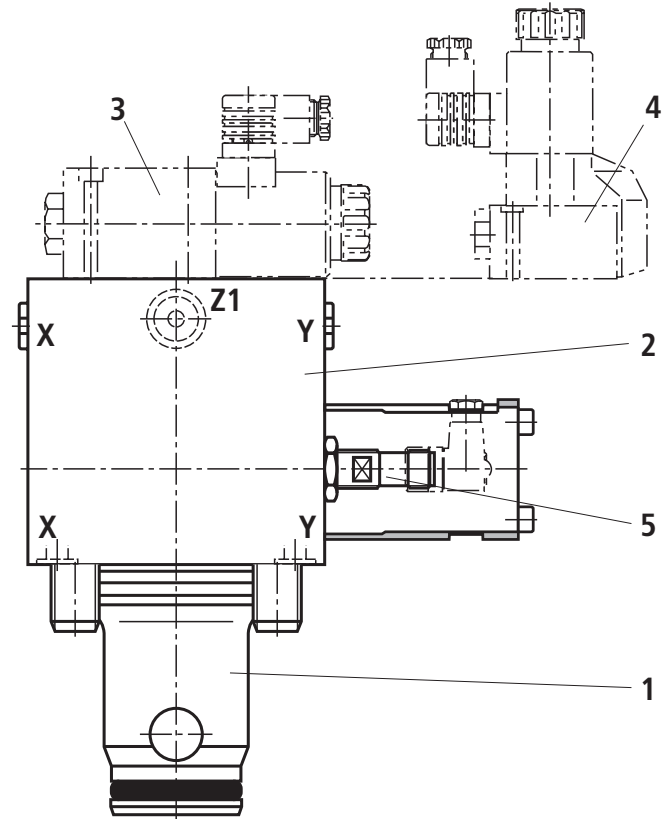
Control cover

The control cover (2) closes the bore of the installation elements. It also acts as a link between the cartridge valve and the pilot control valve.

Pilot control valve

With control covers for setting up a directional spool valve (3) or seat valve (4), the positions of the ports are arranged according to ISO 4401 and DIN 24340

The cartridge element (1) and the control cover (2) form a functional unit. It is calibrated in the factory and must not be dismantled or combined with other foreign matter. The mounted position switch (5) monitors the closed spool position.



Function, section, 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.

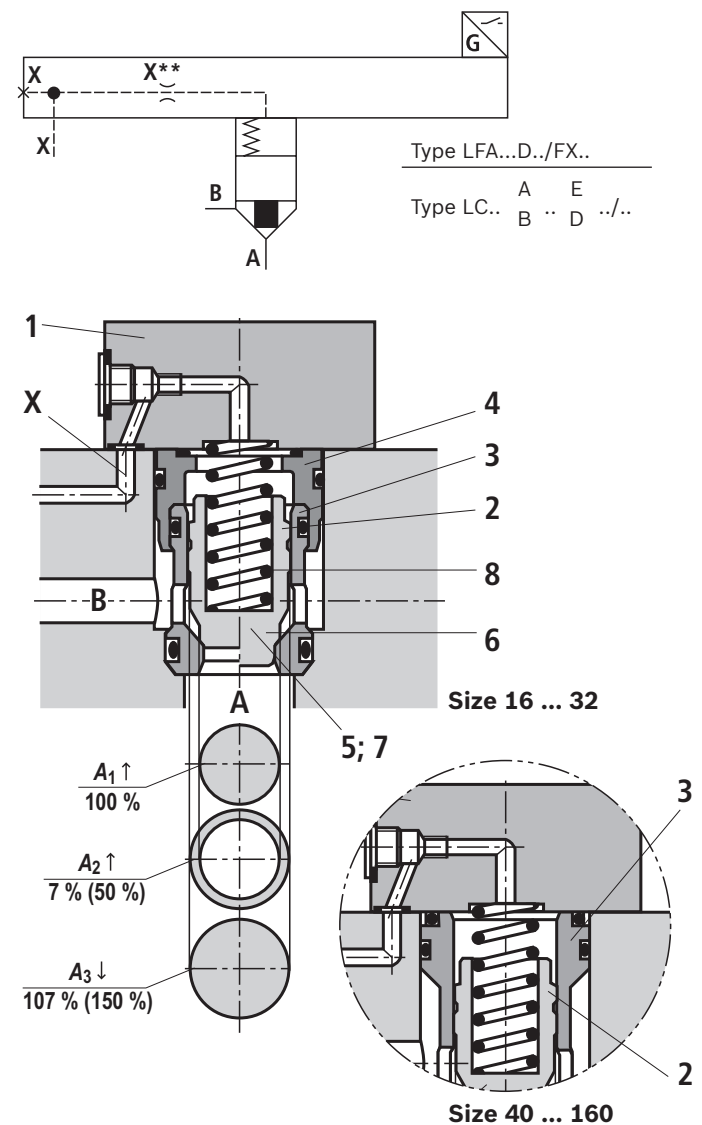
2-way cartridge valves consist mainly of a control cover (1) and an installation kit (2). The control cover contains the control bores and stroke limitation, hydraulically controlled directional seat valve or a shuttle valve depending on the overall function required. Electrically operated directional 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. Area A_3 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 the area regarded as 100% A_1 on the seat.

The following applies:

Area A_1 and A_2 act in the opening direction. Area A_3 and the springs act in the 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.



For the installation bore and connection dimensions see data sheet 21010.

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

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
LFA			-	/													

02										03	04	05	06	07	08	09	10	11	12	13	14	15	16	...
Size										Type	Component series	Area ratio	Set the cracking pressure	Damping	Spool position monitoring	Remote control port	Nozzles in the channel ¹⁾						...	
16	25	32	40	50	63	80	100	125	160								A	B	P	T	X	F	Z1	...
x	x	x	x	x	x	x	x	x	x	E		x	x	D		F					x			
x	x	x	x	x	x	x	x	x	•	E15		x	x	D		F					x		x	
x	x	x								EM		x	x	D									x	
x	x	x								EM19		x	x	D									x	
x	x	x	x	x	x	x	x	x	x	EH2		x	x	D		F					x			
x	x	x	x	x	x					EWMA		x	x	D				x	x			x	x	
x	x	x	x	x	x					EWMB		x	x	D				x	x			x	x	
x	x	x	x	x	x	x	•	•	•	EWA		x	x	D			x		x	x				
x	x	x	x	x	x	x	•	•	•	EWB		x	x	D				x	x	x				
•	x	x	x	x	x					EHWMA2		x	x	D			x		x	x		x	x	
•	x	x	x	x	x					EHWMB2		x	x	D				x	x	x		x	x	
x	x	x	x	x	x	•	•	•	•	EGWA		x	x	D			x		x	x			x	
x	x	x	x	x	x	•	•	•	•	EGWB		x	x	D				x	x	x			x	
x	x	x	x	x	x	•	•	•	•	EKWA		x	x	D			x		x	x			x	
x	x	x	x	x	x	•	•	•	•	EKWB		x	x	D				x	x	x			x	
x	x	x	x	x	x	x				D7		x	x	D										
x	x	x	x	x	x	x				H2-7		x	x	D										
	x									E51		x	x	E		F								
	x									E52		x	x	E		F								
	x									E76		x	x	D/E		F								
	x									E78		X	x	E										
	x									E79		x	x	E										

04	Component series 70 to 79 (70 to 79: unchanged installation and connection dimensions)	7X
	Component series 60 to 69 (60 to 69: unchanged installation and connection dimensions)	6X
	Component series 20 to 29 (20 to 29: unchanged installation and connection dimensions)	2X

Spool design (for area ratio see section on page 5, for symbols see right)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
	$A_1 : A_2 = 1 : 1$	CD
06	Cracking pressure 0.5 bar	05
	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 3.0 bar (only size 125)	30
	Cracking pressure 4.0 bar (only size 125 and 160)	40
07	Valve poppet with damping nose	D
	Valve poppet without damping nose (only version "Q8G08")	E

Spool position monitoring

08	Hydraulic	no code
	Electric (depending on size)	QMG24
	Electric (depending on size)	Q6G24
	Electric (NAMUR)	Q8G08

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

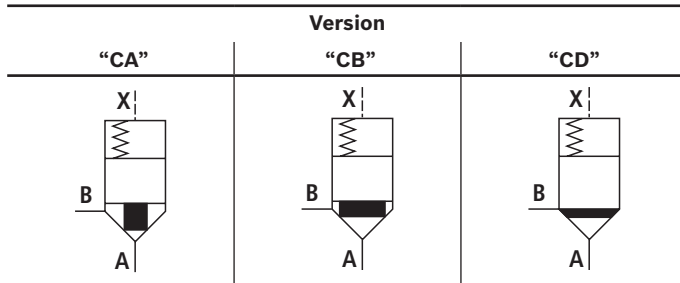
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
LFA			-	/													

Seal material

17	NBR seals	no code
	FKM seals	V
	Observe compatibility of seals with hydraulic fluid used! (Other seals on request)	

Ports, plug screws and nozzles

18	Metric	no code
	UNC	/12



x = available

• = on request

1) Sequence of the nozzles for the order and display in symbols and circuit diagrams.

Exact information is available on the pages for the individual control cover versions and page 69.

Notice:

The cartridge valve is included in the type designation!

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 Ø 1.2 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	EWM., EW., EHWM., EGW., EKW.	6	4/3, 4/2 and 3/2 directional spool valve, direct operated (subplate mounting)
63 ... 100	EWM., EW., EHWM., EGW., EKW.	10	2/2, 3/2, 4/2 directional seat valve, direct operated (subplate mounting)
125	EW., EGW., EKW.	10	
160	EW., EGW., EKW.	25	

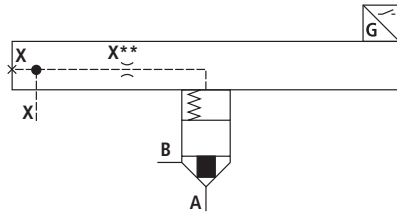
Note:

- ▶ 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 delivery.

Symbols

Version "E" (size 16 ... 160)

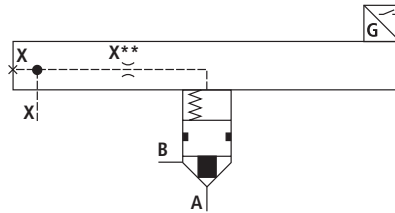
Control cover with electric close position monitoring, incl. installation kit



See page 18 ... 23

Version "E15" (size 16 ... 160)

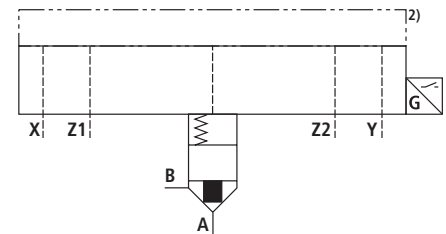
Control cover with electric close position monitoring, incl. installation kit with spool sealing



See page 24 ... 29

Version "EM" (size 16 ... 32)

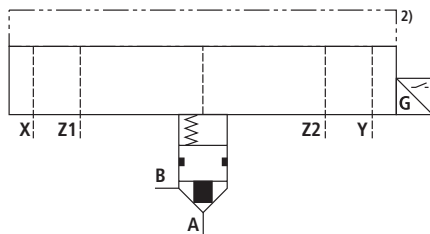
Control cover (intermediate cover) with electric monitoring of the close position, incl. installation kit and control cover holding option



See page 30 ... 31

Version "EM19" (size 16 ... 32)

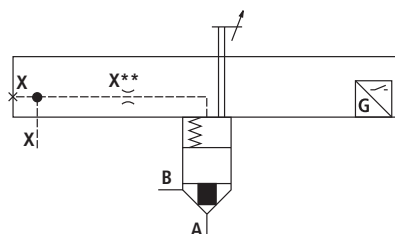
Control cover (intermediate cover) with electric monitoring of the close position, incl. installation kit with spool sealing and control cover holding option



See page 32 ... 33

Version "EH2" (size 16 ... 160)

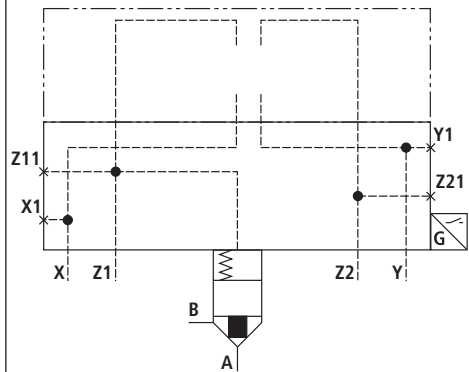
Control cover with electric close position and stroke limitation monitoring, incl. installation kit



See page 34 ... 41

Version "EWMA" (size 16 ... 63)

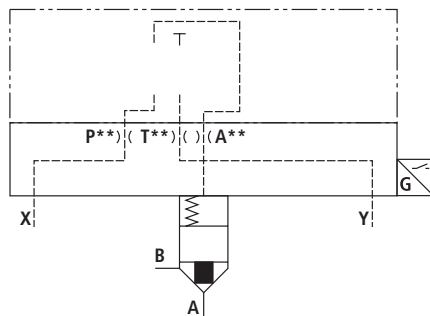
Control cover with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve with control port for switching a second valve, including installation kit



See page 42 ... 45

Version "EWA" (size 16 ... 80)

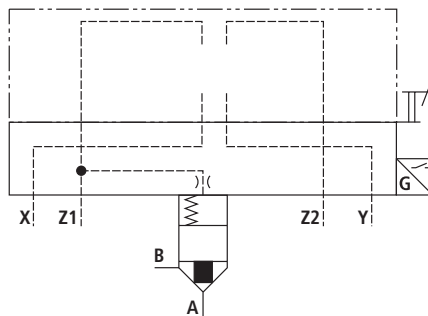
Control cover with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit



See page 46 ... 53

Version "EHWMA2" (size 25 ... 63)

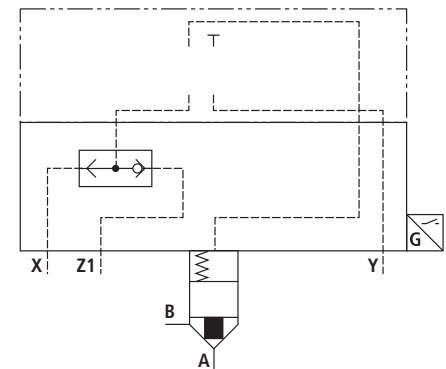
Control cover with electric monitoring of the close position and stroke limitation, for mounting a directional spool valve or directional seat valve with control port for switching a second valve, including installation kit.



See page 54 ... 57

Version "EGWA" (size 16 ... 63)

Control cover with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, with installed shuttle valve, incl. installation kit



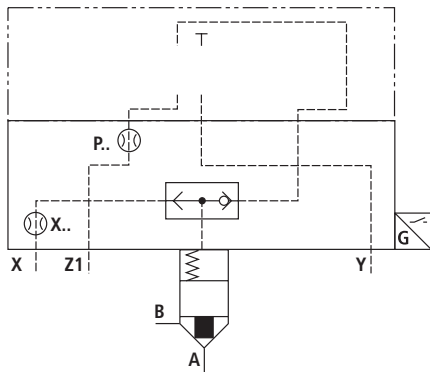
See page 58 ... 61

Notice: Basic symbols! Compulsory symbols in the following type descriptions!

Symbols

Version "EKWA" (size 16 ... 63)

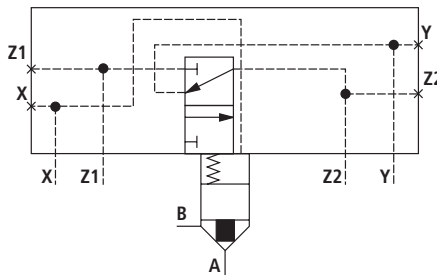
Control cover with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, with installed shuttle valve as check valve switch, incl. installation kit



See page 58 ... 61

Version "D7" (size 16 ... 80)

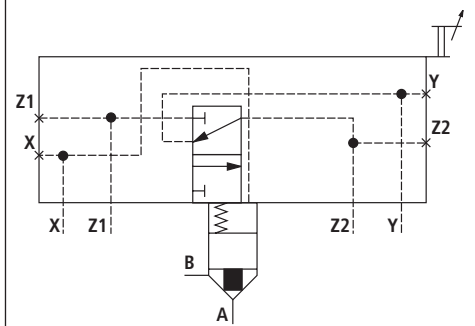
Control cover with hydraulic monitoring of the close position



See page 62 ... 63

Version "H2-7" (size 16 ... 80)

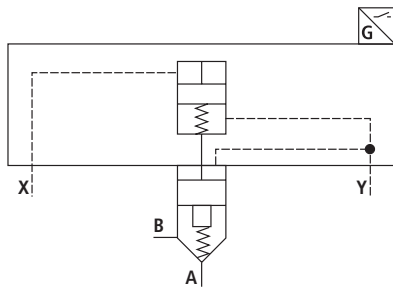
Control cover with hydraulic monitoring of the close position and stroke limitation



See page 64 ... 65

Version "E51" (size 25)

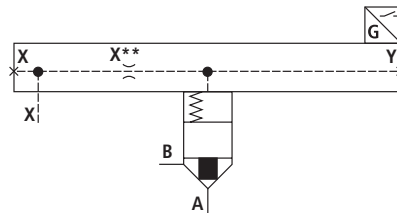
Control cover with electric monitoring of the close position and open zero position (NAMUR)



See page 66

Version "E52" (size 25)

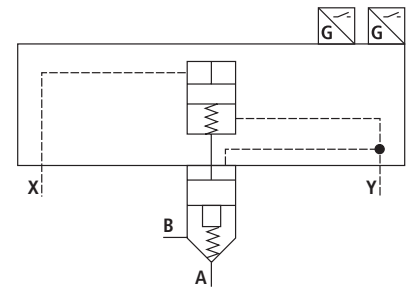
Control cover with electric monitoring of the close position (NAMUR)



See page 68

Version "E76" and "E79" (size 25)

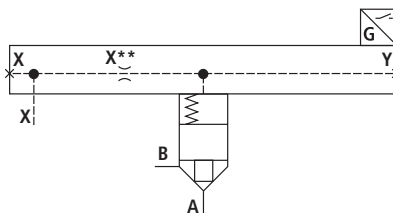
Control cover with electric monitoring of the close position and open zero position



See page 67

Version "E78" (size 25)

Control cover with electric monitoring of the close position



See page 68

Notice:

Basic symbols! Compulsory symbols in the following type descriptions!

Technical data

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

General		
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 400 (with position switch type QM) 420 (with position switch type Q6, Q8)
	▶ Port A, B, X, Z1, Z2	bar 315; 350 (depending on the mounted directional valve)
	▶ Port Y	bar depending on the maximum tank pressure of the mounted directional valve
	▶ With electrically monitored spool position	bar 400 (with position switch type QM) 420 (with position switch type Q6, Q8)
Maximum flow	l/min 25.000 (dependent on the size; see characteristic curves page 12 ... 14)	
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	Data sheet
Mineral oils	HL, HLP, HLPD, HVLP, HVLPD	NBR, FKM	DIN 51524	90220
Bio-degradable	▶ Insoluble in water	HETG	ISO 15380	90221
		HEES		
	▶ Soluble in water	HEPG	ISO 15380	
Flame-resistant	▶ Water free	HFDU, HFDR	ISO 12922	90222
	▶ Containing water	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	ISO 12922	on request

**Important information on hydraulic fluids:**

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

▶ Flame-resistant – containing water:

- Maximum pressure differential per control edge 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 life cycle of the components.

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

Technical data

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

Size of the annulus area

Area in cm ²	Version	Size									
		16	25	32	40	50	63	80	100	125	160
A ₁	"CA"	1.89	4.26	6.79	11.1	19.63	30.2	37.9	63.6	95	160.6
	"CB"	2.66	5.73	9.51	15.55	26.42	41.28	52.8	89.1	133.7	224.8
A ₂	"CA"	0.95	1.89	3.39	5.52	8.64	14.0	18.84	31.4	48	79.9
	"CB"	0.18	0.43	0.67	1.07	1.85	2.90	3.94	5.9	9.3	15.7

Spool form (damping nose)

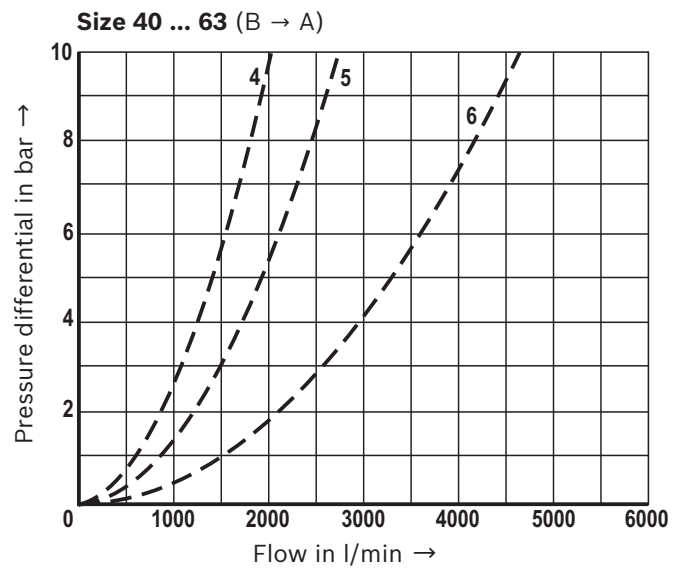
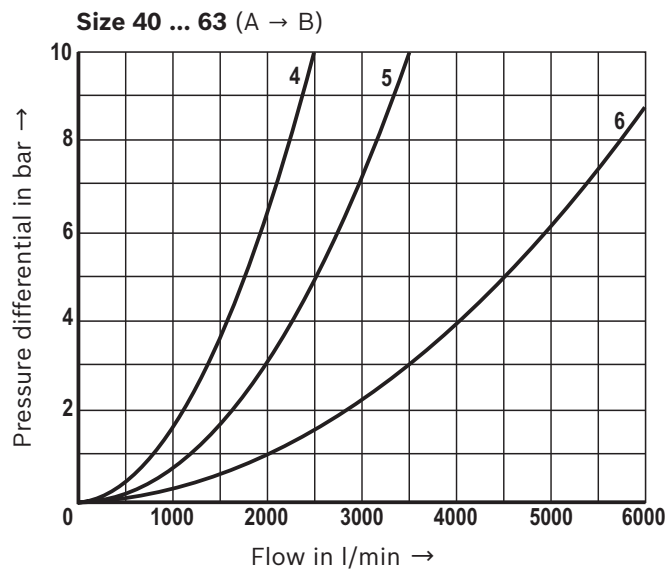
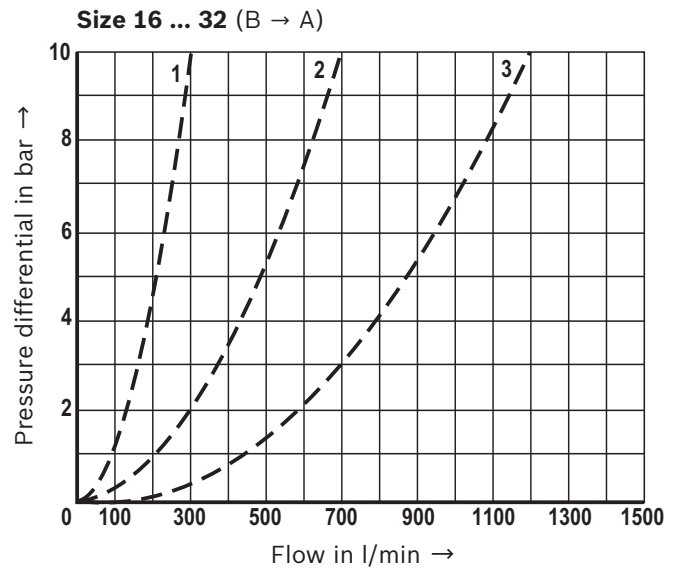
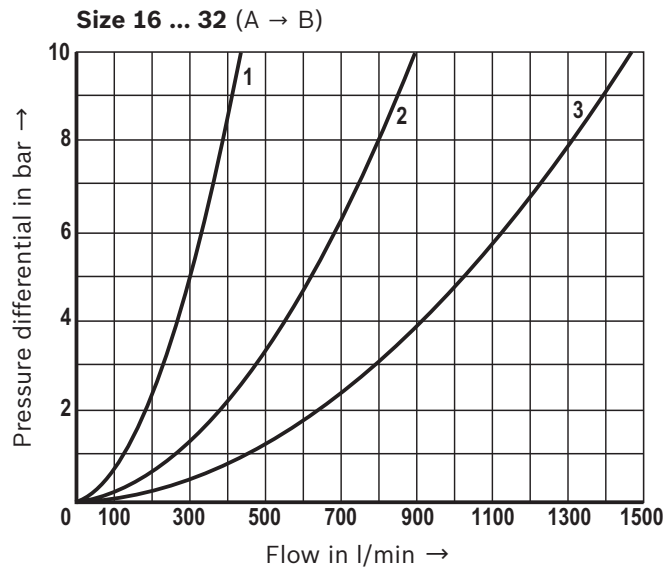
		Size									
		16	25	32	40	50	63	80	100	125	160
Stroke	cm	0.9	1.17	1.4	1.9	2.3	2.8	3.0	3.8	4.8	6.5
Pilot volume	cm ³	2.56	7.21	14.3	31.6	65.0	124	170	361	687	1563
Theoretical pilot flow ¹⁾	l/min	15.4	43.3	86	190	390	744	1020	2166	4122	9378

Cracking pressure in bar

	Version	Size									
		16	25	32	40	50	63	80	100	125	160
Direction of flow A to B	"CA10"	0.70	0.68	0.72	0.71	0.67	0.64	0.88	0.88	0.88	–
	"CA20"	2.03	2.18	2.12	2.02	2.01	2.0	1.75	1.75	1.76	1.94
	"CA30"	–	–	–	–	–	–	–	–	2.05	–
	"CA40"	3.50	3.90	3.80	4.0	4.11	3.8	3.13	3.04	–	–
	"CB10"	0.49	0.50	0.51	0.51	0.48	0.47	0.63	0.63	0.62	–
	"CB20"	1.44	1.62	1.52	1.44	1.5	1.5	1.26	1.25	1.25	1.4
	"CB30"	–	–	–	–	–	–	–	–	1.45	–
	"CB40"	2.48	2.90	2.70	2.86	3.05	2.8	2.25	2.17	–	–
Direction of flow B to A	"CA10"	1.38	1.53	1.42	1.43	1.47	1.37	1.77	1.78	1.73	–
	"CA20"	4.05	4.91	4.25	4.06	4.57	4.33	3.53	3.54	3.50	3.9
	"CA30"	–	–	–	–	–	–	–	–	4.0	–
	"CA40"	6.96	8.74	7.6	8.05	9.34	8.15	6.3	6.2	–	–
	"CB10"	7.43	6.69	7.24	7.37	6.88	6.62	8.4	9.4	8.9	–
	"CB20"	21.3	21.5	21.6	20.9	21.4	20.9	16.9	18.7	17.9	20
	"CB30"	–	–	–	–	–	–	–	–	20.7	–
	"CB40"	36.6	38.3	38.6	41.5	43.6	39.4	30.2	32.5	–	–

¹⁾ Switching time = 10 ms

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

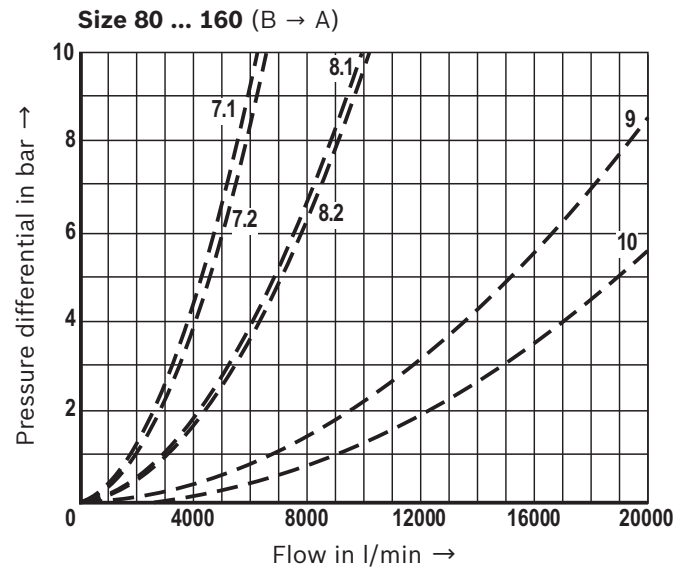
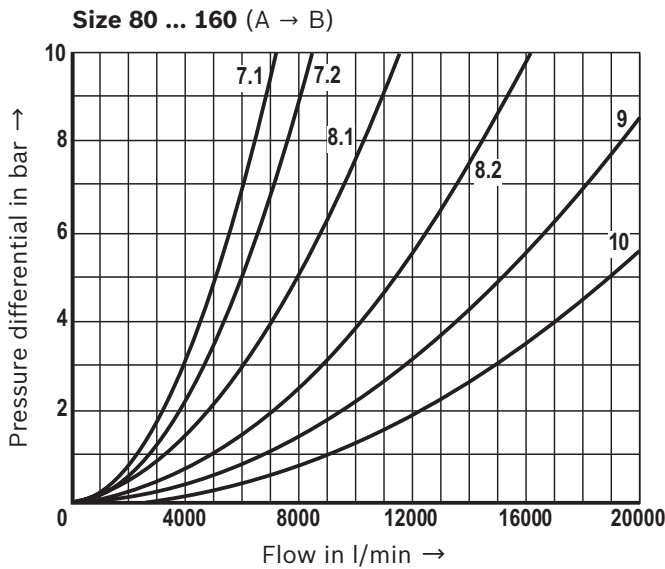


Notice:

The indicated characteristic curves have been determined without inserted springs.

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

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

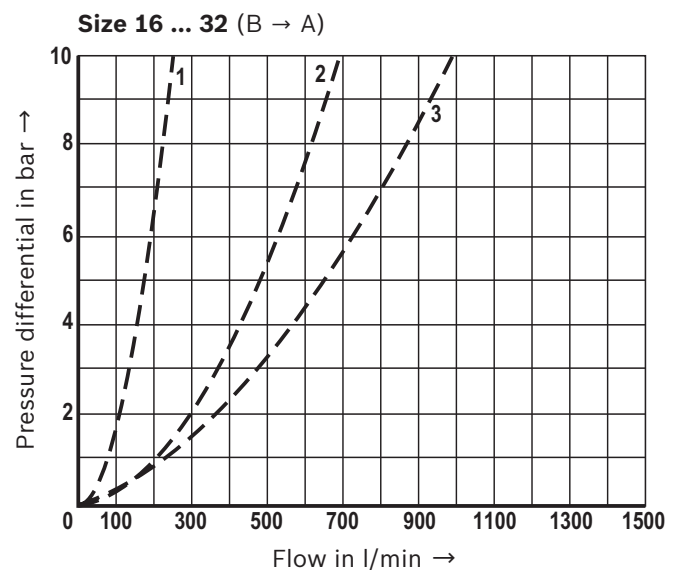
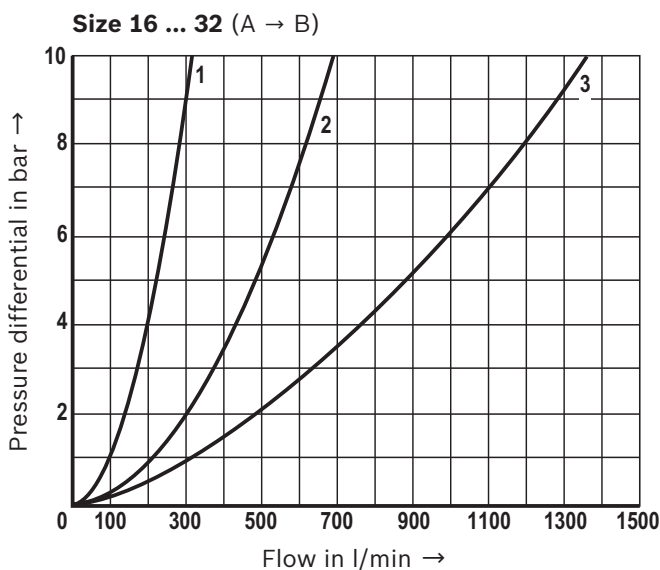


Notice:

The indicated characteristic curves have been determined without inserted springs.

- 7.1 Size 80, spool design “CA”
- 7.2 Size 80, spool design “CB” and “CD”
- 8.1 Size 100, spool design “CA”
- 8.2 Size 100, spool design “CB” and “CD”
- 9 Size 125
- 10 Size 160

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

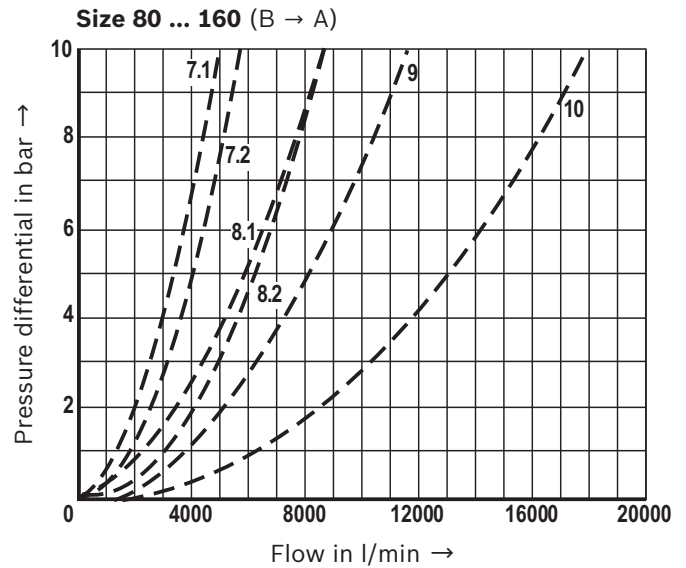
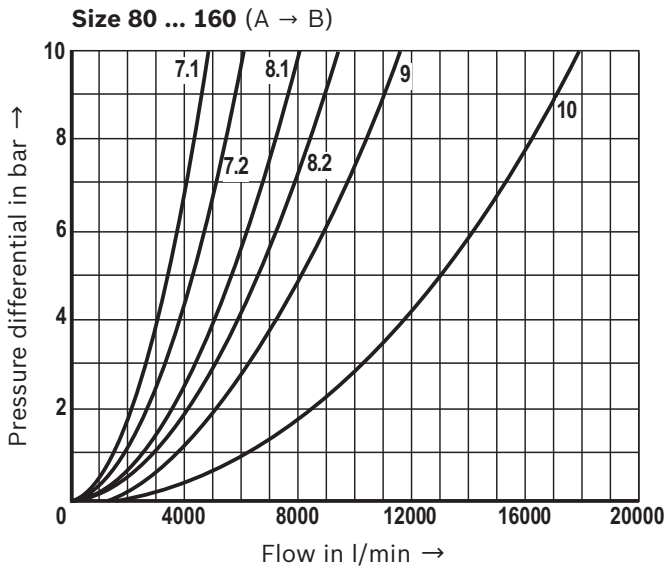
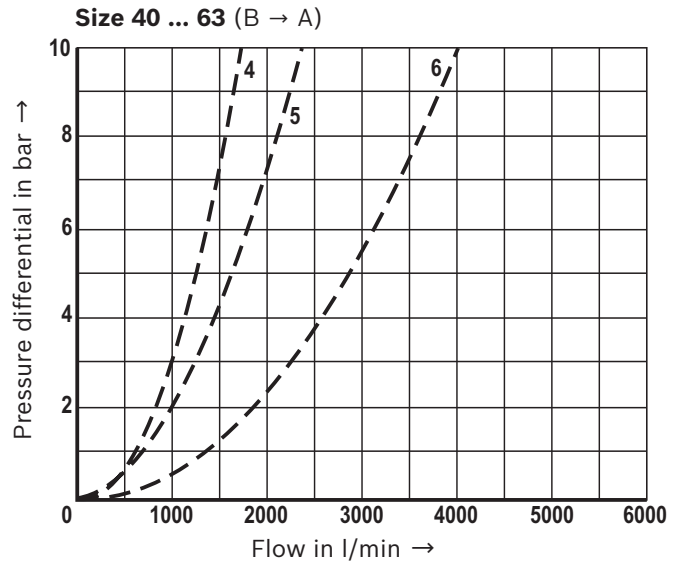
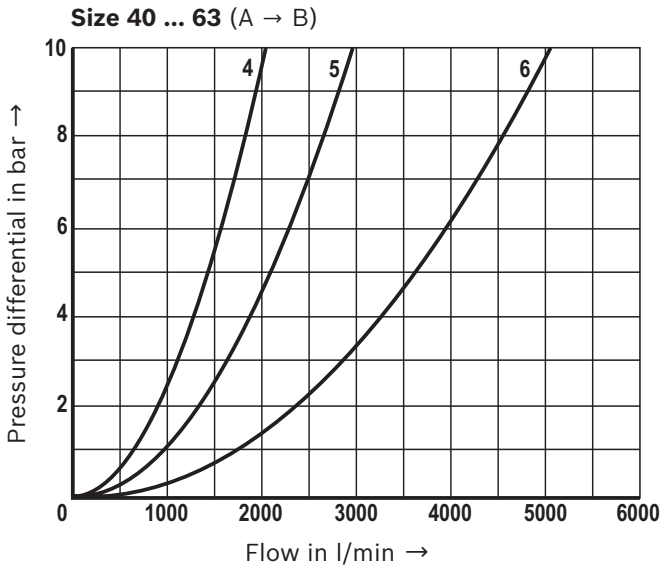


Notice:

The indicated characteristic curves have been determined without inserted springs.

- 1 Size 16
- 2 Size 25
- 3 Size 32

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



Notice:

The indicated characteristic curves have been determined without inserted springs.

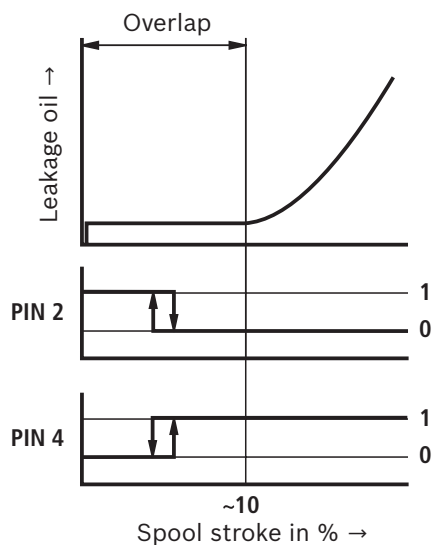
- 4 Size 40
- 5 Size 50
- 6 Size 63
- 7.1 Size 80, spool design “CA”
- 7.2 Size 80, spool design “CB” and “CD”
- 8.1 Size 100, spool design “CA”
- 8.2 Size 100, spool design “CB” and “CD”
- 9 Size 125
- 10 Size 160

Inductive position switch type QM: Electrical connection

The electric connection is realized via a 4-pin mating connector (separate order, see page 70) with connection thread M12 x 1.

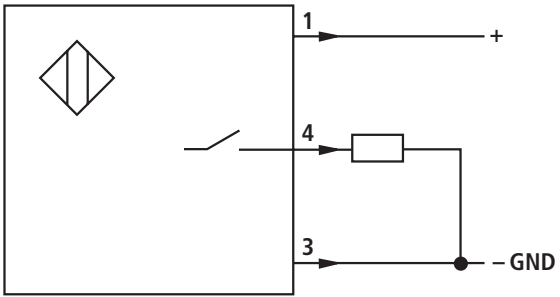
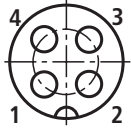
Connection voltage:	24 V +30%/-15%, direct voltage
Admissible residual ripple:	≤ 10%
Load capacity:	maximum 400 mA
Switching outputs:	PNP transistor outputs, load between switching outputs and GND
Pinout:	
	1 +24 V 2 Switching output: 400 mA 3 0 V, GND 4 Switching output: 400 mA

Inductive position switch type QM: Switching logic

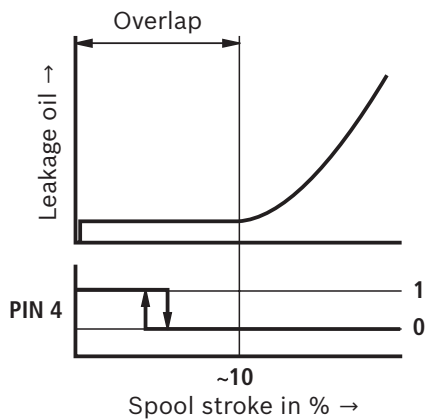


Inductive position switch, type Q6: Electrical connection

The electric connection is realized via a 4-pin mating connector (separate order, see page 70) with connection thread M12 x 1.

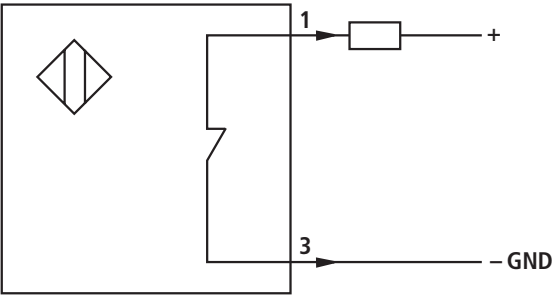
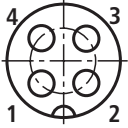
Connection voltage:	24 V +30%/-15%, direct voltage								
Admissible residual ripple:	≤ 10%								
Load capacity:	maximum 200 mA								
Switching outputs:	PNP transistor outputs, load between switching outputs and GND								
									
Pinout:	<table border="1"> <tr> <td>1</td> <td>+24 V</td> </tr> <tr> <td>2</td> <td>free</td> </tr> <tr> <td>3</td> <td>0 V, GND</td> </tr> <tr> <td>4</td> <td>Switching output: 200 mA</td> </tr> </table>	1	+24 V	2	free	3	0 V, GND	4	Switching output: 200 mA
1	+24 V								
2	free								
3	0 V, GND								
4	Switching output: 200 mA								
									

Inductive position switch, type Q6: Switching logic

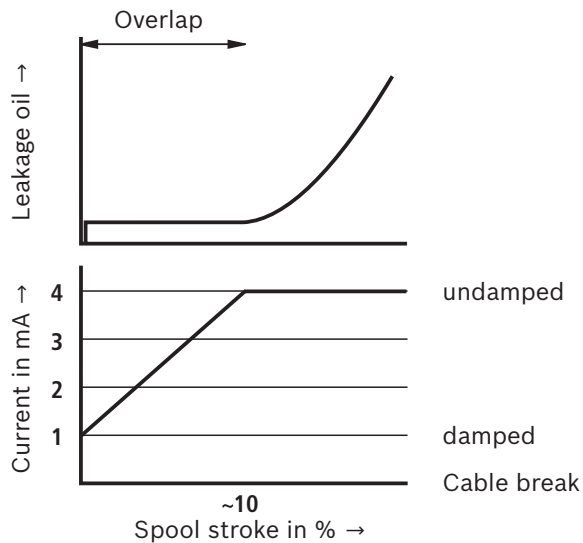


Inductive position switch, type Q8: Electrical connection

The electric connection is realized via a 4-pin mating connector (separate order, see page 70) with connection thread M12 x 1.

Connection voltage:	8.2 V +9%/-6%, direct voltage								
Maximum current consumption, damped:	1 mA								
Maximum current consumption, undamped:	4 mA								
Switching outputs:	NAMUR switch								
									
Pinout:									
	<table border="1"> <tr> <td>1</td> <td>Power source</td> </tr> <tr> <td>2</td> <td>-</td> </tr> <tr> <td>3</td> <td>0 V, GND</td> </tr> <tr> <td>4</td> <td>-</td> </tr> </table>	1	Power source	2	-	3	0 V, GND	4	-
1	Power source								
2	-								
3	0 V, GND								
4	-								

Inductive position switch, type Q8: Switching logic



Control cover “E” with electric close position monitoring, incl. installation kit: Size 16 ... 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		E	-	7X	/			D	QMG24	F						1)

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

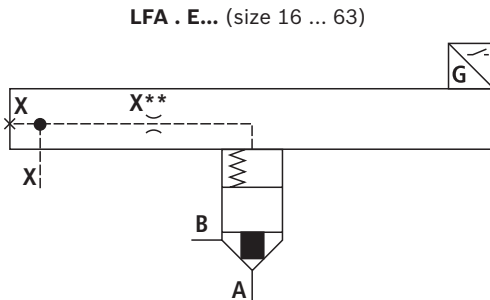
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 0.5 bar (only size 63)	05
	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

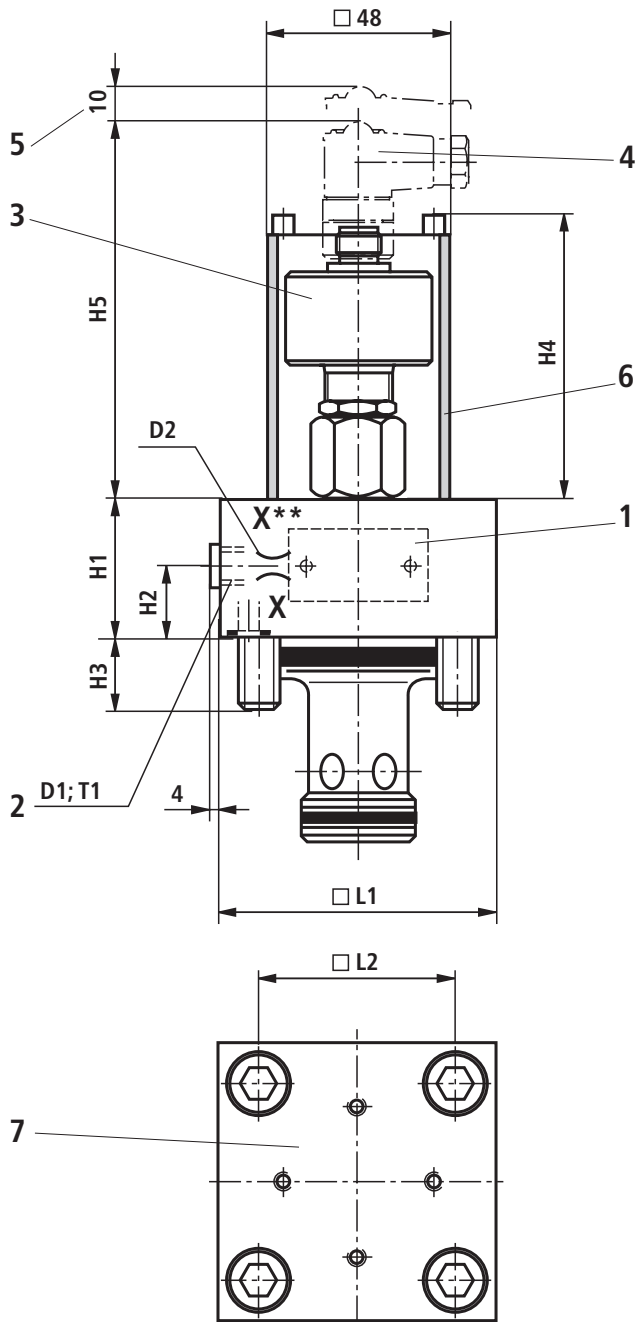
△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See “General information on ordering codes for control cover type LFA...” page 6.



Control cover “E” with electric close position monitoring, incl. installation kit: Size 16 ... 63
(dimensions in mm)



Size	16	25	32	40	50	63
D1	G1/8	G1/4	G1/4	G1/2	G1/2	G3/4
D2	M6	M6	M6	M8 x 1	M8 x 1	M8 x 1
H1	50	50	70	110	120	150
H2	12	16	16	83	93	113
H3	15	24	28	32	34	50
H4	78	78	78	98	98	98
H5	105	105	105	123	123	123
□ L1	65	85	100	125	140	180
□ L2	46±0.1	58±0.15	70±0.15	85±0.2	100±0.2	125±0.2
T1	8	12	12	14	14	16

- 1 Name plate
- 2 Port X optionally as a threaded connection
- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 7 Shown without position switch

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 15.

Control cover “E” with electric close position monitoring, incl. installation kit: Size 80 ... 100

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		E	-	6X	/		D	Q6G24	F							1)

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

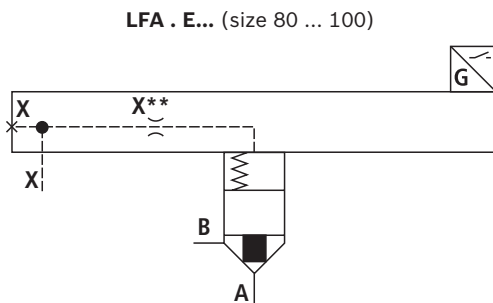
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 0.5 bar (only size 100)	05
	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

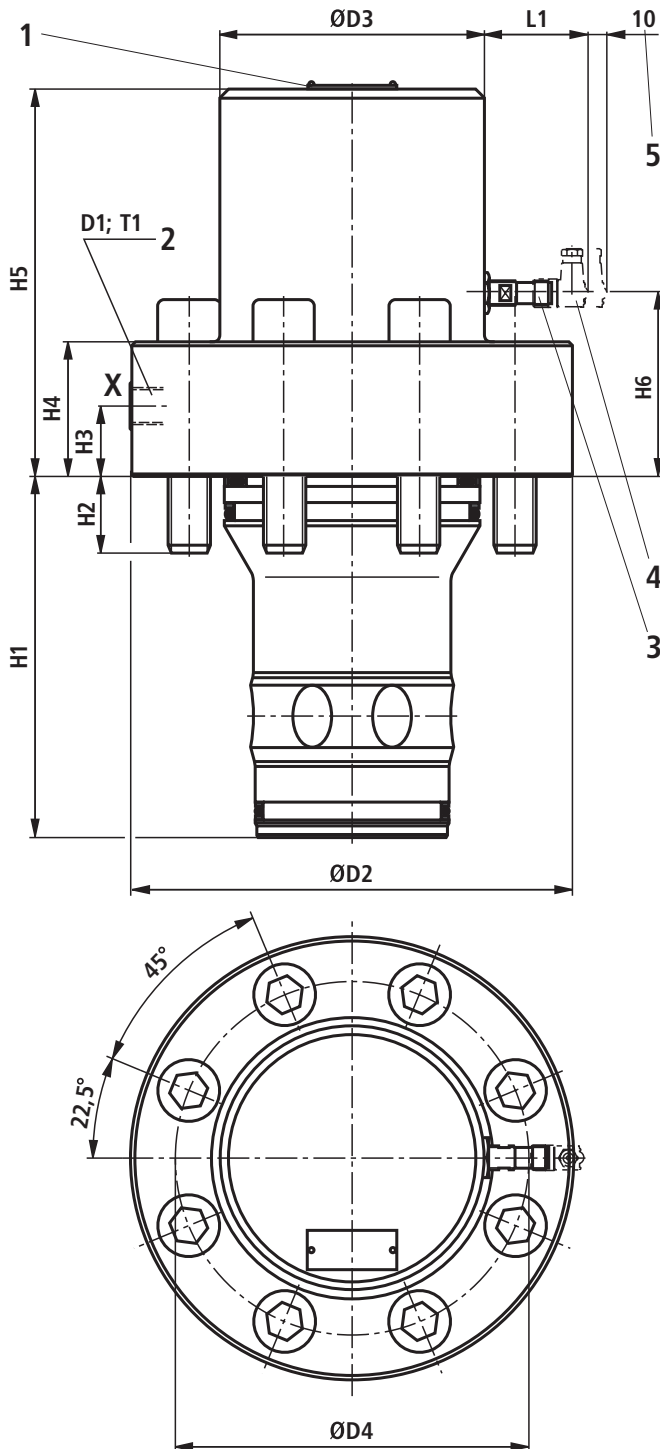
△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover "E" with electric close position monitoring, incl. installation kit: Size 80 ... 100
(dimensions in mm)



Size	80	100
D1	G1/2	G1
ØD2	250	300
ØD3	150	175
ØD4	200±0.2	245±0.3
H1	205	245
H2	45	52.5
H3	40	35
H4	76.5	88.5
H5	220	250
H6	105	140.5
L1	38	29.5
T1	14	18

- 1 Name plate
- 2 Port X optionally as a threaded connection
- 3 Position switch type Q6
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 16.

Control cover “E” with electric close position monitoring, incl. installation kit: Size 125 ... 160

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		E	-	2X	/			D	Q6G24	F						1)

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

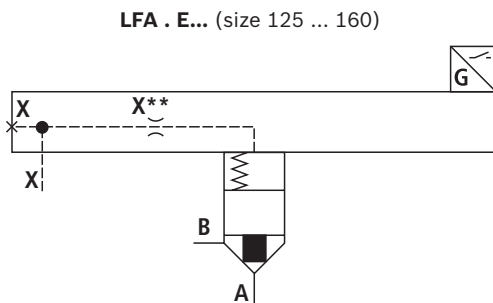
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 3.0 bar (only size 125)	30
	Cracking pressure 4.0 bar	40

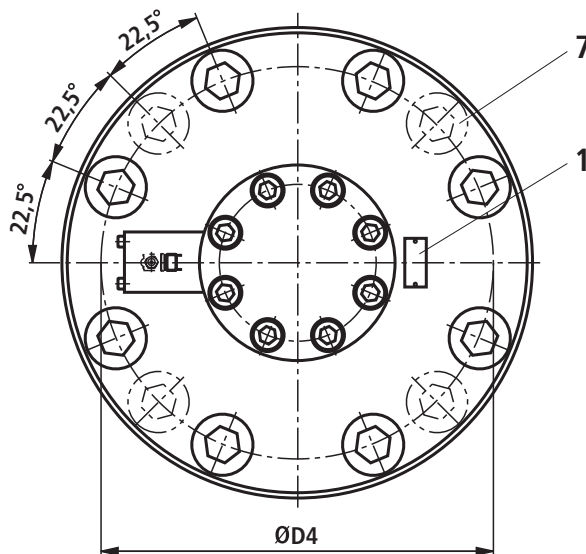
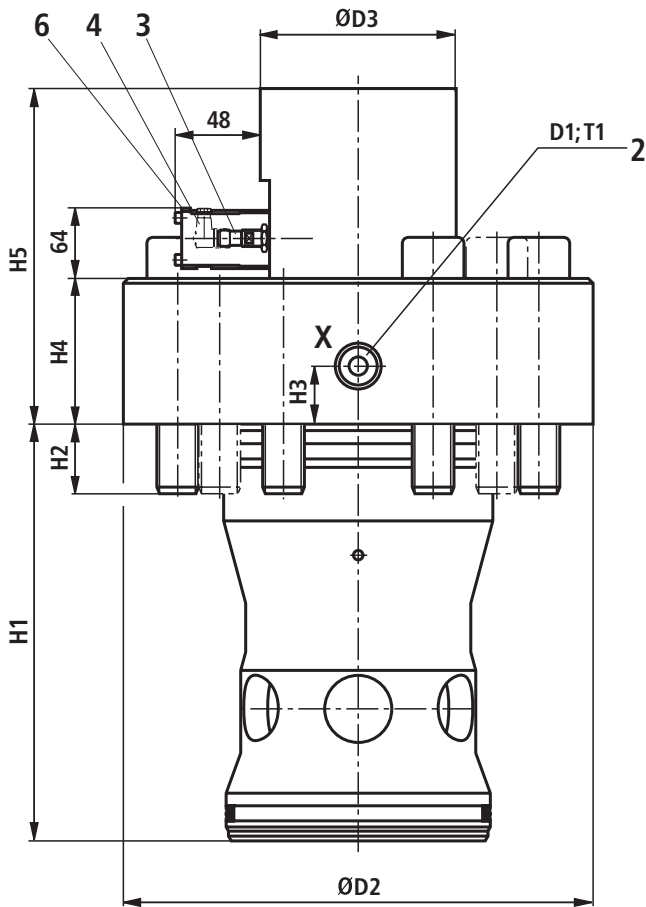
△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “E” with electric close position monitoring, incl. installation kit: Size 125 ... 160
(dimensions in mm)



Size	125	160
D1	G1	G3/4
ØD2	380	480
ØD3	230	200
ØD4	300±0.2	400±0.3
H1	300±0.15	425±0.15
H2	61	74
H3	50	60
H4	100	150
H5	310	344
T1	18	18

- 1 Name plate
- 2 Port X as a threaded connection
- 3 Position switch type Q6
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 6 Protective housing
- 7 4 additional valve mounting screws with size 160

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 16.

Control cover “E15” with electric close position monitoring, incl. installation kit with spool sealing
Size 16 ... 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		E15	-	7X	/			D	QMG24	F						1)

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

Spool design (for area ratio see section on page 5)

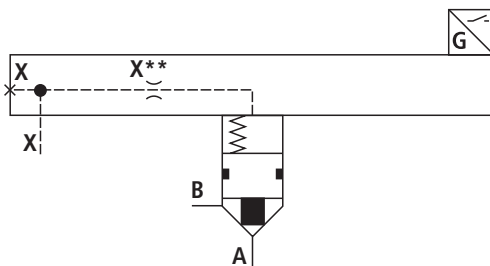
05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
	$A_1 : A_2 = 1 : 1$	CD
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required

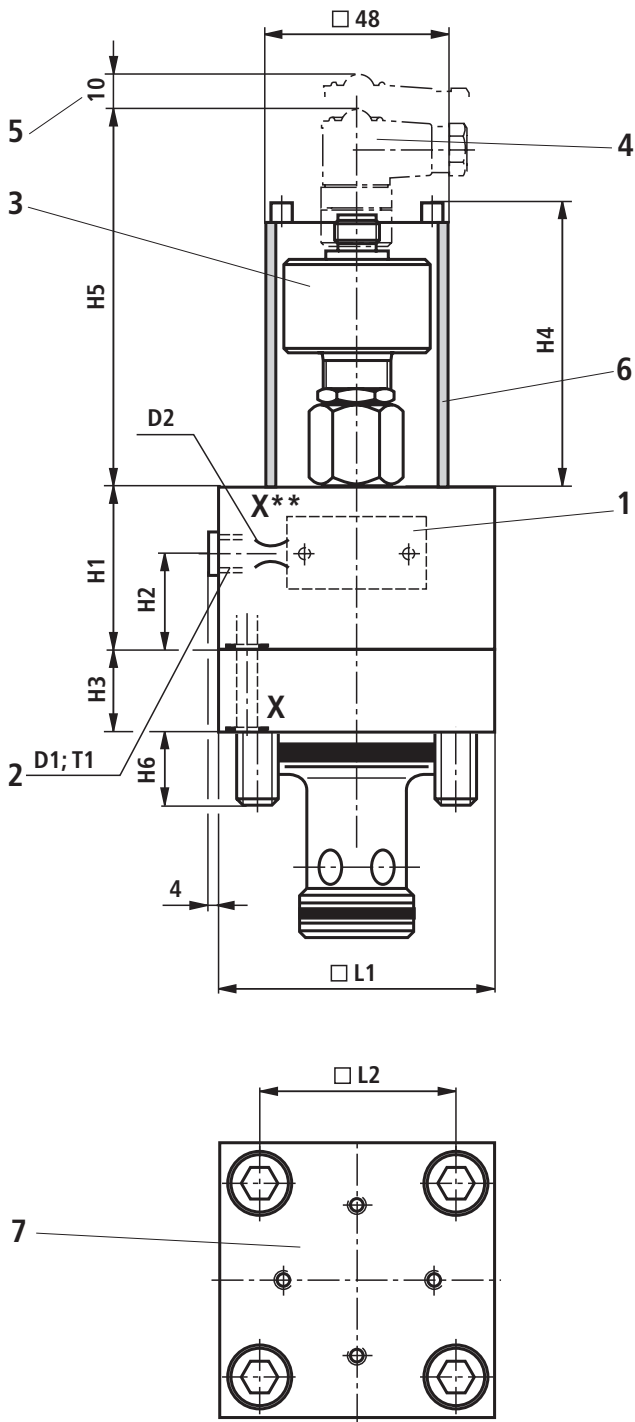
Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.

LFA . E15... (size 16 ... 63)



Control cover “E15” with electric close position monitoring, incl. installation kit with spool sealing
 Size 16 ... 63 (dimensions in mm)



Size	16	25	32	40	50	63
D1	G1/8	G1/4	G1/4	G1/2	G1/2	G3/4
D2	M6	M6	M6	M8 x 1	M8 x 1	M8 x 1
H1	50	50	70	110	120	150
H2	29.5	29.5	47.5	83	93	113
H3	25	25	30	30	40	...
H4	78	78	78	98	98	98
H5	105	105	105	123	123	123
H6	15	24	28	32	34	50
□ L1	65	85	100	125	140	180
□ L2	46±0.1	58±0.15	70±0.15	85±0.2	100±0.2	125±0.2
T1	8	12	12	14	14	16

- 1 Name plate
- 2 Port X as a threaded connection
- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 7 Shown without position switch

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 15.

Control cover “E15” with electric close position monitoring, incl. installation kit with spool sealing
 Size 80 ... 100

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	E15	-	6X	/		D	Q6G24	F								1)

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

Spool design (for area ratio see section on page 5)

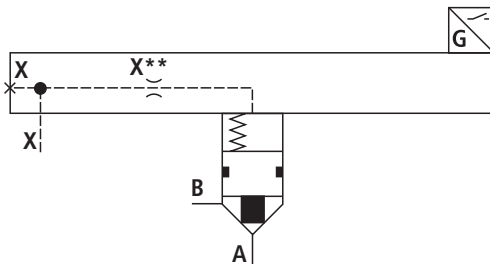
05	A ₁ : A ₂ = 2 : 1 (annulus area = 50%; standard version)	CA
	A ₁ : A ₂ = 14.3 : 1 (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required

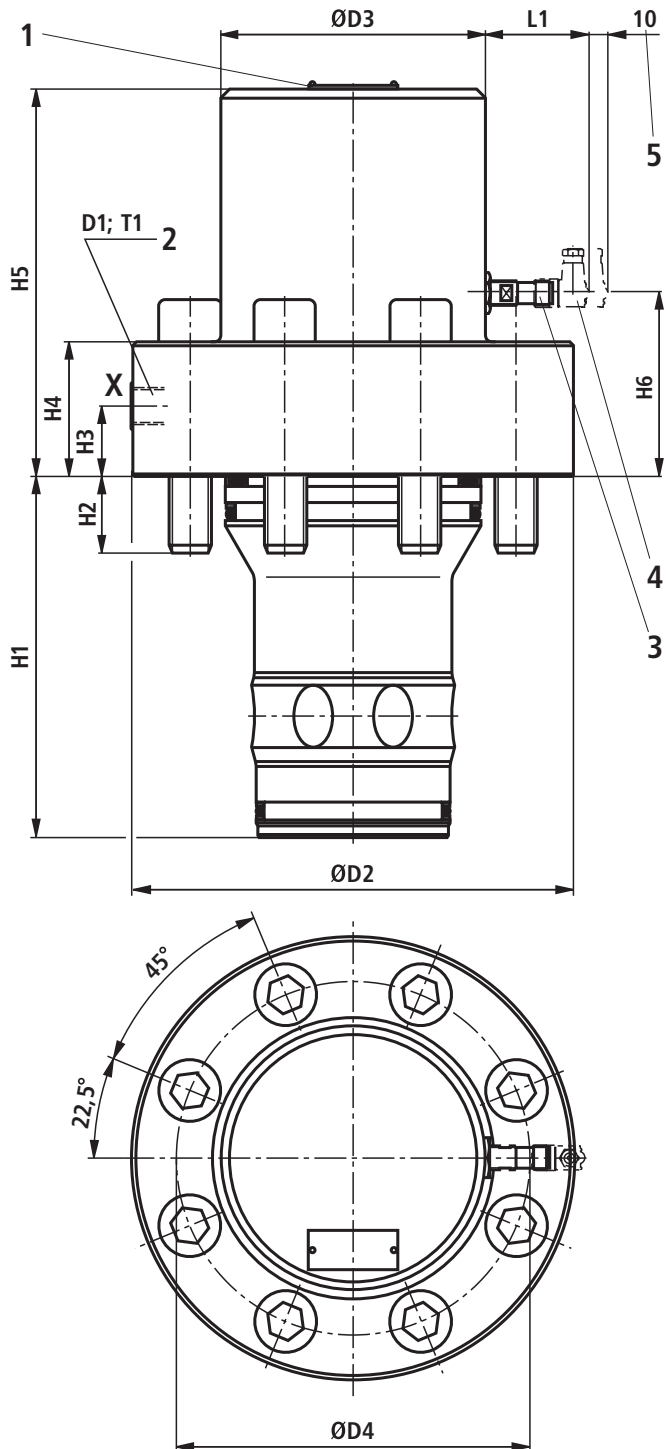
Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.

LFA . E... (size 80 ... 100)



Control cover “E15” with electric close position monitoring, incl. installation kit with spool sealing
Size 80 ... 100 (dimensions in mm)



Size	80	100
D1	G1/2	G1
ØD2	250	300
ØD3	150	175
ØD4	200±0.2	245±0.3
H1	220	250
H2	45	52.5
H3	40	35
H4	76.5	88.5
H5	220	250
H6	105	140.5
L1	38	29.5
T1	14	18

- 1 Name plate
- 2 Port X as a threaded connection
- 3 Position switch type Q6
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 16.

Control cover “E15” with electric close position monitoring, incl. installation kit with spool sealing
Size 160

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	160	E15	-	2X	/			D	Q6G24	F						1)

14
Nozzle in channel (Ø in 1/10 mm)
X
X**

Spool design (for area ratio see section on page 5)

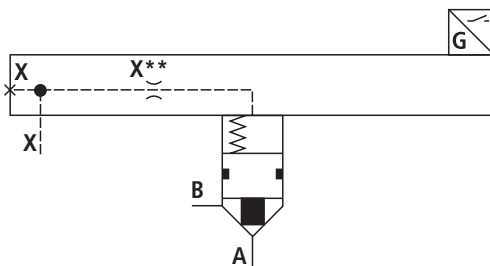
05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required

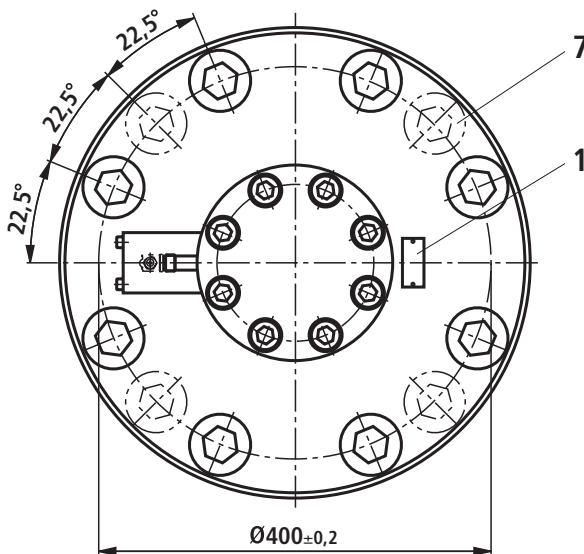
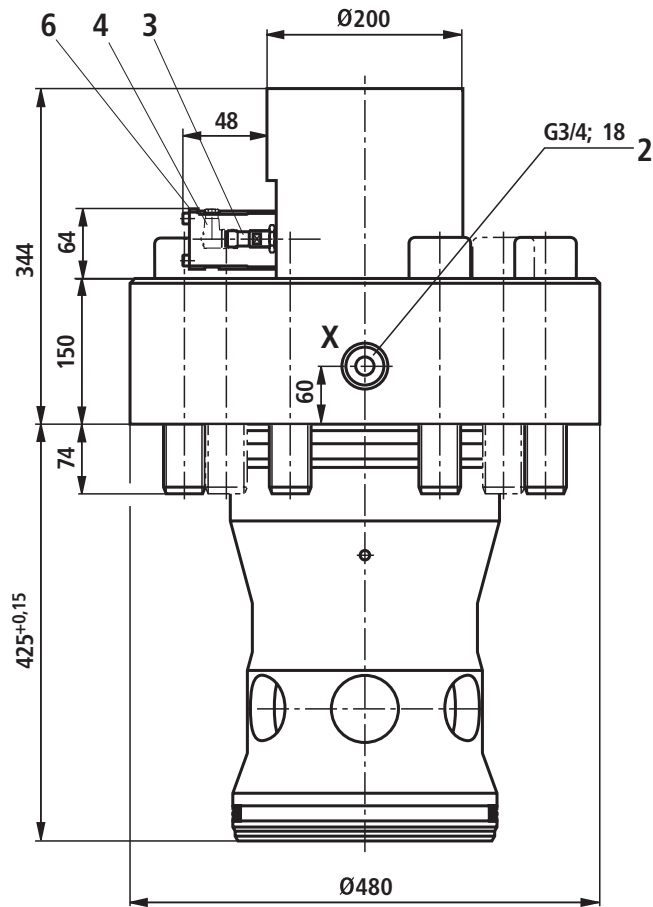
Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.

LFA . E... (size 160)



Control cover "E15" with electric close position monitoring, incl. installation kit with spool sealing
Size 160 (dimensions in mm)



- 1 Name plate
- 2 Port X as a threaded connection
- 3 Position switch type Q6
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 6 Protective housing
- 7 4 additional valve mounting screws with size 160

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 16.

Control cover (intermediate cover) **“EM”** with electric monitoring of the close position, incl. installation kit and control cover holding option: Size 16 ... 32

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		EM	-	7X	/			D	QMG24							1)

02		
Size		
16	25	32

Spool design (for area ratio see section on page 5)

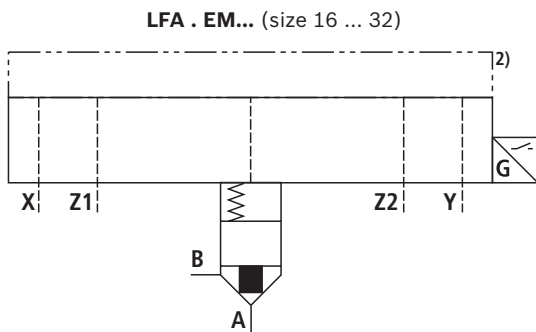
05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
	$A_1 : A_2 = 1 : 1$	CD
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

⚠ Nozzle possible, must be specified if required

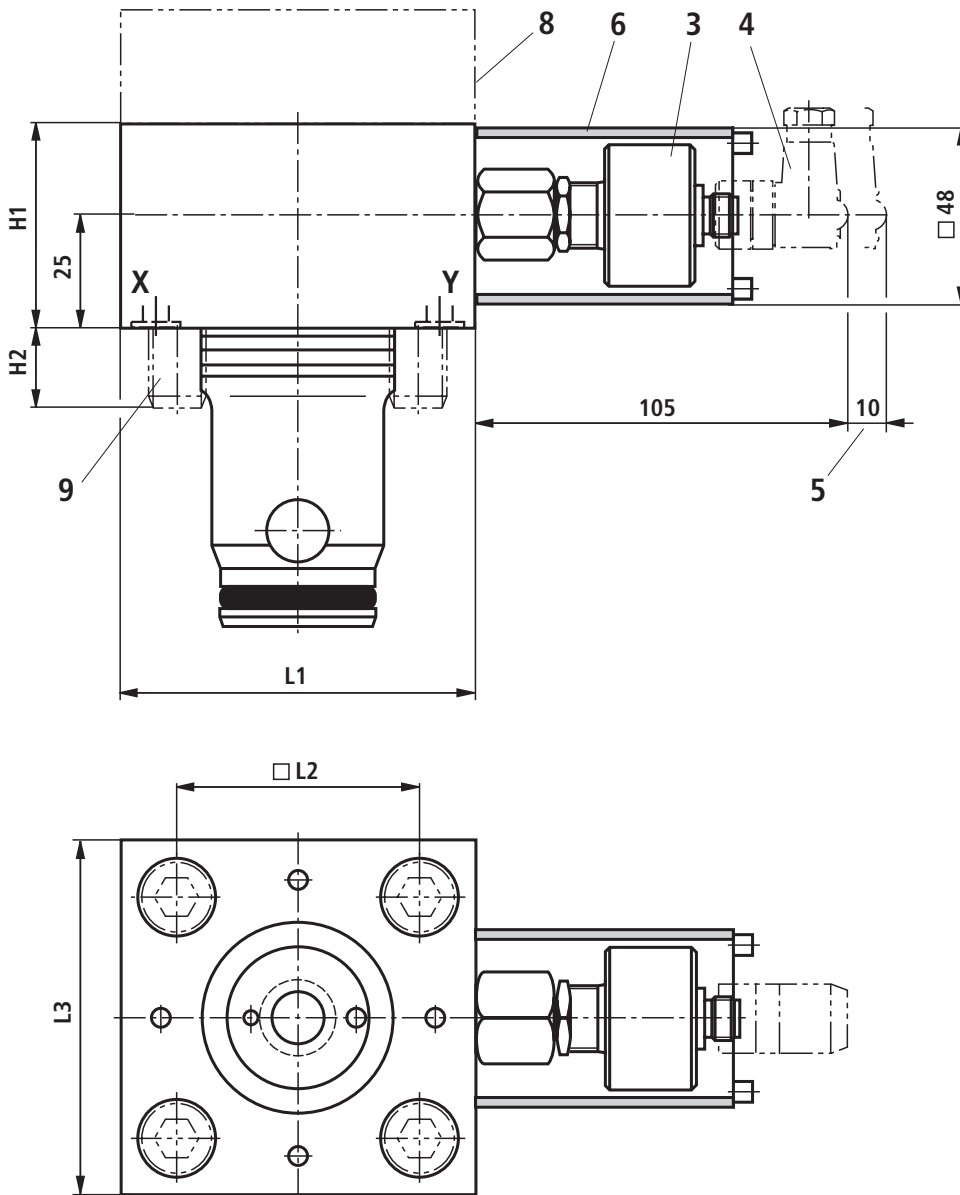
Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.

2) Standard cover required (separate order, see data sheet 21010).



Control cover (intermediate cover) "EM" with electric monitoring of the close position, incl. installation kit and control cover holding option: Size 16 ... 32 (dimensions in mm)



- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 8 Standard cover (separate order, see data sheet 21010)
- 9 Mounting screws not included in the scope of delivery

Size	16	25	32
H1	50	50	50
H2	15	24	28
L1	80	85	100
□ L2	46	58	70
L3	65	85	100

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 15.

Control cover (intermediate cover) **“EM19”** with electric monitoring of the close position, incl. installation kit with spool sealing and control cover holding option: Size 16 ... 32

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		EM19	-	7X	/		D	QMG24								1)

02		
Size		
16	25	32

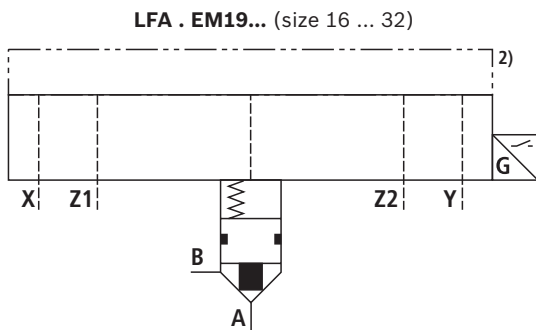
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

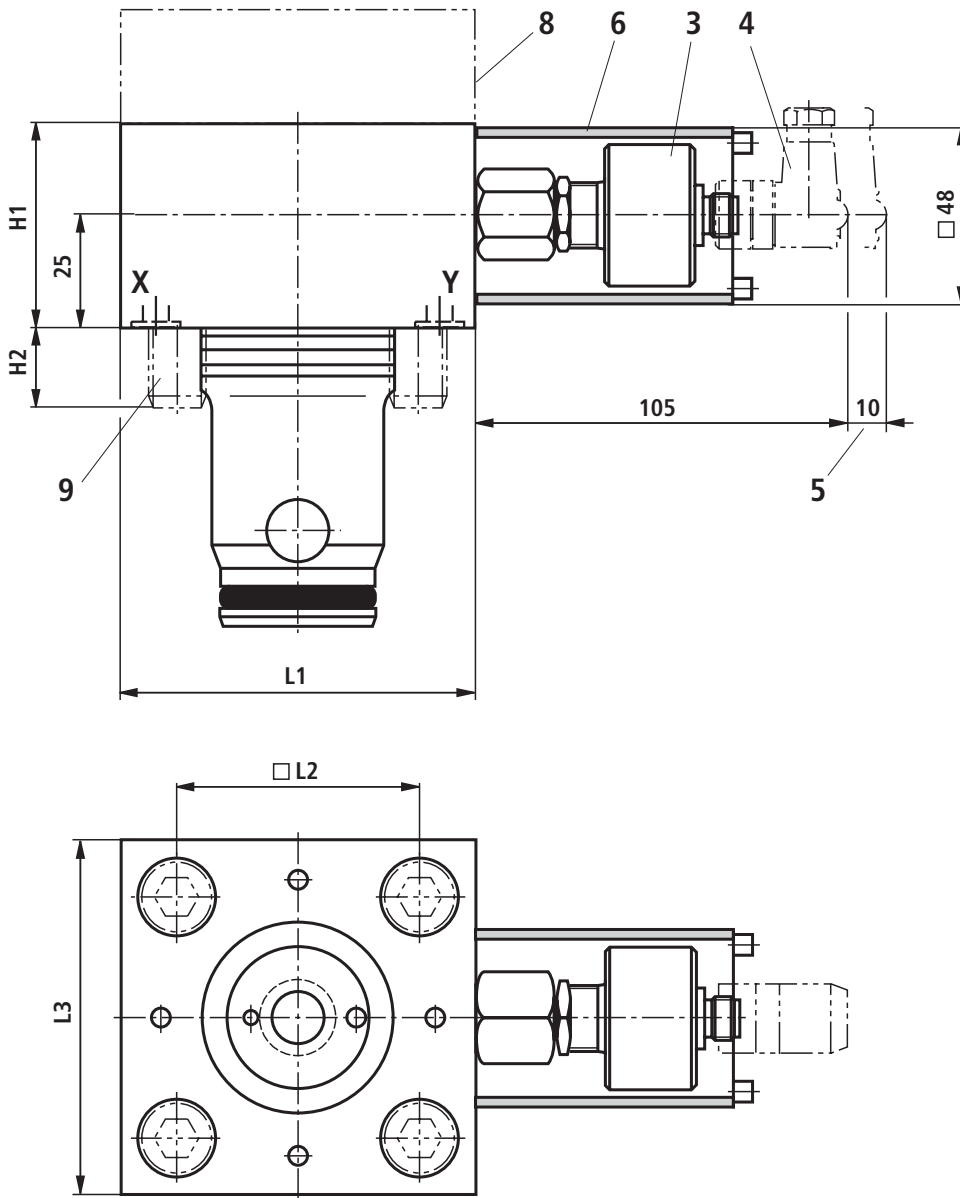
⚠ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

- 1) See „General information on ordering codes for control cover type LFA...“ page 6.
- 2) Standard cover required (separate order, see data sheet 21010).



Control cover (intermediate cover) “EM19” with electric monitoring of the close position, incl. installation kit with spool sealing and control cover holding option: Size 16 ... 32 (dimensions in mm)



- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 8 Standard cover (separate order, see data sheet 21010)
- 9 Mounting screws not included in the scope of delivery

Size	16	25	32
H1	60	75	80
H2	15	24	28
L1	80	85	100
□ L2	46	58	70
L3	65	85	100

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 15.

Control cover “EH2” with electric close position and stroke limitation monitoring, incl. installation kit: Size 16 ... 32

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		EH2	-	7X	/		D	QMG24	F							1)

02			14
Size			Nozzle in channel (Ø in 1/10 mm)
			X
16	25	32	X**

Spool design (for area ratio see section on page 5)

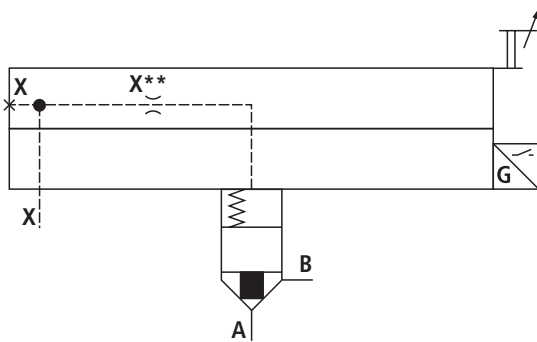
05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required

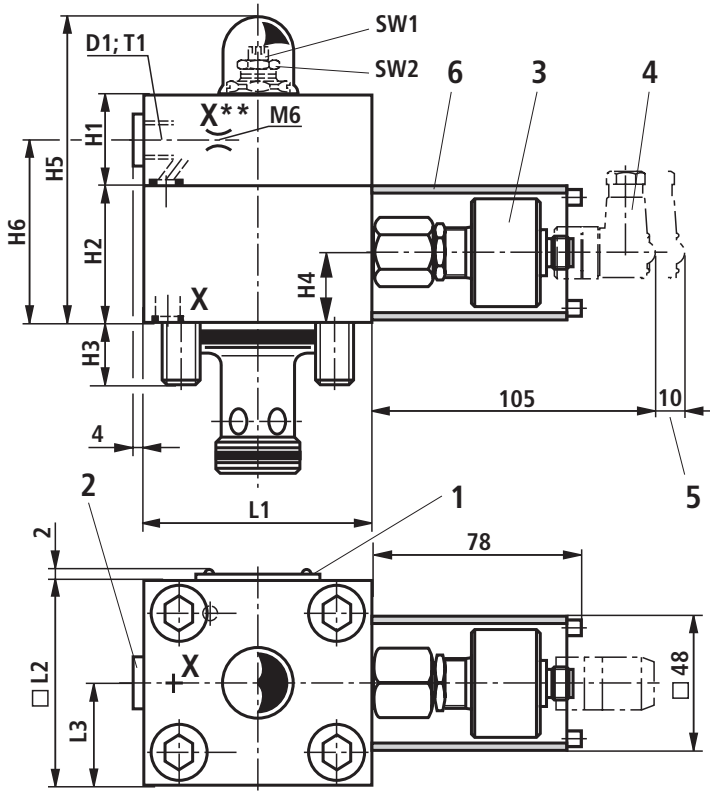
Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.

LFA . EH2... (size 16 ... 32)



Control cover “EH2” with electric close position and stroke limitation monitoring, incl. installation kit: Size 16 ... 32 (dimensions in mm)



- 1 Name plate
- 2 Port X as a threaded connection
- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing

Size	16	25	32
D1	G1/8	G1/4	G1/4
H1	35	40	50
H2	50	50	50
H3	15	24	28
H4	25	25	25
H5	126	130	150 ⁴⁾
H6	62	66	66
L1	65	85	100
□ L2	80	85	100
L3	32.5	42.5	50
T1	8	12	12
Wrench size 1 mm	6	6	10
Wrench size 2 mm	21	21	27

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 15.

Control cover “EH2” with electric close position and stroke limitation monitoring, incl. installation kit: Size 40 ... 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		EH2	-	7X	/		D	Q6G24	F							1)

02			14
Size			Nozzle in channel (Ø in 1/10 mm)
			X
40	50	63	X**

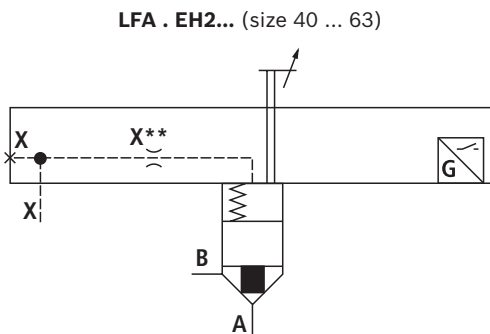
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

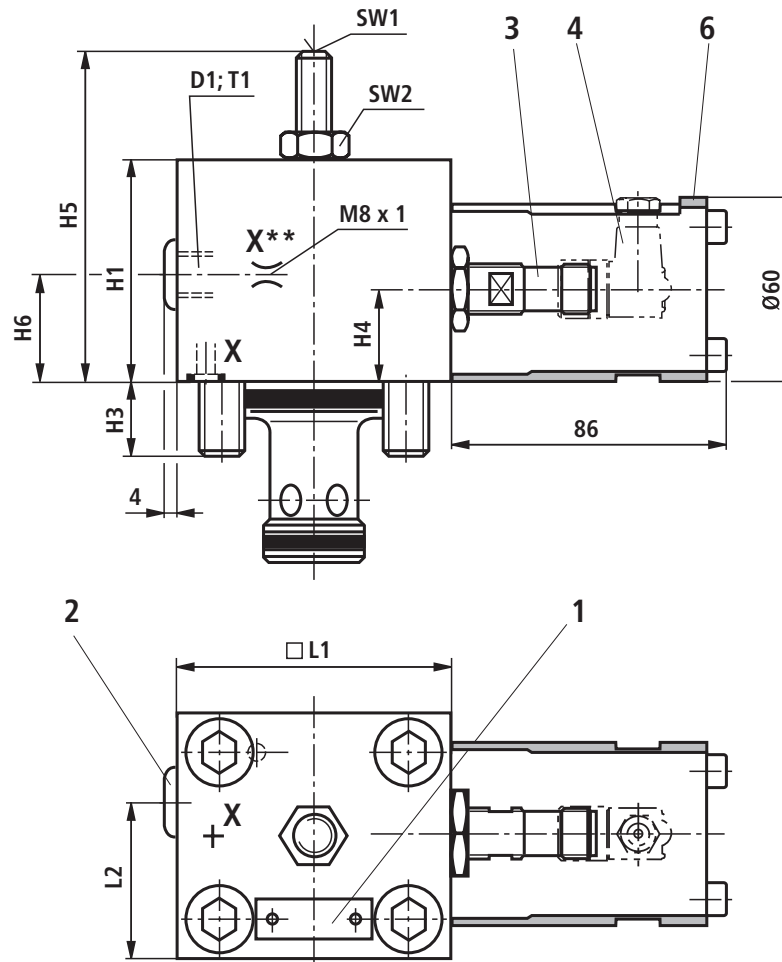
△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...” page 6.



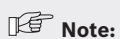
Control cover “EH2” with electric close position and stroke limitation monitoring, incl. installation kit: Size 40 ... 63 (dimensions in mm)



- 1 Name plate
- 2 Port X as a threaded connection
- 3 Position switch type Q6 (QM with size 40)
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 6 Protective housing

Size	40	50	63
D1	G1/2	G1/2	G3/4
H1	190	210	246
H3	32	34	50
H4	25	59	72.5
H5	233 ²⁾	255 ²⁾	295 ²⁾
H6	84.5	95	120
□ L1	125	140	180
L2	62.5	70	90
T1	14	14	16
Wrench size 1mm	14	17	24
Wrench size 2mm	46	55	65

²⁾ Maximum dimension



Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 16.

Control cover “EH2” with electric close position and stroke limitation monitoring, incl. installation kit: Size 80 ... 100

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		EH2	-	6X	/		D	Q6G24	F							1)

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

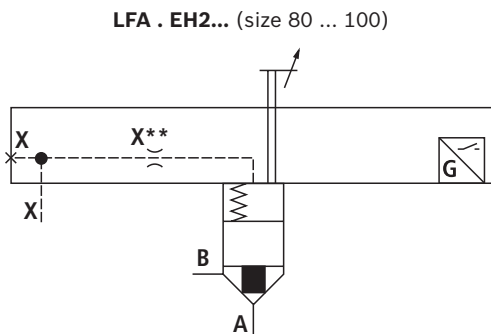
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

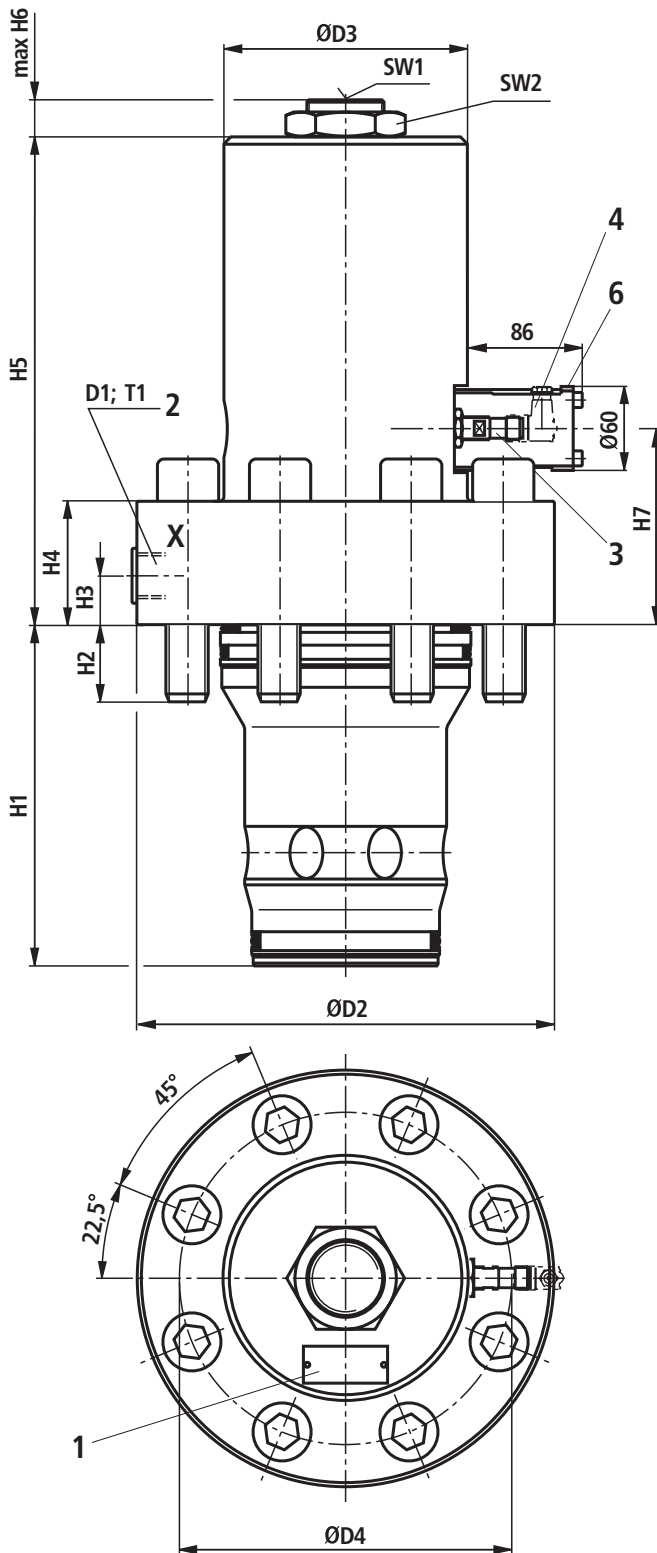
△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “EH2” with electric close position and stroke limitation monitoring, incl. installation kit: Size 80 ... 100 (dimensions in mm)



Size	80	100
D1	G3/4	G1
ØD2	250	300
ØD3	150	175
ØD4	200	245
H1	205	245
H2	45	52.5
H3	40	35
H4	76.5	88.5
H5	305	350
H6	58	68
H7	105	140.5
T1	16	18
Wrench size 1 mm	75	75
Wrench size 2 mm	24	27

- 1 Name plate
- 2 Port X as a threaded connection
- 3 Position switch type Q6
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 6 Protective housing

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 16.

Control cover “EH2” with electric close position and stroke limitation monitoring, incl. installation kit: Size 125 ... 160

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		EH2	-	2X	/		D	Q6G24	F							1)

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

Spool design (for area ratio see section on page 5)

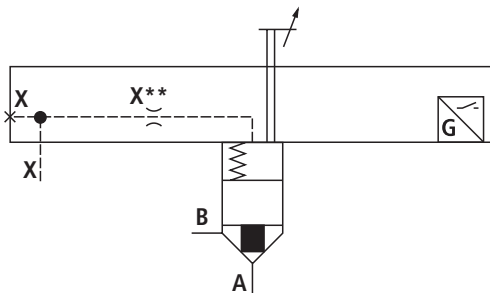
05	A ₁ : A ₂ = 2 : 1 (annulus area = 50%; standard version)	CA
	A ₁ : A ₂ = 14.3 : 1 (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required

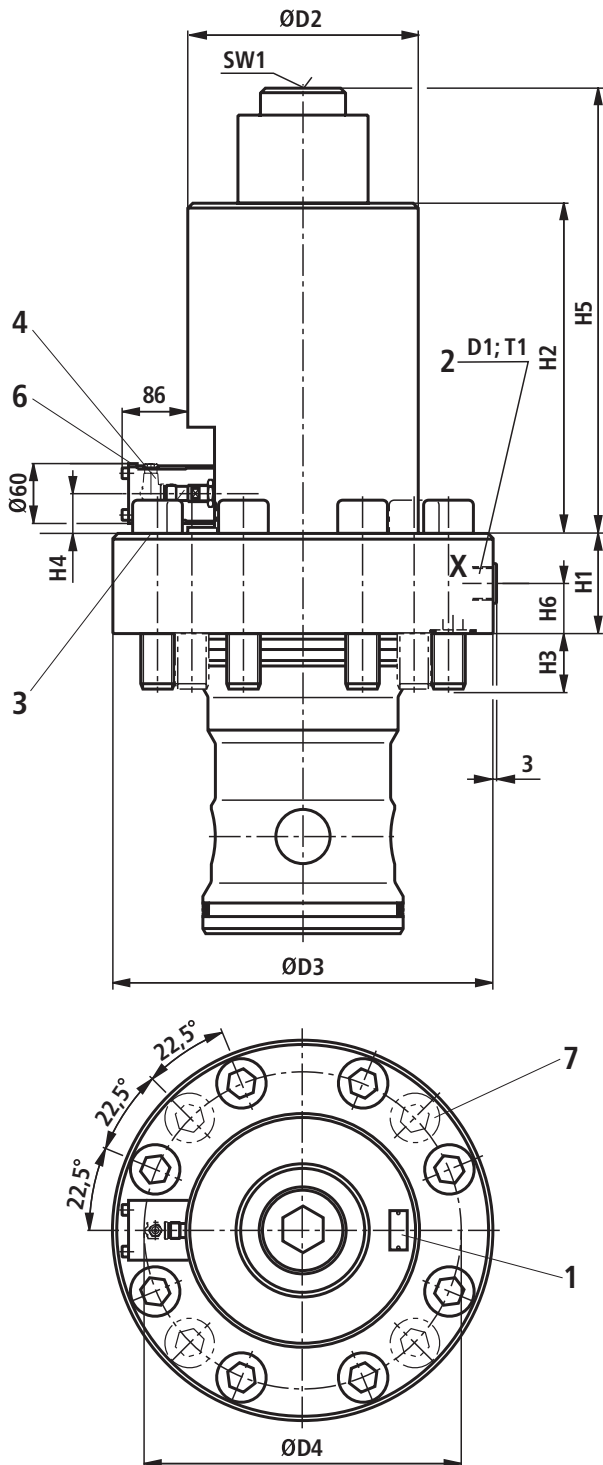
Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...” page 6.

LFA . EH2... (size 125 ... 160)



Control cover “EH2” with electric close position and stroke limitation monitoring, incl. installation kit: Size 125 ... 160 (dimensions in mm)



Size	125	160
D1	G1	G1
ØD2	230	300
ØD3	380	480
ØD4	300	400
H1	100	167
H2	330	383
H3	61	74
H4	40	38
H5	445	498
H6	50	70
T1	18	18
Wrench size	32	32
1 mm		

- 1 Name plate
- 2 Port X as a threaded connection
- 3 Position switch type Q6
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 6 Protective housing
- 7 4 additional valve mounting screws with size 160

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 16.

Control cover “EWMA” and “EWMB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 16 ... 32

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/		D	QMG24								1)

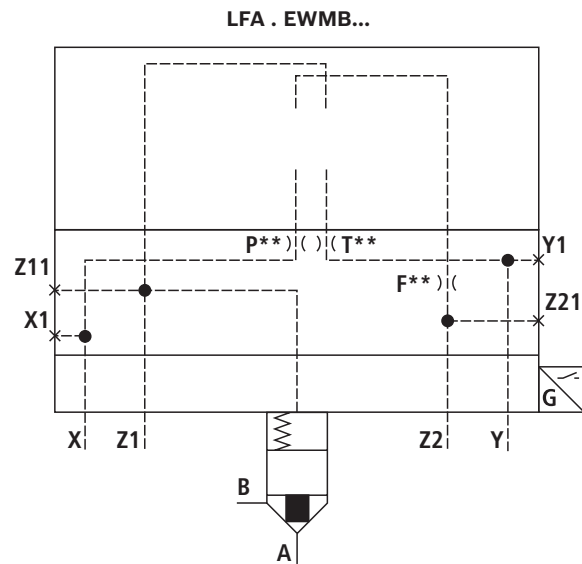
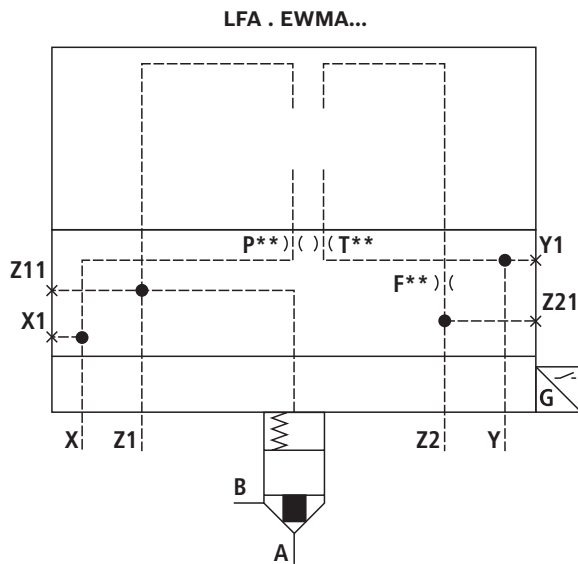
Size			Type	Nozzle in channel (Ø in 1/10 mm)		
				P	T	F
16	25	32	EWMA	P**	T**	F**
			EWMB	P**	T**	F**

Spool design (for area ratio see section on page 5)

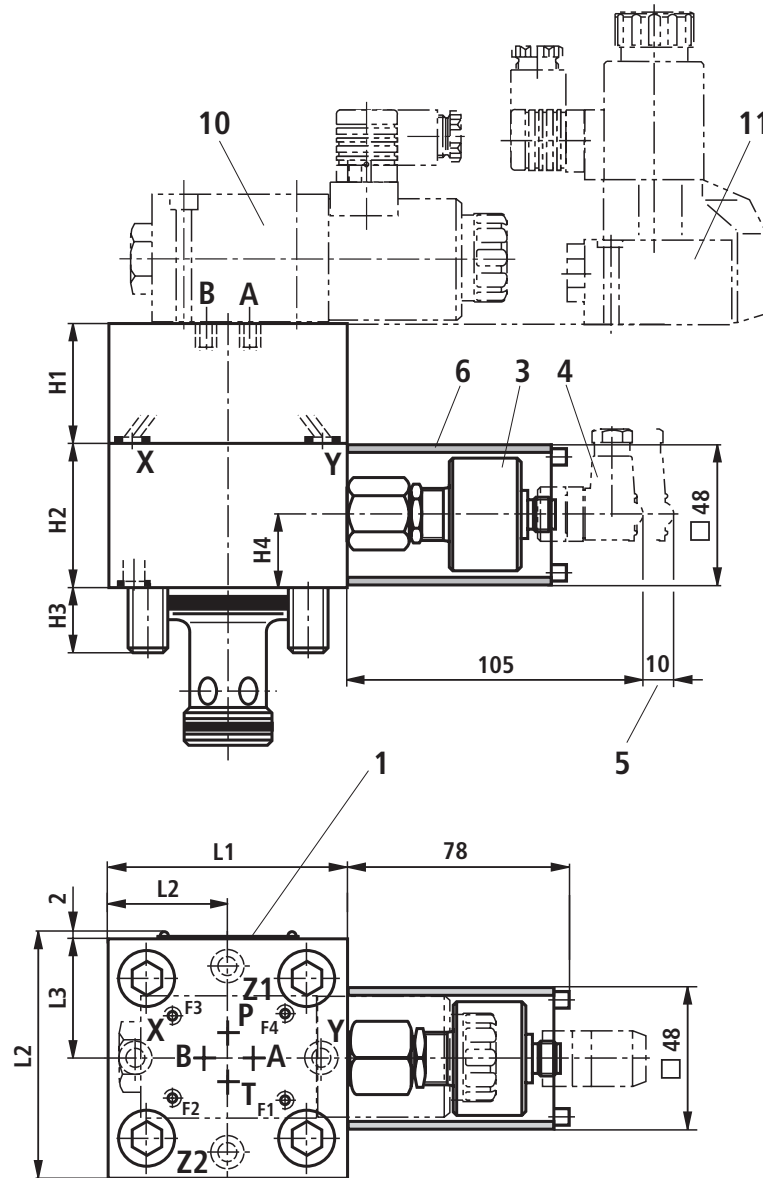
05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required
 Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “EWMA” and “EWMB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 16 ... 32 (dimensions in mm)



- 1 Name plate
- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 10 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 7
- 11 Directional seat valve type M-3SEW 6... (pilot control valve), separate order see page 7

Size	16	25	32
H1	65	40	50
H2	50	50	50
H3	15	24	28
H4	25	25	25
L1	80	85	100
L2	65	85	100
L3	40	42.5	50

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 15.

Control cover “EWMA” and “EWMB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 40 ... 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/		D	Q6G24								1)

Size			Type	Nozzle in channel (Ø in 1/10 mm)		
				P	T	F
40	50	63	EWMA	P**	T**	F**
			EWMB	P**	T**	F**

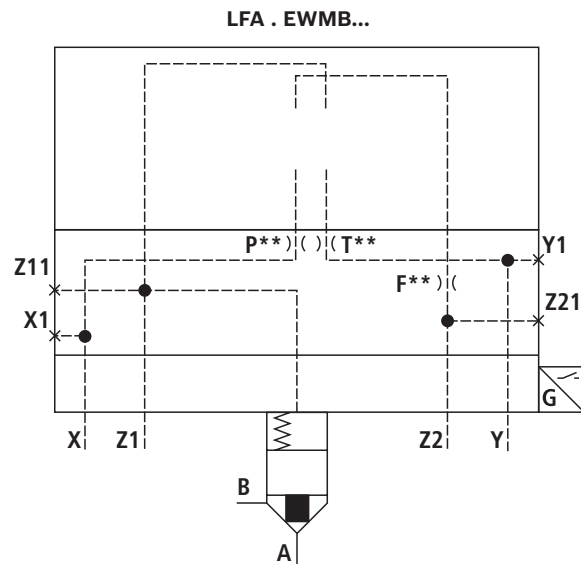
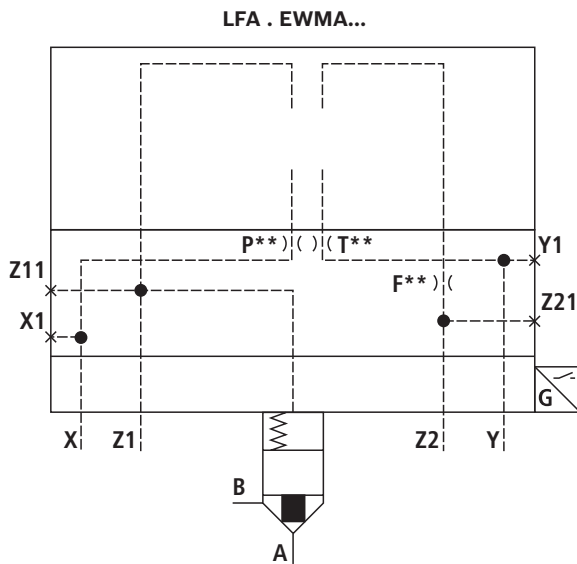
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

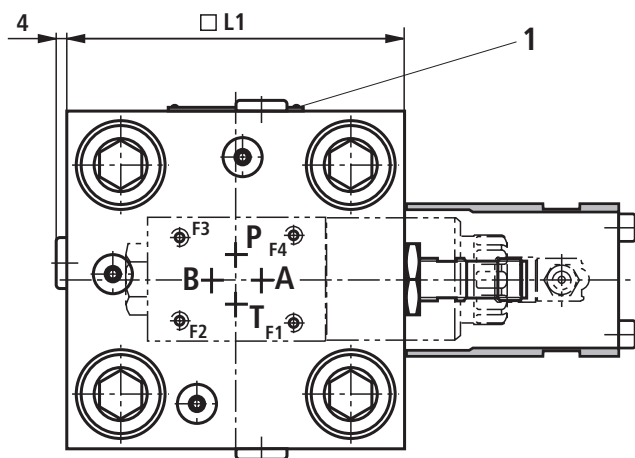
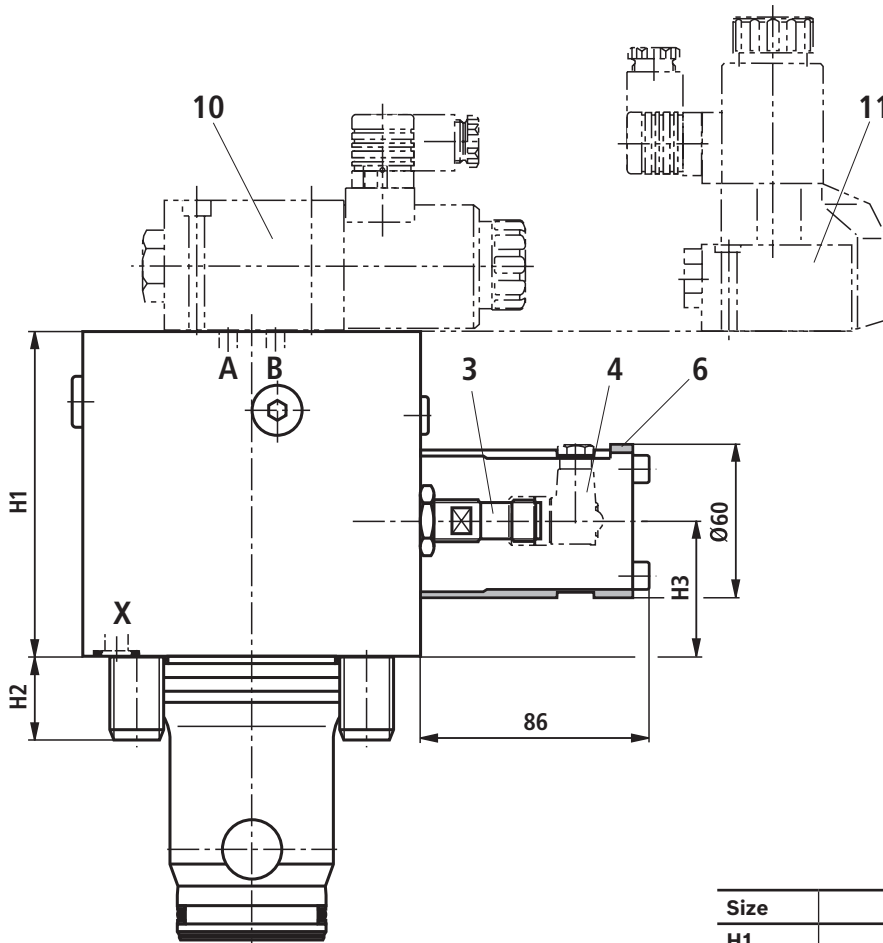
△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “EWMA” and “EWMB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 40 ... 63 (dimensions in mm)



Size	40	50	63
H1	120	130	170
H2	32	34	50
H3	50	59	73
□ L1	125	140	180

- 1** Name plate
- 3** Position switch type Q6
- 4** Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 6** Protective housing
- 10** Directional spool valve type (pilot control valve), separate order see page 7
 - ▶ Size 40 and 50: Type 4WE 6 D...
 - ▶ Size 63: Type 4WE 10 A...
- 11** Directional seat valve type (pilot control valve), separate order see page 7
 - ▶ Size 40 and 50: Type M-3SEW 6 ...
 - ▶ Size 63: Type M-3SEW 10 ...

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 16.

Control cover “EWA” and “EWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 16 ... 32

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/		D	QMG24								1)

Size			Type	Nozzle in channel (∅ in 1/10 mm)			
				A	B	P	T
16	25	32	EWA	A**		P**	T**
			EWB		B**	P**	T**

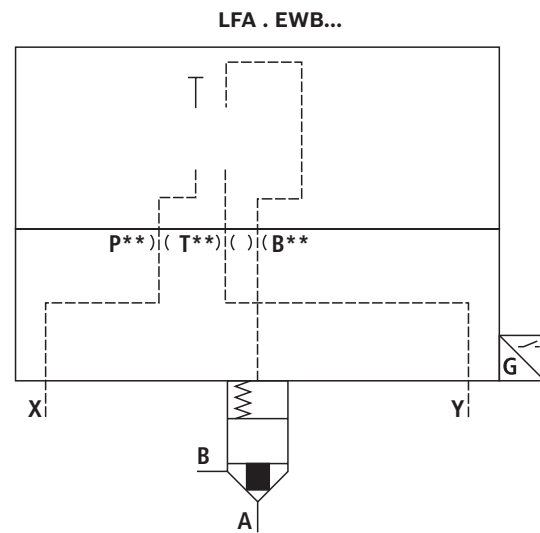
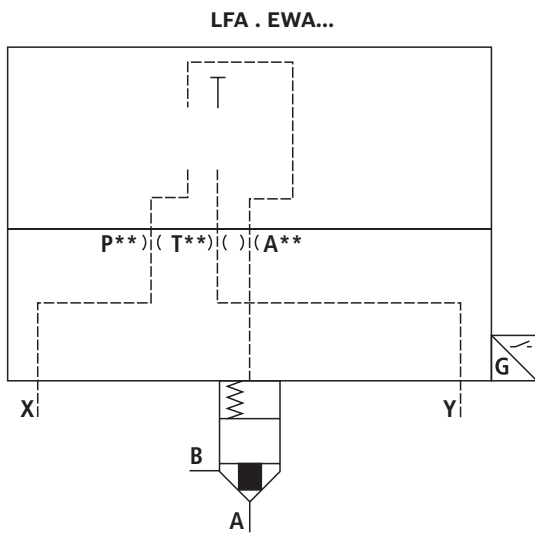
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

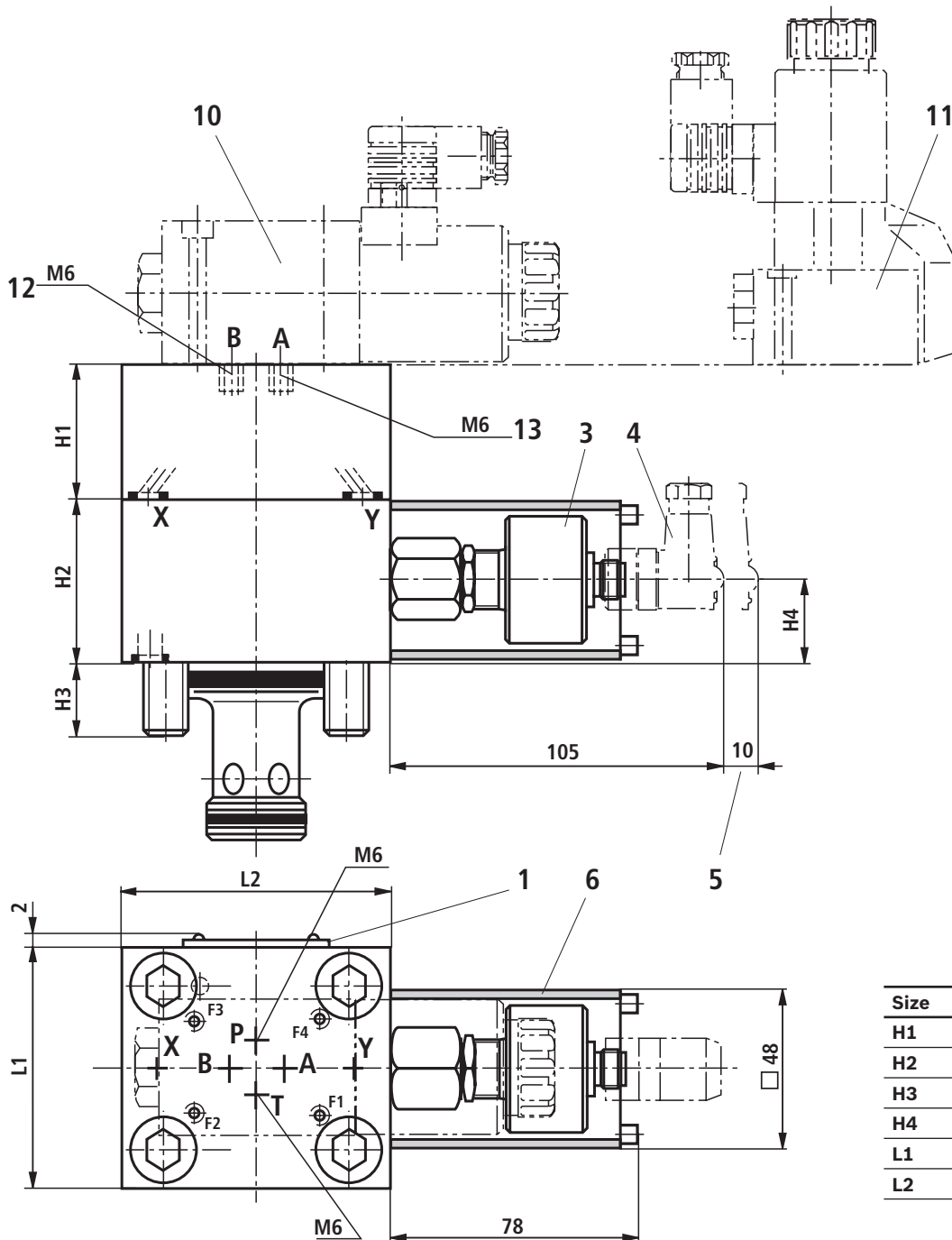
△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “EWA” and “EWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 16 ... 32 (dimensions in mm)



Size	16	25	32
H1	40	40	50
H2	50	50	50
H3	15	24	28
H4	25	25	25
L1	65	85	100
L2	80	85	100

- 1 Name plate
- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 10 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 7
- 11 Directional seat valve type M-3SEW 6... (pilot control valve), separate order see page 7

- 12 Plug screw with type EWB
- 13 Plug screw with type EWA

Electrical data, pinout and switching logics, see page 15.



Note:

The dimensions are nominal dimensions which are subject to tolerances.

Control cover “EWA” and “EWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 40 ... 50

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/		D	QMG24								1)

Size		Type	Nozzle in channel (∅ in 1/10 mm)			
			A	B	P	T
40	50	EWA	A**		P**	T**
		EWB		B**	P**	T**

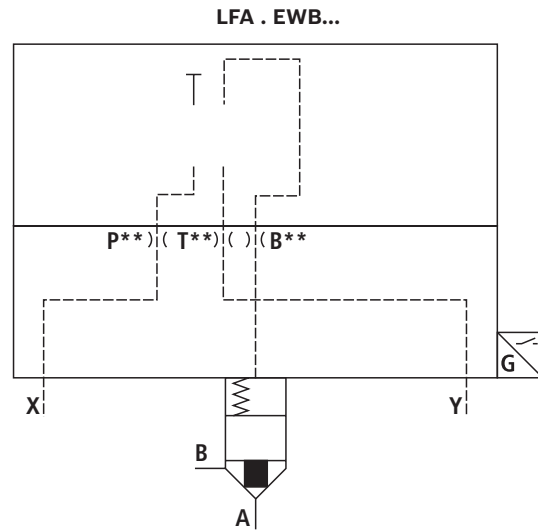
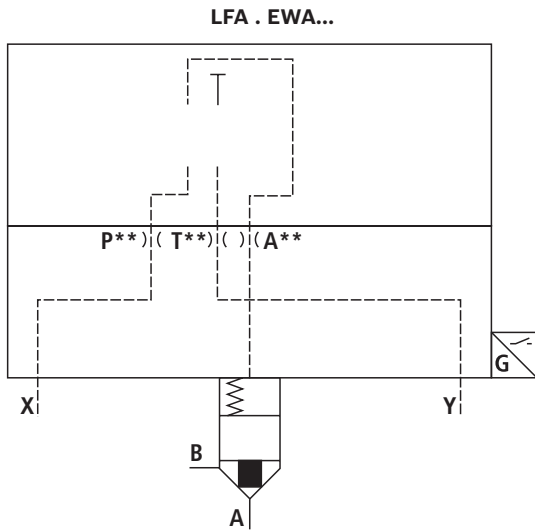
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

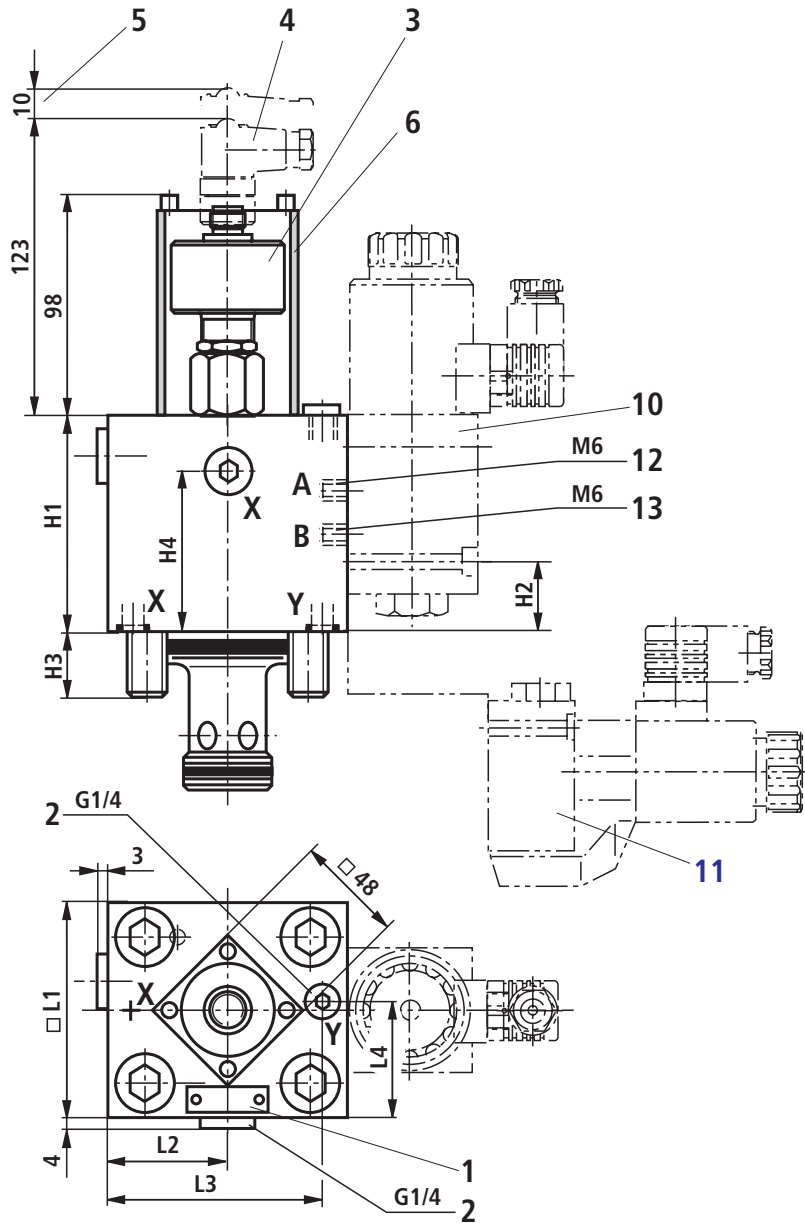
△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “EWA” and “EWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 40 ... 50 (dimensions in mm)



Size	40	50
H1	110	120
H2	58.5	68
H3	32	34
H4	77.5	87
□ L1	125	140
L2	62.5	70
L3	98.5	113
L4	66.5	70

- 1 Name plate
- 2 Ports X and Y optionally as threaded connection
- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 10 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 7
- 11 Directional seat valve type M-3SEW 6... (pilot control valve), separate order see page 7

- 12 Plug screw with type EWB
- 13 Plug screw with type EWA

Electrical data, pinout and switching logics, see page 15.



Note:

The dimensions are nominal dimensions which are subject to tolerances.

Control cover “EWA” and “EWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	63		-	7X	/		D	QMG24								1)

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

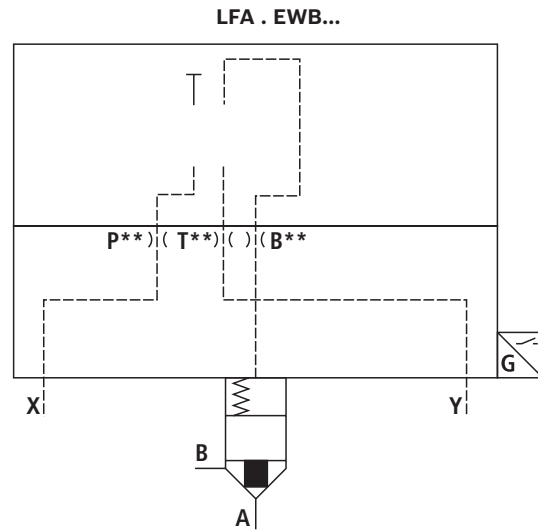
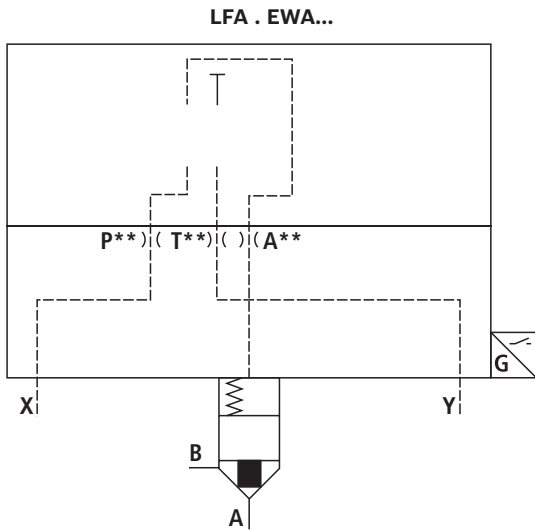
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

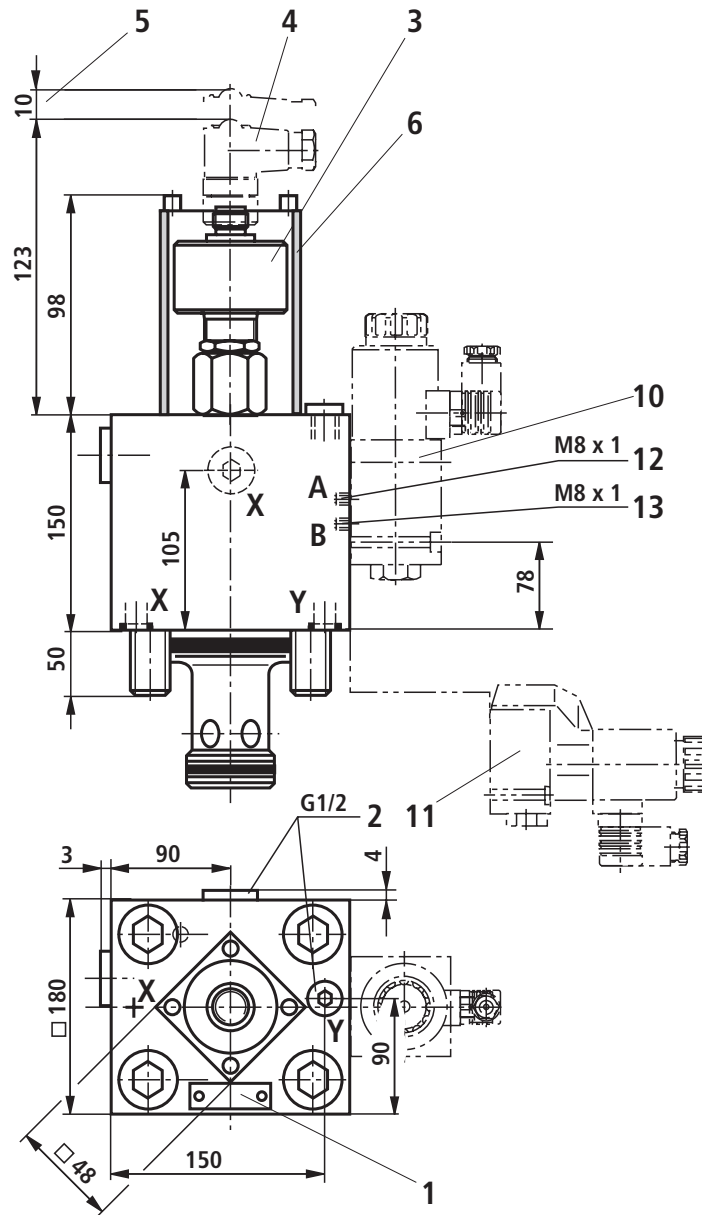
△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “EWA” and “EWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: size 63 (dimensions in mm)



- 1 Name plate
- 2 Ports X and Y optionally as threaded connection
- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 10 Directional spool valve type 4WE 10 D... (pilot control valve), separate order see page 7
- 11 Directional seat valve type M-3SEW 10... (pilot control valve), separate order see page 7
- 12 Plug screw with type EWB
- 13 Plug screw with type EWA

Electrical data, pinout and switching logics, see page 15.



Note:

The dimensions are nominal dimensions which are subject to tolerances.

Control cover “EWA” and “EWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 80

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	80		-	6X	/		D	Q6G24								1)

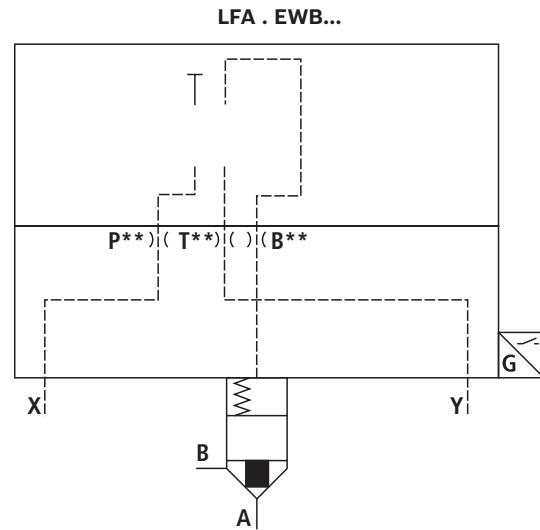
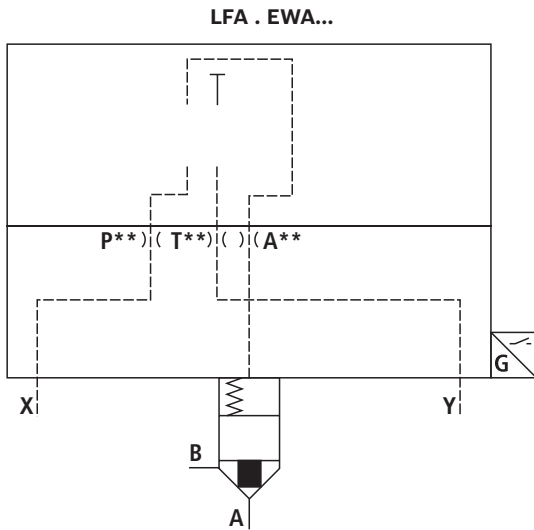
	03	10	11	12	13
Type	Nozzle in channel (Ø in 1/10 mm)				
	A	B	P	T	
EWA	A**		P**	T**	
EWB		B**	P**	T**	

Spool design (for area ratio see section on page 5)

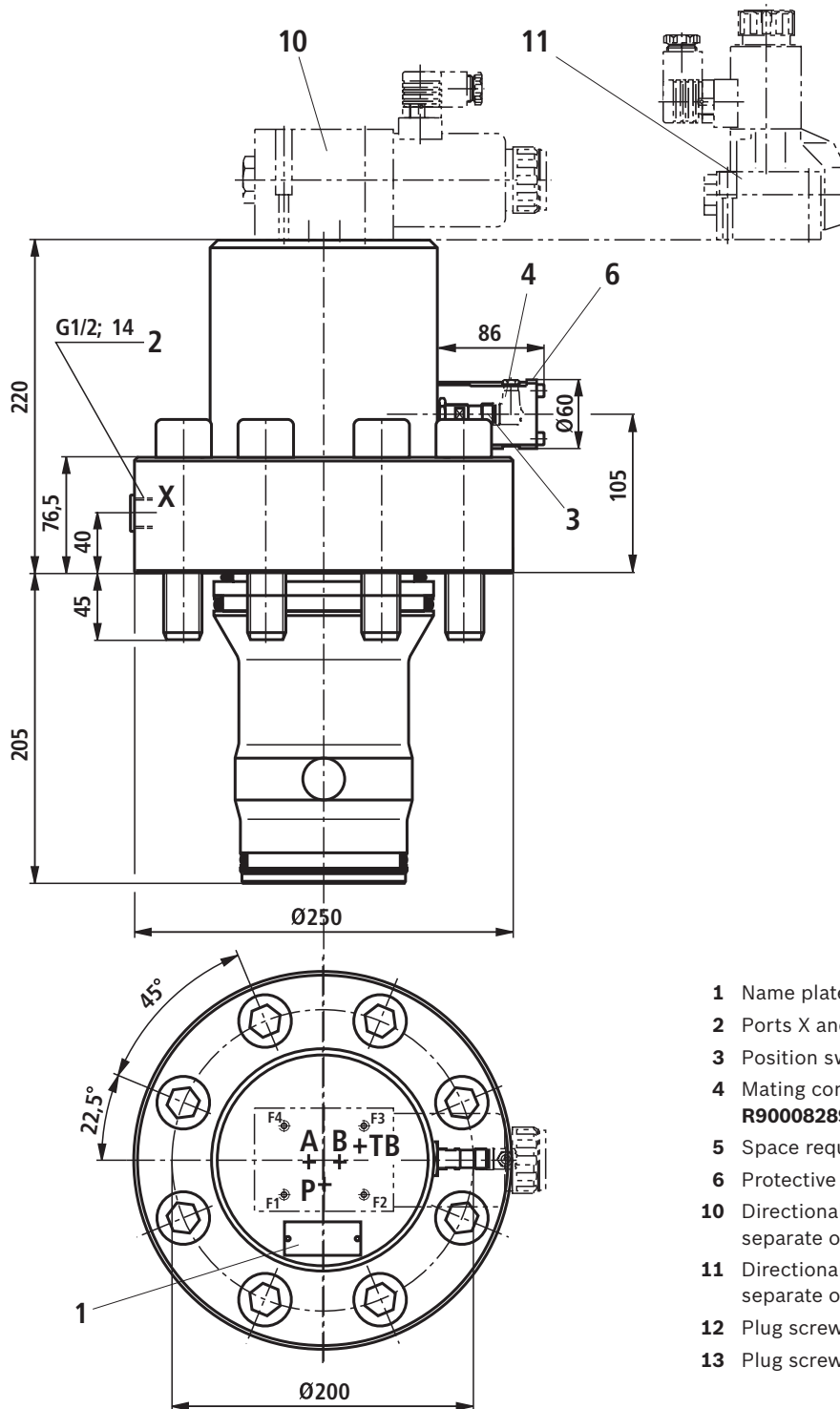
05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required
 Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “EWA” and “EWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 80 (dimensions in mm)



- 1 Name plate
- 2 Ports X and Y optionally as threaded connection
- 3 Position switch type Q6
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 10 Directional spool valve type 4WE 10 D... (pilot control valve), separate order see page 7
- 11 Directional seat valve type M-3SEW 10... (pilot control valve), separate order see page 7
- 12 Plug screw with type EWB
- 13 Plug screw with type EWA

Electrical data, pinout and switching logics, see page 16.



Note:

The dimensions are nominal dimensions which are subject to tolerances.

Control cover “EHWMA2” and “EHWMB2” with electric monitoring of the close position and stroke limitation, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 25 ... 32

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/	CA		D	QMG24							1)

02		03		12		13		15	
Size		Type		P	T	F			
25	32	EHWMA2		P**	T**	F**			
		EHWMB2		P**	T**	F**			

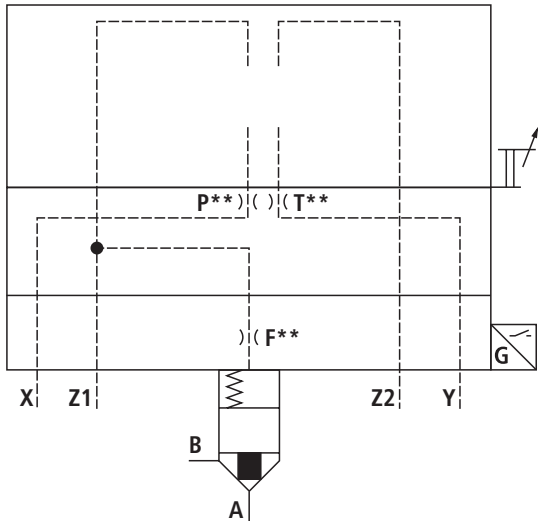
06	Cracking pressure 1.0 bar	10
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required

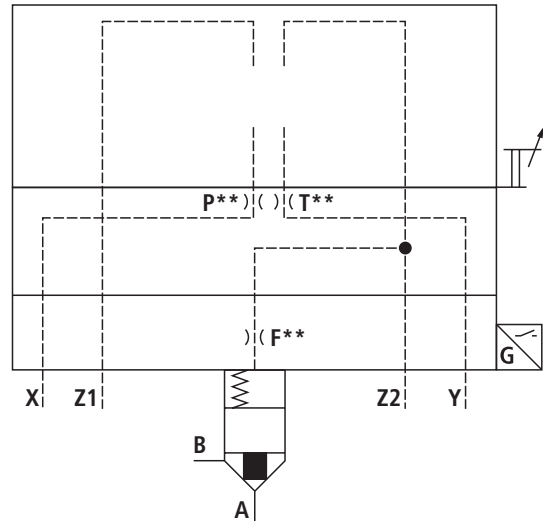
Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...” page 6.

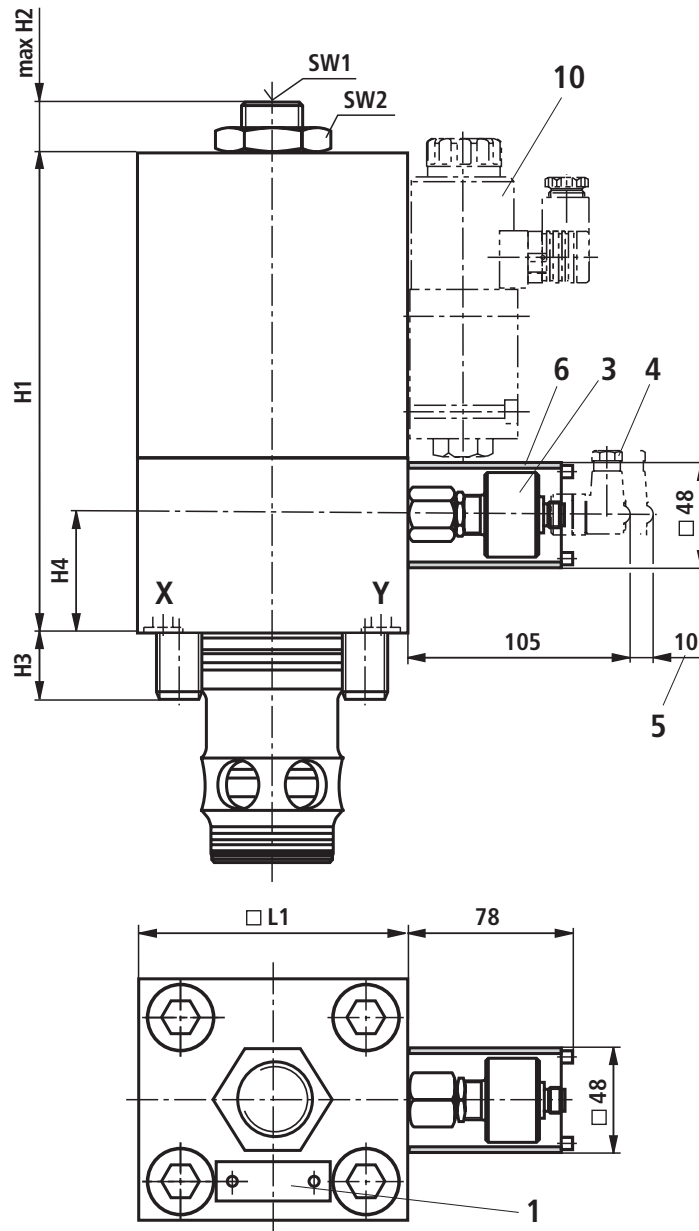
LFA . EHWMA2...



LFA . EHWMB2...



Control cover “EHWMA2” and “EHWMB2” with electric monitoring of the close position and stroke limitation, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 25 ... 32 (dimensions in mm)



Size	25	32
□ L1	85	100
H1	140	150
H2	40	50
H3	24	28
H4	25	25
Wrench size 1mm	6	10
Wrench size	22	27

- 1 Name plate
- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 10 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 7



Note:

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 15.

Control cover “EHWMA2” and “EHWMB2” with electric monitoring of the close position and stroke limitation, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 40 ... 63

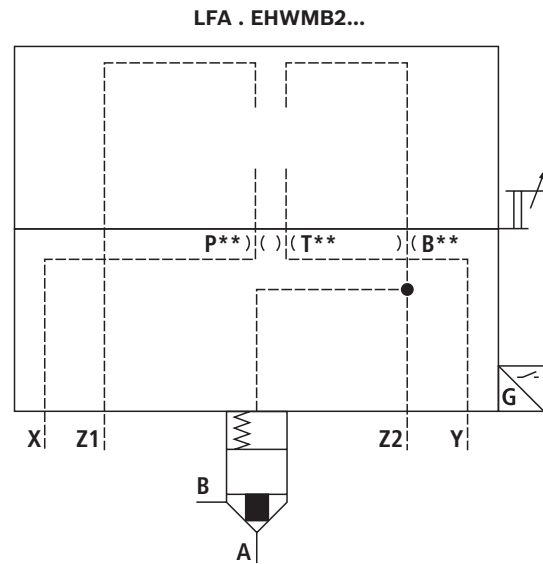
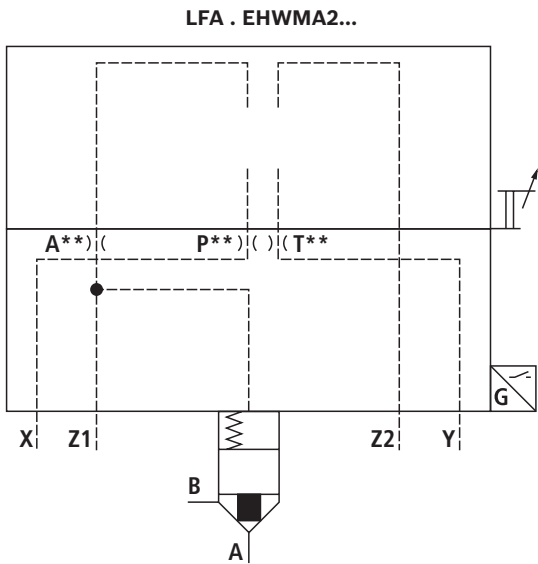
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/	CA		D	Q6G24							1)

02			03			10		11		12		13	
Size			Type			Nozzle in channel (∅ in 1/10 mm)							
						A	B	P	T				
40	50	63	EHWMA2			A**		P**	T**				
			EHWMB2				B**	P**	T**				

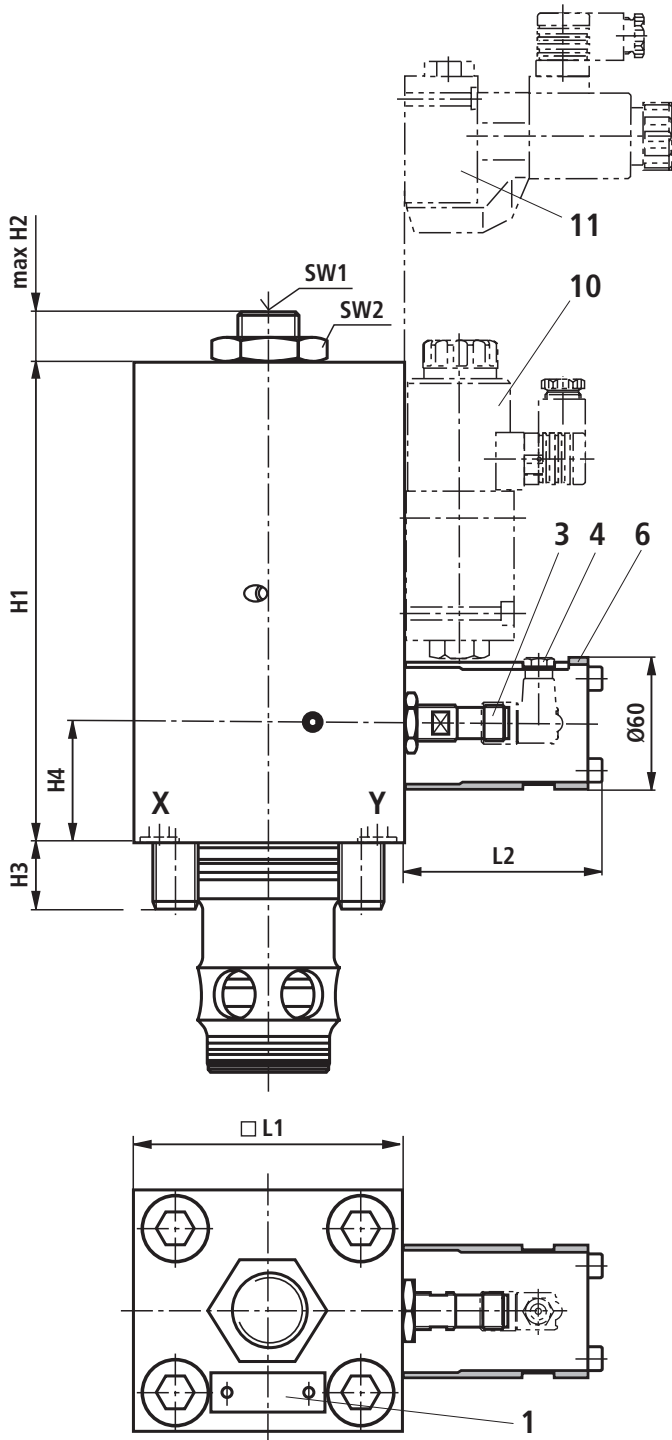
06	Cracking pressure 1.0 bar	10
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required
 Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...” page 6.



Control cover “EHWMA2” and “EHWMB2” with electric monitoring of the close position and stroke limitation, for mounting a directional spool valve or directional seat valve, incl. installation kit: Size 40 ... 63 (dimensions in mm)



Size	40	50	63
□ L1	125	140	180
H1	220	210	246
H2	42	23	48
H3	32	71	83
H4	55	59	72.5
Wrench size 1 mm	14	17	24
Wrench size 2 mm	46	55	65

- 1 Name plate
- 3 Position switch type Q6 (QM with size 40)
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 10 Directional spool valve type (pilot control valve), separate order see page 7
 - ▶ Size 40 and 50: Type 4WE 6 D...
 - ▶ Size 63: Type 4WE 10 A...
- 11 Directional seat valve type (pilot control valve), separate order see page 7
 - ▶ Size 40 and 50: Type M-3SEW 6 ...
 - ▶ Size 63: Type M-3SEW 10 ...

**Note:**

The dimensions are nominal dimensions which are subject to tolerances.

Electrical data, pinout and switching logics, see page 16.

Control cover “EGWA”, “EGWB”, “EKWA” and “EKWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, with installed shuttle valve incl. installation kit: Size 16 ... 32

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/			D	QMG24							1)

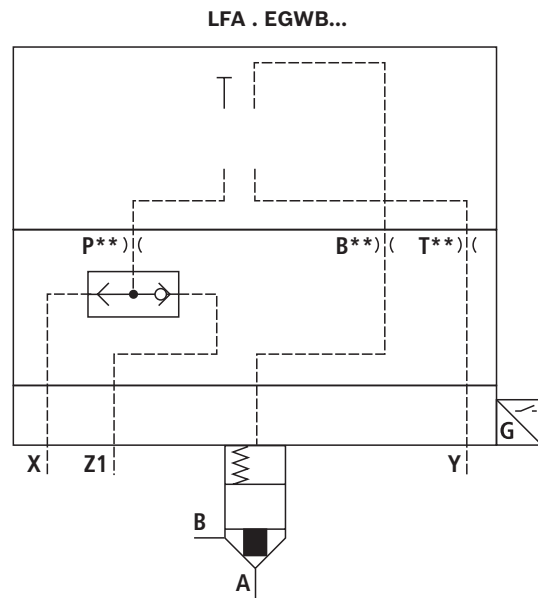
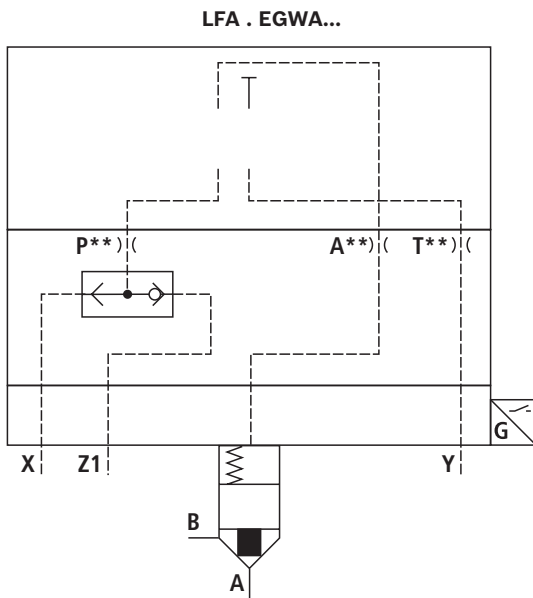
Size			Type	Nozzle in channel (Ø in 1/10 mm)			
				A	B	P	T
16	25	32	EGWA, EKWA	A**		P**	T**
			EGWB, EKWB		B**	P**	T**

Spool design (for area ratio see section on page 5)

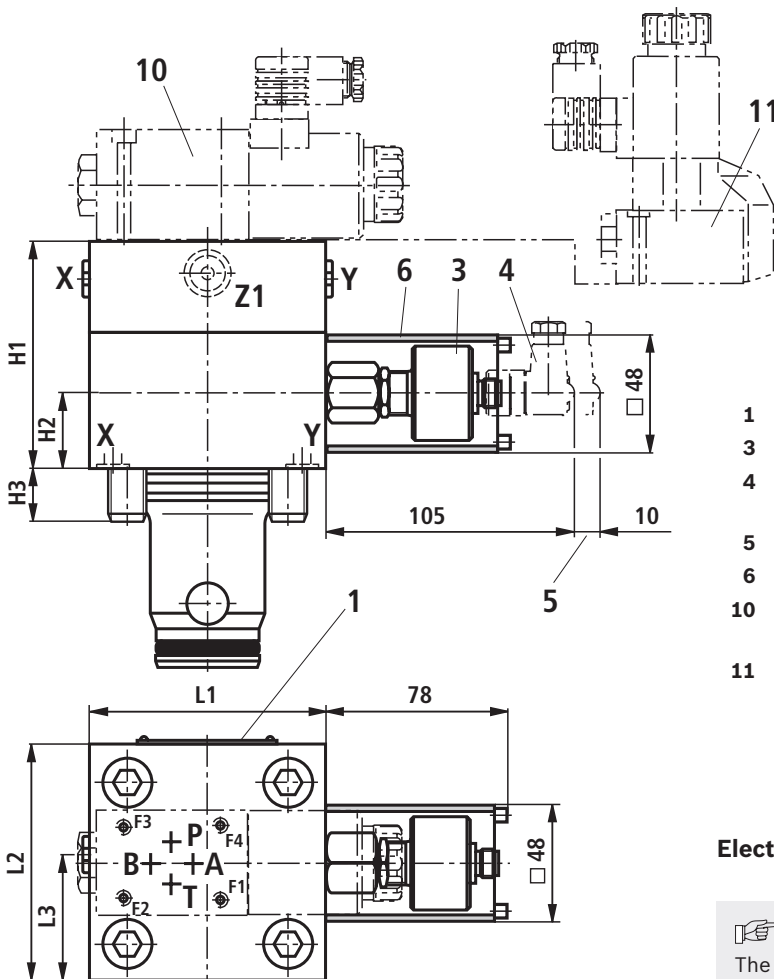
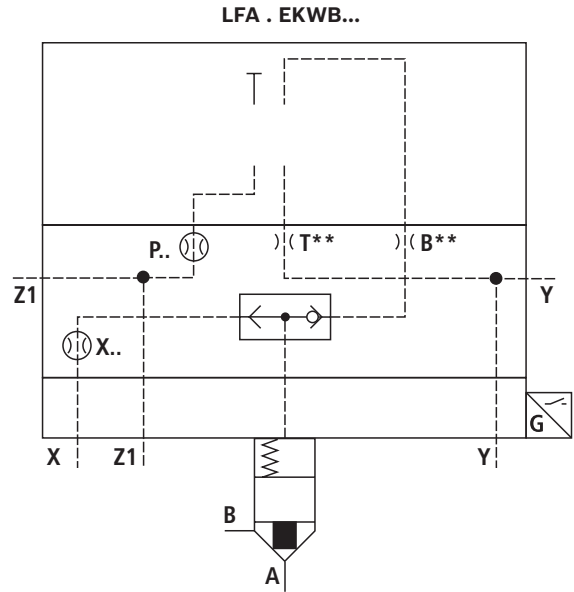
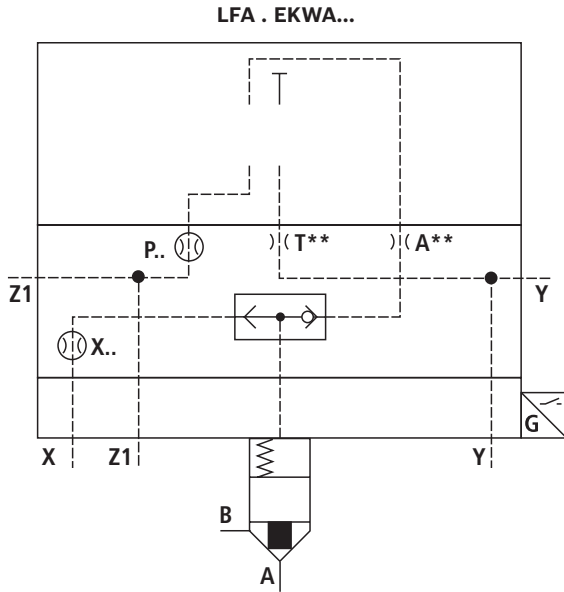
05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required
 Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “EGWA”, “EGWB”, “EKWA” and “EKWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, with installed shuttle valve incl. installation kit: Size 16 ... 32 (dimensions in mm)



Size	16	25	32
H1	90	90	100
H2	25	25	25
H3	15	24	28
L1	Type EGW.	80	85
	Type EKW.	65	85
L2	Type EGW.	65	85
	Type EKW.	39.5	45.5
L3	Type EGW.	39.5	45.5
	Type EKW.	36.5	45.5

- 1 Name plate
- 3 Position switch type QM
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 10 Directional spool valve type 4WE 6 D... (pilot control valve), separate order see page 7
- 11 Directional seat valve type M-3SEW 6... (pilot control valve), separate order see page 7

Electrical data, pinout and switching logics, see page 15.



Note:

The dimensions are nominal dimensions which are subject to tolerances.

Control cover “EGWA”, “EGWB”, “EKWA” and “EKWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, with installed shuttle valve incl. installation kit: Size 40 ... 63

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA			-	7X	/			D	Q6G24							1)

Size			Type	Nozzle in channel (Ø in 1/10 mm)			
				A	B	P	T
40	50	63	EGWA	A**		P**	T**
			EGWB		B**	P**	T**
			EKWA	A**		P**	
			EKWB		B**	P**	

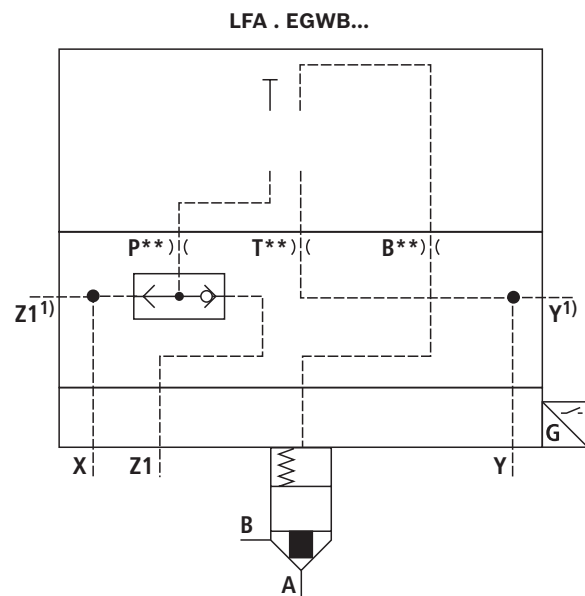
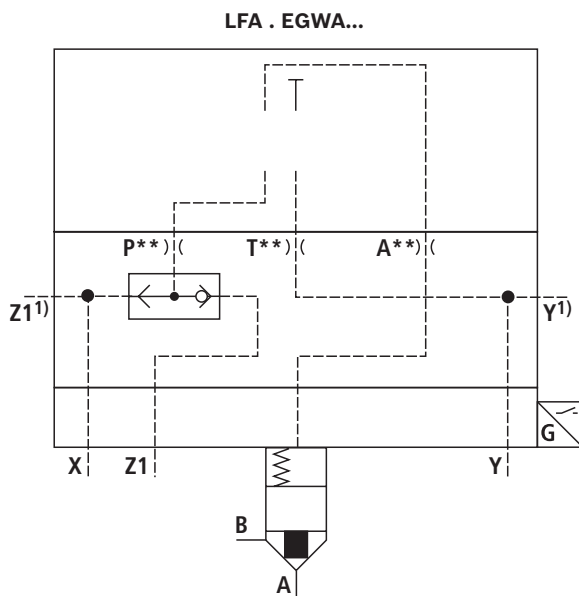
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 1.0 bar	10
	Cracking pressure 2.0 bar	20
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

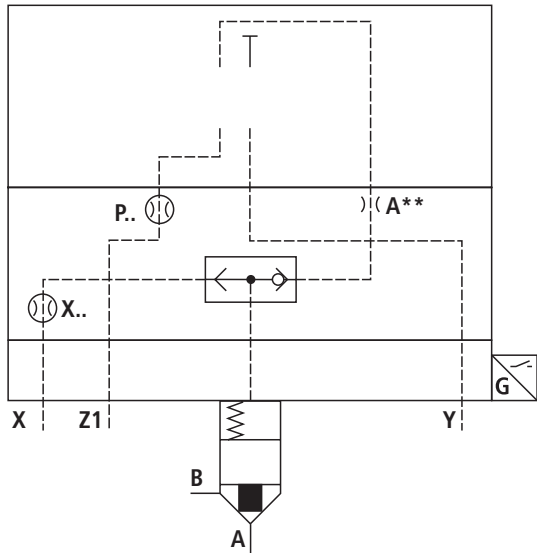
1) See „General information on ordering codes for control cover LFA...“ page 6.



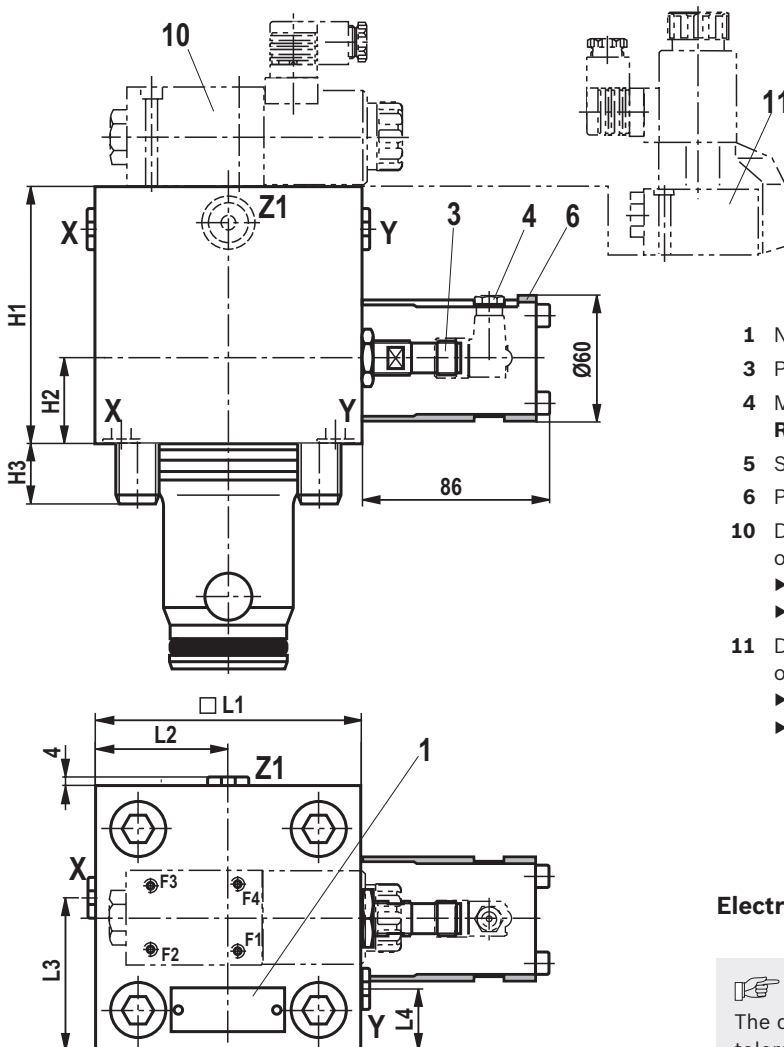
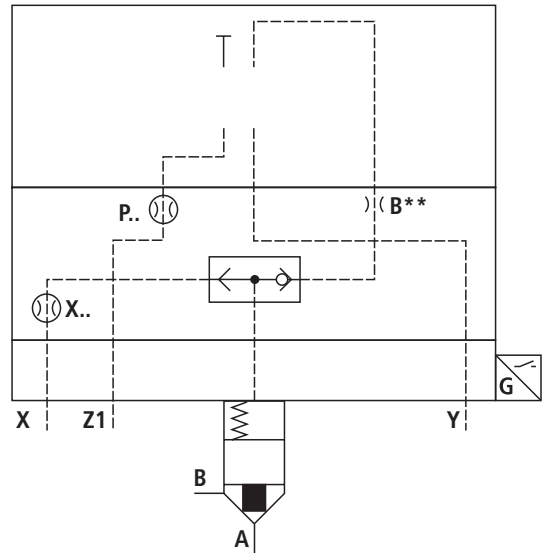
1) Only size 40 and 50

Control cover “EGWA”, “EGWB”, “EKWA” and “EKWB” with electric monitoring of the close position, for mounting a directional spool valve or directional seat valve, with installed shuttle valve incl. installation kit: Size 40 ... 63 (dimensions in mm)

LFA . EKWA...



LFA . EKWB...



Size	40	50	63
H1	125	130	160
H2	50	59	73
H3	32	34	50
□ L1	125	140	180
L2	62.5	89	119
L3	81	92	115
L4	52	68.5	102

- 1 Name plate
- 3 Position switch type Q6
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector
- 6 Protective housing
- 10 Directional spool valve type (pilot control valve), separate order see page 7
 - ▶ Size 40 and 50: Type 4WE 6 D...
 - ▶ Size 63: Type 4WE 10 A...
- 11 Directional seat valve type (pilot control valve), separate order see page 7
 - ▶ Size 40 and 50: Type M-3SEW 6 ...
 - ▶ Size 63: Type M-3SEW 10 ...

Electrical data, pinout and switching logics, see page 16.

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

Control cover “D7” with hydraulic monitoring of the close position: Size 16 ... 80

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA		D7	-	6X	/		D									1)

02						
Size						
16	25	32	40	50	63	80

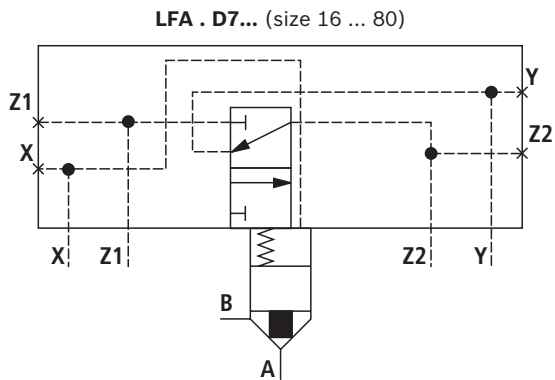
Spool design (for area ratio see section on page 5)

05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
06	Cracking pressure 0.5 bar	05
	Cracking pressure 1.0 bar	10
	Cracking pressure 4.0 bar	40

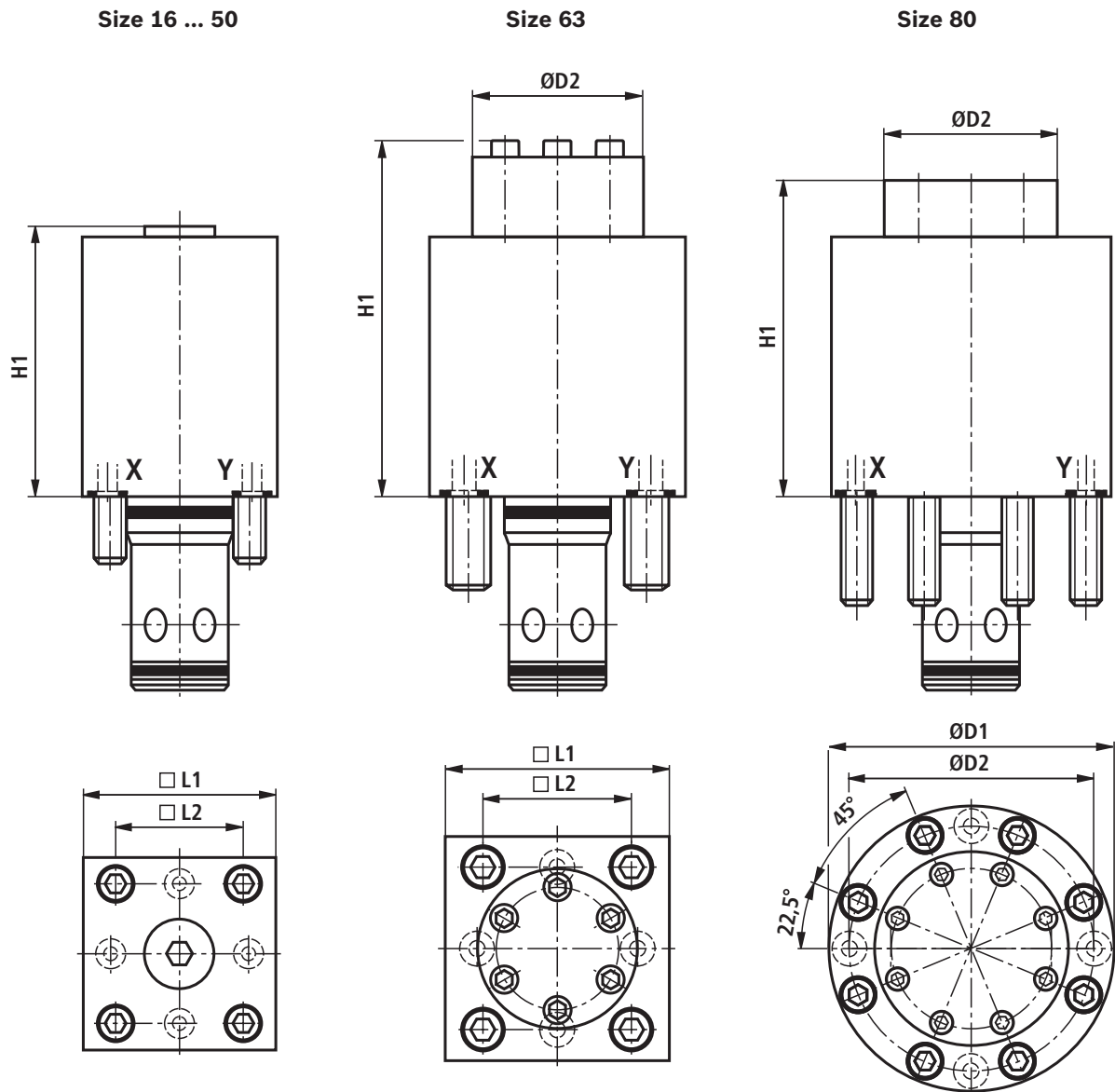
⚠ Nozzle possible, must be specified if required

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



Control cover “D7” with hydraulic monitoring of the close position: Size 16 ... 80
(dimensions in mm)



Size	16	25	32	40	50	63	80
H1	95	109	118	161	175	264	213
□ L1	65	85	100	125	140	180	-
□ L2	46	58	70	85	100	125	200
ØD1	-	-	-	-	-	-	250
ØD2	-	-	-	-	-	115	155

Note:

The dimensions are nominal dimensions which are subject to tolerances.

Control cover “H2-7” with hydraulic monitoring of the close position and stroke limitation:
Size 16 ... 80

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	H2-7	-	6X	/		D										1)

02						
Size						
16	25	32	40	50	63	80

Spool design (for area ratio see section on page 5)

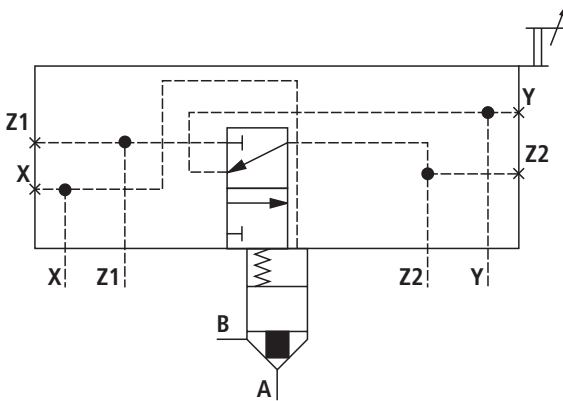
05	$A_1 : A_2 = 2 : 1$ (annulus area = 50%; standard version)	CA
	$A_1 : A_2 = 14.3 : 1$ (annulus area = 7%)	CB
	$A_1 : A_2 = 1 : 1$	CD
06	Cracking pressure 0.5 bar	05
	Cracking pressure 1.0 bar	10
	Cracking pressure 4.0 bar	40

△ Nozzle possible, must be specified if required

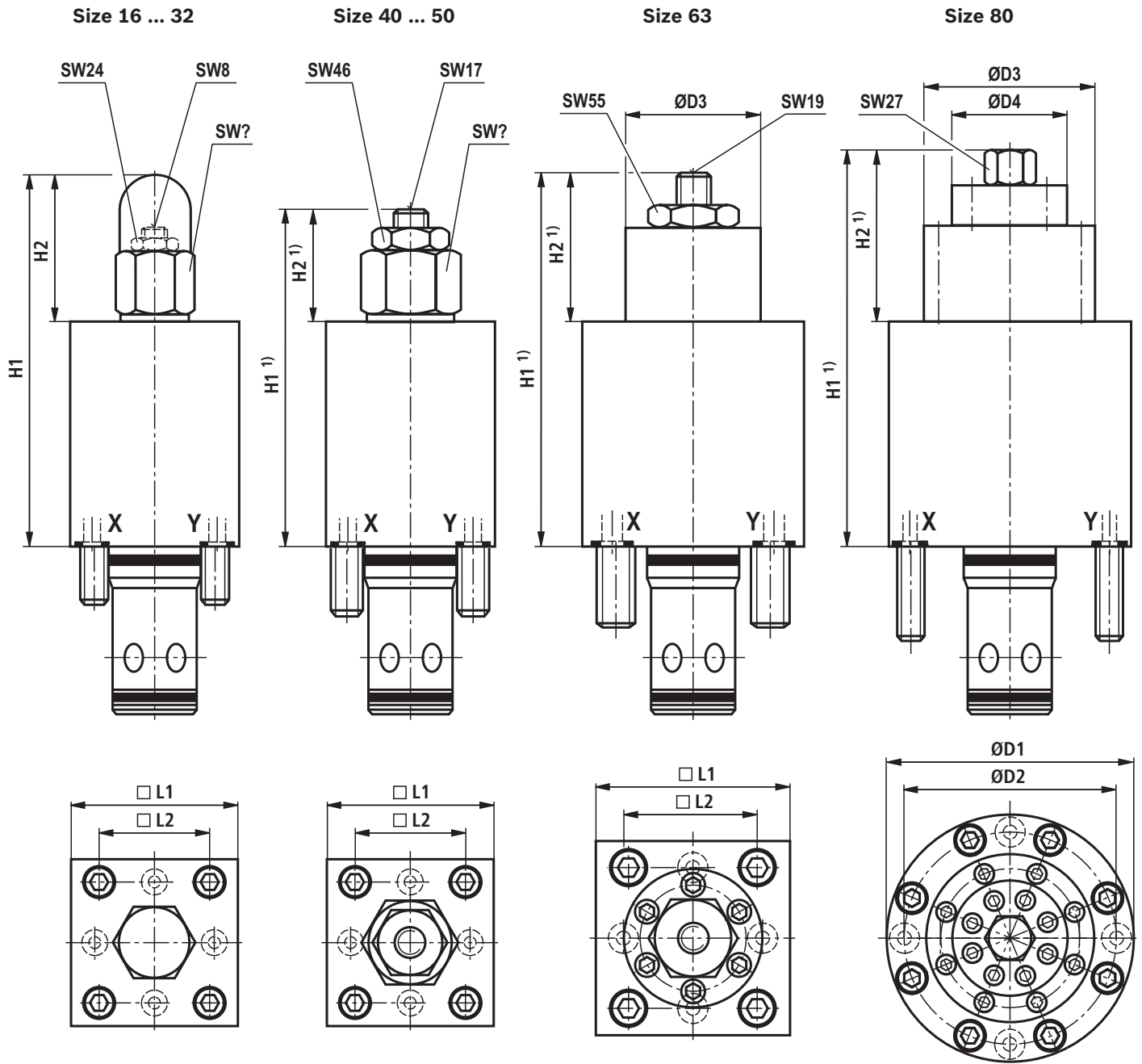
Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.

LFA . H2-7... (size 16 ... 80)



Control cover “H2-7” with hydraulic monitoring of the close position and stroke limitation:
Size 16 ... 80 (dimensions in mm)



Size	16	25	32	40	50	63	80
H1	95	109	118	161	175	264	213
H2	90	90	90	125	125	140	190
□ L1	65	85	100	125	140	180	-
□ L2	46	58	70	85	100	125	200
ØD1	-	-	-	-	-	-	250
ØD2	-	-	-	-	-	-	-
ØD3	-	-	-	-	-	115	155
ØD4	-	-	-	-	-	-	-

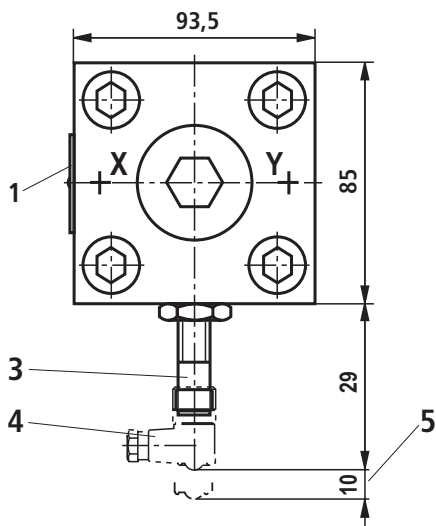
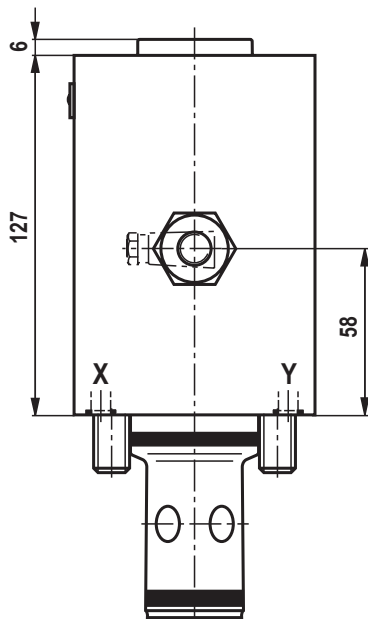
Note:
The dimensions are nominal dimensions which are subject to tolerances.

Control cover “E51” with electric monitoring of the close position and open zero position: Size 25 (dimensions in mm)

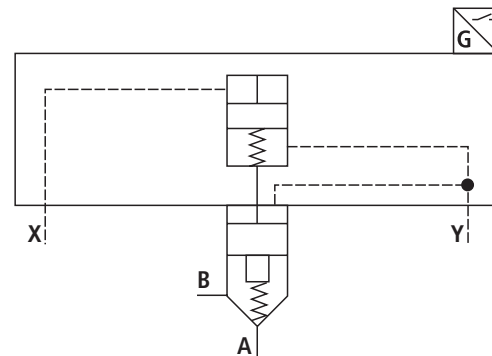
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	25	E51	-	6X	/	CA	20	E	Q8G08							1)

Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...” page 6.



LFA . E51...



- 1 Name plate
- 3 Position switch type Q8
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector

Electrical data, pinout and switching logics, see page 17.



Note:

The dimensions are nominal dimensions which are subject to tolerances.

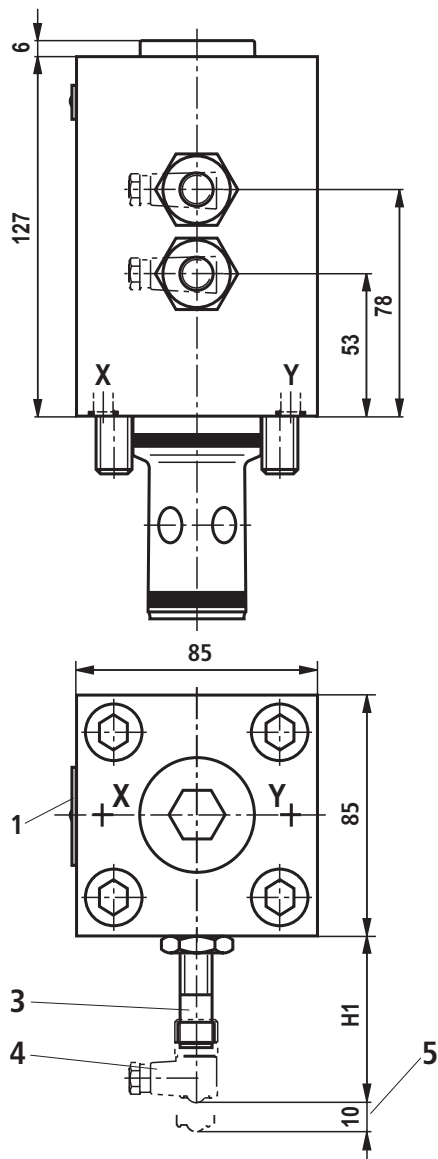
Control cover “E76” and “E79” with electric monitoring of the close position and open zero position: Size 25 (dimensions in mm)

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	25		-	6X	/	CA	20	E								1)

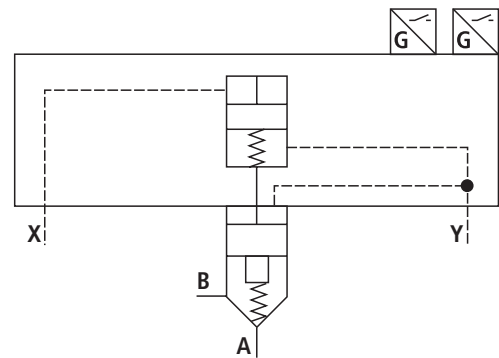
03	08
Type	Spool position monitoring
E76	Q8G08
E79	Q6G24

△ Nozzle possible, must be specified if required
 Characteristic curves for selecting nozzles see page 69.

1) See „General information on ordering codes for control cover type LFA...“ page 6.



LFA . E76..., LFA . E79...



	Q6	Q8
H1	20	29

- 1 Name plate
- 3 Position switch type Q6 or Q8
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector

Electrical data, pinout and switching logics, see page 16 and 17.

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

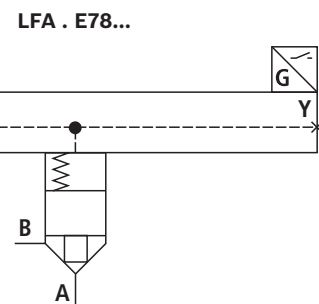
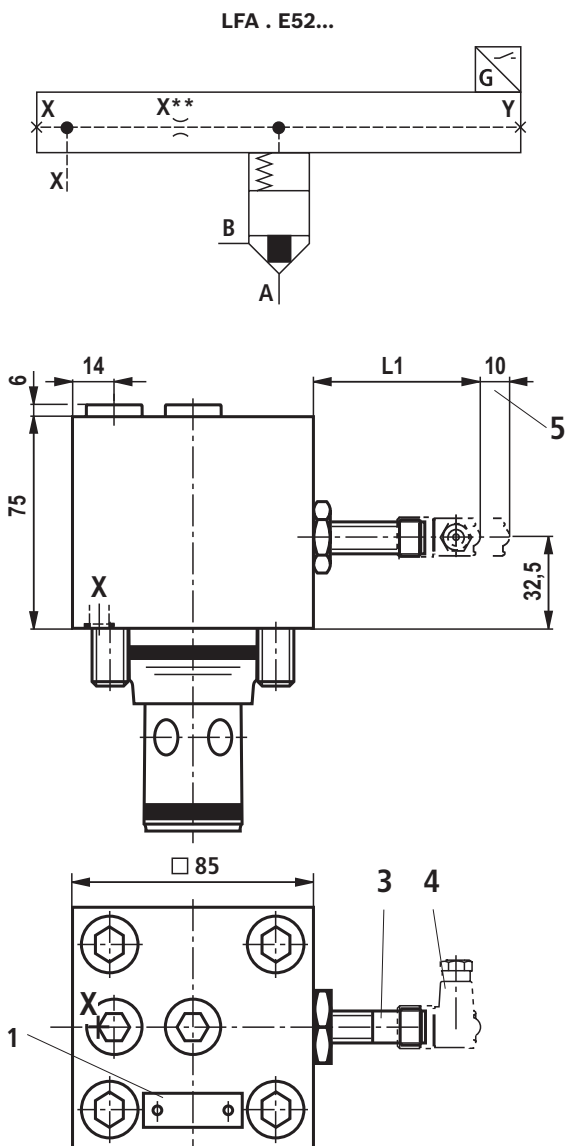
Control cover “E52” and “E78” with electric monitoring of the close position: Size 25
(dimensions in mm)

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
LFA	25	E52	-	7X	/	CA										1)

03	08
Type	Spool position monitoring
E76	Q8G08
E79	Q6G24

06	Cracking pressure 1.0 bar (only version “D”)	10
	Cracking pressure 2.0 bar (only version “E”)	20
07	Valve poppet with damping nose (only version “10”)	D
	Valve poppet without damping nose (only version “20”)	E

1) See „General information on ordering codes for control cover type LFA...“ page 6.



	Q6	Q8
L1	10.5	19.5

- 1 Name plate
- 3 Position switch type Q6 or Q8
- 4 Mating connector angled (separate order, material no. **R900082899**, see page 70)
- 5 Space required to remove the mating connector

Electrical data, pinout and switching logics, see page 16 and 17.

Note:

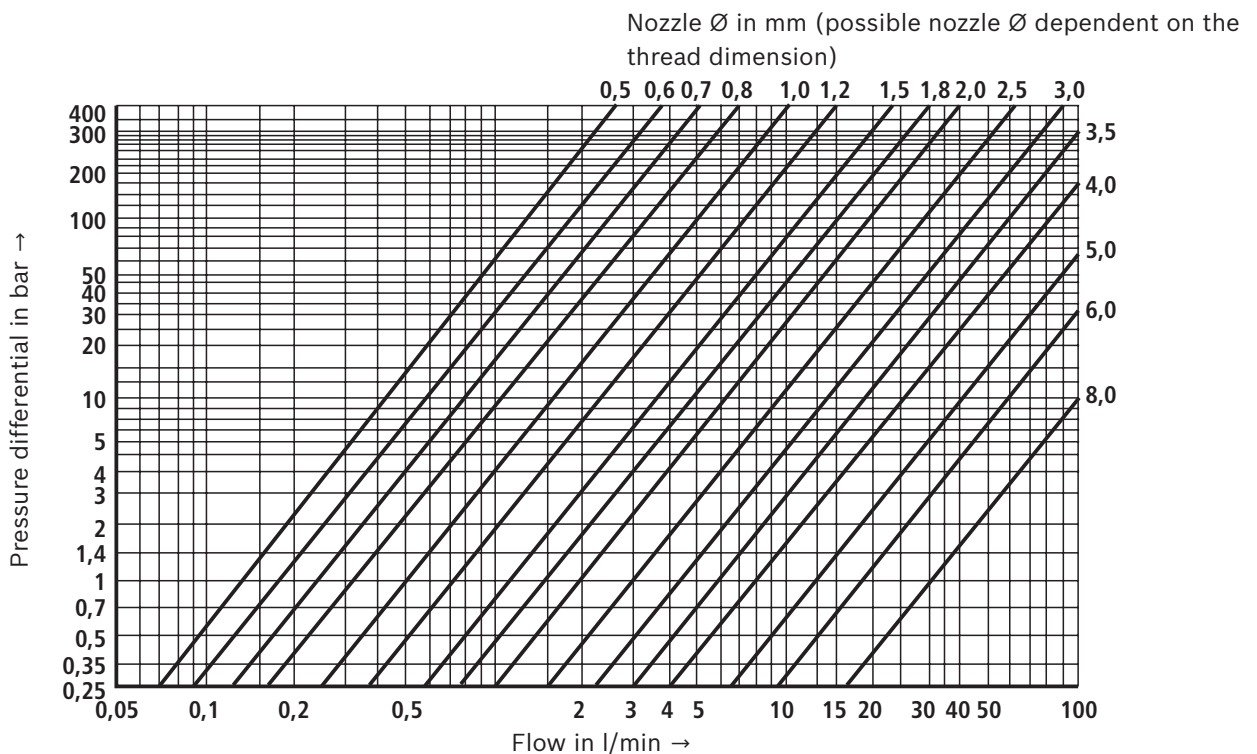
The dimensions are nominal dimensions which are subject to tolerances.

Mounting screws control cover LFA (included in the scope of delivery)**Hexagon socket head cap screws ISO 4762 - 10.9**

Size	Quantity	Tightening torque M_A in Nm
16	4	32
25	4	110
32	4	270
40	4	520
50	4	520
63	4	1800
80	8	900
100	8	1800
125	8	3100
160	12	5000

Notice:

- ▶ The specified tightening torques 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.

Characteristic curves for selecting nozzles; screw plugs**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.

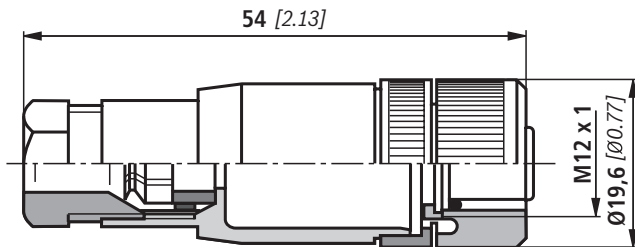
Plug screws

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

Mating connectors (dimensions in mm [inch])

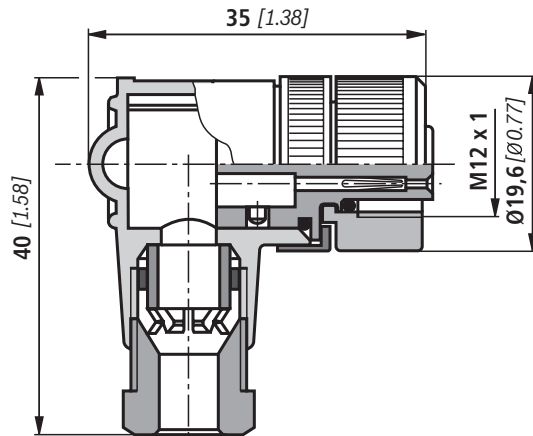
Mating connector suitable for K24 4-pin, M12 x 1 with screw connection, cable gland Pg 9.

Material no. **R900031155**



Mating connector suitable for K24 4-pin, M12 x 1 with screw connection, cable gland Pg 9, angled. Housing can be rotated by 4 x 90° in relation to the contact insert.

Material no. **R900082899**



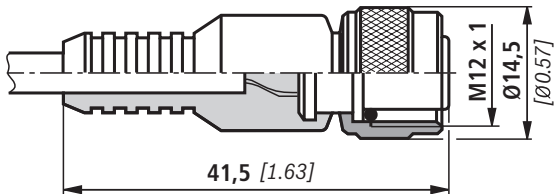
Mating connector suitable for K24-3m 4-pin, M12 x 1 with potted-in PVC cable, 3 m long.

Line cross-section: 4 x 0.34 mm²

Core marking:

1	brown
2	white
3	blue
4	black

Material no. **R900064381**



For more information refer to data sheet 08006.

Further information

▶ 2-way cartridge valves directional functions	Data sheet 21010
▶ 2-way cartridge valves-pressure functions	Data sheet 21050
▶ 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 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
▶ Inductive position switch and proximity sensors (contactless)	Data sheet 24830
▶ Mineral oil-based hydraulic fluids	Data sheet 90220
▶ Environmentally compatible hydraulic fluids	Data sheet 90221
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Reliability characteristics according to EN ISO 13849	Data sheet 08012
▶ Hexagon socket-head screws metric/UNC	Data sheet 08936
▶ General product information on hydraulic products	Data sheet 07008
▶ Assembly, commissioning and maintenance of industrial valves	Data sheet 07300
▶ Hydraulic valves for industrial applications	Data sheet 07600-B
▶ Filter range	www.boschrexroth.com/filter

Notes

Bosch Rexroth AG
Hydraulics
Zum Eisengiesser 1
97816 Lohr am Main, Germany
Phone +49 (0) 93 52/18-0
documentation@boschrexroth.de
www.boschrexroth.de

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It must be remembered that our products are subject to a natural process of wear and aging.