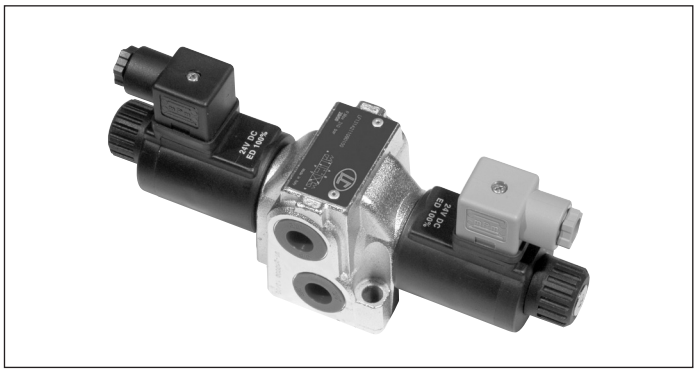
rexroth
A Bosch Company

Stand alone 4/3, 4/2 direct acting directional valve LF1_2... (LC1F-DZ)

RE 18305-02
Edition: 10.2024
Replaces: 10.2021



Size 6
Series 00
Maximum operating pressure 310 bar (4500 psi)
Maximum flow 70 l/min (18.5 gpm)
Port connections G 3/8 - G 1/2 - SAE8

NEW spool position sensor available for this valve.
See RE18300-30

General specifications

4 way, 2 or 3 position spool type solenoid operated directional valves.
Stand-alone valve body intended for “in-line” application. Available with a choice of threaded ports; mounting surface with installation holes for direct fitting on the machine structure.
Zinc plated body with yellow trivalent chrome treatment.
Wet pin tubes for DC coils, with push rod for mechanical override; nickel plated surface.
Coils can be rotated 360° around the tube; they can be energized by AC current through special connectors with rectifier (RAC).
Plug-in connectors available: EN 175301-803 (was DIN 43650); AMP Junior; DT04-2P (Deutsch), free leads.
Coils removable.
Manual override (push button or lever type) available as option.
Spool variants (for different hydraulic schemes) are available for both 2 and 3 position versions.

Contents

Ordering details

01	02	03	04	05	06	07	08	09
L	**F**	**1**		**2**				

Family

01	Directional Valve elements CDV	**L**

Type

02	Directional valve 4/3, 4/2	**F**

Size

03	6	**1**

Ports

04	G 3/8 DIN 3852	**3**
	G 1/2 DIN 3852	**2**
	3/4”-16 UNF (SAE8)	**C**

Coil Type

05	C 45	**2**

Spool variants[1)]

06	4/3 operated on both sides a and b	**_ 2 _ _**
	4/2 operated on side a only	**_ 3 _ _**
	4/2 operated on side b only	**_ 4 _ _**

Voltage supply		**07**	**03**	**01**	**00**	
07	Without coil	–	–	–	●	**00**
	12V DC	●	●	●	–	**OB**
	13V DC	●	●	●	–	**AD**
	24V DC	●	●	●	–	**OC**
	27V DC	●	●	●	–	**AC**
	48V DC	–	–	●	–	**OD**
	110V DC	–	–	●	–	**OE**
	24V AC (21.5 DC)	–	–	●	–	**OV**
	110V AC (98 DC)	–	–	●	–	**OW**
	230V AC (207 DC)	–	–	●	–	**OZ**

Electric connections

08	Without coils	**00**
	With coils, without mating connector DIN EN 175301-803 [2)]	**01**
	With coils, with bi-directional diode, without mating connector vertical Amp-Junior	**03**
	With coils, with bi-directional diode, without mating connector DT04-2P	**07**

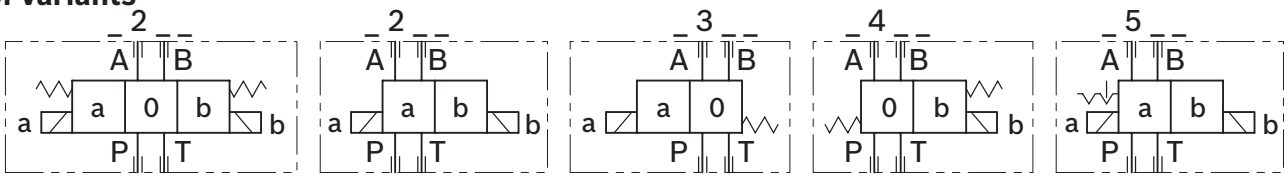
Options

09	Standard	**00**
	Push-button type manual override	**0P**
	Screw type manual override	**0F**
	Lever type manual override [3)]	**_ _**

● = Available – = Not available

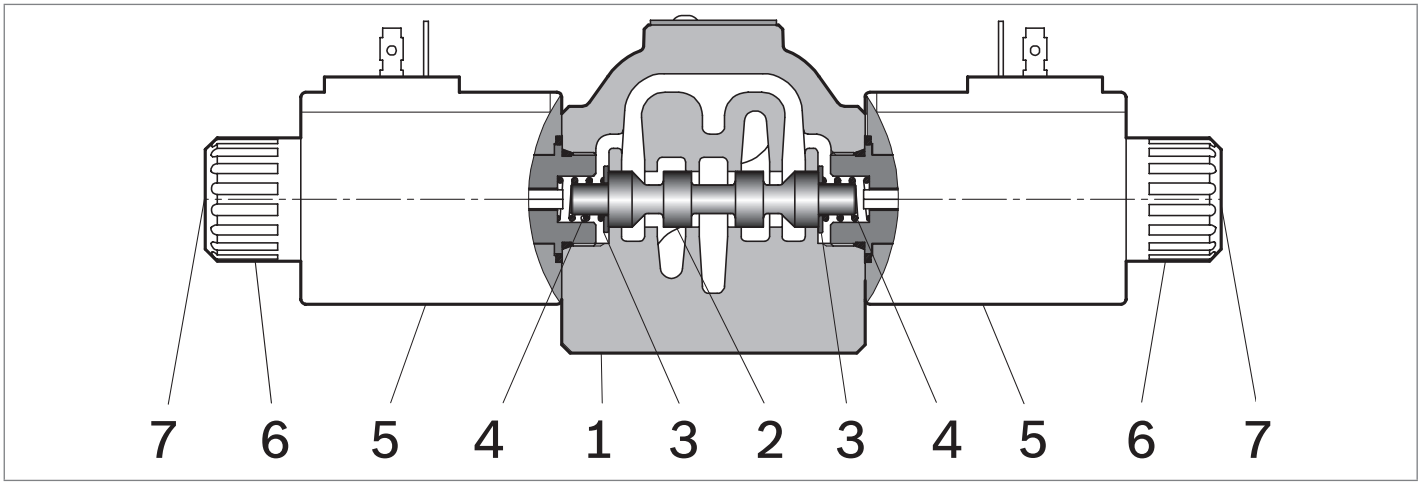
1) The required hydraulic symbol and spool variant can be chosen by consulting page 3.
2) For connectors ordering code see data sheet RE 18325-90.
3) Each different option for the type of emergency chosen implies a specific ordering code (refer to page 8).

Spool variants



				=A201
				=C201
				=E201
				=F201
				=G209
				=K209
				=V201
				=J201
				=L201
				=N201
				=L501
				=N501
				=A301
				=B301
				=C301
				=D301
				=E301
				=K301
				=T301
				=X301
				=U369
				=A401
				=A471
				=B401
				=C401
				=D401
				=E401
				=K401
				=T409
				=X401
				=A211
				=B201
				=D201
				=E2R1
				=G201
				=K201
				=U201
				=M201
				=A581
				=M501
				=A311
				=A361
				=B361
				=C361
				=D361
				=E361
				=N301
				=T361
				=Y301
				=A411
				=B471
				=C471
				=D471
				=E471
				=N401
				=T479
				=Y401

Functional description



The directional valves LC1F_DZ are compact direct operated solenoid valves which control the start, the stop, the direction of the oil flow. They basically consist of a housing (**1**) with a control spool (**2**), one or two solenoids (**5**), and one or two return springs (**4**).
When energized, each solenoid (**5**) displaces the control spool (**2**) from its neutral-central position to the “a” or “b” position and the oil flow P is diverted to A, or to B.

Once the solenoid is de-energized, the return spring (**4**) pushes the spool thrust washer back against the housing and the spool (**2**) returns in its neutral-central position “0”. Each coil is fastened to the solenoid tube (**5**) by a ring nut (**6**). A pin (**7**) allows to push the spool (**2**) in emergency conditions, when the solenoid cannot be energized, like in case of voltage shortage.

Technical data

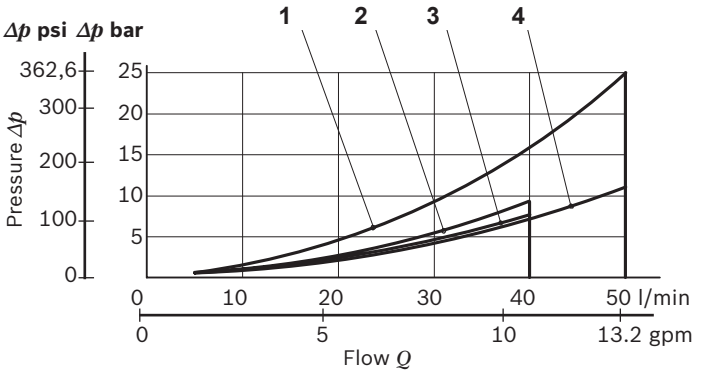
General		
Valve element with 2 solenoids	kg (lbs)	2.23 (4.92)
Valve element with 1 solenoid	kg (lbs)	1.75 (3.86)
Valve element with 2 solenoids, with lever type emergency	kg (lbs)	2.53 (5.58)
Valve element with 1 solenoid, with lever type emergency	kg (lbs)	2.00 (4.41)
Mounting position		Unrestricted. Horizontal with spool type _5__
Ambient Temperature	°C (°F)	–20....+50 (-4....+122) (NBR seals)
MTTFd		150 years (see also RE 18350-51) (NOT valid for L201-M201-N201 spool variants)
Hydraulic		
Maximum pressure at P, A and B ports	bar (psi)	310 (4500)
Maximum pressure at T [1)]	bar (psi)	250 (3626)
Maximum pressure on T when using spool type A211, A311, A411	bar (psi)	250 (3626)
Max pressure, with lever type emergency at T	bar (psi)	100 (1450)
Maximum inlet flow	l/min (gpm)	70 (18.5)
Maximum flow when using spool type A201, A301, A361, A401, A471, A2EA, G201, G209	l/min (gpm)	50 (13.2)
Maximum flow when using spool type A211, A311, A411 l/min (gpm)	l/min (gpm)	40 (10.6)
Hydraulic fluid General properties: it must have physical lubricating and chemical properties suitable for use in hydraulic systems such as, for example:		Mineral oil based hydraulic fluids HL (DIN 51524 part 1). Mineral oil based hydraulic fluids HLP (DIN 51524 part 2). For use of environmentally acceptable fluids (vegetable or polyglycol base) please consult us.

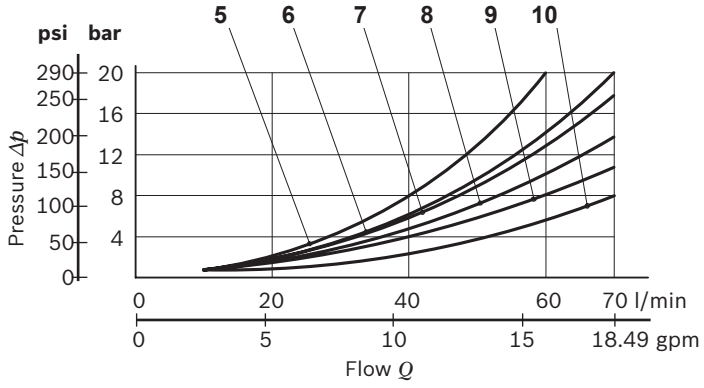
Fluid Temperature	°C (°F)	–20....+80 (-4....+176) (NBR seals)								
Permissible degree of fluid contamination		ISO 4572: $\beta_x \geq 75$ X=12...15 ISO 4406: class 20/18/15 NAS 1638: class 9								
Viscosity range	mm^2/s	5....420								
Maximum leakage on A and B ports (P and T pressurised) when using A211 type spools	cc/min (in^3/min)	8 - 20 (0.49 - 1.21) (100 bar (1450 psi))								
1) Variation on T line pressure for circuits 5_ with mechanical detent can cause autoinversion.										
Electrical										
Voltage type		DC (AC only with RAC connection)								
Voltage tolerance (nominal voltage)	%	-10 .... +10								
Duty		Continuous, with ambient temperature ≤ 50°C (122°F)								
Coil wire temperature not to be exceeded	°C (°F)	150 (302)								
Insulation class		H								
Compliance with		Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC								
Coil weight with connection EN 175301-803	kg (lbs)	0.335 (0.74)								
Voltage	V	12	13	24	27	48	110	24 +RAC (21,5)	110 +RAC (98)	230 +RAC (207)
Voltage type		DC	DC	DC	DC	DC	DC	DC	DC	DC
Power consumption	W	33	31	33	33	33	35	33	33	35
Current (nominal at 20 °C (68 °F))	A	2.8	2.3	1.4	1.2	0.7	0.32	1.6	0.34	0.16
Resistance (nominal at 20 °C (68 °F))	Ω	4.24	5.42	17	21.8	69.8	341.8	13.6	285	1229

Note
For applications with different specifications consult us

Code	Voltage [V]	Connector type	Coil description	Marking	Coil Mat no.
OB 01	12 DC	EN 175301-803 (Ex. DIN 43650)	C4501 12DC	12 DC	R933000026
OB 03	12 DC	AMP JUNIOR	C4503 12DC	12 DC	R933000027
OB 07	12 DC	DEUTSCH DT 04-2P	C4507 12DC	12 DC	R933000030
AD 01	13 DC	EN 175301-803 (Ex. DIN 43650)	C4501 13DC	13 DC	R933000028
AD 03	13 DC	AMP JUNIOR	C4503 13DC	13 DC	R933000029
AD 07	13 DC	DEUTSCH DT 04-2P	C4507 13DC	13 DC	R933000031
OC 01	24 DC	EN 175301-803 (Ex. DIN 43650)	C4501 24DC	24 DC	R933000034
OC 03	24 DC	AMP JUNIOR	C4503 24DC	24 DC	R933003630
OC 07	24 DC	DEUTSCH DT 04-2P	C4507 24DC	24 DC	R933000032
AC 01	27 DC	EN 175301-803 (Ex. DIN 43650)	C4501 27DC	27 DC	R933000035
AC 03	27 DC	AMP JUNIOR	C4503 27DC	27 DC	R933000036
AC 07	27 DC	DEUTSCH DT 04-2P	C4507 27DC	27 DC	R933000033
OD 01	48 DC	EN 175301-803 (Ex. DIN 43650)	C4501 48DC	48 DC	R933000037
OE 01	110 DC	EN 175301-803 (Ex. DIN 43650)	C4501 110DC	110 DC	R933000040
OV 01	24 RAC	EN 175301-803 (Ex. DIN 43650)	C4501 21.5DC	21.5 DC	R933000038
OW 01	110 RAC	EN 175301-803 (Ex. DIN 43650)	C4501 98DC	98 DC	R933000039
OZ 01	230 RAC	EN 175301-803 (Ex. DIN 43650)	C4501 207DC	207 DC	R933000041

Characteristic curves

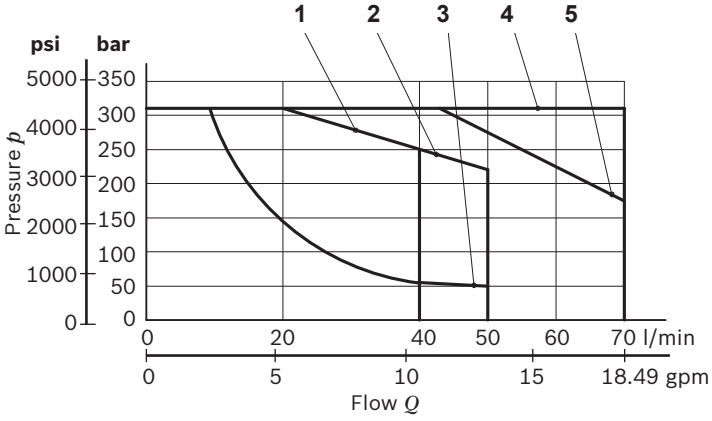




Spool Variant	Curve no.				
	P>T	P>A	P>B	A>T	B>T
A201, A301, A401, A361, A471,A2EA	4	1	1	1	1
A211,A311,A411,	2	3	3	3	3
A581	1	1	1	1	1
B201, B301, B401, B361, B471, B2EA		9	8	7	7
C201. C301, C401, C361, C471, C2EA	9	10	9	8	8
D201, D301, D401, D361, D471		10	10	9	9
E201, E301, E401, E361, E471		8	8	9	9
E2R1		8	8	9	9
F201, F2EA		7	7		
G201,G209	4	1	1	1	1
K201, K209, K301, K401		8	8	7	7
L201, L501		9	8	8	8
M201, M501		8	7	7	7
N201, N501		9	9		
N301, N401		7	7		
T301, T361, T409, T479				7	7
U201, U369		9	5	7	b>a 5
X301, X401, Y301, Y401		8	8	7	7
V201	9	9	9	6	8

Measured with hydraulic fluid ISO-VG32 at 45° ±5 °C (113° ±9 °F); ambient temperature 20 °C (68 °F).

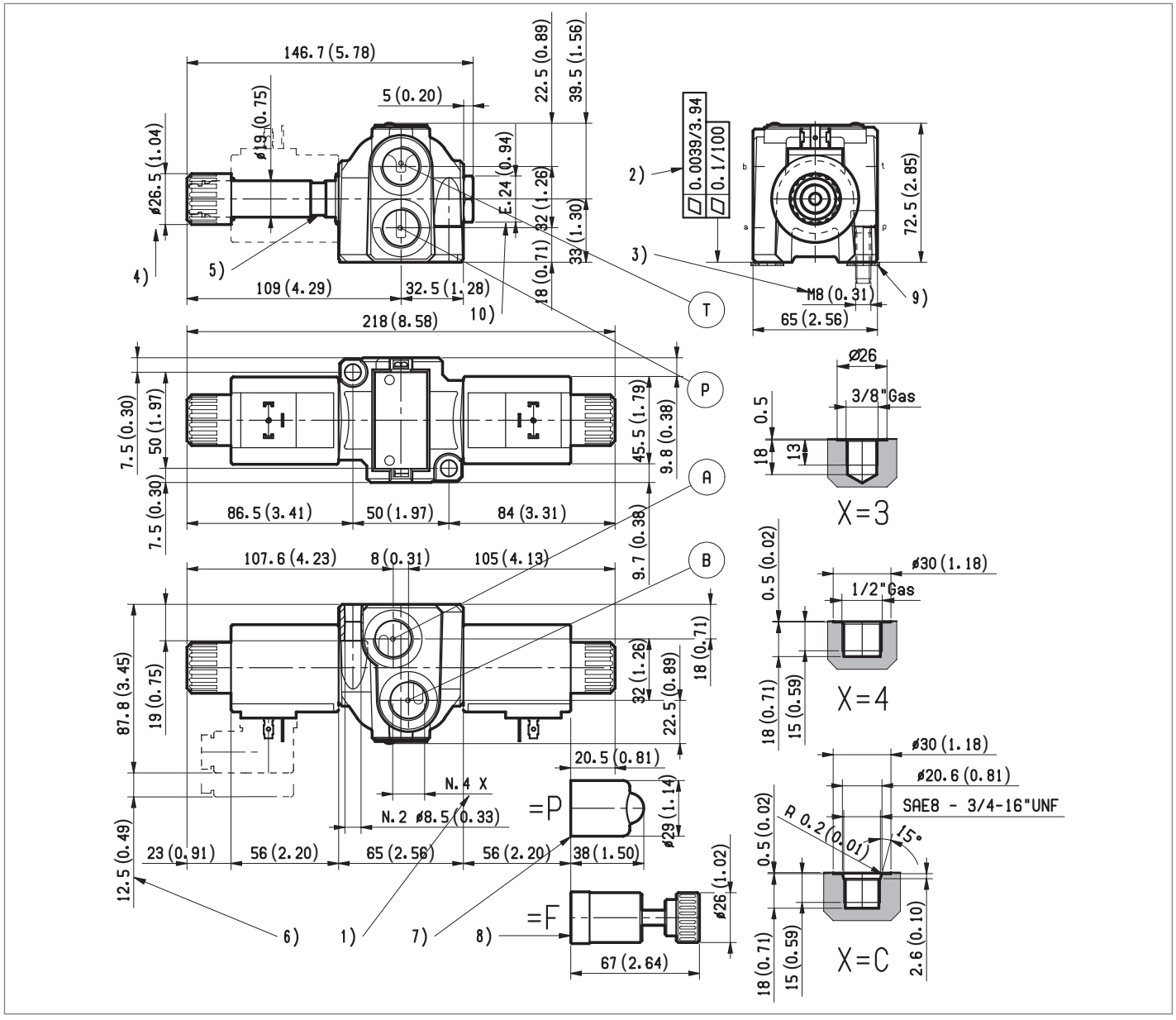
Performance limits



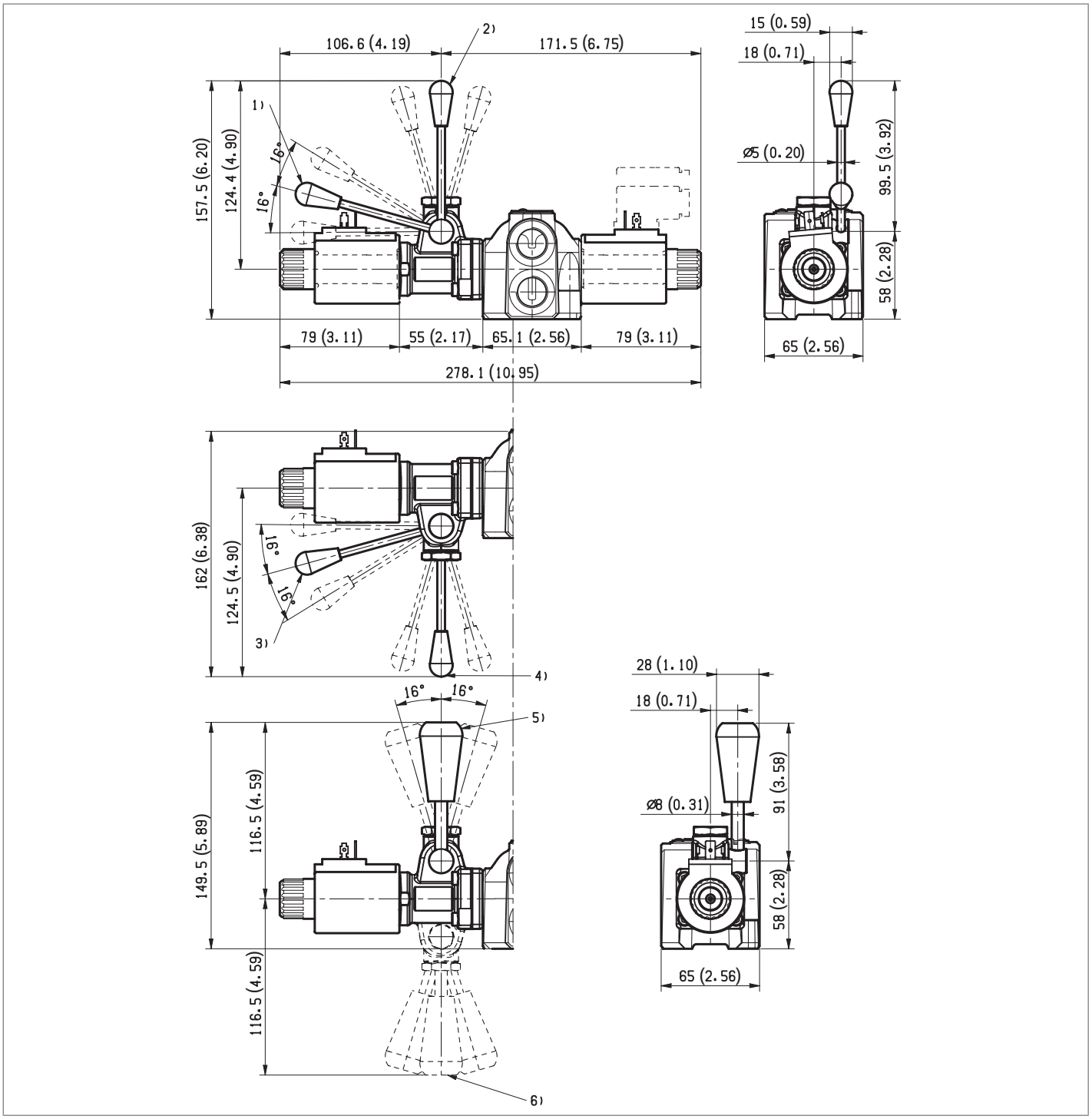
Spool Variant	Curve no.
A211, A311, A411, A581	1
A201, A301, A401	2
N301, N401, V201	3
B201, B301, B401, B361, B471, B2EA, C201. C301, C401, C361, C471, C2EA, D201, D301, D401, D361, D471, E201, E301, E401, E361, E471, E2R1, F201, F2EA, G201,G209, K201, K209, K301, K401, U201, U369, T301, T361, T409, T479, N201, N501, M201, M501, L201, L501	4
X301,X401, Y301, Y401	5

The performance curves are measured with flow going across and coming back, like P>A and B>T. With “lever type” emergency control, the performance limits are slightly lower.

External dimensions and fittings



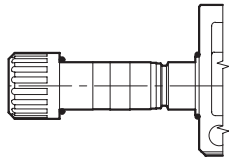
1 Work ports A, B, P, and T.
2 Flatness needed for mounting surface.
3 Two through installation holes reccomended screws M8x30 DIN 8.8. Must be ordered separately.
4 Ring nut for coil locking. Torque 3-4 Nm (2.2-3 ft-lb).
5 Solenoid tube Ø 19 mm (0.75 inch).
6 Clearance needed for connector removal.
7 Optional push-button manual override for spool opening: it is pressure stuck to the ring nut for coil locking. Code R933000043.
8 Optional screw type manual override for spool opening: it is screwed (torque 6-7 (4.4-5.2 ft-lb)) to the tube as replacement of the coil ring nut. Mat. no R933007215.
9 Kit ring nut for coil locking with seals. Mat no. R933003529.
10 Plug for 2 positions versions (4/2).



1 Ordering Details: HA (if fitted to side A) or HB (if fitted to side B).
2 Ordering Details: VA (if fitted to side A) or VB (if fitted to side B).
3 Ordering Details: H1 (if fitted to side A) or H9 (if fitted to side B).
4 Ordering Details: V1 (if fitted to side A) or V9 (if fitted to side B).
5 Ordering Details: XA (if fitted to side A) or XB (if fitted to side B).
6 Ordering Details: X1 (if fitted to side A) or X9 (if fitted to side B).

Electric connection

00



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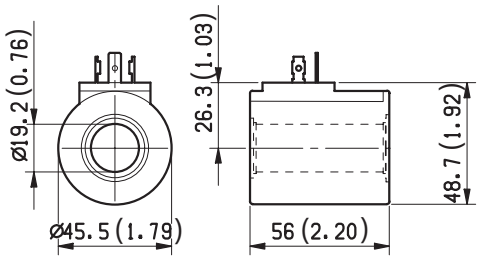
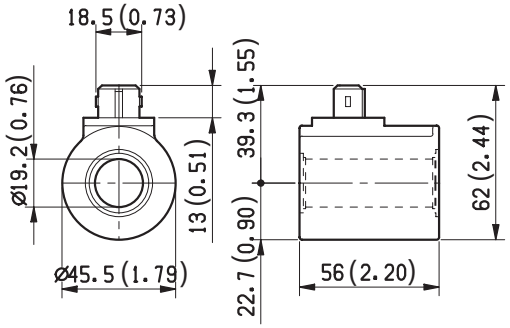
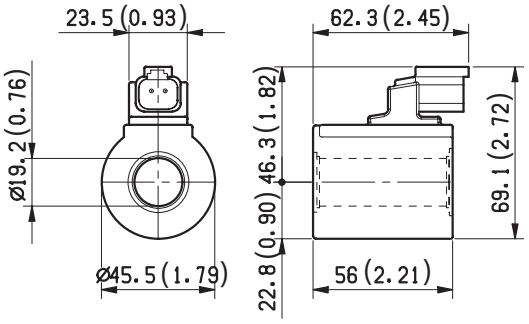


03 Protection class: IP 65 with female connector properly fitted (see drawing).



07 Protection class: IP 69 K with female connector properly fitted (see drawing).



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