



Rexroth
Bosch Group

Special Directional Valves

RE 00169/01.06

The Drive & Control Company





Oleodinamica LC s.r.l. Compact Directional Valves

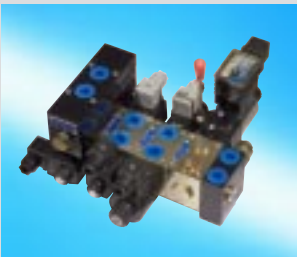
The Drive & Control Company

Product Program ■ Programma Prodotti



- Flow Diverters
- Deviatori di Flusso

RIE 00158



- Modular Directional Valves
- Elettrodistributori Modulari

RIE 00159



- Solenoid Valves CETOP 2
- Elettrovalvole CETOP 2

RE 00157
RI 00157



- Special Directional Valves
- Valvole Direzionali Speciali

RE 00169
RI 00169



Special Directional Valves

Designation	Type	Size	Series	Ports	P max bar	Q max l/min	Page
Stand alone 4/3, 4/2 direct acting directional valve	LC1F-Z	06	00	3/8" Gas SAE8 (3/4-16 UNF)	310	35	5
Stand alone 4/3, 4/2 direct acting directional valve	LC1F-DZ	06	00	3/8" Gas - 1/2" Gas SAE8 (3/4-16 UNF)	310	70	13



SALES, DELIVERY AND WARRANTY TERMS

SALES AND DELIVERY TERMS

Oleodinamica LC s.r.l., with factory and offices situated at:

via Artigianale Sedrio, 12-12A - 42030 Vezzano sul Crostolo (REGGIO EMILIA) Italy,

distributes its valves through its sales network in compliance with the delivery terms (contract) shown in the specific documents (offers, order, confirmations, invoices), and those conditions shall be applicable for all what not specified here.

ORDERS

All orders shall be in written form and shall show the following information:

- a) date and place where the order is issued;
- b) full name and address of the purchasing company;
- c) signature of a legal representative, with indication of his/her qualification;
- d) reference of the suppliers offer (when applicable);
- e) complete ordering code and eventual description of the valves ordered;
- f) number of pieces;
- g) delivery time requested (eventual)
- h) carrier (eventual).

The order will be considered valid at the LC Oleodinamica delivery terms.

The delivery terms requested or shown, and eventually notified in writing, can be considered essential only in case of specific signed agreement between both parties, supplier and buyer.

WARRANTY

The LC limited warranty lasts for a period of 12 months starting from the delivery date of the valve.

If the buyer deems that one or more products are faulty due to improper manufacturing, he undertakes to notify immediately the presence of these faults to the supplier, by means of detailed written report, so that LC may verify, through an expert of its own trust, whether the complained faults are really present. Once the LC expert has verified that the notified faults are effectively present and that they are due to manufacturing defects, Oleodinamica LC s.r.l. undertakes to repair or to replace the valve within an adequate term and the buyer undertakes not to ask for contract cancellation before the adequate term to repair or replace the valve has expired.

Written permission for warranty returns must be obtained from Oleodinamica LC s.r.l. prior to shipment. All warranty returns shall be shipped freight pre-paid and shall include a detailed description of the malfunction and of the working conditions. The warranty does not cover products which have been contaminated, used improperly or tampered without control and approval of Oleodinamica LC s.r.l.. Similarly the warranty is not valid if changes are made to the circuits or systems which could negatively affect the valve function. If the valve supplied must be assembled in systems which could cause damages to third parties exceeding by for the price of the valve, the buyer undertakes to adapt all safety measures in order to avoid any damage, since he recognizes that mass production of the valves at market prices entails the risk, even if limited, that occasional faulty valves may result.

USER'S INSTRUCTIONS

The buyer shall not use the valve for purposes different from what pointed out in the relevant drawings or in the Oleodinamica LC s.r.l. catalogues.

If the buyer wants to use the valves for other purposes he shall ask specific approval from Oleodinamica LC s.r.l..

All LC valves are tested and checked in compliance with the specifications shown by the relevant documents. Since the actual detailed performance of the buyer's equipment cannot be totally reproduced in LC's testing laboratory, the full assurance of suitability of LC valves in the buyer's applications is the responsibility of the buyer.

Generally the buyer will validate the valve in his own application by manufacturing a prototype to be submitted to a full testing program.

STATEMENT

The valves and the multifunction integrated blocks described in this catalogue can be employed in systems or machines falling into the specifications of EEC Directive 89/37/CE (Machine Directive) and later amendments. The valves and the blocks shall not be operated before the complete machine is verified to be in compliance with the requirements of the above mentioned Directive.

JURISDICTION

In case of a dispute where Oleodinamica LC s.r.l. is summoned before court, the Court of law in Reggio Emilia (Italy) is exclusively competent: drafts, acceptance of settlement, dispatches without or with C.O.D. do not constitute a derogation from this clause of jurisdiction even in case Oleodinamica LC s.r.l. should be pursued for concession or continuance of cause. When Oleodinamica LC s.r.l. is the plaintiff, it will be able to recur both to the Court of Law in Reggio Emilia and to that where the other party resides.

Notes

- The present catalogue cancels and supersedes all the previous issues.
- Oleodinamica LC s.r.l. reserves the right to stop production or to change specifications and dimensions of any valve without prior notice and without incurring in any obligation.
- All rights are reserved. It is specifically forbidden to reproduce partially or totally the present catalogue.



TECHNICAL DATA

FUNCTIONAL TESTING

All performance curves in this catalogue are obtained using mineral based hydraulic oil with 32 cSt viscosity at 40°C (ISO VG 32 viscosity class).

All valves go through functional testing at these conditions before shipment.

Our test stands ensure 15 micron Absolute Filtration (NAS 9).

TEMPERATURE RANGES

Ambient Temperature from -20°C to +50°C

Oil Temperature from -20°C to +80°C

PORTS

G sizes (BSPP) from G 1/4" to G 1" are standard; other threads can be manufactured upon request.

SEALS

O-RINGS: Acryl – Nitrile Butadiene Rubber NBR (BUNA-N) standard for temperature between -20°C and +100°C. Fluorocarbo FPM (Viton) and other compounds are available on request.

BACKUP RINGS: Lubriflon – PTFE – PBK.

STOCKING OF NEW VALVES

encapsulated by a protective wrapping, the valves shall not be exposed to direct sun light nor to source of heat or ozone (like electric motors running) and kept in a dry place at a temperature between -20°C and +50°C.

VALVES INSTALLATION

It is recommended to follow these steps:

- Inspect the sub-plate to ensure that it is in good conditions and no external contaminant is present.
- Check that O-Rings are intact and correctly positioned.
- Don't tighten screws or connectors more than the maximum torque specified in the catalogue.

INLET VOLTAGE

To obtain correct operation and long life of coils it is necessary that the operating voltage fluctuations do not exceed +5% -10% of nominal voltage.

WORKING DUTY

The working duty ED of a coil is the ratio between energized time t_i and full cycle time t_c where $t_c = t_i + t_r$ and t_r = de-energized time.

$$ED = (t_i/t_c) \cdot 100 \%$$

All coils are rated for ED = 100 % provided that temperature limit of their insulation class is not exceeded.

PROTECTION EN 60529

On request coils with IP65/IP69K protection.

HYDRAULIC FLUID

It must have physical lubricating and chemical properties suitable for use in hydraulic systems such as, for example:

MINERAL OIL FLUIDS HL (DIN 51524 part1)

MINERAL OIL FLUIDS HLP (DIN 51524 part2)

For use of environmentally acceptable fluids (vegetable or polyglycol base) please consult LC Oleodinamica.

Viscosity class: with ISO-DIN, the viscosity class is expressed by ISO-VG (no.); the no. Indicates the average kinematic viscosity at 40°C in mm²/s or centiStoks (cSt).

- See Tab. A -

CONTAMINATION – FILTRATION

GENERAL INFORMATION: Manufacturers and users of hydraulic equipment admit that contamination is the most likely cause of malfunction or failure in hydraulic systems and reduces security and reliability of components and systems. Metal particles flowing throughout the circuit scratch moving surfaces so that contamination level, if not controlled, increases very rapidly.

It is strongly recommended to maintain contamination level at least at nominal values shown below, choosing adequate filtration products.

FILTRATION RATIO BETA_x: It's the ratio between the number of particles before and after the filter with diameter larger than X micron.

ABSOLUTE FILTRATION RATIO ISO 4572: It's the diameter X of the largest particle with BETA_x ≥ 75.

CONTAMINATION CLASS ISO 4406: it's expressed by 3 scale numbers representing respectively: the number of particles equal to or larger than 4 micron (c); the number of particles equal to or larger than 6 micron (c); the number of particles equal to or larger than 14 micron(c), contained in 1 ml of fluid.

CONTAMINATION CLASS NAS 1638: It's expressed by one scale numbers representing the number of particles of different size ranges contained in 100 ml of fluid.

- See Tab. B -



VISCOSITY CLASS AND FILTRATION DATA

- Tab. A -

Viscosity class	Kinematic viscosity		
	MAXIMUM AT 0°C	MEDIUM AT 40°C	MINIMUM AT 100°C
ISO VG 10	90	10	2.4
ISO VG 22	300	22	4.1
ISO VG 32	420	32	5.0
ISO VG 46	780	46	6.1
ISO VG 68	1400	68	7.8
ISO VG 100	2560	100	9.9

- Tab. B -

TYPE OF SYSTEM TYPE OF VALVE	L.C. FILTRATION RECCOMENDATIONS			
	NOMINAL FILTRATION (micron)	ABSOLUTE FILTRATION RATING ISO 4572 ($BETA_x$ 75)	CONTAMINATION CLASS ACCORDING TO:	
			ISO 4406	NAS 1638
System/components operating at HIGH PRESSURE >250 bar HIGH DUTY CYCLE APPLICATIONS Systems/components with LOW dirt tolerance	10	$X = 10...12$	19 / 17 / 14	8
System/components operating at MEDIUM HIGH PRESSURE HIGH DUTY CYCLE APPLICATIONS Systems/components with moderately dirt tolerance	15	$X = 12... 15$	20 / 18 / 15	9
System/components operating at LOW PRESSURE <100 bar LOW DUTY CYCLE APPLICATIONS Systems/components with GOOD dirt tolerance	25	$X = 15... 25$	21 / 19 / 16	10



Stand alone 4/3, 4/2 direct acting directional valve

Type LF1_1... (LC1F-Z)

Size 6
Series 00
Max. operating pressure 310 bar
Max. flow 35 l/min
Port connections 3/8" BSP and SAE8



Table of contents

Contents	Page
Features	3
Ordering codes	5
Spools	5
Functions, section	6
Technical data	6
Curves	8
Performance limits	8
Unit dimensions	9
Electrical connections	10

Features:

- 4 ways 2 or 3 position spool operated directional valves
- Standalone valve body intended to be used "in-line". It has various port thread connection options, and a surface with fixing holes for direct mounting on the application or machine.
- The body has surface zinc plating for protection.
- Nickel plated and oil immersed solenoid tubes for DC current with integrated emergency button.
- Coils with DC windings which can be fixed on the solenoid tube in any position. AC current is available through the use of connectors with integrated rectifiers.
- Available coil connections: DIN 43650; AMP JUNIOR, DTM (DEUTSCH DT04)
- Easy coil replacing
- Optionals include manual emergency rubber push buttons, and emergency levers.
- Various types of spools (hydraulic circuits) available in 2 and 3 positions



Ordering code

L F 1 _ 1 _ _ _ _ _ _ _ _

CDV
Directional Valves

Type
Directional valve 4/3, 4/2

Size
6

Ports
3/8" BSP = 3
SAE8 = C
Specials = _

Coil Type
C36 coil = 1
Specials = _

Spools
2 solenoids A and B side = _ 2 _ _
1 solenoid A side = _ 3 _ _
1 solenoid B side = _ 4 _ _
Specials = _ _ _ _

Accessories
00 = Normal
0V = Viton seals
P0 = Emergency rubber button
F0 = Emergency screw
_ _ = Specials

Connections
00 = Without coil
01 = With coil without connector
02 = With DIN 43650 connector
03 = AMP junior connection
07 = DT04-2P DEUTSCH
31 = 350 mm cable connection
_ _ = Specials

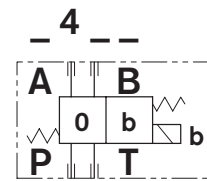
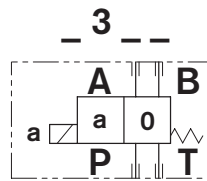
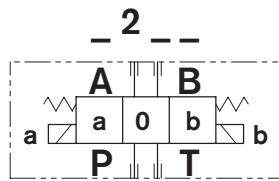
	Voltage					
00 =						
OB =						
AD =						
OC =						
AC =						
OD =						
OE =						
OV =						
OW =						
OZ =						

31 07 03 02 01 00

Available connections



Spool types



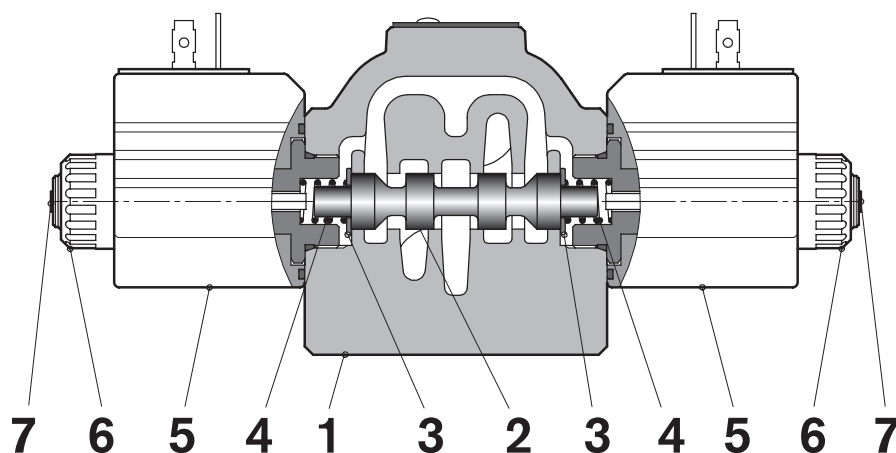
Functions, part section

These directional valves are used to control the direction of flow from "P" to A or B or T.

The valve body (1) integrates the port connections therefore hoses and tubes can be connected directly to the valve body, eliminating the use of a subplate. Using the mounting holes the valve can be fastened anywhere on the machine.

When one of the solenoids (5) is energised it will push the spool (2) which diverts the oil flow to either a or b.

The "o" (neutral) position is achieved by de-energising the coil and allowing the spring (4) to recoil. The coil is kept in place by the threaded nut (6). The emergency push button (7) permits to move the spool without energising the solenoids.



Technical data (if you intend to use the valve with different parameters than the ones mentioned here please contact us)

General

Valve weight with 2 solenoids	kg	1.85
Valve weight with 1 solenoid	kg	1.55
Valve installation positions		Any
Ambient temperature	°C	-20....+50 (with NBR seals)

Hydraulic characteristics

Maximum pressure on P, A and B	bar	310
Maximum dynamic pressure on T	bar	180
Maximum static pressure on T	bar	210
Maximum flow	l/min	35
Maximum flow when using spool type A201-A301-A401	l/min	30
Hydraulic oil		(DIN 51524/1-2). If you intend to use other types of hydraulic oil please contact factory.
Oil temperature	°C	-20....+80
Hydraulic oil filtrations		$\beta_x \geq 75$ X=12...15 ISO 4572
Cleanlines class to ISO codes		20/18/15 ISO 4406; 9 NAS 1638
Oil viscosity	mm ² /s	5....420



Electrical characteristics

Voltage	DC (AC possible by using rectifiers)									
Available voltages	V	12 ... 207								
Voltage tolerance (nominal tension)	%	-10 ... +5								
Power consumption	W	DC 26; AC 29								
Duty cycle	100% with maximum ambient temperature at 40°C									
Switching time	ms	ON 50 ... 90; OFF 40 ... 80								
Maximum shift frequency	Hz	3								
Isolation class of coil	H									
Conforms to the EU directive (low voltage)	73/23/CEE, 89,336/CEE									
Coil weight	kg	0.215								
Voltage	V	12	13	24	27	48	110	24 +RAC (21,5)	110 +RAC (98)	230 +RAC (207)
Type of voltage DC=continuous current; AC=alternate current		DC	DC	DC	DC	DC	DC	AC	AC	AC
Frequency	Hz	-	-	-	-	-	-	50/60	50/60	50/60
Power	W	26	26	26	26	26	26	29	29	29
Current ⁽¹⁾	A	2.15	2	1.1	1	0.54	0.27	1.2	0.29	0.14
Resistance ⁽²⁾	Ω	4	4.7	16	20.5	63.6	431	12	261	1163

¹⁾ Nominal

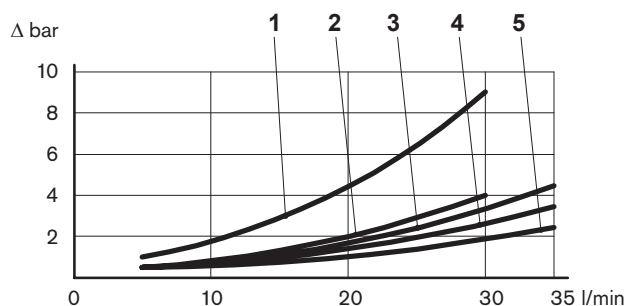
²⁾ ± 7% at ambient temperature of 20°C

	Volts	Connections	Model	Marking on coil	Coil code
=OB 01 =OB 02	12 DC	DIN 43650 – ISO 4400	C3601 12DC	12 DC	271-0510
=OB 03	12 DC	AMP JUNIOR	C3603 12DC	12 DC	271-05102
=OB 07	12 DC	DEUTSCH DT 04-2P	C3607 12DC	12 DC	271-0510207
=OB 31	12 DC	CABLE 350 mm	C3631 12DC	12 DC	271-0510002
=AD 01 =AD 02	13 DC	DIN 43650 – ISO 4400	C3601 13DC	13 DC	271-05104
=AD 07	13 DC	DEUTSCH DT 04-2P	C3607 13DC	13 DC	271-0510208
=OC 01 =OC 02	24 DC	DIN 43650 – ISO 4400	C3601 24DC	24 DC	271-0511
=OC 03	24 DC	AMP JUNIOR	C3603 24DC	24 DC	271-05112
=OC 07	24 DC	DEUTSCH DT 04-2P	C3607 24DC	24 DC	271-0511207
=OC 31	24 DC	CABLE 350 mm	C3631 24DC	24 DC	271-0511002
=AC 01 =AC 02	27 DC	DIN 43650 – ISO 4400	C3601 27DC	27 DC	271-051101
=AC 07	27 DC	DEUTSCH DT 04-2P	C3607 27DC	27 DC	271-0510209
=OD 01 =OD 02	48 DC	DIN 43650 – ISO 4400	C3601 48DC	48 DC	271-0512
=OE 01 =OE 02	110 DC	DIN 43650 – ISO 4400	C3601 110DC	110 DC	271-0514
=OV 01 =OV 02	24 RAC ⁽¹⁾	DIN 43650 – ISO 4400	C3601 21.5DC	21.5 DC	271-05110
=OW 01 =OW 02	110 RAC ⁽¹⁾	DIN 43650 – ISO 4400	C3601 98DC	98 DC	271-0513
=OZ 01 =OZ 02	230 RAC ⁽¹⁾	DIN 43650 – ISO 4400	C3601 207DC	207 DC	271-0515

¹⁾ Use connectors with rectifiers.

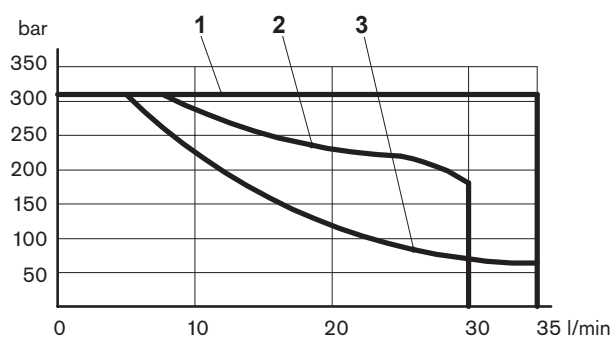


Curves (measured using a ISO VG 32 Cst oil at an ambient temperature of 45±5°C)



Spool	Curve n°				
	P>T	P>A	P>B	A>T	B>T
A201, A301, A401	2	1	1	1	1
B201, B301, B401		4	4	3	3
C201, C301, C401	5	5	5	5	5
D201, D301, D401		4	4	3	3
E201, E301, E401		3	3	5	5
K201, K209		4	4	4	4
N301, N401		4	4		
X301, X401, Y301, Y401		4	3	3	3

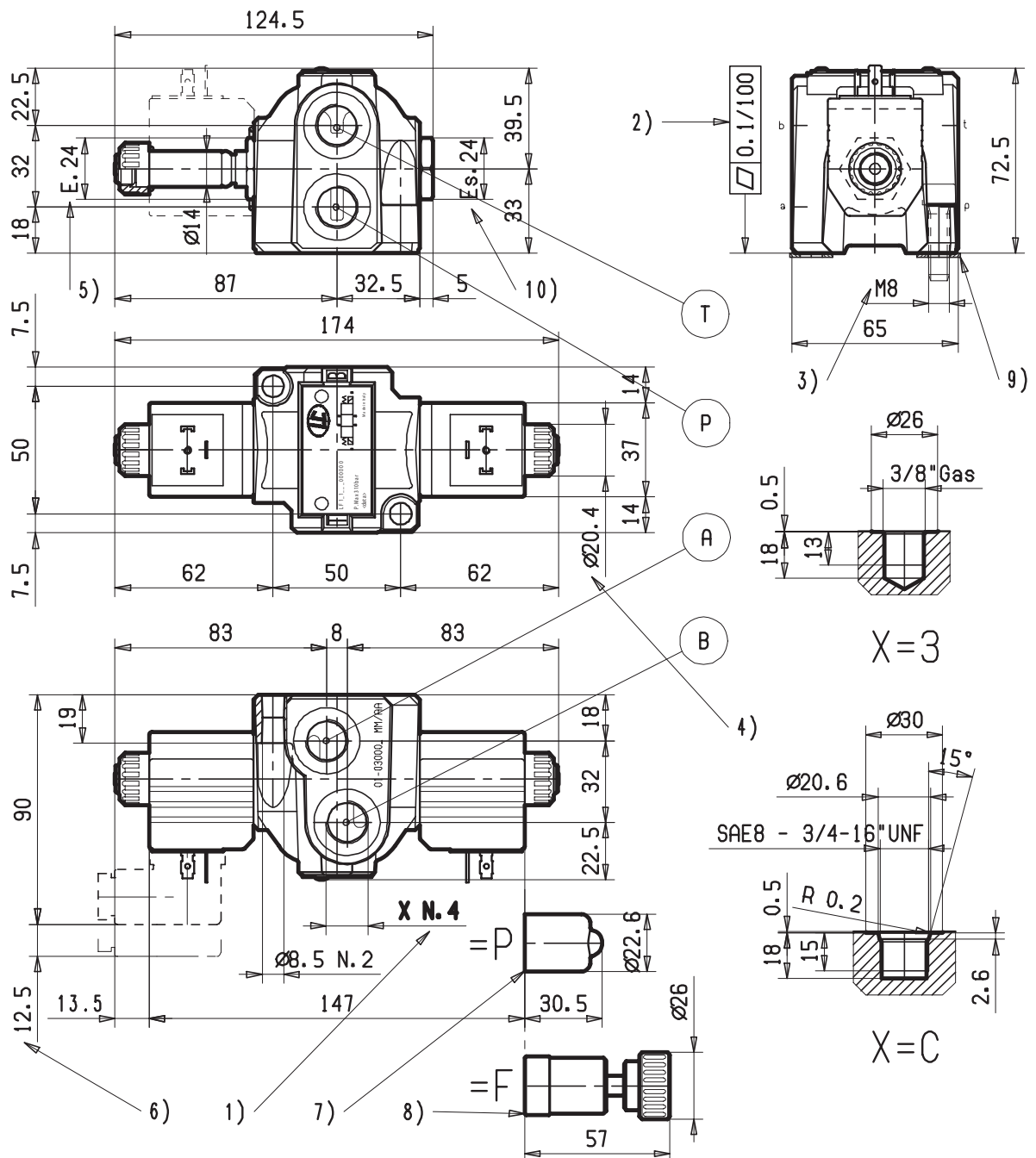
Limits (measured using a ISO VG 32 Cst oil at an ambient temperature of 45±5°C)



Spool	Curve n°
B201, B301, B401, C201, C301, C401, D201, D301, D401, E201, E301, E401, K201, K209, X301, X401, Y301, Y401	1
A201, A301, A401	2
N301, N401	3

Unless otherwise specified all curves are generated using 4 ports connections. These curves can be considerably lower than the represented ones by unequal flow at A and B ports.

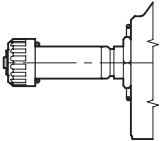
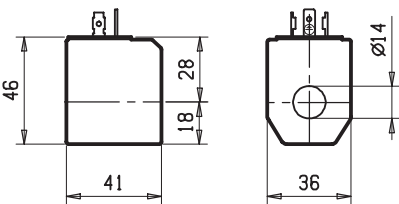
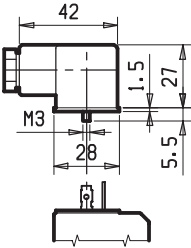
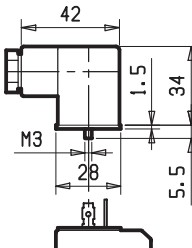
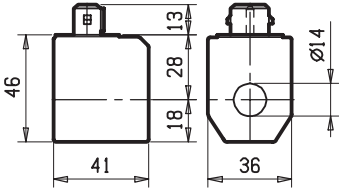
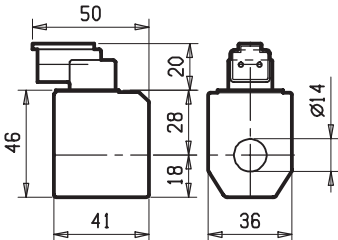
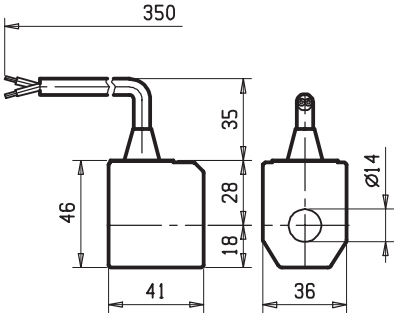
Unit dimensions



- 1 Work ports A, B, P, and T
- 2 Mounting surface required
- 3 Fixing screws N°2 TCEI M8x30 DIN 912-screw material 8.8 tightening torque 20-22 Nm. Must be ordered separately.
- 4 Coil retainer nut. tightening torque 5-6 Nm
- 5 Solenoid tube Ex.24 tightening torque 22-24 Nm.
- 6 Minimum space necessary to remove or mount connector

- 7 Emergency rubber push button, supplied as an optional, is slid over the coil retainer nut with glue. code of rubber boot Ref: 271-05098
- 8 Emergency screw, supplied as optional, is fixed on the solenoid tube replacing the coil retainer nut. fixing torque 6-7 Nm. Code of the emergency screw Ref: LC04ZEF
- 9 Please put 2 washers whenever you see that the mounting surface where the valve is flanged is not as per point (2)
- 10 Plug for 1 solenoid valve ex.24 tightening torque 22-24Nm.

Electrical connections

<p>=00</p> <p>Without coil(s), with retainer nut and seals. version is recommended for flexibility.</p> 	<p>=01</p> <p>Coil(s) with DIN 43650 – ISO 4400 connection, (connectors are not supplied)</p> 																										
<p>Coil(s) supplied with DIN 43650 – ISO 4400 connectors (not assembled to the coil). Protection class: IP 65 with connector and sealed properly fixed at screw and cable clamp properly tightened.</p> <div style="display: flex; justify-content: space-between;"> <div data-bbox="76 645 742 1200"> <p>=02</p> <p>182-09: Normal</p>  <table border="1"> <thead> <tr> <th>Code</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>29-0001</td> <td>182-09 GREY</td> </tr> <tr> <td>29-0002</td> <td>182-09 BLACK</td> </tr> </tbody> </table> </div> <div data-bbox="742 645 1396 1200"> <p>532-09 RAC: With built in rectifier for AC applications. 182-LED-T-A1: With indicator leds. 182-09-G-DO-2-1: With surge suppressor diodeo.</p>  <table border="1"> <thead> <tr> <th>Code</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>29-0003/A</td> <td>532-09 RAC GREY</td> </tr> <tr> <td>29-0003</td> <td>532-09 RAC BLACK</td> </tr> <tr> <td>29-0004</td> <td>182-LED-T-A1 12 DC/AC</td> </tr> <tr> <td>29-0005</td> <td>182-LED-T-A1 24 DC/AC</td> </tr> <tr> <td>29-0006</td> <td>182-LED-T-A1 48 DC/AC</td> </tr> <tr> <td>29-0007</td> <td>182-LED-T-A1 110 DC/AC</td> </tr> <tr> <td>29-0008</td> <td>182-LED-T-A1 230 DC/AC</td> </tr> <tr> <td>29-00010</td> <td>182-09-G-DO-2-1 12DC with VDR</td> </tr> <tr> <td>29-00011</td> <td>182-09-G-DO-2-1 24DC with VDR</td> </tr> </tbody> </table> </div> </div>		Code	Type	29-0001	182-09 GREY	29-0002	182-09 BLACK	Code	Type	29-0003/A	532-09 RAC GREY	29-0003	532-09 RAC BLACK	29-0004	182-LED-T-A1 12 DC/AC	29-0005	182-LED-T-A1 24 DC/AC	29-0006	182-LED-T-A1 48 DC/AC	29-0007	182-LED-T-A1 110 DC/AC	29-0008	182-LED-T-A1 230 DC/AC	29-00010	182-09-G-DO-2-1 12DC with VDR	29-00011	182-09-G-DO-2-1 24DC with VDR
Code	Type																										
29-0001	182-09 GREY																										
29-0002	182-09 BLACK																										
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29-0003	532-09 RAC BLACK																										
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29-0007	182-LED-T-A1 110 DC/AC																										
29-0008	182-LED-T-A1 230 DC/AC																										
29-00010	182-09-G-DO-2-1 12DC with VDR																										
29-00011	182-09-G-DO-2-1 24DC with VDR																										
<p>=03</p> <p>Coil(s) with integrated AMP junior connection and built in bidirectional diode protection class: IP 65 with connector properly fixed.</p> 	<p>=07</p> <p>Coil(s) with integrated DEUTSCH DT 04-2P connection and built in bidirectional diode protection class: IP 69K with connector properly fixed.</p> 																										
<p>=31</p> <p>Coil(s) with 350 mm cable with extra protective sheath and built in bidirectional diode.</p> 																											



Stand alone 4/3, 4/2 direct acting directional valve

Type LF1_2... (LC1F-DZ)

Size 6
Series 00
Max. operating pressure 310 bar
Max. flow 70 l/min
Port connections 3/8" Gas - 1/2" Gas - SAE8



DVI0002

Table of contents

Contents	Page
Features	11
Ordering codes	12
Spools	13
Functions, section	14
Technical data	14
Curves	17
Performance limits	17
Unit dimensions	18
Electrical connections	20

Features:

- 4 ways 2 or 3 position spool operated directional valves
- Standalone valve body intended to be used "in-line". It has various port thread connection options, and a surface with fixing holes for direct mounting on the application or machine.
- The body has surface zinc plating for protection.
- Nickel plated and oil immersed solenoid tubes for DC current with integrated emergency button.
- Coils with DC windings which can be fixed on the solenoid tube in any position. AC current is available through the use of connectors with integrated rectifiers.
- Available coil connections: DIN 43650; AMP JUNIOR, DTM (DEUTSCH DT04)
- Easy coil replacing
- Optionals include manual emergency rubber push buttons, and emergency levers.
- Various types of spools (hydraulic circuits) available in 2 and 3 positions



Ordering code

L	F	1	-	2	-	-	-	-
Divisione CDV Directional Valves								
Type Directional valve 4/3, 4/2								
Size 6								
Ports								
3/8" BSP				= 3				
1/2" BSP				= 2				
SAE8				= C				
Specials				= -				
Coil Type								
C45 coil				= 2				
Specials				= -				
Spools								
2 solenoids A and B side				= 2				
1 solenoid A side				= 3				
1 solenoid B side				= 4				
Lever override side A				= EA				
Specials				= -				

Accessories

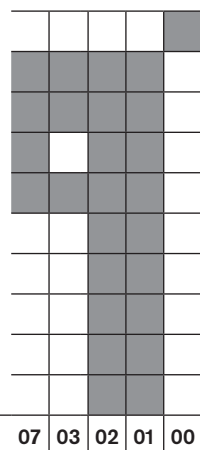
00 =	Normal
0V =	Viton seals
P0 =	Emergency rubber button
F0 =	Emergency screw
-- =	Specials

Connections

00 =	Without coil
01 =	With coil without connector
02 =	With DIN 43650 connector
03 =	AMP junior connection
07 =	DT04-2P DEUTSCH
-- =	Specials

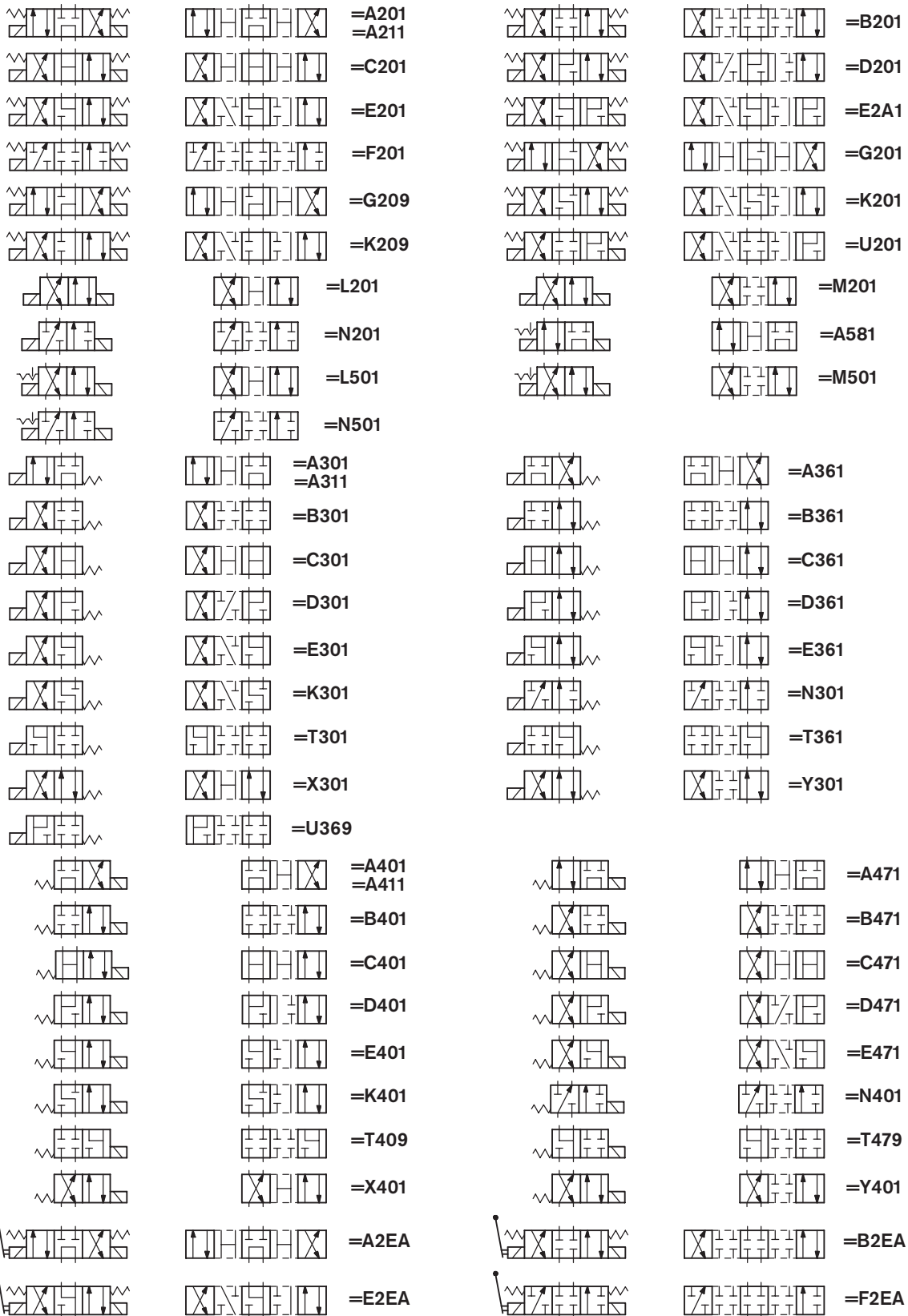
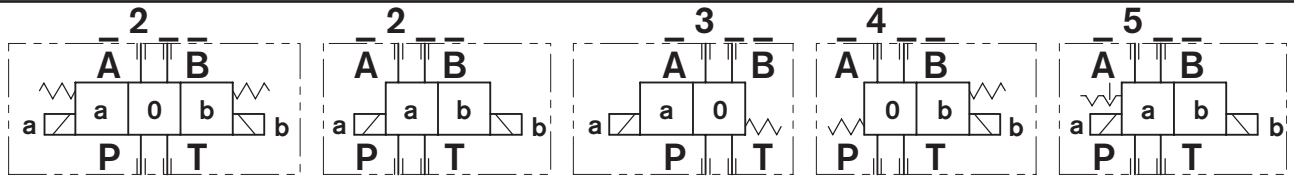
Voltage

00 =	Without coil
OB =	12V DC
AD =	13V DC
OC =	24V DC
AC =	27V DC
OD =	48V DC
OE =	110V DC
OV =	(21.5 DC) 24V AC
OW =	(98 DC) 110V AC
OZ =	(207 DC) 230V AC



Available connections

Spool types



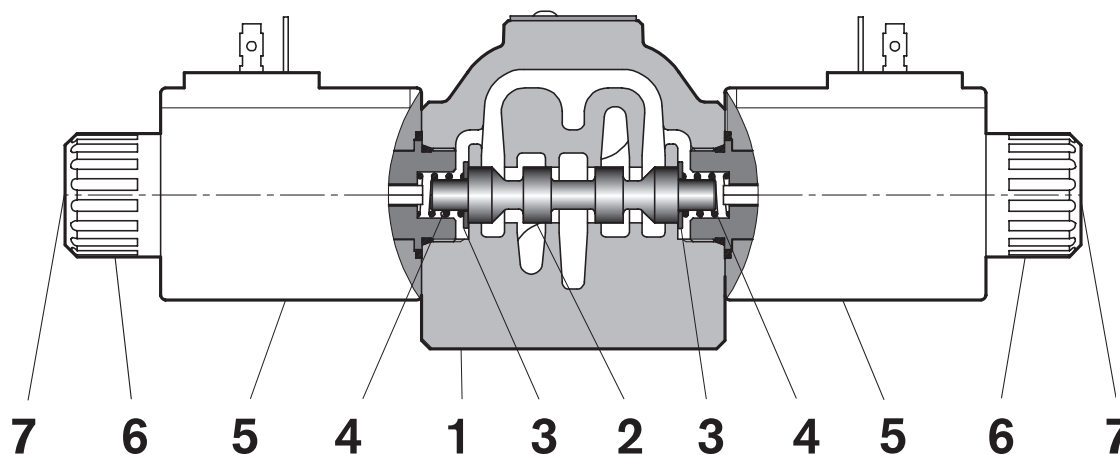
Functions, part section

These directional valves are used to control the direction of flow from "P" to A or B or T.

The valve body (1) integrates the port connections therefore hoses and tubes can be connected directly to the valve body, eliminating the use of a subplate. Using the mounting holes the valve can be fastened anywhere on the machine.

When one of the solenoids (5) is energised it will push the spool (2) which diverts the oil flow to either a or b.

The "o" (neutral) position is achieved by de-energising the coil and allowing the spring (4) to recoil. The coil is kept in place by the threaded nut (6). The emergency push button (7) permits to move the spool without energising the solenoids.



Technical data (if you intend to use the valve with different parameters than the ones mentioned here please contact us)

General

Valve weight with 2 solenoids	kg	2.23
Valve weight with 2 solenoids and Lever override	kg	2.53
Valve weight with 1 solenoid	kg	1.75
Valve weight with 1 solenoid and Lever override	kg	2.00
Valve installation positions		Any. Horizontal with spool type <u>_5_</u>
Ambient temperature	°C	-20....+50 (with NBR seals)



Hydraulic characteristics

Maximum pressure on P, A and B	bar	310
Maximum dynamic pressure on T ¹⁾	bar	250
Maximum dynamic pressure on T when using spool type A211, A311, A411	bar	150
Maximum dynamic pressure on T with lever override ¹⁾	bar	100
Maximum static pressure on T	bar	275
Maximum static pressure on T with lever override	bar	140
Maximum flow	l/min	70
Maximum flow when using spool type A201, A301, A361, A401, A471, A2EA, G201, G209	l/min	50
Maximum flow when using spool type A211, A311, A411	l/min	40
Hydraulic oil	(DIN 51524/1-2). If you intend to use other types of hydraulic oil please contact factory.	
Oil temperature	°C	-20....+80
Hydraulic oil filtrations	$\beta_x \geq 75$ X=12...15 ISO 4572	
Cleanlines class to ISO codes	20/18/15 ISO 4406; 9 NAS 1638	
Oil viscosity	mm ² /s	5....420
Maximum leakage on A and B ports (P and T pressurised) when using A_11 type spools	cc/min.	8 (100 bar), 14 (200 bar).

¹⁾ Variation on **T** line pressure for circuits **5_** with mechanical detent can cause autoinversion.

Electrical characteristics

Voltage	DC (AC possible by using rectifiers)									
Voltage tolerance (nominal tension)	%	-10 +5								
Power consumption	W	33								
Duty cycle	100% with maximum ambient temperature at 40°C									
Switching time	ms	ON 30 90; OFF 40 60								
Maximum shift frequency	Hz	3								
Isolation class of coil	H									
Conforms to the EU directive (low voltage)	73/23/CEE, 89,336/CEE									
Coil weight	kg	0.335								
Voltage	V	12	13	24	27	48	110	24 +RAC (21,5)	110 +RAC (98)	230 +RAC (207)
Type of voltage DC=continous current; AC=alternate current		DC	DC	DC	DC	DC	DC	AC	AC	AC
Frequency	Hz	-	-	-	-	-	-	50/60	50/60	50/60
Power	W	33	31	33	33	33	35	33	33	35
Current ⁽¹⁾	A	2.8	2.4	1.4	1.2	0.7	0.32	1.57	0.34	0.16
Resistance ⁽²⁾	Ω	4.2	5.4	17	21.7	68.6	342	13.7	285	1228

¹⁾ Nominal

²⁾ ± 7% at ambient temperature of 20°C

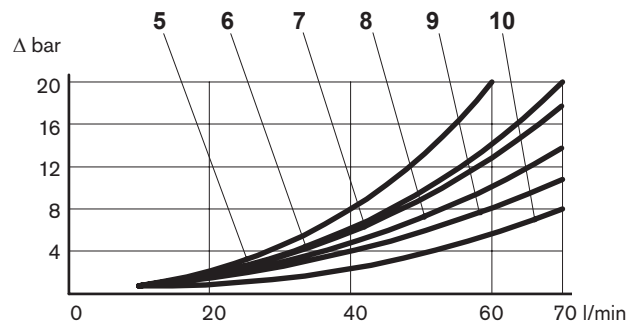
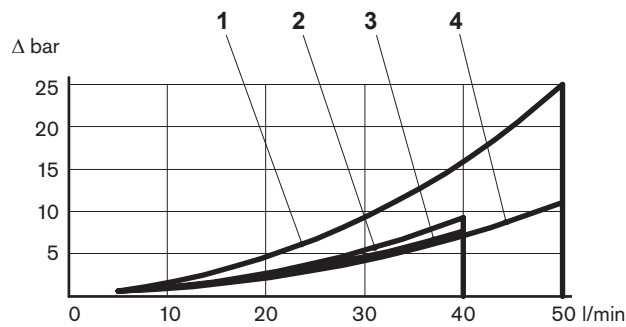
**Electrical characteristics**

	Volts	Connections	Model	Marking on coil	Coil code
=OB 01 =OB 02	12 DC	DIN 43650 – ISO 4400	C4501 12DC	12 DC	271-0417
=OB 03	12 DC	AMP JUNIOR	C4503 12DC	12 DC	271-041710
=OB 07	12 DC	DEUTSCH DT 04-2P	C4507 12DC	12 DC	271-041717
=AD 01 =AD 02	13 DC	DIN 43650 – ISO 4400	C4501 13DC	13 DC	271-041711
=AD 03	13 DC	AMP-Junior	C4503 13DC	13 DC	271-041712
=AD 07	13 DC	DEUTSCH DT 04-2P	C4507 13DC	13 DC	271-041718
=OC 01 =OC 02	24 DC	DIN 43650 – ISO 4400	C4501 24DC	24 DC	271-0418
=OC 07	24 DC	DEUTSCH DT 04-2P	C4507 24DC	24 DC	271-041719
=AC 01 =AC 02	27 DC	DIN 43650 – ISO 4400	C4501 27DC	27 DC	271-04181
=AC 03	27 DC	AMP-Junior	C4503 27DC	27 DC	271-041812
=AC 07	27 DC	DEUTSCH DT 04-2P	C4507 27DC	27 DC	271-041720
=OD 01 =OD 02	48 DC	DIN 43650 – ISO 4400	C4501 48DC	48 DC	271-0419
=OE 01 =OE 02	110 DC	DIN 43650 – ISO 4400	C4501 110DC	110 DC	271-041921
=OV 01 =OV 02	24 RAC (1)	DIN 43650 – ISO 4400	C4501 21.5DC	21.5 DC	271-04191
=OW 01 =OW 02	110 RAC (1)	DIN 43650 – ISO 4400	C4501 98DC	98 DC	271-04192
=OZ 01 =OZ 02	230 RAC (1)	DIN 43650 – ISO 4400	C4501 207DC	207 DC	271-04193

¹⁾ Use connectors with rectifiers.

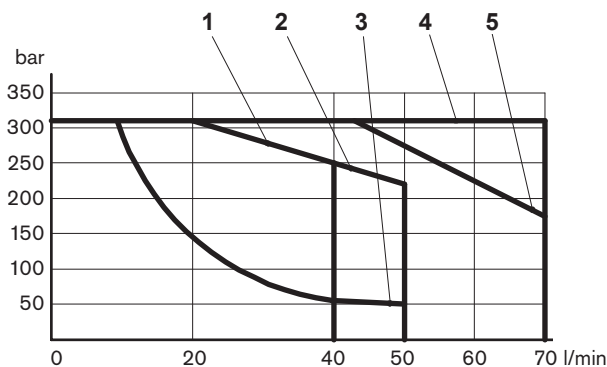


Curves (measured using a ISO VG 32 Cst oil at an ambient temperature of 45±5°C)



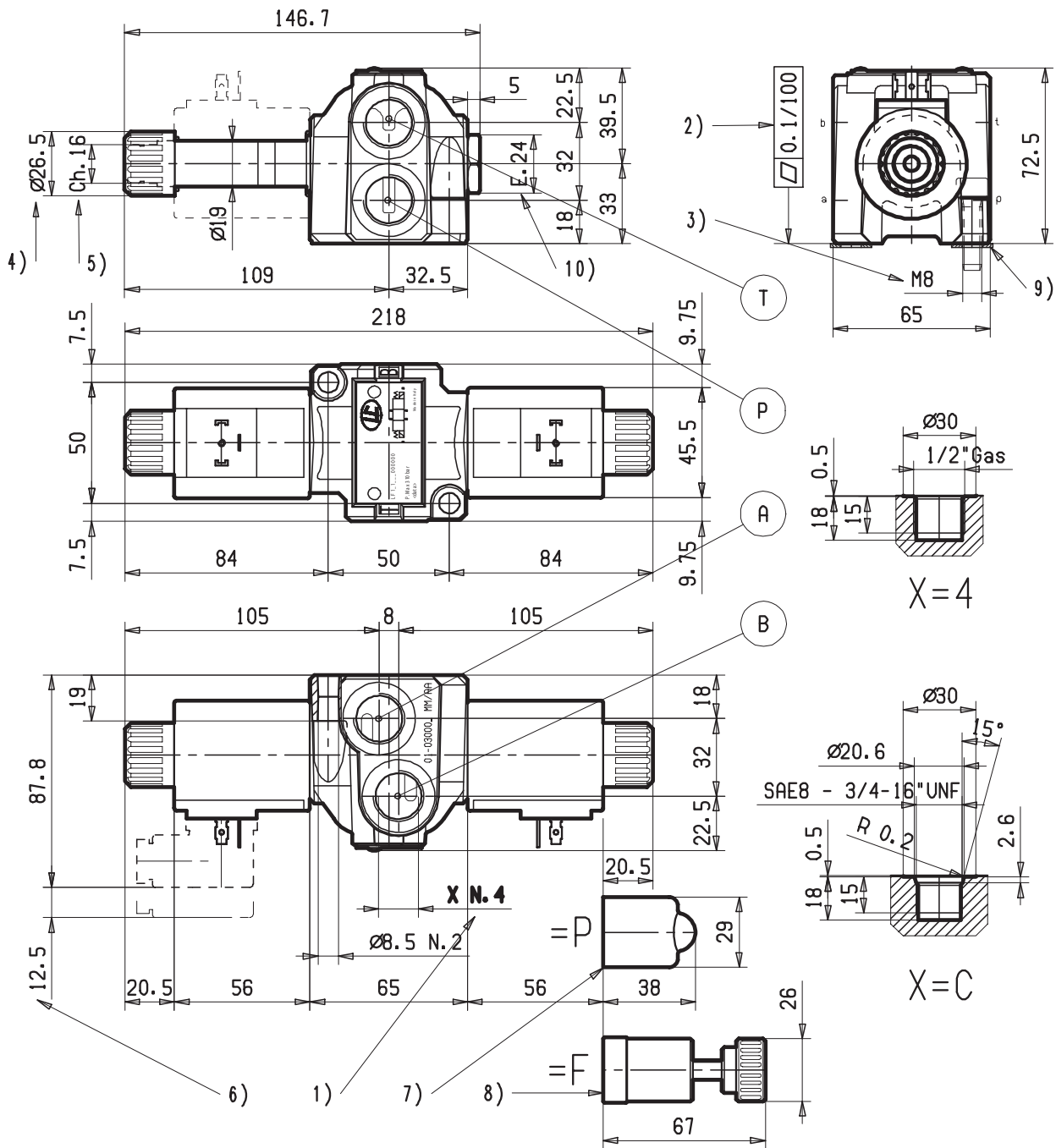
Spool	Curve n°				
	P>T	P>A	P>B	A>T	B>T
A201, A301, A401, A361, A471, A2EA	4	1	1	1	1
A211, A311, A411, A581	2	3	3	3	3
B201, B301, B401, B361, B471, B2EA		9	8	7	7
C201, C301, C401, C361, C471, C2EA	9	10	9	8	8
D201, D301, D401, D361, D471		10	10	9	9
E201, E301, E401, E361, E471		8	8	9	9
E2R1		8	8	9	9
F201, 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

Limits (measured using a ISO VG 32 Cst oil at an ambient temperature of 45±5°C)



Spool	Curve n°
A211, A311, A411, A581	1
A201, A301, A401	2
N301, N401,	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

Unless otherwise specified all curves are generated using 4 ports connections. These curves can be considerably lower than the represented ones by unequal flow at A and B ports.

Unit dimensions

1 Work ports abpt

2 Mounting surface required

3 Fixing screws N°2 TCEI M8x30 DIN 912-screw material 8.8 tightening torque 20-22 Nm. Must be ordered separately

4 Coil retainer nut. D. 26,5 tightening torque 5-6 Nm

5 Solenoid tube Ex.16 tightening torque 22-24 Nm.

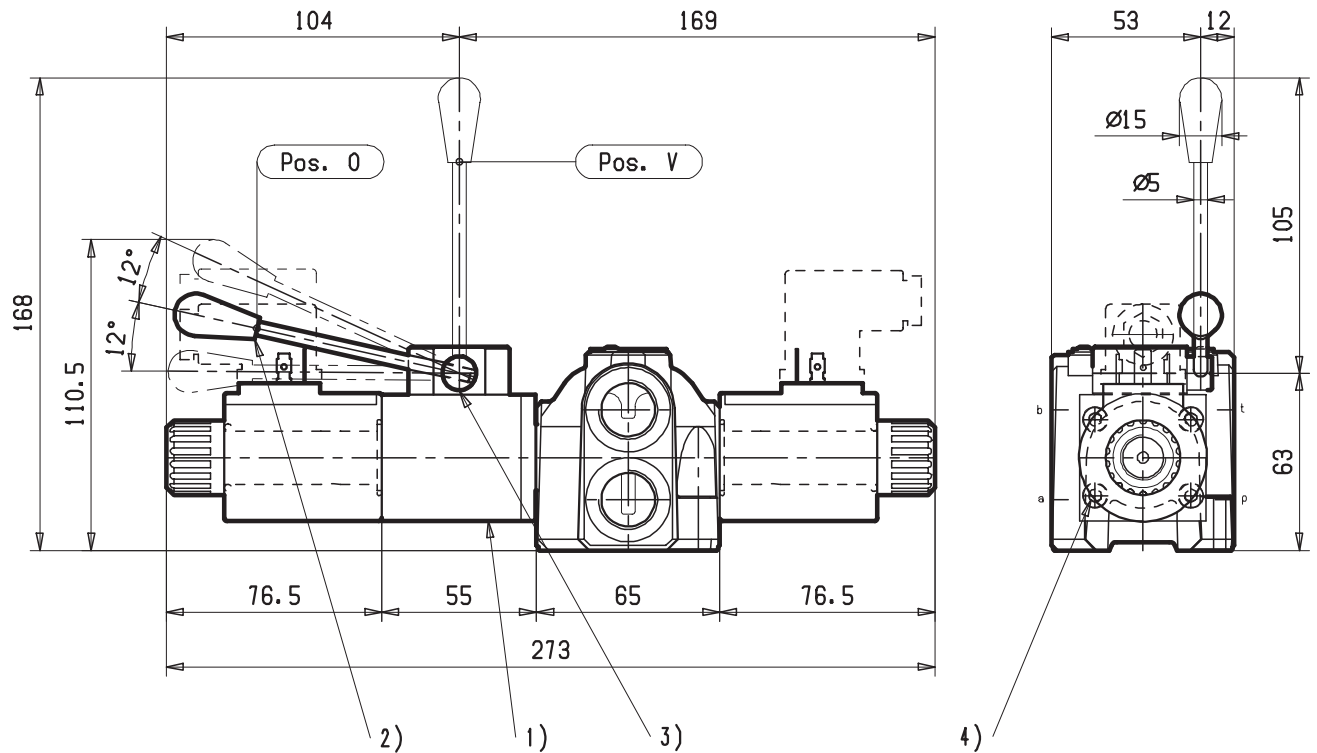
6 Minimum space necessary to remove or mount connector

7 Emergency rubber push button, supplied as an optional, is slid over the coil retainer nut with glue. code of rubber boot Ref: 271-05099

8 Emergency screw, supplied as optional, is fixed on the solenoid tube replacing the coil retainer nut. fixing torque 6-7 Nm. Code of the emergency screw Ref: LC1DZEF



Unit dimensions



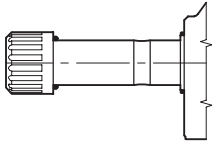
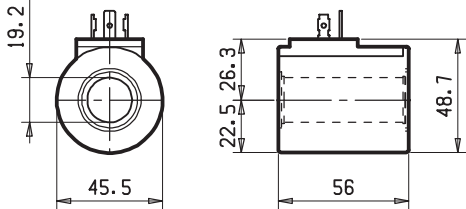
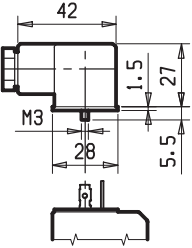
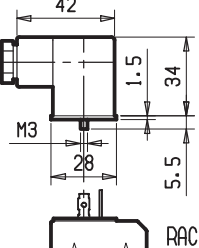
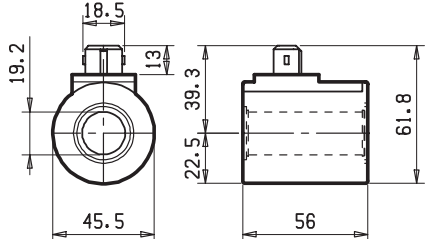
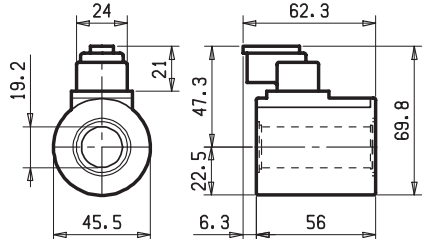
Production standard mounts the lever 1) on the "A" side. On request the lever can be supplied on the "B" port

Production standard mounts lever 2) in the "O" position (see picture). If the "V" position is required, please dismount the

flanging cap and reposition the internal pivot Key 7 (3).

It is possible to turn the position of the lever in respect to the axis of the solenoid tube by 0° to 360°.

Electrical connections

<p>Without coil(s), with retainer nut and seals. version is recommended for flexibility.</p> <p>=00</p> 	<p>Coil(s) with DIN 43650 – ISO 4400 connection, (connectors are not supplied)</p> <p>=01</p> 																										
<p>Coil(s) supplied with DIN 43650 – ISO 4400 connectors (not assembled to the coil).</p>																											
<p>Protection class: IP 65 with connector and sealed properly fixed at screw and cable clamp properly tightened.</p> <p>=02</p> <p>182-09: Normal</p>  <table border="1" data-bbox="167 943 454 1025"> <thead> <tr> <th>Code</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>29-0001</td> <td>182-09 GREY</td> </tr> <tr> <td>29-0002</td> <td>182-09 BLACK</td> </tr> </tbody> </table>	Code	Type	29-0001	182-09 GREY	29-0002	182-09 BLACK	<p>532-09 RAC: With built in rectifier for AC applications.</p> <p>182-LED-T-A1: With indicator leds.</p> <p>182-09-G-DO-2-1: With surge suppressor diode.</p>  <table border="1" data-bbox="758 943 1348 1227"> <thead> <tr> <th>Code</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>29-0003/A</td> <td>532-09 RAC GREY</td> </tr> <tr> <td>29-0003</td> <td>532-09 RAC BLACK</td> </tr> <tr> <td>29-0004</td> <td>182-LED-T-A1 12 DC/AC</td> </tr> <tr> <td>29-0005</td> <td>182-LED-T-A1 24 DC/AC</td> </tr> <tr> <td>29-0006</td> <td>182-LED-T-A1 48 DC/AC</td> </tr> <tr> <td>29-0007</td> <td>182-LED-T-A1 110 DC/AC</td> </tr> <tr> <td>29-0008</td> <td>182-LED-T-A1 230 DC/AC</td> </tr> <tr> <td>29-00010</td> <td>182-09-G-DO-2-1 12DC with VDR</td> </tr> <tr> <td>29-00011</td> <td>182-09-G-DO-2-1 24DC with VDR</td> </tr> </tbody> </table>	Code	Type	29-0003/A	532-09 RAC GREY	29-0003	532-09 RAC BLACK	29-0004	182-LED-T-A1 12 DC/AC	29-0005	182-LED-T-A1 24 DC/AC	29-0006	182-LED-T-A1 48 DC/AC	29-0007	182-LED-T-A1 110 DC/AC	29-0008	182-LED-T-A1 230 DC/AC	29-00010	182-09-G-DO-2-1 12DC with VDR	29-00011	182-09-G-DO-2-1 24DC with VDR
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<p>Coil(s) with integrated AMP junior connection and built in bidirectional diode</p> <p>Protection class: IP 65 with connector properly fixed.</p> <p>=03</p> 	<p>Coil(s) with integrated DEUTSCH DT 04-2P connection and built in bidirectional diode</p> <p>protection class: IP 69K with connector properly fixed.</p> <p>=07</p> 																										



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Rexroth
Bosch Group

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