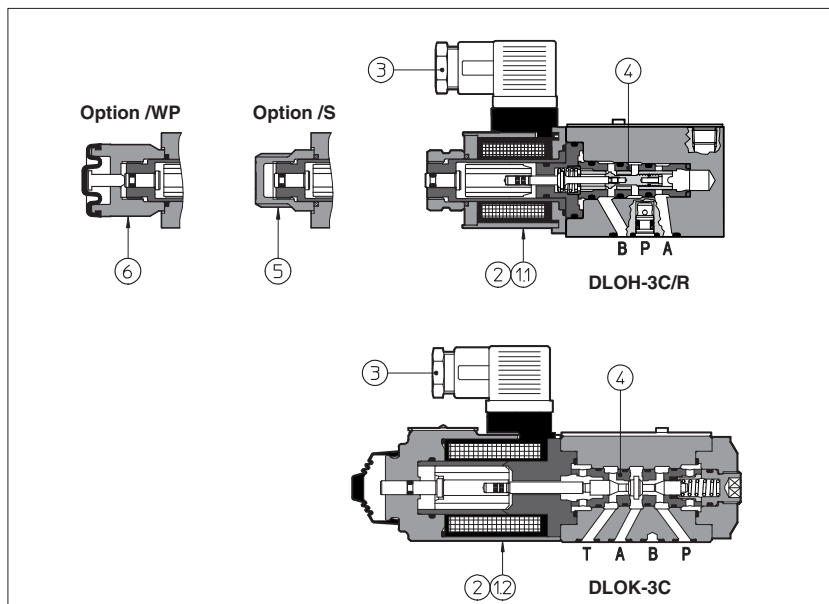


Solenoid directional valves type DLOH, DLOK

poppet type leak free, direct operated, ISO 4401 size 06



DLOH and DLOK are poppet type, two or three way, two position direct operated solenoid valves, designed to operate in oil hydraulic systems with leak free requirements.

They are operated by wet type solenoids type OE for DC and RC rectified current supply.

The DLOH are available with optional manual prolonged override, protected by a rubber cap ⑥.

Standard dimensions cartridge construction allows a wide variety of configurations only by easy replacement of the cartridge ④.

Cartridges of DLOH are available also as loose parts for mounting in manifolds, see ⑩.

They can be supplied with optional devices for control of switching times.

Standard electric connectors ③ able to satisfy the requirements of modern machines for electric interfaces characteristics.

The coils ② are fully encapsulated with temperature class H.

Surface mounting: ISO 4401 size 06.

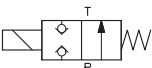
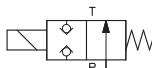
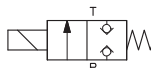
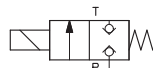
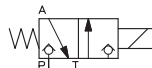
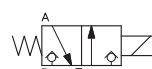
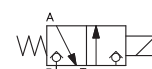
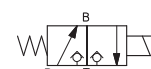
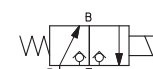
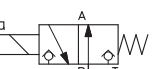
**Max flow: 12 l/min (DLOH)
30 l/min (DLOK).**

**Max pressure: 350 bar for DLOH
315 bar for DLOK**

1 MODEL CODE

DLO	H - 2	A	/WP - U	X	24DC	**	/*
Directional control valve poppet type size 06							Seals material: omit for NBR (mineral oil & water glycol) PE = FPM
H = max flow: 12 l/min K = max flow: 30 l/min							Series number
2 = two way (only DLOH) 3 = three way							Voltage code, see section ⑤: 00 = solenoid valve without coils
Valve configuration, see table ②: A = open in resting position C = closed in resting position							X = without connector See section ④ for available connectors, to be ordered separately
Options: /WP = prolonged manual override protected by rubber cap (only DLOH) /R = with check valve on port P, see ② (only DLOH) /S = no hand operation and poppet overlapping during the intermediate position for safety applications (only DLOH) /L1, /L2, /L3 = device for controlling switching time							- O = solenoid OLK for DC supply (only for DLOK) - U = solenoid OLU for DC supply (only for DLOH)

2 VALVE CONFIGURATION

DLOH-2A	DLOH-2A/R	DLOH-2C	DLOH-2C/R	DLOK-3A
				
DLOH-3A	DLOH-3A/R	DLOH-3C	DLOH-3C/R	DLOK-3C
				

3 MAIN CHARACTERISTICS OF DIRECTIONAL VALVES TYPE DLOH, DLOK

Assembly position / location	Any position
Subplate surface finishing	Roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101)
Ambient temperature	from -20°C to +70°C
Fluid	Hydraulic oil as per DIN 51524 535; for other fluids see section 11
Recommended viscosity	15 ÷ 100 mm ² /s at 40°C (ISO VG 15 ÷ 100)
Fluid contamination class	ISO 4406 class 21/19/16 NAS 1638 class 10, in line filters of 25 µm (β ₂₅ ≥ 75 recommended)
Fluid temperature	-20°C +60°C (standard seals and water glycol) -20°C +80°C (/PE seals)
Flow direction	As shown in the symbols of table 2
Operating pressure	<div>DLOH</div> <div>Ports P, A, B: 350 bar</div> <div>Port T: 160 bar</div> <div>DLOK</div> <div>Ports P, A, B: 315 bar</div> <div>Port T: 210 bar</div>
Rated flow	See diagrams Q/Δp at section 6
Maximum flow	<div>DLOH</div> <div>12 l/min see operating limits at section 7</div> <div>DLOK</div> <div>30 l/min see operating limits at section 7</div>
Internal leakage	Less than 5 drops/min (≤ 0,36 cm ³ /min) at max working pressure

3.1 Coils characteristics

Insulation class	H (180°C) Due to the occurring surface temperatures of the solenoid coils, the European standards EN ISO 13732-1 and EN ISO 4413 must be taken into account
Connector protection degree	IP 65
Relative duty factor	100%
Supply voltage and frequency	See electric feature 5
Supply voltage tolerance	± 10%
Certification	cURus

4 ELECTRIC/ELECTRONIC CONNECTORS ACCORDING TO DIN 43650

The connectors must be ordered separately

Code of connector	Function
666	Connector IP-65, suitable for direct connection to electric supply source
667	As 666 connector IP-65 but with built-in signal led, suitable for direct connection to electric supply source
669	With built-in rectifier bridge for supplying DC coils by alternating current (AC 110V and 230V - I _{max} 1A)

<div>666, 667 (for AC or DC supply)</div> <div></div>		<div>669 (for AC supply)</div> <div></div>	
CONNECTOR WIRING			
<div>666, 667</div> <div>1 = Positive ⊕ 2 = Negative ⊖ ⊕ = Coil ground</div>		<div>669</div> <div>1,2 = Supply voltage V_{AC} 3 = Coil ground</div>	
SUPPLY VOLTAGES			
<div>666</div> <div>All voltages</div>		<div>667</div> <div>24 AC or DC 110 AC or DC 220 AC or DC</div>	
		<div>110/50 AC 110/60 AC 230/50 AC 230/60 AC</div>	

5 ELECTRIC FEATURES

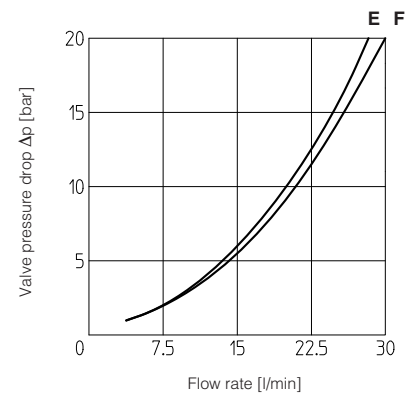
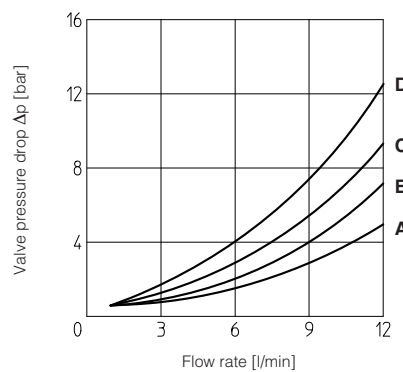
Valve	External supply nominal voltage $\pm 10\%$ (1)	Voltage code	Type of connector	Power consumption (2)	Code of spare coil	Colour of coil label
DLOH	DIRECT CURRENT	6 DC	666 or 667	33 W	COU-6DC / 80	brown
		12 DC			COUR-12DC / 10	green
		24 DC			COUR-24DC / 10	red
		48 DC			COU-48DC / 80	silver
	ALTERNATE CURRENT	110/50 AC	669	40 VA	COU-110RC / 80	gold
		120/60 AC		35 VA	COUR-110RC / 10	gold
		230/50 AC		40 VA	COU-230RC / 80	blue
		230/60 AC		35 VA	COUR-230RC / 10	blue
DLOK	DIRECT CURRENT	12 DC	666 or 667	32 W	–	–
		24 DC			–	–
		110 DC			–	–
		220 DC			–	–
	ALTERNATE CURRENT	110/50 AC	669	40 VA	–	–
		120/60 AC		35 VA	–	–
		230/50 AC		40 VA	–	–
		230/60 AC		35 VA	–	–

- (1) For other supply voltages available on request see technical table E010.
(2) Average values based on tests performed at nominal hydraulic condition and ambient/coil temperature of 20°C.

6 FLOW VERSUS PRESSURE DROP DIAGRAM based on mineral oil ISO VG 46 at 50°C

Flow direction	P → A (1) (P → B)	A → T (B → T)
Valve type		
DLOH-2A	B	–
DLOH-2C	C	–
DLOH-3A	D	C
DLOH-3C	C	A
DLOK-3A	F	E
DLOK-3C	F	E

(1) For two-way valves, pressure drop refers to P→T



7 OPERATING LIMITS based on mineral oil ISO VG 46 at 50°C

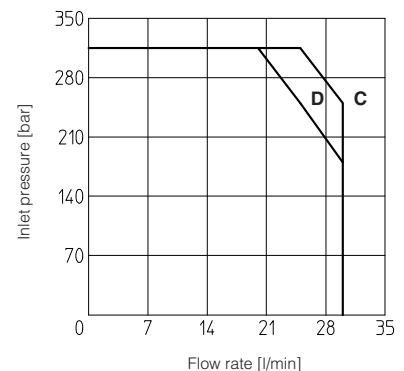
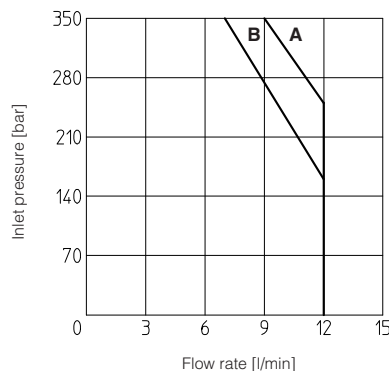
The diagram has been obtained with warm solenoids and power supply at lowest value (Vnom - 10%).

A = DLOH-3A

B = DLOH-2A, DLOH-3C

C = DLOK-3A

D = DLOK-3C



8 SWITCHING TIMES (average values in msec)

Valve type	Connector	Switch-on AC	Switch-on DC	Switch-off
DLO*-**	666, 667	–	45	25
DLO*-**	669	30	–	75
DLO*-**/L1	666, 667	–	60	60
DLO*-**/L2	666, 667	–	80	80
DLO*-**/L3	666, 667	–	110	150

TEST CONDITIONS:

- 8 l/min; 150 bar
- nominal voltage
- 2 bar of counter pressure on port T
- based on mineral oil ISO VG 46 at 50°C

The response time is affected by elasticity of the hydraulic circuit, by variation of hydraulic characteristics and temperature

9 DIMENSIONS [mm]

DLOH-2* DLOH-2*/R

ISO 4401: 2005

Mounting surface: 4401-03-02-0-05
without A and B ports

Fastening bolts:

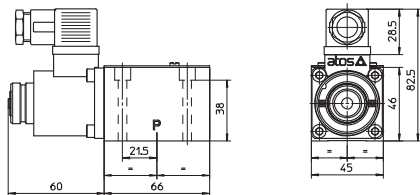
4 socket head screws M5x50 class 12.9

Tightening torque = 8 Nm

Seals: 2 OR 108

Ports P, T:

Ø = 7,5 mm (max)



Mass: 1,5 Kg

P = PRESSURE PORT

T = USE PORT

For the max pressures on ports, see section 3

DLO-3* DLO-3*/R

ISO 4401: 2005

Mounting surface: 4401-03-02-0-05

Fastening bolts:

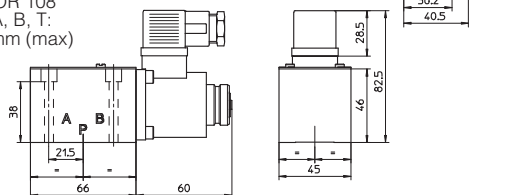
4 socket head screws M5x50 class 12.9

Tightening torque = 8 Nm

Seals: 4 OR 108

Ports P, A, B, T:

Ø = 7,5 mm (max)



Mass: 1,5 Kg

P = PRESSURE PORT

A = USE PORT (not used for -3C versions)

B = USE PORT (not used for -3A versions)

T = TANK PORT

For the max pressures on ports, see section 3

DLOK-3*

ISO 4401: 2005

Mounting surface: 4401-03-02-0-05

Fastening bolts:

4 socket head screws M5x50 class 12.9

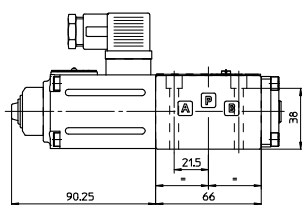
Tightening torque = 8 Nm

Seals: 4 OR 108

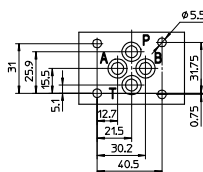
Ports P, A, B, T:

Ø = 7,5 mm (max)

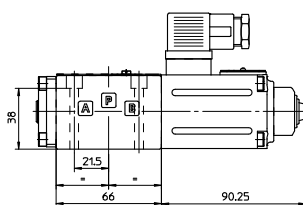
DLOK-3C



Mass: 1,6 Kg



DLOK-3A



Mass: 1,6 Kg

P = PRESSURE PORT

A = USE PORT

B = CLOSED

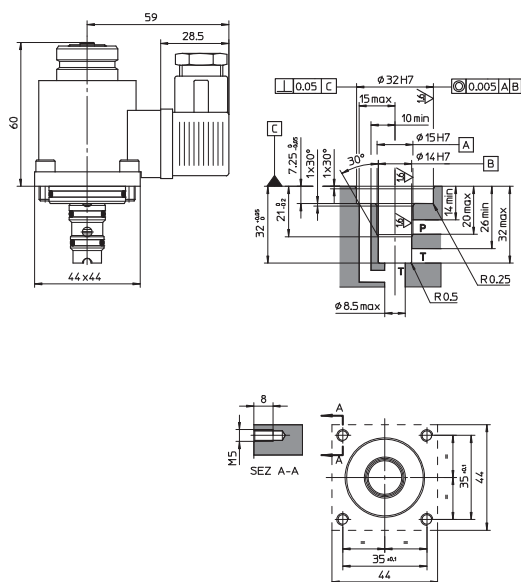
T = TANK PORT

For the max pressures on ports, see section 3

Overall dimensions refer to valves with connectors type 666

10 INSTALLATION DIMENSIONS OF CARTRIDGES [mm]

LU-O2*, cartridge of DLOH-2*

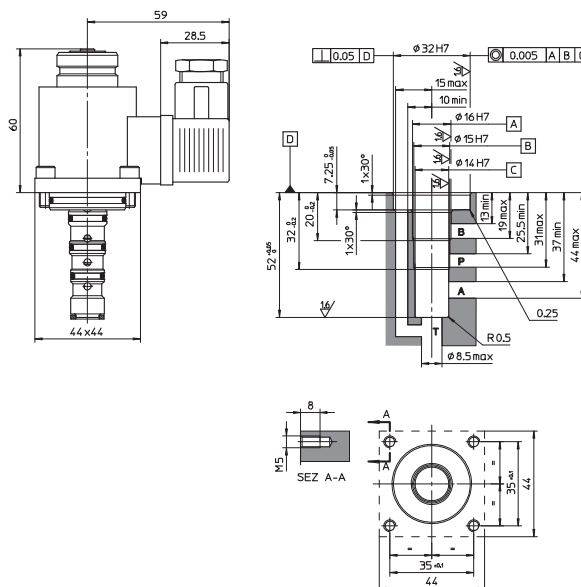


Note:

(*) for version /WP the height is increased by 14,5 mm

These cartridges can be installed in the manifolds

LU-O3*, cartridge of DLOH-3*



Notes:

The orifice B is not used by the cartridge type LU-O3A

The orifice A is not used by the cartridge type LU-O3C

(*) for version /WP the height is increased by 14,5 mm

11 MOUNTING SUBPLATES

Valve	Subplate model	Ports location	GAS ports A-B-P-T	Ø Counterbore [mm] A-B-P-T	Mass [Kg]
DLOH-*, DLOK-*	BA-202 (1)	Ports A, B, P, T underneath;	3/8"	—	1,2
	BA-204 (1)	Ports P, T underneath; ports A, B on lateral side	3/8"	25,5	1,8
	BA-302 (1)	Ports A, B, P, T underneath;	1/2"	30	1,8

(1) The subplates are supplied with 4 fastening bolts M5x50 class 12.9; Also available multi station and modular subplates. For further details see table K280.