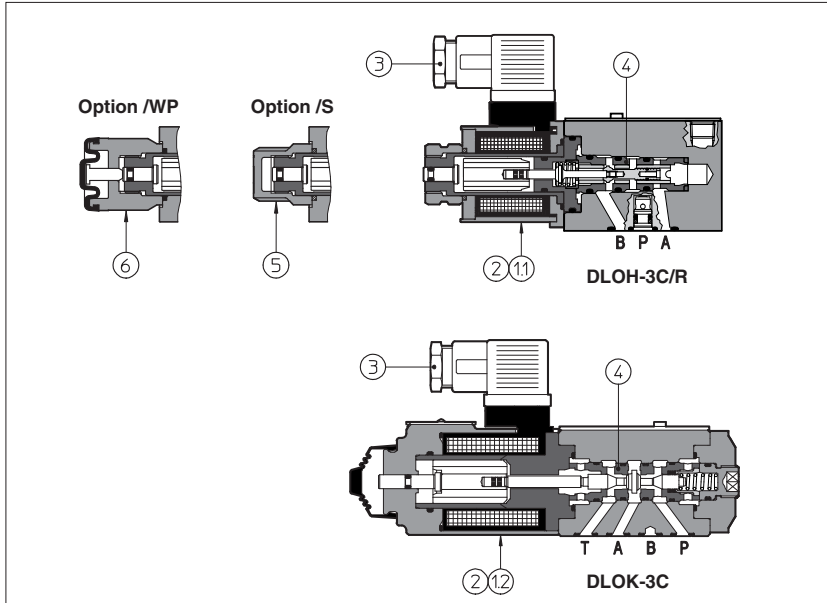


Solenoid directional valves type DLOH, DLOK

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								
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							X = without connector See section ④ for available connectors, to be ordered separately	
							- 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	DLOH	Ports P, A, B: 350 bar Port T: 160 bar
	DLOK	Ports P, A, B: 315 bar Port T: 210 bar
Rated flow	See diagrams Q/Δp at section 6	
Maximum flow	DLOH	12 l/min see operating limits at section 7
	DLOK	30 l/min see operating limits at section 7
Internal leakage	Less than 5 drops/min (≤ 0,36 cm ³ /min) at max working pressure	

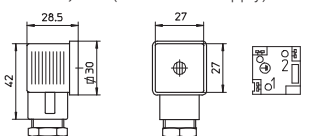
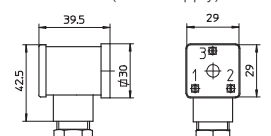
3.1 Coils characteristics

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)

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

5 ELECTRIC FEATURES

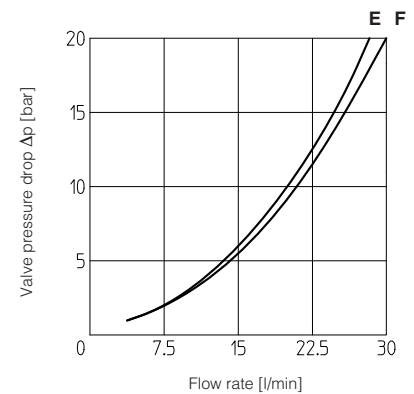
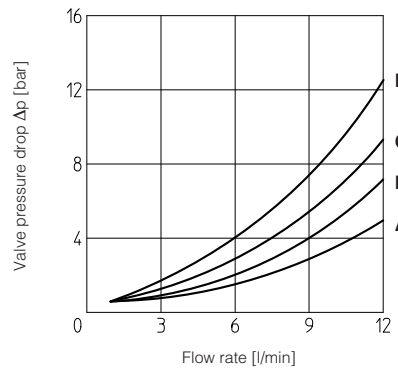
Valve	External supply nominal voltage $\pm 10\%$ (1)	Voltage code	Type of connector	Power consumption (2)	Code of spare coil	Colour of coil label	
DLOH	DIRECT CURRENT	6 DC	666 or 667	33 W	COU-6DC / 80	brown	
		12 DC			12 DC	COUR-12DC / 10	green
		24 DC			24 DC	COUR-24DC / 10	red
		48 DC			48 DC	COU-48DC / 80	silver
	ALTERNATE CURRENT	110/50 AC	110RC	669	40 VA	COU-110RC / 80	gold
		120/60 AC			35 VA	COUR-110RC / 10	gold
		230/50 AC	230RC 230/60 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			24 DC	-	-
		110 DC		110 DC	40 W	-	-
		220 DC		220 DC		-	-
	ALTERNATE CURRENT	110/50 AC	110 RC	669	40 VA	-	-
		120/60 AC			35 VA	-	-
		230/50 AC	220 RC		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)
DLOH-2A	B	-
DLOH-2C	C	-
DLOH-3A	D	C
DLOH-3C	C	A
DLOK-3A	F	E
DLOK-3C	F	E

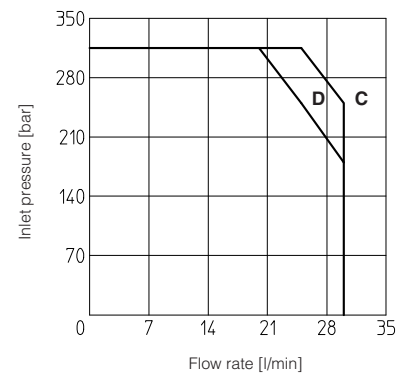
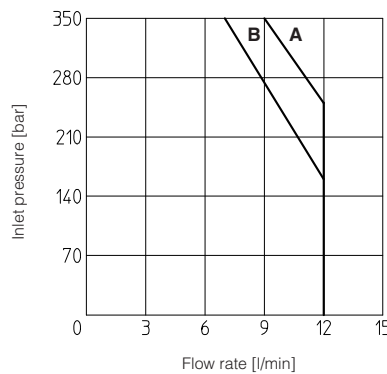
(1) For two-way valves, pressure drop refers to P→T



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

