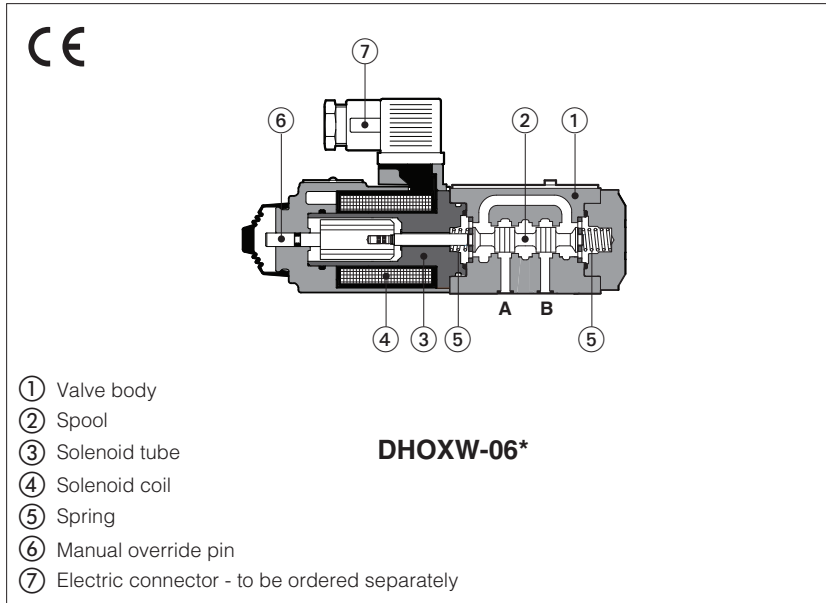


Stainless steel solenoid directional valves for water base fluids

on-off, direct or pilot operated, spool type or poppet type leak free

Availability and price only on request



Solenoid directional valves with stainless steel internal parts for application with water base fluids.

Features:

- These valves are made by selected inoxidizable materials for internal parts to withstand applications with water base fluids or just pure water. External components are derived from standard valves.
- Two basic versions are available, poppet type, 3-way leak free (suitable for accumulator systems) or spool type, 4-way on-off valves.

Common Applications:

Steel plants, die casting, foundry.

1 SUMMARY OF AVAILABLE MODELS

Code	Description	ISO 4401 size	Voltages	Power consumption	Max flow l/min	Max pressure bar
DHOXW	direct, 4 way, spool type	06	12 DC	32 W	70	350
DLOHXW	direct, 3 way, poppet type	06	24 DC	32 W	12	350
DLOHMXW	direct, 3 way, poppet type	06	110 DC	32 W	25	315
DLOPXW	direct, 3 way, spool type	-	220 DC	32 W	220	315
			110 RC	34 W		
			230 RC	34 W		

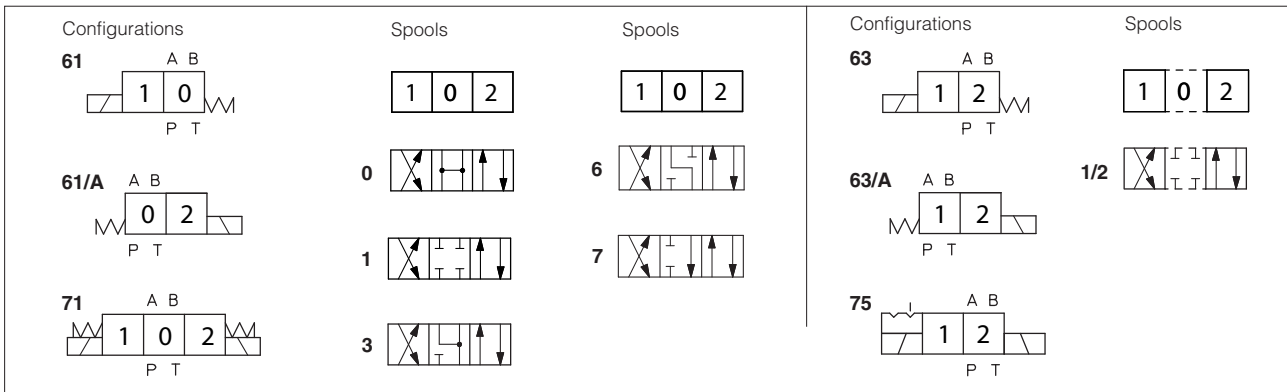
2 SPOOL TYPE VALVES: MODEL CODE

DHO	XW	-	0	63	/	A	24DC	**	/*
Spool type - direct			Stainless steel execution for internal parts			Voltage code - see section 8			Seals material, see section 9: - = NBR low temp. -40°C PE = FKM
Size: 0 = 06			Valve configuration, see section 4 61, 63, 71, 75 (configurations 63 and 75 are available only with spool type 1/2)			Options: A = solenoid at side of port B			Spool type, see section 4

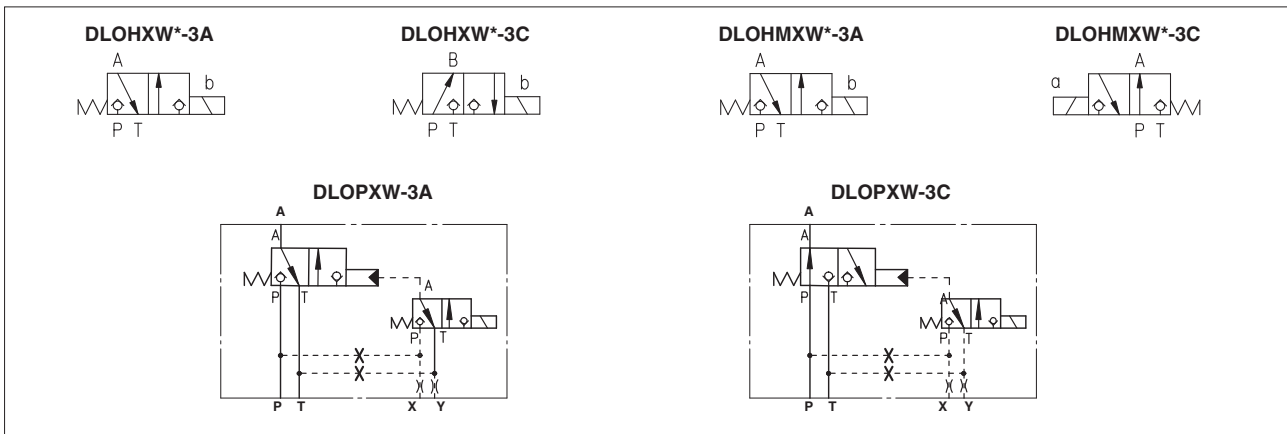
3 POPPET TYPE LEAK FREE VALVES: MODEL CODE

DLOH	XW	-	3	A	/	D	24DC	**	/*
DLOH = direct (12 l/min) DLOHM = direct (25 l/min) DLOP = electro-hydraulically piloted			Stainless steel execution for internal parts			Voltage code - see section 8			Seals material, see section 9: - = NBR low temp. -40°C PE = FKM
3 = three way			Valve configuration, see section 4 A = A to T in rest position C = P to B in rest position (DLOHXW) P to A in rest position (DLOHMXW and DLOPXW)			Options only for DLOP D = internal drain E = external pilot pressure			

4 CONFIGURATIONS and SPOOLS of spool type valves



5 CONFIGURATIONS of POPPET TYPE leak free valves



6 GENERAL CHARACTERISTICS

Assembly position / location	Any position
Subplate surface finishing	Roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101)
MTTFd values according to EN ISO 13849	75 years (DLOPXW), 150 years (DLOHXW, DLOHMXW), for further details see technical table P007
Ambient temperature	Standard = -40°C ÷ +70°C /PE option = -20°C ÷ +70°C
Storage temperature range	Standard = -40°C ÷ +80°C /PE option = -20°C ÷ +80°C
Compliance	CE to Low Voltage Directive 2014/35/EU RoHs Directive 2011/65/EU as last update by 2015/863/EU REACH Regulation (EC) n°1907/2006

7 HYDRAULIC CHARACTERISTICS

Max operating pressure	DHOXW, DLOHXW Ports P,A,B = 350 bar; Port T = 110 bar DLOHMXW Ports P,A,B = 315 bar; Ports T = 110 bar DLOPXW Ports P,A,B, X = 315 bar; Ports T, Y = 110 bar
Piloting pressure	Only for DLOPXW - max 315 bar; min: see diagram at section 14
Rated flow	See diagrams Q/Δp at section 12
Max flow	DHOXW = 70 l/min DLOHXW = 12 l/min DLOHMXW = 25 l/min DLOPXW = 220 l/min See operating limits at section 13
Internal leakages	Only for DLOHXW, DLOHMXW, DLOPXW: ≤ 0,36 cm ³ /min (less than 5 drops/min)

The pressure at T port makes difficult the manual override operation that can be possible only if its value is lower than 50 bar

8 ELECTRICAL CHARACTERISTICS

Voltage code	12DC	24DC	110DC	220DC	110RC	220RC
Supply voltage V _{DC} ±10%	12DC	24DC	110DC	220DC	110/50AC 120/60AC	230/50AC 230/60AC
Power consumption at 20°C	32W				34W	
Coil insulation	class H					
Protection degree	IP65 to DIN EN60529					
Duty factor	100%					

9 MATERIALS SPECIFICATION

Valve type	solenoid housing ①	valve body ②	internal parts ③ + ④	spring ⑤	seals	
					std	/PE
DHOXW	Cast iron	AISI 316L	AISI 316L, 420B, 440C, 430F	AISI 302	NBR 70Sh low temp	FKM (viton)
DLOHXW DLOHMWX	Cast iron	AISI 316L	AISI 316L, 420B, 440C, 430F	AISI 302	NBR 70Sh low temp	FKM (viton)
DLOPXW	Cast iron	AISI 630	AISI 316L, 420B, 440C, 430F	AISI 302	NBR 70Sh low temp	FKM (viton)


10 SEALS AND HYDRAULIC FLUIDS - for other fluids not included in below table, consult our technical office

Seals, recommended fluid temperature (1)	NBR low temp. seals (standard) = -40°C ÷ +60°C FKM seals (/PE option) = -20°C ÷ +80°C		
Recommended viscosity	15 ÷ 100 mm ² /s - max allowed range 2.8 ÷ 500 mm ² /s min = 0,9 mm ² /s with pure water		
Max fluid contamination level	ISO4406 class 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog		
Hydraulic fluid	Suitable seals type	Classification	Ref. Standard
Mineral oils	NBR low temp., FKM	HL, HLP, HLPD, HVLP, HVLDP	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water (2)	NBR low temp.	HFA-E, HFA-S, HFB, HFC	

(1) The operating temperature of the fluid must be compatible with the maximum viscosity range allowed for the valve

(2) Performance limitations in case of flame resistant fluids with water:

-max operating pressure = 210 bar -max fluid temperature = 50°C

 The ignition temperature of the hydraulic fluid must be 50°C higher than the max solenoid surface temperature

11 ELECTRIC CONNECTORS ACCORDING TO DIN 43650 (to be ordered separately, see tech table K500)

666 = standard connector IP-65, suitable for direct connection to electric supply source

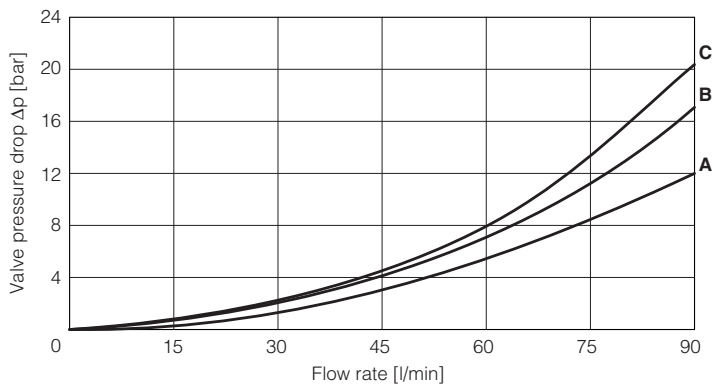
667 = as 666, but with built-in signal led. Available for power supply voltage 24 DC, 110 DC, 220 DC

669 = with built-in rectifier bridge for supplying RC coils by alternate current (AC 110V and 230V - I_{max} 1A)

12 Q/Δp DIAGRAMS (based on mineral oil ISO VG 46 at 50°C)

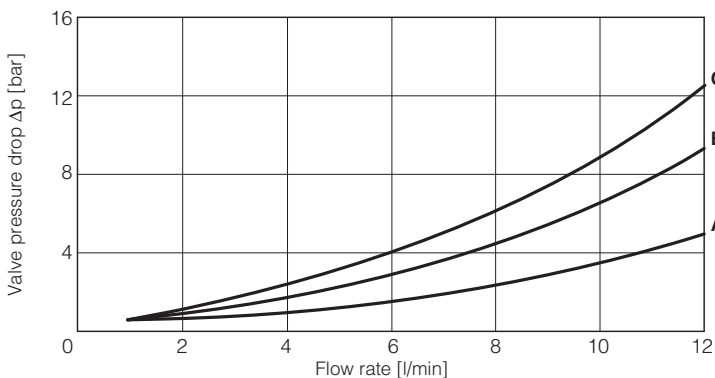
DHOXW

Spool type	Flow direction				
	P→A	P→B	A→T	B→T	P→T
0	A	A	B	B	C
1	C	B	B	B	
3	C	C	A	A	
1/2	C	C	C	C	
6, 7	C	C	C	C	



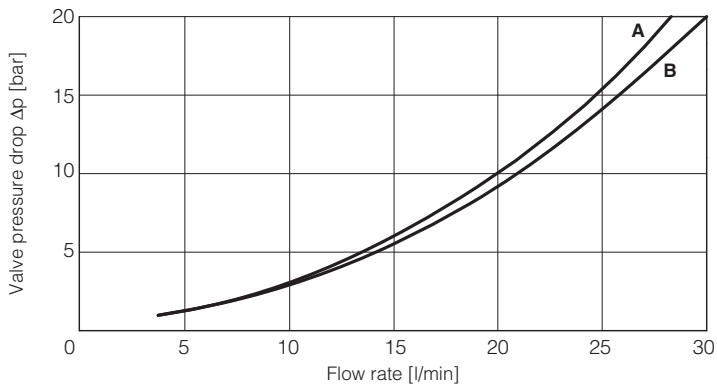
DLOHXW

Valve type	Curve	Flow direction
DLOHXW-3A	C	P-A, P-B
	B	A-T, B-T
DLOHXW-3C	B	P-A, P-B
	A	A-T, B-T



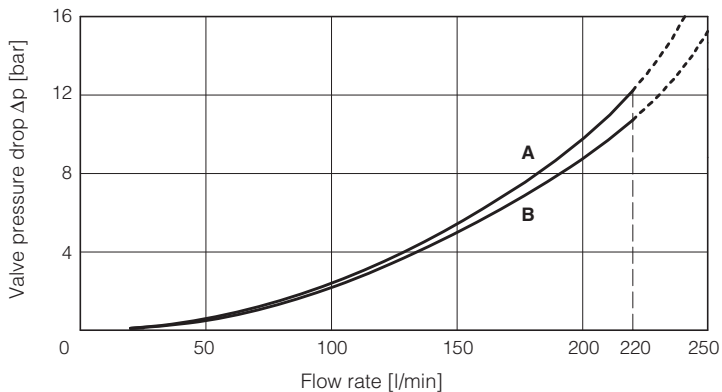
DLOHMWX

Valve type	Curve	Flow direction
DLOHMWX-3A	B	P-A, P-B
	A	A-T, B-T
DLOHMWX-3C	B	P-A, P-B
	A	A-T, B-T



DLOPXW

Valve type	Curve	Flow direction
DLOPXW	A	A-T
	B	P-A

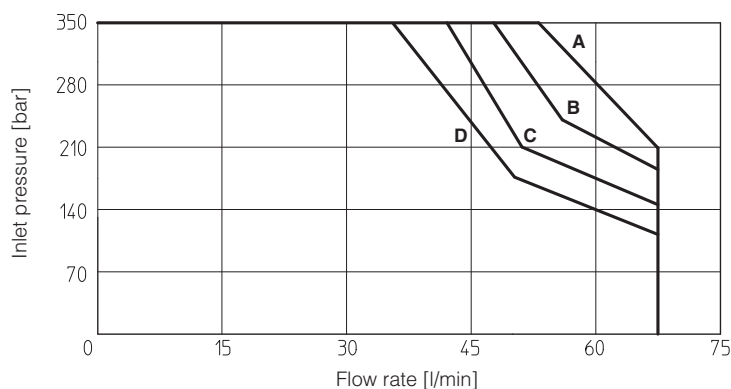


13 OPERATING LIMITS (based on mineral oil ISO VG 46 at 50°C)

The diagram have been obtained with warm solenoids and power supply at lowest value ($V_{nom} - 10\%$). For DHOXW valves the curves refer to application with symmetrical flow through the valve (i.e. P → A and B → T). In case of asymmetric flow the operating limits must be reduced.

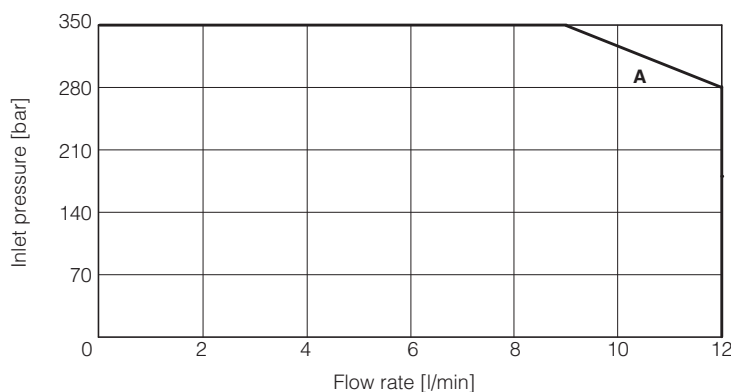
DHOXW

Valve type	Curve	Spool type
DHOXW	A	0, 1
	B	3
	C	1/2
	D	6, 7



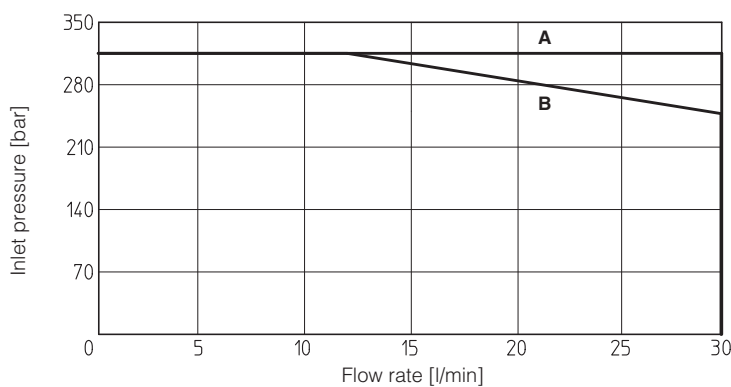
DLOHXW

Valve type	Curve	Configuration
DLOHXW	A	3A, 3C

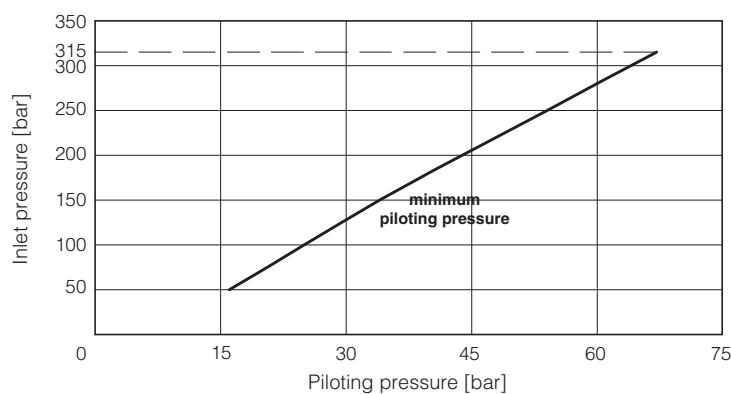


DLOHMXW

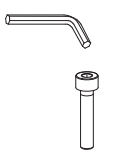
Valve type	Curve	Configuration
DLOHMXW	A	3C
	B	3A



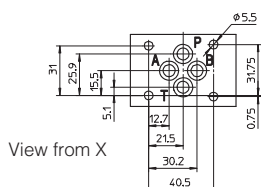
14 MINIMUM PILOT PRESSURE FOR DLOPXW



15 FASTENING BOLTS AND SEALS

	<p>DHOXW, DLOHXW, DLOHMWX</p> <p>Fastening bolts: 4 socket head screws M5x50-A4-70 Tightening torque = 5,5 Nm</p>	<p>DLOPXW</p> <p>Fastening bolts: 4 socket head screws M10x70-A4-70 Tightening torque = 40 Nm</p>
	<p>Seals: 4 OR 108; Diameter of ports P, A, B, T: Ø 7,5 mm (max)</p>	<p>Seals: 3 OR 3081; Diameter of ports P, A, B, T: Ø 16 mm (max) 2 OR 108; Diameter of ports P, A, B, T: Ø 7 mm (max)</p>

16 INSTALLATION DIMENSIONS [mm]

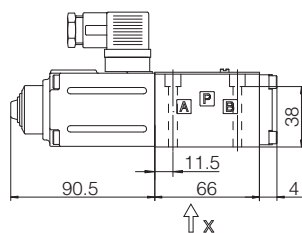


ISO 4401: 2005
Mounting surface: 4401-03-02-0-05

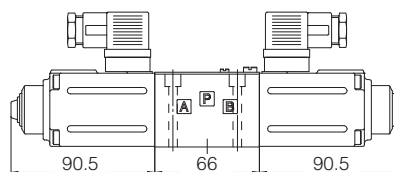
P = PRESSURE PORT
A, B = USE PORT
T = TANK PORT

Mass (Kg)	
DHOXW-06	1,9
DHOXW-07	2,6

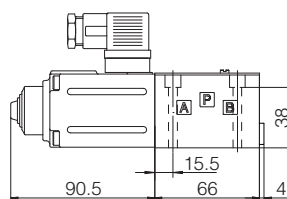
DHOXW-06



DHOXW-07

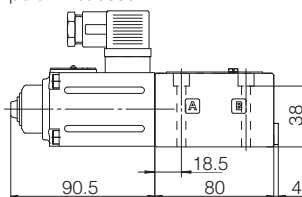


DLOHXW

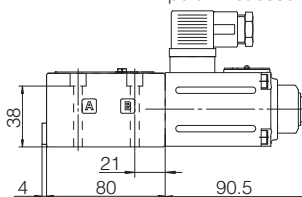


Mass (Kg)	
DLOHXW	1,7

DLOHMWX-3A
port B not used

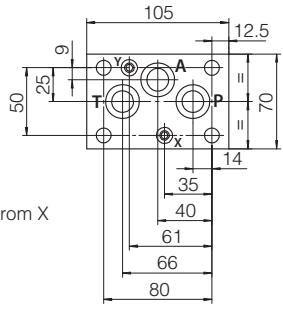


DLOHMWX-3C
port B not used



Mass (Kg)	
DLOHMWX	2

Overall dimensions refer to valves with connectors type 666

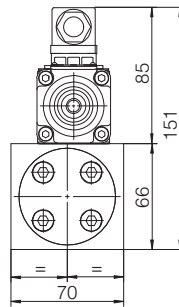
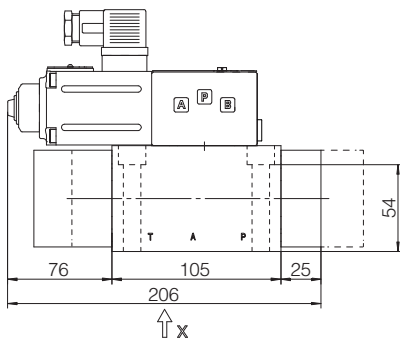


View from X

**Mounting surface of DLOPXW
is not ISO standard**

- P** = PRESSURE PORT
- A** = USE POR
- T** = TANK PORT
- X** = PILOT PORT
- Y** = DRAIN PORT

DLOPXW-3C
DLOPXW-3A (dotted line)



Mass (Kg)	
DLOPXW	7

Overall dimensions refer to valves with connectors type 666