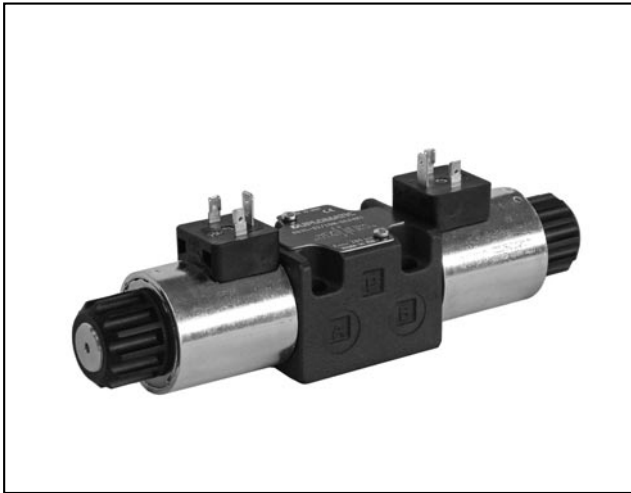


# DS3L

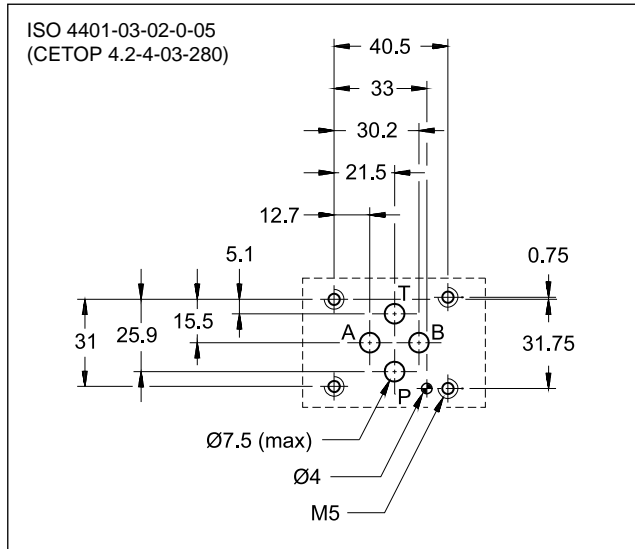
## 8 WATT SOLENOID OPERATED DIRECTIONAL CONTROL VALVE SERIES 10



### SUBPLATE MOUNTING ISO 4401-03

p max **280** bar  
Q max **60** l/min

### MOUNTING INTERFACE



### PERFORMANCES

(with mineral oil of viscosity of 36 cSt at 50°C)

Maximum operating pressure: - ports P - A - B - port T	bar	280 210
Maximum flow rate	l/min	60
Pressure drop $\Delta p-Q$	see point 4	
Operating limits	see point 5	
Electrical features	see point 7	
Ambient temperature range	°C	-20 / +50
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	according to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass: single solenoid valve double solenoid valve	kg	1,5 2

### OPERATING PRINCIPLE

- Low consumption (8 watt) direct operated directional solenoid valve for subplate mounting, with mounting surface according to ISO 4401-03 standards.
- The valve body is made with high strength iron castings provided with wide internal passages in order to minimize the flow pressure drop. Wet armature solenoids with interchangeable coils are used (for further information on solenoids see point 7).
- The valve is available in the 4-port version, 2 or 3 positions, and with the most common spools.
  - It is available also with zinc-nickel surface treatment, that ensures a salt spray resistance up to 240 hours.
  - Solenoids are 24 V power supply, DC.

## 1 - IDENTIFICATION CODE

	D S 3 L - / 10 - DL24 K1		
Solenoid operated directional control valve			Option: <b>/ W7</b> = Zinc-nickel surface treatment (see <b>NOTE</b> ) Omit if not required
ISO 4401-03 size			
Low energy consumption			Coil electrical connection: plug for connector type EN 175301-803 (ex DIN 43650) ( <b>standard</b> )
Spool type (see point 2):			
Series No. _____ (the overall and mounting dimensions remain unchanged from 10 to 19)			DC power supply 24 V
Seals: _____ <b>N</b> = NBR seals for mineral oil (standard) <b>V</b> = FPM seals for special fluids			

**NOTE:** Standard surface treatment is phosphating black.  
On request we can supply these valves with zinc-nickel finishing, suitable to ensure a salt spray resistance up to 240 h (test operated according to UNI EN ISO 9227 standard and test evaluation operated according to UNI EN ISO 10289 standard)  
Add **/W7** at the end of the code.

## 2 - SPOOL TYPE

<p><b>Type S*:</b> 2 solenoids - 3 positions with spring centering</p> <div style="text-align: center;"> </div> <p>S1 S2 S3 S4</p>	<p><b>Type SA*:</b> 1 solenoid side A 2 positions (central + external) with spring centering</p> <div style="text-align: center;"> </div> <p>SA1 SA2 SA3 SA4</p>	<p><b>Type SB*:</b> 1 solenoid side B 2 positions (central + external) with spring centering</p> <div style="text-align: center;"> </div> <p>SB1 SB2 SB3 SB4</p>
<p><b>Type RK:</b> 2 solenoids - 2 positions with mechanical retention</p> <div style="text-align: center;"> </div> <p>RK</p>	<p><b>Type TA:</b> 1 solenoid side A 2 external positions with return spring</p> <div style="text-align: center;"> </div> <p>TA</p>	<p><b>Type TB:</b> 1 solenoid side B 2 external positions with return spring</p> <div style="text-align: center;"> </div> <p>TB</p>

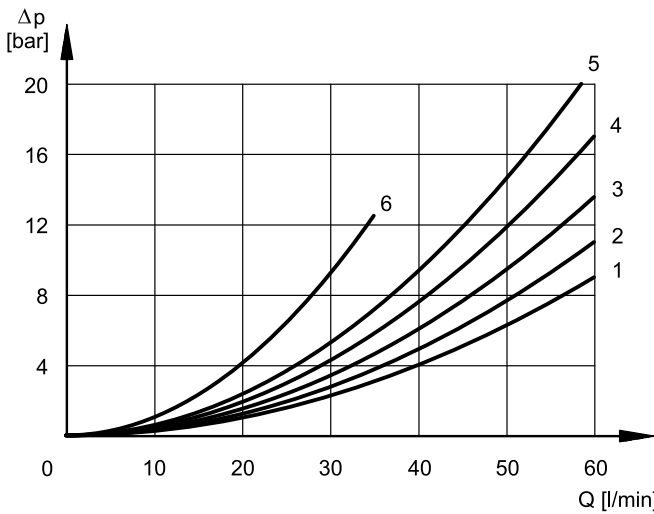
**NOTE:** Others spools available on request only.

## 3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other fluid types such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

### 4 - PRESSURE DROPS $\Delta P-Q$

(obtained with viscosity of 36 cSt at 50 °C)



#### ENERGIZED VALVE

SPOOL	FLOW DIRECTIONS				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S1, SA1, SB1	2	2	3	3	
S2, SA2, SB2	1	1	2	2	3
S3, SA3, SB3	3	3	1	1	
S4, SA4, SB4	5	5	5	5	
TA, TB	3	3	4	3	
RK	2	2	3	3	

#### DE-ENERGIZED VALVE

SPOOL	FLOW DIRECTIONS				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S3, SA3, SB3			6	6	

### 5 - OPERATING LIMITS

The curves define the flow rate operating fields according to the valve pressure of the different versions.

The values have been obtained according to ISO 6403 norm with solenoids at rated temperature and supplied with voltage equal to 90% of the nominal voltage. The value have been obtained with mineral oil, viscosity 36 cSt, temperature 50 °C and filtration according to ISO 4406:1999 class 18/16/13.

**TA spools limits refer to the 4-port operation. The operating limits of a 4-port valve in 3-port operation or with port A or B plugged or without flow may reduce considerably.**



SPOOL	CURVE
S1	1
S2	2
S3	3
S4	4
TA	5
RK	2

### 6 - SWITCHING TIMES

The values indicated are obtained with spool S2, according to ISO 6403 standard, with mineral oil viscosity 36 cSt at 50 °C.

TIMES ( $\pm 10\%$ ) [ms]	
ENERGIZING	DE-ENERGIZING
100	20 ÷ 30



## 7 - ELECTRICAL FEATURES

### 7.1 - Solenoids

These are essentially made up of two parts: tube and coil. The tube is threaded into the valve body and includes the armature that moves immersed in oil, without wear. The inner part, in contact with the oil in the return line, ensures heat dissipation.

The coil is fastened to the tube by a threaded ring, and can be rotated 360°, to suit the available space.

<b>SUPPLY VOLTAGE FLUCTUATION</b>	± 10% Vnom
<b>MAX SWITCH ON FREQUENCY</b>	7.000 ins/hr
<b>DUTY CYCLE</b>	100%
<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b>	In compliance with 2014/30/EU
<b>LOW VOLTAGE</b>	In compliance with 2014/35/EU
<b>CLASS OF PROTECTION</b> Atmospheric agents IEC 60529 Coil insulation (VDE 0580) Impregnation	IP 65 ( <b>NOTE</b> ) class H class F

**NOTE:** The IP65 protection degree is guaranteed only with the connector correctly connected and installed.

### 7.2 - Current and absorbed power for solenoid valve

The table shows current and power consumption values relevant to the 24 VDC coil.

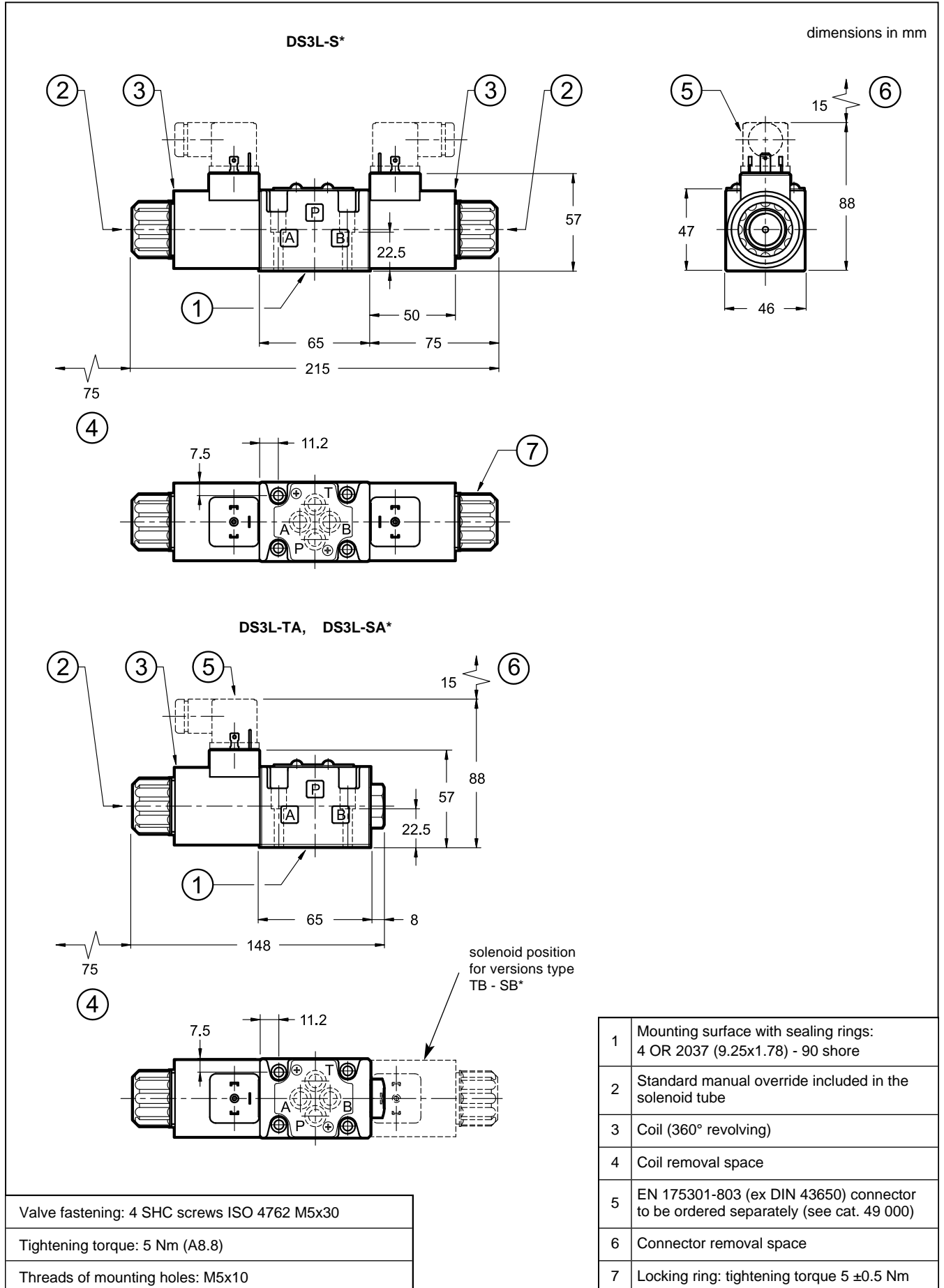
#### Coil for direct current (values ±10%)

	Nominal voltage [V]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt [W]	Coil code
<b>DL24</b>	24	64.6	0.37	8.92	1903291

## 8 - ELECTRIC CONNECTORS

Solenoid operated are delivered without connectors. Connectors must be ordered separately. See catalogue 49 000.

9 - OVERALL AND MOUNTING DIMENSIONS

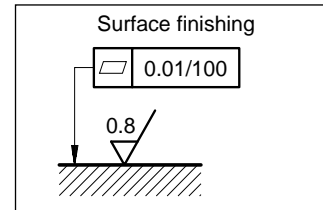


## 10 - INSTALLATION

Configurations with centering and return springs can be mounted in any position; type RK valves - without springs and with mechanical detent - must be mounted with the longitudinal axis horizontal.

Valve fitting takes place by means of screws or tie rods, fixing the valve on a lapped surface, with values of planarity and smoothness that are equal to or better than those indicated in the drawing.

If the minimum values of planarity or smoothness are not met, fluid leakages between valve and mounting surface can easily occur.



## 11 - SPARE PARTS

1	Coil locking ring with seal included cod. 0119412 Tightening torque $5 \pm 0.5$ Nm
2	ORM type 0220-20 (22x2) - 70 Shore
3	Coil C22L3B-DL24K1/11
4	Solenoid tube for standard version: TDM22-DS3L/10N (NBR seals) TDM22-DS3L/10V (FPM seals) <b>NOTE:</b> OR n°5 included
5	OR type 2062 (15.6x1.78) - 70 Shore
6	N. 4 OR type 2037 (9.25x1.78) - 90 Shore

**SEALS KIT**

The codes include the O-Ring n° 2, 5 and 6.

**Cod. 1985406** NBR seals  
**Cod. 1985410** FPM (viton) seals

## 12 - SUBPLATES

(see catalogue 51 000)

Type PMMD-AI3G with rear ports 3/8" BSP
Type PMMD-AL3G with side ports 3/8" BSP

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