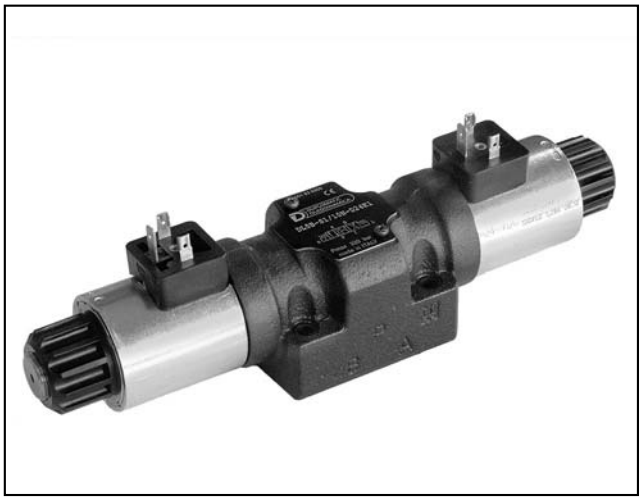
DUPLOMATIC OLEODINAMICA



DL5B

SOLENOID OPERATED DIRECTIONAL CONTROL VALVE COMPACT VERSION

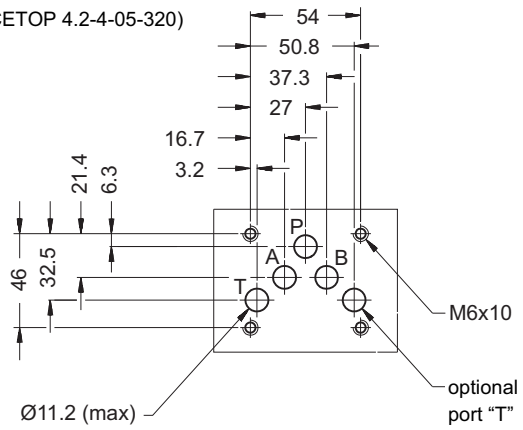
SERIES 10

SUBPLATE MOUNTING
ISO 4401-05 (CETOP 05)

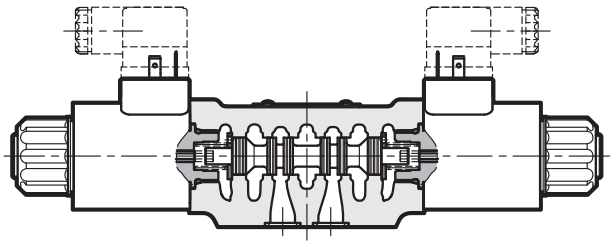
p max **320** bar
Q max **125** l/min

MOUNTING INTERFACE

ISO 4401-05-04-0-05
(CETOP 4.2-4-05-320)



OPERATING PRINCIPLE



— Direct acting, subplate mounting directional control valve, with mounting surface according to ISO 4401 (CETOP RP 121H) standards.

— The valve is suitable for special applications, guaranteed by the reduced solenoid dimensions.

— 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 paragraph 7).

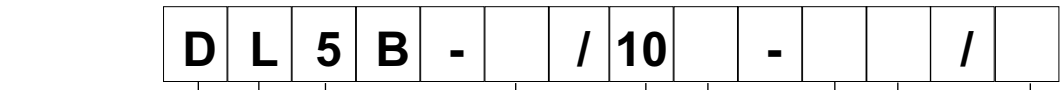
— The valve is supplied with 3 or 4 way designs and with several interchangeable spools with different porting arrangements.

— The valve is available with DC current solenoids only.

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

Maximum operating pressure: - ports P - A - B - port T	bar	 320 210
Maximum flow rate	l/min	125
Pressure drop Δp-Q	see paragraph 4	
Operating limits	see paragraph 5	
Electrical features	see paragraph 7	
Electrical connections	see paragraph 8	
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
Masse: single solenoid valve double solenoid valve	kg	2,4 3

1 - IDENTIFICATION CODE



Solenoid operated directional control valve

Compact version

ISO 4401-05 (CETOP 05) size

Spool type (see paragraph 3):

S* **TA***
SA* **TB***
SB* **RK**

Series no.: (the overall and mounting dimensions remain unchanged from 10 to 19)

Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

DC power supply
D12 = 12 V
D24 = 24 V
D28 = 28 V
D00 = valve without coils (see **NOTE 1**)

Coil electrical connection: (see paragraph 9)
K1 = plug for connector type DIN 43650 (**standard**)
K2 = plug for connector type AMP JUNIOR (available on D12 and D24 coils only)
K7 = plug DEUTSCH DT04-2P for male connector type DEUTSCH DT06-2S (available on D12 and D24 coils only)

Option: Surface treatment not standard. Omit if not required (see **NOTE 2**)

NOTE 1: Coils locking ring and related OR are supplied together with valves.

NOTE 2:The valve is supplied with standard surface treatment of phosphating black. On request we can supply these valves with other surface finishes. Add suffix **/ W *** at the end of the code.

W2 = mat epoxy painting black RAL 9005
thickness 20 ÷ 40µ

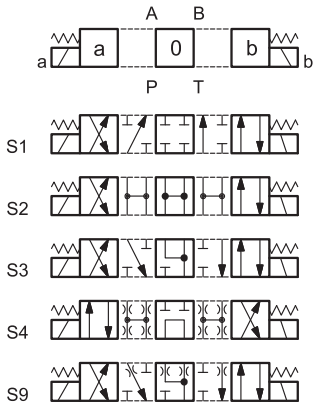
2 - HYDRAULIC FLUIDS

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.

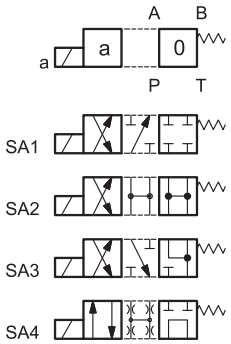
Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

3 - SPOOL TYPE

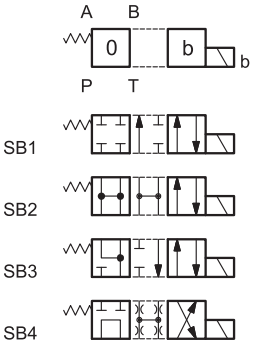
Type **S***:
2 solenoids - 3 positions
with spring centering



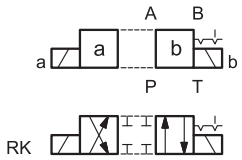
Type **SA***:
1 solenoid side A
2 positions (central + external)
with spring centering



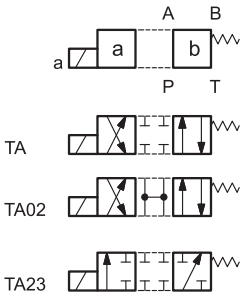
Type **SB***:
1 solenoid side B
2 positions (central + external)
with spring centering



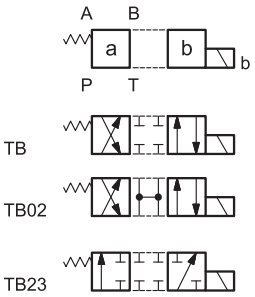
Type **RK**:
2 solenoids - 2 positions
with mechanical retention



Type **TA**:
1 solenoid side A
2 external positions
with return spring

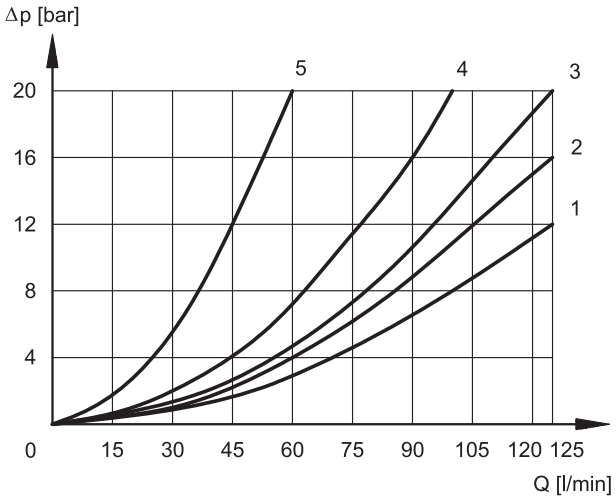


Type **TB**:
1 solenoid side B
2 external positions
with return spring



NOTE: Others spools available on request only.

4 - PRESSURE DROPS Δp-Q (obtained with viscosity of 36 cSt at 50 °C)



ENERGIZED VALVE

SPOOL	FLOW DIRECTIONS			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPHS			
S1	1	1	2	2
S2	1	1	1	1
S3	1	1	1	1
S4	4	4	4	4
S9	1	1	1	1
RK	2	2	2	2
TA	2	2	3	3
TA02	2	2	1	1
TA23	3	3	-	-

DE-ENERGIZED VALVE

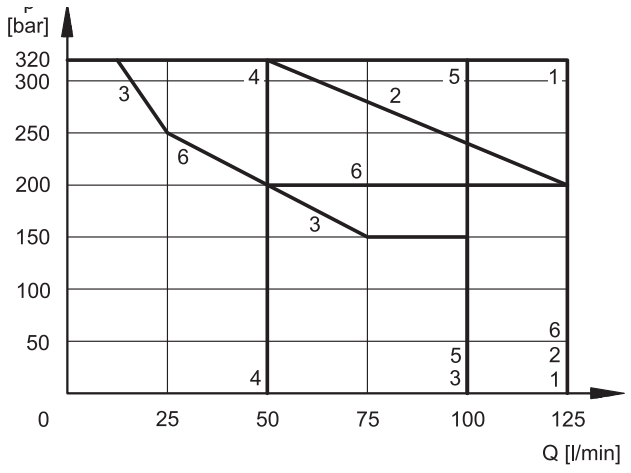
SPOOL	FLOW DIRECTIONS		
	A→T	B→T	P→T
	CURVES ON GRAPHS		
S2	-	-	1
S3	5	5	-
S4	-	-	1

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.

The limits for TA02 and TA spools refer to the 4-way operation. The operating limits of a 4-way valve in 3-way operation or with port A or B plugged or without flow are shown in the chart on the next page.

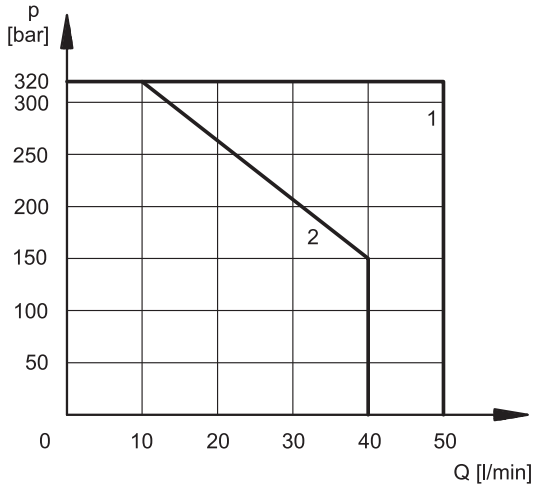
DC SOLENOID VALVE



SPOOL	CURVE
S1, S2, RK	1
TA02	2
S3	3
S4	4
TA, TA23	5
S9	6

5.1 - 4-way valve in 3-way operation

Operating limits of a 4-way valve in 3-way operation or with port A or B plugged or without flow.



SPOOL	CURVE
TA	1
TA02	2

6 - SWITCHING TIMES

The values indicated are obtained with spool S1, according to ISO 6403 standard, with mineral oil viscosity 36 cSt at 50°C.

SUPPLY	TIMES (±10%) [ms]	
	ENERGIZING	DE-ENERGIZING
DC	70 ÷ 100	15 ÷ 20

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 +/- 90°, to suit the available space
The coils are interchangeabile.

Protection from atmospheric agents CEI EN 60529

Plug-in type	IP 65	IP 67	IP 69 K
K1 DIN 43650	x (*)		
K2 AMP JUNIOR	x	x (*)	
K7 DEUTSCH DT04 male	x	x	x (*)

(*) The protection degree is guaranteed only with the connector correctly connected and installed

NOTE: In order to further reduce the emissions, use of type H connectors is recommended. These prevent voltage peaks on opening of the coil supply electrical circuit (see cat. 49 000).

SUPPLY VOLTAGE FLUCTUATION	± 10% Vnom
MAX SWITCH ON FREQUENCY	10.000 ins/hr
DUTY CYCLE	100%
ELECTROMAGNETIC COMPATIBILITY (EMC)	In compliance with 2004/108/CE
LOW VOLTAGE	In compliance with 2006/95 CE
CLASS OF PROTECTION : Coil insulation (VDE 0580) Impregnation:	 class H class F

7.2 DC valve - Current and power consumption

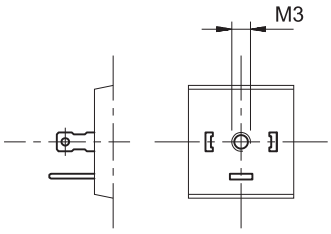
In direct current energizing, current consumption stays at fairly constant values, essentially determined by Ohm's law: V = R x I

The table shows current and power consumption values for DC types.

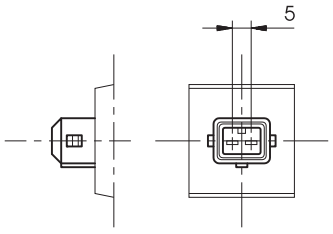
	Resistance at 20°C [Ω] (±5%)	Current consumption [A] (±10%)	Power consumption [W] (±10%)	Coil code K1	K2	K7
C22S3-D12	4,4	2,72	32,7	1903080	1903100	1902940
C22S3-D24	18,6	1,29	31	1903081	1903101	1902941
C22S3-D28	26	1,11	31	1903082		-

8 - ELECTRIC CONNECTIONS

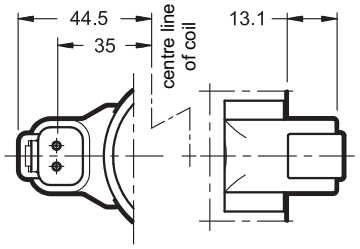
connection for DIN 43650 connector type code **K1** (**standard**)



connection for AMP JUNIOR connector type code **K2**



connection DEUTSCH DT04-2P for DEUTSCH DT06-2S male connector type code **K7**

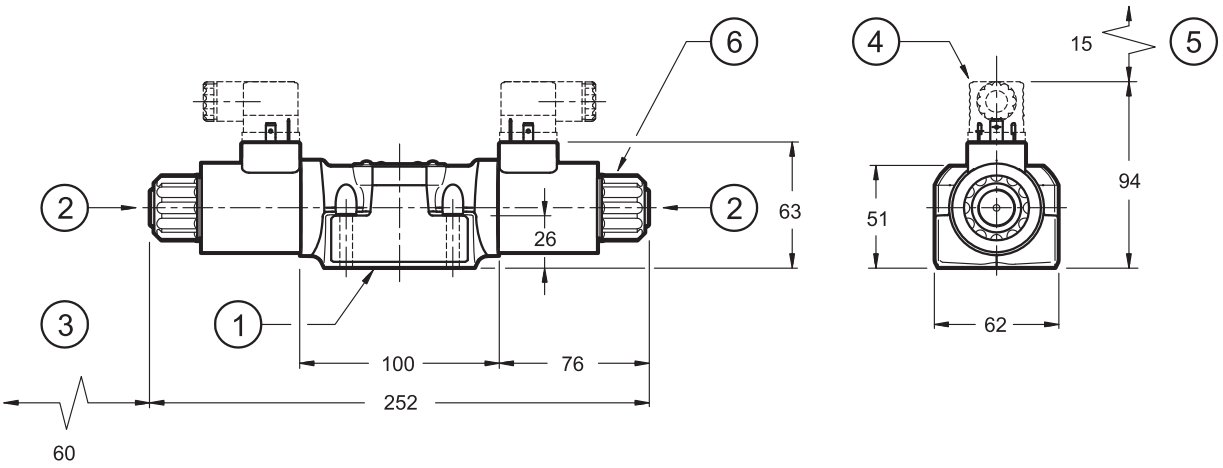


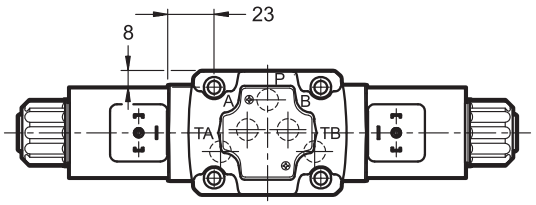
9 - ELECTRIC CONNECTORS

The solenoid operated valves with K1 connection are not supplied with connector. Connectors must be ordered separately (see catalogue 49 000). K2 and K7 connectors are not available.

10 - DL5B DC OVERALL AND MOUNTING DIMENSIONS

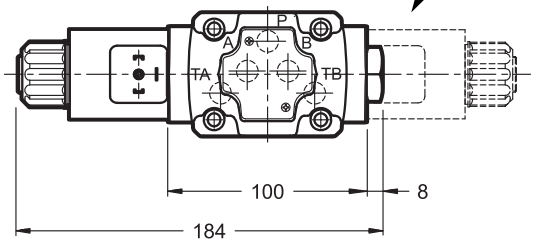
DL5B-S*





DL5B-TA, DL5B-SA*

solenoid position for versions type TB* - SB*



dimensions in mm

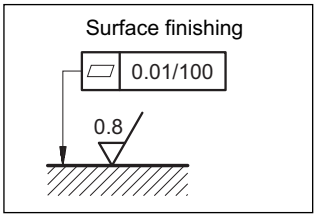
1	Mounting surface with sealing rings
2	Locking ring with standard manual override integrated in the tube
3	Coil removal space
4	DIN 43650 electrical connector (representation with K1 standard connection)
5	Connector removal space
6	Locking ring: tightening torque: 5 ± 0.5 Nm

See par. 13 for fastening bolts and sealing rings

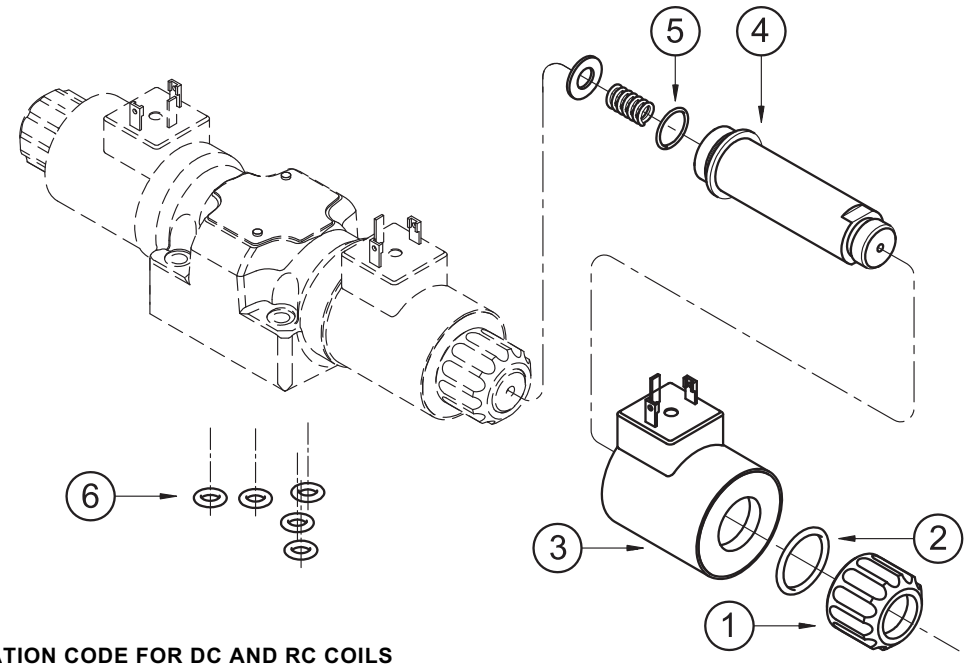
11 - INSTALLATION

The configuration with centering and return springs can be mounted in any position.

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.



12 - SPARE PARTS FOR DC SOLENOID VALVE



IDENTIFICATION CODE FOR DC AND RC COILS

C	22	S3	-			/	

Supply voltage
D12 = 12 V
D24 = 24 V
D28 = 28 V

Series no.:
10 = for K7
11 = for K1and K2
(the overall and mounting dimensions remain unchanged from 10 to 19)

Coil electrical connection:
K1 = plug for connector type DIN 43650 (**standard**)
K2 = plug for connector type AMP JUNIOR (available on D12 and D24 coils only)
K7 = plug DEUTSCH DT04-2P for male connector type DEUTSCH DT06-2S (available on D12 and D24 coils only)

1	Coil locking ring - code 0119412 tightening torque: 5 ±0.5 Nm
2	ORM-0220-20 - 70 shore
3	Coil (see identification code)
4	Solenoid tube: TD22-DL5/10N (NBR seals) TD22-DL5/10V (FPM seals) (OR n° 6 included)
5	OR type 3.910 (19.18x2.46) - 70 shore
6	N. 5 OR type 2050 (12.42x1.78) - 90 Shore

SEAL KIT

The codes included the OR n° 2, 5, and 6.
Cod. 1985461 NBR seals
Cod. 1985462 FPM seals

13 - FASTENING BOLTS AND SEALING RINGS

Single valve fastening: 4 SHC screws M6x35
Tightening torque: 8 Nm
Sealing rings: N. 5 OR type 2050 (12.42x1.78) - 90 Shore

14 - SUBPLATES (See catalogue 51 000)

Type PMD4-AI4G with rear ports - threading: 3/4” BSP
Type PMD4-AL4G with side ports - threading: 1/2” BSP

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com