

Part number:

**094-10050a**

**HYDROMA**

HYDRAULICKÉ SYSTÉMY

**HIDROMA  
SYSTEMS**

UKŁADY HYDRAULICZNE

**HYDROMA**

ГИДРАВЛИЧЕСКИЕ СИСТЕМЫ

41 310/108 ED

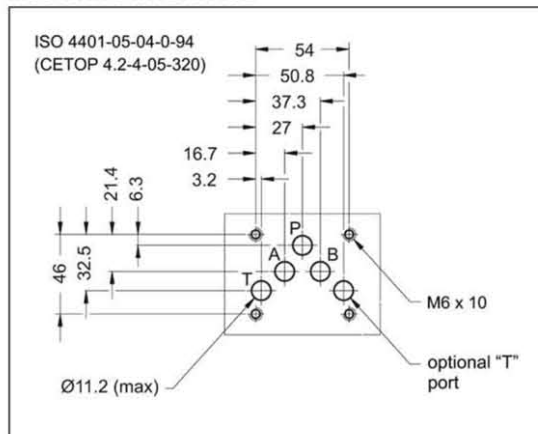


## DS5 SOLENOID OPERATED DIRECTIONAL CONTROL VALVE

**SUBPLATE MOUNTING  
ISO 4401-05 (CETOP 05)**

**p max 320 bar  
Q max 150 l/min**

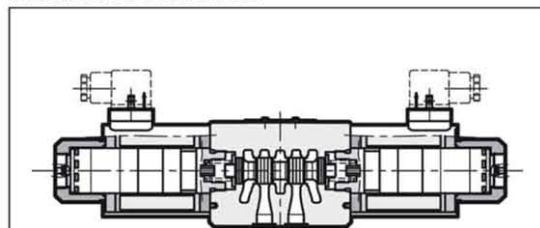
### MOUNTING INTERFACE



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

Maximum operating pressure P - A - B ports	bar	DC	AC
		320	
T port	standard version	210	140
	version with Y port	320	-
Maximum flow rate	l/min	150	120
Pressure drop $\Delta p-Q$	see paragraph 4		
Operating limits	see paragraph 6		
Electrical features	see paragraph 7		
Electrical connections	plug for connector DIN 43650		
Ambient temperature range	°C	-20 / +50	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 ÷ 400	
Recommended viscosity	cSt	25	
Fluid contamination degree	according to ISO 4406:1999 class 20/18/15		
Mass:	single solenoid valve	kg	4,4
	double solenoid valve	kg	5,9
			3,6
			4,3

### OPERATING PRINCIPLE



- Direct acting, subplate mounting directional control valve, with mounting surface according to ISO 4401 (CETOP RP121H).
- 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 or AC solenoids. DC solenoids can also be fed with AC power supply, by using connectors with a built-in rectifier bridge (see cat. 49 000).
- The DC solenoids DS5 directional valve is available in the following special versions:
  - version with Y external subplate drain port, (see paragraph 12.1).
  - version with soft-shifting (see paragraph 12.4)
  - version with adjustable "soft-shifting" device (see paragraph 12.5)







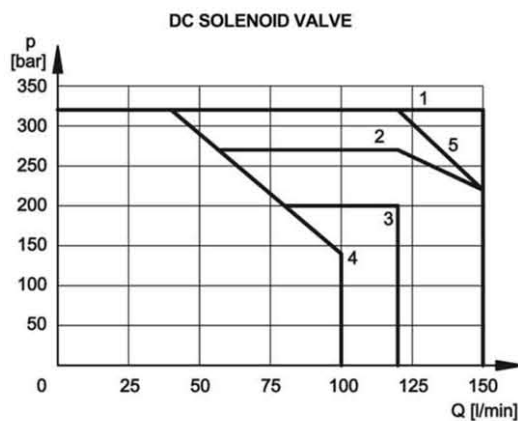
# DS5

## 6 - OPERATING LIMITS

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

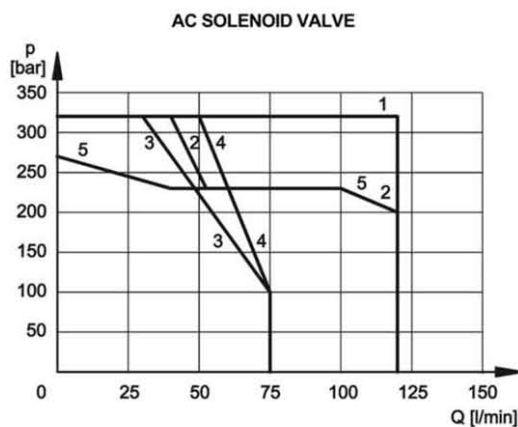
The values have been obtained according to ISO 64003 norm with solenoids at rated temperature and supplied with voltage equal to 90% of the nominal voltage.

The values have been obtained with mineral oil, viscosity 36 cSt, temperature 50 °C and filtration according to ISO 4406:1999 class 18/16/13.



SPOOL TYPE	CURVE	
	P-A	P-B
S1, SA1, SB1	1	1
S2, SA2, SB2	1	1
S3, SA3, SB3	2	2
S4, SA4, SB4	3	3
S5	1	1
S6	2	1
S7	4	4
S8	4	4
S9	1	1
S10	1	1
S11	1	2
S12	1	1

SPOOL TYPE	CURVE	
	P-A	P-B
S17	1	3
S18	1	1
S19	3	1
S20		
S21		
S22		
S23		
TA, TB	5	5
TA02, TB02	3	3
TA23, TB23	1	1
RK	1	1
RK02	1	1
RK1, 1RK	1	1



SPOOL TYPE	CURVE	
	P-A	P-B
S1, SA1, SB1	1	1
S2, SA2, SB2	2	2
S3, SA3, SB3	2	2
S4, SA4, SB4	4	4
S5	1	1
S6	2	1
S7	3	3
S8	3	3
S9	2	2
S10	1	1
S11	1	2
S12	1	1

SPOOL TYPE	CURVE	
	P-A	P-B
S17	1	5
S18	1	1
S19	5	1
S20		
S21		
S22		
S23		
TA, TB	1	1
TA02, TB02	5	5
TA23, TB23	1	1
RK	1	1
RK02	1	1
RK1, 1RK	1	1

**NOTE:** The values indicated in the graphs are relevant to the standard solenoid valve. The operating limits can be considerably reduced if a 4-way valve is used with port A or B plugged.

For flow and pressure performances of soft-shifting configuration (options F) see par. 12.5

Flow and pressure performances of adjustable soft-shifting device configurations (options S) are influenced by the set shifting time.

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**DS5****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, to suit the available space.

**NOTE 1:** 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).

**7.2 Current and absorbed power for DC solenoid valve**

The table shows current and power consumption values relevant to the different coil types for DC.

The rectified current supply takes place by fitting the valve with an alternating current source (50 or 60 Hz), rectified by means of a bridge built-in to the "D" type connectors (see cat. 49 000).

**7.3 Current and absorbed power for AC solenoid valve**

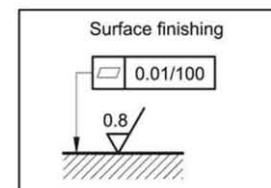
The table shows current and power consumption values at inrush and at holding, relevant to the different coil types for AC current.

**Coils for alternating current (values  $\pm 5\%$ )**

Suffix	Nominal voltage [V]	Frequency [Hz]	Resistance at 20°C [ohm]	Current consumption at inrush [A]	Current consumption at holding [A]	Power consumption at inrush [VA]	Power consumption at holding [VA]	Coil code
A24	24	50	0,53	25	3,96	600	95	1902890
A48	48		2,09	12,5	2,3	600	110	1902891
A110	110V-50Hz	50/60	10,9	5,2	0,96	572	105	1902892
	120V-60Hz		10,9	5,2	0,89	572	105	
A230	230V-50Hz		52,7	2,8	0,46	644	105	1902893
	240V-60Hz		52,7	2,8	0,38	644	105	
F110	110	60	8,80	5,2	0,95	572	105	1902894
F220	220		35,2	2,7	0,48	594	105	1902895

**8 - 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 fixing is by means of screws or tie rods, with the valve mounted 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 and/or smoothness are not met, fluid leakage between valve and mounting surface can easily occur.

**9 - ELECTRIC CONNECTORS**

The solenoid valves are not supplied with connector. Connectors must be ordered separately. For the identification of the connector type to be ordered, please see catalogue 49 000.

<b>SUPPLY VOLTAGE FLUCTUATION</b>	$\pm 10\%$ Vnom
<b>MAX SWITCH ON FREQUENCY</b>	15.000 ins/hr
<b>DUTY CYCLE</b>	100%
<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b> emissions (see NOTE 1) immunity	EN 50081-1 EN 50082-2 in compliance with 89/336 EEC
<b>LOW VOLTAGE</b>	in compliance with 73/23/EEC 96/68/EEC
<b>CLASS OF PROTECTION:</b> Atmospheric agents Coil insulation Impregnation	(CEI EN 60529) (VDE 0580) IP 65 (see NOTE 2) class H class F

**NOTE 2:** The IP65 protection degree is guaranteed only with the connector correctly connected and installed.

**Coils for direct current (values  $\pm 5\%$ )**

Suffix	Nominal voltage [V]	Resistance at 20°C [ $\Omega$ ]	Current consumpt. [A]	Power consumpt. [W]	Coil code
D12	12	3 - 3,4	3,81	45,8	1902870
D24	24	12 - 14	1,90	45,3	1902871
D110	110	235-270	0,44	48,4	1902872
D220	220	960-1110	0,21	47,1	1902873

**NOTE:** It is necessary to allow, when supplying the valve with rectified current, a reduction of the operating limits by 5-10% approx.



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# DS5

## 10 - OVERALL AND MOUNTING DIMENSIONS FOR DC SOLENOID VALVES

