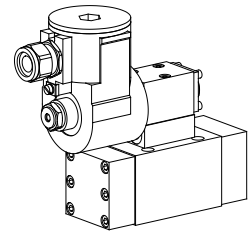


**Spool valve pilot operated**

- 4/2-way impuls version detented
- 4/3-with spring centred mid position
- 4/2-way with spring reset
- $Q_{max} = 100 \text{ l/min}$ ,  $p_{max} = 315 \text{ bar}$

**NG10**  
 ISO 4401-05

**II 2 G**  
**EEx d II C**

**DESCRIPTION**

Pilot operated spool valve in flange type NG10 with 4 connections. Pilot valve as direct operated spool valve with a 5 annular chamber body design. Spool made from hardened steel. Valve body made from high grade hydraulic cast iron.

**EEx:** in accordance with european standards EN 50014, EN 50018

**d:** flameproof enclosure

**Group II C:** (gas group II A, II B)

for all applications except mining

**Zone 1:** (and 2) explosive mixtures present intermittently

**EC-type examination certificate:**

Execution T4: PTB 98 ATEX 1009

Execution T6: PTB 98 ATEX 1008

**FUNCTION**

By operating the pilot valve pressure will be applied to one end of the main spool and move it into activated position as indicated on table.

- 4/2-way impuls valve
  - 4/3-way spring centered
  - 4/2-way spring reset
- (see data sheets of the corresponding pilot valves) Pilot pressure supply and drain either internal are as an option external through a ported sandwich plate between main and pilot valve.

**APPLICATION**

Solenoid operated spool valves are mainly used to control the direction of movement and retain hydraulic cylinders and motors. The direction of flow through the valve is determined by the spool symbol. Pilot operated valves are used where high flows have to be controlled. These valves are suitable for hazardous areas in off-shore and shipbuilding applications as well as in chemical, oil and gas industry.

**TYPE CODE**

	A	EXd	VP	4	<input type="checkbox"/>	-	<input type="checkbox"/>	-S1788-	<input type="checkbox"/>	/	<input type="checkbox"/>	#	<input type="checkbox"/>
International interface ISO													
Pilot operated valve:													
Explosion proof solenoid													
Pilot operated spool valve													
No. of control ports													
Type charts/Symbols acc. to table 1.9-36/2													
Pilot pressure supply and drain:													
Pressure supply (x) and drain (y) internal	<input type="checkbox"/> ti												
Pressure supply (x) and drain (y) external	<input type="checkbox"/> te												
Pressure supply (x) internal drain (y) external	<input type="checkbox"/> pi												
Pressure supply (x) external drain (y) internal	<input type="checkbox"/> pe												
Terminal box without cable													
Standard nominal voltage $U_N$ :	24VDC	<input type="checkbox"/> G24	115VAC	<input type="checkbox"/> R115									
			230VAC	<input type="checkbox"/> R230									
Execution:	T1...T4	<input type="checkbox"/> T4											
	T1...T6	<input type="checkbox"/> T6											
Design-Index (Subject to change)													

**GENERAL SPECIFICATIONS**

Description	4/2-, 4/3-way valve	Mounting position	any, preferably horizontal
Nominal size	NG10 acc. to ISO 4401-05	Fastening torque	$M_D = 9,5 \text{ Nm}$ (screw quality 8.8)
Construction	Pilot operated spool valve	Weight: Main valve	$m = 3,6 \text{ kg}$
Operations	Solenoid operated valve	Sandwich plate	$m = 0,4 \text{ kg}$
Pilot supply valves	BEXd4.4. data sheet 1.3-22	Pilot valve	$m = 3,2...5,1 \text{ kg}$ depending on the valve typ
Mounting	Flange mounting		
	4 holes for socket cap screws M6 x65		
Connections	Threaded connection plates		
	Multi-flange plates		
	Longitudinal stacking system		
Admissible ambient temp. *:			
Execution T4	-20...+40°C		
Execution T6	-20...+90°C (operation as T1...T4)		
	-20...+40°C (operation as T5/T6)		

**HYDRAULIC SPECIFICATIONS**

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 20/18/14 (Required filtration grade $\beta_{10...16} \geq 75$ ) refer to data sheet 1.0-50/2
Viscosity range	12 mm <sup>2</sup> /s...320 mm <sup>2</sup> /s
Admissible fluid temp. *:	
Execution T4	-20...+40°C
Execution T6	-20...+70°C (operation as T1...T4) -20...+40°C (operation as T5/T6)
Operating pressure in port P, A, B	$p_{max} = 315 \text{ bar}$
Tank pressure in port T	$p_{Tmax} = 160 \text{ bar}$ at pilot supply te and pi $p_{Tmax} = 100 \text{ bar}$ at pilot supply ti and pe $p_T$ minimum 12 bar deeper at $p_v$
Pilot over sandwich plate	$p_{vmin} = 12 \text{ bar}$
Max. volume flow	$p_{vmax} = 315 \text{ bar}$
Leakage volume flow	$Q_{max} = 100 \text{ l/min}$ see characteristics

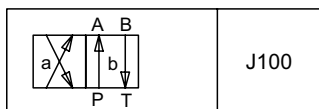
\* Deviating pressure medium - or ambient temperatures are possible for special arrangements after checking and authorisation by a responsible inspector. Measures for the prevention of the exceeding of the admissible solenoid surface - and internal temperatures can be: a good ventilation, low ambient temperatures (for higher pressure medium temperatures), limitation of the maximum possible power supply voltage, a short switching-on duration, installation on large heat dissipating blocks, etc. The responsibility in all cases lies with the operator, resp. with his inspector.

**ELECTRICAL CONTROL**

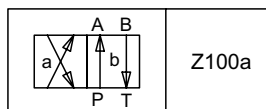
Construction	Solenoid, wet pin push type, pressure tight
Standard-nominal voltage	$U_N = 24 \text{ VDC}$ $U_N = 115 \text{ VAC}$ , $U_N = 230 \text{ VAC}$ DC wired with VDR AC = 50 bis 60 Hz $\pm 2\%$ ; with half wave rectifier and recovery
diode	
Voltage tolerance	$\pm 10\%$ of nominal voltage
Protection class	IP 65 acc. to EN 60 529
Relative duty factor	100% DF
Switching cycles	12 000/h
Operating life	$10^7$ (number of switching cycles, theoretically)
Connection/Power supply	Through cable entry for cable diameter $\varnothing 11...14 \text{ mm}$ (acc. to EN 50014)
Temperature class:	
Execution T4	T1...T4
Execution T6	T1...T6
Nominal power:	
Execution T4	22 W (DC), 35 VA (AC)
Execution T6	7 W (DC), 12 VA (AC)

**START-UP**

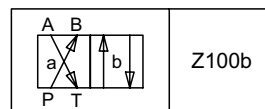
Information concerning the installation and commissioning is contained in the operating instructions supplied together with the solenoid coil.

**TYPE LIST / DESIGNATION OF SYMBOLS**
**4/2-way valve impulse**


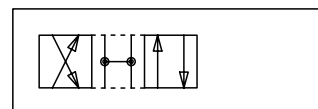
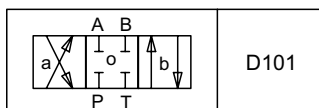
J100

**4/2-way valve with spring reset operation A-side**


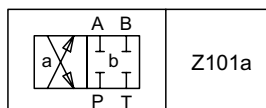
Z100a

**operation B-side**


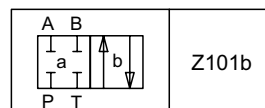
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**Transitional functions**

**4/3-way valve spring centered**


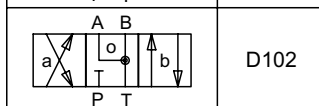
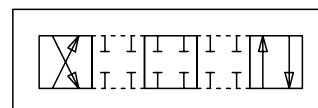
D101



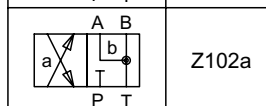
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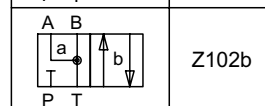
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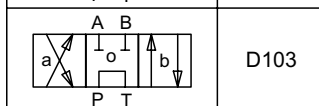
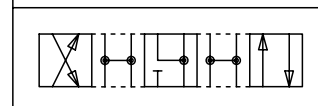
D102



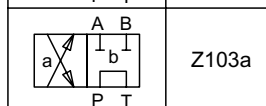
Z102a



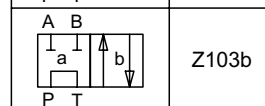
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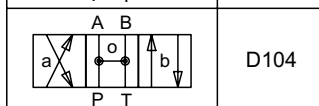
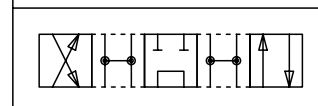
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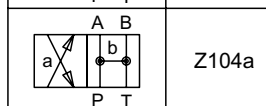
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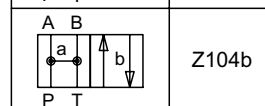
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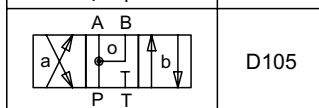
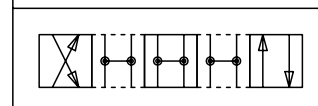
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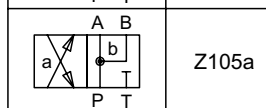
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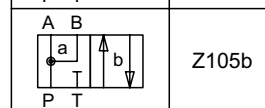
Z104b



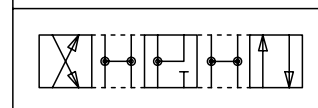
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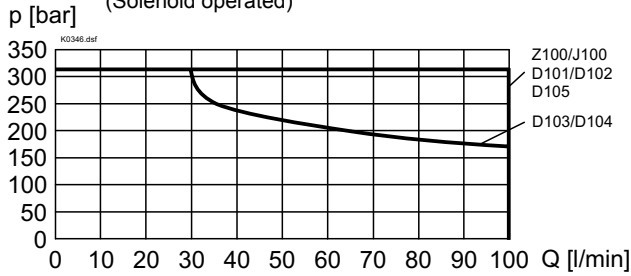
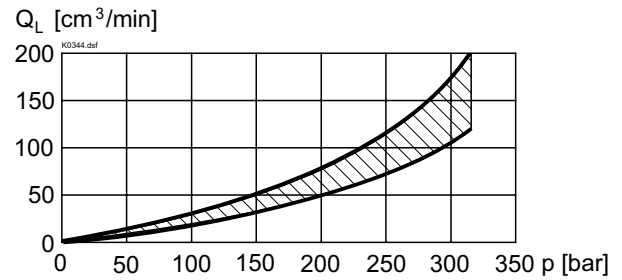
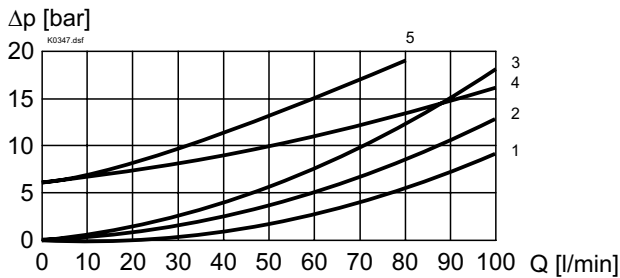


Z105a



Z105b

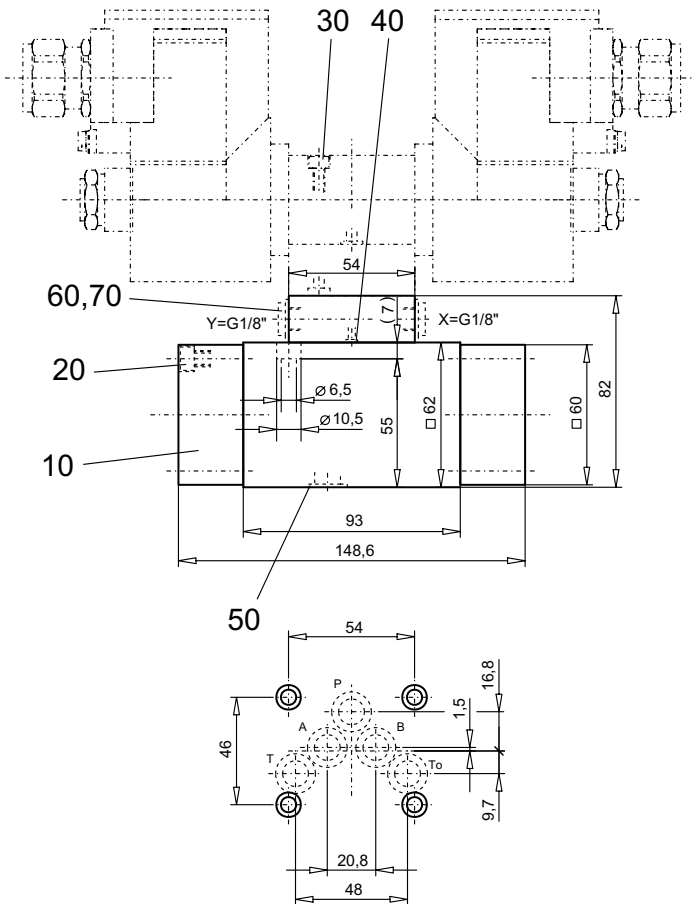


**CHARACTERISTICS** Oil viscosity  $\nu = 30 \text{ mm}^2/\text{s}$ 
 $p = f(Q)$  Performance limits with standard voltage -10%  
 (Solenoid operated)

 $Q_L = f(p)$  Leakage volume flow characteristics per control edge

 $\Delta p = f(Q)$  Pressure drop volume flow characteristics

**Pilot supply  $t_i$  and  $p_i$** 

Symbol	Pressure drop curve no.	Volume flow direction				
		P - A	P - B	P - T	A - T	B - T
Z100/J100	1	1	1	-	1	2
D101/Z101	1	1	1	-	1	2
D102/Z102	1	1	1	-	1	2
D103/Z103	4	4	4	5	1	2
D104/Z104	4	4	4	-	1	2
D105/Z105	1	1	1	-	1	2

**Pilot supply  $t_e$  and  $p_e$** 

Symbol	Pressure drop curve no.	Volume flow direction				
		P - A	P - B	P - T	A - T	B - T
Z100/J100	1	1	1	-	1	2
D101/Z101	1	1	1	-	1	2
D102/Z102	1	1	1	-	1	2
D103/Z103	1	1	1	3	1	2
D104/Z104	1	1	1	-	1	2
D105/Z105	1	1	1	-	1	2

**DIMENSIONS**

**PARTS LIST**

Position	Article	Description
10	059.2206	Cover
20	246.3131	Socket head cap screw M6 x 30 DIN 912
30	249.2000	Socket head cap screw M5x60 for pilot supply ti
	246.2180	Socket head cap screw M5x80 for pilot supply te, pi and pe
40	160.2052	O-ring ID 5,28x1,78
50	160.2140	O-ring ID 14,00x1,78
60	238.1202	Plug screw DIN 908 G1/8"
70	049.2102	Bonded seal ID 10,7x17x1,5

**ACCESSORIES**

Threaded connecting plates, Multi-flange subplates and Longitudinal stacking system see Reg. 2.9

Technical explanation see data sheet 1.0-100

**Mounting instruction**

To screw the main valve ( $M_D = 9,5$  Nm, quality 8.8) to the base plate the pilot valve ( $M_D = 5,5$  Nm, quality 8.8) must be taken off.