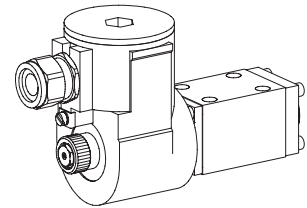


Solenoid operated spool valve

- 4/2-way impulse valve
- 4/3-way with spring centred mid position
- 4/2-way spring reset
- $Q_{max} = 50 \text{ l/min}$, $p_{max} = 350 \text{ bar}$

NG6

ISO 4401-03


II 2 G
EEx d II C

DESCRIPTION

Spool valve flange type NG6 with 4 con-nections. Direct solenoid operated spool valve with a 5 annular chamber body design. Activated with explosion proof solenoid. Spool detented or with spring reset. Wet pin solenoid. Precise spool fit, low leak, long service life. 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

The energised solenoid shifts the spool into the corresponding position.

• 4/2-way impulse valve detented:

Two solenoids and 2 detented positions. With the solenoid deenergised the spool remains in the last switched position.

• 4/3-way spool valve:

Two solenoids and 3 positions, spring centered. With the solenoids deenergised the spool returns to the center position by spring force.

• 4/2-way spool valve:

One solenoid and 2 positions, spring offset. With the solenoid deenergised the spool returns to the offset position by spring force.

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. Switching performance and possible leakage must be taken into consideration when designing a system. These valves are suitable for hazardous areas in off-shore and ship-building applications as well as in chemical, oil and gas industry.

CONTENT

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TYPE CODE

A EXd 4 <input type="checkbox"/> - S1788 - <input type="checkbox"/> / <input type="checkbox"/> # <input type="checkbox"/>							
International mounting interface ISO	<input type="checkbox"/>						
Explosion proof solenoid	<input type="checkbox"/>						
Number of control ports	<input type="checkbox"/>						
Description of symbols acc. to table 1.3-32/2	<input type="checkbox"/>						
Terminal box without cable	<input type="checkbox"/>						
Standard nominal voltage U_N :	<table> <tr> <td>24 VDC</td> <td><input type="checkbox"/></td> </tr> <tr> <td>115 VAC</td> <td><input type="checkbox"/></td> </tr> <tr> <td>230 VAC</td> <td><input type="checkbox"/></td> </tr> </table>	24 VDC	<input type="checkbox"/>	115 VAC	<input type="checkbox"/>	230 VAC	<input type="checkbox"/>
24 VDC	<input type="checkbox"/>						
115 VAC	<input type="checkbox"/>						
230 VAC	<input type="checkbox"/>						
Execution:	<table> <tr> <td>T1...T4</td> <td><input type="checkbox"/></td> </tr> <tr> <td>T1...T6</td> <td><input type="checkbox"/> (on request)</td> </tr> </table>	T1...T4	<input type="checkbox"/>	T1...T6	<input type="checkbox"/> (on request)		
T1...T4	<input type="checkbox"/>						
T1...T6	<input type="checkbox"/> (on request)						
Design-Index (Subject to change)							

GENERAL SPECIFICATIONS

Description	4/2-, 4/3-spool valve
Nominal size	NG6 to ISO 4001-03
Construction	Direct operated spool valve
Operation	Solenoid
Mounting	Flange 4 fixing holes for cyl. screws M5x45 M5x75 with distance plate ADP6/30
Connections	Threaded connection plates Multi-flange subplates 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)
Mounting position	any, preferably horizontal
Fastening torque	$M_0 = 5,5 \text{ Nm}$ (quality 8.8)
Weight: 4/2-way impulse	$m = 5,0 \text{ kg}$
4/3-way	$m = 5,0 \text{ kg}$
4/2-way (1 solenoid)	$m = 3,0 \text{ kg}$

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, classe 20/18/14 (Required filtration grade $\beta_{10...16} \geq 75$) refer to data sheet 1.0-50/2
Viscosity range	12 mm ² /s...320 mm ² /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)
Working pressure	$p_{max} = 350 \text{ bar}$
in port P, A, B	
Tank pressure in port T	$p_{max} = 100 \text{ bar}$
Max. volume flow	$Q_{max} = 50 \text{ l/min}$
Leakage volume flow	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

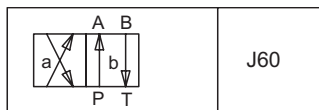
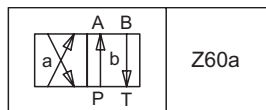
Construction	Solenoid, wet pin push type, pressure tight
Standard-nominal voltage	$U_N = 24$ VDC $U_N = 115$ VAC, $U_N = 230$ VAC DC = Ripple 20%, wired with VDR AC = 50 to 60 Hz $\pm 2\%$; with half wave rectifier and recovery diode
Voltage tolerance	+/- 10% of rated voltage
Protection class	IP 65 to 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 11...14 mm
Temperature class:	(acc. to EN 50014)
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

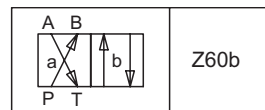
Information concerning the installation and commissioning is contained in the operating instructions supplied together with the solenoid coil.

TYPE LIST/DESIGNATION OF SYMBOLS

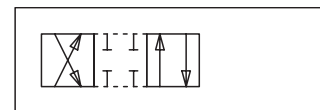
4/2-way valve impulse


 4/2-way valve with spring reset
 Operation A-side


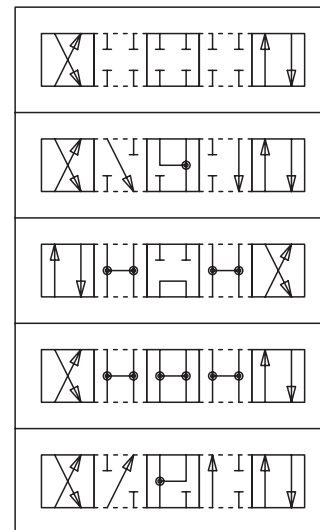
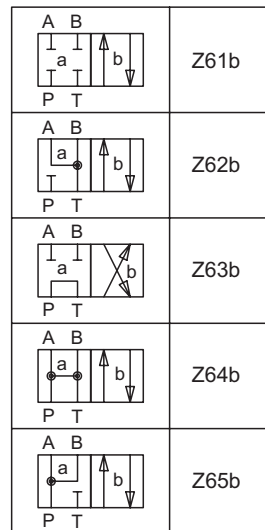
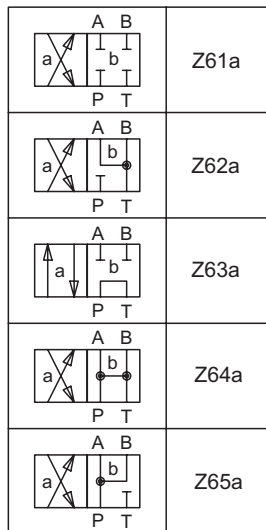
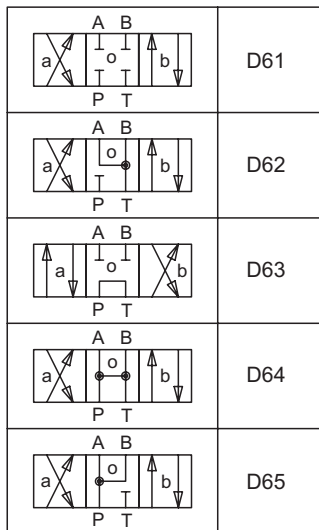
Operation B-side



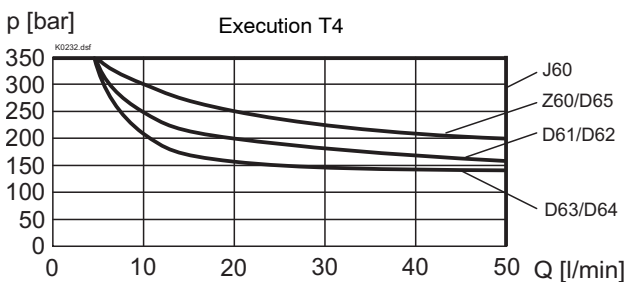
Transitional functions

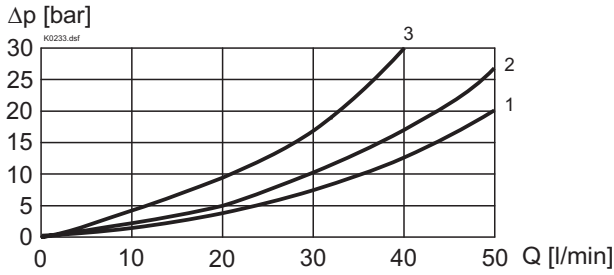


4/3-way valve spring centred

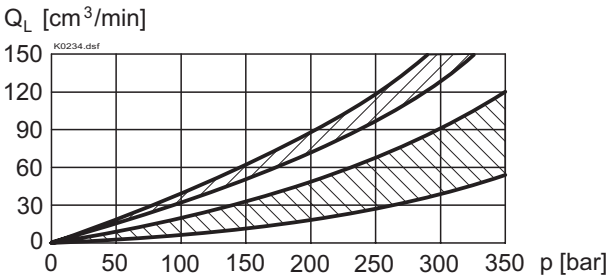

CHARACTERISTICS (T6 on request) Oil viscosity $\nu = 30$ mm²/s



$p = f(Q)$ Performance limits with standard voltage -10 %



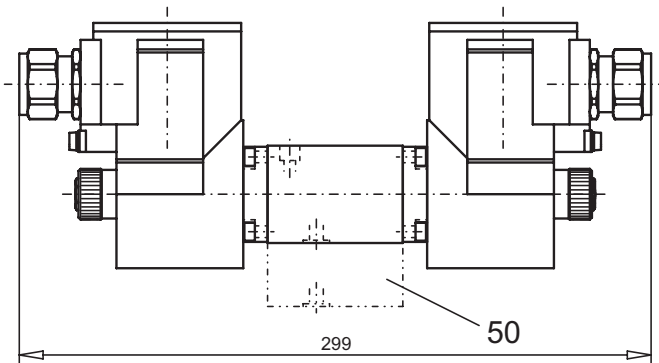
$\Delta p = f(Q)$ Pressure drop volume flow characteristics


Pressure drop Curve no.	Volume flow direction				
	Symbol	P - A	P - B	P - T	A - T
Z60/J60	2	2	-	2	2
D61/Z61	2	2	-	2	2
D62/Z62	2	2	-	2	2
D63/Z63	2	2	3	2	2
D64/Z64	1	1	-	1	1
D65/Z65	1	1	-	2	2

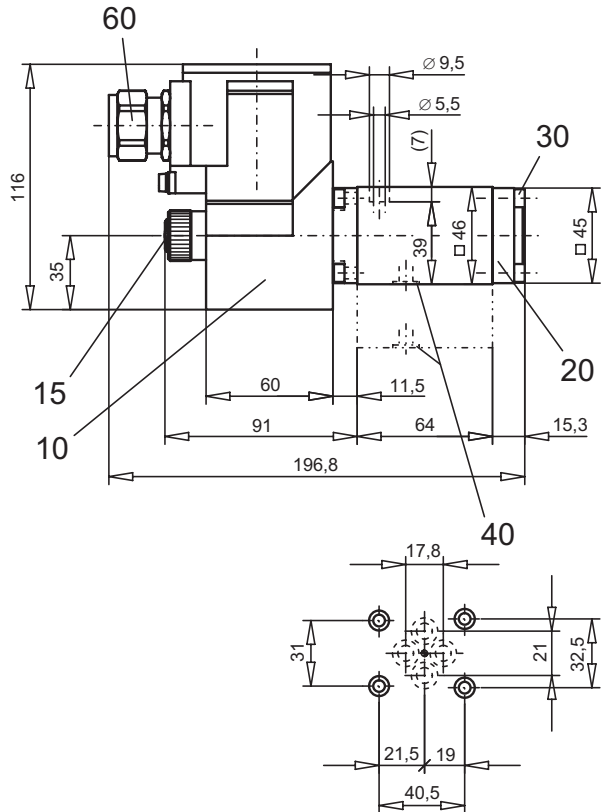
 $Q_L = f(p)$ Leakage volume flow characteristics per control edge


-  Envelop curve for spool no. 3
-  Envelop curve for the remaining spools

DIMENSIONS

 4/3-way valve (spring centred)
 4/2-way valve (impulse)

 Order distance plate
 ADP6/30 separately

4/2-way valve (spring offset)


PARTS LIST

Position	Article	Description
10	207.5...	Coil type EExd
15	253.8000	Plug with integrated manual override HB4,5
20	058.4200	Cover
30	246.2117	Socket head cap screw M5x16 DIN 912
40	160.2093	O-ring ID 9,25x1,78
50	173.3453	Distance plate ADP6/30
60	111.1080	Cable entry brass M20

ACCESSORIES

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

Technical explanation see data sheet 1.0-100E