


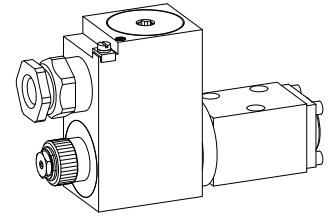


Solenoid operated spool valve

- 4/2-way impulse version, detented
- 4/3-way with spring centred centre position
- 4/2-way spring reset
- $Q_{max} = 20 \text{ l/min}$, $p_{max} = 350 \text{ bar}$

NG4-Mini[®]

-  II 2 G Ex d IIC
-  II 2 D Ex tD A21 IP65
-  I M2 Ex d I Mb


DESCRIPTION
For explosion-hazard zones

Spool valve flange type NG4-Mini with four connections. Direct operated solenoid spool valve in 5-chamber-system.

Solenoid coil in acc. with directive 94/9/EC (ATEX) for explosion-hazard zones.

The flameproof enclosures (acc. to EN/IEC 60079-1/31 and EN/IEC 61241-1) prevents an explosion in the interior from getting outside. The design prevents a surface temperature capable of igniting.

FUNCTION

The energised solenoid shifts the spool into the corresponding position.

- 4/2-way impulse spool valve:

Two solenoids and two detented switched positions. With the solenoids de-energised, the spool remains in the corresponding switched position, by the detentings.

- 4/3-way spool valve:

Two solenoids and three switched positions. With the solenoids de-energised, the spool returns to the centre position by spring force.

- 4/2-way spool valve:

One solenoid and two switched positions. With the solenoid de-energised the spool returns to the offset position by spring force.

APPLICATION

These valves are suitable for applications in explosion-hazard zones, open cast and also in mines. Solenoid operated spool valves are mainly used to control the direction of movement and to hold hydraulic cylinders and motors. The direction of flow through the valve is determined by the spool symbol. The switching performance and the possible leakage must be taken into consideration when designing a system.

CERTIFICATES

in accordance with	Surface gas + dust	Mining
ATEX	x	x
IECEX	x	x
GOST Ex	x	x
Australia	x	x
Inmetro	x	x
NEPSI	x	

The certificates can be found on www.wandfluh.com / DOWNLOADS / Accompanying Ex-proof / MKY45/18-...-L...

TYPE CODE

		B EXd 4 <input type="checkbox"/> - <input type="checkbox"/> / <input type="checkbox"/> / <input type="checkbox"/> # <input type="checkbox"/>	
International mounting interface ISO			
Explosion-proof execution, Ex d			
Number of control ports			
Description of symbols acc. to table			
nominal voltage U_N	12 VDC <input type="checkbox"/>	G12	
	24 VDC <input type="checkbox"/>	G24	
	115 VAC <input type="checkbox"/>	R115	
	230 VAC <input type="checkbox"/>	R230	
Nominal power P_N	9W <input type="checkbox"/>	L9	Ambient temp. by: 40 °C or 90 °C
	15W <input type="checkbox"/>	L15	70 °C
Certificate	ATEX, IECEX, GOST Ex <input type="checkbox"/>		
	Australia <input type="checkbox"/>	AU	Inmetro <input type="checkbox"/> IM
			NEPSI <input type="checkbox"/> NP
Design-Index (Subject to change)			

GENERAL SPECIFICATIONS

Description	4/2-, 4/3-way valve
Nominal size	NG4 acc. to Wandfluh standards
Construction	Direct operated spool valve
Operation	Solenoid operated
Mounting	Flange installation 3 attachment holes for cylinder screws M5x40 or M5x50 with distance plate BDP 4/12
Connections	Screw connection fixing plates In-line flange plates Longitudinal stacking system
Admissible ambient temp.	Execution L9: -20...+40 °C (operation as T1...T6/T80 °C) -20...+90 °C (operation as T1...T4/T130 °C) Execution L15: -20...+70 °C (operation as T1...T4/T130 °C) In case of $U_N < 20V$, the max. ambient temperature has to be reduced by 10 °C.
Mounting position	any, preferably horizontal
Fastening torque	$M_D = 5,5 \text{ Nm}$ (quality 8.8) for fixing screw $M_D = 5 \text{ Nm}$ for knurled nut
Weight: 4/2-way impulse	$m = 4,4 \text{ kg}$
4/3-way	$m = 4,4 \text{ kg}$
4/2-way (1 solenoid)	$m = 2,6 \text{ kg}$

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 L9: -20...+40 °C (operation as T1...T6/T80 °C) -20...+70 °C (operation as T1...T4/T130 °C) Execution L15: -20...+70 °C (operation as T1...T4/T130 °C)
Working pressure in port P, A, B	$p_{Tmax} = 350 \text{ bar}$ ($p_T < 20 \text{ bar}$) $p_{max} = 315 \text{ bar}$ ($p_T > 20 \text{ bar}$)
Tank pressure in port T	$p_{Tmax} = 100 \text{ bar}$
Max. volume flow	$Q_{max} = 20 \text{ l/min}$
Leakage volume flow	see characteristics



In case of the execution L15 for ambient temperatures of up to 70 °C the characteristic performance values were established at an ambient temperature of 50 °C.

ELECTRICAL CONTROL

Construction	Solenoid, wet pin push type, pressure-proof
Standard-nominal voltage	$U_N = 12 \text{ VDC}, 24 \text{ VDC}, 115 \text{ VAC}, 230 \text{ VAC}$ AC = 50 up to 60 Hz $\pm 2\%$; with built-in two-way rectifier
Voltage tolerance	$\pm 10\%$ of rated voltage
Protection class	IP67 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 gland for cable diameter 6,5...14 mm
Temperature class:	(acc. to EN 60079-0)
Execution L9	T1...T6
Execution L15	T1...T4
Nominal power:	
Execution L9	9 W
Execution L15	15 W

For further electrical characteristics, refer to the data sheet of the solenoid coil 1.1-183

OPERATION SECURITY

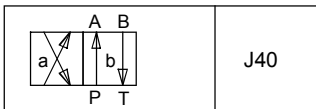
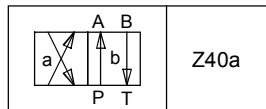

The solenoid coil must only be put into operation, if the requirements of the operating instructions supplied are observed to their full extent.
In case of non-observance, no liability can be assumed.

INSTALLATION

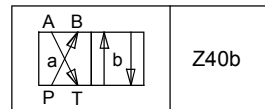
For stack assembly please observe the remarks in the operating instructions.

TYPE LIST / DESIGNATION OF SYMBOLS

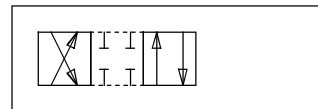
4/2-way valve impulse


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


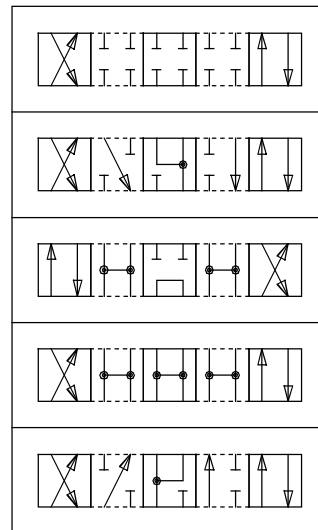
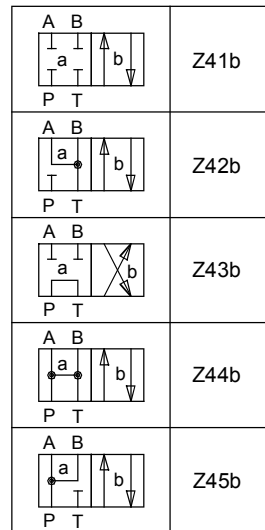
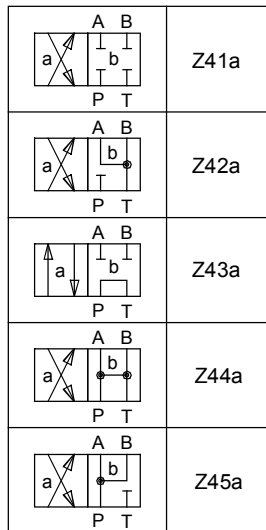
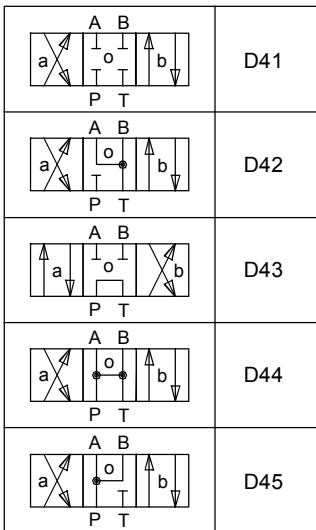
Operation B-side



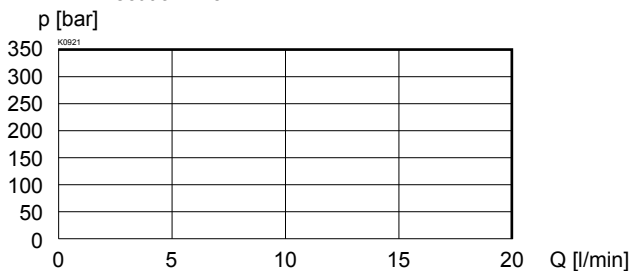
Transitional functions



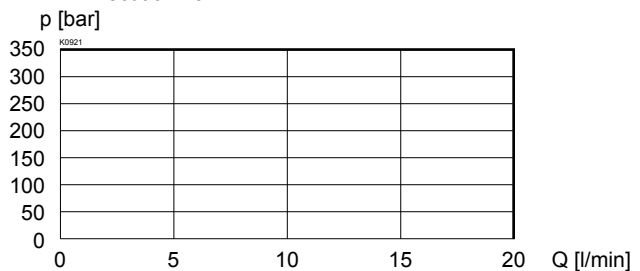
4/3-way valve spring centred

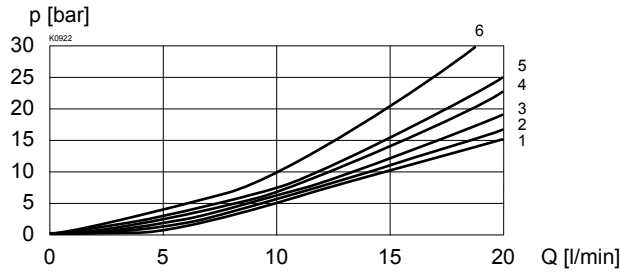

CHARACTERISTICS Oil viscosity $\nu = 30 \text{ mm}^2/\text{s}$

$p = f(Q)$ Power limits
in case of the standard voltage -10 %
measured at 50 °C
Execution L15

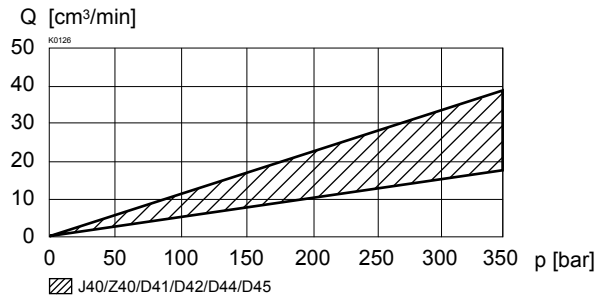

Execution L9/90° on request

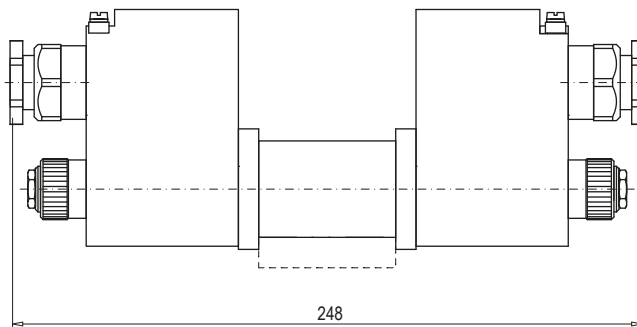
$p = f(Q)$ Power limits
in case of the standard voltage -10 %
measured at 40 °C
Execution L9



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


Symbol	Pressure loss characteristic curve no.	Volume flow direction				
		P - A	P - B	P - T	A - T	B - T
Z40/J40	5	5	5	-	2	2
D41/Z41	5	5	5	-	2	2
D42/Z42	5	5	5	-	1	1
D43/Z43	4	4	4	6	2	2
D44/Z44	4	4	4	3	2	2
D45/Z45	4	4	4	-	2	2

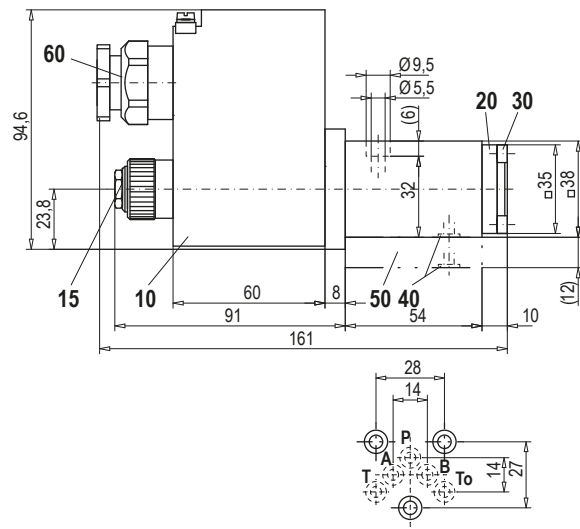
 $Q_L = f(p)$ Leakage volume flow characteristics per control edge

DIMENSIONS

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


Dimensions of the solenoid coil, refer to data sheet 1.1-183

Order distance plate BDP4/12 separatley

4/2-way valve (spring offset)


PARTS LIST

Position	Article	Description
10	263.6....	Spool MKY45/18x60-...
15	253.8000	Plug with integrated manual override HB4,5
20	057.4202	Cover
30	246.1113	Socket head cap screw M4x12 DIN 912
40	160.2052	O-Ring ID 5,28x1,78
50	173.1450	Distance plate BDP4/12
60	111.1080	Cable gland brass M20

ACCESSORIES

Threaded connecting plates, Multi-flange subplates and longitudinal stacking system see reg. 2.9

Technical explanation see data sheet 1.0-100