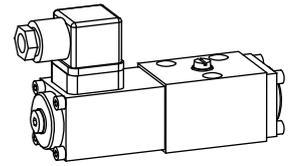


Solenoid operated spool valve with soft switching

- 4/2-way with 2 solenoids
- 4/3-way with spring centred mid position
- 4/2-way with spring reset
- $Q_{max} = 10 \text{ l/min}$, $p_{max} = 315 \text{ bar}$

NG4-Mini[®]

DESCRIPTION

Spool valve with soft switching, NG4-Mini flange construction in accordance to Wandfluh-standard with 4 connections. Solenoids to norme VDE 0580. Direct solenoid operated spool valve with a 5 annular chamber body design. The valve's with soft switching characteristic is achieved by means of an optimum combination of removable orifice and piston design. Solenoid wet pin oil immersed armature type. Precision honed spool for low leakage. Low pressure drop due to the body design and spool profiling. Spool is of hardened steel, body is of high grade hydraulic cast iron for long service life. Wide range of standard and special voltages in 2 solenoid versions. The body made of high grade hydraulic casting for long service life is painted. The cover and the solenoid are zinc coated.

FUNCTION

The solenoid shifts the spool into the corresponding position.

- 4/2-way
Two solenoids and 2 switch settings. 100% ED holds the switch setting on the solenoid (no mechanical detente).
- 4/3-way spool valve:
2 solenoids and 3 spool positions, spring centered. With the solenoids deenergised the spool returns to the center position.
- 4/2-way spool valve:
1 solenoid and 2 spool positions, spring offset. With the solenoid deenergised the spool returns to the offset position.

APPLICATION

Normal solenoid spool valves switch very quickly. This can induce shocks in the hydraulic system which can cause mechanical wear and have a negative effect on performance. The soft switching valves slow down and dampen the switching movements. All starting, stopping and oscillating movements are done softly, which benefits the system. Optimum results can be achieved if all ports are connected and the valve is properly bleed of air. Individual settings are available on request.

Important: at the time the valve is taken into service, the valve must be vented under pressure (max. 2 revolutions of screw E).

CONTENT

GENERAL SPECIFICATIONS.....	1
HYDRAULIC SPECIFICATIONS.....	1
ELECTRICAL CONTROL.....	2
SOLENOID DESCRIPTION.....	2
TYPE LIST/ DESIGNATIONS OF SYMBOLS.....	2
CHARACTERISTICS.....	3
DIMENSIONS.....	3
SHIFTING TIMES.....	4
PARTS LIST.....	4
ACCESSORIES.....	4

TYPE CODE

	B	W	4	-	/	#
Interface						
Economy-solenoid	<input type="checkbox"/>					
Medium-solenoid	<input type="checkbox"/>					
Soft switching						
Number of control ports						
Description of symbols acc. to table 1.4-11/2						
Standard- nominal voltage U_N :	12 VDC	<input type="checkbox"/>	G12	110 VAC	<input type="checkbox"/>	R110
	24 VDC	<input type="checkbox"/>	G24	115 VAC	<input type="checkbox"/>	R115
				230 VAC	<input type="checkbox"/>	R230
Orifice area:	$\varnothing 0,3$			Standard type no remark		
	$\varnothing 0,2$	<input type="checkbox"/>	0,2			
Design-Index (Subject to change)						

GENERAL SPECIFICATIONS

Description	4/2-, 4/3-way spool valve
Nominal size	NG4-Mini to Wandfluh-standard
Construction	Direct operated spool valve
Operations	Solenoid
Mounting	Flange 3 fixing holes for socket head cap screw M5x40
Connections	Threaded connection plates Multi-flange subplates Longitudinal stacking system
Ambient temperature	-20...+50 °C
Mounting position	any, preferably horizontal
Fastening torque	$M_p = 5,5 \text{ Nm}$ (screw quality 8.8)

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade $\beta_{6...10} \geq 75$) refer to data sheet 1.0-50/2
Viscosity range	12 mm ² /s...320 mm ² /s
Fluid temperature	-20...+70 °C
Working pressure in port P, A, B	Economy: $p_{max} = 250 \text{ bar}$ Medium: $p_{max} = 315 \text{ bar}$
Tank pressure in port T	$p_{max} = 100 \text{ bar}$
Max. volume flow	$Q_{max} = 10 \text{ l/min}$, see characteristics
Leakage volume flow	see characteristics

Weight	Economy	Medium
4/2-way (2 solenoid)	m = 1,2 kg	m = 1,4 kg
4/3-way	m = 1,2 kg	m = 1,4 kg
4/2-way (1 solenoid)	m = 0,83 kg	m = 0,93 kg

ELECTRICAL CONTROL

Construction	Solenoid, wet pin push type, pressure tight
Standard-nominal voltage	$U_N = 12 \text{ VDC}, 24 \text{ VDC}$ $U_N = 110 \text{ VAC}^*, 115 \text{ VAC}^*, 230 \text{ VAC}^*$ $AC = 50 \text{ to } 60 \text{ Hz}$ * Rectifier integrated in the plug, other nominal voltages and nominal performances on request.
Voltage tolerance	$\pm 10\%$ of nominal voltage
Protection class	IP 65 to EN 60529
Relative duty factor	100% DF (see data sheet 1.1-430)
Switching cycles	Since switching is damped and slow, the switching frequency is of secondary importance.
Operating life	10^7 (number of switching cycles, theoretically)
Connection/Power supply	Over device plug connection to ISO 4400/DIN 43650, (2P+E), other connections on request.

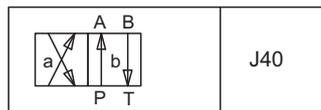
SOLENOID DESCRIPTION

With respect to the selection of the solenoid, the following statements are important:

- The solenoid is the most expensive component of the solenoid spool valve.
- For this reason, it is not economical to use the same solenoid for all applications.
- Depending on the application, sales area, and customer, the requirements for solenoid spool valves and solenoids differ very considerably.
- In order to be able to offer the customer an optimum, we can supply our solenoid spool valves NG4 in 2 different versions:
 - Economy BEIV (data sheet 1.1-100)
 - Medium SIN35V (data sheet 1.1-105)

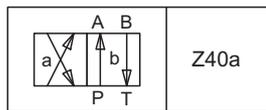
TYPE LIST / DESIGNATION OF SYMBOLS

4/2-way valve with 2 solenoids



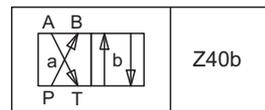
J40

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



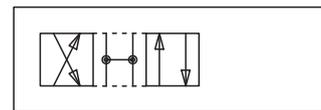
Z40a

operation B-side

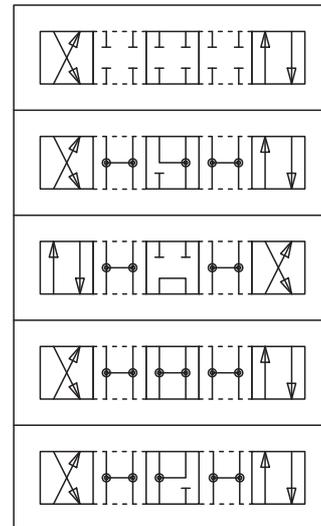
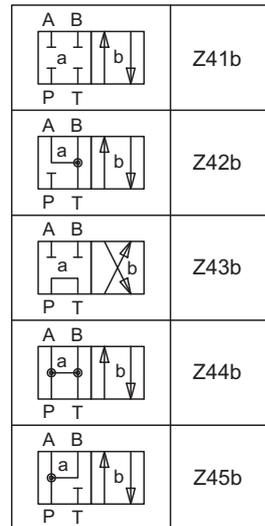
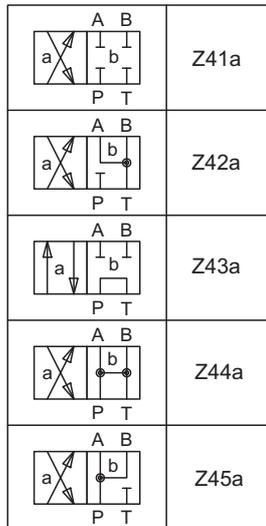
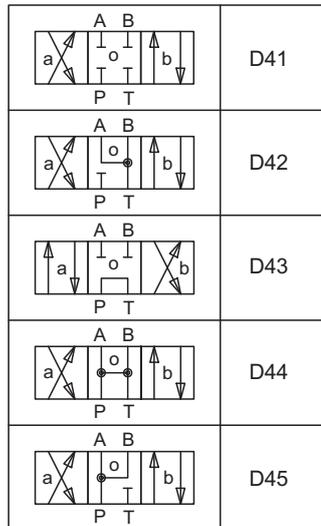


Z40b

Transitional functions

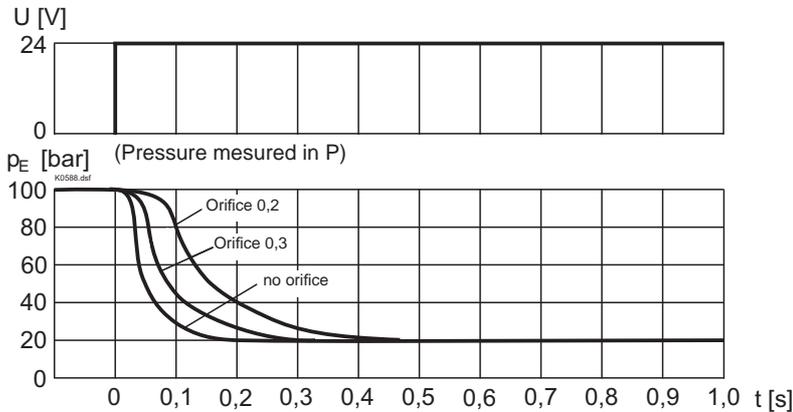


4/3-way valve spring centered

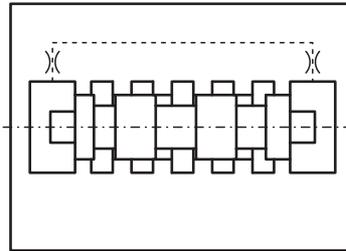


SHIFTING TIMES Influence of orifices on shifting
 Measured with BMW4D41-G24 Flow Q = 5 l/min

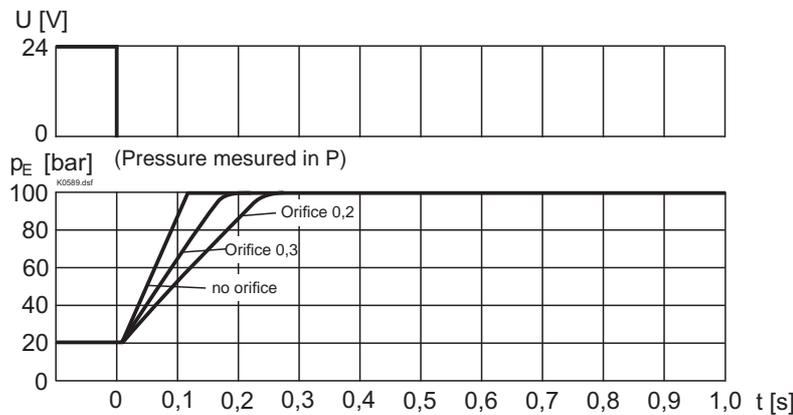
Solenoid energised



Orifices in valve body influence shifting time



Solenoid deenergised


PARTS LIST

Position	Article	Description
10	260.1 ... 260.4 ...	Economy-solenoid BEIIV Medium-solenoid SIN35V
20	239.2033	Plug HB0 (incl. seal)
30	219.2001	Plug A (grey)
35	219.2002	Plug B (black)
40	057.4202	Cover
50	246.1146	Screw M4 x 45 DIN912 (for BEIIV)
	246.1161	Screw M4 x 60 DIN912 (for SIN35V)
60	246.1113	Socket head cap screw M4 x 12 DIN 912
70	160.2052	O-ring ID 5,28 x 1,78
80	246.2006	Socket head cap screw M5 x 6 DIN84 A
90	049.2050	Bonded seal ID 5,7 x 10 x 1

ACCESSORIES

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

Technical explanation see data sheet 1.0-100