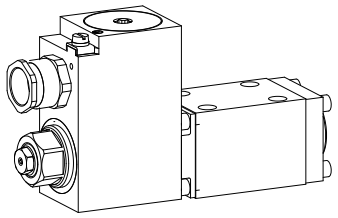
Solenoid operated spool valve
- **4/2-way impulse version, detented**
- **4/3-way with spring centred centre position**
- **4/2-way spring reset**
- **Q_{max} = 50 l/min, p_{max} = 350 bar**

NG6

ISO 4401-03

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 NG6 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 valve detented:
Two solenoids and two detented positions.
• 4/3-way spool valve:
Two solenoids and three positions.
• 4/2-way spool valve:
One solenoid and two positions.

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 and dust	Mining
ATEX	x with option -60°C	x
IECEx	x with option -60°C	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

A EXd 4 [ ] - [ ] / [ ] / [ ] - [ ] # [ ]

International connection standard ISO			
Explosion protection version, Ex d			
Number of control ports			
Description of symbols acc. to table			
Nominal voltage U_N	12 VDC	G12	
	24 VDC	G24	
	115 VAC	R115	
	230 VAC	R230	
			Ambient temp. with:
Nominal power P_N	9 W	L9	40 °C or 90 °C
	15 W	L15	70 °C
Certification			
	ATEX, IECEx, GOST Ex		
	Australia	AU	Inmetro IM NEPSI NP
Temperature range	-25°C to ...		
	-40°C to ...	Z604	only with 15W
	-60°C to ...	Z591	only with 15W / ATEX and IECEx / Surface
Design-Index (Subject to change)			

GENERAL SPECIFICATIONS

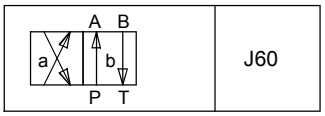
Description	4/2-, 4/3-way valve
Nominal size	NG6 acc. to ISO 4401-03
Construction	Direct operated spool valve
Operation	Solenoid operated
Mounting	Flange installation 4 attachment holes for cylinder screws M5x45 In case of valves for the temperature ran ge „-60°C to ...“ (Z591) screws of the quality A4 have to be used.
Connections	Screw connection fixing plates In-line flange plates Longitudinal stacking system
Admissible ambient temp.	**Execution L9:** -25…+40 °C (operation as T1…T6/T80 °C) -25…+90 °C (operation as T1…T4/T130 °C) **Execution L15:** Temperature range „-25° to ...“ -25…+70 °C (operation as T1…T4/T130 °C) Temperature range „-40° to ...“ -40…+70 °C (operation as T1…T4/T130 °C) Temperature range „-60° to ...“ -60…+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 Nm (quality 8.8) for fixing screw M_D = 5 Nm for knurled nut
Weight: 4/2-way impulse	m = 4,6 kg
4/3-way	m = 4,6 kg
4/2-way (1 solenoid)	m = 2,8 kg

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, classe 20/18/14 (Required filtration grade ß10...16≥75) refer to data sheet 1.0-50/2
Viscosity range	12 mm²/s...320 mm²/s
Admissible fluid temp.	**Execution L9:** -25…+40 °C (operation as T1…T6/T80 °C) -25…+70 °C (operation as T1…T4/T130 °C) **Execution L15:** Temperature range „-25° to ...“ -25…+70 °C (operation as T1…T4/T130 °C) Temperature range „-40° to ...“ -40…+70 °C (operation as T1…T4/T130 °C) Temperature range „-60° to ...“ -60…+70 °C (Betrieb als T1…T4/T130 °C)
Working pressure in port P, A, B	p_{max} = 350 bar
Tank pressure in port T	p_{Tmax} = 100 bar
Max. volume flow	Q_{max} = 50 l/min
Leakage volume flow	see characteristics

TYPE LIST / DESIGNATION OF SYMBOLS

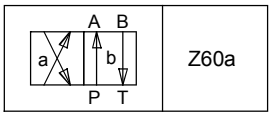
4/2-way valve impulse



J60

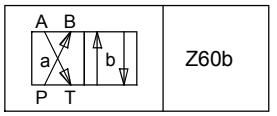
4/2-way valve with spring reset

Operation A-side



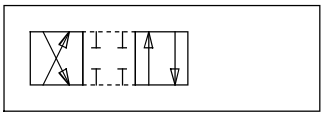
Z60a

Operation B-side

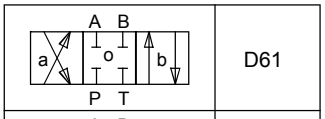
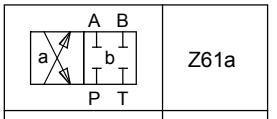
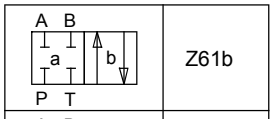
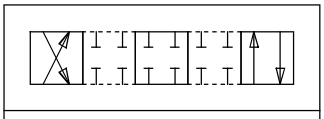
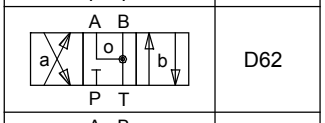
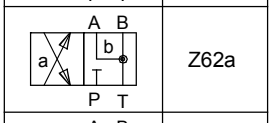
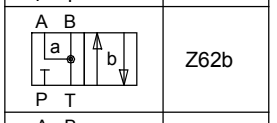
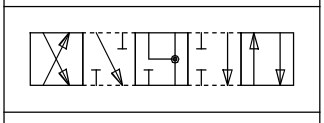
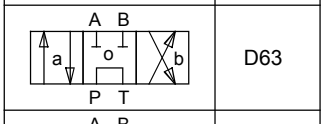
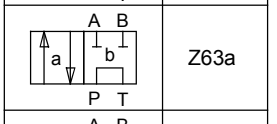
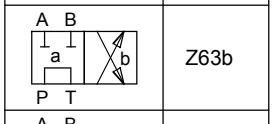
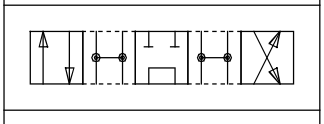
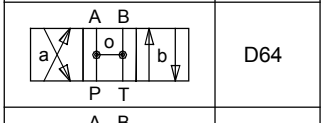
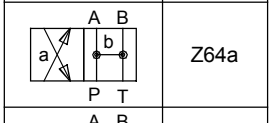
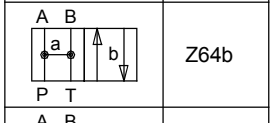
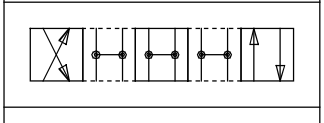
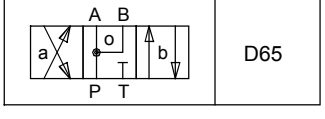
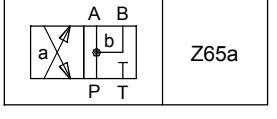
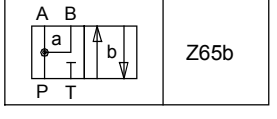
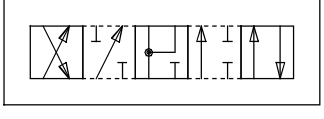


Z60b

Transitional functions

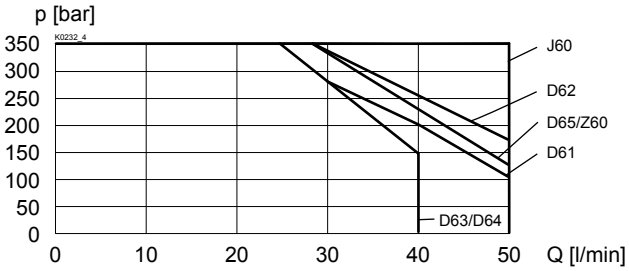


4/3-way valve spring centred

	D61		Z61a		Z61b	
	D62		Z62a		Z62b	
	D63		Z63a		Z63b	
	D64		Z64a		Z64b	
	D65		Z65a		Z65b	

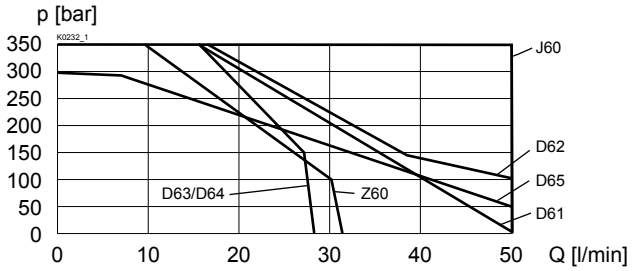
CHARACTERISTICS Oil viscosity υ = 30 mm²/s

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

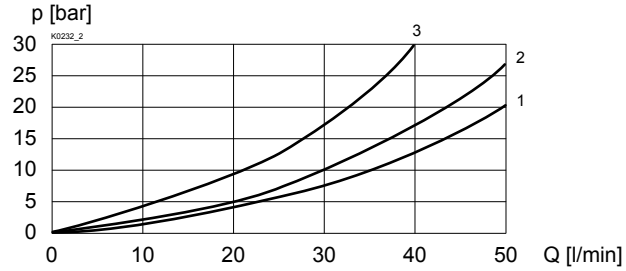


Execution L9/90° on request

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

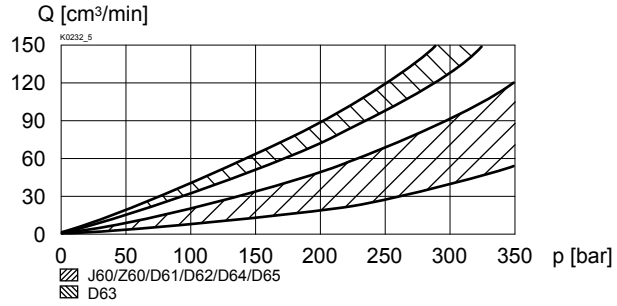


Δp = f (Q) Pressure drop volume flow characteristics



Symbole / Pressure loss characteristic curve no.	Volume flow direction P - A	P - B	P - T	A - T	B - 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



ELECTRICAL CONTROL

Construction	Solenoid, wet pin push type, pressure-proof
Standard-nominal voltage	U_N = 12 VDC, 24 VDC, 115 VAC, 230 VAC AC = 50 to 60 Hz ±2%; with built-in two-way rectifier
Voltage tolerance	±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

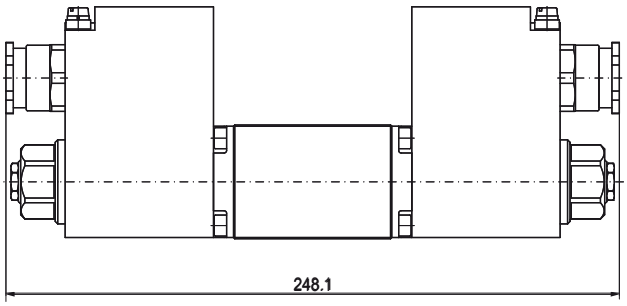
For further electrical characteristics, refer to the data sheet of the solenoid coil 1.1-183

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.

In case of valves for the temperature ranges "-40°C to ..." (Z604) and "-60°C to ..." (Z591), the leakage volume flow can be greater up to eight times.

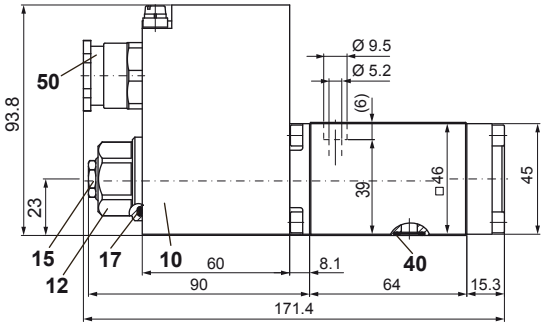
DIMENSIONS

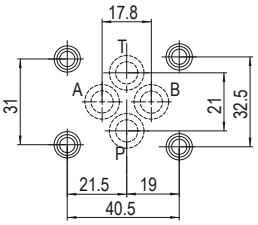
4/3-way valve (spring centred)
4/2-way valve (impulse)



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

4/2-way valve (spring offset)





PARTS LIST

Position	Article	Description
10	263.6....	Coil type MKY45/18x60-...
12	154.2603	Knurled nut M16 x 1 x 18
15		Plug with integrated manual override **„-25°C to ..."**
	253.8000	HB4,5 **-40°C to ...“**
	253.8023	HB4,5-D3 **„-60°C to ...“**
	253.8024	HB4,5-Z591
17	160.2251	O-ring ID 25.07 x 2,62 (NBR)
40	160.2093	O-ring ID 9,25x1,78 **„-25°C to ...“**
	160.7092	O-ring ID 9.25x1,78 **„-40°C to ...“**
	160.0091	O-ring ID 9,25x1,78 **„-60°C to ...“**
50	111.1080	Cable entry brass M20x1,5

ACCESSORIES

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

Technical explanation see data sheet 1.0-100

INSTALLATION

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

SECURITY OPERATED

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.